



MCO-170ACL/MCO-170AC

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



165 L

### Optimising cell culture outcomes and reproducibility

PHCbi CO<sub>2</sub> Incubators provide precise control of CO<sub>2</sub> concentration and accurate, uniform, and highly responsive temperature control within the chamber. During cell culturing, the inCu-saFe® germicidal interior and optional SafeCell UV lamp continuously work to prevent contamination.

#### Easier to Clean

The slide-out perforated stainless steel shelves rest securely in integrated shelf channels molded into the left and right sidewalls, eliminating the need for troublesome shelf brackets and clips. Molded shelf channels reduce the amount of interior parts by up to 80%. Perforated shelves promote natural temperature and gas uniformity.

#### Unified Controller

A central intuitive control panel with graphic user interface simplifies operation and improves visibility of key performance parameters. An OLED input/output display creates an ergonomically-friendly selection of all functions including temperature and CO<sub>2</sub> setpoints and alarm deviation limits for temperature and CO<sub>2</sub>. A USB data port permits download of logged performance and event information.

#### Elimination of Condensation

The innovative Peltier powered dew stick located in the interior chamber draws condensation away from the inner door, outer door and inside inCu-saFe® copper-enriched stainless steel surfaces. The dew stick returns moisture to the humidity reservoir and halts contamination before it can destroy cell cultures. Interior temperature control and uniformity are not affected.



#### Germicidal Barriers

The inCu-saFe® copper-enriched stainless steel alloy creates an internal germicidal barrier against airborne contaminants. Unlike pure copper, the inCu-saFe® surface will not discolour or corrode due to CO<sub>2</sub> exposure over time. An optional UV lamp automatically destroys airborne contaminants through serial dilution of air that gently circulates through a rear plenum.



#### Central Management

The microprocessor controller manages all incubator functions and user inputs through an arrow prompted menu. Notifications include actual temperature, actual CO<sub>2</sub>, door status, UV status and deviation alarms. CO<sub>2</sub> sensor maintains setpoint to within 0.1% and eliminates any need for periodic calibration.



#### Reproducibility Assured

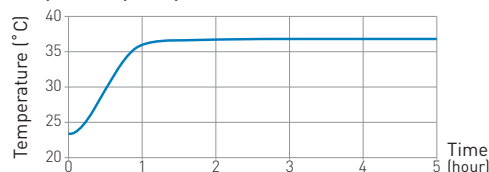
Reduction of interior parts and condensation control helps minimise external factors that often complicate efforts to reproduce cell culture and other protocols. Stable temperature and CO<sub>2</sub> are quickly restored to setpoints after door openings, while relative humidity returns to an elevated state to prevent media desiccation.



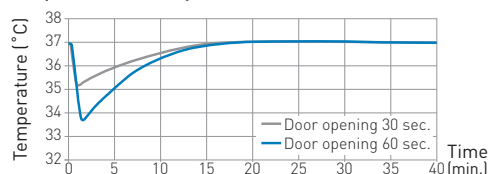
MCO-170ACL/MCO-170AC

## Performance Data\*

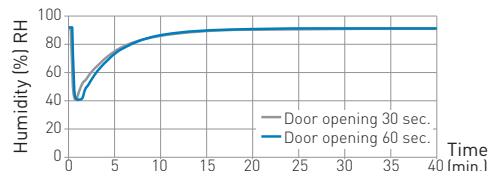
### Temperature pull-up characteristics



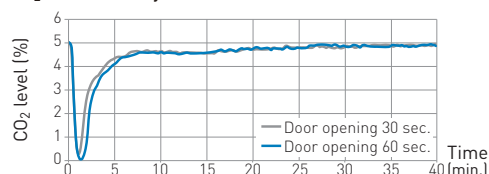
### Temperature recovery characteristics



### Humidity recovery characteristics

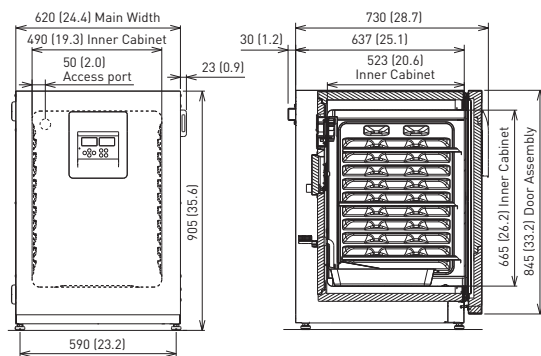


### CO<sub>2</sub> level recovery characteristics



## Dimensions

Unit : mm (inch)



Model Number	MCO-170ACL-PA	MCO-170ACL-PE	MCO-170AC-PK
External dimensions (W x D x H) <sup>1)</sup>	mm	620 x 730 x 905	
Internal dimensions (W x D x H)	mm	490 x 523 x 665	
Volume	litres	165	
Net weight	kg	74	
<b>Performance</b>			
Temperature control range and fluctuation	°C	AT +5 to +50 <sup>2)</sup> , ±0.1	
Temperature uniformity <sup>3)</sup>	°C	±0.25	
CO <sub>2</sub> setting range and fluctuation <sup>3)</sup>	%	0 to 20, ±0.15	
Humidity level and fluctuation	% RH	95, ±5	
<b>Control</b>			
Temperature sensor		Thermistor	
CO <sub>2</sub> sensor		Thermal conductivity	
Display		Digital (white graphic OLED)	
<b>Construction</b>			
Exterior material		Painted steel (rear cover not painted)	
Interior material		Stainless steel copper-enriched alloy	
Insulation material		Styrene Acrylonitrile Copolymer	
Heating method		Direct Heat & Air Jacket System	
Outer door		1	
Field reversible door		Included	
Inner door		1 (tempered glass)	
Trays		3 x stainless steel copper-enriched alloy	
Shelf dimensions (W x D x H)	mm	470 x 450 x 12	
Max. load per shelf	kg	7	
Access port		1	
Access port position		Rear upper left	
Access port diameter	Ø mm	30	
<b>Alarms</b> (V = Visual Alarm, B = Buzzer Alarm, R = Remote Alarm)			
Power failure		R	
Out of temperature setting		V-B-R	
High temperature		V-B-R	
Out of CO <sub>2</sub> setting		V-B-R	
Door open		V-B	
<b>Electrical and Noise Level</b>			
Power supply	V	110-120	220-240
Frequency	Hz	60	50 / 60
Noise level <sup>4)</sup>	dB [A]	29	60
<b>Options</b>			
UV System Set		MCO-170UVS-PA / MCO-170UVS-PE	
Small Door		MCO-170ID-PW	
Gas Regulator		MCO-010R-PW	
Gas Auto Changer		MCO-21GC-PW	
Tray (same as that of standard accessory)		MCO-170ST-PW	
Half Tray		MCO-25ST-PW	
Double-stacking Bracket		MCO-170PS-PW	
Stacking Plate		MCO-170SB-PW	
Roller Base		MCO-170RB-PW	
<b>Optional Communication Systems</b>			
Interface Board <sup>5)</sup> , for LAN		MTR-L03-PW	
Interface Board <sup>5)</sup> , for RS-232C/RS-485		MTR-480-PW	
Interface Board (4-20mA)		MCO-420MA-PW	
<b>Quality Management System<sup>6)</sup></b>			
Certification		ISO9001	ISO13485

- 1) External dimensions of main cabinet only, excluding handle and other external projections.
- 2) When set temperature is 37°C, ambient temperature must be 32°C or less. Regardless of ambient temperature, the maximum of temperature control range is always 50°C.
- 3) The measurement condition complies with PHCbi specified measuring method.
- 4) Nominal value.
- 5) Only for the data acquisition system MTR-5000 user.
- 6) MCO-170ACL is for laboratory use.

- The optimum performance may not be obtained if the ambient temperature is not above 15°C.
  - Appearance and specifications are subject to change without notice.
  - \* Ambient temperature: 23°C, setting: 37°C, CO<sub>2</sub>: 5 %, no load
- Caution:** PHC Corporation guarantees this product under certain warranty conditions. However, please note that PHC Corporation shall not be responsible for any loss or damage to the contents of the product.



Preservation Equipment, Experimental Environment Equipment, Dispensary Equipment, Culturing Equipment and Drying & Sterilising Equipment for General Laboratory use

The management of the design, development, production and servicing of the above.



Freezers, Refrigerators, Incubators, and Drying and Sterilising Equipment for Medical use

The management of the design, development, production and distribution of the above.



PHC Corporation, Biomedical Division is certified for:  
**Environmental management system: ISO14001**

PHC Corporation, Biomedical Division 1-1-1 Sakada, Oizumi-machi, Ora-gun, Gunma 370-0596, Japan

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## CO<sub>2</sub> Incubators | MCO-50AIC/MCO-50AICL

### Easier to Clean

The slide-out perforated stainless steel shelves rest securely in integrated shelf channels molded into the left and right sidewalls, eliminating the need for troublesome shelf brackets and clips. Molded shelf channels reduce the amount of interior parts. Perforated shelves promote natural temperature and gas uniformity.

### Precision Gas Sensor IR CO<sub>2</sub>

The IR CO<sub>2</sub> sensor offers continuous calibration for excellent control and accuracy. This ceramic sensor is not affected by moderate temperature and humidity changes and is linked to the P.I.D. controller for fast recovery. As CO<sub>2</sub> and pH levels are key components for proper tissue culture, "Real Time" recovery and monitoring of CO<sub>2</sub> levels provide better culture outcomes.

### Reproducibility by Elimination of External Factors

Reduction of interior parts and condensation control by Peltier powered dew stick helps minimise external factors that often complicate efforts to reproduce cell culture and other protocols. Stable temperature is maintained by the Direct Heat and Air Jacket system. CO<sub>2</sub> is quickly restored to set-point after door openings, while relative humidity returns to an elevated state to prevent media desiccation.

