



HAMILTON-C3

The compact high-end ventilator



Swiss
Quality

HAMILTON
MEDICAL

Intelligent Ventilation since 1983



OPS Garderoben

OPS

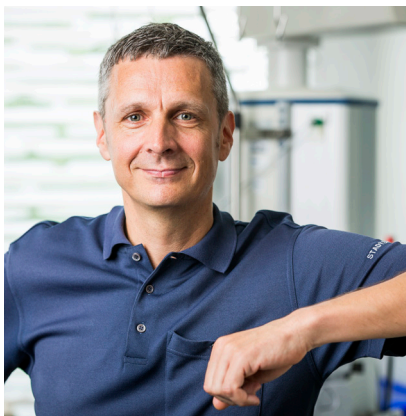


The compact high-end ventilator

HAMILTON-C3 - The all-rounder for ICUs

The HAMILTON-C3 ventilator is a modular high-end ventilation solution for all patient groups. Offering a number of unique features, the HAMILTON-C3 is one of the first ventilators featuring the “Ventilation Autopilot” INTELLiVENT-ASV®. The HAMILTON-C3’s compact design and independence from compressed air allow maximum mobility throughout the hospital. The integrated high-flow turbine guarantees an optimal pneumatic performance even in the presence of leakage (NIV).

- Automated control of the patient’s ventilation and oxygenation with INTELLiVENT-ASV
- P/V Tool Pro: Protective Ventilation Tool for lung assessment and recruitment
- High flow oxygen therapy
- High-performance NIV ventilation
- Compact and independent from compressed air
- Adult, pediatric, and neonatal ventilation



This compact all-rounder is easy to use and reliable, and has a user-friendly interface. With the INTELLiVENT-ASV option, the HAMILTON-C3 belongs to the top class of ventilators.

Matthias Parthe, Head of ICU Training and Education,
Triemli Hospital Zurich, Switzerland

Intelligent ventilation solutions

ASV & INTELLiVENT-ASV: automated lung-protective ventilation

The HAMILTON-C3 features the intelligent ventilation mode, Adaptive Support Ventilation (ASV®). ASV maintains an operator-set minute volume, and continuously determines respiratory rate, tidal volume, inspiratory pressure, and inspiratory time automatically depending on the patient's lung mechanics and effort. ASV adapts ventilation breath-by-breath, 24 hours a day, from intubation to extubation.

With the optional INTELLiVENT-ASV mode, you can upgrade your HAMILTON-C3 to a HAMILTON-C3S. This unique mode takes the proven concepts of ASV one step further: the clinician sets targets for PetCO_2 and SpO_2 for the patient. INTELLiVENT-ASV then automates the ventilator controls to reach these targets while taking into account the physiologic inputs from the patient (PetCO_2 , SpO_2 , lung mechanics, and spontaneous breaths). It automatically adjusts controls relevant to oxygenation (PEEP, Oxygen) and ventilation (respiratory rate, tidal volume, inspiratory pressure, and inspiratory time). In addition, INTELLiVENT-ASV provides an automated weaning protocol (Quick Wean) including automatic spontaneous breathing trials.

P/V Tool Pro: Protective Ventilation Tool for lung assessment and recruitment

The optional P/V Tool performs a respiratory mechanics maneuver that records a quasi-static pressure/volume curve showing both the inflation and deflation curves. This data can then be analyzed to determine the lung recruitability and recruitment strategy to apply. The P/V Tool can also be used for lung-recruitment maneuvers and to display the recruited lung volume. The P/V Tool is particularly helpful for ARDS patients, as appropriate lung recruitment and the correct setting of PEEP as an anti-derecruiting force are critical.



The HAMILTON-C3S edition includes INTELLiVENT-ASV



P/V Tool Pro

Ventilation therapies for various needs

From neonates to adults

The HAMILTON-C3 provides a tidal volume range of 20 ml – 2000 ml for adult or pediatric patients, or optionally 2 ml – 300 ml for neonates. This allows for the effective, safe, and lung-protective ventilation of all patient groups.

