

WORLD SCIENCE

THE WORLD'S BEST CO₂ INCUBATOR

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The Best Partner of Your Life

CO₂ Incubator

CO₂ / O₂ Incubator

Multifunctional CO₂ Incubator

Sterilization CO₂ Incubator

Shaker

CO₂ Incubator...

CO₂ Incubator...

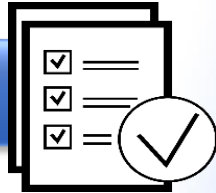
As a leader in CO₂ Incubator, water jacket and air jacket technology, we will be the center of communication.

World Science Co. is a research and development company specializing in CO₂ Incubator, we are focusing on one area of CO₂ incubators with the aim of being the best in biotechnology, chemical appliances, and medical devices.

We have been developing various products such as small incubators, large incubators and multi incubators based on our long-standing experience.

With the goal of Best Customer Satisfaction, we promise continuous technical support and best A/S for World Science products and will continue to lead the CO₂ Incubator market with a lot of investment and research and development.

World Science



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General Feature 05

- Circulation system and heating type
- Dual Beam NDIR CO₂ Sensor
- Display
- Over All

Advanced Function 09

WS-15 CO₂ Incubator Series 11

- WS-15CA (CO₂ Incubator)
- WS-15COA (CO₂ O₂ incubator)

WS-40 CO₂ Incubator Series 13

- WS-40CA (CO₂ Incubator)
- WS-40COA (CO₂ O₂ Incubator)
- WS-40CW (CO₂ Incubator)
- WS-C40CW (Cooling CO₂ Incubator)
- WS-40SC (Sterilization CO₂ Incubator)
- WS-40COW (CO₂ O₂ Incubator)

WS-80 CO₂ Incubator Series 15

- WS-80CA (CO₂ Incubator)
- WS-80COA (CO₂ O₂ Incubator)
- WS-80CW (CO₂ Incubator)
- WS-80SC (Sterilization CO₂ Incubator)
- WS-80CS (Shaking CO₂ Incubator)
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WS-180 CO₂ Incubator Series 17

- WS-180CA (CO₂ Incubator)
- WS-180COA (CO₂ O₂ Incubator)
- WS-180CW (CO₂ Incubator)
- WS-180COW (CO₂ O₂ Incubator)
- WS-180SC (Sterilization CO₂ Incubator)
- WS-180CS (Shaking CO₂ Incubator)
- WS-180COS (Shaking CO₂ Incubator)
- WS-180CR (Rocker CO₂ Incubator)
- WS-180CSR (Shaking & Rocker CO₂ Incubator)

Large Capacity CO₂ Incubator Series 19

- WS-580C (Direct Heat CO₂ Incubator)
- WS-880C (Direct Heat CO₂ Incubator)

Accessory 21

Product Selection Guide



World Science Product List							
Jacket Type	Capacity	Model	Advanced function				
			Standard	O2	Shaking	Rocking	Steril
Air Jacketed Type	40	CA	✓				
		COA	✓	✓			
		SC	✓	✓			✓
	80	CA	✓				
		COA	✓	✓			
		CS	✓	✓	✓		
		SC	✓	✓			✓
	180	CA	✓				
		COA	✓	✓			
		CS,CR	✓	✓	✓	✓	
		CSR	✓	✓	✓	✓	
		SC	✓	✓			✓
Water Jacketed Type	40	CW	✓				
		COW	✓	✓			
	80	CW	✓				
		COW	✓	✓			
	180	CW	✓				
		COW	✓	✓			
Large Capacity	580	CA	✓	✓			
		CS	✓	✓	✓		
	800	CA	✓	✓			
		CS	✓	✓	✓		

✓ Function included

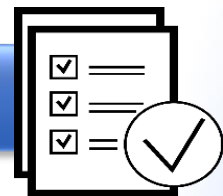
✓ Additional function

※ Select the capacity of the chamber according to the size of the laboratory.,

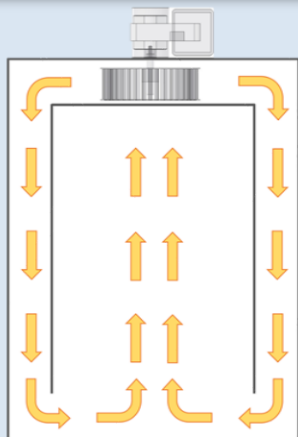
※ Refer to the following table for the purpose of experimentation and culture.

After that, we will provide you with products and specifications suitable for the laboratory through technical consultation.

General Feature – Circulation system and heating type



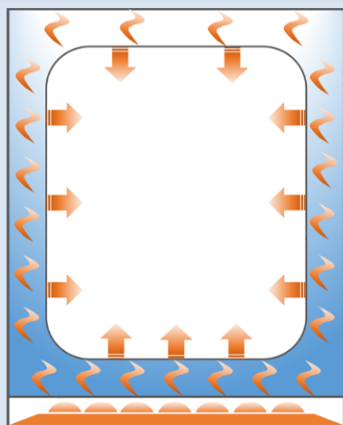
Air Circulation Flow Schematic Diagram



By maintaining a uniform temperature distribution and gas distribution inside the chamber, It provides the best experimental space. As shown in the picture, through an internal circulation fan, It induces convection..