Model Number		MCO-50AIC/MCO-50AICL		
External dimensions (W x D x H) <sup>1)</sup>	mm	480 x 550 x 585		
Internal dimensions (W x D x H)	mm	370 x 363 x 385		
Volume	litres	50		
Net weight	kg	45		
Performance				
Temperature control range and fluctuation	°C	AT +5 to +50 <sup>2)</sup> , ±0.1		
Temperature uniformity <sup>3)</sup>	°C	±0.25		
CO <sub>2</sub> setting range and fluctuation <sup>3)</sup>	%	0 to 20, ±0.15		
Humidity level and fluctuation	% RH	95 ±5 (Natural evaporation with humidifying pan)		
Control				
Temperature sensor		Thermistor		
Sensor	CO <sub>2</sub>	Dual IR		
Display		Digital (white graphic OLED) readable to 0.1 increments		
Construction				
Exterior material		Painted steel (rear cover not painted)		
Interior material		Stainless steel copper-enriched alloy		
Insulation material		Styrene AcryloNitrile copolymer		
Heating method		Direct Heat & Air Jacket System		
Outer door	qty	1 (Field reversible door)		
Inner door	qty	1 (tempered glass)		
Shelves	qty	2 x stainless steel copper-enriched alloy		
Shelf dimensions (W x D x H)	mm	353 x 308 x 12		
Max. load-per shelf	kg	7		
Access port	qty	1 (on the back side / Ø 30 mm)		
Alarms (V = Visual Alarm, B = Buzzer Alarm, R = Remote Alarm)				
Power failure		R		
Out of temperature setting		V-B-R		
High temperature		V-B-R		
High/Low gas density		V-B-R		
Door open		V-B		
Electrical and Noise Level		MCO-50AICL-PA	MCO-50AICL-PE	MCO-50AIC-PK
Power supply	V	110-120	220-240	220
Frequency	Hz	60	50/60	60
Power Consumption [230V/50Hz]	kWh/day	1.014 (during cultivation)	0.245 (during decontamination cycle)	
Noise level <sup>4)</sup>	dB [A]	29		
Options				
UV system set		MCO-170UVS-PA / MCO-170UVS-PE		
H <sub>2</sub> O <sub>2</sub> decontamination kit <sup>5)</sup>		MCO-50HB-PW		
Electric door lock with password <sup>5)</sup>		MCO-170EL-PW		
H <sub>2</sub> O <sub>2</sub> generator <sup>5)</sup>		MCO-50HP-PW (on sale soon)		
H <sub>2</sub> O <sub>2</sub> reagent		MCO-5H2O2-PV		
CO <sub>2</sub> /N <sub>2</sub> gas pressure regulator		MCO-010R-PW		
Automatic CO <sub>2</sub> cylinder changeover system		MCO-50GC-PW		
Tray		MCO-50ST-PW (same as that of standard accessory)		
Double stacking bracket		MCO-170PS-PW (allows for stacking two MCO-50 series incubators)		
Stacking plate		MCO-50SB-PW		
Roller base		MCO-50RB-PW		
Optional Communication Systems				
Digital interface [RS232C/RS485] <sup>4)</sup>		MTR-480-PW		
Ethernet interface [LAN] <sup>4)</sup>		MTR-L03-PW		
Analogue interface [4-20 mA]		MCO-420MA-PW		
Quality Management System <sup>7)</sup>		MCO-50AICL-PA	MCO-50AICL-PE	MCO-50AIC-PK
Certification		ISO9001		ISO13485

1) External dimensions of main cabinet only, excluding handle and other external projections.

2) When set temperature is 37°C, ambient temperature must be 32°C or less. Regardless of ambient temperature, the maximum of temperature control range is always 50°C.

3) The measurement condition complies with PHCbi specified measuring method.

4) Nominal value background noise 20 dB[A].

5) MCO-50AIC(L) requires MCO-50HB, MCO-170EL, MCO-50HP and UV option for H<sub>2</sub>O<sub>2</sub> decontamination.

6) Only for the data acquisition system MTR-5000 user.

7) MCO-50AICL is for laboratory use.

- The optimum performance may not be obtained if the ambient temperature is not above 15°C.
- Appearance and specifications are subject to change without notice.

**Caution:** PHC Corporation guarantees this product under certain warranty conditions. However, please note that PHC Corporation shall not be responsible for any loss or damage to the contents stored in the product.

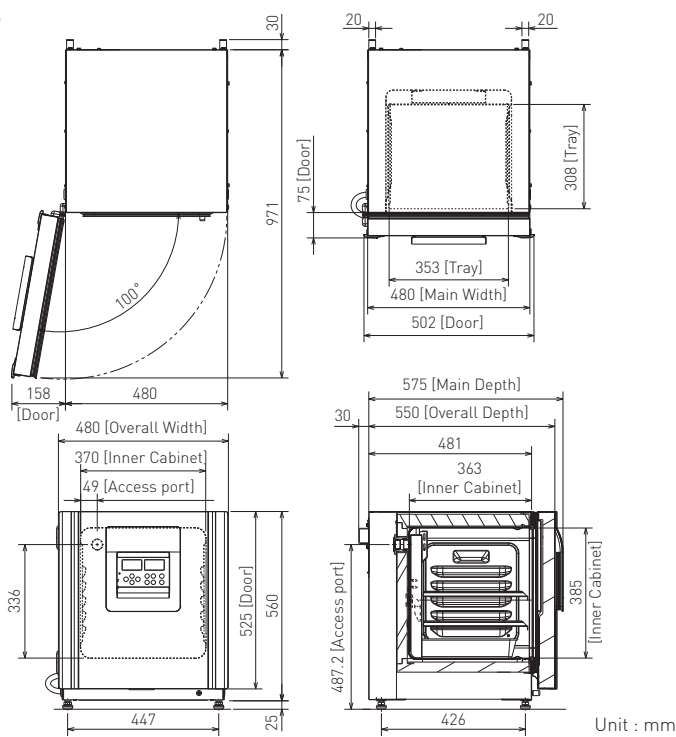


### Unified Controller

A central intuitive control panel with graphic user interface simplifies operation and improves visibility of key performance parameters. An OLED input/output display creates an ergonomically-friendly selection of all functions including temperature, CO<sub>2</sub> setpoint and alarm deviation limits for temperature and CO<sub>2</sub>. A USB data port permits downloading logged performance and event information.



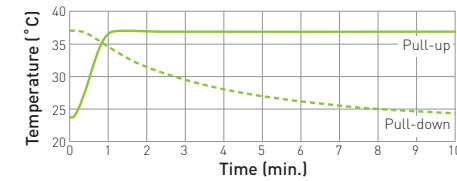
Dimensions



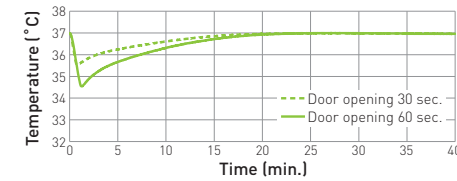
Performance Data

AT23°C, SV37°C, CO<sub>2</sub>: 5 %, 230V/50Hz, no load

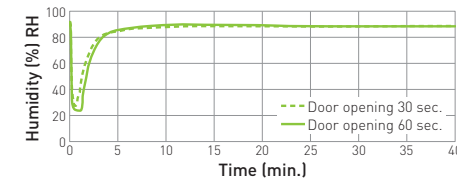
Temperature pull-down/pull-up characteristics



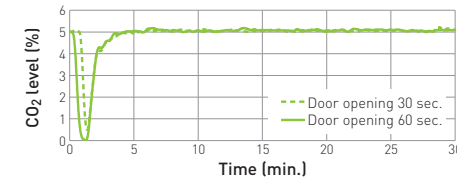
Temperature recovery characteristics



Humidity recovery characteristics

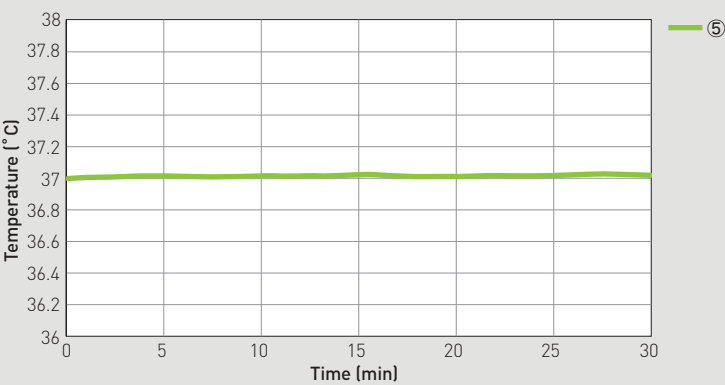


CO<sub>2</sub> level recovery characteristics



Temperature Stability

Condition: SV37°C, AT23°C, CO<sub>2</sub> 0%, 220V 50Hz, no load



Internal Temperature Uniformity [Reference Data]

Distribution data

Temperature of the cycle in each area (SV37°C, air temperature)

Conditions

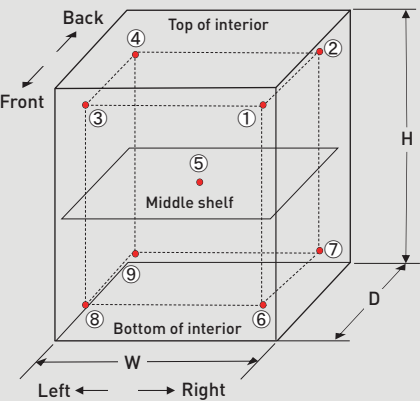
Load: Unloaded

Ambient temperature 23°C, CO<sub>2</sub> 0%, 220V/50Hz

Unit: °C

	①	②	③	④	⑤	⑥	⑦	⑧	⑨
Chamber temp. at nine point (Ave.) <Pt:100Ω>	37.14	37.07	37.06	37.01	37.00	37.07	36.99	36.95	37.01

Temperature uniformity - 9 points measuring



[Note] Disclaimer

- Specification may change without notice.
- The performance data was measured by inhouse test data of PHC.
- The Performance data is a reference data and not guaranteed.
- Not all the products available in all countries.

# CO<sub>2</sub> Incubators | MCO-230AIC/AICL/AICUV/AICUVL

## InCu-saFe® Construction for Germicidal Protection

PHCbi offers the exclusive use of inCu-saFe® copper-enriched stainless steel alloy interior surfaces to eliminate contamination sources such as mold, spores, and other contaminating spills while providing a noncorrosive environment, and to mitigate the effect of airborne contaminants introduced through normal use.

## Precision Gas Sensor IR CO<sub>2</sub>

The IR CO<sub>2</sub> sensor offers continuous calibration for excellent control and accuracy. This ceramic sensor is not affected by moderate temperature and humidity changes and is linked to the P.I.D. controller for fast recovery. As CO<sub>2</sub> and pH levels are key components for proper tissue culture, "Real Time" recovery and monitoring of CO<sub>2</sub> levels provide better culture outcomes.

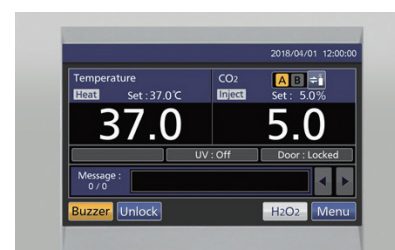
## SafeCell UV Decontamination

Isolated Ultra Violet (UV) lamp decontaminates circulating air and the humidity water reservoir without harming the cultured cells. The 5,000 hour UV lamp provides long-term maintenance-free service without the ozone production. The UV lamp also provides easy access to an effective 24 hour chamber decontamination feature through the touch panel controller.

