



HAMILTON-C1

Minimum size for maximum performance



Swiss
Quality

HAMILTON
MEDICAL

Intelligent Ventilation since 1983



Minimum size for maximum performance

HAMILTON-C1 - All in one

Requiring only a minimum of space, the HAMILTON-C1 mechanical ventilator combines invasive and noninvasive modes as well as high flow oxygen therapy with maximum mobility. The integrated high-performance turbine enables the HAMILTON-C1 to be completely independent from compressed air. This makes it an ideal companion for all patient groups in the intensive care unit, emergency ward, recovery room or intermediate care, long-term acute care facilities, and during intrahospital transport.

- ✓ Adult, pediatric, and neonatal ventilation
- ✓ More than 4 hours of battery operating time
- ✓ Independence from gas cylinders or compressors
- ✓ Noninvasive ventilation and integrated high flow oxygen therapy*
- ✓ Advanced ventilation modes, including ASV® - Adaptive Support Ventilation



Small but mighty! Despite its compact size, the HAMILTON-C1 is a fully featured ventilator for use in almost any environment.

Jesko Mertha, Group Leader, Clinic for Intensive Care Medicine
Cantonal Hospital St. Gallen, St. Gallen, Switzerland

For use in any situation

Enhanced safety for your intensive care patients

The ventilation cockpit of the HAMILTON-C1 allows the user to check critical parameters at a glance and provides the patient's status as a valuable tool for clinical assessment. The ASV mode provides increased safety and comfort for your patients by adjusting the ventilation to the patients' normal breathing pattern. In doing so, ASV prevents abnormal breathing patterns as well as apnea and tachypnea.

Noninvasive ventilation due to the integrated high-performance turbine

The integrated high-performance turbine is capable of supplying a peak flow rate of up to 260 l/min, which allows for noninvasive ventilation even in the event of large leaks.

Adaptive synchronization

The IntelliTrig function automatically adjusts the inspiratory and expiratory trigger sensitivity to potential leaks and ensures adaptive synchronization with the patient's breathing pattern. This is achieved both in invasively and noninvasively ventilated patients.



Invasive ventilation



Noninvasive ventilation

Optimal performance

Give your patients a voice

In pressure-controlled modes (PCV+, SPONT, PSIMV+), an optional feature enables use of conventional speaking valves with the HAMILTON-C1. Monitoring, triggering, and alarm management have been adjusted to allow the use of speaking valves.

Pressure, volume, and flow measurement

The flow sensor is designed to minimize dead space, and measures the pressure, volume, and flow directly at the patient's airway opening. This proximal measurement promotes the required sensitivity and a quicker response time, which should result in better synchronization and less work of breathing for your patients.

Integrated high flow oxygen therapy

With the option of an integrated high flow oxygen therapy mode, the HAMILTON-C1 offers you a range of ventilation and therapy options in one device, including invasive and noninvasive ventilation, and high flow oxygen therapy. In just a few steps, you can change the interface and use the same device and breathing circuit to accommodate your patient's needs.



Compatibility with speaking valves



High flow oxygen therapy

Product overview

- 1 Integrated handle
- 2 Patient interfaces and ports
- 3 Press-and-turn knob
- 4 Ventilation Cockpit
- 5 360° visible alarm lamp
- 6 Power supply and connectors



6





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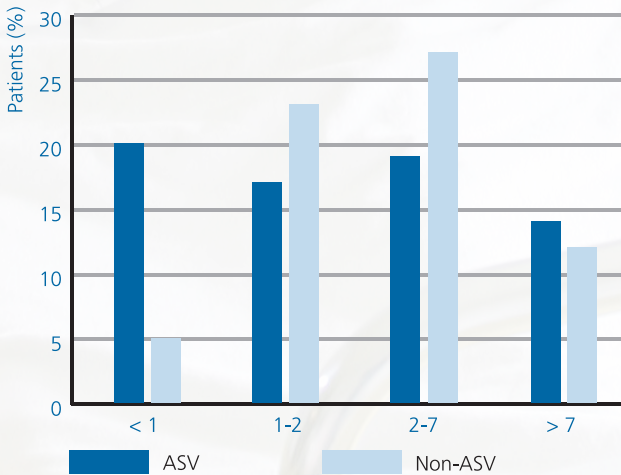
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**HAMILTON
MEDICAL**