This provides a much higher level of circulation effect than natural convection in temperature recovery and CO₂ concentration recovery after door opening.

WATER JACKET TYPE Heat Transfer Schematic Diagram

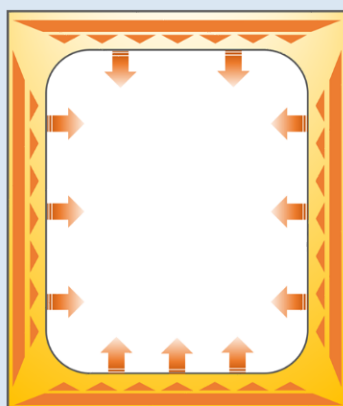


The WATER JACKET Type is a double chamber type that fills the water. The response speed (time to reach the set temperature) is slightly lower, but the temperature stability inside the chamber is high due to the high specific gravity of the water.

Since the grid structure is heated with water, distilled water injection is required when installing it.

Although it is inconvenient to move equipment in the future due to increased weight, high stability shows excellent performance in experiments that are sensitive to short-term temperature changes.

AIR JACKET TYPE Heat Transfer Schematic Diagram

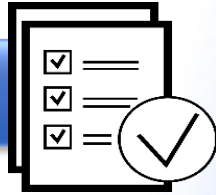


It is relatively lighter and easier to move than the WATER JACKET Type.

AIR JACKET Type uses Direct Heating and radiant heat through the air layer.

The response speed is fast, but the temperature stability is relatively low compared to the WATER JACKET depending on the opening frequency of the door.

It does not inject water into the grid, making it easy to move and install equipment.



※ World Science applies Dual-Beam NDIR CO₂ sensors to all product lines. ※

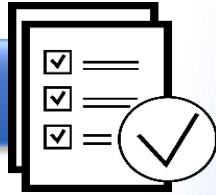
* Compare the NDIR Single Wavelength Type and Dual Wavelength Type

	Single Wavelength Type	Dual Wavelength Type
Configuration		
Difference	<p>In general, it is called the "single type" in the market. Most of the low-cost NDIR sensors in the market are single-type.</p> <p>Single-type errors increase over time due to long-term use such as lamps, power sources, and amplifiers, or due to external temperatures, so periodic calibration is required.</p> <p>It is not suitable for indoor air control except for measuring instruments that can be calibrated using standard gas when measuring.</p> <p>In particular, most NDIR sensors that do not have the specification of dual-type are single-type.</p>	<p>This is a type that complements the weakness of the single type, and is generally referred to as a "dual type" in the market.</p> <p>The configuration sensor is built into two sensors in one package and detects the reference value on one side and the amount of infrared attenuation affected by CO₂ concentration on the other.</p> <p>The reference value is infrared sensing in a wavelength band that is not affected by CO₂ as well as other gases, and serves as a self-calibration depending on external effects.</p> <p>Currently, it is the most stable and can maintain precision for a long time without separate calibration, and is also widely used for IAQ.</p>

(It can be divided into two main categories depending on the IR lamp and sensor configuration, and the important differences are as follows.)

It measures the CO₂ concentration inside the chamber more effectively than a single beam infrared type or TC sensor, and contributes to the recovery and stability of gas through a fast response speed.

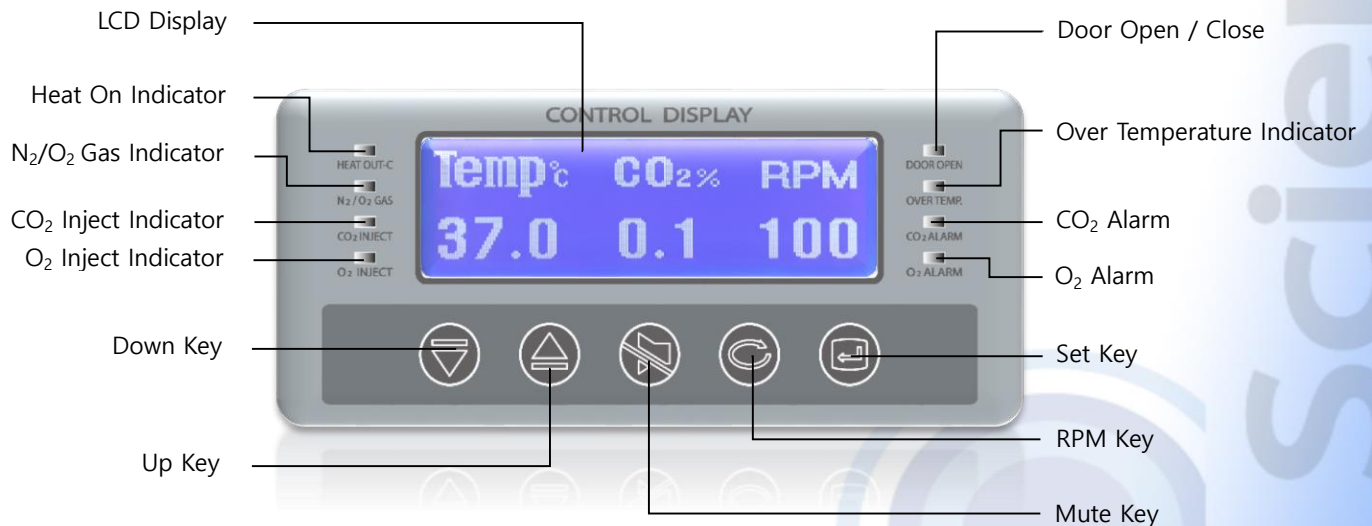
World Science uses its own Digital PID method to precisely control gas concentration without overshoot..