Model Number		MCO-230AIC/MCO-230AICL/MCO-230AICUV/MCO-230AICUVL		
External dimensions (W x D x H) <sup>1)</sup>	mm	770 x 730 x 905		
Internal dimensions (W x D x H)	mm	643 x 523 x 700		
Volume	litres	230		
Net weight	kg	90		
Performance				
Temperature control range and fluctuation	°C	AT +5 to +50 <sup>2)</sup> [AT 5°C–35°C]		
Temperature uniformity <sup>3)</sup>	°C	±0.25		
CO <sub>2</sub> setting range and fluctuation <sup>3)</sup>	%	0 to 20, ±0.15		
Humidity level and fluctuation	% RH	95 ±5 [Natural evaporation with humidifying pan]		
Control				
Temperature sensor		Thermistor		
Sensor	CO <sub>2</sub>	Dual IR		
Display		Touch Panel [WVGA full color LCD]		
Construction				
Exterior material		Painted Steel [rear cover not painted]		
Interior material		Stainless Steel Copper-Enriched Alloy		
Insulation material		Styrene AcryloNitrile copolymer		
Heating method		Direct Heat & Air Jacket System		
Outer door	qty	1 [Field reversible door]		
Inner door	qty	1 [tempered glass]		
Shelves	qty	4 x stainless steel copper-enriched alloy		
Shelf dimensions (W x D x H)	mm	628 x 450 x 12		
Max. load-per shelf	kg	7		
Access port	qty	1 [on the back side / Ø 30 mm]		
Alarms (V = Visual Alarm, B = Buzzer Alarm, R = Remote Alarm)				
Power failure		R		
Out of temperature setting		V-B-R		
High temperature		V-B-R		
High/Low gas density		V-B-R		
Door open		V-B		
Electrical and Noise Level		MCO-230AIC-PK MCO-230AICUV-PK	MCO-230AICL-PE MCO-230AICUVL-PE	MCO-230AICUVL-PA
Power supply	V	220	220-240	110-120
Frequency	Hz	60	50/60	60
Power Consumption [230V/50Hz]	kWh/day	2.021 [during cultivation]	0.508 [during decontamination cycle]	
Noise level <sup>4)</sup>	dB [A]	25		
Options				
UV system set		MCO-170UVS-PA / MCO-170UVS-PE		
H <sub>2</sub> O <sub>2</sub> decontamination kit <sup>5)</sup>		MCO-170HB-PA / MCO-170HB-PE		
Electric door lock with password <sup>5)</sup>		MCO-170EL-PW		
H <sub>2</sub> O <sub>2</sub> generator <sup>5)</sup>		MCO-HP-PW		
H <sub>2</sub> O <sub>2</sub> reagent		MCO-H2O2-PV		
CO <sub>2</sub> gas pressure regulator		MCO-010R-PW		
STD gas auto-calibration kit		MCO-SGP-PW		
Automatic CO <sub>2</sub> cylinder changeover system		MCO-21GCP-PW		
Tray		MCO-230ST-PW [same as that of standard accessory]		
Additional half tray [inCu-saFe®]		MCO-35ST-PW		
Double stacking bracket		MCO-170PS-PW		
Stacking plate		MCO-230SB-PW		
Roller base		MCO-230RB-PW		
Optional Communication Systems				
Digital interface [RS232C/RS485] <sup>6)</sup>		MTR-480-PW		
Ethernet interface [LAN] <sup>6)</sup>		MTR-L03-PW		
Analogue interface [4–20 mA]		MCO-420MA-PW		
Quality Management System <sup>7)</sup>		MCO-230AIC-PK MCO-230AICUV-PK	MCO-230AICL-PE MCO-230AICUVL-PE	MCO-230AICL-PA
Certification		ISO13485	ISO9001	

1) External dimensions of main cabinet only, excluding handle and other external projections.  
 2) When set temperature is 37°C, ambient temperature must be 32°C or less. Regardless of ambient temperature, the maximum of temperature control range is always 50°C.  
 3) The measurement condition complies with PHCbi specified measuring method.  
 4) Nominal value background noise 20 dB(A).  
 5) MCO-230AIC(L) requires MCO-170HB, MCO-170EL, MCO-HP and UV option for H<sub>2</sub>O<sub>2</sub> decontamination.

6) Only for the data acquisition system MTR-5000 user.  
 7) MCO-230AICL and MCO-230AICUVL are for laboratory use.  
 • The optimum performance may not be obtained if the ambient temperature is not above 15°C.  
 • Appearance and specifications are subject to change without notice.  
**Caution:** PHC Corporation guarantees this product under certain warranty conditions. However, please note that PHC Corporation shall not be responsible for any loss or damage to the contents stored in the product.



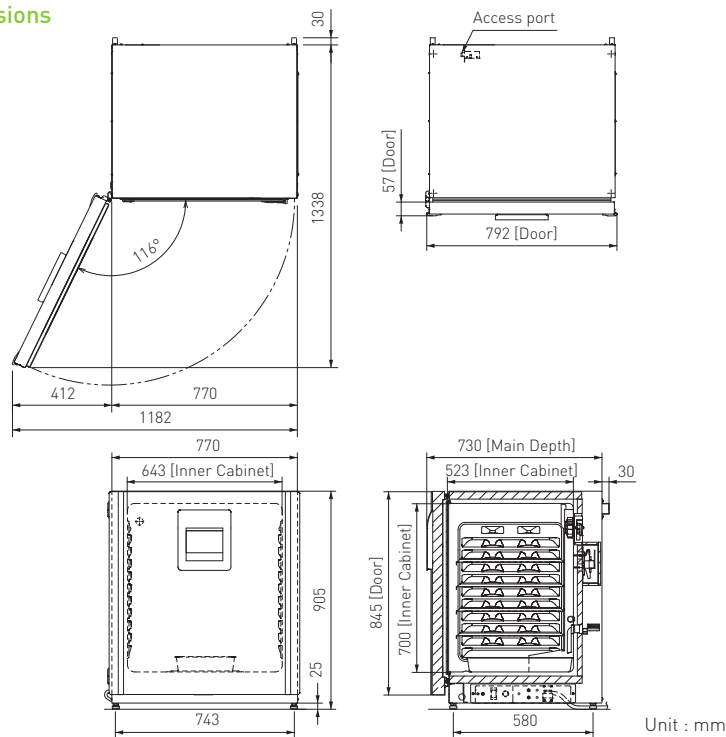
## Reliable controllability and data log function.

Large colour LCD touchpanel is accurately controlled even with a gloved hand, while the USB memory port makes transferring logged data of product's operational status to a PC convenient.



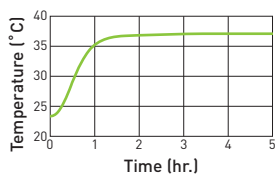


Dimensions

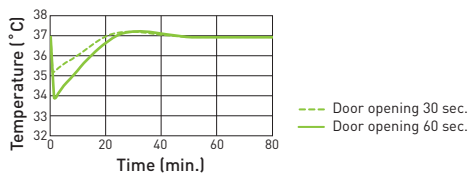


Performance Data

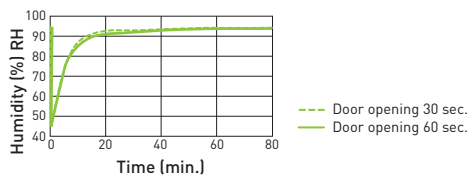
AT23°C, SV37°C, CO<sub>2</sub>: 5 %, 220V/50Hz, no load  
Temperature pull-up characteristics



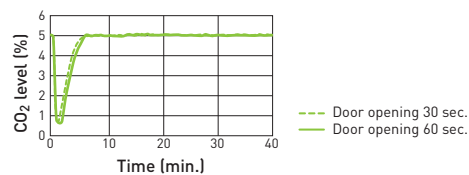
Temperature recovery characteristics



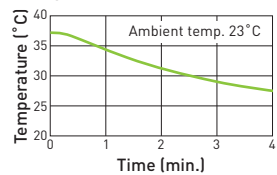
Humidity recovery characteristics



CO<sub>2</sub> level recovery characteristics

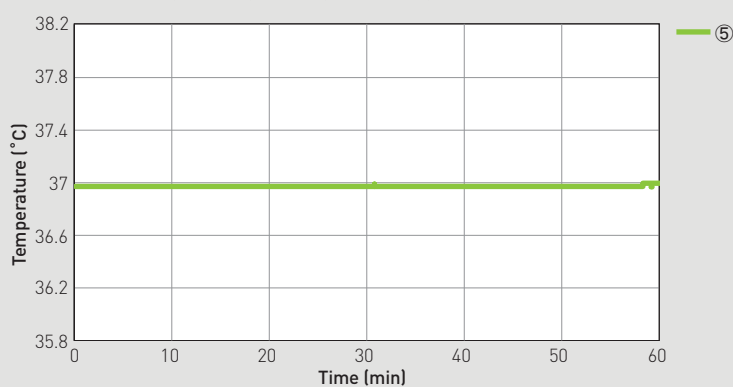


Temperature decrease characteristics when power failure occurs



Temperature Stability

Condition: SV37°C, AT23°C, CO<sub>2</sub> 0%, 220V 50Hz, no load



Internal Temperature Uniformity [Reference Data]

Distribution data

Temperature of the cycle in each area (SV37°C, air temperature)

Conditions

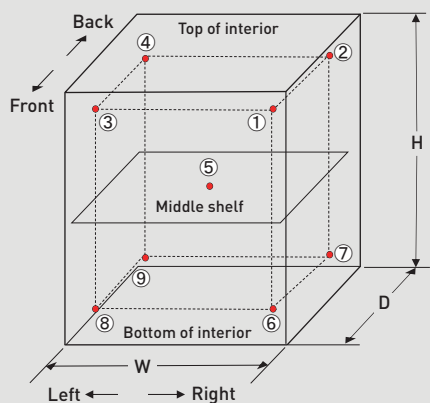
Load: Unloaded

Ambient temperature 23°C, CO<sub>2</sub> 0%, 220V 50Hz

Unit: °C

	①	②	③	④	⑤	⑥	⑦	⑧	⑨
Chamber temp. at nine point (Ave.) <Pt:100Ω>	37.29	37.07	37.03	36.97	36.97	36.97	36.95	36.65	36.81

Temperature uniformity - 9 points measuring



[Note] Disclaimer

- Specification may change without notice.
- The performance data was measured by inhouse test data of PHC.
- The Performance data is a reference data and not guaranteed.
- Not all the products available in all countries.



MCO-170AICUVD

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

165 L



\*Standard for Model No. including UV

### Optimising cell culture outcomes and reproducibility

InCu-saFe CO<sub>2</sub> Incubators provide precise control of CO<sub>2</sub> concentration and accurate, uniform, and highly responsive temperature control within the chamber. During cell culturing, the inCu-saFe germicidal interior and optional SafeCell UV lamp continuously prevent contamination.

#### Precise & Regulated Environment

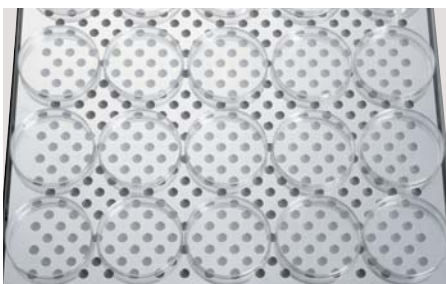
InCu-saFe and SafeCell UV both function to prevent contamination. Direct Heat System and melamine foam insulation ensure optimal temperature distribution throughout the chamber while the Dual IR sensor controls the CO<sub>2</sub> level.

#### Dual Heat Sterilisation

Dual heat sterilisation utilises the incubator's two heaters during the 180°C sterilisation process, which takes 11 hours. Because there is no effect on temperature inside stacked incubators due to low heat dissipation, cell culturing can continue uninterrupted.

#### Improved Use & Maintenance

A colour LCD touchscreen panel allows full control, even with gloved hands. Transfer of data is easy via a USB port. The easy-to-clean incubator interior features fully rounded corners and integrated shelf supports.



#### Optimum cell growth

Optimal results and reproducibility make these incubators ideal for tissue research, genomic expression, antibody production and transfection and transduction procedures.



