

MAQUET

GETINGE GROUP

VENTILATION
SERVO-i ONE SYSTEM
MULTIPLE OPTIONS

CRITICAL CARE





ADAPTABLE CLINICAL APPLICATIONS FROM ONE SYSTEM **MAQUET – THE GOLD STANDARD**



Leading the way: MAQUET is a premier international provider of medical technology solutions. Focused on the OR and ICU, the company is committed to developing solutions that improve patient care.

MAQUET draws on many years' experience in supplying state-of-the-art ventilator systems. Since the introduction of the first SERVO ventilator in 1971, MAQUET has delivered more than 100,000 units and SERVO has become the world's number one ventilation brand.

SERVO-i[®] now sets the standard for critical care ventilation. It delivers a high level of clinical performance to help clinicians provide the best possible care for neonatal, pediatric and adult patients.

SERVO-i is also easy to learn and use. Designed to be easily upgradeable, it grows with the hospital's changing needs to ensure lasting value.

MAQUET – The Gold Standard

DESIGNED TO MEET YOUR CURRENT AND FUTURE NEEDS

All-in-one platform: SERVO-i combines a high level of clinical performance for invasive, non-invasive or neurally controlled ventilation with outstanding mobility and cost efficiency. It features all the modes you would expect from an advanced ventilation system in one adaptable platform.

Four basic configurations are available: SERVO-i Infant, SERVO-i Adult, and two editions of SERVO-i Universal for all patient categories. SERVO-i Infant and SERVO-i Adult can always be upgraded to SERVO-i Universal.

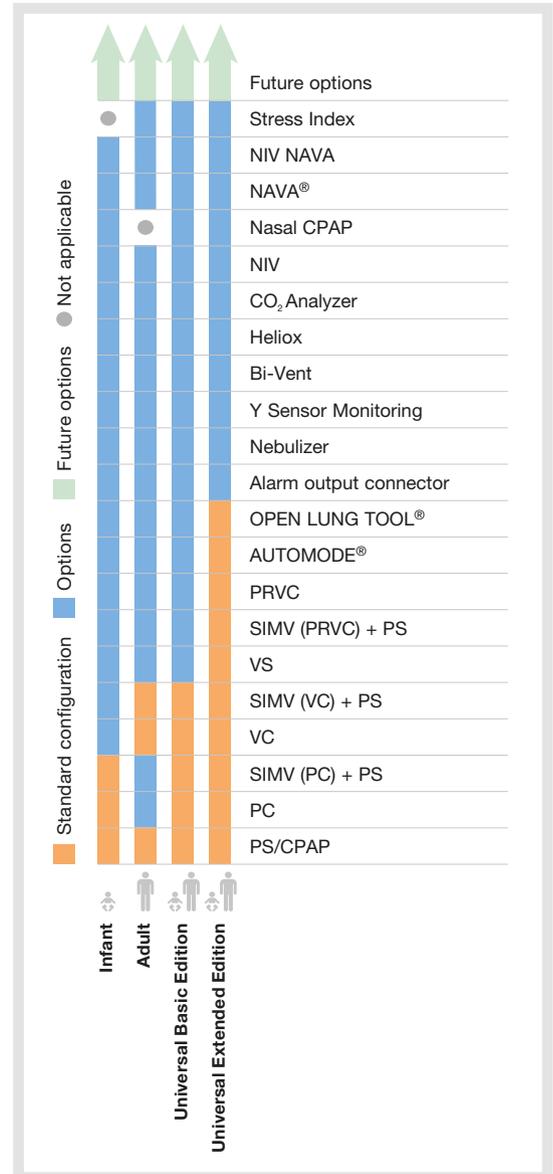
All SERVO-i ventilatory configurations are effective for bedside use and most of them are also available in MR edition.

Designed to grow with you: Unique features and upgrades can be added as your needs change, ensuring dependable performance in the years to come and the best possible return on your investment.