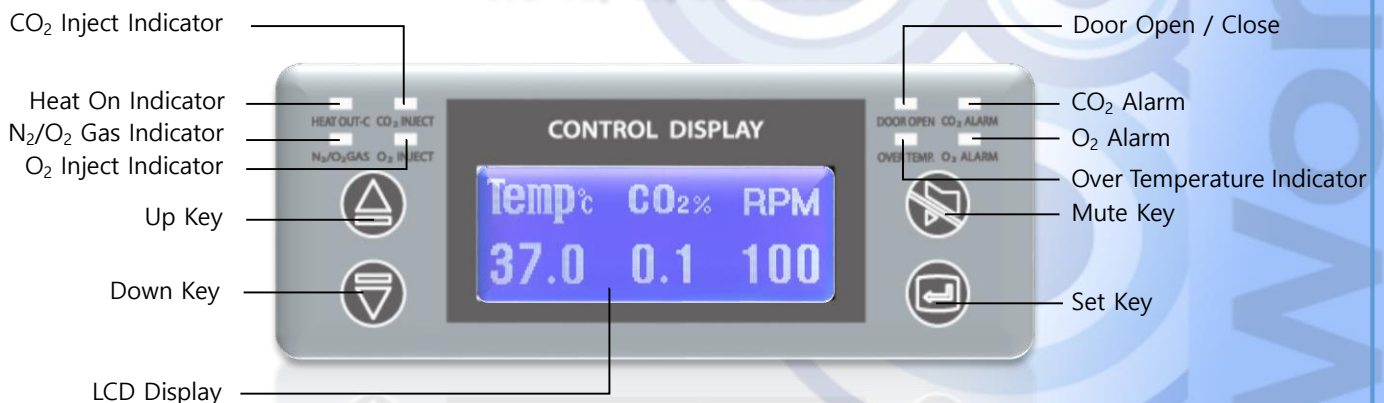
Graphics LCD Display System

- 240x64 Graphics LCD for better legibility
- Font size changes according to SET menu
- Intuitive menu setting simplifying the process of menu choices
- Input setting with the touch sensor

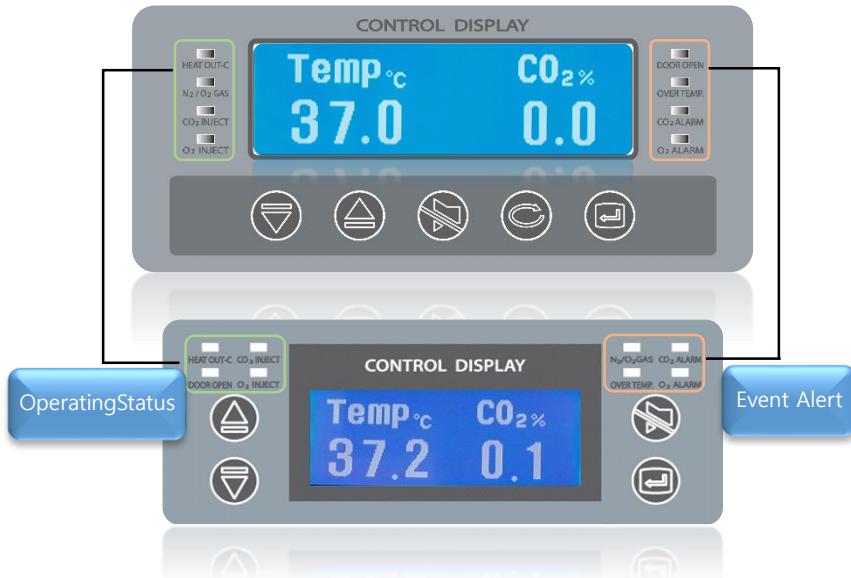
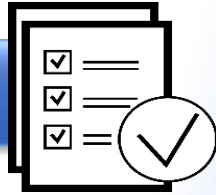
WS-180, Large Capacity SERIES



