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NIMM-PS-2 Multi-parameter Physiological Simulator



NIMM-PS-2

Built-in point procedures and positions are more in line with the operation habits of domestic first-line users.

It is equipped with a detachable internal lithium battery and adopts a modular design. The main unit features a 7-inch touch-screen color LCD display, allowing multiple physiological parameters to be displayed simultaneously. It also includes internal calibration procedures for multi-parameter monitors, electronic blood pressure meters, mercury blood pressure meters, and blood pressure charts.

Measurements can be entered on the screen, and the errors or repeatability can be automatically calculated. Electronic versions of the original records and certificates can be issued based on the original data recorded by the inspector, and they can also be exported.

It integrates 8 physiological parameter simulation functions such as electrocardiogram (ECG), non-invasive blood pressure (NIBP), invasive blood pressure (IBP), end-tidal carbon dioxide (EtCO2), cardiac output (CO), body temperature (TEMP), respiration (chest impedance method simulation), and pulse oxygen saturation (SPO2).

Technical Specification

-ECG (Electrocardiogram) Section

Item	Specifications
Square Wave	Amplitude: (0.005 ~ 5.0) mV; Maximum permissible error: ±2% within (0.5 ~ 2.0) mV.Frequency: (0.001 ~ 2000) Hz; Maximum permissible error: ±1%

Item	Specifications
	within (0.2 ~ 2.5) Hz.Duty cycle: 0.1 ~ 0.9
Sine Wave	Amplitude: (0.005 ~ 5.0) mV; Maximum permissible error: ±2% within (0.5 ~ 2.0) mV.Frequency: (0.001 ~ 2000) Hz; Maximum permissible error: ±1% within (0.1 ~ 100) Hz
Standard Heart-Rate Signal	Amplitude: (0.1 ~ 5.0) mV; Maximum permissible error: ±2% within (0.5 ~ 2.0) mV.Heart rate: (10 ~ 360) bpm; Maximum permissible error: ±(1 % of reading + 1) bpm for (30 ~ 300) bpm
Pulse Wave	Amplitude: (0.005 ~ 5) mV; Period: (0.001 ~ 100) s;Pulse width: (0.1 ~ 50000) ms; Delay: (0 ~ 50000) ms
Triangle Wave	Amplitude: (0.005 ~ 5) mV; Period: (0.001 ~ 1000) s;Rise time: (0.1 ~ 500000) ms; Fall time: (0.1 ~ 500000) ms
Maternal-Fetal ECG Mixed Signal	Maternal amplitude: (1 ~ 2) mV; Maternal heart rate: (10 ~ 360) bpm.Fetal amplitude: (0 ~ 1) mV; Fetal heart rate: (10 ~ 360) bpm
Synthesized ECG Waveform	Heart rate: (10 ~ 360) bpm; R-wave amplitude: (0 ~ 2) mV; S-wave amplitude: (0 ~ −2) mV;ST-segment baseline amplitude: (−2 ~ 2) mV; T-wave amplitude: (0 ~ 2) mV; P-wave amplitude: (0 ~ 2) mV;QRS-wave amplitude: (0 ~ 2) mV; QRS-wave interval: (0 ~ 750) ms; ST-wave interval: (0 ~ 750) ms;T-wave interval: (0 ~ 750) ms; P-wave interval: (0 ~ 750) ms; PQ-wave interval: (0 ~ 750) ms
Computer-Generated Random Noise	(0 ~ 2) mV
ECG Simulation Signal	Heart rate, P1 amplitude, P2 amplitude, Q amplitude, R1 amplitude, R2 amplitude, R3 amplitude, R4 amplitude, ST amplitude, T amplitude, P1 time, P2 time, PQ time, R1 time, R2 time, R3 time, R4 time, S time, ST time, T time, QT time. All parameters are independently adjustable.
Differential Signal	Period: (0 ~ 10000) ms; Amplitude: (0 ~ 2) mV; Time constant: (0.01 ~ 1000) ms;Negative-pulse duration: (0 ~ 10000) ms
Other Signals	Simulates DC offset, trapezoidal signal, DC Gaussian noise, bigeminy_3a, slow-varying bigeminy_3b, fast-varying bigeminy_3c, bidirectional contraction_3d, ventricular tachycardia_1mV_206bpm_4a, ventricular tachycardia_2mV_195bpm_4b and other waveforms.

NIBP (Non-Invasive Blood Pressure) Section

Item	Specifications
Pressure Units	mmHg, kPa, cmH_2O, inH_2O, psi
Pressure Measurement	Measuring range: (0 ~ 400) mmHg; Resolution: 0.1 mmHg; Maximum permissible error: ≤ ±0.8 mmHg
Pressure Source	Output range: (0 ~ 400) mmHg; Resolution: 1 mmHg.Deviation between target and actual pressure: ±10 mmHg for 100-400 mmHg with minimum volume of 300 cc.
Dynamic Blood-Pressure Simulation (Oscillometric Method)	Systolic pressure: (25 ~ 255) mmHg; Diastolic pressure: (15 ~ 245) mmHg;Blood-pressure repeatability: ≤ 2.25 mmHg; Heart-rate range: (30 ~ 200) bpm;Maximum heart-rate error: ±(1 % reading + 1) bpm;Cuff types: external cuff, internal cuff
Custom Blood-Pressure Simulation	Presets: 7 standard blood-pressure profiles, 8 patient states, 4 arrhythmia modes, 4 respiration modes, 4 neonatal modes, 3 wrist-cuff modes
Air-Tightness Verification	Pre-configured verification workflow per regulatory requirements. System pressure points are read at 1-minute and 5-minute intervals, and pressure-leakage rate is calculated automatically.

SpO_2 (Pulse Oximetry) Section

Item	Specifications
Pulse Oxygen Saturation	Simulation range: (30 % ~ 100 %); Resolution: 1 %; Repeatability: ≤ 1 %;Maximum permissible error: ±2 % for 75 %-100 %; ±3 % for 35 %-74 %
Pulse Rate	Simulation range: (25 ~ 300) bpm; Resolution: 1 bpm;Maximum permissible error: ±1 % of reading or ±1 bpm, whichever is larger
Perfusion Index	Range: (0.000 % ~ 20.000 %);Resolution: 1 % within (1.000 %-20.000 %); 0.1 % within (0.100 %-0.900 %)
10 built-in R-curves: BCI, Criticare, Datascope, Datex, PMS M1190, Masimo, Nellcor, Nihon-Kohden, Ohmeda&Nova, Respironics	

$EtCO_2$ (End-Tidal Carbon Dioxide) Section [Optional]

Item	Specifications
Respiration rate	(0 ~ 150) breaths/min; Accuracy: ±0.5 %
Gas Interfaces	-CO_2 calibration- gas input: quick- connect fitting for 6 mm- outer-diameter PU tubing - Modulated-gas output: barb fitting, outer diameter 15 mm, length 20 mm
Matching Accessories - CO_2 calibration gas: 5 % volume fraction (nitrogen balance gas); Maximum permissible error: ±2 % - Two- stage pressure- reducing valve (with gas flowmeter): High- pressure gauge range 25 MPa; Low- pressure gauge range 0.6 MPa; CO_2 outlet pressure: (0.15 ~ 0.2) MPa - Precision digital barometer: 3.5- inch display with numerical and curve readout; Pressure measuring range 900- 1100 hPa; Accuracy class 0.1; Units: kPa, hPa, Pa, mmHg configurable.	

Product Configuration

Main unit, power adapter, oximetry simulation finger, temperature- measurement lead set, respiration- rhythm generator and accessories (optional).