#### Efficient workflows

No need to remove inner parts or recalibrate after sterilisation, therefore laboratory processes are more efficient with less incubator downtime.



#### Intuitive Usability

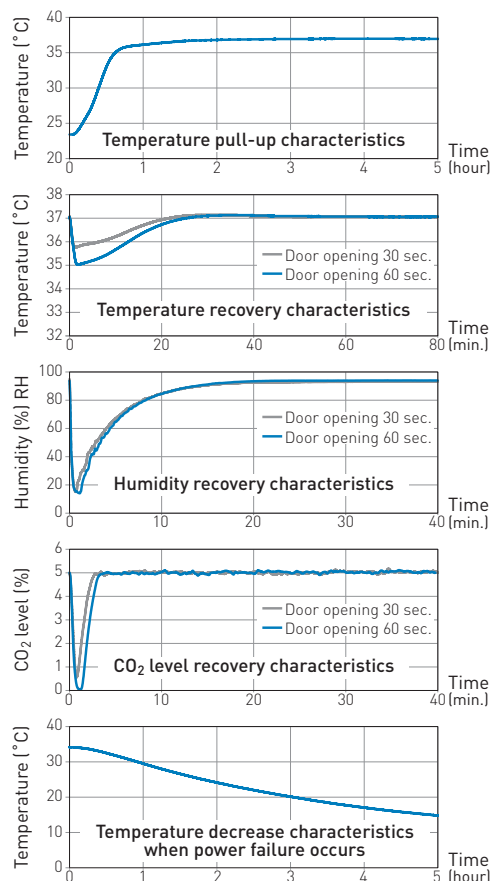
Easy control and visibility of the internal conditions such as CO<sub>2</sub> level and temperature.

**Dual IR CO<sub>2</sub> Sensor** The incubator's PID controlled Dual IR Sensor enables ultra-fast CO<sub>2</sub> recovery without overshoot even following multiple door-openings.

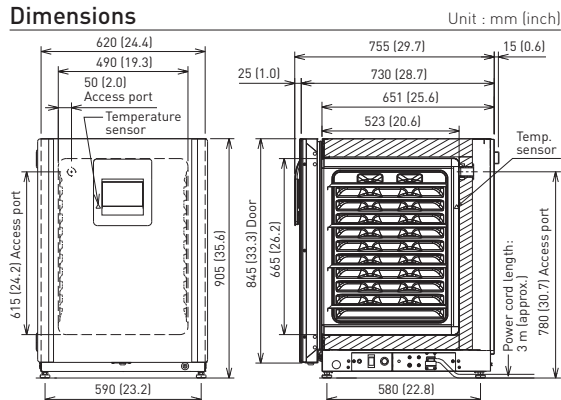
**Active Background Decontamination** The inCu-saFe copper-enriched stainless steel alloy interior offers the germicidal properties of copper as well as the corrosion resistance of stainless steel. The optional, isolated, SafeCell UV lamp decontaminates circulating air and water in the humidifying pan, without harming cultured cells.

**Simultaneous use of stacked units** The melamine foam insulation limits heat dissipation during dry heat sterilisation. This means that cell culture can continue uninterrupted in incubators stacked on those actively running sterilisation.

## Performance Data



## Dimensions



### Preservation (freezers, refrigerators) and Culturing (incubators) Equipment

The management of the design, development, production, sales support, and servicing of the above.

PHC Corporation, Biomedical Division

1-1-1 Sakada, Oizumi-machi, Ora-gun, Gunma 370-0596, Japan



PHC Corporation, Biomedical Division is certified for:  
**Environmental management system: ISO14001**

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Printed in Japan 3301-2018-04-BB

Model Number		MCO-170AICUVDL-PA	MCO-170AICD-PK MCO-170AICUVD-PK	MCO-170AICD-PE MCO-170AICDL-PE MCO-170AICUVDL-PE
External dimensions (W x D x H) <sup>1)</sup>	mm	620 x 755 x 905		
Internal dimensions (W x D x H)	mm	490 x 523 x 665		
Volume	litres	165		
Net weight	kg	79 (MCO-170AICD) / 80 (MCO-170AICUVD/MCO-170AICUVDL)		
Performance				
Temperature control range & fluctuation	°C	AT +5 to +50, ±0.1		
Temperature uniformity <sup>2)</sup>	°C	±0.25		
CO <sub>2</sub> control range & fluctuation <sup>2)</sup>	%	0 to 20, ±0.15		
Humidity level & fluctuation	% RH	95, ±5		
Control				
Temperature sensor		Thermistor		
CO <sub>2</sub> sensor		Dual IR		
Display		Colour LCD touchscreen		
Construction				
Exterior material		Painted steel (rear cover not painted)		
Interior material		Stainless steel copper-enriched alloy		
Insulation material		Melamine resin foam		
Heating method		Heater jacket		
Sterilisation method <sup>3)</sup>		Dry heat sterilisation, 180°C, 11 hours		
Outer door	qty	1		
Electric door lock with password		Standard		
Field reversible door		Included		
Inner door		1		
Shelves		4 x Stainless steel copper-enriched alloy		
Shelf dimensions (W x D x H)	mm	475 x 450 x 12		
Max. load per shelf	kg	7		
Access port	qty	1		
Access port position		Rear upper left		
Access port diameter	Ø mm	30		
Alarms		(V = Visual Alarm, B = Buzzer Alarm, R = Remote Alarm)		
Power failure		R		
Temperature deviation		V-B-R		
High temperature		V-B-R		
CO <sub>2</sub> deviation		V-B-R		
Door open		V-B		
Electrical and Noise Level		MCO-170AICUVDL-PA	MCO-170AICD-PK MCO-170AICUVD-PK	MCO-170AICD-PE MCO-170AICDL-PE MCO-170AICUVDL-PE
Power supply	V	110-120	220	220-240
Frequency	Hz	60	60	50 / 60
Noise level <sup>4)</sup>	dB [A]	25		
Options				
UV system set		MCO-170UVSD-PE (MCO-170AICUVD/MCO-170AICUVDL Standard equipment)		
Gas regulator		MCO-010R-PW		
Gas auto changer		MCO-21GC-PW		
STD gas auto calibration kit		MCO-SG-PW		
Tray		MCO-170ST-PW		
Half tray		MCO-25ST-PW		
Double stacking bracket <sup>5)</sup>		MCO-170PS-PW		
Stacking plate <sup>5)</sup>		MCO-170SB-PW		
Roller base		MCO-170RB-PW		
Optional Communication Systems				
Ethernet interface (LAN) <sup>6)</sup>		MTR-L03-PW		
Digital interface (RS232C/RS485) <sup>6)</sup>		MTR-480-PW		
Analogue interface (4-20 mA)		MCO-420MA-PW		

<sup>1)</sup> Exterior dimensions of main cabinet only, excluding handle and other external projections. <sup>2)</sup> Ambient temperature 23°C, setting 37°C, CO<sub>2</sub> 5%, no load. <sup>3)</sup> Dry heat sterilisation can be performed only for the chamber and inner attachments with standard specifications, not for any other objects. <sup>4)</sup> Nominal value. <sup>5)</sup> If stacking two incubators, make sure the double-stacking dedicated securing hardware and spacer are used. <sup>6)</sup> Only for the Data acquisition system MTR-5000 user. MCO-170AICD series can only be fitted with one communications interface.  
**Caution:** PHC Corporation guarantees this product under certain warranty conditions. However, please note that PHC Corporation shall not be responsible for any loss or damage to the contents of the product.



Model Number		MCO-170AIC-PK MCO-170AICUV-PK	MCO-170AICL-PE MCO-170AICUVL-PE MCO-170AICUVL-PA	MCO-170AICUVHL-PE MCO-170AICUVHL-PA	MCO-230AIC-PK MCO-230AICUV-PK	MCO-230AICL-PE MCO-230AICUVL-PE MCO-230AICUVL-PA
External dimensions (W x D x H)*1	mm	620 x 730 x 905			770 x 730 x 905	
Internal dimensions ( W x D x H )	mm	490 x 523 x 665			643 x 523 x 700	
Volume	litres	165			230	
Net weight	kg	80			90	
Performance						
Temperature control range	°C	ambient temperature +5 to 50*2 (AT 5°C to 35°C)				
Temperature control uniformity*3	°C	±0.25*4				
CO <sub>2</sub> control range and fluctuation*3	%	0 to 20 / ±0.15				
CO <sub>2</sub> sensor platform		Ceramic based, single beam infrared sensor, with dual wavelength measurement for continuous auto-zero calibration				
CO <sub>2</sub> sampling, patent pending		No moving parts; airflow passes over in/out ports to sustain continuous sampling				
CO <sub>2</sub> calibration		Automatic, continuous zero reference calibration.				
Airflow		Gentle vertical airflow, continuous with inner door closed				
Interior humidity	% RH	95 ±5 at 37°C by natural evaporation with humidifying pan				
Control, monitoring, alarm						
Temperature and CO <sub>2</sub> control		P.I.D. control system setpoint resolution 0.1°C, 0.1 %				
Data acquisition		Automatic log function of temperature, CO <sub>2</sub> , Door opening/closing, Alarm and CSV file output				
Communication		Remote alarm contacts standard. Optional 4-20mA connection. Optional with RS-232C/ RS-485/LAN data ports*5				
Construction						
Display		Touch Panel (WVGA full color LCD)				
USB data logging		Standard				
Exterior cabinet and door		Galvanized steel with baked-on finish				
Interior and shelves		Copper-enriched stainless steel				
Inner door		Tempered glass				
Outer door		Field-reversible, Heated				
Shelves	qty	4 x standard (Maximum 10)			4 x standard (Maximum 10)	
Shelf dimensions (W x D x H)	mm	470 x 450 x 12, maximum load 7 kg/shelf			628 x 450 x 12, maximum load 7 kg/shelf	
Insulation		Styrene AcryloNitrile Copolymer				
Access port		Diameter 30mm port with non-VOC silicone stoppers (1 on back side)				
Leveling feet		4, Adjustable				
Energy and CO <sub>2</sub> utilities						
Maximum power consumption	W	380			430	
Maximum heat dissipation	kJ/h	1,070			1,250	
CO <sub>2</sub> gas connection	mm	ID 4, OD 6 tubing				
CO <sub>2</sub> gas pressure		0.03 MPa [G] — 0.1 MPa [G] [0.3 kgf/cm <sup>2</sup> [G] — 1 kgf/cm <sup>2</sup> [G], 4.4 psi [G] — 14.5 psi [G]] from two stage CO <sub>2</sub> regulator				
Electrical		MCO-170AIC-PK MCO-170AICUV-PK	MCO-170AICL-PE MCO-170AICUVL-PE MCO-170AICUVL-PA	MCO-170AICUVHL-PE MCO-170AICUVHL-PA	MCO-230AIC-PK MCO-230AICUV-PK	MCO-230AICL-PE MCO-230AICUVL-PE MCO-230AICUVL-PA
Power supply	V	220	220 – 240 (PEI/110 – 120 [PA])		220	220 – 240 (PEI/110 – 120 [PA])
Frequency	Hz	60	50/60		60	50/60
Quality Management System**6						
Certification		ISO13485	ISO9001		ISO13485	ISO9001

\*1 External dimensions of main cabinet only. See dimension drawings showing handles and other external projections. \*2 When set temperature is 37°C, ambient temperature must be 32°C or less. Regardless of ambient temperature, the maximum of temperature control range is always 50°C. \*3 Ambient temperature 23 °C, SV 37°C, CO<sub>2</sub>: 5 %, no load. \*4 The measurement condition complies with PHC Corporation specified measuring method. \*5 For the data acquisition system MTR-5000 user only. \*6 MCO-170AICL, MCO-170AICUVL, MCO-170AICUVHL, MCO-230AICL and MCO-230AICUVL are for laboratory use. • The optimum performance may not be obtained if the ambient temperature is not above 15°C.