WS-15, 40, 80 SERIES



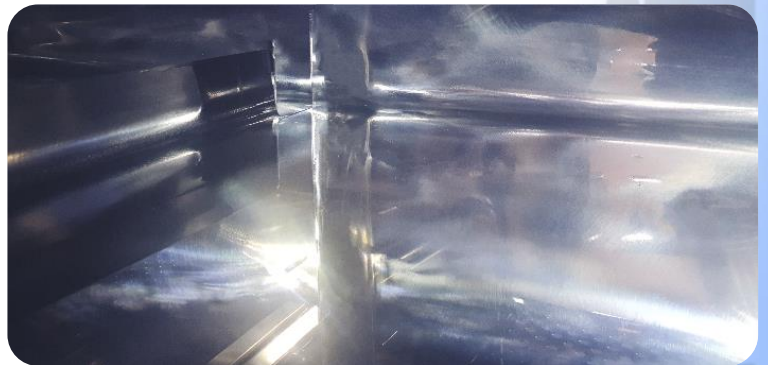
General Feature – Over all



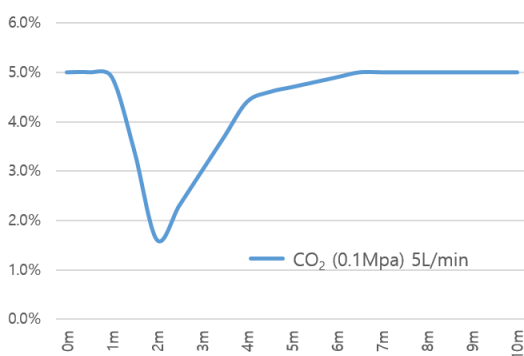
Graphics LCD Display System and 7-segment developed independently by World Science.

LED System provides excellent convenience in the condition and management of CO₂ Incubators during experiments.

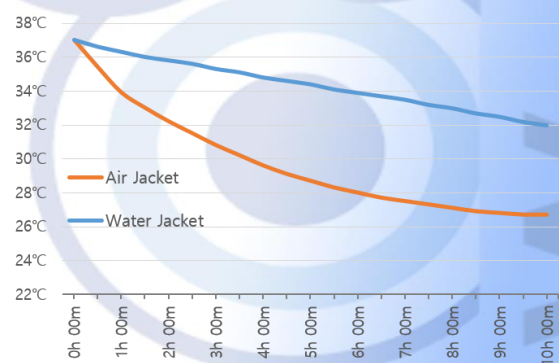
The full round corner design is applied to provide the safety and ease of cleaning of the experimenter.

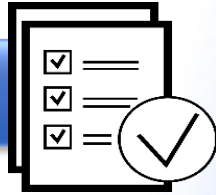


CO₂ Gas response after door opening



Temperature change during power outage





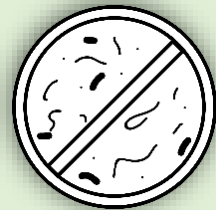
Advanced function

If you have chosen the right capacity and jacket type for your experimental environment, you can create a better culture environment by adding the completed additional features with World Science's unique technology.

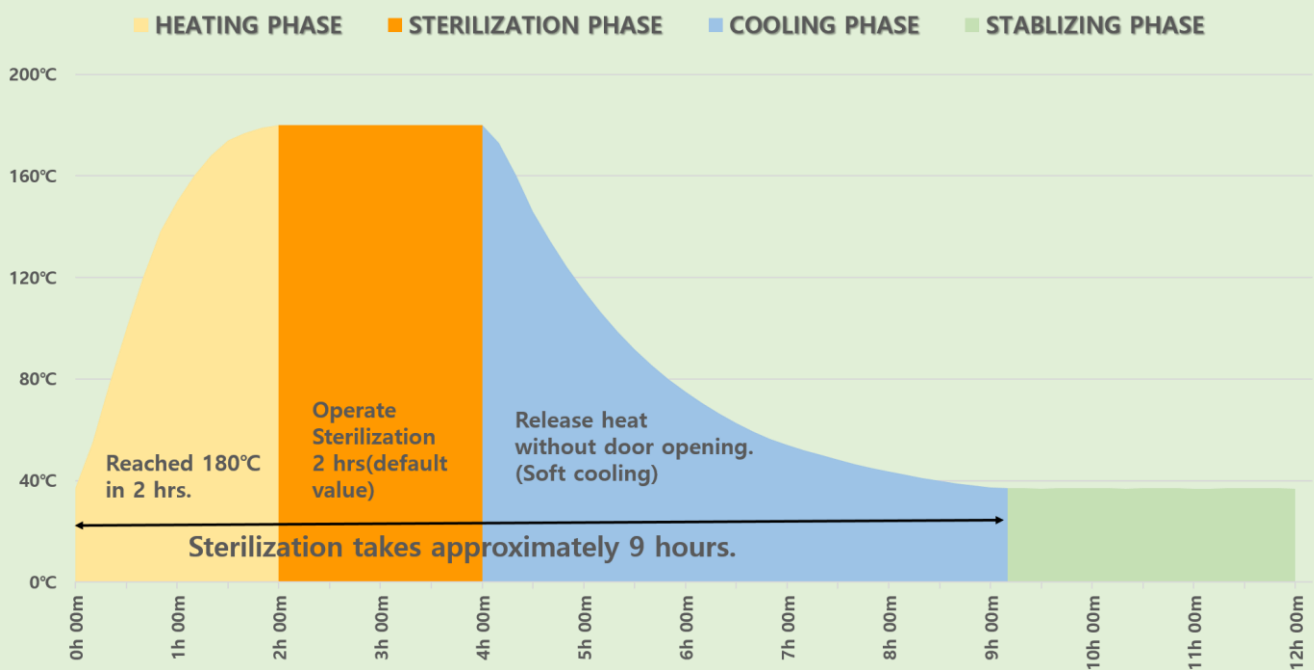
Take advantage of a number of additional options, such as chambers in Hypoxia and Hyperoxia environments, high-temperature sterilization cycle capabilities at 180°C, and intracellular gas supply through Shaking and Rocking.

