



YP-2200B

Infant Incubator



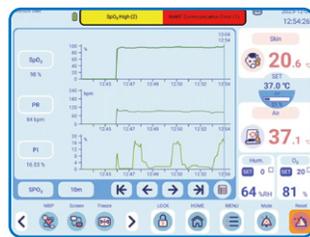
Brief Introduction

Incubator module:

- Dual LCD screen, with 12.1-inch LCD color touch screen and 5.6-inch LCD color screen, can be achieved by simple click; With data storage and curve display functions, it can record the changing trend of newborn vital signs within 48 hours (temp/humidity/O2/weight).



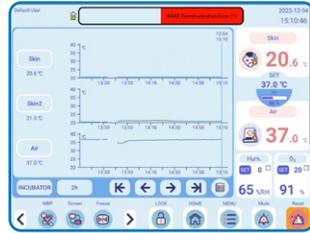
SpHb/PVI/PI Trend



SpO₂/PR/PI Trend



Heating/Humidity/O₂ Trend



Skin1 and 2/Air temperature

- Temperature servo control: air mode, baby mode and kangaroo mode;
- Equipped with an embedded smart system and an Android display system . The updated PID core algorithm makes the temperature and humidity fluctuation in the incubator more uniform;
- Double-hood cover antifog with UV protection;
- In the scientific air circulation system with front-rear air outlet and left-right air return, the incubator will automatically form a vertical air curtain when the cabin door is open, thereby minimizing the heat loss;
- The high-temperature steam humidification method is used to kill most of the common pathogenic bacteria in the water tank, greatly reducing the risk of infection (integrated water tank in the humidifier);
- One-piece injection molding hood, with smooth appearance, strong toughness and long service life, hinged structure for opening the hood with safety lock;
- Once the knobs on both sides are turned in place, the electric control bassinet can be smoothly tilted and adjusted at multiple angles, effectively reducing the spitting up of newborns;
- 4 pcs operating windows with rubber seal and 2 pcs rotating windows for clinical staff to operation, 10 pcs small soft port for tube and cable going through;
- Pressure-relief waterproof mattress is made of TPU material, which is soft and breathable, thereby improving the comfort of newborns and protecting the integrity of the skin;
- The angle of the bassinet can be adjusted through the touch screen and support one-key leveling, which is more convenient for operation;sliding bassinet for x-ray procedure
- The X-ray cassette can be placed under the bassinet, eliminating the need to move the newborns and reducing the risk of infect;
- The electric height adjustable stand from pedals on both sides;
- 3 pcs drawers and the large-capacity swivel storage drawer is ergonomic;
- Built-in weighing system, convenient to measure the weight of children and monitor the weight trend changes (optional);
- Camera can perform local image shooting and video recording, which is convenient for clinical review (optional);
- RS-232 connector to support data transmission;
- The front drawer-type water tank
- 4 pcs wheels with 4 brakes.

Product Dimensions

Transport handles on both sides

Dimension: L 1500mm × W 675mm × H 1650mm~1800mm

Distance from the bassinet to the floor: 980mm~1130mm

Weight : 117kg

● Newborn special monitoring module (optional)

- **Masimo** Rainbow SpO₂ pulse oximetry monitoring system: effectively eliminates exercise interference and improves the measurement performance under weak perfusion and body movement.
- Hemoglobin monitoring:the perfusion variation index (PVI) enables clinicians to assess the patient's infusion status, and non-invasively and continuously measures the hemoglobin SpMet in the blood to assess the total blood oxygen content SpOC.
- ECG monitoring: 3-lead or 5-lead monitoring of neonatal ECG waveform and heart rate.
- **SunTech** NIBP non-invasive blood pressure monitoring: it has double protection function of software and hardware.
- **Masimo** CO₂ monitoring: provides two measurement methods: mainstream and external side flow to monitor CO₂ accurately in a real-time manner.
- Apnea wake-up monitoring: it has the functions of close monitoring, real-time prompt and adopt early intervention for neonates at risk of apnea.

Standard Configuration

Main body (including infant compartment, machine case, controller, I.V. pole and tray), external display screen, sensor box with dual skin sensors, humidity control function, oxygen concentration control function, >37°C temperature set function, vertical height adjustment stand, skin temperature sensor, electric tilting system, automatic adjustment of screen brightness,heat monitoring system

Optional Configuration

Weighing system (the tilting angle of the bassinet display/adjustment function, one-key leveling function), external observation lamp, camera function, ambient temperature and humidity monitoring device, panel damping system, Monitoring system (SpO₂, CO₂, ECG, NIBP, apnea wake-up, hemoglobin monitoring device).