Integrated high flow oxygen therapy

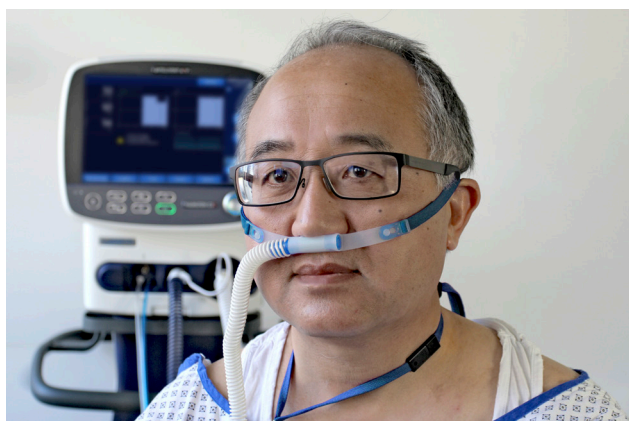
The HAMILTON-C3 optionally provides an integrated high flow oxygen therapy mode with a flow of up to 80 l/min. If the patient's situation changes, and NIV, intubation, extubation, or even weaning is required, you are well prepared with the HAMILTON-C3. In just a few steps, you can change the interface and use the same device and breathing circuit to accommodate your patient's needs.

Optimal performance for noninvasive ventilation

The integrated high-flow turbine provides impressive pneumatic performance. The HAMILTON-C3 turbine delivers a peak flow rate of up to 240 l/min, providing optimal performance, even with noninvasive ventilation.

Mobility for intrahospital transport

The HAMILTON-C3's compact design and independence from external power and air supplies allow for mobility and easy handling throughout the hospital. The HAMILTON-C3 can be easily mounted onto a trolley.



High flow oxygen therapy



Noninvasive ventilation

Product overview

- 1 Integrated handle
- 2 Patient interfaces and ports
- 3 Press & turn control knob
- 4 Ventilation Cockpit
- 5 360° visible alarm lamp
- 6 SpO₂, CO₂, Nurse call (optional communication board)





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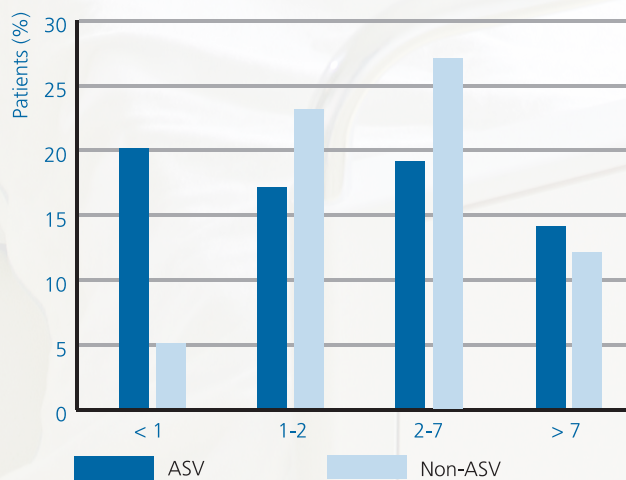


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Patients in the medical intensive care unit could be extubated earlier following the introduction of ASV.⁵

Time to Extubation Readiness (d)

More safety and comfort for your patients

Lung-protective ventilation

Hamilton Medical's intelligent ventilation modes ASV and INTELLiVENT-ASV, automatically employ lung-protective strategies to minimize complications such as AutoPEEP and volutrauma/barotrauma. Within the rules of this lung-protective strategy, they encourage the patient to breathe spontaneously.

According to several studies, these intelligent ventilation modes help reduce ventilation time in various patient groups. They decrease work of breathing and improve patient-ventilator synchrony.

P/V Tool Pro offers additional support to execute your lung-protective ventilation strategy.