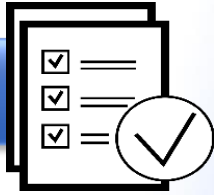
● Sterilization

- Through the sterilization function, contamination inside the chamber can be easily eliminated to maintain the best culture conditions.
- It is equipped with a safety device function to protect the sensor when operating the sterilization function.
- The sterilization cycle is about 9 hours and is continuously monitored, and the current status is displayed on the control panel..
- When operating the sterilization function, the temperature is above 60 degrees and the alarm goes off when the door is opened.



STERILIZATION CYCLE





● O₂ Control



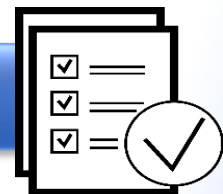
- You can choose a galvanic or zirconia oxygen sensor.
- You can choose according to the experimental environment of 0-20% hypoxic and 20-100% hypoxic.
- Through precise measurement, stable oxygen concentration inside the chamber is provided to create a culture environment such as stem cells and tumor cells..
- Galvanic sensors and zirconia sensors have the following specifications..
- The oxygen sensor, which is basically applied to our CO₂/O₂ line products, is an electrochemical galvanic cell that is consumed and varies depending on the environment of use, but has a lifespan of about two years.
- The solid electrolyte type zirconia oxygen sensor is non-consumable and has a life expectancy of 5 years or more and is semi-permanent depending on the environment of use.

● Shaking, Rocking



- World Science's Shaking and Rocking system is fully embedded inside the CO₂ incubator, providing convenience to users who cultivate various microorganisms and immune cells that require oxygen supply.

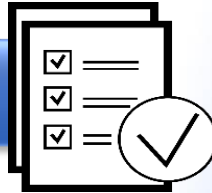
- It prevents corrosion through a mechanism composed of stainless steel, providing stable performance even in long-term use.
- It provides a quiet laboratory environment through low noise and low vibration, does not have any access code or hole inside to block contamination that may occur from the outside, and maintains confidentiality inside the chamber.
- A safer experiment is possible by adding the desired type of accessory to the Shaking platform.



Feature of WS-15 Series

World Science's Benchtop CO₂ Incubator WS-15 is a small-scale experiment of cell culture, It is suitable for small laboratories and is very easy to move equipment.

It can be used inside the clean bench to minimize pollutants from the outside and provide convenience in movement. As the chamber capacity is low, it shows excellent performance in creating a Hypoxia environment, minimizes consumption of CO₂ and N₂ gas, and shows fast recovery and response speed.

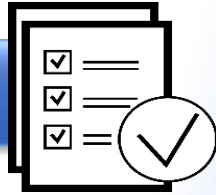


General Specification

Model No.		WS-15CA	WS-15COA
Jacket Type		Air Jacket Type	
Dimension	Chamber Dimension	230(w)x340(d)x280(h)mm	
	Overall Dimension	307(w)x354(d)x410(h)mm	
Capacity		15 Liters	
Temperature	Range	Ambient+5°C To 50°C	
	Accuracy	± 0.1°C at 37°C	
	Stability	± 0.1°C at 37°C	
	Uniformity	± 0.3°C at 37°C	
	Sensor	Platinum RTD	
	Control	Microprocessor Digital P.I.D Controller	
CO ₂	Range	0~20%	
	Accuracy	± 0.1% at 5%	
	Sensor	Dual-Beam NDIR Sensor	
Inlet Pressure		0.1 Mpa 2ℓ/min	
Humidification		Up to 95% RH at 37°C	
Operating Timer Set		999h : 59m	
Door	Out Door	Silicone Packing Magnet Door	
	Inner Door	Tempered Safety Glass	
Material	Chamber	Stainless Steel(304)	
	Outside	Steel Plate with Powder Coating	
Shelves		1EA, Adjustable type (Max Shelves 2EA)	
Display		192X64 Graphics LCD	
Circulation Fan		Internal Convection Fan	
Safety		Exclusive Over Temp. Protector	
Weight		18kg	
Power		AC220V, 2.5A, 50/60Hz	

Additional Specification

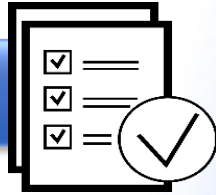
Model No.		WS-15COA
O ₂	Range	Galvanic Cell: 0.1~20% , Zirconia (1~95% Option)
	Accuracy	Galvanic Cell: ±0.1% at 5%, Zirconia ± 1% FS
	Sensor	Oxygen Galvanic Cell Type, Transmitter-Zirconia Type (Option)
	Program	Automatic Hypoxia-Re oxygenation Program Pattern function (Option)



Feature of WS-40 Series

Provide optimal laboratory environment for small-scale culture.

