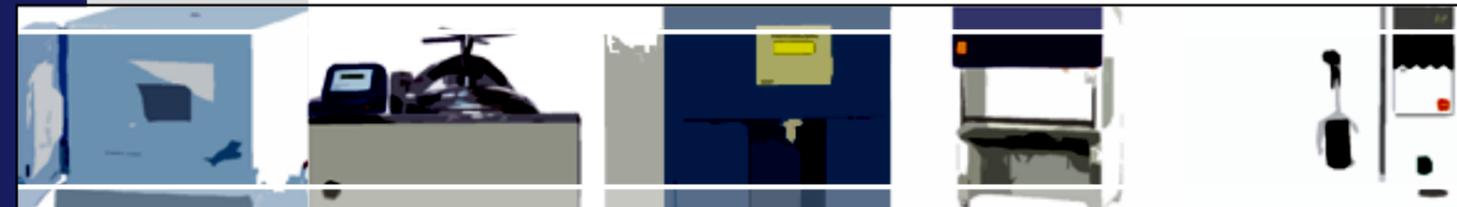


Laboratory Equipments Catalog 2016



HumanLab Inc.

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Company Overview

HumanLab Inc. seems of very importance thing to meet customers.

Three words ; honest, integrity and trust form the foundation for our business.

We are supplying quality products to researcher in company, laboratory of institutes and universities , and field of manufacturing.

We always support our best service to customers.

HumanLab Inc., which was founded in 1993 and formerly named Human Engineering Co, is specialized in selling and distributing fine scientific instruments of various fields , such as medical research, environmental protection, education, biological and chemical research, architectural analyzing, etc. And after, our company name is changed to HumanLab Instrument Co, in April 2006. Our factory is located in Hanam-si near in Seoul, Korea.

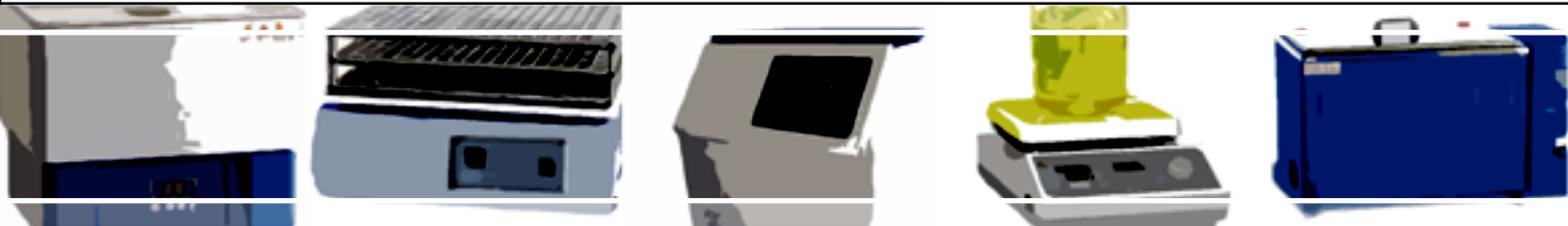
Our main products are Autoclave, Environment & Growth Chambers, Lab freezer & refrigerator, Muffle furnace, Incubator, Dry Oven, Laminar air cabinet, Safety cabinet, Shakers, Stirrer, Water purification system, Water Still etc,all approved by ISO9001.

We devote much to exporting business by co-operating with many companies in oversea.

With advanced technology, humanized management, satisfying service and high sense of responsibility, we've acquired good reputation from overseas customers.

Currently, we are active in strengthening ourselves to join the fierce international competition.

We welcome friends from all over the world to expect co-operation with all of you.



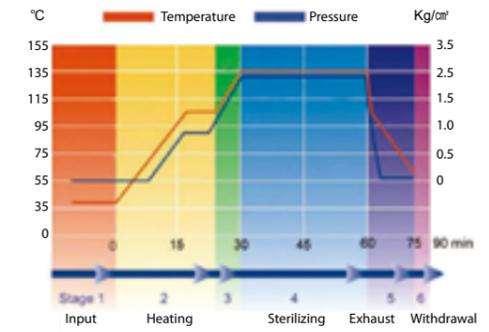
How to use the CD catalogue

1. Insert the CD into CD-R/CD-RW on your computer system.
2. Click the "HumanLab_V2016.PDF" file format.
3. If the file does not open, please download the acrobat reader program on internet.
4. Browse the product name in the page of "Contect"
5. Click the product name what you interest.
6. Then, the related file we offer will open, and you can see the details of products.

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Digital Autoclave



Baskets

Features

- For the process of drying cycle filtered clean air flows into the chamber during vacuum system removes the remaining steam and vapor
- Self-diagnostic system : When the malfunction occurs in the operating, it sounds and display
- Wrapped, unwrapped and liquid cycle and user mode are operated by pre-programmed cycle
- Pre-vacuum For effective air removal that result in increasing sterilization performance
- Easy operation with full automatic system by microprocessor
- It has such safety system as over pressure release valve, over heating & temp. protector, door open & power-off,
- low water protection, over current breaker and interlock door system.

