

# GROWTH CHAMBERS



**JSR**








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JS Research Inc.

# Growth CHAMBER

## CLIMATIC CONTROL Phytotron

### Control Performance

- High precision Digital PID Microprocessor controller and cooling system controls temperature from +0°C to 60 °C
- Humidifier controls humidity from 30% to 85% RH with excellent temperature control
- Built-in light sensor in chamber measure and display light intensity in LUX  
Combination of maximum 8 level light control can create sixteen light intensity gradation.
- Optional CO<sub>2</sub> control with precise NDIR-Diffusion Sensor controls CO<sub>2</sub> concentration from ambient approx. 700 ppm to 5000 ppm  
Concentration can be expressed in % as well
- Program mode capable to create various climatic conditions of temperature, humidity, lighting and CO<sub>2</sub> conc. with time duration up to 11 Segments 999 cycles or unlimited repeating operation with easy-to-use 3-line back light LCD display and alpha numeric key pad

	Temp. +0 °C ~ 60 °C
	Humidity 30 ~ 98% RH
	Lighting 0 ~ 40,000 Lux
	CO <sub>2</sub> Conc. amb. ~ 5000 ppm (%)
	Program Controller
	Photoperiodic Control 



## 3-D Illumination Plant Growth Chamber

### JSPG-Series

JSPG-1500C 3-Side Illumination Plant Growth Chamber provides reliable controlled climatic condition of temperature, humidity, lighting and CO<sub>2</sub> concentration.

Ideal to growing plant, plant tissue culture or any other laboratory experiments needs controller climatic simulation.

1512 L large capacity and tall height of the chamber suitable to growing larger plants up to 1.2 m.

Combination of top and two side light bank with HQI and fluorescent lamps provide light intensity up to 50,000 LUX.



## Top Illumination

### JSGC-Series

JSGC-Series Top Illumination Plant Growth Chamber provides reliable controlled climatic condition of temperature, humidity, lighting and CO<sub>2</sub> concentration

Ideal to growing plant, plant tissue culture or any other laboratory experiments needs controller climatic simulation.

Various choice of capacity from 432L ~ 1512 L suitable to growing larger plants up to 1.2 m.

Light bank on the top with HQI and fluorescent lamps provide light intensity up to 40,000 LUX.



## 3-Side Illumination

### JSPC-Series

JSPC-Series 3-Side Illumination Plant Growth Chamber provides reliable controlled climatic condition of temperature, humidity, lighting and CO<sub>2</sub> concentration

Ideal to growing plant, plant tissue culture or any other laboratory experiments need controlled climatic simulation.

Various choice of capacity from 200L ~ 964 L for tissue culture and plants growing.

Light bank on the 3-side with fluorescent lamps provides light intensity up to 30,000 LUX.

# Growth CHAMBER

CLIMATIC  
CONTROL  
Phytotron

## Controller

### JSC-4CP Programmable Controller



- ▶ High precision Digital PID Microprocessor controls temperature, humidity, lighting and CO<sub>2</sub> concentration in one integrated unit with easy to use 4-line back-light LCD display interface
- ▶ Constant temperature, humidity, lighting and CO<sub>2</sub> conc. operation with automatic OFF timer
- ▶ Programmable operation capability of various climatic conditions of temperature, humidity, lighting and CO<sub>2</sub> conc. with time duration up to 11 Segments 999 cycles or unlimited repeating operation
- ▶ Calibration and auto-tuning function
- ▶ Class A Pt-100 Ω temperature sensor
- ▶ Precision electronic humidity sensor
- ▶ Built-in LUX Meter in chamber to measure light intensity
- ▶ The most accurate NDIR-Diffusion (Infra Red) CO<sub>2</sub> Sensor
- ▶ Automatic defrost cycle