The SERVO-i ventilator fulfills the requirements in the most recent standards concerning performance, accuracy and functional safety. The SERVO-i ventilator comply with:

- IEC 60601-1:2005 (3rd edition)
- ISO 80 601-2-12:2011
- ISO 80 601-2-55:2011

SERVO-i ventilatory configurations



Key to abbreviations

- NAVA** Neurally Adjusted Ventilatory Assist
- NIV** Non-invasive ventilation
- SIMV** Synchronized Intermittent Mandatory Ventilation
- PRVC** Pressure Regulated Volume Control
- VS** Volume Support
- VC** Volume Control
- PS** Pressure Support
- PC** Pressure Control
- CPAP** Continuous Positive Airway Pressure

Cost-effective care: SERVO-i is a single system offering a broad range of treatment options, which means it is always ready to adapt to your changing clinical needs. Up-time is maximized thanks to the following features:

- Same system for invasive and non-invasive ventilation of adult, pediatric and neonatal patients, at the bedside and during transport and MR examinations
- Interchangeable modules can be used on all SERVO-i systems (CO₂ Analyzer, Y Sensor and Edi plug-in modules, batteries, expiratory cassettes)
- Plug-in modules and extra batteries can be inserted/removed during ventilation
- Quick automatic pre-use check of entire system including breathing circuit
- 1 year/5,000 hours planned maintenance interval
- MCare Remote Services

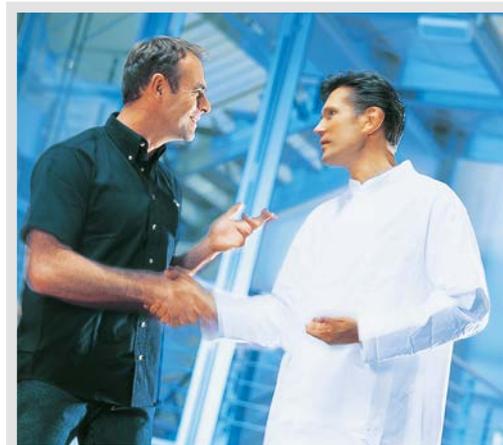
The system can be used more frequently and in more situations, saving time, ensuring continuous care and simplifying training and maintenance.



MCare remote connection allows high product flexibility and fast support services.



Easy to interchange functionality between ventilators.



MCare Services offers complete flexibility with a variety of services.

A SINGLE SYSTEM TO CUSTOMIZE TREATMENT FOR EVERY PATIENT

A flexible solution: The SERVO-i ventilation platform can satisfy the ventilatory needs of every patient, neonatal as well as adult, from the most acute phases of respiratory distress through recovery to the weaning phase. It continuously delivers outstanding ventilator treatment as gently as possible thanks to its ventilator performance, monitoring capabilities, treatment options and tools.

- Switch between conventional pneumatic ventilation or neurally-controlled ventilation
- Backup ventilation in case of apnea with automatic return to the supported mode if the patient starts to trigger breaths again
- Sensitive flow and pressure triggering with fast response time minimizes the work of breathing
- Compensation of compressible volume during inspiration
- Adjustable trigger sensitivity, apnea times and alarm sound level settings



SERVolution COMPREHENSIVE THERAPEUTIC PACKAGES

SERVolution™: MAQUET has introduced four comprehensive therapeutic packages for the SERVO-i. Each gives clinicians the ventilator capabilities to meet a specific therapeutic challenge.



SERVolution SYNCHRONIZE provides tools to objectively assess patient respiratory contribution and comfort levels and respond accordingly – guided by evidence.



SERVolution PROTECT offers tools to assess lung stress and implement lung protective interventions. NAVA ensures early respiratory muscle reconditioning in spontaneously breathing patients.



SERVolution RELIEVE supports obstructive patients with non-invasive ventilation and quantitative assessment tools. NAVA® together with extracorporeal CO₂ removal opens up a new treatment option for severe COPD patients.



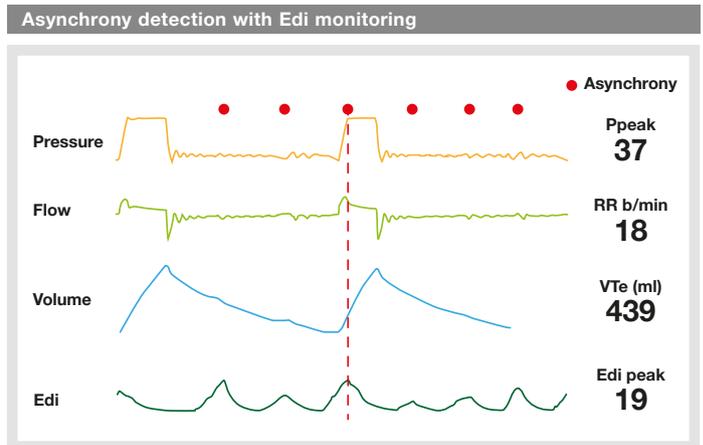
SERVolution BABY is configured with the assessment and intervention tools to address the unique support, protection and comfort needs of babies.