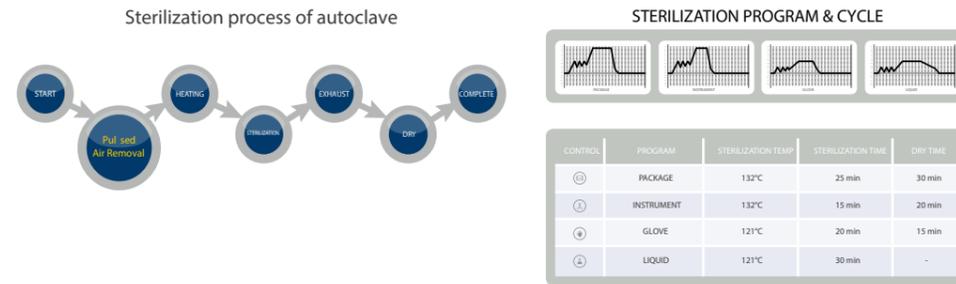
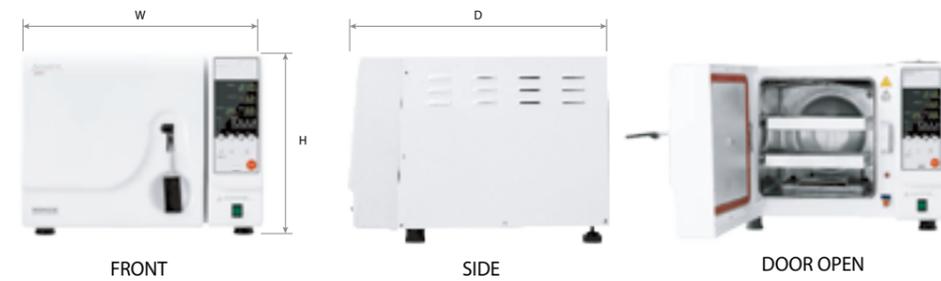
Specifications

Model	DAC-60	DAC-80	DAC-100	DAC-120
Temp. range	Ambient to 125°C ±1°C / Sterilizing 121°C / Sensor PT100Ω			
Model	HAC-60	HAC-80	HAC-100	HAC-120
Temp. range	Ambient to 138°C ±1°C / Sterilizing 121°C or 135°C / Sensor PT100Ω			
Chamber (DxL)	350x650 mm	400x630 mm	450x630 mm	450x750 mm
Capacity	60 liters	80 liters	100 liters	120 liters
Timer	CPU Built-in Micro program time controller / 1Hr - 100Hr or 0min - 99min			
Material	Door, Chamber: Stainless steel / Exterior: Steel plate with powder coating Gasket: High Banding Silicon rubber			
Basket	Standard type 2ea			
Air Bent	Automatic selectable and adjustable valve			
Door Lock	One touch screw handle pressure locking door device			
Operation Pressure	Temp: 2.4 kg/cm² 135°C, 1.2kg/cm² 121°C (gauge: Mechanical type, 0-4kg/cm²)			
Control & Display	Microprocessor digital control & PV & SV dual LED display			
Safety device	Pressure safety valve, Over current protector, Over temp. limiter, Low water level switch, Steam generating heater protector, Drain cold trap			
Power source	220V, 50/60Hz, Single phase			
Overall (WxDxH)	650x500x880 mm	700x550x860 mm	750x600x860 mm	750x600x980 mm
Weight (KG)	75	100	110	120

Option | 1) Programmable control | 2) Dot Printer



Bench Top Autoclave



Features

- Thorough safety design in accordance with A.S.M.E international standard
- High precision electronic control mechanism and self-diagnosis system
- An effective sterilization performance by Pulsed Air Removal technology
- High space utilization with square type sterilization chamber
- Built in automatic sterilization program which is applicable by use purpose
- Fast and perfect drying with the adoption of automatic drying device
- Use eco-friendly adiabatic materials and easy maintenance with low cost

Specifications

Model	H220S	H480S	H680S
Capacity	22 liter	48 liter	60 liter
Chamber	Size (mm) 235x235x430	320x320x470	340x340x600
	Type	Rectangular	
Tray	Size (mm) 205x30x390 / 2EA	280x35x410 / 2EA	310x35x570 / 2EA
Heater	Power 1.6Kw	2.5Kw	3.1Kw
Sterilization	Temp range 121°C (103kPa) ~ 132°C (186kPa)		
	Course	Normal 4 Kinds / Special 3 Kinds (User, Dry, Bowie-Dick Test)	
Control System	Micro Process		
Material	Chamber: Stainless Steel, Tray: Incoloy 840		
Display	FND Type		
Steam Source	Built in steam generator		
Water Supply	Built in Water Tank		
Power Source	AC 220V, 50/60Hz, 1600W, 2500W, 3100W		
Overall	(WxDxH) 504x370x610 mm	600x460x650 mm	600x460x810 mm
Weight	55 KG	77 KG	85 KG

Option | 1) Thermal Printer 2) Cart

Large Steam Sterilizer



Features

- For the process of drying cycle filtered clean air flows into the chamber during vacuum system removes the remaining steam and vapor
- Self-diagnostic system : When the malfunction occurs in the operating, it sounds and display
- Wrapped, unwrapped and liquid cycle and user mode are operated by pre-programmed cycle
- Pre-vacuum For effective air removal that result in increasing sterilization performance
- Easy operation with full automatic system by microprocessor
- It has such safety system as over pressure release valve, over heating & temp. protector, door open & power-off,
- low water protection, over current breaker and interlock door system.

Specifications

Model	S2000	S2500D	S3600
Chamber	size (mm) Dia.500 x 1000L	1000x500x1000 (Double door)	500Wx710Dx1000H
	capacity 196 liter / Cylindrical	250 liter / Rectangular	355 liter / Rectangular
	material	Stainless steel	
Shelves	size (mm) 1 no-240Wx950L	2no's -480Wx950L	2no's-440Wx900L
	material	Stainless steel	
Loading style	Front loading by manual or Loading cart & carriage (option)		
Temp. range	110 to 135°C (230 to 275°F)		
Water supply	15A, 1 - 3 Kg/cm ²		20A, 3 - 5 Kg/cm ²
Steam source	Built-in Steam generator		
Dry system	Steam Ejector	Watering vacuum pump	
Control system	Pre-programed microprocessor control & digital display		
Printer	By option	Thermal dot matrix, 16 columns	
Power source	380VAC, 50/60Hz, 11 Kw / 20Kw / 25Kw		
Overall (WxDxH)	725x1410x1620mm	730x1500x1730mm	800x1600x1790mm
Weight (KG)	700	780	850

Option | 1) Loading cart & carriage (stainless steel)

