Thermoline

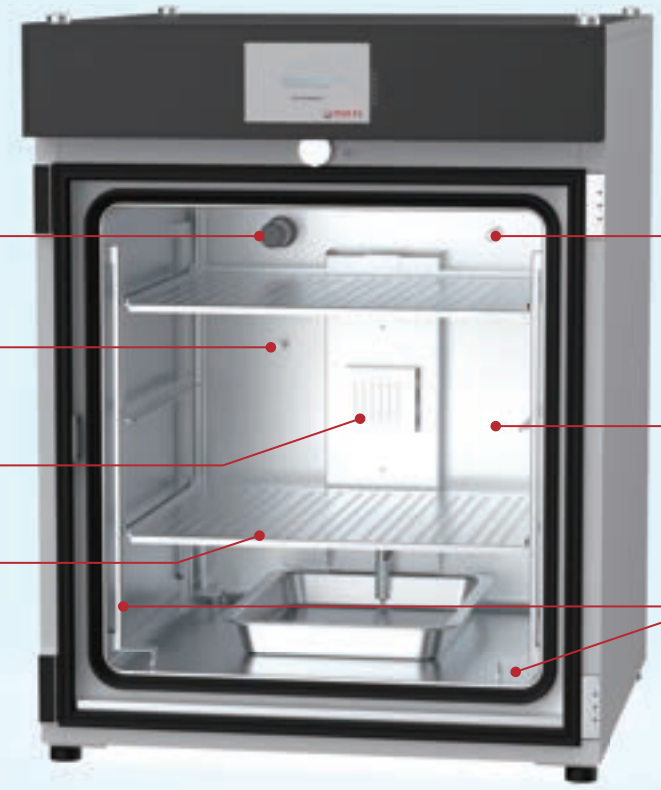
CO_2 Incubator
ICO170

Easily accessible USB ports for efficient data export and documentation

7-inch touchscreen interface for intuitive navigation and control

Left/Right-handed door orientation options

Ergonomically designed handle for comfortable, low-stress door operation



Rapid-response infrared CO_2 sensor for reliable atmosphere control

High-precision O_2 sensor (ZrO_2) for long-lasting performance (optional)

Multiple temperature sensors ensure accuracy

Seamless chamber with mirror finish for enhanced cleanability and reduced contamination risk

Fan-assisted circulation and HEPA filters ensures optimal uniformity and reduced airborne contamination

High-quality, stable shelving system

Fastener-free construction allowing easy dismantling

Optimized Cellular Growth Environment

- Superior temperature uniformity through fan-assisted circulation and direct heat + air jacket chamber design
- Precise CO_2 control utilizing dual infrared CO_2 sensors
- Rapid temperature and gas recovery without overshoot
- Integrated humidity monitoring and optional active humidification control

Enhanced Contamination Prevention

- Seamless chamber with rounded edges mitigates microbial buildup
- 180°C high-temperature disinfection (HTD) for enhanced sterility
- Standard configuration includes durable stainless-steel chamber; antimicrobial copper chamber available as an option
- In-chamber HEPA filter effectively captures airborne contaminants

Ergonomic Design & Easy Maintenance

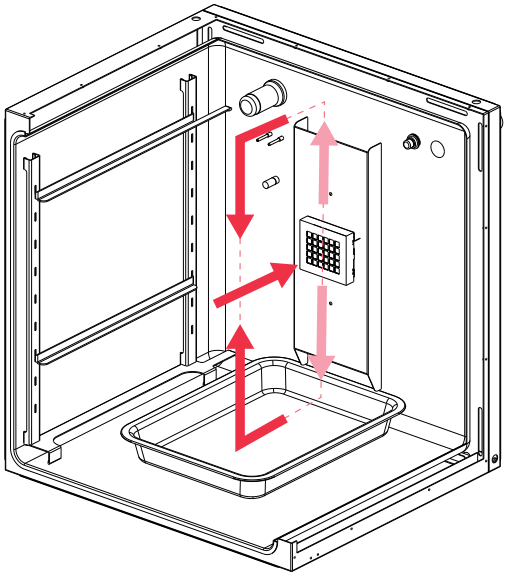
- Left/Right-handed door orientation options
- Magnetically sealed outer door requires minimal force to open
- Inner door latch to ensure perfect closure during operation
- Chamber features rounded edges and mirror finish for easy cleaning
- No need to remove CO_2 and humidity sensors during high-temperature disinfection (HTD)
- Stands and shelves features screw-less design allowing easy dismantling