Environmental Requirement

Operating range: 20°C~30°C

Relative Humidity: 30%RH ~75%RH

Atmospheric pressure range: 700hPa~1060hPa

Ambient air velocity: <0.3m/s

Specification

Infant Incubator

Power requirement: AC220-230V, 50/60Hz or AC110-120V, 50/60HZ, 1300VA
 Auxiliary power output: AC220-230V, 50/60Hz, maximum current allowed: 3A
 Air temperature control range: 20°C~37°C (override mode 37.1°C~39°C)
 Baby temperature control range: 34°C~37°C (override mode 37.1°C~38°C)
 Temperature sensor display range: 5°C~65°C
 Warm-up time (with the ambient temperature at +22°C): No longer than 40 minutes
 Difference between the air temperature at one point and the average air temperature: No greater than 0.5°C

Difference between the average air temperature and the control temperature: No greater than 1.0°C

Temperature overshoot in Air Control mode: No greater than 1.0°C

Temperature uniformity: No greater than 0.8°C (mattress horizontally placed)

Temperature uniformity: No greater than 1.0°C (mattress tilted)

Accuracy of skin temperature sensor: within $\pm 0.2^{\circ}\text{C}$

Humidity display range: 0%RH~100%RH

Humidity control range: 30%RH~95%RH

Accuracy of humidity display and control: $\pm 5\%$ RH

Oxygen concentration display range: 0%O₂~100%O₂

Electronic control of oxygen concentration: 20%~65%O₂

Accuracy of oxygen display concentration:

- $\pm 2\%$ O₂ (oxygen concentration sets $\leq 25\%$)
- $\pm 3\%$ O₂ (oxygen concentration sets $> 25\%$)

Accuracy of oxygen control concentration: $\pm 4\%$ O₂ volume concentration (Dual O₂ sensors for control and monitoring)

Weighing Range: 100~8000g (optional)

Weight display accuracy: $\pm 10\text{g}$ (optional)

Noise inside hood: Under stable temperature $\leq 45\text{dB(A)}$ (ambient noise: $\leq 35\text{dB(A)}$)

CO₂ concentration in the compartment: Lower than 0.5% when the CO₂ mixture is pumped in at the speed of 750 mL/min at 10 cm above the center of the mattress.

Air flow speed above the mattress: no greater than 0.1 m/s

Mattress size: 755 x 375 mm

Maximum tilt Angle for crib with electric adjustment function: $\pm 12^{\circ}$

Precision of tilt Angle display for crib equipped with electric adjustment function: within $\pm 1^{\circ}$

Failure alarm (visual and sound) with alarm cancel button: power failure alarm, high/low air temperature failure, high/low skin temperature failure, high/low oxygen, fan motor alarm, sensor alarm, deviation alarm, over-temperature alarm, water shortage alarm, water tank position alarm, system alarm, SpO₂ alarm, ECG alarm, RESP alarm, NIBP alarm, CO₂ alarm and so on.

Video storage duration: no less than 24 hours (optional)

SpO₂ INDICATORS (optional)

SpO₂ display range: 0~100%, SpO₂ display resolution: 1%

SpO₂ measurement accuracy: within the range 70%~100% and without body movement: $\pm 3\%$

SpO₂ waveform scan speed: 6.25mm/s, 12.5mm/s, 25mm/s, 50mm/s

SpO₂ alarm upper limit: 51%~100%, SpO₂ alarm lower limit: 50%~99%

SpO₂ average time: 2s~4s, 4s~6s, 8s, 10s, 12s, 14s, 16s, Factory default 8s

PR display range: 25bpm~240 bpm, PR display resolution: 1 bpm

PR measurement accuracy: within the range 30bpm~240bpm and without body movement: $\pm 3\text{bpm}$

PR alarm upper limit: 26bpm~240 bpm, PR alarm lower limit: 25bpm~239 bpm

PI display range: 0.02%~20.0%, PI display resolution: 0.01%

Hemoglobin parameters (applicable only to incubators with the Masimo Rainbow sensor), Parameters that can be measured and displayed: SpOC, PVI, SpMet.

CO₂ PERFORMANCE INDICATORS (optional)

Total system response time: Mainstream system $< 3\text{s}$, Sidestream system $< 5\text{s}$

Measurement parameters: CO₂, AwRR

Measuring range: 0.0~25.0Vol% (CO₂), 0~150rpm (AwRR)

Resolution: 0.1Vol% (CO₂), 1rpm (AwRR)

Measurement accuracy: under standard conditions (22 \pm 5°C and 1013 \pm 40hPa, single gas): when CO₂ within the range of 0~15Vol% , measurement accuracy $\pm (0.2\text{Vol}\% + 2\% \text{ of reading})$, AwRR measurement accuracy: $\pm 1\text{rpm}$.

Under all conditions: when CO₂ within the range of 0 Vol%~15Vol%, measurement accuracy $\pm (0.3\text{kpa} + 4\% \text{ of reading})$, AwRR respiratory rate: $\pm 1\text{rpm}$.

