

HAMILTON·C3

Technical Specifications

Ventilation Cockpit	
Dynamic Lung	Real-time visualization of the lungs with representations of tidal volume, lung compliance, resistance, and patient activity
Vent Status Panel	Visual representation of ventilator dependency, grouped into oxygenation, CO ₂ elimination, and patient activity
ASV target graphics	Graphic display of target and actual parameters for tidal volume, frequency, pressure, and minute ventilation
Numeric monitoring	41 monitoring parameters can be displayed (see monitoring parameters)
Real-time waveforms	Paw, Flow, Volume, Ptrachea, FCO ₂ ¹⁾ , PCO ₂ ¹⁾
Others	Loops: P-V, V-Flow, P-Flow, V-FCO ₂ ¹⁾ , V-PCO ₂ ¹⁾ Trends: 1h, 6h, 12h, 24h, 72h
Controls	
Ventilation modes	(S)CMV+/APVcmv, SIMV+/APVsimv, PCV+ , SPONT, ASV, PSIMV+, APRV ¹⁾ , DuoPAP ¹⁾ , NIV ¹⁾ , NIV-ST ¹⁾ , nCPAP-PS ¹⁾
Special functions	Manual breath, O ₂ enrichment, standby, screen-lock, apnea backup ventilation, inspiratory hold, nebulization, screen-shot, suctioning tool, dimmable screen, configurable Quickstart-Settings, start-up over body height and IBW, sigh, Tube Resistance Compensation (TRC) ¹⁾ , reference loops
Patient types	Adult/pediatric, infant/neonatal/pediatric ¹⁾
(S)CMV+/APVcmv, PCV+, SIMV+/APVsimv, DuoPAP, PSIMV+, NIV-ST, nCPAP-PS	4 to 80 b/min, 4 to 150 b/min ¹⁾ 1 to 80 b/min, 1 to 150 b/min ¹⁾
APRV	1 to 200 b/min
Tidal volume	20 to 2000 ml, 2 to 2000 ml ¹⁾
PEEP/CPAP	0 to 35 cmH ₂ O
Oxygen	21 to 100 %
I:E ratio	1:9 to 4:1, DuoPAP 1:599 to 149:1 ¹⁾
Inspiratory time (TI)	0.1 to 12 s
Flow	0 to 240 l/min
Flow trigger	Off, 1 to 20 l/min, 0.1 to 20 l/min ¹⁾
Pressure control	5 to 60 cmH ₂ O, added to PEEP/CPAP
Pressure support	0 to 60 cmH ₂ O, added to PEEP/CPAP
Pressure ramp	0 to 2000 ms
P high (APRV/DuoPAP) ¹⁾	0 to 60 cmH ₂ O
P low (APRV) ¹⁾	0 to 35 cmH ₂ O
T high (APRV/DuoPAP) ¹⁾	0.1 to 40 s
T low (APRV) ¹⁾	0.2 to 40 s
Expiratory trigger sensitivity (ETS)	5 to 80 % of inspiratory peak flow
% MinVol (ASV)	25 to 350 %
Alarms	
Operator-adjustable	Low/high minute volume, low/high pressure, low/high tidal volume, low/high rate, apnea time, low/high oxygen, low/high PetCO ₂ ¹⁾
Special alarms	Oxygen concentration, disconnection, loss of PEEP, exhalation obstruction, flow sensor, power supply, ASV batteries, gas supply
Loudness	Adjustable (1 – 10)
Event log	
	Storage and display of up to 1000 events with date and time



Standards	IEC 60601-1, IEC 60601-1-2, IEC 60601-2-12, CAN/CSA-C22.2 No. 601.1, UL 60601-1, EN 794-1
Physical dimensions	
Size	See above (right)
Weight	9.5 kg (21 lb) without trolley
Display	12.1 inch, TFT color 1280 x 800 pixel, backlit, touchscreen
Main patient outlet	ISO 5356-1; 22M/15F
Oxygen inlet	DISS or NIST male
Low oxygen inlet	CPC quick coupling, 3.2 mm ID
Electrical and gas supplies	
Input voltage	100 to 240 VAC, 50/60 Hz or 12 to 24 V DC
Power consumption	50 W typical, 150 W maximum
Backup battery time	6.5 h typical with 2 Li-Ion batteries / hot swappable
Oxygen supply	280 to 600 kPa (41 to 87 psi), 120 l/min
Low pressure oxygen	≤15 l/min, max. 600 kPa for low pressure
Air supply	Integrated ultra-quiet turbine
Environment	
Temperature	5 to 40 °C (operating), -20 to 60 °C (storage)
Humidity	10 to 95 % non condensing (operating and storage)
Altitude	Up to 4000 m (13,120 ft) 1100 to 600 hPa
Interface connectors	USB, RS-232, nurse call, CO ₂

