HAMILTON·G5

Intelligent Ventilation

More safety for your patients

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The HAMILTON-G5 is designed to provide Intelligent Ventilation, delivering:

Ease of use

Improved patient outcome

www.hamilton-medical.com/G5

Help protect 5 million lives!

Errors in health care in the USA alone cause up to 98,000 deaths every year.[1] In response, the Institute of Health Care Improvement (IHI) started the 100,000 Lives Campaign, an initiative to improve patient care and prevent avoidable deaths. This developed into the 5 Million Lives Campaign with the aim of protecting patients on a global scale.[2]

Start with changes in your ICU

The 5 Million Lives Campaign and other initiatives focus on changes that can be implemented in any hospital – and particularly in ICUs. According to the IHI, "Intensive care is not only complex, it is also expensive … Errors occur in ICUs at unacceptable rates".[3] A number of initiatives, such as the Ventilator Bundle (5 Million Lives Campaign, IHI), focus on critical care.

The latest HAMILTON-G5 technology supports you

As one of the leading manufacturers of ICU ventilators, it is our duty to support these initiatives. Other high-risk industries such as aviation and nuclear power have embraced automation and user interface design.[4] The HAMILTON-G5 is the first ventilator to provide:

- an initial patient height setting while displaying the actual ml/kg (IBW) tidal volume applied
- a Ventilation Cockpit that is designed to improve safety through intuitive operation and monitoring
- proven closed-loop ventilation that automatically applies lung-protective strategies, reducing the risk of operator error and promoting early weaning.

Efficiency through innovation

[1] Kohn LT et al. To err is human: a safer health system. National Academy Press; Washington DC, 2000.
[2] http://www.ihi.org/IHI/Programs/Campaign/[Status: June 2010]
[3] http://www.ihi.org/IHI/Programs/Campaign/CampaignMaterials [Status: Oct. 2006]
[3] http://www.ihi.org/IHI/Programs/CollaborativeLearning/Implementing-anIdealizedModelforCriticalCare.htm [Status: July 2010]
[4] Drews FA, Westenskow DR. The right picture is worth a thousand numbers: data displays in anesthesia. Hum Factors. 2006 Spring;48:59-71.

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Normal compliance and resistance

Low compliance (stiff lung) and medium resistance

Understand lung mechanics
The Dynamic Lung expands and contracts in synchrony with actual breaths. It visualizes in real-time:
- tidal volume
- lung compliance
- resistance
- patient activity

Low dependency – Consider taking the patient off the ventilator

Highly dependent patient

Ease of use in your ICU

Aren't a dozen ventilation modes more confusing than helpful? Aren't there already more monitoring parameters available than most users ever need? Ventilators clearly need to be simpler to use. HAMILTON MEDICAL has responded with the HAMILTON-G5: the first mechanical ventilator designed from scratch for ease of use.

See all important information at a glance

Monitoring in mechanical ventilation means curves, loops, numbers and more numbers. But what do they tell us about the patient's condition? The HAMILTON-G5 is the first ventilator to provide a Ventilation Cockpit that visualizes the patient's respiratory mechanics and ventilatory support in an intuitive way.

Guidance on alarms

When an alarm limit is exceeded, the color-coded monitoring parameter clearly indicates the value that is outside the expected range. The new i-Icon gives you direct access to the alarm event log which means the situation can be more easily understood. The silence timer provides you with information about the remaining alarm silenced time.

Provide patient-centered care with fewer resources

Unlike conventional modes, which require you to set many parameters, closed-loop ventilation with Adaptive Support Ventilation (ASV) requires attention to just one: minute ventilation.

Studies show that ASV

- can be used to ventilate virtually all intubated patients – whether active or passive and regardless of the lung disease [1]
- requires less user interaction, adapts to the patient's breathing activity more frequently and causes fewer alarms [2]
- adapts to changes in the patient's lung mechanics over time
- works comparable to expierenced clinicians [3]

ASV adapts to lung mechanics by automatically applying lower tidal volumes in ARDS patients.[4]

[1] Arnal JM et al. Int Care Med 2004;30:84.
[2] Petter AH et al. Anesth Analg 2003;97:1743-50.
[3] Iotti GA et al. Int. Care Med 2010; 36:1371-9
[4] Arnal Jm et al. Int Care Med 2006; 32: 120

Know when to take the patient off the ventilator
The Vent Status panel gives you a visual representation of 6 parameters related to patient-ventilator dependency, grouped into:

- oxygenation
- CO_2 elimination
- patient activity

Since the panel is user-configurable, it helps you enforce your ICU's weaning protocol.