Measurement error drift: it can meet the requirement of measurement error within 6 hours.

O₂ compensation: Compensation range: 0-100%
Resolution: 1% Default: 21%

N₂O compensation: Compensation range: 0-100%
Resolution: 1% Default: 0%

Flow rate control accuracy: $\pm 15\%$ of the setting or $\pm 15\text{ mL/min}$, whichever is greater

The minimum sampling rate of by-pass CO₂ module is 50ml/min \pm 10ml/min

Pre-warm time: Accuracy mode: $\leq 45\text{s}$

Full Accuracy mode $\leq 10\text{ min}$

ECG PERFORMANCE INDICATORS (optional)

Lead type: 3leads: I, II, III; 5leads: I, II, III, aVR, aVL, aVF, V

Gain and error: at least supports 1.25mm/mV ($\times 0.125$), 2.5mm/mV ($\times 0.25$), 5mm/mV ($\times 0.5$), 10mm/mV ($\times 1$), 20mm/mV ($\times 2$), 40mm/mV ($\times 4$), accuracy error is less than $\pm 5\%$.

Waveform scanning speed: four scanning speeds: at least 6.25mm/s, 12.5mm/s, 25mm/s, 50mm/s, with an error within $\pm 10\%$.

Common mode rejection ratio (CMRR): Diagnostic mode: $> 90\text{dB}$,
Monitor mode: $> 100\text{dB}$,
Surgery mode: $> 105\text{dB}$

Power frequency notch: Monitor and Surgery modes: 50Hz and 60Hz
Diagnostic mode: 50Hz, 60Hz, and Off

Power frequency interference suppression capacity: $\geq 20\text{dB}$

Input impedance: when the input signal frequency is 10Hz, input impedance $> 5\text{M}\Omega$

Input signal range: $\pm 10\text{mV}$ (peak-to-peak value)

Input dynamic range (IDR): Meet the requirements of IEC 60601-2-27.

The DC bias voltage can reach $\pm 300\text{mV}$

Lead-off detection current: measuring electrode: $< 0.1\mu\text{A}$,
drive electrode: $< 1\mu\text{A}$

Baseline recovery time: recovery time after defibrillation $< 5\text{s}$

Patient leakage current: $< 10\mu\text{A}$

Calibration signal: 1mV \pm 0.01 mV (peak-to-peak), accuracy $\pm 10\%$

System noise: $\leq 30\mu\text{V p-p}$

High T wave suppression capability: can suppress a maximum of 1.2 mV T waves, meeting the requirements of IEC 60601-2-27

Electric knife noise suppression: with the test method in Article IEC 60601-2-27, when the ECG leads meeting the standard are used.

The peak-peak noise is less than or equal to 2 mV compared with the ECG baseline.

Measuring range: 15bpm~350bpm, Resolution: 1bpm

Accuracy: $\pm 1\%$ or $\pm 1\text{bpm}$ (whichever the larger)

HR alarm upper limit: (low limit+1bpm) ~ 350bpm,
HR alarm lower limit: 15bpm~(high limit - 1bpm)

Change response time: When the HR changes from 80bpm~120bpm: less than 10s; When the HR changes from 80bpm~40bpm: less than 10s.

The response time does not include the 1.0 second within the update interval.

HR average: the HR average must meet the requirements of IEC 60601-2-27 and be calculated as follows: If the last three consecutive RR intervals is greater than 1,200 ms, the HR is calculated by the average of the last four RR intervals. Otherwise, the HR is calculated by the average of the last 12 RR intervals with the maximum and minimum values excluded. Response to irregular heart rhythms: meet the requirements of IEC 60601-2-27, that is, the HR displayed when the heart rhythm becomes stable 20s later:

Waveform 3a (ventricular bigeminy): 80±6 bpm

Waveform 3b (slow alternating ventricular bigeminy): 60±6 bpm

Waveform 3c (fast alternating ventricular bigeminy): 120±8 bpm

Waveform 3d (bidirectional contraction): 90±9 bpm

Tachycardia alarm time: Half R-wave amplitude: <10s;

One R-wave amplitude: <10s;

Duobel R-wave amplitude: <10s;

Waveform b2: Half R-wave amplitude: <10s;

One R-wave amplitude: <10s;

Duobel R-wave amplitude: <10s.

PACE PULSE PERFORMANCE INDICATORS (optional)

Pulse sign: Pulse amplitude: ±2 mV to ±700 mV

Pulse width: 0.1 ms-2.0 ms

Rise time: 10 μs-100 μs

Pulse suppression: meet the requirements of Article 4.1.4.1 in ANSI/AAMIEC13:2002 and IEC 60601-2-27 suppress pace pulses meeting the following conditions: Pulse amplitude: ±2 mV to ±700 mV

Pulse width: 0.1 ms-2.0 ms

Rise time: 10 μs-100 μs

(This device is not suitable for dual-pulse pacing in IEC 60601-2-27)

Suppression of fast ECG signal: 0.4 V/s±0.1V/s, test with the method in Article IEC 60601-2-27.

