

Technical Specification		
<b>Ventilation Modes</b>	Assisted Control Mandatory Ventilation	CMV
	Synchronized Intermittent Mandatory Ventilation	SIMV
	Spontaneous Ventilation	SPONT
<b>Breath Types</b>	Volume-controlled breaths	V-CMV, V-SIMV
	Pressure-controlled breaths	P-CMV, P-SIMV, PS
	Volume Targeted Pressure-controlled breaths (Pressure Regulated Volume Control) & (Volume Support)	PRVC-CMV, PRVC-SIMV, VS
	Dual Level PEEP breaths (Spontaneous Positive Airway Pressure)	SPAP
	Patient Height	42 – 250 cm
	IBW (Ideal Body Weight )	5–200 Kg
	Gender	Male, Female
<b>VBS (Ventilator Breathing System)</b>	Acceptable Compliance range	0.5 – 5 ml/cmH <sub>2</sub> O
	Acceptable Inspiratory Resistance range	0 – 2.5 cmH <sub>2</sub> O.s/l
	Acceptable Expiratory Resistance range	0 – 2.5 cmH <sub>2</sub> O.s/l
<b>Apnea Backup</b>	Settings	On (Rate, Pcontrol,Ti); OFF
<b>Breath triggering</b>	Pressure triggering	(-2) – (-20) cmH <sub>2</sub> O
	Flow triggering	2 – 20 l/min
<b>Additional Setting</b>	Respiratory Rate Accuracy:±1 b/min or 4% wig	2– 120 b/min
	Tidal Volume Accuracy:	20 – 2000 ml (Compliance & BTPS compensated)

<p>For 50–2000 ml: <math>\pm (4 \text{ ml} + 15\% \text{ Actual reading})</math></p> <p>For 20–49 ml: <math>\pm (7 \text{ ml} + 15\% \text{ Actual reading})</math></p>	
<p>PEEP / CPAP</p> <p>Accuracy: <math>\pm 12\%</math> or <math>\pm (2 \text{ cmH}_2\text{O} + 4\% \text{ Actual reading})</math> wig</p>	0 – 40 cmH <sub>2</sub> O
<p>Pcontrol</p> <p>Accuracy: <math>\pm 12\%</math> or <math>\pm (2 \text{ cmH}_2\text{O} + 4\% \text{ Actual reading})</math> wig</p>	2 – 80 cmH <sub>2</sub> O
<p>Psupport</p> <p>Accuracy: <math>\pm 12\%</math> or <math>\pm (2 \text{ cmH}_2\text{O} + 4\% \text{ Actual reading})</math> wig</p>	0 – 60 cmH <sub>2</sub> O
<p>Peak Flow</p> <p>Accuracy: <math>\pm 12\%</math> or <math>\pm (3 \text{ l/min} + 4\% \text{ Actual reading})</math> wig</p>	<p><i>Mandatory</i></p> <p>3– 120 l/min</p> <p><i>Spontaneous</i></p> <p>1 – 200 l/min</p>
<p>Leak Comp</p> <p>Automatic Leak Compensation</p>	On or Off
<p>Base Flow</p>	4.5 – 25 l/min
<p>Flow Patterns</p>	Square, Dec, Dec 50%
<p>NIV</p>	<p>On or Off</p> <p>Non–Invasive ventilation can be enabled in</p>
<p>I–Time (Ti)</p> <p>Accuracy: <math>\pm 0.02 \text{ sec}</math></p>	0.2 – 5.0 sec

Pause (insp plateau) Accuracy: $\pm 0.02$ sec	0.0 – 2.0 sec
Rise time	Fast, Med, Slow
Exhalation sensitivity Accuracy: $\pm 12\%$ or $\pm (3 \text{ l/min} + 4\% \text{ Actual reading})$ wig	10–80 % of peak flow
Oxygen (FiO <sub>2</sub> ) Accuracy (Delivery): $\pm (3 \%)$ full scale	21 – 100 %
Nebulizer Accuracy: $\pm 10$ s	On or Off; User selected duration (1–480 minutes) User selected interval (1–480 minutes)
Sigh	On or Off; 0 – 50% of volume or pressure Interval; 20 – 200 breaths Sighs per time: 1 – 6
Humidification Type	None, HME, Warm Humidified
Compliance Comp	On or Off
Graph Settings	Waveforms; up to 3 (flow, pressure, volume) Loops; 1 or 2
Trend Data Settings	Up to 3 trends
Displayed Measurements	6
Compliance Compensation	On or Off

