

MAQUET

VENTILATION
SERVO-i
INSPIRATION IN EVERY BREATH

CRITICAL CARE





PROVIDING THE HIGHEST LEVEL OF CLINICAL CARE **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, SERVO has become the world's number one ventilation brand.

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

SERVO-i is also very simple 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 THE NEEDS OF TODAY AND TOMORROW

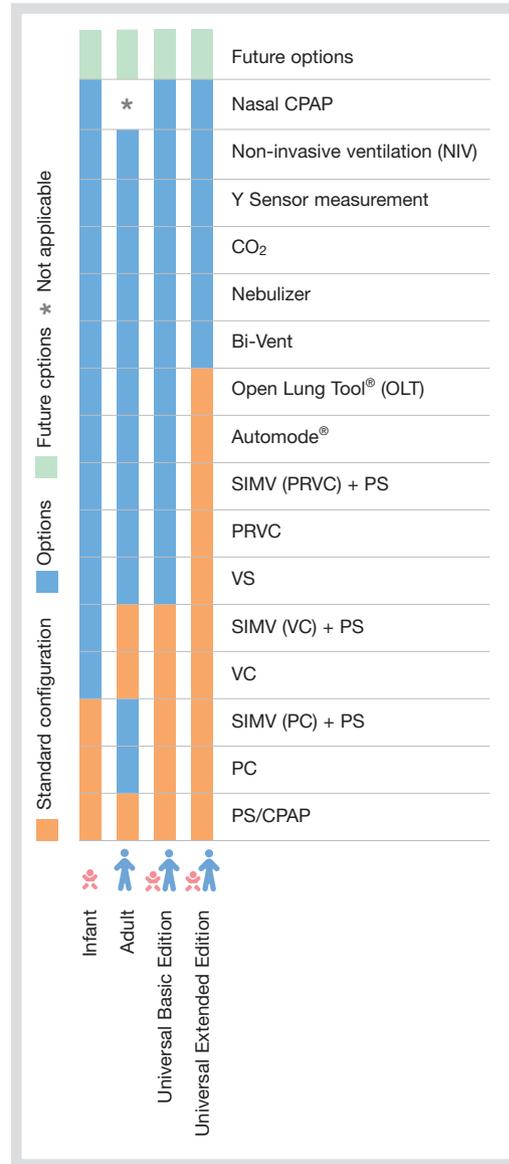
Comprehensive platform: SERVO-i combines the highest level of clinical performance with outstanding mobility and cost efficiency. The typical ICU needs to be prepared for many combinations of patient and clinical situations; SERVO-i addresses the treatment needs of neonatal, pediatric and adult patients from a single ventilation platform. Four configurations are available: SERVO-i Infant, SERVO-i Adult, and two editions of SERVO-i Universal.

The system is designed to grow to meet clinicians' changing needs. Upgrading is easy: software options and add-on modules add functionality to ensure any treatment requirements can be met. SERVO-i Infant and SERVO-i Adult can be upgraded to SERVO-i Universal, which caters to all patient categories. SERVO-i supports both invasive and non-invasive ventilation.

Additional software applications can be quickly loaded on-site, increasing the capabilities of SERVO-i in line with changing needs



SERVO-i ventilatory configurations



Key to abbreviations

- 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





A SINGLE SYSTEM FOR TREATING EVERY PATIENT

Sensitive to even the smallest patients: SERVO-i has outstanding sensitivity, essential for optimal treatment of neonatal and pediatric patients. It detects and immediately reacts to a minute change in lung pressure. This enhances interaction between the patient and the ventilator, allows for precise adjustments to changing patient conditions, and ensures a high degree of accuracy in delivered tidal volume.

As an alternative to integrated monitoring, Y Sensor measurement lets the clinician monitor as close to the patient as possible. As a safety measure, if problems should occur with the Y Sensor, the ventilator automatically takes over the monitoring. An oxygen sensor offers measurement of O₂ concentration as an alternative to traditional O₂ cell measurement. This lowers operating costs and is more environmentally friendly.