The relatively small WS-40 series enables efficient spatial arrangement and is an optimized model for small-scale culture or individual users. You can dismantle the inner shelves and guides without additional tools, and round corners are applied to prevent contamination and clean them easily.

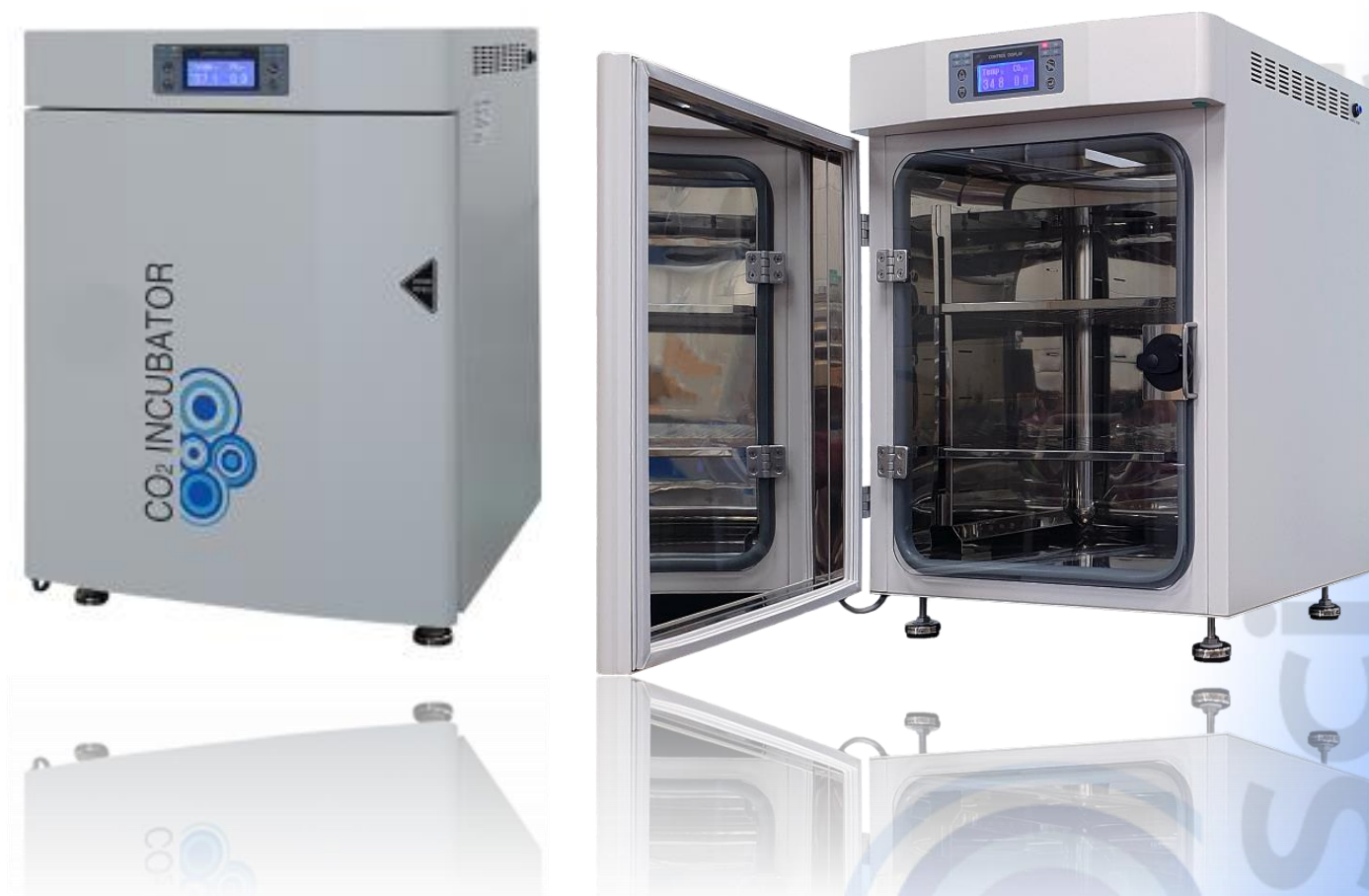
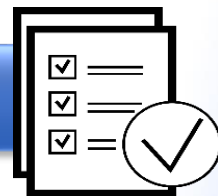


