

HAMILTON-C6

Technical specifications for SW version 1.1.x

Ventilation modes

Mode form	Mode name	Mode	Adult/Ped	Neonatal
Volume-controlled, flow-controlled	(S)CMV	Breaths are volume controlled and mandatory, including patient triggered breaths.	✓	--
	SIMV	Volume controlled mandatory breaths can be alternated with pressure-supported spontaneous breaths.	✓	--
Volume-targeted, adaptive pressure-controlled	APVcmv / (S)CMV+	Breaths are volume targeted and mandatory.	✓	✓
	APVsimv / SIMV+	Volume-targeted mandatory breaths can be alternated with pressure-supported spontaneous breaths.	✓	✓
Pressure-controlled	PCV+	All breaths, whether triggered by the patient or the ventilator, are pressure controlled and mandatory.	✓	✓
	P-SIMV+	Mandatory breaths are pressure controlled. Mandatory breaths can be alternated with pressure-supported spontaneous breaths.	✓	✓
	DuoPAP	Mandatory breaths are pressure controlled. Spontaneous breaths can be triggered at both pressure levels.	✓	✓
	APRV	Spontaneous breaths can be continuously triggered. The pressure release between the levels contributes to ventilation.	✓	✓
	SPONT	Every breath is spontaneous, with or without pressure-supported spontaneous breaths.	✓	✓
Intelligent ventilation	ASV®	Operator sets %MinVol, PEEP, and Oxygen. Frequency, tidal volume, pressure, and I:E ratio are based on physiological input from the patient.	✓	--
	INTELLiVENT®-ASV	Fully automated management of ventilation and oxygenation based on physiological input from the patient. The underlying mode is ASV.	0	--
Noninvasive ventilation	NIV	Every breath is spontaneous.	✓	✓
	NIV-ST	Every breath is spontaneous as long as the patient is breathing above the set rate. A backup rate can be set for mandatory breaths.	✓	✓
	nCPAP-PS	Every breath is spontaneous as long as the patient is breathing above the set rate. A backup rate can be set for mandatory breaths.	--	0
Oxygen therapy	HiFlowO2	High flow oxygen therapy. No supported breaths.	0	0

Standard: ✓ Option: 0 Not applicable: --



Standard configuration and options (in alphabetical order)

Functions	Adult / Ped	Neonatal
Capnography, mainstream (volumetric) and sidestream	O	O
Communication ports: Three COM ports, two USB ports, DVI, Nurse call	✓	✓
Communication protocols: for details see Connectivity brochure	✓	✓
Distributed alarm system (DAS) compatible	✓	✓
Dynamic Lung (real-time visualization of the lungs)	✓	--
Event log (up to 10,000 events with date and time stamp)	✓	✓
HAMILTON-H900 humidifier integration	O	O
Inspiratory and expiratory hold maneuver	✓	✓
IntelliCuff® integrated cuff pressure controller	O	O
IntelliSync+ (inspiratory and expiratory trigger synchronization)	O	--
IntelliTrig (leak compensation)	✓	✓
Languages (English, US English, Chinese, Croatian, Czech, Danish, Dutch, Finnish, French, German, Greek, Hungarian, Indonesian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Romanian, Russian, Serbian, Slovak, Spanish, Swedish, Turkish)	✓	✓
Manual breath / prolonged inspiration	✓	✓
Nebulization (Aerogen [®])	O	O
Nebulization (pneumatic)	✓	--
O2 enrichment	✓	✓
On-screen help	✓	✓
P/V Tool® Pro	O	O
Paramagnetic O2 sensor	O	O
Patient group	✓	O
Print screen	✓	✓
Screen lock	✓	✓
Second battery	O	O
SpO2 monitoring	O	O
Standby with timer	✓	✓
Suctioning tool	✓	✓
Transpulmonary pressure monitoring	✓	✓
TRC (tube resistance compensation)	✓	✓
Trends/Loops	✓	✓
Trigger, flow and pressure selectable	✓	✓
Vent Status (Visual representation of ventilator dependence)	✓	✓