NAVA SYNCHRONY REDEFINED

Neurally Adjusted Ventilatory Assist (NAVA) is a unique approach to mechanical ventilation based on neural respiratory output.

Electrical Activity of the Diaphragm (Edi) is the respiratory vital sign. Monitoring of patient effort and the effects of sedation and asynchrony are best achieved by observing the Edi. The Edi curve and values provide detailed information in all ventilation modes on respiratory drive, volume requirements and the effect of ventilatory settings. Edi monitoring is the backbone of Neurally Adjusted Ventilatory Assist (NAVA), and allows insight on how conventional ventilation is applied.

In NAVA, the Edi is used to provide ventilator assist in synchrony with and in proportion to the patient's own efforts, regardless of patient category or size. As the work of the ventilator and the diaphragm is controlled by the same signal, coupling between the diaphragm and the SERVO-i ventilator is synchronized simultaneously.

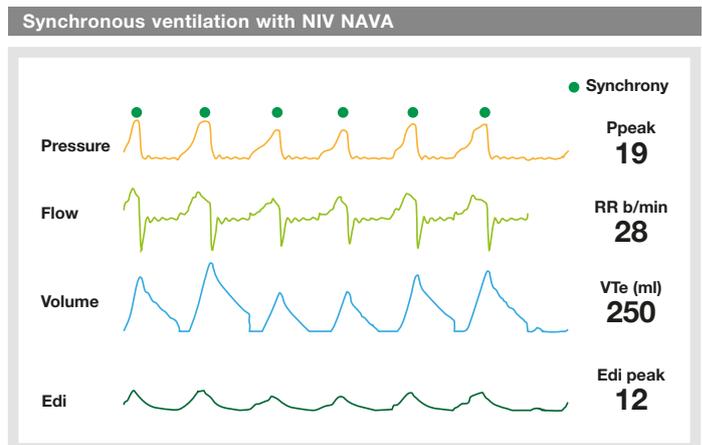


Comparing pressure and Edi reveals severe asynchrony between patient effort (Edi) and pressure response. Note also how lung filling (Volume curve) only began when the patient stopped inspiration.

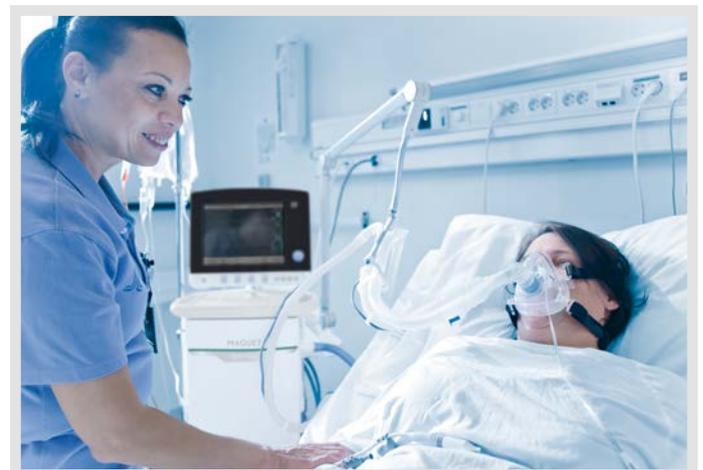


Patient-ventilator asynchrony is common in conventional non-invasive ventilation (NIV). Scientific studies suggest that leaks play a major role in generating patient ventilator asynchrony and discomfort. In infants and neonates, conventional NIV may be complicated by leakage and also because the effort by the infant is too weak to be reliably detected by the ventilator's pressure and flow triggers.

NIV NAVA is neurally-controlled non-invasive ventilation. NIV NAVA will provide synchronized assist independent of conventional pneumatic sensors and leakage associated with patient interfaces. NIV NAVA manages asynchrony, as the mode does not rely on a pneumatic signal and is not affected by auto PEEP. Breath triggering and cycle off are not affected by leakage, and every patient effort – independent of type of interface – is assessed and responded to equally effectively for all patients from adult to the smallest neonates.



The figure shows a COPD patient on NIV NAVA that is well aligned with the ventilator. The Edi-signal will help you to continuously assess the patient's comfort and progress.