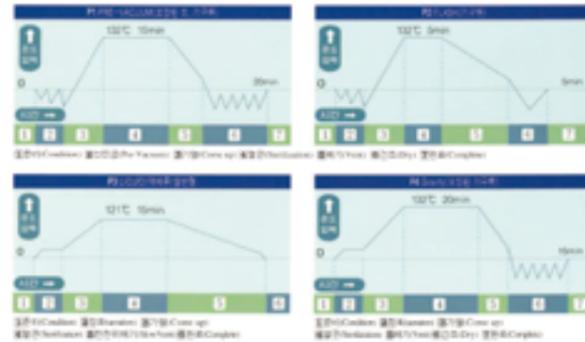
Large Steam Sterilizer

EO Gas Sterilizer



S1100

STERILIZATION PROGRAM & CYCLE



Features

- All functions are Automatic controlled by Micro-process.
- Air removal methods are using Water ejector or watering vacuum pump which is fast and make high vacuum.
- There is self-test function, checks conditions and Errors. Happened Error, beep and show Error No. Touch screen Display or VFD Display
- Using both Power door & Manual door.
- Steam source : House supply.
- Wall type / LCD TFT Touch screen / Pneumatic valve using.

Specifications

Model	S7600	S11000	S11000D
Door Type	Singel	Double	
Open & Close	Automatic (open / close and lock / unlock) / Manual		
Chamber Size	680Wx1000Hx1120L mm / 760 L	680Wx1200Hx1300L mm / 1060 L	
Loading	630Wx1040L mm	630Wx1220L mm	
Car system	Stainless Steel or Carbon Steel		
Temperature Range	110°C ~ 130°C		
Control system	Microprocessor		
Dry system	Vacuum with Watering Vacuum pump (Standard) or Water Ejector (Option)		
Material	STS 316L		
Display	VFD (Standard) or TFT color LCD Touch screen (Option)		
Steam Source	Size 1", Flow rate - Max 200kg/hr, Pressure 3.5~5Kgf/cm ²		
Water supply	Size 1", above, Water pressure 3~5Kgf/cm ²		
Drain pipe	Material: Copper or steel (not melt at 100°C), above 1"+½"		
Printer	Thermal Dot Matrix, 40charactersper line		
Power source	Single 220V and 3 Phase AC380V or 220V, 50/60Hz 3.8Kw		
Overall (WxHxL)	1510x2000x1540 mm	1510x2000x1850 mm	1930x2000x2000 mm
Weight	1,250KG	1,760KG	2,240KG



EOG-300



EOG-600

Features

- This unit utilizes low temperature chemical sterilization with EO gas for sensitive to moisture or sharp medical device and instrument
- Full automatic control with microprocessor and sounds an alarm
- Prevent any pollution in chamber by vacuum pump
- Anti-pollution with air filter can achieve the particle up to 99.99%
- Digital LCD display indicates the program, temperature, pressure

Specifications

Model	EOG-300	EOG-600
Capacity	32 liter	62 liter
Chamber (DxL)	Dia. 300x450mm	Dia. 350x650mm
Temp. range	38,55,30 - 60°C	
Pressure	1 Kg/cm ²	
Gas	EO (20%) + CO ² (80%)	
Vacuum	Oil-less Vacuum pump	
Control & display	3 Pre-programmed & digital display	
Power source	220VAC, 50/60Hz	
Overall (WxDxH, mm)	490x510x650	540x600x850
Weight	60 KG	80 KG

Features

- This sterilizer are used when pressurized steam sterilization is not appropriate such as instrument tray and glassware
- Sterilize metals and delicate items without distortion
- Safety limit control offers protection from over temperature

Specifications

Model	HAS-56	HAS-56-U
Capacity	56 liter	
Chamber (WxBxH)	400x350x400mm	
Temp. Range	Amb. to 230°C ±1°C	Amb. to +60°C
Timer	Digital, 99 hr 59 min	
Heater	Element	1.2 Kw
	Time	10 - 15 min up to 100°C
Blower	60W x 1	
Sterilizing	-	UV 10Wx2 ea
Material	Chamber	Stainless steel
	Body	Powder coated steel plate
	Shelves	Electroplating wire x 2 no's
Control & display	Microprocessor PID control & digital display	
Power source	220VAC, 50/60Hz	
Overall (WxDxH)	545x500x770mm	
Weight	50 KG	

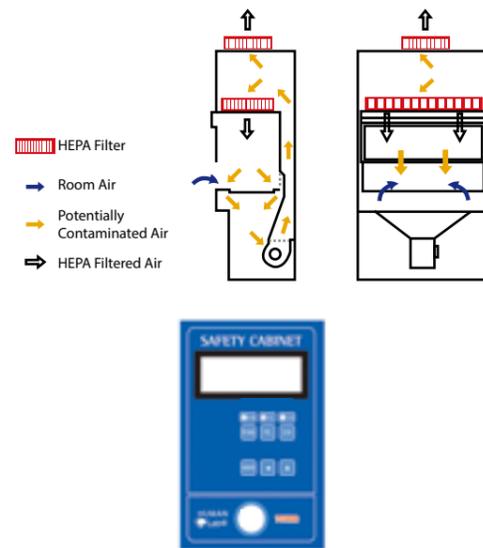


HAS-56

Biosafety Cabinet / Class II



CB-120-B



Features

- These Class II biosafety cabinet protect you, your product, and the laboratory environment from exposure.
- Designed for operations requiring biosafety level 1,2 or 3 containment such as culture analysis and bacteriological
- Included HEPA filter are 99.97% efficient on particles of 0.3um
- Cabinet interior is manufactured from type 304 SS and features radiuses comers and a removable work surface
- Service fixture enable connection to gas, air, water or vacuum source
- Also included FL lighting and UV lamp for work area decontamination