Standard: ✓ Option: O Not applicable: --

Technical performance data (in alphabetical order)

Description	Specification
Automatic expiratory base flow	Fixed at 6 l/min
Inspiratory pressure	0 to 100 cmH ₂ O
Maximum inspiratory flow	260 l/min
Means of inspiratory triggering	Flow trigger control, pressure trigger control, or optional IntelliSync+ control
Means of expiratory triggering	Flow cycle (ETS), or optional IntelliSync+ control
Minimum expiratory time	20% of cycle time; 0.2 to 0.8 s
O ₂ input flow	80-150 l/min (at 2.8 bar/ 280 kPa / 41 psi input pressure)
Oxygen mixer accuracy	± (Volume fraction of 2.5% + 2.5% of actual reading)
Preoperational checks	Tightness test, flow sensor/O ₂ sensor/CO ₂ sensor calibration
Tidal volume	Adult/Ped: 20 to 2000 ml Neonatal: 2 to 300 ml

Standards and approvals

Classification	Class IIb, continuously operating according to EC directive 93/42/EEC
Certification	EN 60601-1:2006/A1:2013, IEC 60601-1-2:2014, ANSI/AAMI ES60601-1:2005/(R)2012, ISO 80601-2-12:2011, CAN/CSA-C22.2 NO. 60601-1:14, EN ISO 5356-1:2015, ISO 80601-2-55:2011
Declaration	The HAMILTON-C6 was developed in accordance with pertinent international standards and FDA guidelines. The ventilator is manufactured within an EN ISO 13485 and EN ISO 9001, Council Directive 93/42/EEC, Annex II, Article 3 certified quality management system. The ventilator meets the Essential Requirements of Council Directive 93/42/EEC, Annex I.
Electromagnetic compatibility	According to IEC 60601-1-2:2014
Safety Class	Class I, Type B applied part (ventilator breathing system, VBS), type BF applied parts CO ₂ sensor including CO ₂ module connector, humidifier, Aerogen ^s system, nebulizer, and SpO ₂ sensor including SpO ₂ adapter, continuous operation according to IEC 60601-1

Pneumatic specifications

O2	Input pressure	2.8 to 6 bar / 41 to 87 psi
	Connector	DISS (CGA 1240) or NIST
Air supply		Integrated turbine with lifetime warranty
Inspiratory outlet (To patient port)	Connector	ISO 15 mm ID/22 mm OD conical
Expiratory outlet (From patient port)	Connector (on expiratory valve)	ISO 15 mm ID/22 mm OD conical

Electrical specifications

Input power	100 to 240 VAC \pm 10%, 50/60 Hz	
Power consumption	60 VA typical, 210 VA (510 VA with humidifier) maximum	
Battery	Electrical specifications:	14.4 V, 5.0 Ah, 72 Wh, 48 W typical, 288 W maximum
	Type:	Lithium-ion
	Normal operating time:	\geq 90 min with one battery / \geq 180 min with two batteries

Graphical patient data

Graphic type/Tab name	Options
Waveforms	Pressure, Flow, Volume, Off, PCO ₂ ¹ , FCO ₂ ¹ , Plethysmogram ¹ , Ptrachea, Pes, Ptranspulm
Intelligent panels	Dynamic Lung ² , Vent Status, ASV Graph ³ , SMPs (Secondary monitoring parameter)
Trends	1-, 6-, 12-, 24-, or 72-h trend data for a selected parameter or combination of parameters
Loops	Pressure/Volume, Pressure/Flow, Volume/Flow, Volume/PCO ₂ ¹ , Volume/FCO ₂ ¹ , Pes/Volume, Ptranspulm/Volume