	Audio/Display Settings	Audio Level LCD Brightness
<b>SPAP Mode Settings</b>	<b>Phigh</b> Accuracy: ±12% or ±(2cmH2O +4% Actual reading) wig	5 to 50 cmH2O
	<b>Plow</b> Accuracy: ±12% or ±(2cmH2O +4% Actual reading) wig	0 to 50 cmH2O
	<b>Psup High</b> Accuracy: ±12% or ±(2cmH2O +4% Actual reading) wig Phigh + Psup High will not exceed 80 cmH2O	0 to 75cmH <sub>2</sub> O
	<b>Psup Low</b> Accuracy: ±12% or ±(2cmH2O +4% Actual reading) wig Plow + Psup Low will not exceed 80 cmH2O	0 to 80 cmH2O
	<b>Thigh</b> Accuracy: ±0.02 sec (Thigh+Tlow ≤ 60 sec)	0.1 to 59.8 sec
	<b>Tlow</b> Accuracy: ±0.02 sec (Thigh+Tlow ≤ 60 sec)	0.2 to 59.9 sec
<b>Monitored / Displayed Patient Values</b>	<b>Pressure Values</b>	
	Ppeak (peak pressure during a breath)	0 – 100 cmH2O

Accuracy: $\pm 12\%$ or $\pm(2\text{cmH}_2\text{O} + 4\% \text{ Actual reading})$ wig	
<p>PEEP (pressure at end exhalation)</p> <p>Accuracy: <math>\pm 12\%</math> or <math>\pm(2\text{cmH}_2\text{O} + 4\% \text{ Actual reading})</math> wig</p>	0 – 100cmH <sub>2</sub> O
<p>P<sub>mean</sub> (averaged mean pressure)</p> <p>Accuracy: <math>\pm 12\%</math> or <math>\pm(2\text{cmH}_2\text{O} + 4\% \text{ Actual reading})</math> wig</p>	0 – 100 cmH <sub>2</sub> O
<p>P<sub>endInsp</sub></p> <p>Accuracy: <math>\pm 12\%</math> or <math>\pm(2\text{cmH}_2\text{O} + 4\% \text{ Actual reading})</math> wig</p>	0 – 100 cmH <sub>2</sub> O
<b>Volume / Flow Values</b>	
<p>V<sub>te</sub> (expiratory tidal volume)</p> <p>Accuracy: <math>\pm(4 \text{ ml} + 15\% \text{ Actual reading})</math></p>	0 – 3000 ml
<p>V<sub>ti</sub></p> <p>Accuracy: <math>\pm(4 \text{ ml} + 15\% \text{ Actual reading})</math></p>	0 – 3000 ml
<p>V<sub>e</sub> (exhaled minute volume)</p> <p>Accuracy: <math>\pm 12\%</math> or <math>\pm(2 \text{ L} + 4\% \text{ Actual reading})</math> wig</p>	0 – 99l/min
<p>V<sub>eSpont</sub> (spontaneous exhaled minute volume)Accuracy: <math>\pm 12\%</math> or <math>\pm(2 \text{ L} + 4\% \text{ Actual reading})</math> wig</p>	0 – 99l/min
<p>Leak</p> <p>Accuracy: <math>\pm 12\%</math> or <math>\pm(3\% + 4\% \text{ Actual reading})</math> wig</p>	0 – 100%
<p>PF (peak inspiratory flow)</p> <p>Accuracy: <math>\pm 12\%</math> or <math>\pm(3 \text{ l/min} + 4\% \text{ Actual reading})</math> wig</p>	0 – 200 l/min

<p>PFe (peak expiratory flow)</p> <p>Accuracy: <math>\pm 12\%</math> or <math>\pm(3 \text{ l/min} + 4\% \text{ Actual reading})</math> wig</p>	0 – 160 l/min
<b>Time Values</b>	
<p>Rate (measured mandatory and spontaneous breaths per minute)</p> <p>Accuracy: <math>\pm 1 \text{ b/min}</math> or <math>4\%</math> wig</p>	0 – 150 b/min
<p>Rate Sp.</p> <p>Accuracy: <math>\pm 1 \text{ b/min}</math> or <math>4\%</math> wig</p>	0 – 150 b/min
<p>Inspiration Time (Ti)</p> <p>Accuracy: <math>\pm 0.2 \text{ sec}</math></p>	0.1 – 99.9 sec
<p>Expiratory Time (Te)</p> <p>Accuracy: <math>\pm 0.2 \text{ sec}</math></p>	0.1 – 99.9 sec
I:E, calculated only	1:99 – 99:1
H:L	1:599 – 299:1
<p>Ti/Ttot</p> <p>Accuracy: <math>\pm 5\%</math> or <math>\pm 1</math> wig</p>	1 – 99.9%
<b>Respiratory Mechanics</b>	
<p>Cstat</p> <p>(static compliance, lung stiffness)</p> <p>Accuracy: <math>\pm 10\%</math> or <math>\pm 4 \text{ ml/cmH}_2\text{O}</math> wig</p>	0 – 250ml/cmH <sub>2</sub> O
Cdyn	0 – 250 ml/cmH <sub>2</sub> O