- ▶ 정밀한 PID 컨트롤러는 온도, 습도, 조도 및 CO<sub>2</sub> 농도를 통합적으로 제어하고 back-light LCD 창을 통해 손쉽게 조작할 수 있음
- ▶ 정치 제어 기능은 고정된 온도, 습도, 조도 및 CO<sub>2</sub> 농도에서 연속 작동 하거나 타이머 설정
- ▶ 프로그램 제어 기능은 온도, 습도, 조도 및 CO<sub>2</sub> 농도 등 다양한 환경 조건을 시간에 따라 11 segment 999회 또는 무한 반복 작동
- ▶ 온도, 습도, 조도, CO<sub>2</sub> 농도 보정, 오토튜닝 기능
- ▶ Class A Pt-100Ω 온도센서
- ▶ 전자식 습도센서
- ▶ 챔버 내부 조도 센서
- ▶ 정밀한 적외선 방식 (NDIR-Diffusion) CO<sub>2</sub> 농도 센서
- ▶ 자동 제상 시스템

## Performance & Convenience

### Light Bank System

- ▶ Light Bank System with HQI and Fluorescent lamps
- ▶ Combination of 8-Level Lamp Control creates over 16 light intensity gradation
- ▶ Lamp-on-Delay System turn on lamp one by one which provides gradual increase of light intensity



### Chamber

- ▶ Stainless Steel 304 chamber
- ▶ Removable and height adjustable shelf
- ▶ Internal LUX meter sensor
- ▶ Built-in humidifier and automatic water supply
- ▶ Low water level sensor and alarm



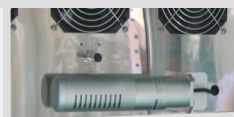
### Maintenance

- ▶ Easy to access Light Bank System for convenient maintenance
- ▶ Easy to maintain refrigeration system



### Infra-Red CO<sub>2</sub> Sensor

- ▶ High precision Dual wavelength NDIR Diffusion sensor to measure and control CO<sub>2</sub> concentration
- ▶ 적외선 방식 CO<sub>2</sub> 센서로 챔버 내부의 이산화탄소 농도를 정밀하게 제어



## Performance

- ▶ Forced air circulation of controlled temperature and humidity to achieve excellent thermal uniformity
- ▶ Durable Stainless Steel 304 Sheath Heater and copper-aluminum finned evaporator
- ▶ Temperature control within  $\pm 0.1^{\circ}\text{C}$  resolution
- ▶ Humidity control within  $\pm 1.0\%$  RH resolution
- ▶ Lighting control from 0 ~ 50,000 Lux by 8-Step light intensity for photoperiodic Day-Night simulation
- ▶ Lamp-on-Delay System by turn on lamp one by one which provides gradual increase of light to eliminate sudden light intensity change
- ▶ CO<sub>2</sub> concentration control within  $\pm 1$  ppm (1%) resolution
  
- ▶ 내구성과 내부식성이 뛰어난 Stainless Steel 304 재질의 히터와 냉각 효율이 뛰어난 냉각기
- ▶ 부드러운 공기 순환식 설계로 균일한 온도 분포
- ▶  $\pm 0.1^{\circ}\text{C}$  해상도의 온도제어능력
- ▶  $\pm 1.0\%$  RH 해상도의 상대습도 제어능력
- ▶ 0 ~ 40,000 Lux 의 조도를 8 단계로 제어하는 일광조절기능
- ▶ 각 단계별로 램프가 한 개씩 순차적으로 점등 되어 급격한 조도의 변화에 의한 식물체의 스트레스를 방지
- ▶  $\pm 1$  ppm (1%) 해상도의 CO<sub>2</sub> 농도 제어능력

## Convenience

- ▶ Outer door with self adhesive magnetic packing
- ▶ Inner glass door with high density silicone packing and air-tight door lock (depends model)
- ▶ Removable and height adjustable shelf by 25mm spacing
- ▶ Easy to access Light Bank System for convenient maintenance
- ▶ Corrosion resistant Stainless Steel 304 (ASTM 304) chamber
- ▶ Auto-defrost system, user settable interval and time
- ▶ Built-in casters for easy transport
  