Alarms⁴

Priority	Alarm
High priority	Apnea time (s), ExpMinVol high/low (l/min), Oxygen high/low (%), Pressure high/low (cmH ₂ O), Flow sensor calibration needed, Exhalation obstructed, Disconnection, Oxygen supply failed
Medium priority	fTotal high/low (b/min), PetCO ₂ high/low (mmHg), Pressure limitation (cmH ₂ O), Vt high/low (ml), SpO ₂ high/low, SpOC high/low, %leak, High PEEP, Loss of PEEP, Pulse high/low
Low priority	High SpO ₂ , Loss of external power, Cuff leak

¹ CO₂ + SpO₂ option required | ² For adult/pediatric patients only | ³ Only available in ASV mode | ⁴ For a complete list of alarms, see your ventilator *Operator's Manual*

Control settings and ranges⁵

Parameter (units)	Range Adult/Ped	Range Neonatal
Apnea backup	On, Off	On, Off
Cuff pressure (cmH2O)	0 to 50	0 to 50
Expiratory trigger sensitivity ETS (%)	5 to 80	5 to 80
Flow (in HiFlowO2) (l/min)	2 to 80	2 to 12
Flow pattern	Square, 50% decelerating, Sine, 100% decelerating	--
Flow trigger (l/min)	0.5 to 20, off	0.1 to 5.0, off
Gender (sex)	Male, Female	--
I:E	1:9 to 4:1	1:9 to 4:1
%MinVol (%)	25 to 350	--
Nebulizer Duration (min)	5 to 40, continuous	5 to 40, continuous
Nebulizer Synchronisation	Inspiration, Exhalation, Insp. and Exh.	Inspiration, Exhalation, Insp. and Exh.
Oxygen (%)	21 to 100	21 to 100
P high (cmH2O) (only in DuoPAP and APRV)	0 to 100	0 to 60
P low (cmH2O) (only in APRV)	0 to 50	0 to 25
Pasvlimit (cmH2O)	5 to 100	--
Pat. height (cm) (in)	30 to 250 / 12 to 98	--
Pause (%)	0 to 70	--
Pcontrol (cmH2O)	5 to 100	3 to 60
Peak flow (l/min)	1 to 195	--
PEEP/CPAP (cmH2O)	0 to 50	0 to 25
Pinsp (cmH2O)	3 to 100	0 to 60
P-ramp (ms)	0 to 2000	0 to 600
Pressure trigger (cmH2O)	-0.1 to -15.0, off	-0.1 to -15.0, off
Psupport (cmH2O)	0 to 100	0 to 60
Rate (b/min)	1 to 80	1 to 150
Set temp (°C) (with the HAMILTON-H900)	NIV: 30 to 35; INV: 35 to 41	NIV: 30 to 35; INV: 35 to 41
Sigh	On, Off	--
T gradient (°C) (with the HAMILTON-H900)	-3 to 2	-3 to 2
T high (s) (in DuoPAP und APRV)	0.1 to 40	0.1 to 40
T low (s) (in APRV)	0.2 to 40	0.2 to 40
TI (s)	0.1 to 12	0.1 to 12
TI max (s)	0.5 to 3	0.25 to 3.0
Tip (s)	0 to 8	--
Tpause (s)	0 to 30	0 to 30
TRC compensation (%)	0 to 100	0 to 100
Vt (ml)	20 to 2000	2 to 300
Weight (kg)	--	0.2 to 30.0

