Servo-u

Personalized ventilation

This document is intended to provide information to an international audience outside of the US.

GETINGE

Personalized ventilation for better outcomes

Every patient comes with special challenges. Whether it's a 300-gram newborn or an adult, someone suffering from acute respiratory failure or chronic pulmonary disease, the needs and complexities will differ. That is why we are committed to innovating personalized ventilation solutions that help protect the lungs and diaphragm, speed up weaning and support better outcomes.

50 years of Servo innovation

Based on 50 years of groundbreaking clinical innovation, Servo-u gives you many options for personalized lung protection and weaning. All are easy to understand, implement and use, making it simple to integrate advanced personalized ventilation strategies into your daily patient care. This truly universal ventilator lets you move seamlessly between invasive and non-invasive modes, as well as High Flow therapy, for treatment of all patient categories, from neonates to adults.

Less time on ventilation

Unique tools and therapies support you at every stage. For example, our Stress Index[1–3] and Transpulmonary Pressure tools allow you to assess lung stress. And our groundbreaking Neurally Adjusted Ventilatory Assist (NAVA) ventilation mode shortens the time of weaning and mechanical ventilation[4] and increases the number of ventilator-free days[4–7] for adult patients in the ICU with acute respiratory failure, according to randomized control trials.

Freeing up hospital beds

All of this may translate to a significantly improved health economy, enabling hospitals to free up precious ICU beds and resources. Similar trials on pediatric and neonatal patients also show an increased rate of successful extubations[8,9] and that NAVA shortens the time of mechanical ventilation.[9–11] In short, personalized ventilation that makes a difference.

Simple to learn, safer to use

Servo ventilators build on more than 50 years of close collaboration with intensive care clinicians around the world. The result is continuous innovation, higher levels of patient safety and a superior user experience.[12]

Intuitive touchscreen

The intuitive touchscreen makes Servo-u a breeze to learn and use. Help menus, recommendations and prompts help staff to orientate quickly and follow guidelines. The interface also simplifies knowledge sharing, making it easy to retrieve screenshots and recordings or connect to a larger screen.

Ergonomic design

Servo-u features an ergonomic design. The screen can be rotated through 360°, which means you can place the ventilator anywhere around the bed, depending on clinical requirements. You can also mount Servo-u on a ceiling supply unit or shelf. The system is light and compact, making it highly suitable for intra-hospital transport.

Context-based guidance

Servo-u provides informative guidance for everything from pre-use check to initial parameter setting and throughout the entire treatment.

Safety Scale parameters

The system's Safety Scale tool makes parameter changes quick and intuitive, while dynamic images illustrate how those changes may affect ventilation.

Choose your view

- Basic, Advanced and Loops
- Distance and Family
- Servo Compass® and Pes & PL

Alarm management

The frame lights up when an alarm is triggered, and this visual signal is easy to see from any view point. On-screen checklists help you to manage each active alarm and avoid undesired alarms.

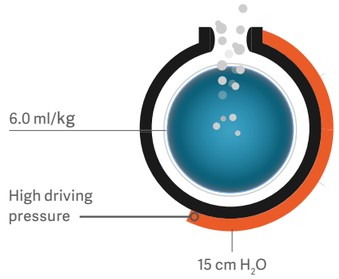
Personalized lung protection breath by breath

Recent clinical studies suggest that many ventilators lack effective bedside decision-support tools. It's a problem that results in protective ventilation strategies being delayed or inconsistently applied. Ultimately, this can harm the patient and worsen the outcome.[1,13,14]

To avoid these situations, Servo-u offers you the complete toolkit for personalized ventilation. It enables you to detect risks early and support timely and consistent implementation of personalized protective ventilation strategies, in line with the latest international guidelines.[14,15]

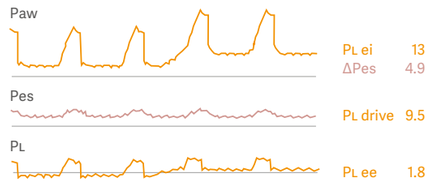
In other words, the right support for each patient, at the right time.