ASV decreases ventilation time

Publications show that

- ASV supports earliest possible spontaneous breathing by the patient^{1), 2)}
- ASV shortens the ventilation time in various patient groups^{1), 2)}

INTELLiVENT-ASV is safe and efficient

Publications show that

- INTELLiVENT-ASV is first among all modes in terms of capabilities related to safety, comfort, and weaning³⁾
- INTELLiVENT-ASV is safe and efficient on post-cardiac surgery patients and requires fewer interactions than conventional modes⁴⁾

1 Kirakli C. Eur Respir J. 2011 Oct;38(4):774-80 | 2 Chen CW. Respir Care. 2011 Jul;56(7):976-83
3 Mireles-Cabodevila E. Respir Care. 2013 Feb;58(2):348-66 | 4 Beijers A.J. Intensive Care Med. 2014 May;40(5):752-3

Ease of use

Intuitive operation

In close cooperation with users and ventilation experts, our engineers have designed the HAMILTON-C3 user interface to allow intuitive operation and direct access to important settings. All Hamilton Medical ventilators are operated according to the same principles, which makes switching between different devices very easy.

Easy-to-understand monitoring

Ventilators display large amounts of data that is often difficult to interpret. The configurable touch screen display, referred to as the Ventilation Cockpit, consolidates the diverse monitoring data, and presents it numerically and in various graphics panels. These easy-to-understand views provide an at-a-glance overview of the patient's current ventilation status, and offer a reliable basis for therapy decisions.

More time for your patients

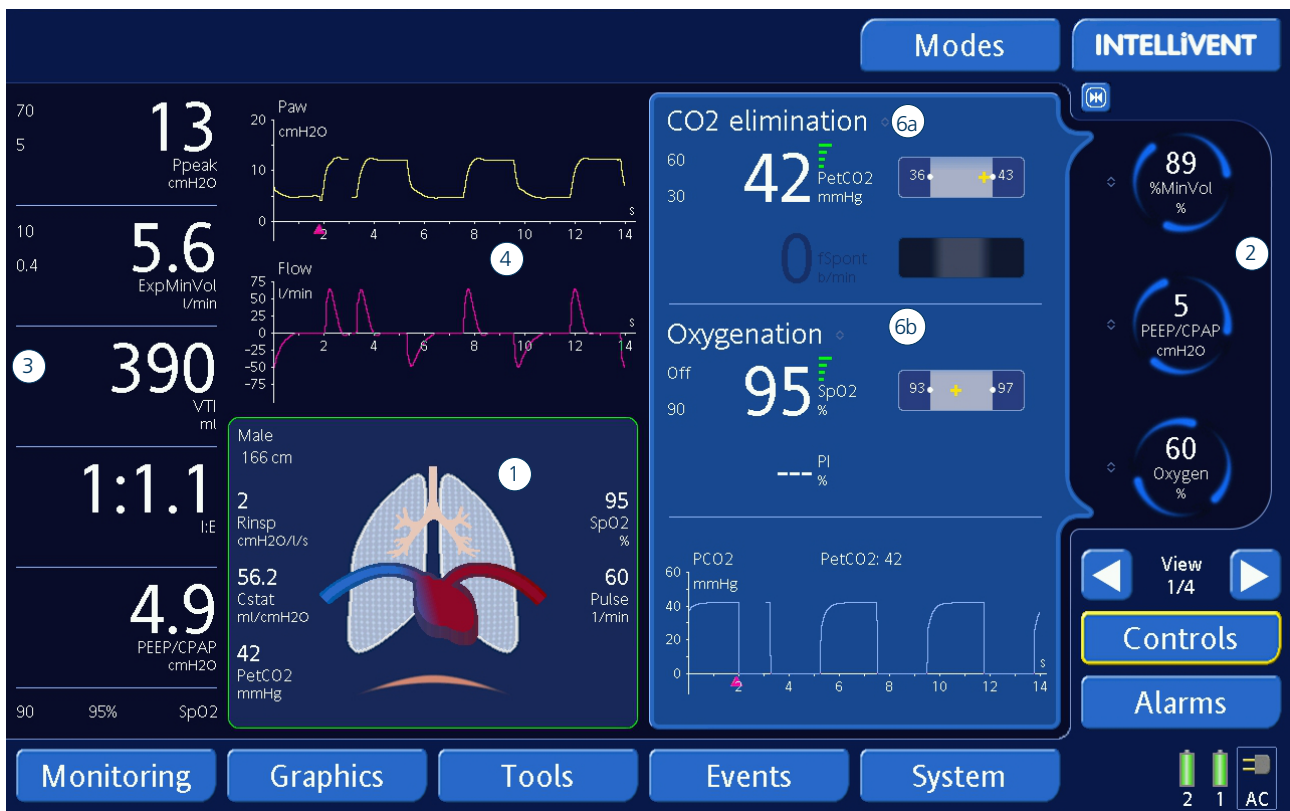
In ASV and INTELLiVENT-ASV modes, the ventilator continuously adjusts to the patient's breathing activity and lung conditions. This means fewer user interactions are required¹⁾ and fewer alarms are generated²⁾, giving you more time for your patients.