General Specification

Model No.		WS-40CA	WS-40COA	WS-40CW	Ws-40COW
Jacket Type		Air Jacket Type		Water Jacket Type	
Dimension	Chamber Dimension	338(w)x334(d)x358(h)mm			
	Overall Dimension	440(w)x458(d)x570(h)mm440(w)x458(d)x570(h)mm			
Capacity		40 Liters			
Temperature	Range	Ambient+5°C To 50°C			
	Accuracy	± 0.1°C at 37°C			
	Stability	± 0.1°C at 37°C			
	Uniformity	± 0.3°C at 37°C			
	Sensor	Platinum RTD			
	Control	Microprocessor Digital P.I.D Controller			
CO2	Range	0~20%			
	Accuracy	± 0.1% at 5%			
	Sensor	Dual-Beam NDIR Sensor			
Inlet Pressure		0.2 Mpa 3ℓ/min			
Humidification		Up to 95% RH at 37°C			
Operating Timer Set		999h : 59m			
Door	Out Door	Silicone Packing Magnet Door			
	Inner Door	Tempered Safety Glass			
Material	Chamber	Stainless Steel(304)			
	Outside	Steel Plate with Powder Coating			
Shelves		2EA, Adjustable type (Max Shelves 5EA)			
Display		192X64 Graphics LCD			
Circulation Fan		Internal Convection Fan			
Safety		Exclusive Over Temp. Protector			
Weight		45kg		50kg	
Power		AC220V, 2.5A, 50/60Hz			

Additional Specification

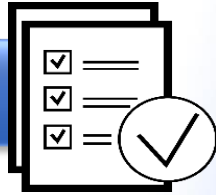
Model No.		WS-40COA	WS-40COW
O2	Range	Galvanic Cell: 0.1~20% , Zirconia (1~95% Option)	
	Accuracy	Galvanic Cell: ±0.1% at 5%, Zirconia ± 1% FS	
	Sensor	Oxygen Galvanic Cell Type, Transmitter-Zirconia Type (Option)	
	Program	Automatic Hypoxia-Re oxygenation Program Pattern function (Option)	



Feature of WS-80 Series

It is the minimum size that a CS (shaking) model can be used, and it can provide an environment in which CO₂ and temperature are controlled stably in an experiment in which a shaking culture environment should be provided. If you need a shaking function, but don't need a large model, or if you're having a problem creating a stable experimental environment, experience an 80-line shaking system.

World Science, which provides a step-by-step size to optimize the size of customers' experiments and space utilization in the laboratory, designs a more precise sensor use and temperature control system for each capacity for the same performance and performance in all product lines.



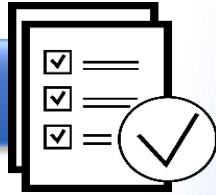
General Specification

Model No.		WS-80CA	WS-80COA	WS-80CS	WS-80CW	WS-80COW
Jacket Type		Air Jacket Type			Water Jacket Type	
Dimension	Chamber Dimension	414(w)x404(d)x486(h)mm				
	Overall Dimension	540(w)x536(d)x663(h)mm				
Capacity		80 Liters				
Temperature	Range	Ambient+5°C To 50°C				
	Accuracy	± 0.1°C at 37°C				
	Stability	± 0.1°C at 37°C				
	Uniformity	± 0.3°C at 37°C				
	Sensor	Platinum RTD				
	Control	Microprocessor Digital P.I.D Controller				
CO2	Range	0~20%				
	Accuracy	± 0.1% at 5%				
	Sensor	Dual-Beam NDIR Sensor				
Inlet Pressure		0.2 Mpa 5ℓ/min				
Humidification		Up to 95% RH at 37°C				
Operating Timer Set		999h : 59m				
Door	Out Door	Silicone Packing Magnet Door				
	Inner Door	Tempered Safety Glass				
Material	Chamber	Stainless Steel(304)				
	Outside	Steel Plate with Powder Coating				
Shelves		2EA, Adjustable type (Max Shelves 6EA)				
Display		192X64 Graphics LCD				
Circulation Fan		Internal Convection Fan				
Safety		Exclusive Over Temp. Protector				
Weight		65kg			70kg	
Power		AC220V, 2.5A, 50/60Hz				

Additional Specification

Model No.		WS-80COA	WS-80COW
O2	Range	Galvanic Cell: 0.1~20% , Zirconia (1~95% Option)	
	Accuracy	Galvanic Cell: ±0.1% at 5%, Zirconia ± 1% FS	
	Sensor	Oxygen Galvanic Cell Type, Transmitter-Zirconia Type (Option)	
	Program	Automatic Hypoxia-Re oxygenation Program Pattern function (Option)	

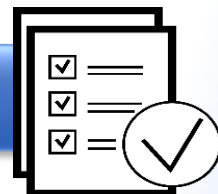
Model No.		WS-80CS
Shaker RPM		30~250 RPM
Shaker Platform Size		320(w)x330(d)mm



Feature of WS-180 Series

The 180 series is the most commonly used size in the laboratory and is a line that all additional advanced options for WS products are available.

Basically, except for all additional functions, the characteristics and specifications of general CO₂ incubators are all the same. Users can select standard or additional functions to select equipment that meets their experimental conditions, thereby reducing the maintenance costs and experimental budget required. It provides solutions for various cases considering the conditions and parameters required for each laboratory and provides an experimental environment suitable for the user's needs.



