



# Air-jacketed CO<sub>2</sub> Incubator

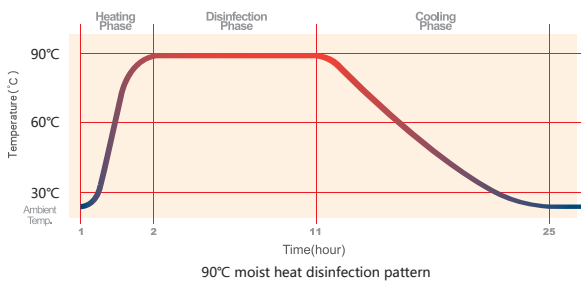
## Introductions

CO<sub>2</sub> incubators are widely used in scientific research to grow and maintain cell cultures. A Heal Force CO<sub>2</sub> incubator provides you with unsurpassed natural simulation to ensure optimum growth conditions for your culture at all time. That's why they become the first choice of researchers in fields of application include tissue engineering, in vitro fertilization, neuroscience, cancer research and other mammalian cell research.



### Safe for cultivation

Cell cultivation in particular is a highly sensitive process in which bacteria, viruses, fungal spores and mycoplasmas can destroy valuable cultures or distort test results, causing more work. Heal Force solves this problem using a unique design and effective method to ensure sterile conditions.



### 90°C moist heat disinfection (HF90 & HF240)

HF90 and HF240 are equipped with 90°C moist heat disinfection system. The validated overnight sterilization cycle ensures reliable destruction of germs that could interfere with your work and requires no extra work, such as removal of interior fittings. Mycoplasma is 100% eliminated in a routine disinfection cycle.

### Ultraviolet disinfection (HF151UV & HF212UV)

A long-life ultraviolet lamp is equipped at the inner back of HF151UV and HF212UV to sterilize chamber air and water in the reservoir to maintain contamination-free conditions within the chamber. To take maximum effect of disinfection, the wavelength of UV light is kept at 254nm.



UV lamp



Coved corners

### Easy-to-clean design

The cleaning process is significantly simplified by Heal Force's unique, seamless, deep-drawn interior chamber, which reduces any areas where contamination could accumulate. Heal Force incubators offer the best usable-space-to-volume ratio due to the total absence of any additional fittings in the interior chamber

### Inlet filter for CO<sub>2</sub> supply

All gas injection lines are filtered via HEPA filter to remove impurities and contaminants before being injected into the chamber. The HEPA filter is able to filter particles larger than 0.3µm at 99.998%.



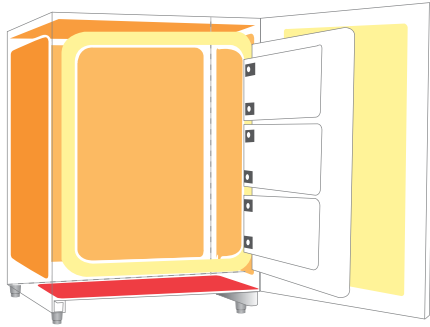
CO<sub>2</sub> inlet filter

### *Absolutely condensation-free, even at high air humidity level*

The high air humidity prevents cell cultures from drying out and also keeps the osmolarity constant in the culture medium. With our CO<sub>2</sub> incubators, you can work with air humidity up to 95% while the internal walls remain completely dry (In order to prevent contamination, however, no condensation must occur). The patented tilted water reservoir system keeps the air humidity absolutely stable.



Water reservoir



### *Optimum temperature control*

A reliable air jacketed heating system combined with PT1000 temperature sensors ensures high precision with homogenous heat distribution in the interior.

Outstanding dynamics ensure short recovery times and balance out any fluctuations caused by door open for Heal Force CO<sub>2</sub> incubators. This provides reliable protection at any time, particularly for sensitive cultures.

- The main heater provides precise temperature control.
- The bottom heater warms the distilled water and ensures chamber humidity.
- The outer door heater prevents condensation on the inner door and facilitates quick temperature recovery after door openings.

### *Divided, inner glass door*

Three inner glass doors (HF90) maintains stable climatic conditions, minimizes any changes to the humidity, heat and gas concentration, shortens recovery times significantly and also further reduces the risk of contamination. Six half-size sealed inner glass doors and shelves are optional for model HF240. This makes it possible for several users to work with the same equipment



HF90 with 3 inner glass doors (standard)



HF240 with 6 half-size inner glass doors and shelves (optional)

### *Auto-start function*

The auto-start function, which considerably simplifies the equipment's operation, contains the incubator's automatic start-up and the measuring system's calibration. The thermal conductivity CO<sub>2</sub> sensor has its baseline automatically reset without manual adjustment. The incubator can be loaded immediately after the start-up routine is completed.