» These new tools have the potential to make a significant difference in terms of patient outcomes. They are far ahead of what we are using today![16]«



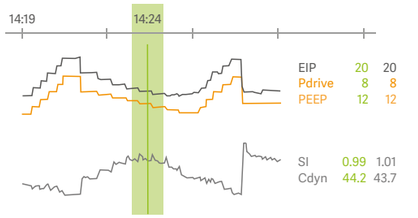
Servo Compass®

Servo Compass® makes it easy to see when plateau/ driving pressure or tidal volume per predicted body weight (VT/ PBW) are off pre-defined targets and interventions are needed.[16] Precisely calculated Dynamic compliance (Cdyn) and Stress index (SI) complete the picture, helping you detect changes in lung volume and verify over-distension.[1–3]



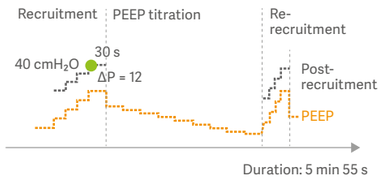
Transpulmonary pressure

To simplify esophageal manometry and improve accuracy, we have developed an automatic maneuver to validate balloon positioning and filling.
A diagnostic view provides esophageal (Pes) and transpulmonary (PL) pressure waveforms, with key parameters for safe assessment of controlled and spontaneous ventilation. The relationship between airway and transpulmonary pressures is now much more intuitive.



Open Lung Tool

Open Lung Tool trends helps you assess lung mechanics and gas exchange – breath-by-breath, in real time and retrospectively. It provides flexibility and guidance when personalizing PEEP and driving pressure during recruitment maneuvers, prone positioning and extracorporeal life support. Stress index, carbon dioxide elimination and transpulmonary pressure are also fully integrated.



Automatic recruitment maneuvers

Auto SRM is an automatic workflow for Stepwise Recruitment Maneuvers based on the Open Lung approach.[17] The tool guides you smoothly through recruitment, decremental PEEP titration, re-recruitment and post-recruitment personalization of PEEP and driving pressure, based on optimal Cdyn. Diagnostic features include assessment of recruitability and additional decision support when patients do not respond to the recruitment maneuver.[18]

Personalized weaning with lung- and diaphragm-protective ventilation

Recent clinical studies reveal that diaphragm weakness is prevalent (23–84%) in ICU patients and consistently associated with poor outcome.[19] Servo-u lets you monitor the patient's diaphragm activity (Edi) to personalize ventilation for successful weaning. It offers several options to start weaning your patients earlier and liberate them from the ventilator.

» NAVA shortens time of mechanical ventilation by almost 35%.[4]«

Target protective volumes and pressures

PRVC is a true volume-targeted mode that automatically adapts the inspiratory pressure to account for rapid changes in lung mechanics. Separated regulation of controlled and assisted breaths reduces tidal volume variations and ensures lower driving pressure. A low tidal volume strategy can therefore be maintained when a patients start breathing spontaneously.

Our interactive Automode eases the transition to spontaneous breathing for patients and staff. It switches seamlessly between controlled and supported modes, depending on patient effort.

Diagnose breathing to facilitate weaning

Edi – the vital sign of respiration – is a bedside diagnostic tool that allows you to monitor respiratory drive and effort and safeguard the patients diaphragm activity.[20,22] With the Edi signal continuously visible, you can detect diaphragm inactivity, over-sedation, patient ventilator asynchrony as well as over- and under-assist. You can also monitor changes in increased work-of-breathing during weaning trials and post-extubation.[22–29]

Edi monitoring is available in all invasive and non-invasive ventilation modes, and can be used from day zero to discharge from the intensive care unit.

Exercise the diaphragm and protect the lungs

NAVA (Neurally Adjusted Ventilatory Assist) follows the patients Edi to personalize lung-protective spontaneous breathing with higher diaphragmatic efficiency, and fewer periods of over- and under-assist.[23–26,30–32] It may improve the patient's ICU experience, helping to reduce sedation with improved comfort and sleep quality.[4,10,11,33–35] NAVA shortens the time of weaning and mechanical ventilation[4] and increases the number of ventilator-free days.

