

# HAMILTON-C1 neo

## Technical specifications

The HAMILTON-C1 neo is a versatile ventilator that combines invasive and noninvasive modes\* with additional options of nCPAP and high flow oxygen therapy. The integrated turbine allows it to be operated independently of a compressed air supply. Due to its compact design, it is an ideal companion for even your smallest patients in various environments such as intensive care unit, emergency ward, as well as during intrahospital transport.

The HAMILTON-C1 neo offers:

- State-of-the-art invasive ventilation modes
- Synchronized noninvasive ventilation\*
- Demand-flow nCPAP modes\*
- High flow oxygen therapy\*
- SpO2 and CO2\*\* measurement
- Leak compensation in every mode
- Over 4 hours of battery operating time and a weight of less than 5 kg

For more information, visit our website: [www.hamilton-medical.com/C1-neo](http://www.hamilton-medical.com/C1-neo)



\* Optional - not available in all markets \*\* Volumetric or sidestream

# Technical specifications

## Ventilation Cockpit

Vent Status	Visual representation of ventilator dependency, grouped into oxygenation, CO2 elimination, patient activity
Monitoring	Display of more than 50 monitoring parameters
Real-time waveforms	Paw, Flow, Volume, Plethysmogram, Capnograph
Others*	SpO2, volumetric CO2, sidestream CO2, Loops: P-V, V-Flow, P-Flow, V-CO2 Trends: 1h, 6h, 12h, 24h, 72h

## Alarms

Operator-adjustable	Low/high minute volume, low/high pressure, low/high tidal volume, low/high rate, apnea time, low/high oxygen, low/high PetCO2*, low/high SpO2*, low/high pulse*, low/high perfusion index*, high flow*, low/high PVI*, low/high SpCO*, low/high SpMet*; low/high SpHb*
Special alarms	O2 cell, disconnection, exhalation obstructed, loss of PEEP, pressure not released, flow sensor, expiratory valve, pressure limitation, performance limited, CO2* and SpO2*, battery, power supply, gas supply, oxygen concentration, check patient interface
Loudness	Adjustable (1 – 10), configurable minimum loudness

## Ventilation modes

Type	Mode	Description
Pressure	PCV+	Pressure-controlled ventilation. Biphasic breathing
	PSIMV+	Pressure-controlled synchronized intermittent mandatory ventilation
	SPONT	Pressure support ventilation
	APRV*	Airway pressure release ventilation
	DuoPAP*	Duo positive airway pressure
Volume	(S)CMV+/APVcmv	(Synchronized) controlled mandatory ventilation
	SIMV+/APVsimv	Synchronized intermittent mandatory ventilation
Noninvasive	NIV*	Noninvasive ventilation
	NIV-ST*	Spontaneous / timed noninvasive ventilation
	nCPAP*	Nasal Continuous Positive Airway Pressure
	nCPAP-PC*	Nasal Continuous Positive Airway Pressure - pressure control
	HiFlowO2*	High flow oxygen therapy

## Maintenance

Blower lifetime	Dynamic lifetime surveillance; typically 8 years. 5 years warranty.
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# Technical specifications

**Standards** IEC 60601-1:2005/A1:2012, IEC 60601-1-2:2007, ISO 80601-2-12:2011 + Cor.:2011, CAN/CSA-C22.2 No. 60601-1:14, ANSI/AAMI ES60601-1:2005/(R)2012

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## Configurations

Trolley accessories Humidifier support, cylinder holder, tubing support arm

Options\* Volumetric mainstream capnography, sidestream capnography, DuoPAP/APRV, NIV/NIV-ST, Trends/Loops, nCPAP/nCPAP-PC; SpO2, HiFlowO2

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## Electrical and pneumatic specifications