The system measures pressure on the expiration side to compensate for compressible volume during inspiration. It also features sensitive triggering with fast response time. Flow and pressure trigger sensitivity are provided. Adjustable Inspiratory Cycle Off ensures an appropriate ventilator response even where leakage is present. For added simplicity, SERVO-i can perform a separate patient circuit leakage check.

Treating adults: In non-complex situations and in stabilized patients, ventilation needs to be safe and reliable, and yet capable of adapting to changing clinical situations. SERVO-i features a range of user interface tools which allow the clinician to tailor the ventilator to the clinical situation. A back-up apnea function ensures safe ventilation in support modes.

The sensitive triggering system helps minimize the work of breathing. The system also offers modes such as Volume Support (VS) to deliver the required tidal volume at the lowest pressures.



All patient categories: The typical ICU must be able to cope with any combination of patient and clinical situations at all times. This means being able to manage different treatment modalities, even if time is short.

SERVO-i Universal represents the ultimate in flexible, adaptable ventilation for all patient categories. A comprehensive array of tools assists the clinician who is interested in investigating many treatment options.

The economic benefits in operating this modular platform are considerable: there is no need to scrap and reinvest for different patient categories and situations.

Having a single system for a broad range of treatment options increases use and saves training time. Common, interchangeable components (batteries, CO₂ modules, etc.) help reduce costs further and increase uptime. And its scalability and open architecture mean that SERVO-i can always be upgraded so that the investment is paid back in the future.

A RANGE OF MODES FOR DIFFERENT TREATMENT SCENARIOS

Flexible treatment: SERVO-i features a range of ventilator modes for different treatment scenarios. The system supports controlled mechanical ventilation, assisted ventilation, non-invasive ventilation and Nasal CPAP. It's easy to switch between these modes, with no change of equipment or resetting of the system required. This ensures continuity of care and simpler procedures.



Invasive ventilation



Non-invasive support: SERVO-i offers outstanding features for non-invasive ventilation (NIV). Using NIV can avoid complications associated with invasive ventilation, such as discomfort, infections and airway trauma, and the patient's ability to speak and eat is relatively unimpaired.

SERVO-i automatically detects and compensates for leakage, triggering an alarm if this is excessive. It displays leakage fraction to show how well the patient interface fits.

The system is in standby mode until ventilation is triggered by patient effort or started manually. Cycling is automatically paused when the mask is removed. SERVO-i is compatible with a wide range of patient interfaces.

Nasal CPAP: This feature is particularly valuable for neonatal and pediatric patients. With high sensitivity to patient effort and stable CPAP pressure, there are indications that Nasal CPAP can significantly reduce work of breathing.



CATCHING GOLDEN MOMENTS IMPROVES LUNG PROTECTION AND PROMOTES SPONTANEOUS BREATHING

Seize the moment: Golden Moments in mechanical ventilation™ are opportunities to improve lung protection and promote spontaneous breathing by providing timely assistance. Catching Golden Moments has many benefits for patients, including enabling of quicker weaning, fewer side effects, effective oxygenation and gas exchange, minimal influence on pulmonary and systemic circulation, and minimal lung damage.

How *SERVO-i* helps catch Golden Moments in mechanical ventilation:

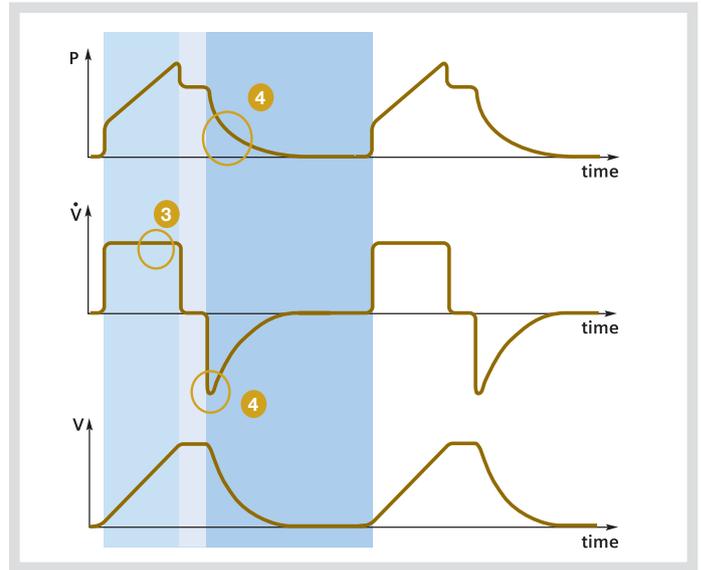
- Very high levels of sensitivity promote the clinician's ability to take accurate corrective actions early
- High speed of sensing allows for precise adjustments to changing patient conditions
- A range of ventilation modes and treatment extension features helps clinicians address specific needs for a wider array of patient characteristics