Optimized Cellular Growth Environment

CO_2 incubators provide a controlled atmosphere conducive to cellular growth by regulating temperature, humidity, and CO_2 levels. Optimizing cell culture conditions in these incubators is critical for obtaining consistent and reproducible results.

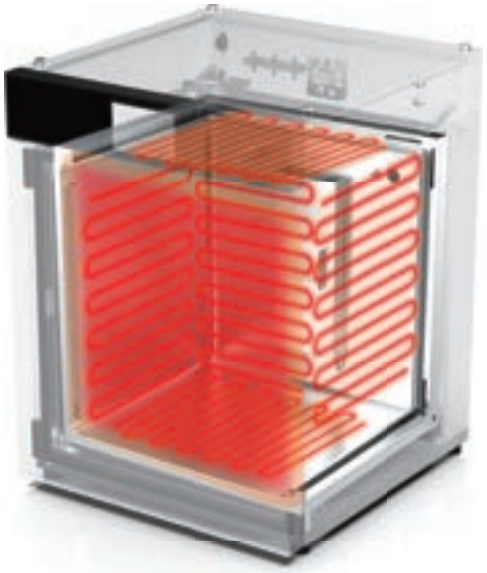
How to maintain an optimal growth environment inside the chamber?

Maintaining precise temperature control within CO_2 incubators ensures that cells are cultured at the optimal temperature for growth and metabolism.



Fan-assisted Circulation

Variations in temperature and environmental parameters can significantly impact cell growth. The integrated circulation fan ensures homogeneous distribution of gas concentration, temperature, and humidity throughout the chamber. The airflow is engineered to move along the chamber walls rather than directly over the cultures, ensuring precise temperature control and uniformity while minimizing turbulence around the samples.



6-sided Direct Heating & Air Jacket

The combination of 6-sided direct heating and an air jacket ensures uniform temperature distribution throughout the entire chamber. This air jacket direct heat approach offers a lighter weight alternative to water jacket systems, making it more suitable for laboratory benchtop installations.

Using the direct heat technology in the CO_2 incubator offers the following benefits

- Lightweight design and rapid initial stabilization (< 8 hours)
- Rapid Temperature Recovery
- Reduced maintenance requirements
- High Heat Disinfection Capability
- Condensation-free operation

Condensation-free

The 6-sided direct heating is achieved through heating elements on five sides of the chamber, complemented by a heated inner door. This design ensures temperature uniformity and effectively prevents condensation. A microprocessor controls these elements to maintain consistent sample temperatures.

Temperature Uniformity: verified at 27 spots inside the incubator

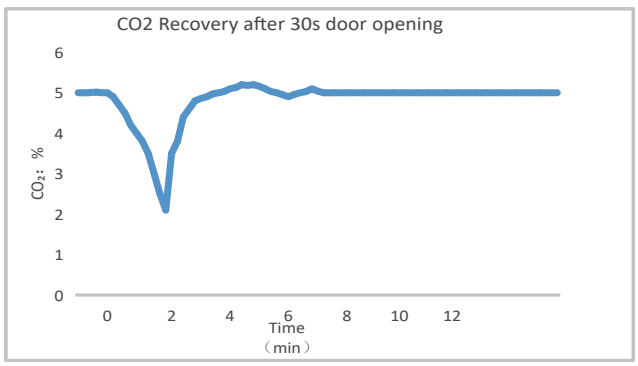
To ensure uniform cell cultures in vessels located at different positions within the chamber, temperature must be consistently uniform. Our advanced temperature control technology achieves this through features such as fan circulation for even heat distribution, 6-sided direct heating technology, and sophisticated microprocessor control.

