

## Operation of Incubator Can Be Monitored



Configuration of IoT module with multi-screen interaction. Provide real-time upload set parameters, operation parameters, operation curves, records, and event records through the IoT cloud platform. The operation of incubator can be monitored at anytime and anywhere through mobile APP or computer terminal. Alarm function, and service function are available through an one button touch.

## Eliminate Pollution with Anti-condensation Heating System

The door on the CO<sub>2</sub> incubator can radiate heat to the inner glass door, effectively preventing the glass door from forming condensation. The possibility of microbial contamination caused by the condensate water is eliminated.

## Intelligent Control of Circulating Air to Maintain Uniformity

The air flow for circulation can be adjusted automatically. The air flow is optimized to avoid volatilization of test samples and to ensure proper uniformity throughout the chamber.

## Comprehensive and Perfect Safety Alarm System

The system ensures the safety of experiments and process by an independent temperature alarm system including a sound, light, and remote reminder. Other alarms include CO<sub>2</sub> concentration, door ajar, and water shortage. New functions bring you the most comprehensive protection of test samples and operators.

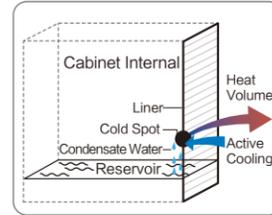
## Thoughtful Design with Concentration on Details



Anti-slipping out of hand and anti-dumping design of integral partition



Convenient drainage design, clean and convenient



Active heat pipe condensation technology with condensate water directly return to reservoir



Data traceable for 15 years with large storage capacity, and data exportable through USB.

## Performance Parameter

Model	Volume(L)	Exterior Dimensions (W×D×H mm)	Interior Dimensions (W×D×H mm)	Shelf Dimensions (W×D×H mm)	Standard Configuration of Shelves No./Maximum			
HCP-168	168	707*812*887	490*560*650	473*434	3/11			
Temperature Control Mode	Humidity Control Range	Temperature Sensor	Temperature Control Range	Temperature Fluctuation	Temperature Uniformity	CO <sub>2</sub> Sensor	CO <sub>2</sub> Control Range	CO <sub>2</sub> Control Accuracy
Direct heating air sleeve	>90%RH	PT1000*2	Ambient temperature +3℃~55℃	±0.1℃	±0.3℃	Infrared sensor (IR) >90%rh	0~20%	0.1%

# Haier Biomedical

Intelligent Protection of Life Science

## Haier CO<sub>2</sub> Incubator

180℃ Dry-heat Sterilization  
Safe Cell Regeneration with IoT Technology



HCP-168

- Uniform and Stable Temperature:**  
 Temperature is precisely controlled within the fluctuation range of ±0.1℃ to ensure the normal growth of cells throughout their life cycle.
- Precise CO<sub>2</sub> Concentration:**  
 A new type of IR sensor controls CO<sub>2</sub> concentration sensitively to keep the culture medium stable in a weak alkaline environment.
- 180℃ Dry-heat Sterilization:**  
 One-button sterilization, effective killing of microorganisms including gemma and spores with strong resistance after 12 hours.
- IoT APP Standard Configuration:**  
 The operation of incubator can be monitored at anytime through mobile APP or computer terminal, also with alarm and push function.

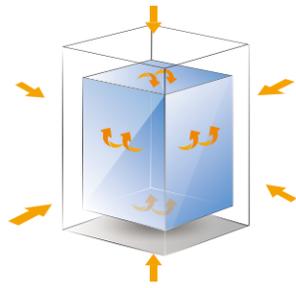
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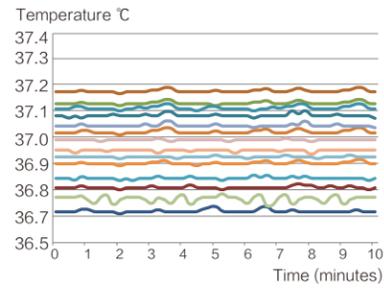


## Concise Test Results with Accurate Temperature Control

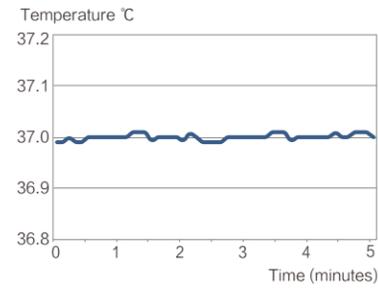
Control the temperature precisely within the fluctuation range of  $\pm 0.1^{\circ}\text{C}$  with six-sided heating based on fuzzy PID control principle to ensure the normal growth of cells throughout their life cycle.



6-sided heating sketch



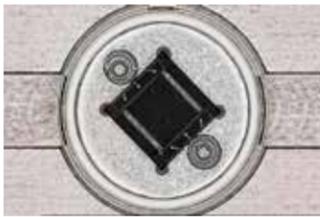
Uniformity of 27 measuring points  $< \pm 0.3^{\circ}\text{C}$



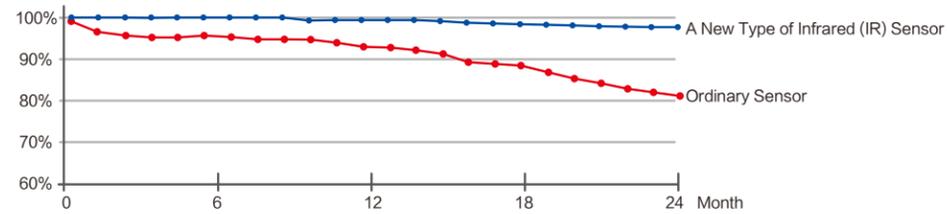
Central point volatility  $< \pm 0.1^{\circ}\text{C}$

## New IR Sensor Control Technology for Precise CO<sub>2</sub> Concentration

New type IR sensor technology, using NDIR measurement principle, can withstand high temperature at  $190^{\circ}\text{C}$ . The silicon MEMS transmitter can carry more than 300 dry heat sterilization cycles with a service life of 15 years. A built-in temperature and humidity compensation technology reduces the impact of changes of humidity and temperature without the need for calibration after high temperature sterilization. Five point calibration yields a higher measuring accuracy, sensitivity with less drift.