SERVO-i helps identify and take advantage of Golden Moments through:

- Late Inspiratory Recruitment
- Breath Initiation
- Flow-Adapted Volume Control
- Early Expiratory Flow
- Patient-Adjusted Inspiratory Flow
- Inspiratory Cycle Off
- Early Weaning

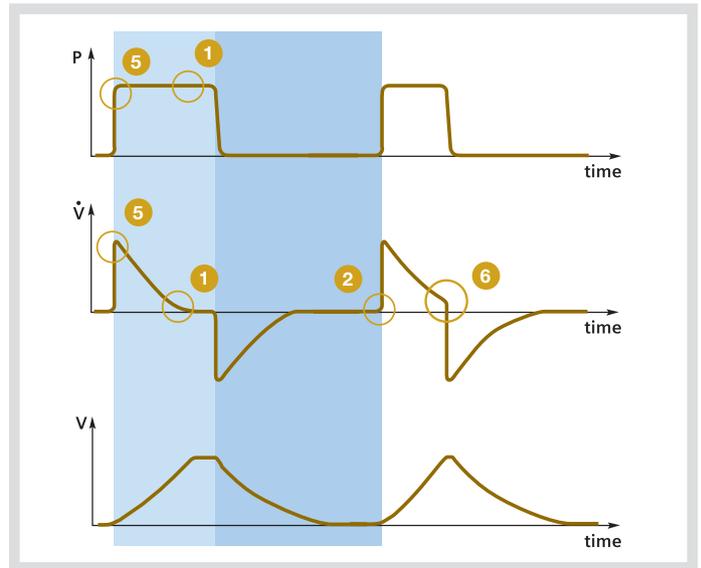
For more information regarding clinical performance, see our brochure "Golden Moments in Mechanical Ventilation"

Volume modes VC



Pressure modes PC/PRVC

PS/VS



- | | |
|--------------------------------|-------------------------------------|
| 1 Late Inspiratory Recruitment | 4 Early Expiratory Flow |
| 2 Breath Initiation | 5 Patient-Adjusted Inspiratory Flow |
| 3 Flow-Adapted Volume Control | 6 Inspiratory Cycle Off |

