VNG®

INFANT INCUBATOR
## VNG 3000

AMBIENT TEMPERATURE MONITORING

With an ambient temperature probe, the incubator is able to compare the gap between ambient and setting temperature and changing heating power output accordingly in order to provide a more stable inside hood air temperature.

HEATING SYSTEM MONITORING

It monitors not only hood air temperature but also a radiator and circuit air temperature. By collecting each parts' temperature information, Its temperature control system is much more accurate and safe than others.

PID FUZZY ALGORITHM

With the help of the latest PID technology, the minimizes the temperature variability to an unprecedented 0.2 and temperature overshoot is also reduced dramatically.

ON/OFF

Temperature

Setting temperature

Time

PID

Temperature

Setting temperature

Time
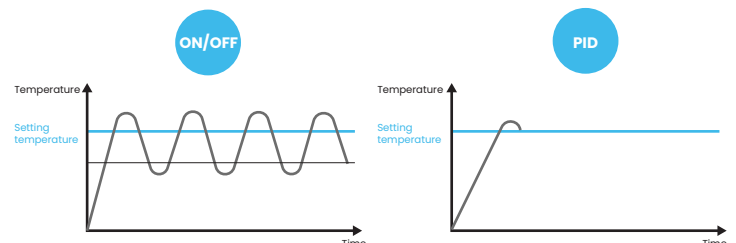
TEMPERATURE UNIFORMITY

The incubator's air circuit system is designed based on massive experimentation. With plenty aerodynamics knowledge, the temperature uniformity is improved as Bmuch as possible in order to give infants the safest micro-environment.

HEATING SOURCE DOUBLE PROTECTION

It is equipped with both a thermocouple and mechanical temperature switch to protect the heating source of the heating system and evaporator. Thermocouple reads real-time temperature and limits the temperature in a safe range by feed-back the temperature value to the control module. While mechanical temperature switch is in series circuits, if the heating source temperature goes unmoral level, the temperature switch cuts off the circuit physically.

THREE CHANNEL TEMPERATURE SENSORS

There are three channel of temperature sensors in the module box. One channel is for reading hood temperature to remain the temperature at setting value. Another temperature sensor is in an individual circuit for protection only. The third sensor is used to compare the reading with other two sensors. If the reading of the three sensors differs from 0.8°C, the alarm is triggered.

BACKUP BATTERY

It is equipped with a backup battery, once the power supply is off, the backup battery supports the air circuit and the alarm system keep working for at least 30 minutes

❘ ALARM LIST

It provides a wide range of physiological and technical alarms in order to improve the treatment effect and eliminate residual risk from the device.

Ⓐ System Fault Alarm

Stuck Key	This alarm occurs when a stuck key is detected.
Sensor Disconnect	This alarm occurs when communication with the sensor module fails.
Sensor Module Failure3	This alarm occurs when the controller detects a sensor module fan is not rotating.
Sensor Module Failure6	This alarm occurs when the controller detects the ambient temperature sensor is open or shorted.
Sensor Module Failure8	This alarm occurs when the controller detects that the sensor module watchdog reset.
Low Air Flow	This alarm occurs when an air circulation failure is detected.
Air Flow Probe Failed	This alarm occurs if the airflow probe connection is open or short-circuited.
Motor Failed	This alarm is activated when the fan motor speed falls outside specified tolerances.
Power Failure	This alarm occurs when the AC power supply is off.(within the 30s)
Battery Disconnect	This Alarm occurs when the battery is disconnected.
Sensor Out of Position	This alarm occurs when the sensor module is not in the hood.
Access Panel Open |	This alarm occurs when the access panel is open.
Heater Failed1	This alarm occurs when the heater is over temperature.
Heater Failed2	This alarm occurs when the heater is damaged.
Air Probe Failed	This alarm occurs when one of the two thermistors in the sensor module differ from the other by 0.8ºC or both two thermistors have a measurement error exceeding acceptable limits.
Skin1 Probe Fail Alarm	This alarm occurs in the Skin mode if the Skin1 probe is electrically open or shorted.
Watchdog Failed	This alarm occurs when a failure is detected with the watchdog.