Silicon-based mems transmitter



Sketch of drift less than 0.3%

## Quick Environment Recovery System in the Incubator

Adopting active air flow control technology, based on the fuzzy PID control principle, the parameters can be restored without overshoot, the door open for 30 seconds, the temperature and CO<sub>2</sub> concentration can be quickly restored within 4 minutes. Even if multiple users share a CO<sub>2</sub> incubator and frequently open and close the door, the stability and uniformity of the incubator can be ensured.

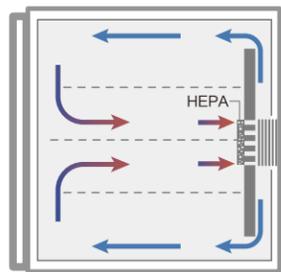
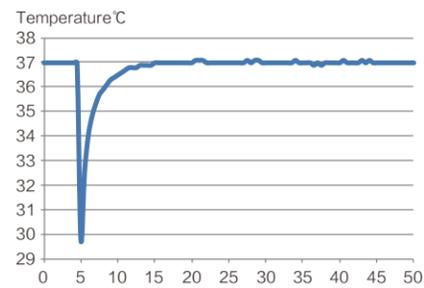
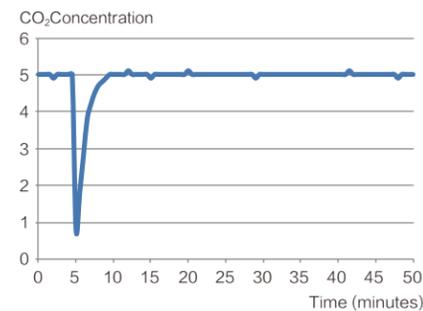


Illustration of purified airflow



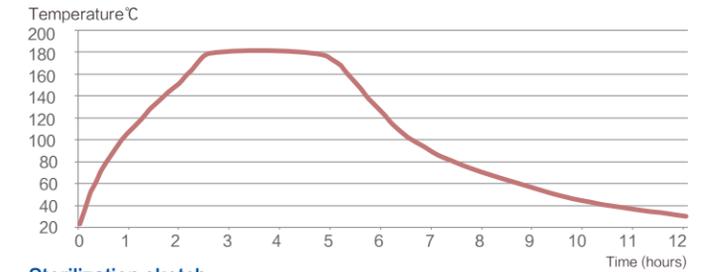
Temperature recovery curve (door open for 30s)



CO<sub>2</sub> concentration recovery curve (door open for 30s)

## 180°C Dry-Heat Sterilization Technology

Effective sterilization of microorganisms including gemma and spores with strong resistance,  $180^{\circ}\text{C}$  high temperature, dry-heat sterilization without consumables, but only a press on the "sterilization key" to complete the sterilization process automatically in 12 hours. The sterility level of all surfaces in the working chamber can meet WS/T367-2012 requirements. During the sterilization process, all the internal components (including CO<sub>2</sub>) sensors are not disassembled with no need sterilize separately to effectively avoid secondary pollution.



Sterilization sketch

Forty-seven points were tested in the working chamber, including glass inner doors and partitions. All regions reached  $180^{\circ}\text{C}$  and maintained for 2 hours.



Ultraviolet disinfection of ordinary CO<sub>2</sub> incubator  
Cells exposed to bacterial environment



90°C hydrothermal disinfection of ordinary CO<sub>2</sub> incubator  
Cells exposed to bacterial environment



180°C dry-heat sterilization of haier CO<sub>2</sub> incubator  
Pollution-free cell growth environment

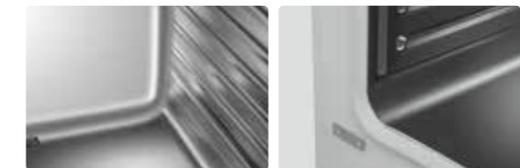
## High Efficiency in Bacteria Filtration with High Efficiency Microbial Filter



The CO<sub>2</sub> inlet is equipped with a high-efficiency microbial filter, which can filter bacteria. For particles larger than or equal to 0.2 micron in diameter, the filtration efficiency reaches 99.99%. It can effectively filter bacteria and dust particles in CO<sub>2</sub> gas to ensure the safety of experimental results.

## The Integral Design of Inner Liner Is Easy to Clean

The working chamber is stamped with stainless steel, laser seamless welding + plasma electropolishing process, large arc angle and bracketless design, enabling cleaning with no dead angle.

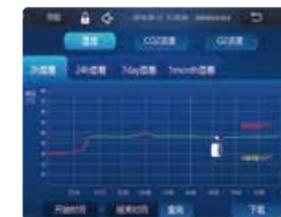


## Intelligent Interactive and Easy Touch Operation

Sensitive response at touching with rapid sensing even when you are wearing rubber gloves. Normal operation parameters are with green display, while abnormal operation parameters are in red warning display, with state data shown at a glance. When the liquid level is low, besides the red display, buzzing alarm will also be accompanied.



Home screen red warning sketch



Real-time display of operation data  
real-time display of temperature, CO<sub>2</sub> concentration and O<sub>2</sub> concentration, and the data during the culture cycle can be viewed at any time.



Announcement function designed for multiple persons to use the same incubator make clear to all users on important things



Operation mode clear management authority: three-level of authority to ensure the security of data