Temperature uniformity inside the CO_2 incubator is verified according to the YY1621-2018 standard, measuring temperature deviation across 27 locations within the incubator. The temperature difference between any two points is maintained at less than 0.3°C

Precise CO_2 Control with Dual IR CO_2 Sensor

Precise regulation of CO_2 levels in the incubator atmosphere is essential for maintaining physiological pH levels in cell culture media and supporting cellular functions. Proper CO_2 levels ensure that cells can perform their metabolic functions efficiently, promoting enhanced growth and viability. Many cell types are cultured to mimic their natural environment as closely as possible. The typical CO_2 concentration in tissues is approximately 5%, so incubators are calibrated to replicate these conditions, providing a more physiologically relevant environment for the cells.

The infrared (IR) sensor's measurements are unaffected by temperature or humidity fluctuations, and it can withstand high temperatures, enabling it to stay inside the during the high-temperature disinfection cycle. The CO_2 IR sensor is equipped with a filter that removes microorganisms, particulates, and aerosols from the chamber air before it reaches the sensor. This enhances detector performance and prevents interference that could cause detector drift



The infrared CO_2 sensor is engineered to establish, maintain, and recover the CO_2 concentration to the desired setpoint with high precision. It ensures accurate control with rapid recovery to the setpoint after door openings, typically within less than 4 minutes.

Humidification Monitoring and Control

Controlling humidity levels is crucial to prevent desiccation of cell cultures and ensure a stable environment conducive to cell growth.

The standard ICO170 CO_2 incubator incorporates a passive humidification system with an easily accessible water reservoir for simple removal, emptying, and refilling. Additionally, it features an integrated humidity sensor that continuously monitors chamber humidity, a feature uncommon in many CO_2 incubator models.

An optional water level alarm for the water pan notifies users when the water level is low, prompting timely refills. For applications requiring more precise control, an optional active humidification control system offers rapid recovery after door openings and minimizes evaporation.

Passive Humidification

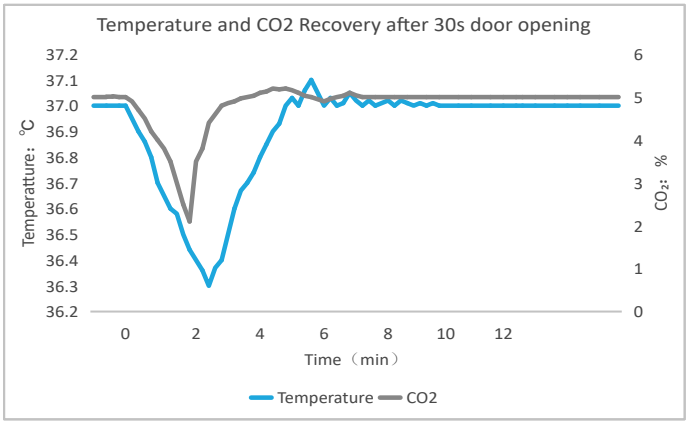
Active Humidification

During high temperature disinfection, humidity sensor does not need to be covered, shortening sterilization preparation.

Rapid Recovery Without Overshooting

Minimizing environmental fluctuations within the incubator is crucial for ensuring experimental reproducibility. To achieve this, it is essential to avoid significant disturbances, such as by reducing the duration and frequency of door openings. Moreover, the environment must rapidly recover without significant overshoot (e.g., temperature exceeding the setpoint).

Our incubator accomplishes this through a combination of fast -response sensors, advanced microprocessor control of gas input valves, and individually controlled heating circuits in each wall (6-sided direct heating). This configuration guarantees rapid air circulation and thorough mixing. The glass inner door allows for easy cell culture observation without disturbing the cell culture environment. Consequently, recovery times and the risk of contamination are effectively minimized, ensuring consistent culture conditions.