Specifications

Model	CB-90-B	CB-120-B	CB-150-B	CB-180-B
	CB-90-B-A2	CB-120-B-A2	CB-150-B-A2	CB-180-B-A2
Working Area (mm)	900x630x630	1200x630x630	1500x630x630	1800x630x630
Cleanliness Class	Class II-A / Class II-A2			
Main & Exhaust Filters	Two HEPA 99.97% efficiency at 0.3um particle / option: ULPA 99.997%			
Air Velocity	Inflow: 0.5 to 0.7 m/s, Down: 0.3 to 0.5 m/s			
Air Flow volume	980 m ³ /h	1100 m ³ /h	1900 m ³ /h	2200 m ³ /h
Sterilizing	2 x UV30W	2 x UV40W	2 x UV40W	2 x UV40W
Illumination	2 x FL30W	2 x FL40W	2 x FL40W	2 x FL40W
Noise Level	55 - 60 dBA			
Blower	Centrifugal high efficiency fan with speed control			
Material	Interior	Stainless steel		
	Exterior	Epoxy powder coated steel plate		
	Door	Tempered safety glass with sliding door		
Utility Device	Air & Gas cock, 110/200 VAC receptacle			
Power source	220V, 50/60Hz, Single phase			
Overall	B type	1020x840x1830	1320x840x1830	1620x840x1830
	B-A2 type	1020x840x1500	1320x840x1500	1620x840x1500
Weight (KG)		220 / 200	250 / 230	270 / 250

Option

- 1) ULPA filter (99.997%)
- 2) Moving stand of A2 type (H=770mm)
- 3) Digital Control & display

Laminar Air Flow Cabinet / Class II

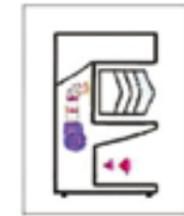


CB-120-V/H

Flow Schematic Diagram



Vertical Flow



Horizontal Flow



Microprocessor Control & display (option)

Features

- These safety cabinet are all steel with welded , unitized construction of main frame and 304 SS of interior
- Air inlet and outlet utilize HEFA filter 99.97% efficient on 0.3um particles
- The negative pressure plenum design provides complete personal protection with Class 100(ISO Class 5) air
- Service fixture enable to connection air, gas, water, electric or vacuum source
- Also included FL lighting and UV lamp for work area decontamination

Specifications

Model	Vertical Flow	CB-90-V	CB-120-V	CB-150-V	CB-180-V
	Horizontal Flow	CB-90-H	CB-120-H	CB-150-H	CB-180-H
Working Area (mm)		900x630x630	1200x630x630	1500x630x630	1800x630x630
Cleanliness Class		Class II / Cleanliness 100			
Main & Exhaust Filters		Two HEPA 99.97% efficiency at 0.3um particle / option: ULPA 99.997%			
Air Velocity		Inflow: 0.6 to 0.7 m/s, Down: 0.3 to 0.5 m/s, Adjustable			
Air Flow volume		980 m ³ /h	1300 m ³ /h	1700 m ³ /h	2030 m ³ /h
Sterilizing		2 x UV30W	2 x UV40W	2 x UV40W	2 x UV40W
Illumination		2 x FL30W	2 x FL40W	2 x FL40W	2 x FL40W
Noise Level		55 - 60 dBA			
Blower		Centrifugal high efficiency fan with speed control			
Control & Display		Analog manometer & push button			
Material	Interior	Stainless steel			
	Exterior	Epoxy powder coated steel plate			
	Door	Tempered safety glass with sliding door			
Utility Device		Gas, Air / Water Cock, 2 x Electric receptacle			
Power source		220V, 50/60Hz, Single phase			
Overall	V type	1020x840x1830	1320x840x1830	1620x840x1830	1960x840x1830
	H type	1060x990x1830	1360x990x1830	1660x990x1830	1960x990x1830
Weight (KG)		230	250	270	290

Option

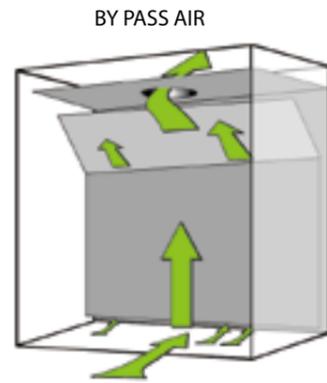
- 1) ULPA filter (99.997%)
- 2) Microprocessor Control & display

Fume Hood

Culture Chamber



FHB-120



Air, N2, Water cock



CC-420

Features

- Optimized for plant tissue culture, light stability, heat and light sensitive micro culture, other application for low temperature researches
- 10 steps program set for various temp. condition with timer.
- Plant tissue culture illumination control with 24 hour timer
- Inner glass window for easy observation
- Low noise, high efficiency refrigerator installed

Specifications

Model	CC-150	CC-250	CC-420
Capacity	150 liter	250 liter	420 liter
Chamber (WxBxH)	500x500x600	500x500x1000	700x600x1000
Temp. Range	-5 to +60°C ±1°C at 25°C		
Material	Stainless steel + Powder coated steel plate		
Heater	Sheathed heater		
Illumination	4 x FL 20W	4 x FL 40W	5 x FL 40W
Refrigerator	1/4 HP	1/3 HP	1/2 HP
Control & Display	Digital PID control & LCD display		
Safety device	Low Temp. limiter, Over current breaker		
Power source	220V, 50/60Hz, Single phase		
Overall (WxBxH)	665x765x600	665x765x1590	865x865x1590
Weight	135 KG	185 KG	265 KG

Features

- These fume hoods utilize by-pass a airflow design to assure safe continuous ventilation. (Class 1)
- Application should limit long-term exposure to harsh solvents and highly-corrosive vapors.
- Include tempered safety glass counterbalanced sash and ceramic work table.
- Built-in blower, and spark-proof configurations
- Blower can be mounted any of three way - within the hood, above the hood, or on the roof.