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

Enhanced patient comfort

Every Hamilton Medical ventilator features the intelligent ventilation mode ASV (Adaptive Support Ventilation). ASV measures the patient's lung mechanics and activity on a breath-by-breath basis and automatically adjusts ventilation, from intubation to extubation. Since its introduction in 1997, ASV has become well established in intensive care units and has been shown to improve patient/ventilator interaction.^{1), 2)}

Lung-protective ventilation

ASV ensures via an optimal breathing pattern that the patient receives the set minute volume, irrespective of the patient's activity. As part of this process, ASV employs lung-protective strategies to minimize complications from AutoPEEP and volutrauma/barotrauma. ASV also prevents apnea, tachypnea, excessive dead-space ventilation, and excessively large breaths.³⁾

Decreased ventilation time

Clinical studies show that:

- ASV supports the earliest possible spontaneous breathing by the patient^{4), 5)}
- ASV shortens the ventilation time in various patient groups^{4), 5)}

Ease of use

Intuitive operation

In close cooperation with users and ventilation experts, our engineers have designed the HAMILTON-C1 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

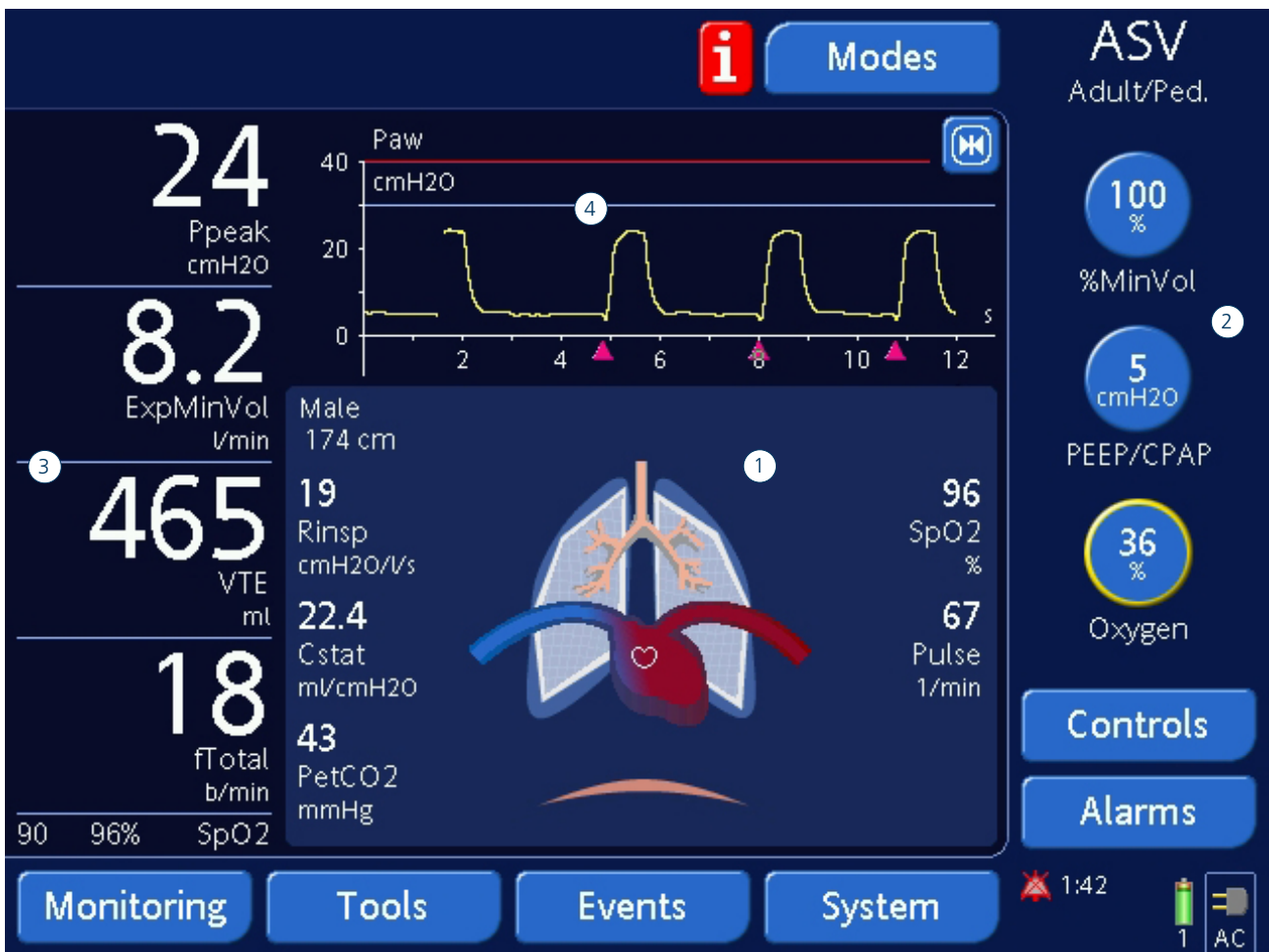
In ASV mode, the ventilator continuously adjusts to the patient's breathing activity and lung conditions. This means fewer user interactions are required and fewer alarms are generated¹⁾, giving you more time for your patients.