Mode
Pressure Control

mmHg



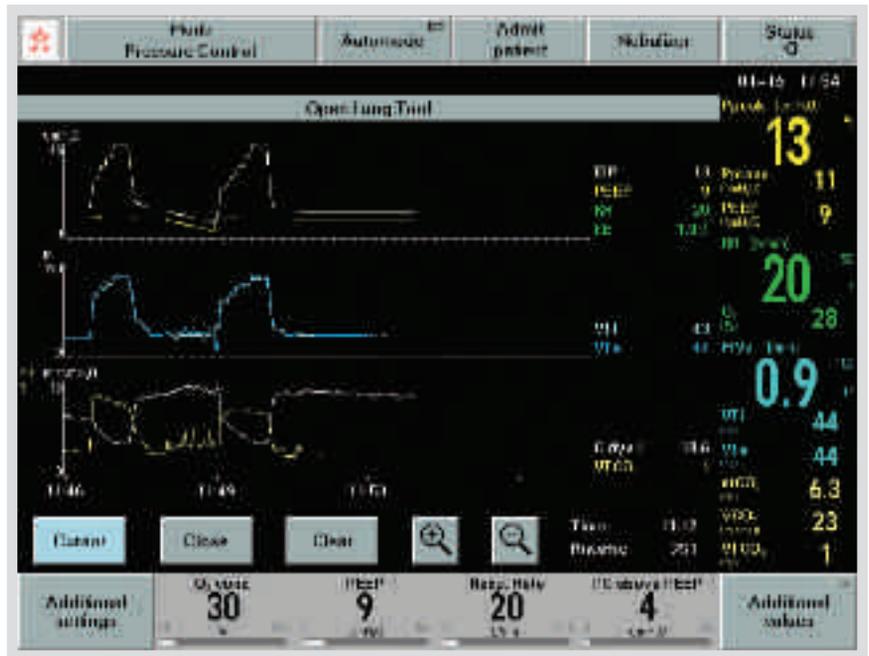
A COMPLETE SPECTRUM OF TREATMENT STRATEGIES

Lung-protective ventilation: All SERVO-i ventilators are designed to deliver lung-protective ventilation, and to help wean the patient at the earliest opportunity. SERVO-i provides enhanced modes and new tools for lung-protective treatment strategies.

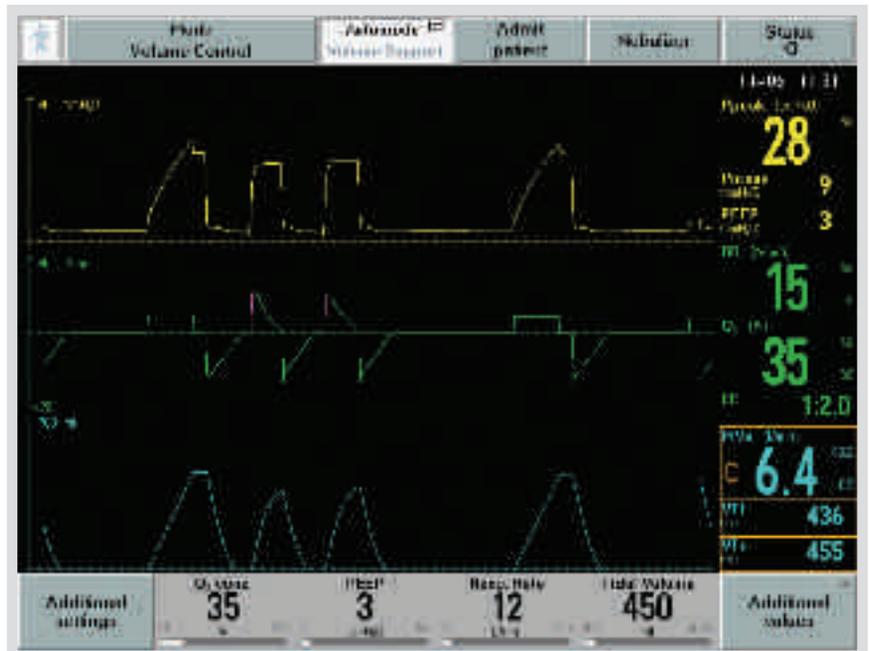
Open Lung Tool® with VT_{CO2}: SERVO-i offers and supports a number of tools to assist in alveolar recruitment and lung-protective strategies, such as the optional Open Lung Tool (OLT). This allows graphical visualization of measured and calculated values for easier interpretation of patient response to user-controlled recruitment procedures. The CO₂ Analyzer option allows the clinician to supervise tidal CO₂ elimination. The OLT can also be used as a breath-by-breath trend monitor of collected and stored parameter data.

Volume Support: Volume Support (VS) is important in helping to decrease the patient's own work of breathing. It provides capabilities such as preset target tidal volume delivery to the lowest inspiratory pressure independent of frequency, and effective adaptation to target levels.

Automode®: This option allows complete and automatic patient interaction, enabling the patient to breathe spontaneously until assistance is required. This well-established mode, with adjustable apnea time, enables a smoother and safer patient transition between start and steady states. It also provides documented shorter weaning times with less staff intervention.