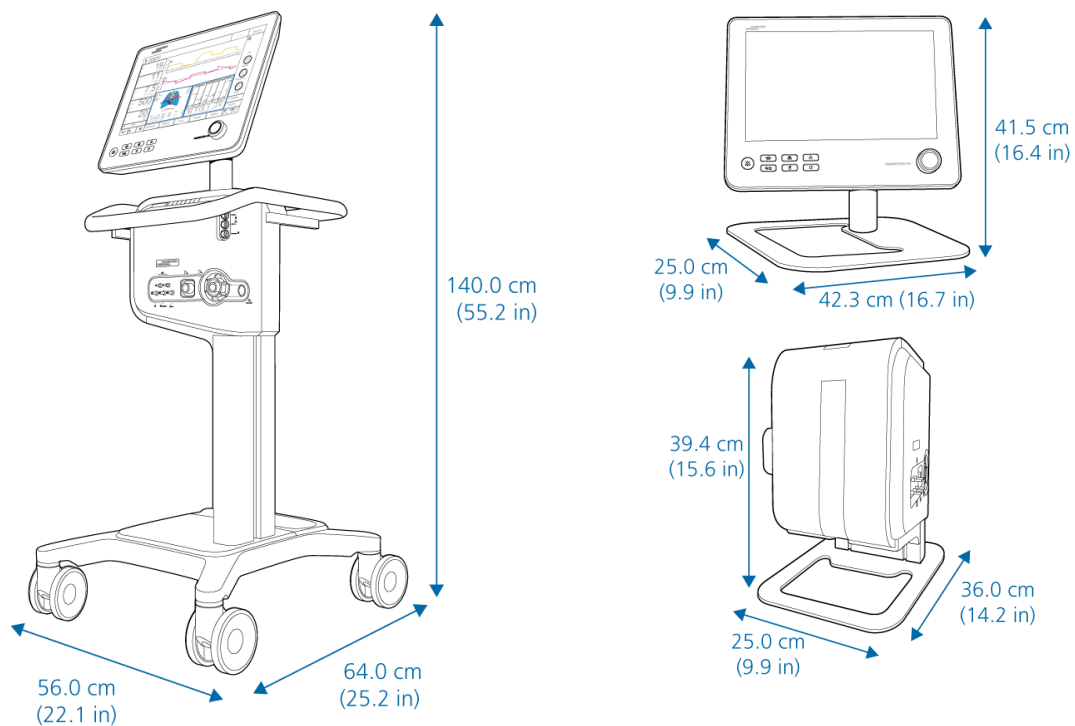
⁵ Parameter settings and ranges can change depending on the mode

Monitoring parameter

Parameter (units)	Description	
Pressure	AutoPEEP (cmH2O)	Unintended positive end-expiratory pressure
	Paw (cmH2O)	Airway pressure
	ΔP (cmH2O)	Driving pressure
	PTP (cmH2O*s)	Inspiratory pressure time product
	Pcuff (cmH2O)	Cuff pressure
	Ptrans I (cmH2O)	The arithmetic mean value of Ptranspulm over the last 100 ms of the last inspiration.
	Ptrans E (cmH2O)	The arithmetic mean value of Ptranspulm over the last 100 ms of the last expiration.
	PEEP/CPAP (cmH2O)	PEEP (positive end-expiratory pressure) and CPAP (continuous positive airway pressure)
	Pinsp (cmH2O)	Inspiratory pressure
	Pmean (cmH2O)	Mean airway pressure
	Ppeak (cmH2O)	Peak airway pressure
	Pplateau (cmH2O)	Plateau or end-inspiratory pressure
	Pes min (cmH2O)	See PEEP. The pressure is measured through the Pes port instead of using airway pressure.
	Pes max (cmH2O)	See Ppeak. The pressure is measured through the Pes port instead of using airway pressure.
	Pes plateau (cmH2O)	See Pplateau. The pressure is measured through the Pes port instead of using airway pressure.
	Pes PTP (cmH2O)	See PTP. The pressure is measured through the Pes port instead of using airway pressure.
	Pes P0.1 (cmH2O)	See P0.1. The pressure is measured through the Pes port instead of using airway pressure.
Flow	Control Flow (l/min)	The set flow of gas to the patient when using HiFlowO2.
	Insp Flow (l/min)	Peak inspiratory flow, spontaneous or mandatory
	Exp Flow (l/min)	Peak expiratory flow
Volume	ExpMinVol or MinVol NIV (l/min)	Expiratory minute volume
	MVSpont or MVSpont NIV (l/min)	Spontaneous expiratory minute volume
	VTE or VTE NIV (ml)	Expiratory tidal volume
	VTEspont (ml)	Spontaneous expiratory tidal volume
	VTI or VTI NIV (ml)	Inspiratory tidal volume
	Vt/IBW	Tidal volume according to ideal body weight (IBW) for adult/ pediatric patients
	Vt/Weight (ml/kg)	and according to the actual body weight for neonatal patients.
	VLeak (%) or MVLeak (l/min)	Leakage percent or total minute volume leakage