Specifications

Model	FHB-120	FHB-150	FHB-180
Material	External	Steel, Powder coating	
	Internal	Stainless steel #304	
	Work top	Ceramide board	
	Windows	Safety glass 5t	
Work area (WxD)	1030x650 mm	1330x650 mm	1630x650 mm
Face Velocity	0.25~0.5 m/sec		
Illuminator	Semi Vapor proof		
Utility Device	Air, N2, Water cock & 110/220V receptacle`		
Power source	220VAC 50/60Hz		
Overall (WxDxH)	1200x800x2300 mm	1500x800x2300 mm	1800x800x2300 mm
Weight	270 KG	320 KG	370 KG



ICH-300

Drug Stability Test Chamber

Features

- Programmable microprocessor controls, together with refrigerator cooling and evaporating humidification allow for confident temperature mapping and acidification, easily exceeding ICH guide line for stability testing
- Suitable for wide range of long-term, intermediate, and accelerated stability testing application

Specifications

Model	ICH-300	ICH-768
Capacity	300 liter	768 liter
Chamber (WxBxH)	500x500x1200 mm	800x800x1200 mm
Temp. Range	0 to +60°C ±1°C / Uniformity ±0.5 at 20°C	
Material	Stainless steel interior + Epoxy coated steel	
Humidifier	Water Evaporating by electric heater	
Range	30 - 98%RH ±1% / Uniformity: ±2-3% at 60%	
Illumination	15 x UV / FL 40W	
Range	0 to 15,000 lux / 3 side wall	
Door	Inner	Tempered glass with silicon packing
Outer	3 side magnetic packing with light bank	
Refrigerator	1/2 HP	3/4 HP
Control & Display	Programmable micro processor control	
Safety device	Temp. limiter, Circuit breaker	
Power source	220V, 50/60Hz, Single phase	
Overall (WxBxH)	750x750x2000 mm	1400x940x2100 mm
Weight	280 KG	530 KG

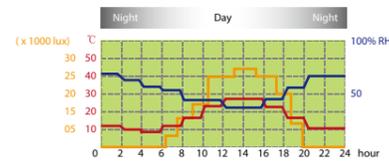
Growth Chamber



GC-432



GC-1344



Touch screen display

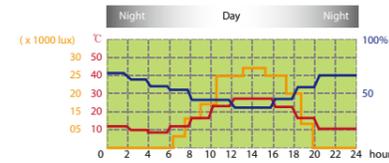
Plant Growth Chamber



PGC-432



PGC-1344



Touch screen display

Features

- This Growth Chamber use for testing the change of environment
- Programmable microprocessor controller may institute and establish the control such as actual temp., & humidity, test temperature, change in day or night and artificial environment condition of Max.99 items
- Reliable and accurate temperature control and tempered pair glass viewing window

Specifications

Model	GC-432	GC-864	GC-1344
Capacity	432 liter	864 liter	1344 liter
Chamber (WxBxH)	600x600x1200 mm	900x800x1200 mm	1400x800x1200 mm
Temp	Range 10 to 60°C (0% illumination) / 14 to 60°C (100% illumination) Accuracy ±0.3°C / uniformity: ±1°C at 25°C		
Humidity	Range 35 to 96%RH Accuracy ±1.0% / uniformity: ±5% at 70%RH		
Illumination	Range 0 - 50,000 Lux / LCD Display Lamp FL 40W x 15 ea HID 2 ea / FL 30W x 8 sets HID 3 ea / FL 40W x 8sets		
Heater	2 x 650W	2 x 800W	2 x 1500W
Refrigerator	3/42 HP	3/42 HP	1 HP
Timer	24 hr and 7 days		
Control & Display	Programmable microprocessor PID controller / Digital LED display		
Safety device	Microprocessor Low, High limit temp. S/W Auto water level monitor, Power Breaker		
Material	Interior Stainless steel plate Exterior Powder coated steel plate Door 1 x tempered glass and silicon packing 2 x tempered glass		
Power Source	220VAC, 50/60Hz, Single phase		
Overall (WxDxH)	800x850x2000 mm	1020x1130x2000 mm	2000x950x2000 mm
Weight	315 KG	510 KG	590 KG

Option

- 1) Daylight and cool white light spectrums
- 2) CO² control & I R Censor / 300 to 5000 ppm, ±20ppm AT 1,500ppm
- 3) Communication interface
- 4) Digital Recorder 16 point

Features

- Advanced refrigeration system prevents chamber icing and condensation
- Preheating technology by humidifier evaporator eliminates hot and cold spots
- 7 days channel, microprocessor ensures high level of accuracy
- Ideal for pharmaceutical stability, QA/QC and food packing testing lab.

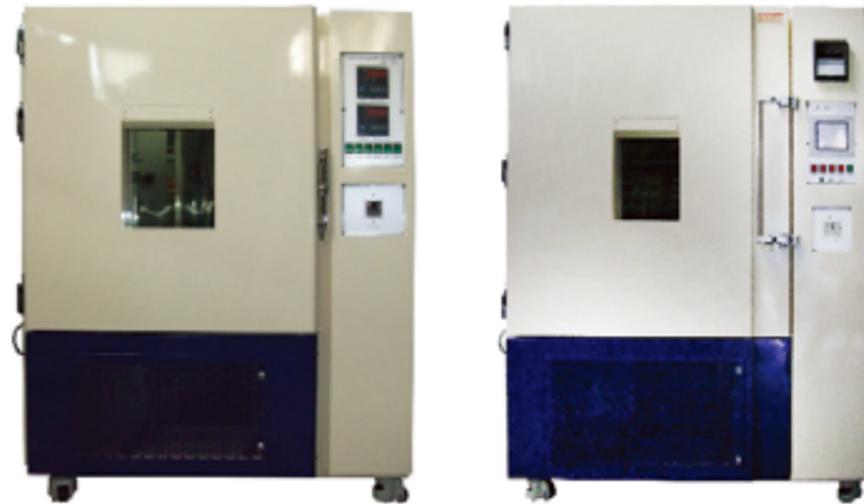
Specifications

Model	PGC-432	PGC-864	PGC-1344
Capacity	432 liter	864 liter	1344 liter
Chamber (WxBxH, mm)	600x600x1200	900x800x1200	1400x800x1200
Temp	Range 10 to 60°C (0% illumination) / 14 to 60°C (100% illumination) Accuracy ±0.3°C / uniformity: ±1°C at 25°C		
Humidity	Range 35 to 96%RH Accuracy ±1.0% / uniformity: ±5% at 70%RH		
Illumination	Range 0 - 50,000 Lux / LCD Display Lamp FL 40W x 15 ea HID 2 ea / FL 30W x 8 sets HID 3 ea / FL 40W x 8sets		
Heater	2 x 650W	2 x 800W	2 x 1500W
Refrigerator	3/42 HP	3/42 HP	1 HP
Timer	24 hr and 7 days		
Control & Display	Programmable microprocessor PID controller / Digital LED display		
Safety device	Microprocessor Low, High limit temp. S/W Auto water level monitor, Power Breaker		
Material	Interior Stainless steel plate Exterior Powder coated steel plate Door 1 x tempered glass and silicon packing 2 x tempered glass		
Power Source	220VAC, 50/60Hz, Single phase		
Overall (WxDxH, mm)	800x850x2000	1020x1130x2000	2000x950x2000
Weight (KG)	315	510	590