- ▶ 자석 접착방식의 외부 도어 패킹
- ▶ 내부 유리 도어와 고밀도 실리콘 패킹, 밀착식 도어락은 기밀성이 뛰어남 [일부모델]
- ▶ 내부식성이 강한 Stainless Steel (SUS304) 챔버
- ▶ 25mm 간격으로 높이 조절 가능한 선반
- ▶ 라이트뱅크 시스템은 손쉽게 조명기구를 교체할 수있음
- ▶ 바퀴와 수평조절좌를 장착하여 설치, 이동, 평형유지 기능

## Safety

- ▶ **OVER TEMP. CUT-OFF**  
Analog system cut-off heater 10% above set temp.
- ▶ **MAX TEMP CUT-OFF** heater and **AUDIO VISUAL ALARM** when if  $+1^{\circ}\text{C}$  above maximum limit
- ▶ **SENSOR DISCONNECTION ALARM**
- ▶ **LOW WATER LEVEL ALARM**
- ▶ **DRY BURN PROTECTION OF HUMIDIFIER**
- ▶ **OVER CURRENT CUT-OFF** : Electrical Leakage Breaker
  
- ▶ **과열방지장치**  
컨트롤러 오류로 설정온도 초과 시 히터차단
- ▶ **최고온도알람기능** : 한계온도 $+1^{\circ}\text{C}$  초과시 히터 차단
- ▶ **센서단락알람**
- ▶ **저수위 알람**
- ▶ **누전차단기** : 전기 누설 시 주전원 차단



# Growth CHAMBER

## JSCC-SERIES TISSUE CULTURE CHAMBER Day-Night Simulation



### Tissue Culture Chamber

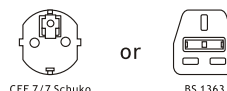
JSCC-Series Plant Tissue Culture Chamber controls temperature and light for photoperiodic day-night simulation to provide controlled climatic condition for crop plants or photosynthetic organisms. Culture conditions such as temperature and light ON/OFF are programmable in 5 pattern memory, up to 80 segments for each pattern, light ON/OFF, temperature range from +0°C to 70°C

-  Temp. +0 °C ~ 70 °C
-  Program Controller  
5 Patterns 80 Segments
-  Lighting 0 ~ 7,000 Lux
-  Photoperiodic Control 
-  [OPTION] RS-232C Serial Computer Interface

### Specifications

<b>Heating</b>	Forced Air Convection
<b>Cooling</b>	CFC Free Air Cooled Compressor
<b>Temp. Range</b>	0 °C ~ 70 °C
<b>Accuracy</b>	± 0.2 °C at 20.0°C (JSCC-150CP)
<b>Uniformity</b>	± 0.5 °C at 20.0°C (JSCC-150CP)
<b>Control</b>	Programmable PID Control 5 Pattern 80 Segments 999 Repeatable
<b>Lighting</b>	ON / OFF Program
<b>Sensor</b>	Class A Pt-100 Ω Sensor
<b>Safety</b>	Over-Temperature Cut-Off Over Current Cut-Off
<b>Material</b>	Body : Epoxy Powder Coated Steel Chamber : Stainless Steel 304 Inner Glass Door : Tempered Safety Including PVC Coated Wire Shelf Built-in Caster for easy moving
<b>Electric</b>	220 ± 10% VAC 50/60Hz 1-Phase

#### Plug config.



### Control Accuracy

- Programmable 16-bit Microprocessor Digital PID control with ±0.1°C resolution
  - 5 Patterns memory 80 Segments 999 times repeatable
  - Constant Temp. Mode / Program Mode
  - Pattern link and Segment skip function
  - Automatic STOP timer Max. 99min 59sec / 99hr 59min
  - Programmable photoperiodic light control
  - Temperature calibration and auto-tuning function
  - Class A Pt-100 Ω sensor
- 
- 해상도 ±0.1 °C 정밀한 16-bit 프로그램 PID 컨트롤러
  - 5패턴 저장 메모리 80세그먼트, 999회 또는무한 반복운전
  - 정치운전 또는 프로그램운전 기능
  - 작동 중인 패턴 종료 후 다른 패턴으로 링크하여 연속작동
  - 현재 작동 중인 세그먼트 건너 뛰기 기능
  - 타이머 내장 99분59초 / 99시간59분
  - 일광조절이 가능한 조도 ON/OFF 프로그램기능
  - 온도보정, 오토튜닝 기능 내장
  - Class A Pt-100 Ω 온도 센서