Auto-start function

## Specifications

Model	HF90	HF240	HF151UV	HF212UV
<b>Construction</b>				
Exterior dimensions (W×D×H)	637×762×909(mm) 25.1×30.0×35.8(inch)	780×820×944(mm) 30.7×32.3×37.2(inch)	615×768×865mm) 24.2×30.2×34.1(inch)	"910×763×795(mm) 35.8×30.0×34.1(inch)"
Interior dimensions (W×D×H)	470×530×607(mm) 18.5×20.8×23.9(inch)	607×583×670(mm) 23.9×22.9×26.4(inch)	470×530×607(mm) 18.5×20.9×23.9(inch)	"600×588×600(mm) 23.6×23.1×23.6(inch)"
Interior Volume	151L/5.3cu.ft.	240L/8.5cu.ft.	151L/5.3cu.ft.	212L/7.5cu.ft.
Net Weight	80kg/176lbs.	80kg/176lbs.	75kg/165lbs.	95kg/209lbs
Interior	Type 304, mirror finish, stainless steel			
Exterior	Electrolyzed galvanization steel, powder coated			
Inner door	3 inner doors standard	6 mini inner doors optional	one inner door standard	one inner door standard
<b>Temperature</b>				
Heating method	Direct Heat & Air Jacket (DHA)			
Temp. control system	Microprocessor	Microprocessor	Microprocessor	Microprocessor
Temp. sensor	PT1000	PT1000	PT1000	PT1000
Temp. range	5 °C above ambient temperature to 50 °C			
Temp. uniformity	±0.2 °C	±0.2 °C	±0.2 °C	±0.3 °C
Temp. stability	±0.1 °C	±0.1 °C	±0.1 °C	±0.1 °C
<b>CO<sub>2</sub></b>				
Inlet pressure	0.1 MPa	0.1 MPa	0.1 MPa	0.1 MPa
CO <sub>2</sub> control system	Microprocessor	Microprocessor	Microprocessor	Microprocessor
CO <sub>2</sub> sensor	Thermal conductivity	Thermal conductivity	Thermal conductivity	Thermal conductivity
CO <sub>2</sub> range	0 to 20%	0 to 20%	0 to 20%	0 to 20%
CO <sub>2</sub> stability	±0.1%	±0.1%	±0.1%	±0.1%
<b>Humidity</b>				
Humidifying system	Special designed water reservoir			
Relative humidity	≥95%	≥95%	≥95%	≥95%
Water reservoir volume	3L	3L	4L	6L
<b>Shelves</b>				
Shelf dimensions (W×D)	423×445(mm) 16.7×17.5(inch)	423×445(mm) 16.7×17.5(inch)	423×445(mm) 16.7×17.5(inch)	590×510(mm) 23.2×20.1(inch)
Shelf construction	3,10	3,12	3,10	3,12
Standard, Maximum	Type 304, mirror finish, stainless steel			
<b>Fittings</b>				
Access port	Standard	Standard	Optional	Optional
Air filter	0.3µm, Efficiency:99.998% (for CO <sub>2</sub> )			
Remote alarm contacts	Standard	Standard	Standard	Standard
<b>De-contamination</b>				
	90 °C moist heat disinfection	90 °C moist heat disinfection	UV lamp	UV lamp
<b>Rated power</b>				
	600W	735W	600W	700W
<b>Power supply</b>				
	220V/50Hz (standard), 110V/60Hz (Optional)	220V/50Hz (standard), 110V/60Hz (Optional)	220V/50Hz (standard), 110V/60Hz (Optional)	220V/50Hz (standard), 110V/60Hz (Optional)
<b>Alarm system</b>				
	Power interruption * High/low temperature * Deviation of CO <sub>2</sub> * RH * Door ajar * Independent overheat protection			
<b>Data output</b>				
	RS232	RS232	RS232	RS232



HF90



HF240



HF212UV



HF151UV

# Water-Jacketed CO<sub>2</sub> Incubator

## *Water-jacketed*

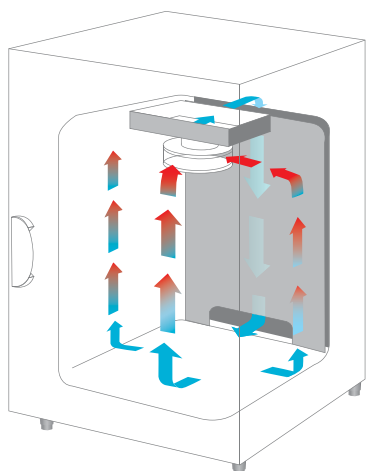
The large size Heal Force HF160W CO<sub>2</sub> incubator incorporates a water jacketed system. Because of the heat retention characteristics of water, there is no sudden temperature change in the event of an unexpected power failure. A stable temperature environment is ensured.