Open Lung Tool with VT_{CO2}



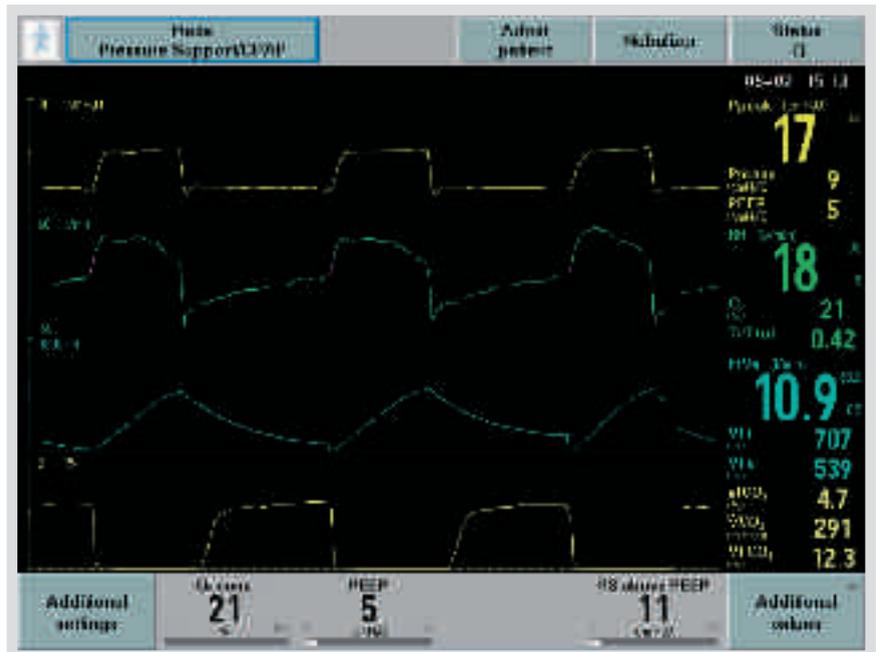
Automode

PRVC: The controlled mode of ventilation PRVC combines the advantages of volume controlled ventilation, where SERVO-i delivers the preset tidal volume with the lowest pressure possible. SERVO-i offers Synchronized Intermittent Mandatory Ventilation (SIMV), together with Pressure Regulated Volume Control (PRVC) and Pressure Support (PS).

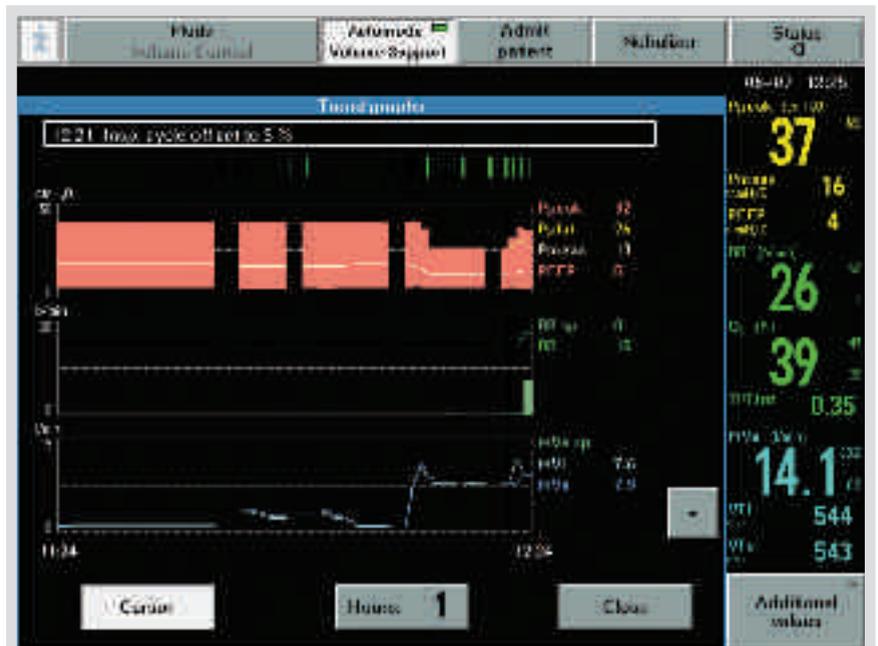
Four waveforms, including CO₂: The system's monitoring capabilities ensure more accurate time and detail recording through trend alternatives. Capnogram (CO₂) waveform can be viewed, together with mainstream monitoring of end tidal CO₂ (etCO₂), tidal CO₂ elimination (VTCO₂) and CO₂ minute elimination (V̇CO₂).