Optional Accessories

Model Number	MCO-170AIC MCO-170AICL	MCO-170AICUV MCO-170AICUVL	MCO-170AICUVHL	MCO-230AIC MCO-230AICL	MCO-230AICUV*7 MCO-230AICUVL
UV System Set	MCO-170UVS-PE MCO-170UVS-PA	Standard		MCO-170UVS-PE MCO-170UVS-PA	Standard
H <sub>2</sub> O <sub>2</sub> Decontamination Control Board	MCO-170HB-PE/-PA			MCO-170HB-PE/-PA MCO-170EL-PW	
Electric Lock	MCO-170EL-PW				
H <sub>2</sub> O <sub>2</sub> Generator	MCO-HP-PW				
H <sub>2</sub> O <sub>2</sub> Reagent	MCO-H202-PV				
Gas Regulator	MCO-010R-PW				
CO <sub>2</sub> Gas Auto Changer	MCO-21GCP-PW				
Tray (same as that of standard accessory)	MCO-170ST-PW			MCO-230ST-PW	
Half Tray	MCO-25ST-PW			MCO-35ST-PW	
Reinforced Additional Tray (inCu-saFe®)	MCO-170RT-PW			MCO-230RT-PW	
Double-stacking Bracket	MCO-170PS-PW			MCO-170PS-PW	
Stacking Plate	MCO-230SB-PW			MCO-230SB-PW	
Roller Base	MCO-170RB-PW			MCO-230RB-PW	
Small Door	MCO-170ID-PW			—	
Optional Communication Systems					
Interface Board*8; for LAN	MTR-L03-PW				
Interface Board*8; for RS-232C/RS-485	MTR-480-PW				
Interface Board (4-20mA)	MCO-420MA-PW				

\*7 Attaching the optional MCO-170HB and MCO-170EL to MCO-230AICUV will add the H<sub>2</sub>O<sub>2</sub> decontamination function.

\*8 For the data acquisition system MTR-5000 user only.

Double-stacking matching table

Accessories needed for stacking 2 units		Upper unit	
		MCO-230AIC	MCO-170AIC (M) MCO-170AICD
Lower unit	MCO-230AIC	MCO-170PS-PW	MCO-230SB-PW
	MCO-170AIC (M)	—	MCO-170PS-PW
	MCO-170AICD	—	MCO-170PS-PW
	MCO-20AIC	MCO-230SB-PW	MCO-230SB-PW
	MCO-5AC (M)	—	—
	MCO-50AIC (M)	—	—

Field-reversible Door (select left/right opening)

• Appearance and specifications are subject to change without notice.  
**Caution:** PHC Corporation guarantees this product under certain warranty conditions. However, please note that PHC Corporation shall not be responsible for any loss or damage to the contents of the product.



CO<sub>2</sub> Incubators



Enhance your cell growth with an intelligent CO<sub>2</sub> incubator designed for precise temperature and CO<sub>2</sub> control, efficient cleaning and rapid decontamination.



\*1 Standard for Model No. including UV. \*2 Standard for MCO-170AICUVHL

Preservation Equipment, Experimental Environment Equipment, Dispensary Equipment, Culturing Equipment and Drying & Sterilising Equipment for General Laboratory use

The management of the design, development, production and servicing of the above.

Freezers, Refrigerators, Incubators, and Drying and Sterilising Equipment for Medical use

The management of the design, development, production and distribution of the above.

PHC Corporation Biomedical Division is certified for:

**Environmental management system: ISO14001**

PHC Corporation, Biomedical Division 1-1-1 Sakada, Oizumi-machi, Ora-gun, Gunma 370-0596, Japan

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Printed in Japan 3104-2022-12-FF

PHC Corporation, Biomedical Division

Life Science  
Innovator  
Since 1966

# Next Generation Incubators for Optimum Cell Culture

PHCbi's CO<sub>2</sub> incubators with touchscreen control panels deliver superior usability, rapid cleaning, and effortless maintenance while keeping the tradition of outstanding environmental stability and precise performance.

## Grow results, not bacteria!

### MCO-170AIC/MCO-230AIC Incubators

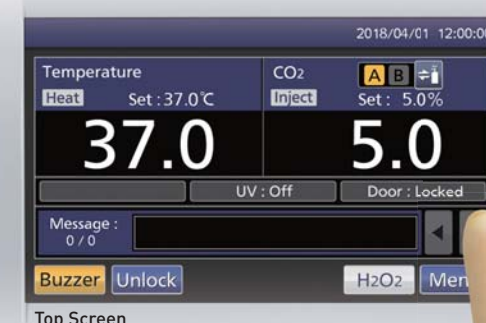
Optimized for high-value samples including hard-to-grow and contamination-sensitive media/reagents.

Applications:

- Stem cell research
- Autologous tissue regeneration
- Genomic and proteomic expression
- Esoteric plant and amphibian cell cultures
- Hyper-sensitive and transgenic cell cultures
- Low volume media microplate work

## Easy Use & Easy Maintenance

## Integrated Tray Catches minimize cleaning time while LCD Panel enhances operation



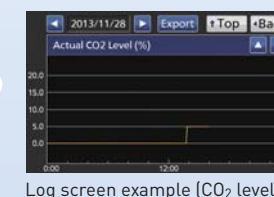
Responds to gloved finger action.

### LCD Touch Panel Controller

A WVGA color LCD touch panel delivers full control over different protocols. Control can be performed with gloved fingers as the controller is equipped with a resistive touch-screen.

### USB Memory Data Transfer

Standard USB port provides convenient log data transfer to a USB memory stick and to a PC. Data log period is 1.5 months using 2-minute intervals.



**Note:** It is impossible to use a USB memory device which is password-protected.

### Door Lock

Automatic door lock (Electric Lock) can be set on the MCO-170AICUVHL (standard equipped) and other models equipped with the optional Electric Lock (MCO-170EL).



The Auto-Lock set up screen



User-ID setting screen



### Integrated Tray Catches

Tray catches are integral parts of the chamber, opening up more space for trays, allowing the incubator to accommodate more culture containers. (Comparison with MCO-20AIC/MCO-19AIC)



MCO-170AIC's/MCO-230AIC's interior components



MCO-170AIC's/MCO-230AIC's tray catches (integral part of the chamber)

MCO-170AIC's Tray  
Internal dimensions  
470(W) x 450(D)mm



Up to 24 ø100 mm dishes (92 mm) can be arrayed (5 wide x 4 deep)  
\*In-house comparison

16 dishes (MCO-19AIC)  
→ 20 dishes (MCO-170AIC)

MCO-230AIC's Tray  
Internal dimensions  
620(W) x 450(D)mm



Up to 24 ø100 mm dishes (92 mm) can be arrayed (6 wide x 4 deep)  
\*In-house comparison

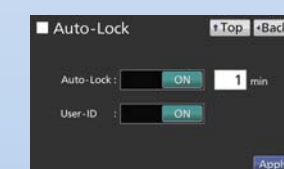
20 dishes (MCO-20AIC)  
→ 24 dishes (MCO-230AIC)

### Optimal Humidity Control

Stable humidity control not influenced by environmental conditions and frequent incubator door openings.



- Control Panel with single-user Key Lock (All models include as standard equipment.)
- Addition of user ID function for better traceability (able to register up to 99 user-IDs and passwords) (MCO-170AICUVHL includes it as standard. Or optional MCO-170EL to be installed for other models.)



- Multiple detailed activity logs exported to individual CSV files.

(\*User Access log downloaded for MCO-170AICUVHL as standard. Or optional MCO-170EL to be installed for other models.)

MCO-230AIC NO.1					
Date	Time	Temp	CO2	Door	Unlock User
2015/3/16	11:13:38	37	5.0	0 Door Open	
2015/3/16	11:13:42	37	5.0	0 Door Close	
2015/3/16	11:32:10	37	5.0	0 Door Open	Aa001
2015/3/16	11:32:25	37	5.0	0 Door Close	
2015/3/16	13:40:58	37	5.0	0 Door Open	Bb002
2015/3/16	13:41:09	36.9	5.0	0 Door Close	
2015/3/16	13:50:01	36.9	5.0	0 Door Open	Cc003
2015/3/16	13:51:19	36.6	5.0	0 Door Close	
2015/3/16	15:27:40	37	5.0	0 Door Open	Aa001
2015/3/16	15:27:45	36.9	5.0	0 Door Close	

User Access log\*





inCu-saFe® Construction for Germicidal Protection

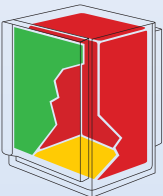
- PHCbi offers the exclusive use of inCu-saFe® copper- enriched stainless steel alloy interior surfaces within a technical design created to eliminate contamination sources and to mitigate the effect of airborne contaminants introduced through normal use.
- Chart summarizes test results with four strains of mycoplasma. Results demonstrate how PHCbi inCu-saFe® copper- enriched stainless steel alloy offers germicidal properties of conventional C1100 copper while maintaining both corrosion-proof and discoloration-resistant properties of conventional stainless steel 304.

Mycoplasma Stain	Positive Control	Conventional Stainless Steel 304	PHCbi inCu-saFe®	Conventional Copper C1100
Mycoplasma fermentans PG18	YES	YES	NO	NO
Mycoplasma orale CH19299				
Mycoplasma arginini G230				
Mycoplasma hominis PG21				

"YES" mycoplasma strains grew on the material.  
"NO" no mycoplasma strain grew on the material.

Accurate Temperature Control

- The patented Direct Heat and Air Jacket conditioning system precisely regulates temperature through three independent heating zones under microprocessor PID\* control. Uniform temperatures are further enhanced by gentle fan circulation.



\*Proportional Integral Derivative

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

Direct Heat and Air Jacket Conditioning System

- To avoid cell culture desiccation, the MCO-170AIC/MCO-230AIC maintains up to 90 % RH at 37°C.
- Humidification is achieved by reliable natural evaporation and forced-air circulation.



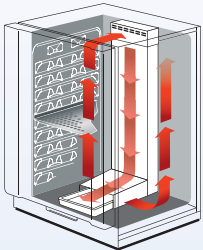
Precise CO<sub>2</sub> Control

- PHCbi proprietary single beam dual detector infrared CO<sub>2</sub> system offers unprecedented control accuracy and stability by simultaneously measuring two wavelengths for continuous zero calibration.
- Benefits include ultra-fast recovery without overshoot and accurate CO<sub>2</sub> averages during periods of frequent incubator access with multiple door openings.