A COMPLETE SPECTRUM OF TREATMENT OPPORTUNITIES

Non-invasive ventilation (NIV): NIV automatically detects and compensates for leakage, clearly displaying the leakage fraction. The system is on standby until triggered by patient effort or started manually. Cycling automatically pauses when the mask is removed.

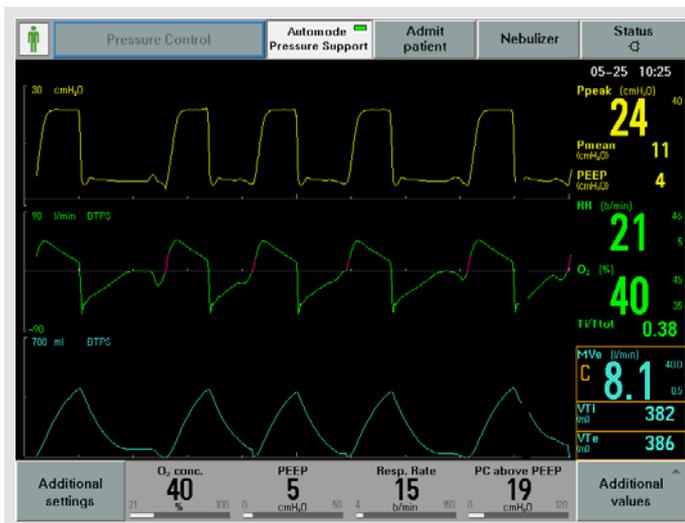
Nasal CPAP: This feature is designed for neonatal and pediatric patients. With high sensitivity to patient effort and stable CPAP pressure, Nasal CPAP allows a more natural patient-ventilator interaction and can reduce the work of breathing significantly.

AUTOMODE®: Starting in controlled ventilation and automatically switching to supported ventilation when the patient is triggering. Automode supports a smoother and safer patient transition between start and steady states and features adjustable apnea time.

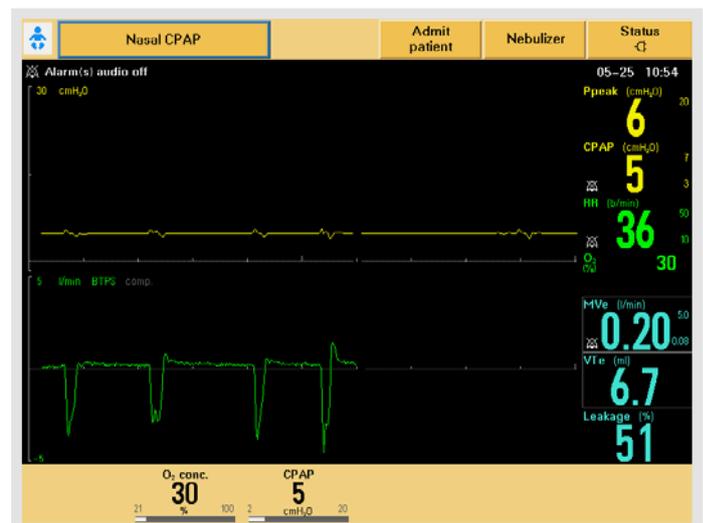
Pressure Regulated Volume Control: PRVC combines the advantages of volume and pressure controlled ventilation, allowing SERVO-i to deliver the preset tidal volume with the lowest pressure possible.

Volume Support: This mode decreases the patient's work of breathing through pressure support, with the added benefit of a set target tidal volume. The breaths are delivered with the lowest pressure needed to reach the target volume, independent of breathing frequency.

Bi-Vent: This option allows a mix of controlled and assisted ventilation at low and high pressure levels. Timings for each pressure level can be set, and the patient can breathe spontaneously at both. Bi-Vent can also be used for Airway Pressure Release Ventilation (APRV).



AUTOMODE delivers supported breath adapted to patient effort.