Option

- 1) Daylight and cool white light spectrums
- 2) CO² control & I R Censor / 300 to 5000 ppm, ±20ppm AT 1,500ppm
- 3) Communication interface
- 4) Digital Recorder 16 point

Humidity & Temp. Chamber



Features

- These chambers are Ideal for research, calibration, conditioning, pharm. stability test labs, and food packing labs
- The max. humidity of 95% RH and temperature of +120°C let you create the right environment for specific application
- Microprocessor based chambers offer accurate, auto tuning PID control of humidity and temperature levels
- Self-diagnostic safety function of The temperature sensor and water level to ensure reliable performance
- The high/low humidity and temperature alarm limits provide added safety assurance
- Features a view-glass on The door for sample viewing without disturbing test conditions

Specifications

Model	THC-81	THC-150	THC-350	THC-504	THC-700
Temp. Range	-10°C to 120°C ±0.3°C / uniformity: ±1°C				
Model	THC-81-L	THC-150-L	THC-350-L	THC-504-L	THC-700-L
Temp. Range	-40°C to 120°C ±0.3°C / uniformity: ±1°C				
Capacity	81 liter	150 liter	350 liter	504 liter	700 liter
Chamber (WxBxH, mm)	450x400x450	500x500x600	700x600x800	800x700x900	1000x700x1000
Humidity Range	30% to 95% RH / ±2% at 60%				
Timer	99hr, 59min				
Material	Interior: Stainless steel plate / SCP.1 (Powder & Liquid coating) Exterior: SCP.41 (Powder & Liquid coating) Door: SUS, Adjustable				
Control & Display	Microprocessor PID control & Digital display				
Air Convection	Tangent flow & motor				
Cooling	Refrigerator Non-CFC refrigerant				
Humidifying	Water evaporating by electric heater				
Safety Device	Exclusive High & Low limit S/W, Automatic water level, Power Breaker				
Power Source	220VAC, 50/60Hz				
Overall (WxDxH, mm)	1100x850x1300	1150x950x1450	1350x1050x1750	1450x1150x1850	1650x1150x1950
Weight	180 KG	320 KG	380 KG	460 KG	540 KG

Option

- 1) Programmable Controller
- 2) Communication interface
- 3) Digital Recorder

Seed Germinator

Features

- This economical dark seed germinator ideal for use in testing labs
- Clear glass window allows light for seed testing that required exposure to light or may be covered for dark testing
- Microprocessor based controller offer the functions of auto tuning, alarm, self-diagnostic error message display
- The shelves support and are removable for decontamination cleaning

Specifications

Model	SG-24S	SG-24S-R
Capacity	245 liter	
Chamber (WxBxH)	490x500x1000mm	
Temp. range	Amb. to +45 °C	-5 to +60 °C
Humidity range	95% to 99%RH at 30 °C	
Timer	Digital , 99hr/59min or hold	
Heating device	Electric heater	
Cooling device	None	Refrigerator
Water Circulation	1/3HP magnetic pump	
Shelves	14 no's of removable	
Safety device	High. Low temp. limiter & Alarm	
Control & display	M/processor PID with digital LED display	
Material	SUS interior & Epoxy coated steel plate	
Power source	220VAC, 50/60Hz, Single phase	
Overall (WxDxH)	620x620x1260mm	660x780x1680mm
Weight	175 KG	215 KG

Option | 1) Programmable microprocessor controller



Material Test Chamber

Features

- This tester is constructed for thermal shock analysis
- Temp. limit from -40°C to +120°C by stored chamber
- Excellent temp. recovery performance by heat & cold within 5 min
- Programmed or manual operation by LCD touch screen
- Glass wool insulation effectively retains for temperature uniformity

Specifications

Model	HLT-180	HLT-280
Capacity	180 liter	280 liter
Chamber (WxBxH)	600x500x600mm	700x500x800mm
Temp. range	-40 to +120 °C	
Temp. rate	-40°C/50min, +120 °C/20 min, Recover/5min	
Heating system	Fin type heater 2 KW	2.5 Kw
Cooling system	Refrigerator 2x1 Hp	2x1.5Hp
Shelves	3 x electroplating steel wire	
Material	Stainless steel interior & steel plate exterior	
Control & display	P/microprocessor PID control & touch screen	
Safety device	High & low temp. limiter, current breaker	
Power source	220VAC, 50/60Hz	
Overall (WxDxH)	840x1050x1750mm	940x1150x1850mm
Weight	150 KG	195 KG

Option | 1) RS485 interface & temp. recorder



Walk In Growth Chamber



Growth Shelf (option)



Inner view of chamber

Features

- Advanced refrigeration system prevents chamber icing and condensation
- Preheating technology by humidifier evaporator eliminates hot and cold spots
- Programmable microprocessor digital PID control ensures high level of accuracy
- Ideal for artificial light source plant growth test lab, work-in chamber inside