1) optional

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Configurations



Ventilation modes

Type	Mode	Description	Adult	Neonatal
Closed-loop control	ASV	Adaptive Support Ventilation. Guaranteed minute volume based on user setting and application of lung-protective rules.	✓	
Pressure	PCV+	Pressure-controlled ventilation. Biphasic breathing.	✓	✓
	PSIMV+	Pressure-controlled synchronized intermittent mandatory ventilation	✓	✓
	SPONT	Pressure support ventilation	✓	✓
	APRV ¹⁾	Airway pressure release ventilation	✓	✓
	DuoPAP	Duo positive airway pressure	✓	✓
Volume	(S)CMV+/APV _{cmv}	(Synchronized) controlled mandatory ventilation	✓	✓
	SIMV+/APV _{simv}	Synchronized intermittent mandatory ventilation	✓	✓
Non-invasive	NIV ¹⁾	Non-invasive ventilation	✓	✓
	NIV-ST ¹⁾	Spontaneous/timed non-invasive ventilation	✓	✓
Nasal CPAP	nCPAP-PS ¹⁾	Nasal continuous positive airway pressure - pressure support ¹⁾		✓



IntelliTrig	Automatic response to varying leaks and adaption of trigger sensitivity in NIV modes
IntelliSync	Guaranteed rate ventilation
Trolley	
Accessories	Humidifier support, cylinder holder, tubing support arm with quick lock
Adapter plate	Quick-lock adapter plate for various applications
Options	Neonatal ventilation, non-invasive ventilation, DuoPAP/APRV, Tube Resistance Compensation (TRC), volumetric mainstream capnography, sidestream capnography, nasal CPAP

1) optional

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Monitoring parameters

Type	Parameter	Unit	Description	Numeric monitoring	Waveforms	Vent Status	Dynamic Lung (visual)
Pressure	Paw	cmH ₂ O;mbar;hPa	Real-time airway pressure		✓		
	Ppeak	cmH ₂ O;mbar;hPa	Peak airway pressure	✓			
	Pmean	cmH ₂ O;mbar;hPa	Mean airway pressure	✓			
	Pinsp	cmH ₂ O;mbar;hPa	Inspiratory pressure			✓	
	PEEP/CPAP	cmH ₂ O;mbar;hPa	Positive end expiratory pressure/ continuous positive airway pressure	✓		✓	
	Ptrachea	cmH ₂ O;mbar;hPa	Real-time tracheal pressure		✓		
	Pplateau	cmH ₂ O;mbar;hPa	Plateau or end 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		✓		✓
	VTE/VTE NIV	ml	Expiratory tidal volume	✓			
	VTI	ml	Inspiratory tidal volume	✓			
	ExpMinVol/MinVol NIV	l/min	Expiratory minute volume	✓		✓	
	MVSpont/MVSpont NIV	l/min	Spontaneous expiratory minute volume, leakage minute volume	✓			
	Leak/MV Leak	%/min	Leakage percentage at the airway	✓			
Time	I:E		Inspiratory - expiratory ratio	✓			✓
	fTotal	b/min	Total breathing frequency	✓			✓
	fSpont	b/min	Spontaneous breathing frequency	✓			
	TI	s	Inspiratory time	✓			✓
	TE	s	Expiratory time	✓			✓
	%fSpont	%	Percentage of spontaneous breathing rate			✓	
Lung mechanics	Cstat	ml/cmH ₂ O	Static compliance	✓			✓
	AutoPEEP	cmH ₂ O;mbar;hPa	Auto PEEP or intrinsic PEEP	✓			
	RCexp	s	Expiratory time constant	✓			
	Rinsp	cmH ₂ O*s/l	Inspiratory flow resistance	✓			✓
	RSB	1/l*min	Rapid shallow breathing index			✓	
	PTP	cmH ₂ O*s;mbar*s	Pressure time product	✓			
	P0.1	cmH ₂ O;mbar;hPa	Airway occlusion pressure	✓			
Oxygen	O ₂	%	Airway oxygen concentration (FiO ₂)	✓		✓	
Carbon dioxide ¹⁾	CO ₂	mmHg%	Real-time CO ₂ measurement		✓		
	FetCO ₂	%	Fractional end-tidal CO ₂ concentration	✓	✓		
	PetCO ₂	mmHg;Torr;kPa	End-tidal CO ₂ partial pressure	✓	✓		✓
	SlopeCO ₂	%CO ₂ /l	V/Q status of the lung	✓			
	VTalv	ml	Alveolar tidal ventilation	✓			
	VTalv/min	ml	Alveolar minute ventilation	✓			
	V'CO ₂ /min	ml/min	CO ₂ elimination	✓			
	VDaw	ml	Airway dead space	✓			
	VDaw/VTE	%	Dead space fraction measured at the airway opening	✓			
	VeCO ₂	ml	Exhaled volume of CO ₂	✓			
ViCO ₂	ml	Inspired volume of CO ₂	✓				

¹⁾ optional: CO₂

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