## Performance

- ▶ Durable epoxy powder coated metallic casing
- ▶ Corrosion resistant Stainless Steel 304 chamber
- ▶ Durable Stainless Steel 304 Sheath Heater and copper-aluminum finned evaporator
- ▶ Forced circulation for excellent thermal uniformity
- ▶ Separate heating and cooling compartment prevents contamination and maintenance free
- ▶ Cooling system with hermetically sealed compressor

- ▶ 내구성이 뛰어난 에폭시 분체 도장 본체
- ▶ 내부식성이 뛰어난 Stainless Steel 304 재질의 챔버
- ▶ 내구성과 내부식성이 뛰어난 Stainless Steel 304 재질의 히터와 냉각 효율이 뛰어난 냉각기
- ▶ 부드러운 공기 순환식 설계로 균일한 온도 분포
- ▶ 가열챔버가 후면에 위치하여 액체 흘림으로 인한 고장이적음
- ▶ 내구성이 강한 냉각 시스템

## Convenience

- ▶ Outer door with adhesive magnetic packing
- ▶ Inner glass door with high density silicone packing and air-tight door lock
- ▶ Stainless Steel 304 Chamber with seamless round cornered edge allows easy cleaning and prevent leakage
- ▶ Removable and height adjustable shelf by 25mm spacing
- ▶ Auto-defrost system, user settable interval and time
- ▶ Built-in casters for easy transport

- ▶ 자석 접착방식의 외부 도어 패킹
- ▶ 내부 유리 도어와 고밀도 실리콘 패킹, 밀착식 도어락은 기밀성이 뛰어남
- ▶ 챔버의 코너는 이음새 없이 라운드 처리 되어 있어 세척이 간편하고 오염 방지
- ▶ 25mm 간격으로 높이 조절 가능한 선반
- ▶ 제상 간격 및 시간을 조절할 수 있는 자동 제상 시스템
- ▶ 바퀴를 장착하여 설치 및 이동이 편리함

## Safety

- ▶ DUAL OVER TEMP. CUT-OFF
- ▶ MAX TEMP CUT-OFF
- ▶ AUDIBLE VISUAL ALARMS
- ▶ SENSOR DISCONNECTION ALARM
- ▶ OVER CURRENT CUT-OFF : Electric Leakage Breaker

## Accessories

Art No.	Descriptions
	<b>Perforated Shelf, Stainless Steel 304</b>
PHS-A06	for JSCC-150, 250CP W470 x D480 mm
PHS-A09	for JSBI-460CP W570 x D580 mm
	<b>PVC Coated Wire Shelf</b>
PHS-C05	for JSCC-150, 250CP W470 x D480 mm
PHS-C13	for JSBI-460CP W570 x D580 mm
PHS-A99	Shelf Support, Set of 4

## Ordering Information

	JSCC-150CP	JSCC-250CP	JSCC-460CP
Chamber Volume (Capacity)	150L	250L	432L
Dimensions Inner	500 x 500 x 600	500 x 500 x 1000	600 x 600 x 1200
W x D x H mm Outer	680 x 830 x 1430	680 x 830 x 1830	780 x 930 x 2030
Temperature Range	+0°C ~ 70 °C		
Accuracy at 20.0°C	± 0.2 °C		
Uniformity at 20.0°C	± 0.5 °C		
Illumination FL Lamps	4 x 20W FL	4 x 30W FL	4 x 36W FL
Max. Intensity	6,500 LUX	7,000 Lux	7,000 Lux
Heater Rating	900 Watt	1.0 kW	1.5 kW
Refrigeration System	CFC Free Air Cooled Compressor		
Number of shelves / Maximum No.	2 / 16	3 / 16	3 / 16
Power Rating	8.0 Amp	8.6 Amp	11.5 Amp
Plug Configuration	CEE 7/7 Schuko		