Efficient Contamination Protection

CO_2 incubators control temperature and CO_2 levels while maintaining a humidified atmosphere to create optimal conditions for cell growth. However, these conditions also promote the growth of contaminants such as bacteria, yeast, molds, and other fungi. When selecting an incubator, it is essential to consider features that minimize contamination risk. Our solutions to combat contaminants include:

180°C High-Temperature Disinfection (HTD) for Sterile Environment

1. Comprehensive Elimination of Contaminants

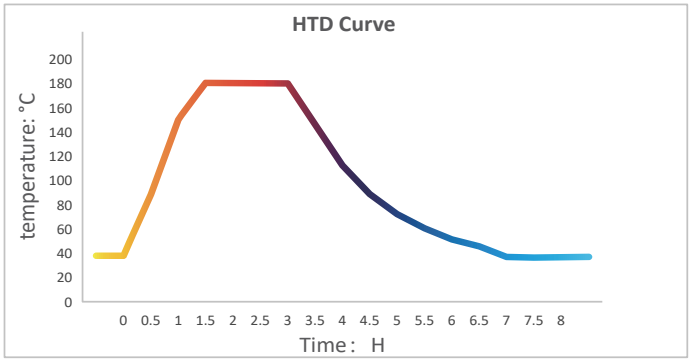
The high temperature used in HTD effectively eliminates a broad spectrum of contaminants, including bacteria, yeast, molds, and fungi.

2. No Chemical Residues

Unlike chemical disinfection methods, HTD does not leave potentially harmful residues that could affect cell cultures.

3. Minimal Preparation Time

The HTD process requires less setup time compared to other sterilization methods.

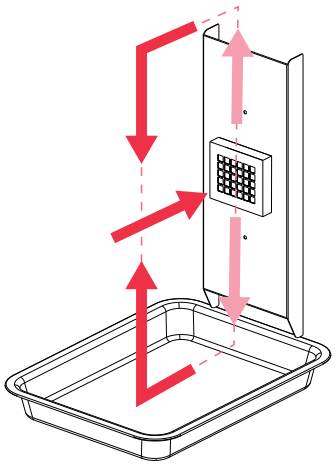


4. Reduced Re-contamination Risk

The chamber can be used immediately after the HTD cycle, minimizing the chance of re-contamination.

5. Step-by-step HTD guide

The user interface provides clear, illustrated step-by-step instructions to ensure a standardized and thorough pre-HTD operation.



In-chamber HEPA and Gas Inlet Filter

The in-chamber HEPA filter effectively captures airborne microorganisms, minimizing the risk of cross-contamination. The gas inlet, located outside the chamber, includes an easily replaceable filter that purifies incoming gas, reducing the ingress of particulates and potential contaminants. Together, these filtration systems maintain chamber cleanliness and significantly reduce the risk of cross-contamination affecting cell growth.

Seamless Chamber Design

Our CO_2 incubator features a seamless interior, minimizing crevices where contaminants can accumulate and facilitating easier cleaning and sterilization. This design reduces potential harborage sites for bacteria, fungi, and other microorganisms, thereby lowering the risk of contamination.

The seamless construction, with fewer parts and joints, requires less maintenance and simplifies disassembly and reassembly during cleaning procedures. Additionally, this design promotes smoother airflow within the incubator, contributing to more consistent conditions for cell growth.

Chamber Material Options

We offer a standard stainless-steel chamber for our CO_2 incubator. Stainless steel provides exceptional durability, resistance to mechanical loads, and high resistance to corrosion, scratches, and abrasions.

In addition to the stainless-steel option, we also provide a copper chamber variant. Copper surfaces exhibit antimicrobial properties.