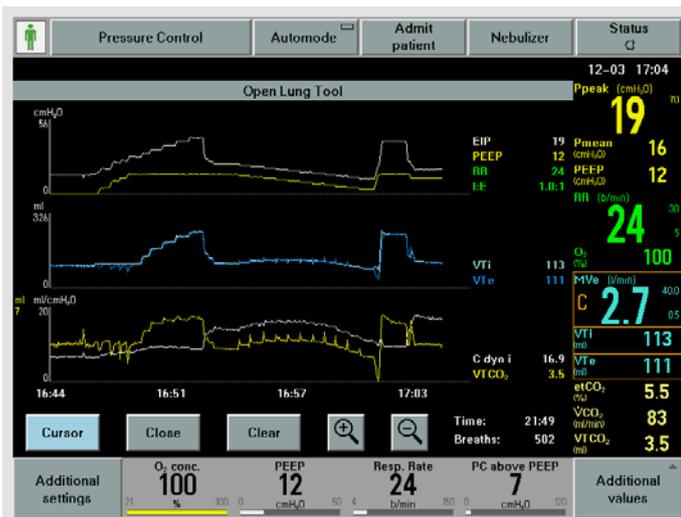
Ventilation with Nasal CPAP.

OPEN LUNG TOOL® (OLT): This option assists with alveolar recruitment and lung-protective strategies, facilitating implementation of hospital protocols. Measured and calculated values on-screen, including dynamic compliance, make it easier to assess recruitment efficacy. The OLT also provides a breath-by-breath trend of vital ventilation parameters.

Stress Index: In patients with ALI and ARDS, it is difficult to identify harmful ventilatory patterns, most importantly Atelectrauma, i.e. repeated tidal recruitment and collapse with each breath, and Barotrauma, i.e. overdistension of the airways and lungs. Stress Index helps the clinician detect and prevent such potentially high-risk scenarios, by analyzing changes in the compliance of the respiratory system during the constant flow of controlled breaths.

Mainstream CO₂ measurement: This interchangeable plug-in module provides fast and accurate measurements in a closed system that does not affect the ventilation, enabling the CO₂ Analyzer to work for all patient categories.

Heliox: Heliox, the low density gas mixture of helium and oxygen, is a widely-recognized therapy that minimizes turbulence, easing the work of breathing for patients from neonate to adult. The Heliox option can be used in all invasive and non-invasive modes and ensures automatic adjustment of monitoring and flow delivery when switching from air to Heliox and back



Lung recruitment with the help of OLT.



The Stress Index can be showed in a high resolution 60 minute trend.

PATIENT AND VENTILATOR STAY CONNECTED FOR CONTINUOUS QUALITY OF CARE

Flexible bedside adaption: SERVO-i can easily be lifted out of the mobile cart and mounted in many different ways. The SERVO-i user interface can be attached to a variety of poles, rails and shelves, and the patient unit can be safely mounted in the SERVO-i holder on e.g. wall-mounted rails or in the shelf base.

Treatment on the move: Continuity of care is essential for critically ill patients. SERVO-i lets you provide the same high level of care for all patients during transport, with no loss of treatment values, trends or information. The SERVO-i mobile cart can carry all SERVO-i accessories, including a dockable gas trolley.

Start to finish MR support: The MR Environment option ensures continued ventilatory performance in the MR room and facilitates transport to and from the MR examination. This minimizes stress, reduces risk of lung complications and improves hospital workflow.

SERVO-i in MR edition requires a separate agreement.

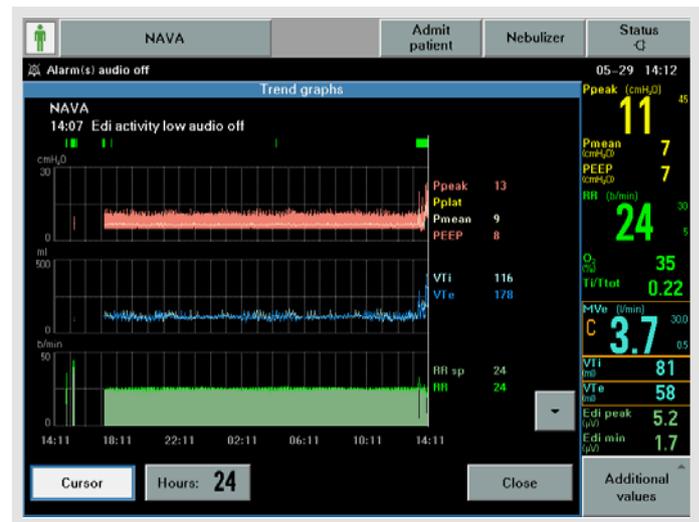


The MR Environment option ensures continued performance in the MR room.