Specifications

Model	WGC-3024	WGC-10368	WGC-15120
Capacity	3,024 Liter	10,368 Liter	15,120 Liter
Chamber	800x700x1800x3rooms	1600x1200x1800x3rooms	2000x1400x1800x3rooms
Main Controller	LCD displayed full microprocessor program touch 11 steps controller (per room)		
Temperature	0 to 60°C / ±0.5°C / uniformity: ±1°C at 25°C		
Humidity	30 to 98%RH / ±1.0% / uniformity: ±5% at 70%RH		
CO2	Range: 0~5000 ppm / ±20 ppm at 1,000 ppm Sensor: Electronic Infra-red ceramic NDIR sensor		
Illumination	Lux.meter: 0 - 50,000 lux. LCD display movable sensor position / 1 dimension type. Ceiling Lamp: H.P.S 423W x 6ea 3 units H.P.S 423W x 9ea 3 units H.P.S 423W x 14ea 3 units Light Bank: 1 dimension type. Ceiling		
Door	Silicon packing one door with tempered glass viewing window		
Material	(In/Out) Stainless steel (SUS304) / SCP-1 powder & liquid coating		
Display	PV & SV dual LCD display		
Circulation fan	20W blower fan		
Evaporator	Auto exchange dual evaporator system		
Compressor	2HP x 3 units	3HP x 3 units	5HP x 3 units
Shelves	SUS, Adjustable 3ea (per room)		
Safety device	High & Low temp. S/W, Auto rain port, Water level monitor, No Fuse breaker S/W, Chamber in water cock		
Power Source	220VAC, 50/60hz, 18Kw	30Kw	48Kw
Overall	3300x900x2630mm	6000x1600x2630mm	7500x1890x2630mm

- Option**
- 1) Digital Recorder / 6 point
 - 2) Communication interface
 - 3) Growth Shelf

Lab Refrigerator



LCR-330-T

Features

- Microprocessor PID controller with LED display provides ±2°C accuracy, and shows set & actual temperature
- Ideal for reagent, seed, enzyme and a various samples
- Non-CFC refrigerant with refrigeration system and polyurethane foam insulation provides excellent temp. uniformity and has auto defrosting
- High quality SS chamber with independent inner door and room
- Over temp. & Over current protection ensures user safety

Specifications

Model	LCR-330(T)	LCR-735(T)	LCR-1176(T)
Capacity	330 liter	735 liter	1176 liter
Volume (WxBxH)	550x600x1000	750x700x1400	1200x700x1400
Temp. Range	4 to 8°C ± 0.2 at 4°C		
Refrigerator	1/4Hp	1/3 Hp	1/2 Hp
Shelf & door	4 shelves / 1 door		8 shelves / 2 doors
Defrosting	By electric heater		
Safety device	Over & low temp. limiter, Over current breaker		
Material	Stainless steel interior & steel plate exterior		
Control&display	Microprocessor PID control & digital LED display		
Power source	220 VAC,50/60Hz		
Overall (WxDxH)	720x800x1650	920x900x1950	1350x900x2000
Weight (KG)	130	225	385

- Option** | 1) 7 days temperature recorder

Lab Refrigerator & Freezer



LRF-450



LRF-450

Features

- Combination of a freezer and refrigerator is one unit
- Independent temperature control by microprocessor PID control system
- Two inner temp. safety glass door with pair glass outer door of refrigerator
- Four Independent inner door of freezer keeps temp. stability & convenience
- High efficiency of refrigeration system with non-CFC refrigerant

Specifications

Model	LRF-450	LRF-920
Capacity	Refrigerator: 225 liter Freezer: 225 liter	Refrigerator: 620 liter Freezer: 300 liter
Chamber (WxBxH)	Refrigerator: 350x500x1300mm Freezer: 350x500x1300mm	Refrigerator: 750x550x1500mm Freezer: 400x500x1500mm
Temp. range & uniformity	Refrigerator: 0 to +10°C ±0.5°C at +4°C Freezer: 0 to -40°C ±2°C at -20°C	
Material	Interior: Stainless steel Exterior: Powder coated steel plate	
Door & Shelves	2 door x 4 shelves	
Refrigerator	1/2Hp x 2	
Defrosting	By electric heater	
Control & display	Microprocessor PID control & digital display	
Safety device	Over & low temp. protector	
Power source	220VAC, 50/60Hz	
Overall (WxDxH)	1500x850x1650 mm	1950x850x1750mm
Weight	320 KG	525 KG

- Option** | 1) 7 days temperature recorder

Pharmaceutical Refrigerator



LPR-637

Features

- Constructed stainless steel interior and High density polyurethane insulation
- Foamed polyurethane High density insulation enables the temp. uniformity
- Top mounted Non-removable refrigeration system as standard
- Digital PID control with alarm function can be set to initiate auto defrost cycle

Specifications

Model	LPR-250	LPR-637	LPR-1225
Capacity	250liter	637 liter	1225liter
Chamber (WxBxH, mm)	500x500x1000	700x700x1300	1250x700x1400
Temp. Range	0°C to +10°C ±0.1°C at 4°C		
Refrigerator	187W	187W	249W
Shelf & door	S : 4 / D : 1	S : 4 / D : 1	S : 8 / D : 2
Defrost	Automatic defrost system		
Safety device	Over&under temp. alarm, thermal protector		
Material	Stainless steel interior & epoxy coated steel plate		
Insulation	High density polyurethane foam		
Control&display	Digital PID control & LED display		
Power source	110/220VAC ,50/60Hz		
Overall (WxDxH, mm)	700x700x1800	800x840x2000	1410x840x2000
Weight (KG)	125	210	350

Option | 1) 7 days temperature recorder

Laboratory Freezer

Features

- Microprocessor PID controller with LED display provides ±0.5°C accuracy, temp. range down to -40°C ,and shows set & actual temperature
- Ideal for reagent, seed, enzyme and a various samples
- Non-CFC refrigerant with refrigeration system and polyurethane foam insulation provides excellent temp. uniformity and has auto defrosting
- High quality SS chamber with independent inner door and room
- Over temp. & Over current protection ensures user safety