Input voltage 100 to 240 V AC -15%/+10%, 50/60 Hz

Power consumption 50 VA typical, 150 VA maximum

Backup battery time Typical 3 h 45 min, maximum 4 h 15 min\*\*

Oxygen supply 280 to 600 kPa (41 to 87 psi), V max 200 l/min

Low pressure oxygen ≤15 l/min, max. 600 kPa (87 psi) for low pressure

Air supply Integrated turbine

Degree of protection IP21

Peak flow Up to 40 l/min

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## Environment

Temperature Operating: 5°C to 40°C (41°F to 104°F)  
Storage: -20°C to 60°C (-4°F to 140°F)

Humidity 10% to 95% non condensing (operating and storage)

Altitude Up to approx. 4,000 m (13,120 ft) 600 to 1,100 hPa

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**Interface connectors** USB, COM1 (RS-232)\*, nurse call\*, CO2\*, SpO2\*

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**Event log** Storage and display of up to 1,000 events with date and time stamp

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**IntelliTrig** Automatic response to varying leaks and adaption of trigger sensitivity in all modes

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**PSync** Guaranteed rate ventilation

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\* Optional - not available in all markets

\*\* Reduced display brightness

# Technical specifications

## Controls

Type	Description
Special functions	Manual breath, O2 enrichment, standby, screen-lock, apnea backup ventilation, inspiratory hold, print screen, suctioning tool, dimmable screen, configuration quick-start settings, start-up over body weight, O2 consumption display
Ventilation modes	See page 2, Ventilation modes
Patient weight	0.2 to 30 kg
(S)CMV+/APVcmv	15 to 80 b/min
SIMV+APVsimv+	1 to 80 b/min
PCV+	15 to 80 b/min
NIV-ST	15 to 80 b/min
PSIMV+	15 to 80 b/min (without PSync 5 to 80 b/min)
DuoPAP	1 to 80 b/min
APRV	1 to 80 b/min
nCPAP-PC	10 to 80 b/min
Tidal volume	2 to 300 ml
PEEP/CPAP	3 to 25 cmH2O
Oxygen	21% to 100 %
I:E ratio	1:9 to 4:1 (DuoPAP 1:599 to 149:1)
Inspiratory time (TI)	0.1 to 12 s
Flow trigger	off, 0.1 to 5 l/min
Pressure control	0 to 45 cmH2O added to PEEP/CPAP
Pressure support	0 to 45 cmH2O added to PEEP/CPAP
Pressure ramp	0 to 600 ms
P high (APRV/DuoPAP)	0 to 45 cmH2O / 3 to 45 cmH2O
P low (APRV)	0 to 25 cmH2O
T high (APRV/DuoPAP)	0.1 to 40 s
T low (APRV)	0.2 to 40 s
Expiratory trigger sensitivity	5% to 80% of peak inspiratory flow
Flow (HiFlowO2)	2 to 12 l/min
PSync	on/off