Monitoring parameter (continued)

Parameter (units)	Description	
CO2	FetCO2 (%)	Fractional end-tidal CO2 concentration
	PetCO2 (mmHg)	End-tidal CO2 pressure
	slopeCO2 (%CO2 / l)	Slope of the alveolar plateau in the PetCO2 curve, indicating the volume/flow status of the lungs
	Vtalv (ml)	Alveolar tidal ventilation
	V'alv (l/min)	Alveolar minute ventilation
	V'CO2 (ml/min)	CO2 elimination
	VDaw (ml)	Airway dead space
	VDaw/VTE (%)	Airway dead space fraction at the airway opening
	VeCO2 (ml)	Exhaled CO2 volume.
	ViCO2 (ml)	Inspired CO2 volume
	SpO2	SpO2 (%)
Pulse (1/min)		Pulse
Plethysmogram		The waveform that visualizes the pulsating blood volume; it is delivered by the pulse oximeter.
SpO2/FiO2 (%)		The SpO2/FiO2 ratio (%) is an approximation of the PaO2/FiO2 ratio, which, in contrast to PaO2/FiO2, can be calculated noninvasively and continuously.
PI (%)		Perfusion index
PVI (%)		Pleth variability index
SpCO (ml/dl) ² (%)		Carboxyhaemoglobin saturation
SpMet (%)		Methaemoglobin saturation
SpHb (g/dl) (mmol/l)		Total haemoglobin
SpOC (ml/dl)		Oxygen content
Oxygen	Oxygen (%)	Oxygen concentration of the delivered gas
Time	I:E	Inspiratory:expiratory ratio
	fControl (b/min)	Mandatory breath frequency
	fSpont (b/min)	Spontaneous breathing frequency
	fTotal (b/min)	Total breathing frequency
	TI (s)	Inspiratory time
	TE (s)	Expiratory time
	Pause (s)	Inspiratory pause or plateau
Lung mechanics	Cstat (ml/cmH2O)	Static compliance
	P0.1 (cmH2O)	Airway occlusion pressure
	PTP (cmH2O*s)	Pressure time product
	RCexp (s)	Expiratory time constant
	Rinsp (cmH2O/(l/s))	Inspiratory flow resistance
	RSB (1/(l*min))	Rapid shallow breathing
Humidifier related	T humidifier (°C)	Measured temperature at the water chamber exit
	T Y-piece (°C)	Measured temperature at the Y-piece



Physical characteristics

Weight	<p>Monitor (interaction panel) 7.8 kg (17.2 lb), with shelf mount: 10.0 kg (22.0 lb)</p> <p>Ventilation unit, shelf mount: 10.5 kg (23.15 lb)</p> <p>46 kg (101 lb) with trolley, monitor, ventilation unit</p> <p>The trolley can accommodate a maximum safe working load of 80 kg (176 lb)</p>
Dimensions	See graphic above
Monitor	Type: Color TFT, Size: 1920 x 1200 pixels, 17 in (431.8 mm) diagonal
Monitor mounting options	VESA, pole mount, rail mount, handle mount
Trolley accessories	Basket, O2 cylinder holder (two bottles), HAMILTON-H900 mounting system, additional standard rail

Manufacturer:

Hamilton Medical AG

Via Crusch 8, 7402 Bonaduz, Switzerland

+41 (0)58 610 10 20

info@hamilton-medical.com

www.hamilton-medical.com

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