Ⓑ Temperature Alarm

High Skin Temperature	This alarm occurs when the indicated displayed temperature differs from the set temperature by >0.5ºC or >1.0ºC (user selectable, default 1.0ºC).
Low Skin Temperature	This alarm occurs when the indicated displayed temperature differs from the set temperature by < 0.5ºC or <1.0ºC (user selectable, default 1.0ºC).
Remove Skin2 Probe	This alarm occurs when two skin probes are installed and the Skin mode is selected.
Skin Probe Disconnect	This alarm is activated when the Skin1 temperature probe (only in the Skin mode) is removed from the sensor module. The associated monitoring display is blanked. (within 30s)
High Temp CutOut	Under air control, this alarm is activated if the displayed incubator temperature reaches 38ºC for set temperatures <37ºC, or 40ºC for set temperatures >37ºC. Under skin control, this alarm is activated if the incubator temperature reaches 40ºC for any set temperature.
High Air Temperature	This alarm occurs when the indicated displayed temperature differs from the set temperature by >1.5ºC.
Low Air Temperature	This alarm occurs when the indicated displayed temperature differs from the set temperature by <2.5ºC.
High Skin1 Temperature	This alarm occurs when the Air mode is enabled and the infant skin temperature (from the Skin1 probe) is >38.0ºC when the Override mode is not active, or >39.0ºC when the >37ºC mode of operation is active.
High Skin 2 Temperature	This alarm occurs when the Air mode is enabled and the infant skin temperature (from the Skin2 probe) is >38.0ºC when the Override mode is not active, or >39.0ºC when the >37ºC mode of operation is active.

Ⓒ Humidity Alarm

Humidity Heater Failed 1	This alarm occurs when the humidity heater temperature is overheated.
Add Water	Not enough water in the water reservoir.
Low Humidity	This alarm occurs when the humidity is 10% lower than setting humidity. Note: The alarm is blocked for 30 minutes every time turn on the machine, or 15 minutes every time the humidity setting value is changed.
Reservoir Out of Position	This alarm occurs when the water reservoir not in position.
Humidity Heater Failed 2	This alarm occurs when the heater thermocouple wires are open or shorted.

Ⓓ Oxygen Alarm

Oxygen Cell	This alarm occurs when the oxygen cell readings differ by more than 3%. As a result, the oxygen flow into the system is interrupted.
Difference	This alarm occurs when the displayed oxygen value is >3% below the oxygen set point.
Low Oxygen	This alarm occurs when the displayed oxygen value is >3% above the oxygen set point.
High Oxygen	This Alarm occurs when the oxygen cells are out of date.
Change Oxygen Cells	This Alarm occurs when the O2 source pressure is low or high.
Check O2 Supply	This Alarm occurs when proportional value is failed.
Servo O2 System Fail	This Alarm occurs when the oxygen cell is disconnected with module box.

COMFORTABLE

- It provides newborn a supper quiet environment. With the help of aerodynamics, It's hood sound is reduced to 45cB.
- With great detail design, It is also devoted to provide medical personnel pleasure operation experience.

Max
Min

| SPECIFICATION

Physical Attributes	Height	Width	Depth	Weigh
	126.1cm to 146.1cm	99.7cm	57.7cm	80kg

Hood Specifications	Tubing access ports	Access door size	Mattress to hood height
	10	18 x 13cm	4.8cm
	Soft bed mattress size	Mattress tilt	Drawer depth
	73.6 x 38.6 x1.8cm	±12°	36cm
	Drawer size		
	28.0 x 24.7cm 28.0 x 11.3cm(x2)		

Temperature Control Modes	Temperature control modes	Air mode control temperature range	Air mode control override temperature range
	Skin and air temperature control mode	20° C-37° C	37° C-39° C
	Air mode control accuracy	Skin mode control temperature range	Skin mode control override temperature range
	≤±1.0°C	34° C-37° C	37° C-38° C
	Skin temperature accuracy	Dual-skin temperature monitoring	
	±0.3°C	Yes	

Servo Humidity Option	Humidity control range	Humidity control operating time without refilling	Humidity control reservoir capacity
	30%-95% RH	24 hours	1500ml
	Humidity display accuracy	Humidity control accuracy	
	±5% RH	±5% RH	

Performance	Air flow velocity across mattress	Temperature rise time at 22 °C (72 °F) ambient	Temperature variability
	< 10 cm/sec	<20min (From 22 °C, 50% RH, to 35 °C)	< 0.2 °C
	Temperature overshoot	Temperature uniformity with a level mattress	Operating noise level in hood
	< 0.5 °C maximum	< 0.8 °C	≤45dBa
	Carbon Dioxide (CO2) Level		
	<0.5%		

Servo Oxygen Option	Oxygen display accuracy of full scale	Oxygen control accuracy (100% calibration)	Oxygen control accuracy (21% calibration)
	± 2%	± 3%	±5%
	Oxygen control range	Oxygen display resolution	
	21 % to 65%	1%	

Scale Option	Weight range	Weight display resolution	Weight accuracy
	300 g to 8 kg	1 g	±10g

Operating Environment	Temperature	Humidity	Air Velocity
	20° to 30° C	10 to 95% RH	Up to 0.3 m/sec

Storage/Shipping Information	Temperature	Humidity	
	-25° to 60° C	0 to 95% RH	

VNG MEDICAL INNOVATION SYSTEM PVT.LTD.

www.vngmedical.com info@vngmedical.com
+91-8725031080 +91-8725031076 JLPL Industrial Park Plot no-197,
Sector-82,Mohali, India