NIV NAVA significantly improves patient-ventilator interaction, and reduces NIV complications.[36] For patients with acute exacerbation of COPD it can be effective in managing their status and to improve patient outcomes.[36–40]

Improve comfort with effective therapies

High Flow therapy reduces the patient's work-of-breathing by providing an accurate flow of humidified oxygen, improving comfort and tolerance.[41]

Heliox therapy – this therapy option is designed for patients with airway resistance diseases. It is safe, reliable and easy to use, thanks to its low density, facilitating laminar flow that minimizes plateau and driving pressures.

Aerogen® nebulizer – this fully integrated feature offers a significantly higher lung deposition compared to jet nebulizers.[42] Its closed-circuit medication filling design mitigates transmission of patient-generated infectious aerosols.[43] For the recovering patient, Edi real-time respiratory drive monitoring will precisely quantify the effect of the above therapies.[44,45]

Get a sustainable solution based on efficiency and responsibility

Servo-u is a sustainable solution on multiple levels: Fewer parts that are long-lasting and easy to reprocess sourced responsibly, interchangeable with other Servos and always supporting your uptime. A flexible, modular platform that can be easily upgraded for your evolving clinical needs. Expert support at hand if needed. In other words, less waste, more productivity and a better environment for all.

Sustainability through efficiency

The Servo-u adds efficiency, drives down maintenance costs and reduces waste. It shares many of the same parts, components and platforms as other Servo ventilators. Hot swappable batteries, for example, and easy-to-clean respiratory cassettes that are interchangeable, meaning you can use any cassette that is ready for use if a patient is waiting. You can also choose from a range of consumables such as catheters, nebulizers and interfaces. All original parts and consumables are optimized for lasting high performance.

Extra support with Getinge Care

With 240 service centers globally, we are always close at hand. To maximize uptime, ask us about local service agreements. Our Getinge Care package, for example, comes in four different levels of support depending on your needs. Whatever your specific situation, our skilled service technicians and staff, many of whom are clinicians, are always there to support you. Servo-u is also designed for a high degree of connectivity: the ventilator connects to a wide range of PDMS systems and patient monitors. It can also use MSync (optional) as an HL7 converter, which makes the system conform to IHE Technical Frameworks.

Ventilation modes*

Invasive ventilation	Automode®
	Bi-Vent/APRV
	NAVA
	PC
	PRVC
	PS/CPAP
	SIMV modes
	VC
	VS
Non-invasive ventilation	Nasal CPAP
	NIV NAVA
	NIV PC
	NIV PS

Breathing therapies*

	High Flow
	Heliox
	Nebulization (Aerogen®)

Lung protection tools*:

	CO_2 analyzer
	Open Lung Tool (OLT) – Auto SRM – Auto RM – OLT trends
	Servo Compass
	Stress Index
	Transpulmonary pressure

Weaning tools*

	Automode®
	Edi monitoring
	Esophageal pressure
	P0.1

Invasive ventilation

Inspiratory tidal volume Adult Pediatric Neonatal	 100 – 4000 ml 10 – 350 ml 2 – 50 ml
Invspiratory flow	≤200 l/min
PEEP	0 – 50 cmH_2O
Pressure above PEEP Adult Pediatric/Neonatal	 0 – (120-PEEP) cm H_2O 0 – (80-PEEP) cm H_2O

Miscellaneous information

Screen	15" TFT LCD touchscreen
Dimensions patient unit	W 300 x D 205 x H 420 mm H incl. user interface 826 mm
Weight	~ 23 kg (patient unit 15 kg, user interface 4 kg) ~ 35 kg with mobile cart
Batteries, hot swappable	6 (2 included)
Battery back-up time	at least 3 h (with 6 batteries)
Nebulization	Aerogen, integrated
Respiratory vital sign	Edi plug-in module
Esophageal pressure	Paux plug-in module
Y sensor	Hot-Wire Anemometer plug-in module
CO_2 analyzer	Capnostat 5 plug-in module
External device interfaces	2 x RS-232C ports, VGA, USB, remote alarm, remote services
IHE technical framework	MSync HL7 converter

*Not all modes/options are available in the standard configuration.
Please contact your local Getinge representative for further information.
Refer to the Servo-u datasheet for additional technical specifications.

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