Trends and recording: Trend values are continuously stored, and trends can be displayed on the screen. Reference loops can also be saved and presented on screen. Information can be retrieved for further analysis for a period of up to 24 hours. A save function allows instant recording and display of waveforms and values. Patient data and screen pictures can easily be saved and exported to a PC via a ventilation record card for archiving, later analysis or research. All waveforms and parameter values for a 20-second period can be saved for later recall. The information can also be transferred to the ventilation record card.

Bi-Vent: This option allows the clinician to mix controlled and assisted ventilation at low and high pressure levels. Timings for each pressure level can be set by the clinician. The patient can breathe spontaneously at both levels.



Four waveforms, including CO₂



Trend



PATIENT AND VENTILATOR STAY CONNECTED FOR CONTINUOUS QUALITY OF CARE

Treatment on the move: Continuity of care is essential for critically ill patients. SERVO-i lets the clinician provide the same high level of care for neonatal, pediatric and adult patients during transport, with no loss of treatment values or trends and events information.

The patient unit can be easily lifted out and attached to the bed. The user interface can be attached to many different surfaces. Maximum flexibility in placement is enabled by the SERVO-i Holder and Shelf Base accessories.

Compact battery modules power the system during transport, and these can be changed during operation.

Inter-hospital transport: Patient transport by land and air is required in a variety of situations, such as when ICU patients need to be transferred to another hospital for specialist care, or to relieve the care burden at a hospital with limited treatment capacity.

SERVO-i is highly suited for inter-hospital transport of ICU patients. An advanced ICU ventilator with all the clinical performance required, its low weight and small dimensions fulfill mobility requirements. The system's long battery operating time and optimized gas consumption are also important advantages during transport.

MAQUET will form an agreement with the responsible organization verifying that the intended use of the SERVO-i can be extended to cover inter-hospital transport.



SERVO-i ensures continuous treatment quality for all patient categories in transport, with no loss of treatment values



Plug-in battery modules are powerful for their size and weight, adding to convenience during the process of transporting the patient



Inter-hospital transport by land



'Lift-Out' capability and the SERVO-i Holder give maximum flexibility in placement



Inter-hospital transport by air



Dockable gas trolley further enhances mobility within the hospital

A FLEXIBLE PLATFORM THAT'S EASY TO USE AND MAINTAIN

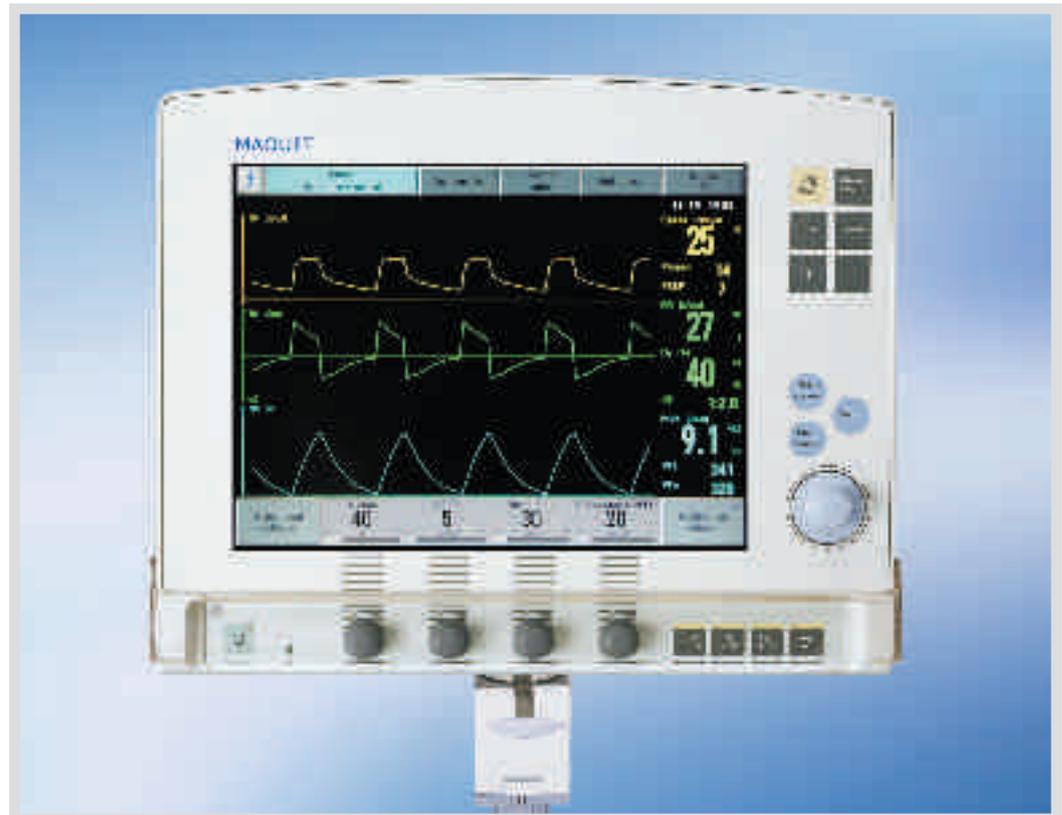
Control with ease: Flexibility, efficiency, and ease of training, operation and maintenance, are important considerations for any hospital. These are key factors in the design of SERVO-i.