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Safely set PEEP
The automated P/V Tool uses an empirical and repeatable method to find best PEEP, based on respiratory mechanics. It also enables sophisticated lung recruitment maneuvers and therapy assessment.

Tailor lung recruitment
With the P/V Tool you can tailor lung recruitment maneuvers to your patient. P/VTool Pro even determines automatically upper and lower Inflection Point (VIP&LIP)

Monitor CO_2
Through the combination of HAMILTON MEDICAL's proximal flow sensing and CO_2 measurement, the HAMILTON-G5 allows not only time-based, but also volume-based, capnography, expanding the use of CO_2 measurement. For neonates even sidestream capnography is available.

Improved patient outcome

In a root cause analysis of deaths or injuries related to long-term ventilation, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) found that inadequate orientation/training and a breakdown in communication between staff members were by far the most important causes.[1]

Increase safety of operation

The Ventilation Cockpit plays a crucial role in simplifying the operation of the ventilator and the interpretation of monitored data. In addition, the specially designed alarm lamp at the top of the unit ensures that an alarming ventilator is immediately identified, without the need to look at the screen.

Ventilate safely with ASV

ASV employs lung-protective strategies to minimize complications from AutoPEEP and resultant volutrauma and barotrauma. ASV also prevents apnea, tachypnea, excessive dead space ventilation and excessively large breaths.[3] ASV guides the patient in a favorable breathing pattern, avoiding potentially detrimental patterns, from fully supported ventilation to extubation.

An international multicenter study also shows that ASV provides ventilation at least as safely and effectively as international ventilation experts using conventional modes.[2]

Improve patient assessment

Two options available for the HAMILTON-G5 help you further improve patient assessment:

- The P/V Tool Pro provides the only way to safely set PEEP and tidal volumes in patients with the most severe conditions determining UIP and LIP automatically.
- Optional mainstream CO_2 measurements provide both time- and volume-based capnograms as well as dead space measurement, allowing you to focus on monitoring the correct ventilation of the patient. The sidestream CO_2 monitoring option is available for neonates.
- New CombiTrends and reference loops provide comprehensive information on changes.

[1] Preventing ventilator-related deaths and injuries. Sentinel Event Alert. 2002 Feb 26:1-3.
[2] Iotti GA et al. Int Care Med 2010; 36:1371-9.
[3] Demet Sulemanji, Robert M. Kacmarek. Anesthesiology 2009; 111:863-70.

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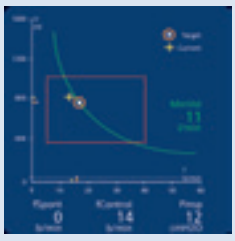
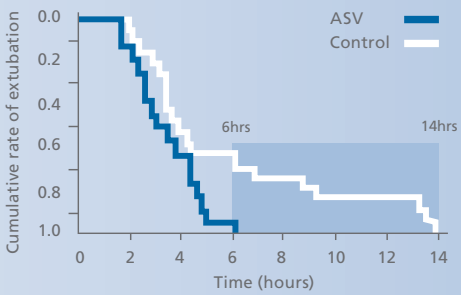


Understand changes in the patient and how ASV reacts

The ASV Graph shows how the adaptive lung controller moves toward its targets. It shows both the target and actual parameters for tidal volume, frequency, pressure, and minute ventilation.



Efficiency through innovation

Critical care is expensive – and so is ventilation. In the USA, each extra day on the ventilator costs an additional $1,522.[1] And the risk of ventilator-associated pneumonia compounds these costs: a study showed that preventing just one case of VAP can save $57,000.[2] The HAMILTON-G5 lets you optimize clinical resources and skills while reducing cost of ownership and management overhead. And most importantly, it can help you reduce the patient's time on the ventilator.