Configurable display



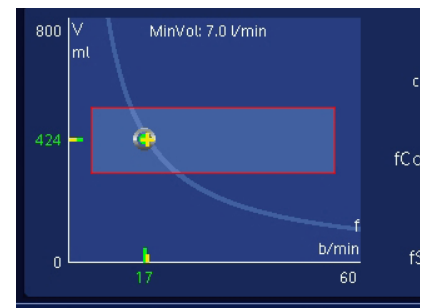
HAMILTON-C3 display, providing an at-a-glance overview of the patient's status.



The Ventilation Cockpit

- ① Dynamic Lung - Provides a real-time display of lung compliance, resistance, breathing activity, PetCO₂, SpO₂, and pulse rate
- ② Automated INTELLiVENT-ASV controls, providing direct access to the INTELLiVENT Settings window
- ③ The most important configurable monitoring parameters
- ④ Configurable waveforms for flow, pressure, volume, SpO₂, and CO₂
- ⑤ Additional display options:
 - a) ASV Graph
 - b) Vent Status
 - c) Quick Wean status
 - d) Trends (not shown)
 - e) Loops (not shown)
- ⑥ Shown in INTELLiVENT-ASV mode only:
 - a) Ventilation horizon, showing PetCO₂ target range
 - b) Oxygenation horizon, showing SpO₂ target range

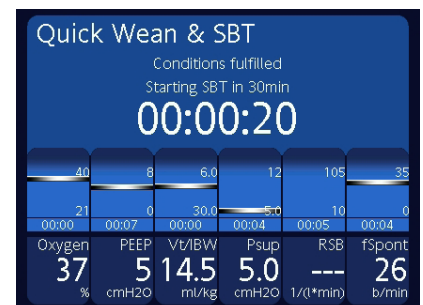
⑤a



⑤b



⑤c





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By using INTELLiVENT-ASV, we gain time that we can use to accomplish other important tasks that take place in an ICU, such as taking care of the patients and providing essential medical care.

Laurent Buscemi, ICU Nurse
Intercommunal Hospital, Var Departement, France

Increased efficiency

Integrated commercial considerations

Ventilators are capital goods that need to be evaluated for cost efficiency. Aspects including treatment costs and the use of human resources play an important role in this process. Assembled with an extensive standard equipment package that is easy to maintain, Hamilton Medical ventilators are an attractive investment with respect to purchase price and operating costs.

Reduction of treatment costs

Each eliminated ventilation day significantly reduces treatments costs on average by 1,500 USD.¹⁾ It has been shown that the use of Hamilton Medical ventilators and ASV can reduce ventilation time. In addition, the ventilator is now available for the next patient much earlier. A shorter ventilation time also reduces the risk of ventilator associated pneumonia (VAP), which can result in costs of up to 57,000 USD per case.²⁾

Better use of human resources

Hamilton Medical ventilators, along with ASV, can reduce the time needed for standard settings and alarm management while maintaining ventilation quality.^{3), 4)} This frees up time for other aspects of patient care. Thanks to the ease of operation, consistent operating concepts across devices, and the free e-learning offerings from Hamilton Medical, the demand for education and training is also reduced.