SERVO-i is extremely easy to learn and use. It features a highly intuitive interface with a large touchscreen and simple, logical menus. Push buttons and knobs can also be used for control. The system gives direct access to vital settings such as PEEP, O₂ concentration, respiratory rate and volume/pressure. Trigger sensitivity, apnea times and alarm volumes are all adjustable.

The clinician can configure the ventilator to start up exactly as he or she chooses. The start-up ventilation mode and corresponding parameters are easy to set. A “previous mode” function switches instantly back to the previously used ventilation mode, with the settings preserved.

Adaptable performance: The system’s flexibility delivers many benefits for the patient, the clinician and the hospital. SERVO-i offers one platform for all patient treatments. There is no need to change equipment when switching from controlled mechanical ventilation/assisted ventilation to non-invasive ventilation/Nasal CPAP, saving time and ensuring continuity of care.

SERVO-i features a highly intuitive interface with large touchscreen

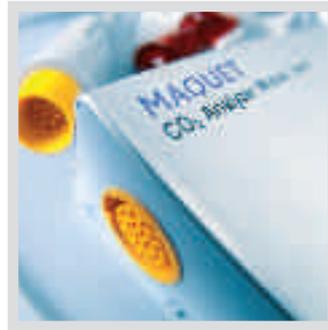


The Suction Support function pauses cycling during a tracheal suction procedure. Oxygen concentration can be manually set during pre- and post-oxygenation phases. For oxygen measurement, the system can be configured with a conventional consumable oxygen cell or an environmentally friendly non-consumable oxygen sensor.

Designed for convenience: Small plug-in modules, such as the CO₂ Analyzer, Y Sensor and batteries, add to convenience. These are also interchangeable between systems, so a separate module does not have to be purchased for each ventilator. All SERVO-i modules, software and options are backward compatible, ensuring the clinician can always take advantage of the latest functionality.

Two nebulizer systems are available. The SERVO Ultra Nebulizer is an integrated system based on ultrasonic technology. The Aeroneb Pro Nebulizer, a standalone system based on vibration technology, is also available as an option. Its small size and light weight make this unit highly suitable for treating the smallest patients.

SERVO-i has a one-piece, cleanable and interchangeable expiratory cassette, so the system can be instantly ready for the next patient. For added flexibility in hospitals with no regular piped air supply, the Compressor Mini has been designed to provide the ventilator with an assured supply of dry, filtered compressed air. It fits conveniently at the base of the SERVO-i Cart, forming a compact unit that is easy to move even in restricted space.



Small, convenient plug-in modules add to convenience during transport



One-piece expiratory cassette ensures shorter downtime and lower operating costs



Compressor Mini option - quiet and compact, ideal for bedside use

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