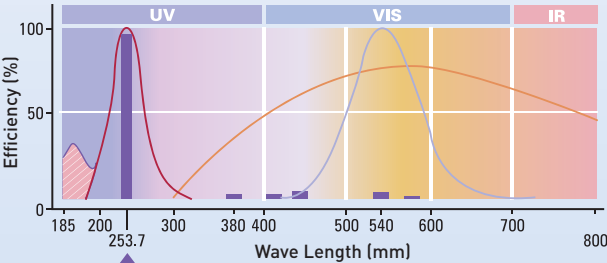


SafeCell UV Decontamination

- SafeCell UV includes a programmable ultraviolet lamp, isolated from cell cultures, that decontaminates conditioned air and humidity reservoir water to prevent contamination without affecting cell cultures in vitro.
- Contaminants trapped within the humidifying pan at the base of the plenum are destroyed by high intensity, ozone-free ultraviolet light.
- Decontaminated, humidified air is released from the lower plenum for vertical convection through and around the perforated shelves. Interior air motion is suspended when the door is opened, minimizing movement of room air contaminants into the chamber. The unique air duct system also improves temperature recovery characteristics.



Airflow and water pan decontamination using a UV system



Use of the MCO-170AICUVHL/MCO-170AICUV/MCO-170AICUVL/MCO-230AICUV/MCO-230AICUVL ultraviolet lamp is a highly effective ozone-free contamination control technique.

■ PHCbi Lamp ■ Ozone Release ■ Germicidal Effect ■ Sunlight

The SafeCell UV lamp cycle is factory set for normal use, and can be re-programmed as desired by entering parameters through the central microprocessor control panel. Program parameters for the H<sub>2</sub>O<sub>2</sub> decontamination cycle are non-adjustable for operator safety.

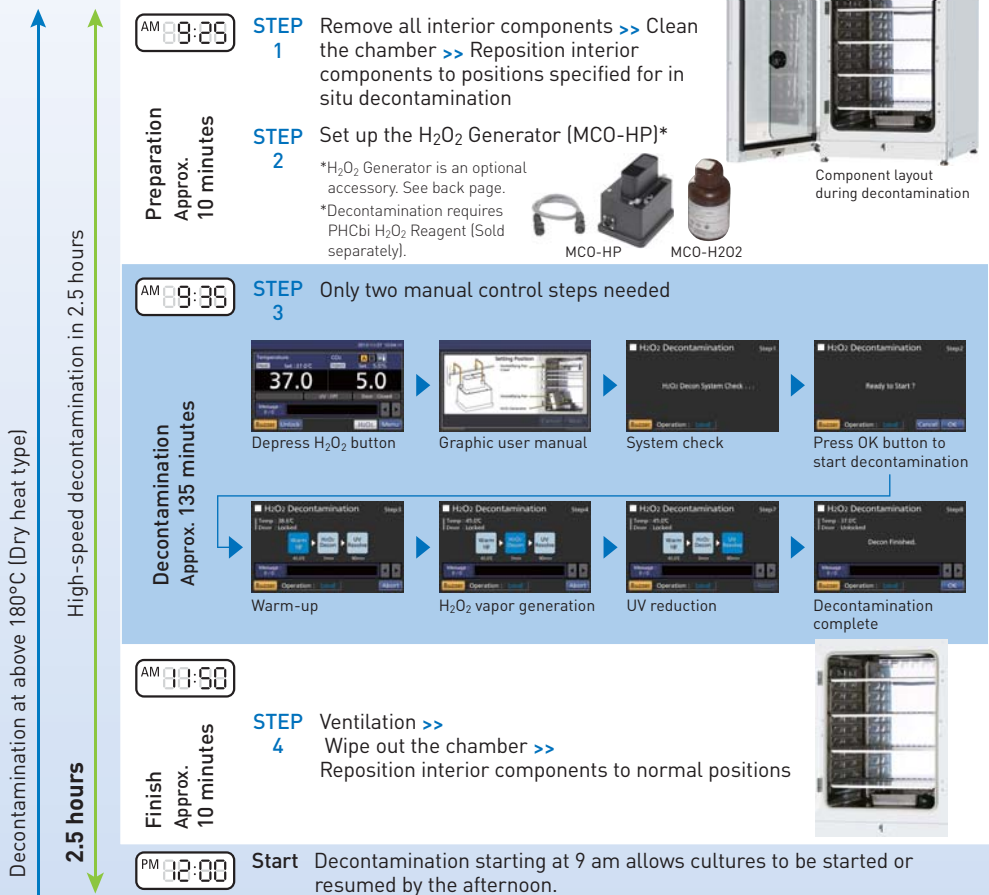


Rapid, Effective and Safe H<sub>2</sub>O<sub>2</sub> Decontamination Cycle

- Industry-first PHCbi unique high-speed decontamination system utilizing vaporized H<sub>2</sub>O<sub>2</sub> offers time-saving and documented chamber decontamination with complete safety.
- Full decontamination process takes less than three hours, saving valuable time. For example, if the decontamination cycle is started at 9 am, the unit will be ready for use in the afternoon.
  - All interior components are decontaminated in situ. No need for time-consuming removal and autoclaving.
  - No high heat emission. No sensor removal necessary.

- After decontamination H<sub>2</sub>O<sub>2</sub> vapor is decomposed to harmless water and oxygen by UV light.
- Outer door is locked automatically by the electric interlock system during the decontamination cycle to ensure operator safety.
- Unlike high-heat decontamination incubators, PHCbi's unique H<sub>2</sub>O<sub>2</sub> decontamination cycle does not emit high heat. Therefore, when two MCO-170AIC/MCO-230AIC units are stacked, one incubator can be decontaminated without affecting the temperature of the other.

H<sub>2</sub>O<sub>2</sub> decontamination process (example)



Chamber conditions during decontamination

**Start of H<sub>2</sub>O<sub>2</sub> solution vaporization**  
H<sub>2</sub>O<sub>2</sub> solution in the H<sub>2</sub>O<sub>2</sub> Generator (MCO-HP) is sprayed into the chamber by the ultrasonic transducer.

**H<sub>2</sub>O<sub>2</sub> fills up chamber**  
H<sub>2</sub>O<sub>2</sub> mist is quickly gasified to thoroughly fill up the chamber.

**UV radiation for H<sub>2</sub>O<sub>2</sub> reduction**  
• UV lamp turns on.  
• H<sub>2</sub>O<sub>2</sub> gas is reduced to water and oxygen.

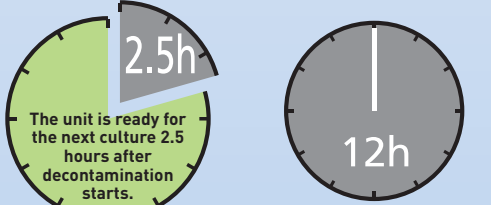
\*Above H<sub>2</sub>O<sub>2</sub> vaporization photos are concept images only.

\* Above decontamination process is performed with standard interior items. Additional shelves and dishes may reduce decontamination effectiveness.

\* Decontamination times shown above are for indication only. Actual process time may differ depending on chamber cleaning time and set-up time.

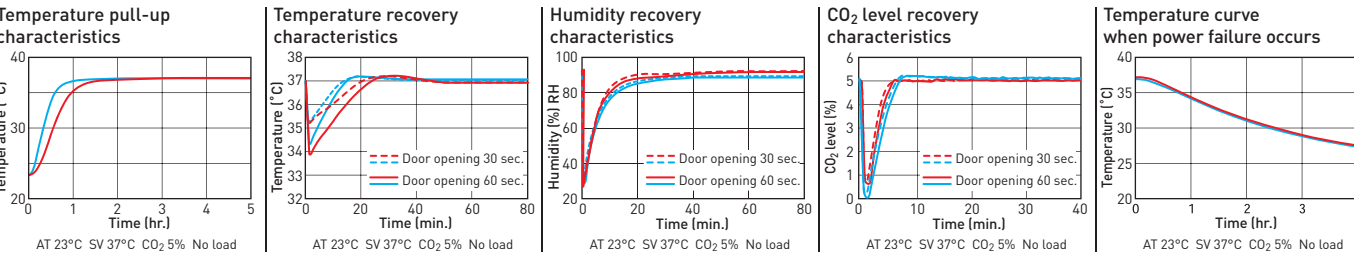
Time comparison between the H<sub>2</sub>O<sub>2</sub> decontamination process and sterilization at above 180°C

MCO-170AIC/MCO-230AIC H<sub>2</sub>O<sub>2</sub> decontamination Average time required for decontamination above 180°C



One-day cultures are not possible with dry heat type incubators.

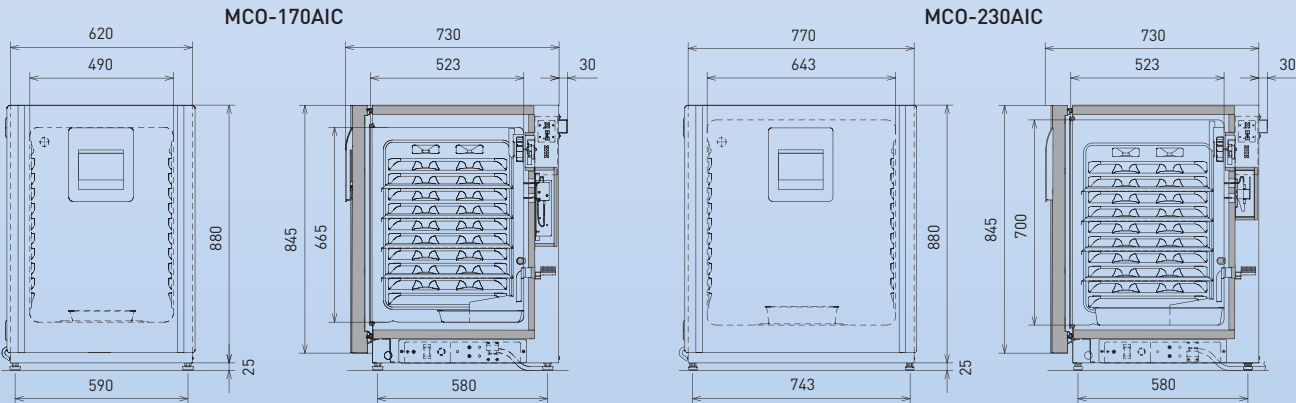
Performance Data MCO-170AIC / MCO-230AIC



\*Internal research as of November 2013

Dimensions

Unit: mm



# CO<sub>2</sub> Incubators | MCO-170AIC/AICL/AICUV/AICUVL/AICUVHL

## InCu-saFe® Construction for Germicidal Protection

PHCbi offers the exclusive use of inCu-saFe® copper-enriched stainless steel alloy interior surfaces to eliminate contamination sources such as mold, spores, and other contaminating spills while providing a noncorrosive environment, and to mitigate the effect of airborne contaminants introduced through normal use.

## Precision Gas Sensor IR CO<sub>2</sub>

The IR CO<sub>2</sub> sensor offers continuous calibration for excellent control and accuracy. This ceramic sensor is not affected by moderate temperature and humidity changes and is linked to the P.I.D. controller for fast recovery. As CO<sub>2</sub> and pH levels are key components for proper tissue culture, "Real Time" recovery and monitoring of CO<sub>2</sub> levels provide better culture outcomes.