## *HEPA filter*

HF160W applies long term effectiveness of the HEPA filter to protect your cultures. The filter is very efficient to entrap particulates larger than 0.3µm at 99.97%. The HEPA filter system runs continuously and within every 60 seconds, the volume of entire chamber is disinfected. With help of HEPA filter, the air quality achieves Class 100 clean room levels within 5 minutes following a door opening.



HEPA filter



HEPA filter and air flow pattern

## *Airflow system*

Optimized air flow system ensures the temperature and CO<sub>2</sub> concentration to be stable and uniform within the chamber.

## *AUTO-ZERO/AUTO-START*

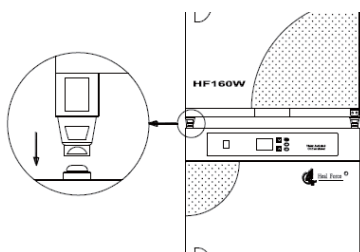
HF160W combines precise CO<sub>2</sub> control with a choice of TC or IR sensors. The microprocessor will automatically "Zero" the incubator (IR type) using room air as a reference every 24 hours. Auto-start function for TC type ensures the sensor's baseline automatically reset without manual adjustment. These features will maintain an accurate CO<sub>2</sub> control without worrying about CO<sub>2</sub> drift.

## *Automatic control door heater*

The outer door incorporates a door heater which is interlocked with the surrounding temperature monitoring system. This prevents temperature differences between the chamber and the inner door, thereby preventing condensation.

## *Humidity display and alarming system*

HF160W is able to create a high humidity environment and the relative humidity (RH) is displayed on the panel, readable in 0.1% increments, including low RH programmable alarm (alerts you of need to add water)



## *Space Utility*

Stackable design takes up less space. Two or three units can be stacked according to available space and usage



### Automatic gas cylinder switchover system

This system automatically switches from the primary to secondary gas cylinder when CO<sub>2</sub> gas level does not change while an injection valve is open.



- A. power switch
- B. camber gas sample port
- C. fill port
- D. CO<sub>2</sub> sensor
- E. temperature sensor
- F. humidity sensor
- G. piling leg
- H. mirror finish shelves
- I. water jacket
- J. glass fibre insulator
- K. high efficiency HEPA
- L. magnetic gasket
- M. outer door heater
- N. water pan
- O. water jacket drain
- P. coved corner

## HF160W Specifications

### Construction

Exterior dimensions (W×D×H)	655×656×1030(mm)	25.8×25.8×40.5(inch)
Interior dimensions (W×D×H)	544×504×681(mm)	21.4×19.8×26.8(inch)
Interior Volume	185L/6.5cu.ft.	
Water jacket volume	43.5L/1.54cu.ft.	
Net Weight	110kg/242lbs	
Interior	Type 304, mirror finish stainless steel	
Exterior	cold-rolled steel, power coated	
Inner door	one inner door standard	

### Temperature

Heating method	Water Jacket	
Temp. control system	Microprocessor	
Temp. sensor	PT1000	
Temp. range	5 C above ambient temperature to 55 C	
Temp. uniformity	±0.2°C	
Temp. stability	±0.1°C	

### CO<sub>2</sub>

Inlet pressure	0.1 MPa	
CO <sub>2</sub> control system	Microprocessor	
CO <sub>2</sub> sensor	Thermal conductivity/Infrared	
CO <sub>2</sub> range	0 to 20%	
CO <sub>2</sub> stability	±0.1%	

### Humidity

Humidifying system	Humidity pan	
Humidifying sensor	Standard	
Relative humidity	≥95%	
Display	In 0.1% increments	
Water reservoir volume	3L	

### Shelves

Shelf dimensions (W×D)	"466×440(mm)18.3×17.3(inch)	
Shelf construction	Type 304, mirror finish, stainless steel	
Standard, Maximum	3,11	

### Fittings

Access port	Standard	
Air filter	0.3µm, Efficiency:99.998% (for CO <sub>2</sub> )	
Remote alarm contacts	Standard	

### De-contamination

HEPA filter system		
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### Rated power

430W		
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### Power supply

220V/50Hz (standard), 110V/60Hz (Optional)		
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### Alarm system

Power interruption * High/low temperature * Deviation of CO <sub>2</sub> * RH * Door ajar * Independent overheat protection		
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### Data output

RS232		
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