(Dynamic compliance)	
R <sub>insp</sub> (resistance of airways and tubes)	0 – 1000 cmH <sub>2</sub> O/l/sec
R <sub>exp</sub> (Expiratory resistance)	0 – 1000 cmH <sub>2</sub> O/l/sec
Auto PEEP (Actual PEEP – set PEEP) Accuracy: ±12% or ±(2cmH <sub>2</sub> O +4% Actual reading) wig	0 – 100 cmH <sub>2</sub> O
P <sub>plateau</sub> Accuracy: ±12% or ±(2cmH <sub>2</sub> O +4% Actual reading) wig	0 – 100 cmH <sub>2</sub> O
RSBI (Measured breathing rate divided by Insp tidal volume) (RR/V <sub>t</sub> = RSBI) Accuracy: ±10% or ±40 b/min/l wig	0 – 3000 b/min/l
O <sub>2</sub> Accuracy (Delivery): ±3 % Response time < 30 s	15 – 103%
P0.1 (The maximal slope of the airway pressure drop during the first 100 ms when the airway is occluded.) Accuracy: ± (2 cmH <sub>2</sub> O + 4%)	-30 – 0 cmH <sub>2</sub> O
NIF	-60 – 0 cmH <sub>2</sub> O

	(The maximum negative pressure generated during inspiration against an occluded airway) Accuracy: $\pm (2 \text{ cmH}_2\text{O} + 4\%)$	
	P0.1/NIF	0 – 100 %
	WOBimp (Work of breathing) Accuracy: $\pm 10\%$ Actual reading	0 – 20 j/l
	RCe (Expiratory time constant)	0 – 99.9 Sec
	C20/C (Compliance ratio)	0.00 – 5.00
	<b>Real Time Curves</b>	
	Pressure + Time , Flow + Time , Volume + Time	Pressure over time, Flow over time, Volume over time
	P–V Loop, F–V Loop	Pressure–volume loop, Flow–volume loop
<b>Performing Procedures</b>	Inspiration-Hold	Pause the ventilator at end inspiration Maximum allowable duration shall be 20 s
	Expiration-Hold	Pause the ventilator in expiration Maximum allowable duration shall be 20 s
	Manual Breathing	Delivery a mandatory breath during the next breath
	P0.1	The maximal slope of the airway pressure during inspiration
	NIF	The maximum negative pressure generated during inspiration against an occluded airway



	Suction	This function allows breaths to be delivered during a suction maneuver. 20 – 120 s; Resolution: 10
	O2 100%	Delivers O2 100% for 2 minutes
	Standby	Places ventilator in standby mode
	Sigh	Breaths delivered at a regular interval, with a larger tidal volume
	Nebulizer	During the nebulization time, the nebulizer is activated and an external medication nebulizer can be used
<b>Configuration setting</b>	Sigh	On or off, 0 – 50% of volume or pressure setting, Resolution: 1% Interval: 20 – 200 breaths, Resolution: 1 breath Sigh per time: 1 – 6 breaths, Duration: 1 – 6 breaths
	Nebulizer	On or off, Duration: 1- 480 min, Resolution: 1 min Accuracy: ±10 s
	Humidification Type	None, HME, Warm Humidified
	Compliance Comp	On or Off;
<b>Power and Gas Supply</b>	AC input	100 to 240 VAC (47 – 63 Hz)
	Battery Backup (with fully charged battery)	≥120 min
	High pressure oxygen inlet supply	29 – 87 psi clean, dry, and oil-free medical grade
<b>Battery specification</b>	Type	Two Li-Ion
	Voltage, Energy	14.4 V, totally >80Wh
<b>Alarm System</b>	Auditory alarm	Internal speakers

	Visual alarm	In the TFT display
	Indicator	LED
	Types	Technical, Physiological, Messages
	Priorities	High, Medium, Low
<b>Environmental Data</b>	Operating temperature	5 – 40 °C
	Storage temperature	(-10) – 60 °C
	Operating Humidity	15% – 95% non condensing
	Storage Humidity	5% – 95% non condensing
	Operating altitude	11,000 ft (3,500 m) above sea level
<b>Physical Data</b>	Width x depth x height (main case)	45 x 35 x 29 cm
	Weight	≈12 Kg
	Noise Level	TBD
<b>Display</b>	TFT Size	12.1” wide, with Touch screen
<b>Pressure Safety</b>	Maximum limited pressure	110 ±10 cmH2O
	Maximum operating pressure	80 cmH2O
<b>Compliance and Approvals</b>	Classifications	Class I equipment, Type BF, internally powered EMC related group and classification: I-B
	Meets International Standards	EN 60601-1: 2006 EN 60601-1-2: 2007 EN 60601-1-8: 2007 EN 60601-2-12: 2006