# Technical specifications

## Monitoring parameters

Type	Parameter	Unit	Description	Numeric monitoring	Wave-forms	Vent Status
Pressure	Paw	cmH2O; mbar; hPa	Real-time airway pressure		✓	
	Ppeak	cmH2O; mbar; hPa	Peak airway pressure	✓		
	Pmean	cmH2O; mbar; hPa	Mean airway pressure	✓		
	Pinsp	cmH2O; mbar; hPa	Inspiratory pressure	✓		✓
	PEEP/CPAP	cmH2O; mbar; hPa	Positive end expiratory pressure / continuous positive airway pressure	✓		✓
	Pplateau	cmH2O; mbar; hPa	Plateau or inspiratory pressure	✓		
Flow	Flow	l/min	Real-time inspiratory flow	✓	✓	
	Insp Flow	l/min	Peak inspiratory flow	✓		
	Exp Flow	l/min	Peak expiratory flow	✓		
Volume	Volume	ml	Real-time tidal volume	✓	✓	
	VT <sub>e</sub>	ml	Expiratory tidal volume	✓		
	VT <sub>I</sub> /VT <sub>I</sub> NIV	ml	Inspiratory tidal volume	✓		
	ExpMinVol/MinVol NIV	l/min	Expiratory minute volume	✓		✓
	MVSpont/MVSpont NIV	l/min	Spontaneous expiratory minute volume	✓		
	Leak/MV Leak	%;l/min	Leakage minute volume/ Leakage percentage at the airway	✓		
	Vt/weight	ml/kg	Tidal volume/weight ratio	✓		
Time	I:E		Inspiratory-expiratory ratio	✓		
	f <sub>Total</sub>	b/min	Total breathing frequency	✓		
	f <sub>Spont</sub>	b/min	Spontaneous breathing frequency	✓		
	T <sub>I</sub>	s	Inspiratory time	✓		
	T <sub>E</sub>	s	Expiratory time	✓		
	%f <sub>Spont</sub>	%	Percentage of spontaneous breathing rate	✓		✓
Lung mechanics	C <sub>stat</sub>	ml/cmH2O	Static compliance	✓		
	AutoPEEP	cmH2O, mbar, hPa	AutoPEEP or intrinsic PEEP	✓		
	R <sub>Cexp</sub>	s	Expiratory time constant	✓		
	R <sub>insp</sub>	cmH2O*s/l	Inspiratory flow resistance	✓		
	RSB	1/l*min	Rapid shallow breathing index	✓		✓
	PTP	cmh2O*s; mbar*s	Pressure-time product	✓		
	P0.1	cmH2O; mbar; hPa	Airway occlusion pressure	✓		
Oxygen	O <sub>2</sub>	%	Airway oxygen concentration (FiO <sub>2</sub> )	✓		✓
Carbon dioxide*	CO <sub>2</sub>	mmHg; Torr; kPa	Real-time CO <sub>2</sub> partial pressure	✓	✓	
	F <sub>et</sub> CO <sub>2</sub>	%	Fractional end-tidal CO <sub>2</sub> concentration	✓	✓	
	P <sub>et</sub> CO <sub>2</sub>	mmHg; Torr; kPa	End-tidal CO <sub>2</sub> partial pressure	✓	✓	
	SlopeCO <sub>2</sub>	%CO <sub>2</sub> /l	V/Q status of the lung	✓		
	V <sub>Talv</sub>	ml	Alveolar tidal ventilation	✓		

\* Optional - not available in all markets

# Technical specifications

## Monitoring parameters

Type	Parameter	Unit	Description	Numeric monitoring	Waveforms	Vent Status
	VTalv/min	ml/min	Alveolar minute ventilation	✓		
	V'CO <sub>2</sub> /min	ml/min	CO <sub>2</sub> elimination	✓		
	VDaw	ml	Airway dead space	✓		
	VDaw/VTE	%	Dead space fraction measured at the airway opening	✓		
	VeCO <sub>2</sub>	ml	Exhaled volume of CO <sub>2</sub>	✓		
	ViCO <sub>2</sub>	ml	Inspired volume of CO <sub>2</sub>	✓		
SpO <sub>2</sub> *	Plethysmogram	-	Real-time Plethysmogram		✓	
	SpO <sub>2</sub>	%	Arterial oxygen saturation in blood	✓		
	Pulse	1/min	Heart rate	✓		
	Perfusion index	ml/dl	calculation of oxygen content	✓		
	SpO <sub>2</sub> /FiO <sub>2</sub>	-	calculated approximation of PaO <sub>2</sub> /FiO <sub>2</sub>	✓		

## Physical dimensions

Size	See illustrations below
Weight	4.9 kg (10.8 lb) without trolley
Display	8.4 in, TFT color, backlit, touch screen
Main patient outlet	ISO 5356-1; 22 OD / 15 ID (mm)
Oxygen inlet	DISS or NIST male
Low oxygen inlet	CPC quick coupling, 3.2 mm ID



\* Optional - not available in all markets