Technical Specifications

alveo, the most advanced high-fidelity lung simulator ever developed. Designed to revolutionize respiratory technology, medical training, and research, alveo sets a new benchmark for realism and functionality in lung simulation.

With its groundbreaking physiological feedback model, alveo also offers unparalleled accuracy in simulating realistic lung behavior. It has been engineered to meet the needs of device manufacturers, simulation centers, and research facilities, empowering them to push boundaries in their respective fields.

- Future-Proof
- Intuitive Design
- Wireless Connectivity

Key Features of alveo

- Intuitive User Interface
- Tablet Operation
- Pediatric to Adult Lung Simulation
- Advanced Physiologic Feedback
- Spontaneous Breath Variability
- Adjustable Leak
- Comprehensive Lung Condition Library
- Incident Scenarios
- Scripting and Automated Testing
- Wireless Connectivity
- Portable & Compact
- Three-Hour Battery Life

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Monitoring Parameter		Range	Accuracy
Flow	Leak Flow ($Flow_{Leak}$)	-150 to 300 L/min	±3.7 %* or ±0.2 L/min**
	Peak Flow Inspiratory ($Flow_{Insp}$)	-150 to 300 L/min	±3.7 %* or ±0.2 L/min**
	Peak Flow Expiratory ($Flow_{Exp}$)	-150 to 300 L/min	±3.7 %* or ±0.2 L/min**
Pressure	Airway Pressure (P_{aw})	-80 to 120 mbar	±1.5 %* or ±0.3 mbar**
	Mean Airway Pressure (P_{Mean})	-80 to 120 mbar	±1.5 %* or ±0.3 mbar**
	Lung Pressure (P_{Lung})	-80 to 120 mbar	±1.5 %* or ±0.3 mbar**
	Mean Lung Pressure ($P_{LungMean}$)	-80 to 120 mbar	±1.5 %* or ±0.3 mbar**
	Positive End Expiratory Pressure (PEEP)	-80 to 120 mbar	±1.5 %* or ±0.3 mbar**
	Total PEEP (PEEP)	-80 to 120 mbar	±1.5 %* or ±0.3 mbar**
Volume	In- & Expiratory Tidal Volume (Vti, Vte)	0-300 L/min	±3.7 %* or ±0.2 L/min**
	In- & Expiratory Minute Volume (Vi, Ve)	0-300 L/min	±3.7 %* or ±0.2 L**
	End Expiratory Lung Volume (EELV)	0-300 L/min	±3.7 %* or ±0.2 L/min**
Timing	Respiratory Rate (Rate)	1-2000 bpm	±1.0 % or ±1 bpm**
	Inspiratory Time (Ti)	0.01-60 s	±0.2 s
	Expiratory Time (Te)	0.01-90 s	±0.2 s
	I:E Ratio	1:300-300:1	±2 %*
	Ti/Tcyc	0-100 %	±5 %*
Work	$Total_{WorkInsp}$	0-1000 J/L	±5 %*
	$WoB_{Patient}$	0-1000 J/L	±5 %*
Power	W_{Total}	0-1000 J/min	±5 %*
Settings		**Range**	**Accuracy**
Compliance Linear/S-Curve	Compliance Respiratory System (Crs) Lung Compliance (C_{Lung}) Compliance Chestwall (C_{cw})	3-300 mL/mbar Adult/Pediatric 0.2-300 mL/mbar Neonatal	±5 %*
Resistance Linear/Parabolic	Inspiratory Resistance (R_{Insp}) Expiratory Resistance (R_{Exp})	5-500 mbar/L/s	Parabolic: ±10 %* Linear: ±20 %*
Spontaneous	Rate	0-100 bpm	±1.0 % or ±1 bpm**
	Muscular Effort Inspiratory ($P_{MusInsp}$) Muscular Effort Expiratory (P_{MusExp})	0-100 mbar	±3 % or ±0.5 mbar**
	Neural Inspiratory Time (T_{Mus})	0.1-10 s	±0.1 s
	Rise/Hold/Release Inspiratory	0.1-30 % / 0.1-90 % / 0.1-30 %	
	Rise/Hold/Release Expiratory	0.1-30 % / 0.1-90 % / 0.1-30 %	
	Variation Rate	0-30 %	
	Variation P_{Mus}	0-30 %	
Additional Settings	Leak	Off, 0.1-100 %	
	Functional Residual Capacity (FRC)	10-4000 mL	
	Recruitability	Good, Medium, Poor, None	
	Physiology Model	On/Off	
Units	Flow	L/min, mL/min	
	Pressure	mbar, cmH_2O	
	Work	J/min, mJ/min, J/L	
	Temperature	°C, °F	
Gas Types		Air, O_2	
Gas Standards		STP, BTPS	
Additional Monitoring	**Description**	**Range**	**Accuracy**
Oxygen	In Flow Channel	0-100 %	±1 % O_2**
Temperature		0-50° C	±2 %**
Humidity		0-100 % RH (non condensing)	±5 % RH ** ±5 % RH **
Atmospheric Pressure (P_{Atmo})		700-1200 mbar	±1.5 %* or ±5 mbar**
Waveforms			
Pressure	P_{aw}, P_{Lung}, P_{aw}/P_{Lung}, P_{Mus}/P_{aw}, P_{Mus}/P_{Lung}		
Flow	$Flow_{aw}$, $Flow_{Leak}$, $Flow_{aw}/Flow_{Leak}$		
Volume	Volume		
Vital Signs (Calculated)			
Vital Signs (Waveforms)		ECG, Plethysmography, Arterial Blood Pressure, End-Tidal CO_2, Respiratory Rate	
Vital Signs (Numeric)		Heart Rate, Respiratory Rate (RR), $etCO_2$, SpO_2, Arterial Blood Pressure	
Metabolism		VO_2, VCO_2	
Respiratory		Vd/Vt, VQ, Shunt, PaO_2 / FiO_2 Index	
Arterial Blood Gas		PaO_2, $PaCO_2$, $AaDO_2$, pH, BE, Hb	
Compliance		Crs, C_{Lung}, Ccw	
Resistance		R_{Insp}, R_{Exp}	
General Information			
Power		100-240 VAC, (± 20 %) 50-60 Hz, 2.0 A	
Battery Operation		180 min.	
Weight		Device 6.8 kg / 16.5 lbs, Tablet 0.48 kg / 1.06 lbs	
Dimensions (w × d × h)		410 x 295 x 160 mm, 16.14 x 11.61 x 6.29"	
Data Storage & Retrieval		Via RS232 and external Tools	
Sample Rate		1 kHz	
Display		11" Android Tablet, 1920 x 1200 (WUXGA)	
Interfaces		2 x USB-C, Ethernet, CAN, COM1, COM2, RS232	
Calibration & Maintenance		Annually	
Operating Temperature		10-40°C (50-104° F)	
Operating Humidity		10-90 % R.H., non-condensing	
Approvals		CE, CSA (North America), IEC 61010-1:2010, IEC 61326-2:2012	

The greater tolerance is valid: *Tolerance related to the measured value, ** Absolute tolerance, with steady air flow

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