Know when to take the patient off the Ventilator

The Ventilation Cockpit's Vent Status panel gives you an intuitive visualization of the most important parameters and settings related to patient-ventilator dependency. This innovation helps you decide when to take the patient off the ventilator.
Studies have shown that notifying caregivers about the patient's recovery from respiratory failure can significantly reduce the duration and total cost of ventilation.[3]

Start weaning at intubation

The closed-loop ventilation system ASV automatically promotes free breathing for patients in all ventilation modes and phases. It encourages spontaneous activity right from the start of ventilation and promotes weaning from first deployment.[4] Studies show the results: shorter ventilation times (see graph).[5]

Avoid intubation

Appropriate non-invasive ventilation can prevent intubation. With leakage compensated IntelliTrig triggering, patient-ventilator-synchronicity is optimized even for non-invasive ventilation. Using the NIV and NIV-ST modes in combination with Heliox application, you can choose the most appropriate therapy.

Efficient medicament nebulization

The new integrated Aerogen® nebulizer of the HAMILTON-G5 provides efficient, synchronized nebulization during the inspiratory phase.

Reduce training costs

The HAMILTON-G5's intuitive interface simplifies ventilator setup. That translates into easy training and less chance of operator error.

Reduce time on the ventilator by over 50 %
ASV facilitates shorter times on the ventilator: 6 hours with ASV as compared to 14 hours with conventional ventilation.[3]

[1] Dasta JF et al. Crit Care Med. 2005 Jun;33:1266-71.
[2] Cocanour CS et al. Surg Infect. 2005 Spring;6:65-72.
[3] Ely W et al. N Engl J Med. 1996 Dec 19;335:1864-9.
[4] Pascale C. Gruber. Anesthesiology. 2008; 109:81-7
[5] Sulzer CF et al. Anesthesiology. 2001 Dec;95:1339-45.

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Touchscreen and one-knob operation
You can operate the HAMILTON-G5 with a touchscreen or with its single knob. Bright backlit hard keys simplify night-time use.

Alarm lamp
Even when you are at a distance or when several devices are operating in the same room, you can immediately identify an alarming ventilator by the alarm lamp at the top.

Interface for storage media
Do you need a screenshot for a presentation or to capture the patient's status? Simple press the Print screen key and your screenshot will be saved to the external storage media – for easy transfer and viewing on a PC.

DVI interface with VGA output
When you need the HAMILTON-G5 for training or a presentation, the standard DVI interface lets you connect the ventilator to a flat panel display or a digital projector.

Serial interface for PDMS or patient monitor
The optional serial RS-232 interface provides two ports for connection to hospital monitors and Patient Data Management Systems (PDMS).

Extended battery backup option
With the extended battery option, your trolley-mount ventilator can run for an indefinite time on hot-swappable batteries. Each battery affords one hour of operating time, augmenting the one hour of power provided by the standard internal battery.

If you want to know more

Configurable Ventilation Cockpit
The Ventilation Cockpit lets you configure your patient's monitored data the way you want. You can select from four different layouts to display a combination of intelligent panels, such as the Dynamic Lung, plus traditional curves and loops.

Besides its unique features, the HAMILTON-G5 includes everything you expect from a high-end ventilator:
- a choice of ventilation modes for invasive and noninvasive ventilation
- an extensive monitoring package
- the ability to ventilate adult, pediatric, and neonatal patients

Neonatal option

The neonatal option expands your ventilator's patient range down to the tiniest infants and premature babies. The HAMILTON-G5 proximal flow sensing meets the needs of your smallest patients by providing precise volume and leak monitoring with accurate responsive triggering with IntelliTrig. The excellent nCPAP qualities and sidestream capnography of this ventilator provides you with a very wide range of diagnostic and therapeutic options for treating your most sensitive patients.

Heliox option

Heliox therapy is gaining acceptance for cases of acute and life-threatening upper airway obstruction. With the heliox option, your HAMILTON-G5 helps you to successfully reduce the patient's work of breathing while treating the cause of the obstruction.

This brochure can't give you an exhaustive overview of all the features and functions of the HAMILTON-G5. You will find detailed information and a simulation at www.hamilton-medical.com/G5.

Flexible device configuration
To adapt the HAMILTON-G5 to your ICU environment, you can configure the device in the following ways:
- on a trolley with the Ventilation Cockpit on top or in front
- as a shelf-mount version with the Ventilation Cockpit on the unit's side or on the shelf

For infection control, you can also place the Ventilation Cockpit outside the patient room.

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For further information about the HAMILTON-G5, please contact:

HAMILTON MEDICAL AG
Via Crusch 8
CH-7402 Bonaduz
Switzerland
(+41) 81 660 60 10
(+41) 81 660 60 20

www.hamilton-medical.com

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