General Specification

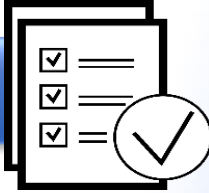
Model No.		WS-180CA	WS-180COA	WS-180CSR		WS-180SC	WS-180CW	WS-180COW
				CS	CR			
Jacket Type		Air Jacket Type					Water Jacket Type	
Dimension	Chamber Dimension	540(w)x500(d)x680(h)mm						633(w)x636(d)x965(h)mm
	Overall Dimension	653(w)x639(d)x965(h)mm						
Capacity		180 Liters						
Temperature	Range	Ambient+5°C To 50°C						
	Accuracy	± 0.1°C at 37°C						
	Stability	± 0.1°C at 37°C						
	Uniformity	± 0.3°C at 37°C						
	Sensor	Platinum RTD						
	Control	Microprocessor Digital P.I.D Controller						
CO2	Range	0~20%						
	Accuracy	± 0.1% at 5%						
	Sensor	Dual-Beam NDIR Sensor						
Inlet Pressure		0.3 Mpa 5ℓ/min						
Humidification		Up to 95% RH at 37°C						
Operating Timer Set		999h : 59m						
Door	Out Door	Silicone Packing Magnet Door						
	Inner Door	Tempered Safety Glass						
Material	Chamber	Stainless Steel(304)						
	Outside	Steel Plate with Powder Coating						
Shelves		3EA, Adjustable type (Max Shelves 6EA)						
Display		240X64 Graphics LCD						
Circulation Fan		Internal Convection Fan						
Safety		Exclusive Over Temp. Protector						
Weight		100kg					105kg	
Power		AC220V, 6A, 50/60Hz						

Additional Specification

Model No.		WS-180COA	WS-180COW
O2	Range	Galvanic Cell: 0.1~20% , Zirconia (1~95% Option)	
	Accuracy	Galvanic Cell: ±0.1% at 5%, Zirconia ± 1% FS	
	Sensor	Oxygen Galvanic Cell Type, Transmitter-Zirconia Type (Option)	
	Program	Automatic Hypoxia-Re oxygenation Program Pattern function (Option)	

Model No.		WS-180CSR	
		WS-180CS	WS-180CR
Shaker RPM		30~250 RPM	
Shaker Platform Size		380(w)x380(d)mm	
Rocker OPM			3~10 OPM
Rocker Shelves Angle			-5°~+5°

Model no.		WS-180SC
Temperature	Wet Sterilization	Ambient+5°C To 90°C
	Dry Sterilization	Ambient+5°C To 180°C



Feature of Large Capacity

The standard-type Large Capacity product provides a large capacity of cell culture space for large-scale laboratories or communal areas used by experimenters..

In addition, the main advantage of Large Capacity is that it can be specially customized to meet the needs of the laboratory. Each laboratory can have its own equipment through consulting with World Science technology teams such as O₂ Control, Sterilization, Pass Through, and Multi-Stage Shaking Platform.

Large Capacity Series



2 Stage Shaking Divided inner door




Pass through

General Specification

Model No.		WS-580CA	WS-800CA
Jacket Type		Air Jacket Type	
Dimension	Chamber Dimension	650(w)x650(d)x1380(h)mm	700(w)x780(d)x1480(h)mm
	Overall Dimension	800(w)x830(d)x1680(h)mm	850(w)x930(d)x1680(h)mm
Capacity		580 Liter	800 Liter
Temperature	Range	Ambient+5°C To 50°C	
	Accuracy	± 0.1°C at 37°C	
	Stability	± 0.1°C at 37°C	
	Uniformity	± 0.4°C at 37°C	
	Sensor	Platinum RTD	
	Control	Microprocessor Digital P.I.D Controller	
CO2	Range	0~20%	
	Accuracy	± 0.1% at 5%	
	Sensor	Dual-Beam NDIR Sensor	
Inlet Pressure		0.3 Mpa 5l/min	
Humidification		Up to 90% RH at 37°C	
Door	Out Door	Silicone Packing Magnet Door	
	Inner Door	Tempered Safety Glass	
Material	Chamber	Stainless Steel(304)	
	Outside	Steel Plate with Powder Coating	
Shelves		6EA, Adjustable type (Max Shelves 12EA)	
Display		240X64 Graphics LCD	
Circulation Fan		Internal Convection Fan (Dual)	
Safety		Exclusive Over Temp. Protector	
Weight		252kg	320kg
Power		AC220V, 6A, 50/60Hz	

Accessory



2 stage Regulator		The flow rate can be precisely adjusted including a flow meter with a research regulator suitable for CO2 Incubator operation.
Line Filter		The line filter filters impurities and organic matter contained in the gas supplied from the bomb (or mainline).
Hepa Filter		The HEPA filter is mounted with an internal circulation fan to collect and filter fine suspended particles inside the chamber
Spring Rack		The spring rack is mounted on the platform of the Shaking function and allows easy fixing of flasks and sample containers.
Flask Holder 100		It is mounted on the platform of the Shaking function and can secure a 100ml flask.
Flask Holder 250		It is mounted on the platform of the Shaking function and can secure a 250ml flask.
Sticky Mat		It is attached to the platform of the Shaking function and can easily fix the flask to a sticky mat.



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