

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, CO 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, DuoPAP, NIV, NIV-ST, 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)
Patient types	Adult/pediatric, infant/neonatal/pediatric ¹⁾
(S)CMV+/APVcmv, PCV+, SIMV+/APVsimv, DuoPAP, PSIMV+, NIV-ST, nCPAP-PS ¹⁾	4 to 80 b/min, 4 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
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)	0 to 60 cmH ₂ O
P low (APRV)	0 to 35 cmH ₂ O
T high (APRV/DuoPAP)	0.1 to 40 s
T low (APRV)	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

¹⁾optional



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	10.4 in., TFT color, 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

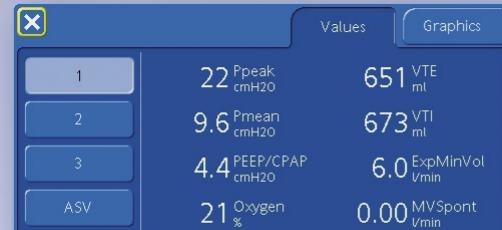
Input voltage	100 to 240 VAC, 50/60 Hz or 12 to 24 V DC
Power consumption	50 W typical, 150 W maximum
Backup battery time	6.5 h typical with 2 Li-Ion batteries / hot swappable
Oxygen supply	280 to 600 kPa (41 to 87 psi), 120 l/min
Low pressure oxygen	≤ 15 l/min, max. 600 kPa for low pressure
Air supply	Integrated ultra-quiet turbine

Environment

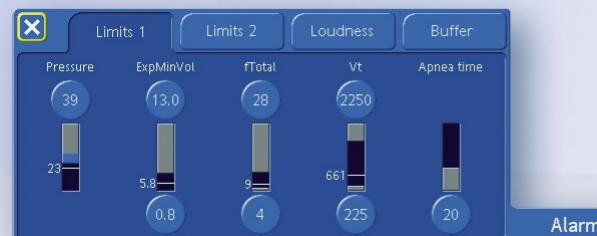
Temperature	5 to 40°C (operating), -20 to 60°C (storage)
Humidity	10 to 95 % non condensing (operating & storage)
Altitude	Up to approx. 4000 m (13,120 ft) 1100 to 600 hPa

Interface connectors

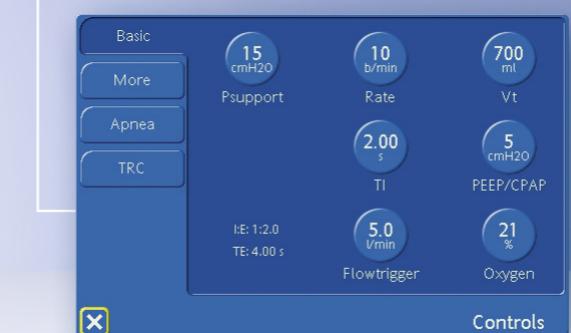
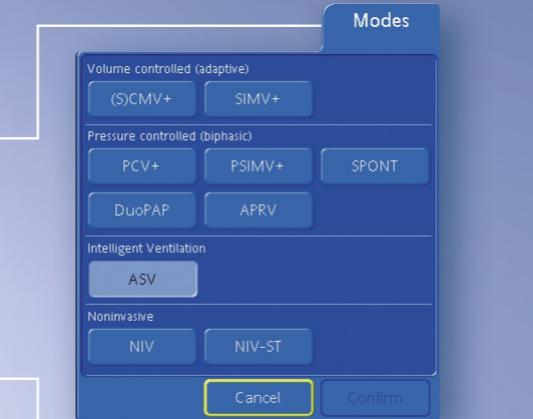
USB, RS-232, nurse call, CO₂



Monitoring



Alarms



Controls

**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	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	Non-invasive ventilation	✓	✓
	NIV-ST	Spontaneous/timed non-invasive ventilation	✓	✓
Nasal CPAP	nCPAP-PS ¹⁾	Nasal continuous positive airway pressure - pressure support ¹⁾	✓	

¹⁾optional**IntelliTrig**

Automatic response to varying leaks and adaption of trigger sensitivity in NIV modes

IntelliSync

Guaranteed rate ventilation

TRC

Tube Resistance Compensation

Trolley

Accessories Humidifier support, cylinder holder, tubing support arm with quick lock

Compact transport solution

Bed mount and wall mount available

Adapter plate

Quick-lock adapter plate for various applications

Options

Neonatal ventilation, nasal CPAP, volumetric mainstream capnography, sidestream capnography

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		✓	✓	
Flow	Ptrachea	cmH ₂ O;mbar;hPa	Real-time tracheal pressure		✓		
	Pplateau	cmH ₂ O;mbar;hPa	Plateau or end inspiratory pressure		✓	✓	
	Flow	l/min	Real-time inspiratory flow		✓		
	Insp Flow	l/min	Peak inspiratory flow		✓		
Volume	Exp Flow	l/min	Peak expiratory flow		✓		
	Volume	ml	Real-time tidal volume		✓		✓
	VTE/VTE NIV	ml	Expiratory tidal volume		✓		
	VTI	ml	Inspiratory tidal volume		✓		
Time	ExpMinVol/MinVol NIV	l/min	Expiratory minute volume		✓		
	MVSpont/MVSpont NIV	l/min	Spontaneous expiratory minute volume, leakage minute volume		✓		
	Leak/MV Leak	%l/min	Leakage percentage at the airway		✓		
	I:E		Inspiratory-expiratory ratio		✓		✓
Lung mechanics	fTotal	b/min	Total breathing frequency		✓		✓
	fSpont	b/min	Spontaneous breathing frequency		✓		
	TI	s	Inspiratory time		✓		✓
	TE	s	Expiratory time		✓		✓
Oxygen	%fSpont	%	Percentage of spontaneous breathing rate			✓	
	Cstat	ml/cmH ₂ O	Static compliance		✓		✓
	AutoPEEP	cmH ₂ O;mbar;hPa	Auto PEEP or intrinsic PEEP		✓		
	RCexp	s	Expiratory time constant		✓		
Carbon dioxide ¹⁾	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)		✓		✓
	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		✓	✓	✓
Carbon dioxide ¹⁾	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		✓		
Carbon dioxide ¹⁾	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

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NEO

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