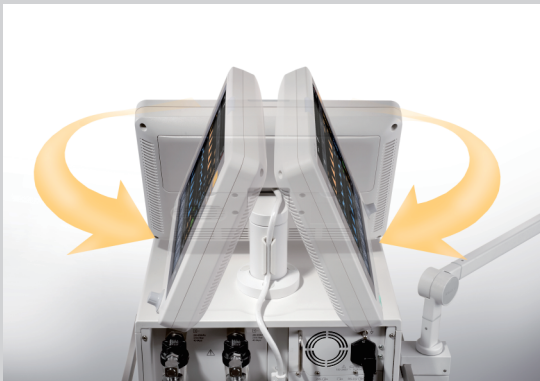




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SynoVent E5 Ventilator



Technical Specifications

Physical Specifications

Dimensions and Weight

Height * Width * Depth: 470mm * 430mm * 500mm

Weight: Approximately 25kg

Caster

Diameter: 100mm

Brakes: Individual lock of front casters

Display

Screen: 12.1" Color active matrix TFT touch screen (separable 180° rotation and 45° tilt)

Brightness: Adjustable

CPU

Type: Dual-CPU

Patient type: Neonate to adult (body weight at least 3kg)

Ventilator Specifications: Should be Ventilator specifications

Modes of ventilation (standard)

V-A/C (volume assist/control) with Sigh

P-A/C (pressure assist/control)

V-SIMV (Synchronized intermittend mandatory ventilation, volume assist)

P-SIMV (Synchronized intermittend mandatory ventilation, pressure assist)

PSV (Pressure support ventilation)

CPAP (Continuous positive airway pressure)

DuoLevel

NIV (Non-invasive ventilation)

Apnea ventilation

Modes of ventilation (optional)

APRV (Airway pressure release ventilation)

PRVC (Pressure regulated volume control)

Ventilation Parameters Ranges

O ₂ %:	21~100%
TV (Tidal volume range):	Pediatric: 20~300 mL (increments of 1 mL)
Adult:	100~2000 mL (increments of 10 mL)
f (Ventilation frequency) range:	1~150 bpm (f SIMV : 1~60 bpm)
I:E range:	4: 1~1: 10 (increments of 0.5)
T _{insp} (inspiratory time) range:	0.02~10 s (increments of 0.5s)
T _{slope} range:	0~2.00 s (increments of 0.05s)
T _{high} range:	0.2~30s (increments of 0.1s)
T _{low} range:	0.2~30s (increments of 0.1s)
Flow range:	0; 6-180L/min
P _{limit} range:	5 ~105 cmH ₂ O (increments of 1 cmH ₂ O)
P _{insp} range:	5 ~100cmH ₂ O (increments of 1 cmH ₂ O)
Δ P _{supp} :	0 ~100 cmH ₂ O (increments of 1 cmH ₂ O)
P _{high} :	0 ~ 100 cmH ₂ O (increments of 1 cmH ₂ O)
P _{low} :	0 ~ 50 cmH ₂ O (increments of 1 cmH ₂ O)
PEEP:	Off, 1 ~ 45 cmH ₂ O (increments of 1 cmH ₂ O)
Δ int.PEEP:	Off, 1 ~ 40 cmH ₂ O (increments of 1 cmH ₂ O)
Flow trigger:	0.5 ~ 15L/min (increments of 0.1L/min)