## SafeCell UV Decontamination

Isolated Ultra Violet (UV) lamp decontaminates circulating air and the humidity water reservoir without harming the cultured cells. The 5,000 hour UV lamp provides long-term maintenance-free service without the ozone production. The UV lamp also provides easy access to an effective 24 hour chamber decontamination feature through the touch panel controller.

Model Number		MCO-170AIC/MCO-170AICL/MCO-170AICUV/MCO-170AICUVL/MCO-170AICUVHL		
External dimensions (W x D x H) <sup>1)</sup>	mm	620 x 730 x 905		
Internal dimensions (W x D x H)	mm	490 x 523 x 665		
Volume	litres	165		
Net weight	kg	80		
Performance				
Temperature control range and fluctuation	°C	AT +5 to +50 <sup>2)</sup> [AT 5°C–35°C]		
Temperature uniformity <sup>3)</sup>	°C	±0.25		
CO <sub>2</sub> setting range and fluctuation <sup>3)</sup>	%	0 to 20, ±0.15		
Humidity level and fluctuation	% RH	95 ±5 [Natural evaporation with humidifying pan]		
Control				
Temperature sensor		Thermistor		
Sensor	CO <sub>2</sub>	Dual IR		
Display		Touch Panel [WVGA full color LCD]		
Construction				
Exterior material		Painted Steel (rear cover not painted)		
Interior material		Stainless Steel Copper-Enriched Alloy		
Insulation material		Styrene AcryloNitrile copolymer		
Heating method		Direct Heat & Air Jacket System		
Outer door	qty	1 [Field reversible door]		
Inner door	qty	1 [tempered glass]		
Shelves	qty	4 x stainless steel copper-enriched alloy		
Shelf dimensions (W x D x H)	mm	475 x 450 x 12		
Max. load-per shelf	kg	7		
Access port	qty	1 [on the back side / Ø 30 mm]		
Alarms [V = Visual Alarm, B = Buzzer Alarm, R = Remote Alarm]				
Power failure		R		
Out of temperature setting		V-B-R		
High temperature		V-B-R		
High/Low gas density		V-B-R		
Door open		V-B		
Electrical and Noise Level		MCO-170AIC-PK MCO-170AICUV-PK	MCO-170AICL-PE MCO-170AICUVL-PE/PA	MCO-170AICUVHL-PE MCO-170AICUVHL-PA
Power supply	V	220	220-240 [PE] / 110-120 [PA]	
Frequency	Hz	60	50 [PE] / 60 [PA]	
Power Consumption [230V/50Hz]	kWh/day	1,844 [during cultivation]	0.454 [during decontamination cycle]	
Noise level <sup>4)</sup>	dB [A]	25		
Options				
UV system set		MCO-170UVS-PA / MCO-170UVS-PE		
H <sub>2</sub> O <sub>2</sub> decontamination kit <sup>5)</sup>		MCO-170HB-PA / MCO-170HB-PE		
Electric door lock with password <sup>5)</sup>		MCO-170EL-PW		
H <sub>2</sub> O <sub>2</sub> generator <sup>5)</sup>		MCO-HP-PW		
H <sub>2</sub> O <sub>2</sub> reagent		MCO-H2O2-PV		
CO <sub>2</sub> gas pressure regulator		MCO-010R-PW		
STD gas auto-calibration kit		MCO-SGP-PW		
Automatic CO <sub>2</sub> cylinder changeover system		MCO-21GCP-PW		
Tray		MCO-170ST-PW [same as that of standard accessory]		
Double stacking bracket		MCO-170PS-PW		
Stacking plate		MCO-170SB-PW		
Roller base		MCO-170RB-PW		
Optional Communication Systems				
Digital interface [RS232C/RS485] <sup>4)</sup>		MTR-480-PW		
Ethernet interface [LAN] <sup>4)</sup>		MTR-L03-PW		
Analogue interface [4–20 mA]		MCO-420MA-PW		
Quality Management System <sup>7)</sup>		MCO-170AIC-PK MCO-170AICUV-PK	MCO-170AICL-PE MCO-170AICUVL-PE/PA	MCO-170AICUVHL-PE MCO-170AICUVHL-PA
Certification		ISO13485	ISO9001	

<sup>1)</sup> External dimensions of main cabinet only, excluding handle and other external projections.

<sup>2)</sup> When set temperature is 37°C, ambient temperature must be 32°C or less. Regardless of ambient temperature, the maximum of temperature control range is always 50°C.

<sup>3)</sup> The measurement condition complies with PHCbi specified measuring method.

<sup>4)</sup> Nominal value background noise 20 dB(A).

<sup>5)</sup> MCO-170AIC(L) requires MCO-170HB, MCO-170EL, MCO-HP and UV option for H<sub>2</sub>O<sub>2</sub> decontamination.

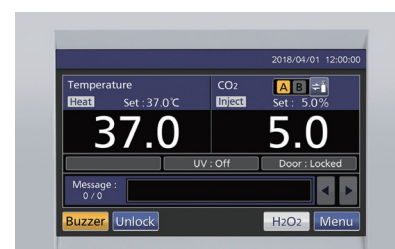
<sup>6)</sup> Only for the data acquisition system MTR-5000 user.

<sup>7)</sup> MCO-170AICL is for laboratory use.

• The optimum performance may not be obtained if the ambient temperature is not above 15°C.

• Appearance and specifications are subject to change without notice.

**Caution:** PHC Corporation guarantees this product under certain warranty conditions. However, please note that PHC Corporation shall not be responsible for any loss or damage to the contents stored in the product.

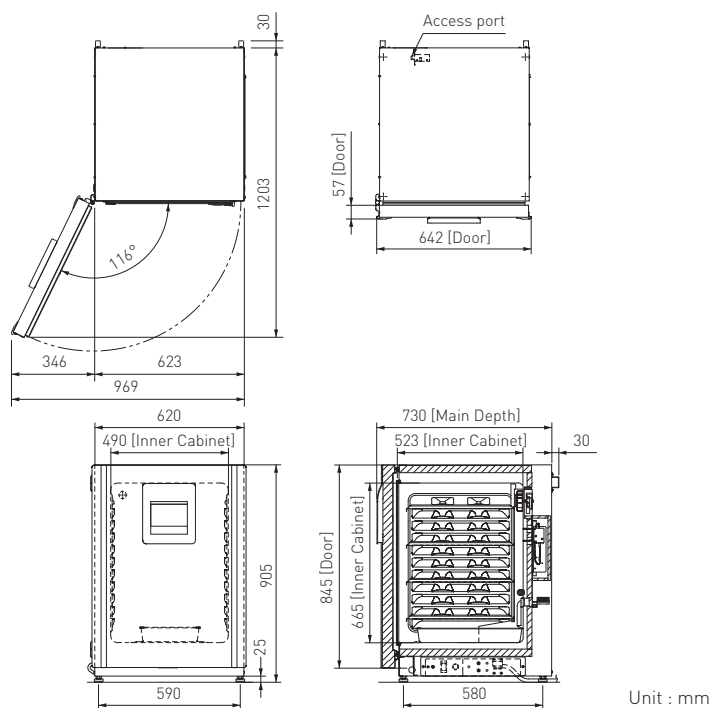


## Reliable controllability and data log function.

Large colour LCD touchpanel is accurately controlled even with a gloved hand, while the USB memory port makes transferring logged data of product's operational status to a PC convenient.

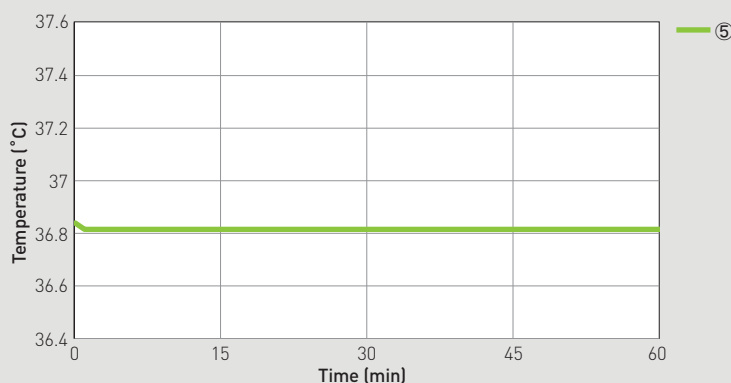


## Dimensions



## Temperature Stability

Condition: SV37°C, AT23°C, CO<sub>2</sub> 0%, 220V 50Hz, no load



## Internal Temperature Uniformity [Reference Data]

Distribution data

Temperature of the cycle in each area (SV37°C, air temperature)

Conditions

Load: Unloaded

Ambient temperature 23°C, CO<sub>2</sub> 0%, 220V 50Hz

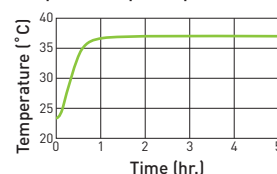
Unit: °C

	①	②	③	④	⑤	⑥	⑦	⑧	⑨
Chamber temp. at nine point (Ave.) <Pt:100Ω>	36.98	36.86	36.73	36.92	36.82	36.73	36.55	36.65	36.81

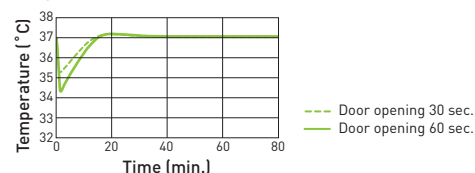
## Performance Data

AT23°C, SV37°C, CO<sub>2</sub>: 5 %, 220V/50Hz, no load

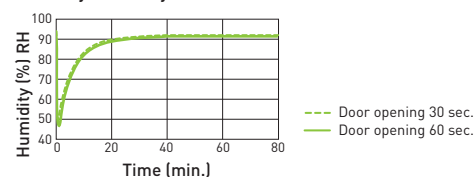
Temperature pull-up characteristics



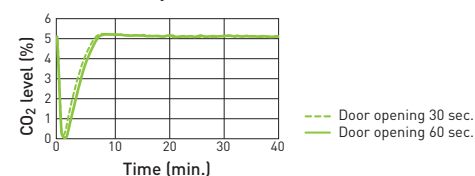
Temperature recovery characteristics



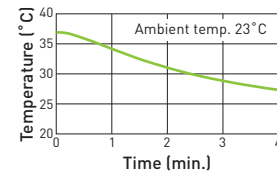
Humidity recovery characteristics



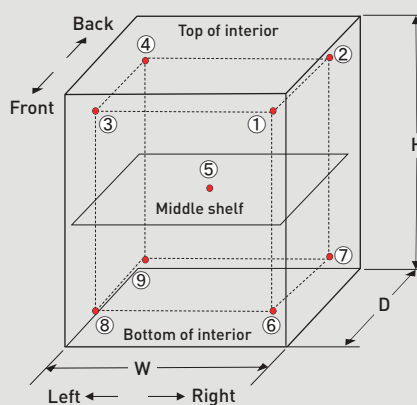
CO<sub>2</sub> level recovery characteristics



Temperature decrease characteristics when power failure occurs



## Temperature uniformity - 9 points measuring



## [Note] Disclaimer

- Specification may change without notice.
- The performance data was measured by inhouse test data of PHC.
- The Performance data is a reference data and not guaranteed.
- Not all the products available in all countries.