HR alarm upper limit: (Lower limit + 1 bpm)-350 bpm, resolution: 1 bpm

HR alarm lower limit: 15 bpm-(upper limit - 1 bpm), resolution: 1 bpm

HR alarm setting range: 15 bpm-350 bpm

RESP PERFORMANCE INDICATORS (optional)

Respiration lead: lead I, II, or Automatic

Respiratory excitation waveform: Sine wave signal, 62.8 kHz (±10%), < 500 μA

Waveform speed: supporting at least 6.25mm/s, 12.5mm/s, 25mm/s, 50mm/s

Waveform amplitude: supporting at least ×0.125, ×0.25, ×0.5, ×1, ×2, ×3, ×4, ×5

Waveform bandwidth: 0.1 Hz-3.0 Hz (-3 dB)

Base impedance range: 500-4,000 Ω (including the 1 k resistance of the lead)

RR measurement range: 0 rpm-150 rpm

RR measurement accuracy: 10rpm~150rpm±2rpm or ±2%, whichever is greater 0 rpm-9 rpm, not defined.

Apnea alarm delay: At least 20s, 25s, 30s, 35s, 40s, 45s, 50s, 55s, and 60s

Allowed delay error: ±3s

RR measurement range: 0~ 150rpm, Resolution: 1rpm

RR alarm upper limit: (low limit+1rpm)~150rpm,

low limit: 0rpm~(high limit-1rpm)

NIBP PERFORMANCE INDICATORS (optional)

Measuring mode: manual, automatic, Short-term automatic mode (STAT)

Automatic measurement mode: 2.5min, 5min, 10min, 15min, 20min, 30min, 45min, 60min, 90min, 120min.

Time of Short-term Auto Mode: 5min±10%

Maximum single measurement time: <90s

Noninvasive blood pressure measuring range:

40mmHg~130 mmHg (Systolic pressure)

20mmHg~100 mmHg (Diastolic pressure)

27mmHg~110 mmHg (Mean blood pressure)

Accuracy: Maximum average error: ±5 mmHg

Maximum standard deviation: 8 mmHg

Pressure resolution: 1mmHg (0.1kPa)

Static pressure measurement range: 0mmHg~140mmHg

Static pressure measurement accuracy: ±3mmHg

PR range: 30bpm~220bpm

PR accuracy: ±3bpm

Initial cuff pressure range: 60mmHg, 70mmHg, 80mmHg, 90mmHg, 100mmHg, 110mmHg, 120mmHg, 130mmHg, 140mmHg, Factory default 90mmHg.

Overpressure protection: < 150mmHg±5mmHg

Start initialization: 7s

SYS alarm upper limit: (lower limit+1mmHg)~130mmHg, resolution: 1mmHg

SYS alarm lower limit: 40mmHg~(upper limit -1mmHg), resolution: 1mmHg

DIA alarm upper limit: (lower limit +1mmHg)~100mmHg, resolution: 1mmHg

DIA alarm lower limit: 20mmHg~(upper limit -1mmHg), resolution: 1mmHg

MAP alarm upper limit:(lower limit +1mmHg)~110mmHg, resolution: 1mmHg

MAP alarm lower limit: 27mmHg~(upper limit -1mmHg), resolution: 1mmHg

SYS alarm upper limit: (lower limit +0.1kPa)~17.3kPa, resolution: 0.1kPa

SYS alarm lower limit: 5.3kPa~(upper limit-0.1kPa), resolution: 0.1kPa

DIA alarm upper limit: (lower limit +0.1kPa)~13.3kPa, resolution: 0.1kPa

DIA alarm lower limit: 2.7kPa~(upper limit-0.1kPa), resolution: 0.1kPa

MAP alarm upper limit: (lower limit +0.1kPa)~14.7kPa, resolution: 0.1kPa

MAP alarm lower limit: 3.6kPa~(upper limit-0.1kPa), resolution: 0.1kPa

APNEA AWAKENING PERFORMANCE INDICATORS (optional)

Trigger condition: when the heart rate (HR), blood oxygen (SpO₂) and any parameter of the newborn are less than the set value, the wake-up device will start to vibrate intermittently, When it is greater than the preset value, the wake-up device will automatically stop intermittent vibration.

When the breathing rate of CO₂ ≤6 rpm, the wake-up device will start to vibrate intermittently;

When the breathing rate of CO₂ >6 rpm, the wake-up device will stop intermittent vibration automatically.

Stimulation mode: Beater vibration

Vibration strength: 50, 60, 70, 80, 90, 100, Factory default 50.



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