1 Dasta JF et al. *Critical Care Med.* 2005 Jun;33:1266-71 | 2 Cocanour CS et al. *Surg Infect.* 2005 Spring;6:65-72
3 Iotti GA. *Intensive Care Med.* 2010 Aug;36(8):1371-9 | 4 Pettier AH. *Anesth Analg.* 2003 Dec;97(6):1743-50

Attention to detail

On-screen help for alarm troubleshooting

The HAMILTON-C3 helps troubleshooting with an integrated on-screen help system. Whenever there is a problem, the HAMILTON-C3 not only generates an alarm using the alarm lamp, sound, and message bar on the display, but also helps you identify where the problem is. As a result, you can immediately start with the troubleshooting.

Customizable user interface

You can configure the display layout with different waveforms, loops, trends, or intelligent panel graphics to suit your institution's needs and protocols. Nurses and clinicians can have their own preferred layout. Access the Monitoring window with the touch of a button at any time during active ventilation.

Free and open e-learning on mechanical ventilation

Join over 15,000 users on the Hamilton Medical College e-learning platform. It provides free and open e-learning modules on the basics of mechanical ventilation, as well as on Hamilton Medical products and features. Register now at college.hamilton-medical.com.

For some modules, a certificate is issued upon successful completion. You can even receive Continuing Respiratory Care Education (CRCE) credits from the American Association of Respiratory Care (AARC) for some modules.



Integrated on-screen help system for troubleshooting



Clinicians using the e-Learning platform

Neonatal ventilation

Tidal volumes as low as 2 ml

With the Neonatal option, the HAMILTON-C3 provides tidal volumes as low as 2 ml for effective, safe, and lung-protective ventilation even for the smallest patients.¹⁾ The proximal flow sensor specifically developed for neonates precisely measures the pressure, volume, and flow directly at the infant's airway opening, ensuring the required trigger sensitivity. This provides improved synchronization and less work of breathing.

Adaptive synchronization, even with uncuffed tubes

Leaks are one of the issues encountered in the ventilation of neonates as a result of using uncuffed tubes. The IntelliTrig leak compensation function automatically adjusts the inspiratory and expiratory trigger sensitivity to leaks. This enables adaptive synchronization with the neonate's breathing pattern.

nCPAP-PS mode

The nCPAP-PS mode is designed so that you set the desired CPAP and inspiratory pressure. Flow and pressure measurement recognizes patient efforts and supports each breath up to the desired inspiratory pressure. A backup rate guarantees minimum patient ventilation. Flow is adjusted automatically based on patient conditions and leaks. nCPAP-PS tries to avoid unintended peak pressures as well as apnea, enables highly efficient leak compensation, and helps to reduce oxygen consumption.



Neonate with nCPAP mask



Neonatal ventilation with the HAMILTON-C3

¹ Volume-targeted versus pressure-limited ventilation in the neonate (Review), 2011 Morley CJ

Hamilton Medical

Intelligent Ventilation since 1983

In 1983 Hamilton Medical was founded with a vision: To develop intelligent ventilation solutions that make life easier for patients in critical care and for the people who care for them. Today, Hamilton Medical is a leading manufacturer of critical care ventilation solutions for a wide variety of patient populations, applications, and environments.

The right ventilation solution for every situation

The ventilators from Hamilton Medical ventilate all of your patients; in the intensive care unit, during an MRI procedure and in all transport situations, from the neonate to the adult. Each of these ventilators is equipped with the same standardized user interface and uses the same Intelligent Ventilation technologies. This enables Hamilton Medical ventilators to help you to

- ✓ Increase the comfort and safety of your patients
- ✓ Make life easier for the caregivers
- ✓ Increase efficiency and return on investment



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