# CO<sub>2</sub> Incubators | MCO-170AICD/AICDL/AICUVD/AICUVDL

## Precise & Regulated Environment

InCu-saFe® and SafeCell UV both function to prevent contamination. Direct Heat System and melamine foam insulation ensure optimal temperature distribution throughout the chamber while the Dual IR sensor controls the CO<sub>2</sub> level.

## Dual Heat Sterilisation

Dual heat sterilisation utilises the incubator's two heaters during the 180°C sterilisation process, which takes 11 hours. Because there is no effect on temperature inside stacked incubators due to low heat dissipation, cell culturing can continue uninterrupted.

## Improved Use & Maintenance

A colour LCD touchscreen panel allows full control, even with gloved hands. Transfer of data is easy via a USB port. The easy-to-clean incubator interior features fully rounded corners and integrated shelf supports.

Model Number		MCO-170AICD/MCO-170AICDL/MCO-170AICUVD/MCO-170AICUVDL			
External dimensions (W x D x H) <sup>1)</sup>	mm	620 x 755 x 905			
Internal dimensions (W x D x H)	mm	490 x 523 x 665			
Volume	litres	165			
Net weight	kg	79 [MCO-170AICD] / 80 [MCO-170AICUVD/MCO-170AICUVDL]			
Performance					
Temperature control range and fluctuation	°C	AT +5 to +50 <sup>2)</sup> [AT 5°C–35°C]			
Temperature uniformity <sup>2)</sup>	°C	±0.25			
CO <sub>2</sub> setting range and fluctuation <sup>2)</sup>	%	0 to 20, ±0.15			
Humidity level and fluctuation	% RH	95 ±5 [Natural evaporation with humidifying pan]			
Control					
Temperature sensor		Thermistor			
Sensor	CO <sub>2</sub>	Dual IR			
Display		Colour LCD touchscreen			
Construction					
Exterior material		Painted Steel (rear cover not painted)			
Interior material		Stainless Steel Copper-Enriched Alloy			
Insulation material		Melamine resin foam			
Heating method		Heater jacket			
Sterilisation method <sup>3)</sup>		Dry heat sterilisation, 180°C, 11 hours			
Outer door	qty	1 [Field reversible door]			
Inner door	qty	1 [tempered glass]			
Shelves	qty	4 x stainless steel copper-enriched alloy			
Shelf dimensions (W x D x H)	mm	475 x 450 x 12			
Max. load-per shelf	kg	7			
Access port	qty	1 [on the back side / Ø 30 mm]			
Alarms [V = Visual Alarm, B = Buzzer Alarm, R = Remote Alarm]					
Power failure		R			
Out of temperature setting		V-B-R			
High temperature		V-B-R			
High/Low gas density		V-B-R			
Door open		V-B			
Electrical and Noise Level		MCO-170AICD MCO-170AICUVD	MCO-170AICDL	MCO-170AICUVDL	
		-PK	-PE	-PE	-PA
Power supply	V	220	220-240		110-120
Frequency	Hz	60	50 / 60		60
Power Consumption [230V/50Hz]	kWh/day	1.367 [during cultivation]		2.887 [during dry heat sterilization ]	
Noise level <sup>4)</sup>	dB [A]	25			
Options					
UV system set		MCO-170UVSD-PE (MCO-170AICUVD/MCO-170AICUVDL Standard equipment)			
Gas regulator		MCO-010R-PW			
Gas auto changer		MCO-21GCP-PW			
STD gas auto calibration kit		MCO-5GP-PW			
Tray		MCO-170ST-PW			
Half tray		MCO-25ST-PW			
Double stacking bracket <sup>5)</sup>		MCO-170PS-PW			
Stacking plate <sup>5)</sup>		MCO-170SB-PW			
Roller base		MCO-170RB-PW			
Optional Communication Systems					
Digital interface [RS232C/RS485] <sup>6)</sup>		MTR-480-PW			
Ethernet interface [LAN] <sup>6)</sup>		MTR-L03-PW			
Analogue interface [4–20 mA]		MCO-420MA-PW			
Quality Management System <sup>7)</sup>		MCO-170AICD MCO-170AICUVD	MCO-170AICDL	MCO-170AICUVDL	
		-PK	-PE	-PE	-PA
Certification		ISO13485		ISO9001	

<sup>1)</sup> External dimensions of main cabinet only, excluding handle and other external projections.

<sup>2)</sup> Ambient temperature 23°C, setting 37°C, CO<sub>2</sub> 5%, no load.

<sup>3)</sup> Dry heat sterilisation can be performed only for the chamber and inner attachments with standard specifications, not for any other objects.

<sup>4)</sup> Nominal value. <sup>5)</sup> If stacking two incubators, make sure the double-stacking dedicated securing hardware and spacer are used.

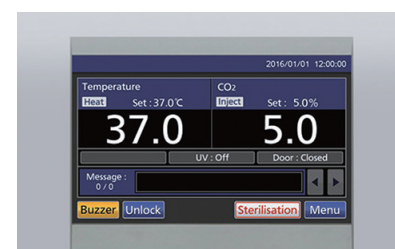
<sup>6)</sup> Only for the Data acquisition system MTR-5000 user. MCO-170AICD series can only be fitted with one communications interface.

<sup>7)</sup> MCO-170AICDL and MCO-170AICUVDL are for laboratory use.

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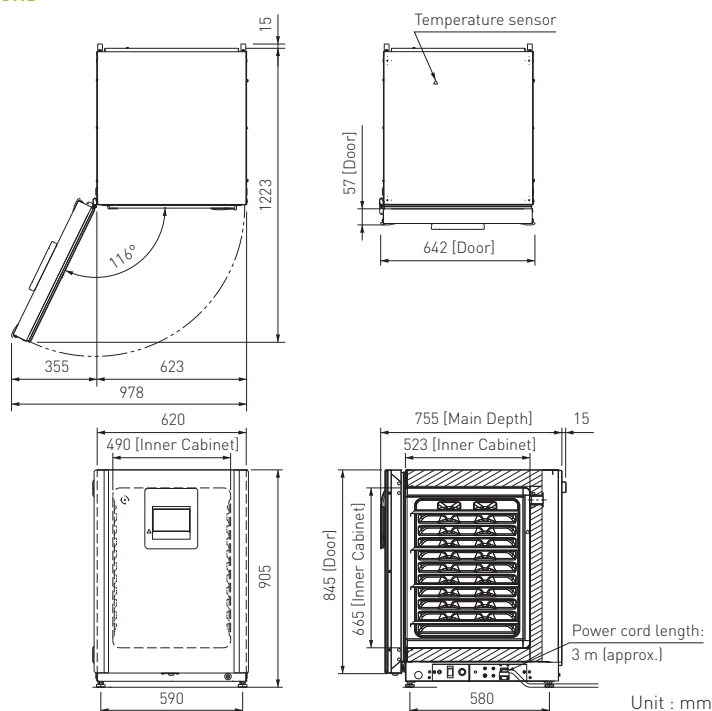


## Intuitive Usability

Easy control and visibility of the internal conditions such as CO<sub>2</sub> level and temperature.

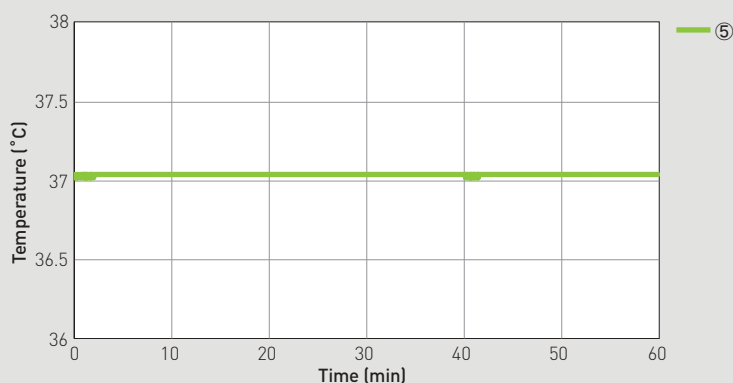


## Dimensions



## Temperature Stability

Condition: SV37°C, AT23°C, CO<sub>2</sub> 0%, 220V 50Hz, no load



## Internal Temperature Uniformity [Reference Data]

Distribution data

Temperature of the cycle in each area (SV37°C, air temperature)

Conditions

Load: Unloaded

Ambient temperature 23°C, CO<sub>2</sub> 0%, 220V 50Hz

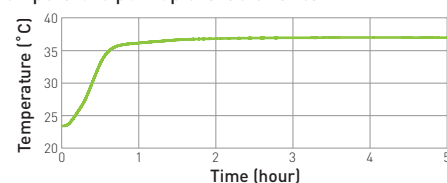
Unit: °C

	①	②	③	④	⑤	⑥	⑦	⑧	⑨
Chamber temp. at nine point (Ave.) <Pt:100Ω>	37.16	37.10	36.91	36.94	37.03	37.01	36.94	37.07	36.90

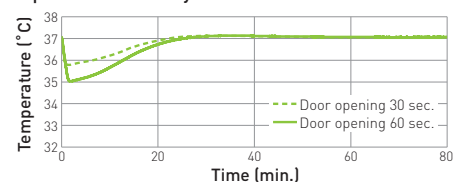
## Performance Data

AT23°C, SV37°C, CO<sub>2</sub>: 5 %, 220V/50Hz, no load

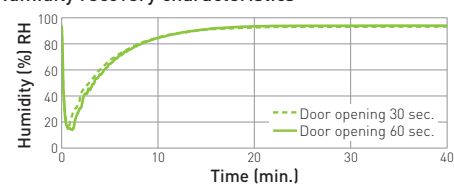
Temperature pull-up characteristics



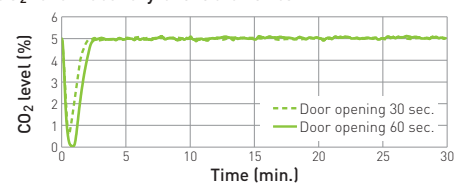
Temperature recovery characteristics



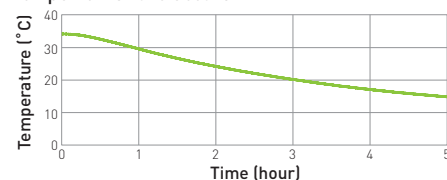
Humidity recovery characteristics



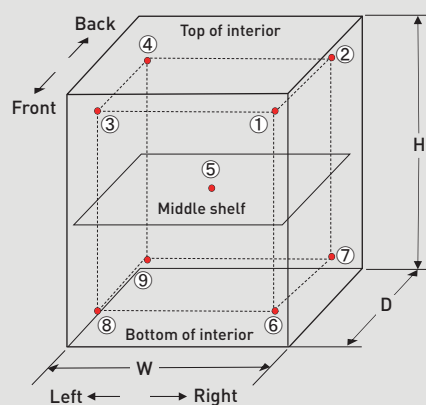
CO<sub>2</sub> level recovery characteristics



Temperature decrease characteristics when power failure occurs



## Temperature uniformity - 9 points measuring



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