Monitoring window

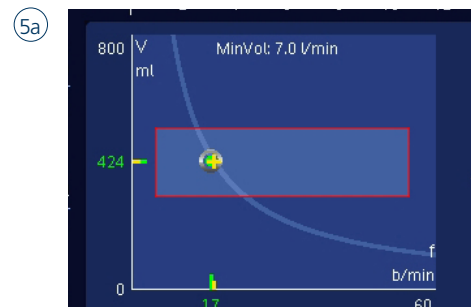


More time for your patient



The Ventilation Cockpit

- ① Dynamic lung - Provides a real-time display of lung compliance, resistance, breathing activity, SpO2 and pulse rate
- ② Direct access to the most important settings
- ③ The four most important monitoring parameters
- ④ Configurable waveforms for flow, pressure, SpO2 and CO2
- ⑤ Display options of the Ventilation Cockpit:
 - a) ASV Graph
 - b) Vent Status
 - c) Trends (not shown)
 - d) Loops (not shown)





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We like to use the HAMILTON-C1 for our noninvasive ventilated patients. The turbine provides a very high flow and the leak compensation works exceptionally well.

Dr. Bernd Schucher, Senior Physician Pneumology
LungenClinic Grosshansdorf, Germany

Increased efficiency

Integrated commercial considerations

Ventilators are capital goods that need to be evaluated for cost efficiency. Factors 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

For each day where ventilation is no longer required, treatment costs are reduced by 1,500 USD on average.¹⁾ It has been shown that the use of Hamilton Medical ventilators and ASV can reduce ventilation time. In addition, the ventilator is then 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 effort 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 Pettler AH. *Anesth Analg.* 2003 Dec;97(6):1743-50

Attention to detail

Volumetric capnography

Proximal flow and CO₂ measurement enables the HAMILTON-C1 to perform up-to-date volumetric capnography. This provides an important basis for the assessment of ventilation quality and metabolic activity. The volumetric capnography is optionally available.

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 22,000 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.



Volumetric capnography



Clinicians using the e-Learning platform

Neonatal ventilation

Tidal volumes as low as 2 ml

With the neonatal option, the HAMILTON-C1 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 - Automatic adaptation, fewer interventions

The HAMILTON-C1's nCPAP mode is designed in such a way that you only need to set the desired CPAP pressure. The flow is subsequently adjusted automatically based on the patient condition and potential leaks. This prevents unintended peak pressures and guarantees highly efficient leak compensation. Flow adjustment occurs very rapidly due to near-patient pressure measurement and the high sensitivity of the measurement.



Neonate with nCPAP mask



Effective, safe, and lung-protective ventilation for the most fragile patients

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