THE USER INTERFACE THAT PUTS YOU IN CONTROL

Control with ease: SERVO-i is easy to learn and use. The system provides the information you need when you need it, allowing a fast and appropriate response from the user. A highly intuitive interface with a large touchscreen and simple, logical menus gives easy access to all settings. You can access the most important parameters through direct access knobs. You are always informed, in control and able to react.

- High-resolution waveforms with diagnostic quality
- Four of the five waveforms available can be viewed at the same time on the screen: pressure, flow, volume, optional Edi and CO₂
- Reference loops can be saved and viewed
- Continuous 24 hours storage of trend data
- Recording of waveforms and values for 20 second periods
- Patient data and screen pictures can be saved and exported to a PC via a Ventilation Record Card for archiving, later analysis or research
- Fast and simple start-up procedure with automated pre-use check and calibration
- Individual patient circuit leakage checks
- User defined start-up configuration



24 hour trend data.



Automatic pre-use check.

DELIVERING EXTRA VALUE WITH FEATURES TO FIT EVERY NEED

Designed for convenience: SERVO-i comes with a number of value-adding features that add to its convenience. Plug-in modules such as the CO₂ Analyzer, Edi Module and batteries are interchangeable between systems: the same module can be used with other SERVO-i ventilators. SERVO-i has a one-piece cleanable and interchangeable expiratory cassette, so the system can be ready for the next patient almost instantly.

MAQUET also offers a wide range of accessories and consumables tested with the SERVO-i to guarantee optimal ventilation performance and patient comfort. The range includes active and passive humidifiers, patient breathing systems, NIV masks and the unique SERVO Duo Guard filter designed for safe use during nebulization.

MAQUET offers solutions for intermittent and continuous nebulization, with reusable or disposable units. All solutions offer high performance in aerosol delivery without affecting the ventilatory settings, making it possible to provide treatment to all, including the smallest patients.

SERVO-i comes with a mobile cart that carries all accessories and makes it easy to position the system to the right or left of the patient. The Compressor Mini provides added flexibility in hospitals with no regular piped air supply.



SERVO Duo Guard filter



Aeroneb Solo Nebulizer



Compressor Mini – quiet and compact, ideal for bedside use



Dockable gas trolley enhances mobility within the hospital



SERVO-i interchangeable expiratory cassette

SERVO-i WITH MCARE SECURING PERFORMANCE FROM DAY ONE

MAQUET MCare® is a holistic service concept that ensures SERVO-i will operate at peak performance throughout its lifecycle, and that your staff can take advantage of all its features in the best possible way. Beyond parts, training, service and maintenance, MCare offers innovative solutions such as unique online services and support and ongoing equipment upgrades.

Access to the MCare Portal. The MCare Portal is a unique offer from MAQUET. Using a remote connection, your team can review their own SERVO-i systems, follow up on service and maintenance schedules, get an instant view of service and user documents and access the latest news about the system. The portal also provides easy access to e-learning modules.

Cost and risk management. At MAQUET, we understand the importance of helping facilities manage ever-escalating health care costs. With MCare services, SERVO-i owners enjoy cost certainty on consumables and even the cost of the service program for its entire duration.

Complete flexibility. Clients can customize MCare to fit the various strategies different hospitals have for system maintenance. A MAQUET representative will be pleased to help shape the MCare solution that best suits your facility's needs.

	MAQUET MCare® Services & support	Customize your MCare®
	Telephone support	Optional
	Preventive service	Standard configuration
	Corrective service	Standard configuration
	Selected spare parts	Standard configuration
	Maintenance kits	Optional
	Selected consumables	Standard configuration
	Updates	Standard configuration
	Technical training	Standard configuration
	User training	Optional
	Emergency backup	Standard configuration
	Upgrades	Standard configuration
	Quality check	Standard configuration
	Consumables discount	Standard configuration
	Software options discount	Standard configuration
	Accessories discount	Standard configuration
	MCare Remote Service	Standard configuration
	MCare Portal	Standard configuration
	E-learning technical	Standard configuration
	E-learning user	Standard configuration

Local variations of MCare may occur. For more information contact your local MAQUET office or visit www.maquet.com



Cost & risk control – securing product life cycle reliability

MAQUET

GETINGE GROUP

Maquet Critical Care AB
171 54 Solna, Sweden
Phone: +46 (0) 8 730 73 00
www.maquet.com

For local contact:

Please visit our website
www.maquet.com

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