Ergonomic Design & Easy Maintenance Features

Magnetic Outer Door and Inner Door Latch

The outer door utilizes a magnetic closure mechanism that requires minimal force to open and close, facilitating quick and efficient access to the incubator. The inner door enables convenient monitoring of cell cultures without significantly disrupting the chamber atmosphere. It features a latching mechanism for optimal sealing and environmental stability.

Ergonomic Design Features

Reversible Door Configuration:

We offer both left and right-handed options for flexible door -opening configurations, allowing users to select the door orientation that best suits their workspace layout and workflow requirements. Please note that the door orientation is factory -configured based on customer preference and cannot be changed by customers.

Optional Segmented Inner Doors

Inner door openings can cause transient drops in temperature, CO_2 concentration, and humidity. Segmented door also allows users to access specific sections of the incubator without disturbing other cultures, making it easier to manage and monitor multiple experiments simultaneously.

Easy to Maintain

Maintaining a clean and sterile environment is crucial for successful cell culture, but cleaning and disinfecting CO_2 incubators has traditionally been challenging for users. Our CO_2 incubator is designed with a focus on user -friendly and low-maintenance operation to minimize routine maintenance efforts:

- Chamber Design: The chamber features rounded edges and a mirror finish, facilitating easy cleaning and reducing the risk of microbial buildup.
- In Situ Sensors: Both the CO_2 and humidity sensors are designed to remain in the chamber during sterilization cycles, eliminating the need for removal and reducing preparation time.
- Tool-Free Removal of Stand and Shelves: Stands and shelves can be effortlessly removed without the need for tools or unscrewing, unlike some models that require disassembly before sterilization.

Model	TI-CO2-170-4E
Heating Method	Direct heat + Air jacket
Capacity	170L
Input Voltage	110V/220V 50/60HZ
Power	<60W/H(37℃)
Power (high temperature sterilization)	<1500W/H(180℃)
Convection	Fan
Heat Insulation	Foam
Display	7-inch touchscreen
Disinfect	180°C high temperature disinfection (HTD)
Chamber Humidity	95±5% R.H. (Relative Humidity)
Inner door material	Tempered glass
Access port (for cables etc.)	Inner diameter 30mm
Noise	< 50dB
Alarm	CO_2 concentration alarm, high & low temperature alarm, door-opening alarm, humidity alarm, low water level alarm (optional), O_2concentration alarm (optional)
Data transfer	USB, Ethernet port
Upgrade method	Wireless or Cable
Inner dimensions	557x518x597mm
Outer dimensions	718x744x956mm
Weight (accessories excluded)	≤80KG

Temperature Control

Temperature range	Ambient+3°C~55°C (ambient: 5℃ ~ 35℃)
Temperature controller	PID
Temperature uniformity at 37°C	±0.3°C
Temperature stability at 37°C	±0.1°C
Temperature Recovery Time (recover to 37°C after 30s door-opening)	< 5 minutes

CO_2 Control

CO_2 sensor	Dual IR sensor
CO_2 concentration range	0.1-20%
CO_2 accuracy	±0.1 %
CO_2 concentration recovery time (recover to 5% after 30s door-opening)	≤ 4 minutes
HEPA filter	Filter 99.97% of 0.22μm foreign particles
CO_2 connector	8mm tube (inner diameter)
CO_2 pressure	0.1MPa

Configurable Features	
Door handle location	Left / Right
Wheel type	Optional Caster (size: 40mm)
Chamber Material	Standard: 304 Stainless Steel / Optional: Copper
Number of shelves	Standard: 3 / Optional: 6 or 10
Number of inner doors	Standard: Unsegmented inner door Optional: 3 or 6-segmented inner doors
Humidification	Standard: Passive humidification water tray Optional: Active humidification external humidity reservoir
Water level monitor in the water tray	Optional
Tri-Gas	Optional

O_2 Control (optional)	
O_2 sensor	Zirconia
O_2concentration range	1~20%
O_2 accuracy	0.10%
O_2 connector	8mm tube (inner diameter)
O_2 pressure	0.1MPa

Thermoline