Pressure trigger:	-10 ~ -0.5 cmH ₂ O (increments of 0.5 cmH ₂ O)
Exp% (Expiration termination level):	10 ~ 85% (increments of 5%)
f _{apnea} (frequency for apnea-ventilation):	Pediatric: 1 ~ 100 bpm (increments of 1bpm)
	Adult: 1 ~ 100 bpm (increments of 1bpm)
ΔP _{apnea} :	refer to P _{insp} specification
Ventilator performance	
Pressure range at inlet:	280kPa ~ 650kPa
Peak gas flow:	> 180L/min
Ventilator monitor	
Airway pressure range:	P _{peak} (peak pressure), P _{plat} (plateau pressure), P _{mean} (mean pressure) (-20 ~ +120 cm H ₂ O)
Tidal volume range:	TV _i , TV _e , TV _{e_spn} (0 ~ 4000 mL)
Frequency range:	f _{total} , f _{mand} , f _{spn} (0 ~ 200 bpm)
Minute volume range:	MV _i , MV _{spn} , MV _{peak} (0 ~ 100 L/min)
PEEP:	0 ~120cmH ₂ O
Inspired oxygen (FiO ₂):	15 ~ 100%
Resistance (R):	R _{insp} , R _{exp} (0 ~ 600 cmH ₂ O/(L/s)
Compliance (C):	C _{stat} , C _{dyn} (0 ~ 300 mL/cmH ₂ O)
PEEPi:	0 ~ 120 cmH ₂ O
RSBI (rapid shallow breathing index):	0 ~ 9999 / (min L)
P0.1:	-20 ~ 0 cmH ₂ O
NIF (negative inspiratory force,optional):	-45 ~ 0 cmH ₂ O
WOB (work of breathing, optional):	0 ~ 100J/min
Waveforms:	Airway pressure-time, Flow-time, Volume-time, EtCO ₂ -time
Loops:	Paw-Volume, Flow-Volume, Paw-Flow
EtCO ₂ (optional):	0 ~ 99 mmHg
FiCO ₂ (optional):	0 ~ 99 mmHg
Trend	
Continuous waveform and tabular trend information together with time discrete events are stored and shown for the latest 72 hours	
for P _{peak} , P _{plat} , P _{mean} , PEEP, R _i , R _e , MV _i , MV _{total} , MV _{spn} , C _{dyn} , TV _i , TV _e , TV _{e_spn} , RSBI, f _{tot} , f _{mand} , f _{spn} , FiO ₂ , and optional WOB, EtCO ₂ , and FiCO ₂ .	
New trend form will be recorded when restarting the machine.	
Ventilator accuracy	
Control accuracy	
O ₂ %:	±3vol.% or ±5% of setting, whichever is greater
TV (Tidal volume range):	±10mL or ±10% of setting, whichever is greater
T _{insp} (inspiratory time) range:	±0.1s or ±10% of setting, whichever is greater
P _{mean} range:	±2.0cmH ₂ O or ±10% of setting, whichever is greater
P _{insp} range:	±2.0cmH ₂ O or ±10% of setting, whichever is greater
PEEP:	±2.0cmH ₂ O or ±10% of setting, whichever is greater
Flow trigger:	±1.0L/min or ±20% of reading, whichever is greater
Pressure trigger:	±1.0cmH ₂ O or ±10% of setting, whichever is greater
Monitor accuracy	
Airway pressure range:	± (2.0cmH ₂ O + 4% of the actual reading)
Tidal Volume range:	±15mL or ± 8% of reading, whichever is greater
Minute volume range:	±0.3L/min or ± 8% of reading, whichever is greater
Inspired oxygen (FiO ₂):	21%~100%; ±3vol.%
Alarm settings	
Tidal volume:	High: Pediatric: 25 ~ 4000mL, OFF Adult: 110 ~ 4000mL, OFF
Minute volume:	High: (non-NIV) Pediatric: 0.2 ~ 60.0L/min; Adult: 0.2 ~ 100.0L/min (NIV) Pediatric: 0.1 ~ 60.0L/min ; Adult: 0.1 ~ 100.0L/min
	Low: (non-NIV) Pediatric: 0.1~ 30.0L/min; Adult: 0.1 ~ 50.0L/min (NIV) Pediatric: 0.1 ~ 30.0L/min, OFF; Adult: 0.1 ~30.0L/min, OFF
Air pressure:	High: 10 ~105 cmH ₂ O Low (auto): PEEP + 4 cmH ₂ O
Frequency:	High: 1~160bpm, OFF
Inspired oxygen (FiO ₂):	High (auto): FiO ₂ exceeds the alarm limit for at least 20s, internal alarm limit: set value+max (7% or set value*10%) Low (auto): FiO ₂ lower than the alarm limit for at least 20s, internal alarm limit : set value-max (7% or set value*10%)
	Absolute FiO ₂ low limit: 18% O ₂
Sustained airway pressure:	(auto) internally set alarm limit: PEEP+15 cmH ₂ O; The alarm limit is exceeded for 15s continuously

Ventilator components	
Flow sensor	
Type:	Variable orifice flow sensor
Dimensions:	22mm OD and 15 mm ID
Location:	Expiratory port
Oxygen sensor	
Type:	Galvanic fuel cell
Response time:	< 15s
Communication ports	
RS-232C connector	
Ethernet (RJ-45)	
CO ₂ /calibration connector	
Nurse call connector	
VGA connector	
USB Port (2)	
Side-Stream Carbon Dioxide (CO₂) Module	
Method:	Infrared absorption
Displayed numerics:	EtCO ₂ , FiCO ₂
Waveforms:	Capnography
Work mode:	Standby or measurement
Measurement range:	0 ~ 99 mmHg
Accuracy:	0 ~ 40 mmHg (±2mmHg)
	41 ~ 76 mmHg (±5%)
	77 ~ 99 mmHg (±10%)
Resolution:	1mmHg
Sampling rate:	70 or 100mL/min
Sampling rate accuracy:	±15% of set value or ±15mL/min ,whichever is larger
Response time:	When measured with a neonatal watertap and a 2.5m-long neonatal sampling line < 3 s @ 100mL/min ; <3.5 s @ 70 mL/min
	When measured with an adult watertap and a 2.5m-long neonatal sampling line <5 s @ 100 mL/min ; <6.5 s @ 70 mL/min
Rise time:	<330 s @ 100 mL/min ; <400 s @ 70 mL/min
Operation Data	
Environmental specifications	
Temperature:	10 ~ 40℃ (operating); -20 ~ +60 °C (storage and transport, O ₂ sensor: -20 ~ +50℃)
Relative humidity (non-condensing):	15 ~ 95% (operating); 10 ~ 95% (storage and transport)
Barometric pressure (kPa):	50 ~ 106 (operating); 50 ~ 106 (storage and transport)
Power and Battery Backup	
Power input:	220 ~ 240 Vac, 50/60 Hz, 10A or 100 ~ 120 Vac, 50/60 Hz, 15A
Main unit power supply:	100 ~ 240 Vac, 50/60 Hz, 1.6 ~ 0.8A
Battery backup:	90 minutes with 1 battery (powered by new fully-charged battery with 25 °C ambient temperature) 180 minutes with 2 batteries (powered by new fully-charged batteries with 25°C ambient temperature)
Battery type:	Built-in Li-ion battery, 11.1 VDC, 4500 mAh
Number of batteries:	1or 2
Gas supply	
Gas type:	O ₂ and Air
Pipeline input range:	0.28 ~ 0.65MPa
Pipeline connections:	NIST, DISS
Electromagnetic compatibility	
Immunity:	Complies with all requirements of IEC 60601-1-2
Emissions:	CISPR 11 group 1 class B, class A; IEC 60601-1-2; IEC 61000-3-2; IEC 61000-3-3
Air compressor	
Power input:	220 ~ 240 Vac, 50/60 Hz, 3A or 100 ~ 120 Vac, 60 Hz, 6A
Output pressure range:	300 ~ 450 kPa
Noise:	< 50dB
Continuous Flow:	≥ 30L/min at out -put pressure of 300kPa
Peak flow:	> 180L/min for more than 0.8s at one barometric pressure

Trolley	
Dimensions:	730mm (depth) * 560mm (width) * 870mm (height)
Weight:	23kg
Power:	220-240V~ 50/60Hz 10A or 100-120V~ 50/60Hz15A
Output1 (air compressor):	220-240V~ 50/60Hz 3A or 100-120V~ 50/60Hz 6A
Output2	220-240V~ 50/60Hz 3A or 100-120V~ 50/60Hz 3.5A
Output3	220-240V~ 50/60Hz 3A or 100-120V~ 50/60Hz 3.5A
System Check	
O ₂ /Air/Expiratory flow sensor test	
Expiratory/safety valve test	
O ₂ sensor test	
Leakage/compliance/circuit resistance measurement	
Leakage, resistance and compliance are automatically compensated during ventilation	
Special functions and procedures	
Sigh	
100% O ₂	
Suction support	
Manual breath	
Expiratory hold	
Inspiratory hold	
P0.1	
NIF	
PEEPi	
Apnea ventilation	
PV-tool	
Alarms	
Physiological alarms	
Airway pressure too high/low	
FiO ₂ too high/low	
Tv _e too high	
MV too high/low	
Apnea	
Frequency too high	
Pressure limited	
EtCO ₂ too high/low	
FiCO ₂ too high	
Selected technical alarms	
Low battery voltage	
Battery in use	
Power supply voltage error	
Air supply pressure low	
O ₂ supply presure low	
Airway leak	
Airway obstruction	
Tube disconnected	
TV not achieved	
P _{insp} not achieved	
Sustained airway pressure	
PEEP too high	
T _{insp} too long	
O ₂ sensor disconnected	
Nebulizer valve failure	

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