Specifications

Model	LFU-210 (L)	LFU-300 (L)	LFU-420 (L)
Capacity	210 liter	300 liter	420 liter
Volume (WxBxH, mm)	600x500x700	600x500x1000	600x700x1000
Overall (WxDxH, mm)	800x700x1400	800x700x1650	800x900x1700
Weight (KG)	165	220	280
Model	LFC-214 (L)	LFC-312 (L)	LFC-420 (L)
Capacity	214liter	312 liter	420liter
Volume (WxBxH, mm)	600x550x650	800x600x650	1000x650x650
Temp. Range	Amb. to -20°C / L type : - 0 to -40°C		
Refrigerator	Low noise compressor with non-CFC refrigerant		
Shelf & door	4 shelves & independent inner door		
Defrost	By electric heater		
Safety device	Low temp.limiter, over current breaker		
Material	Stainless steel & epoxy coated steel plate		
Insulation	Polyurethane foam		
Control&display	Digital PID control & LED display		
Power source	220VAC,50/60Hz		
Overall (WxDxH, mm)	1300x750x950	1500x800x950	1700x850x950
Weight (KG)	160	210	270

Option | 1) Storage box
2) Temperature Recorder



LFU-210



LFC-214

Blood Bank Refrigerator



BB0123



BB0150

Features

- Control system can be workable by keyed lock on/set/off
- Automatic Defrosting Apparatus by Time and Warm/Cold alarm, Remote Alarm, Remote power & Light SIW are equipped
- Heat-treated pair glass is used for door so it can be prevented from the ice-forming phenomena incurred by the temperature difference in/out chamber and easily performs testing as visualizing inside from the outdoor.
- In order to keep accurate temperature, we can get the optimal result by maintaining inner temperature with air circulation system.

Specifications

Model	BB0123	BB0150
Capacity	557 liters	1251 liters
Chamber (WxDxH)	610x630x1450 mm	1370x630x1450 mm
Temp. range	Factory set at 4°C with a range of 0°C to 6°C	
Refrigeration	1/3 HP. Hermetically sealed compressor	
Material	All stainless steel	
Drawers	6 Adjustable solid stainless steel	12 Adjustable solid stainless steel
Door	1 Double-paned temp glass doors	2 Double-paned temp glass doors
Interior Light	15 Watt fluorescent	40 Watt fluorescent
Noise level	45 dB	
Power source	220V, 50/60Hz	
Overall (WxDxH)	740x830x1910 mm	1500x830x1910 mm
Weight	119 KG	173 KG

Option | 1) 7 days temperature recorder

Plasma Quick Freezer

Features

- Designed with the latest technologies on refrigerator and digital temp. control and especially for freezing within 30 minute
- With all shelves being of revolving type, you can easily take out any blood bottle
- Incorporating a high performance temp.controller and forced circulation fan, the bank's inside temperature is kept uniform

Specifications

Model	QFU-483	QFU-600
Capacity	483 liter / 90 bag	601 liter / 110 bag
Volume (WxBxH)	620x650x1200mm	610x680x1450mm
Temp. Range	-10 to -35°C / -35 to -50°C (Option)	
Refrigerator	1/2HP or 1HP	1 HP
Drawer	6 ea (540x530x70H)mm	6 ea (560x610x100H)mm
Safety device	High/Low limit, Over current breaker	
Material	interior exterior	Stainless steel Galvanized steel sheet
Insulation	Foamed polyurethane	
Control & display	Microprocessor control & digital display	
Power source	220VAC,50 or 60Hz , 5 Kw / 7.5 Kw	
Overall (WxDxH)	860x800x1920mm	740x800x1950mm
Weight	380 KG	420 KG

Option | 1) 7 days Temp. recorder & printer



QFU-483

Deep Freezer



Features

- Cold air loss is minimized by insulated inner doors
- Efficient evaporator with maximum contact, with walls for fast cooling down
- Very user-friendly control panel on eye level and easy to clean condenser filter.
- Quiet running fans and compressors create a very low noise level (± 60 dBA)

Specifications

Model	DF9007	DF9010	DF9014	DF9017	DF9020
Capacity	191 liters	295 liters	392 liters	492 liters	593 liters
Chamber (WxDxH, mm)	570x500x670	870x500x670	1170x500x670	1470x500x670	1770x500x670
Temp. range	-40°C to -90°C $\pm 1^\circ\text{C}$				
Refrigerator	Non CFC, 2x1, 1/4 HP				
Insulation	130mm Formed in place polyurethane				
Control & Display	Microprocessor digital control & LED display				
Power source	220V /50,60Hz				
Racks / Freezer	12 racks	18 racks	24 racks	30 racks	36 racks
Overall (WxDxH, mm)	1280x790x1030	1590x790x1030	1880x790x1030	2180x790x1030	2480x790x1030
Weight	211 KG	236 KG	261 KG	286 KG	311 KG

Model	DF8510	DF8514	DF8517	DF8520	DF8524
Capacity	276 liters	369 liters	484 liters	605 liters	730 liters
Chamber (WxDxH, mm)	600x480x970	600x480x1290	600x630x1290	750x630x1290	750x740x1290
Temp. range	-40°C to -86°C $\pm 1^\circ\text{C}$				
Refrigerator	Non CFC, 2x1, 1/4 HP				
Insulation	130mm Formed in place polyurethane				
Control & Display	Microprocessor digital control & LED display				
Power source	220V /50,60Hz				
Racks / Freezer	12 racks	16 racks	16 racks	20 racks	20 racks
Overall (WxDxH, mm)	920x810x1720	920x810x1950	920x960x1950	1070x960x1950	1070x1070x1950
Weight	294 KG	334 KG	380 KG	410 KG	450 KG

Option

- 1) CO₂ Back-up system / LC0070
 - CO₂ Back-up system with battery and temp display
- 2) Chart recorder / CH0067
 - Temperature recorder. 7 days circular chart recorder
- 3) Wireless D.A.S / RWL485 & TWL485
 - As wireless data sending/receiving system
- 4) Remote Alarm Unit
- 5) Electric Door Lock / Unlock System



CO₂ Back-up system



Chart recorder



Rack & Box

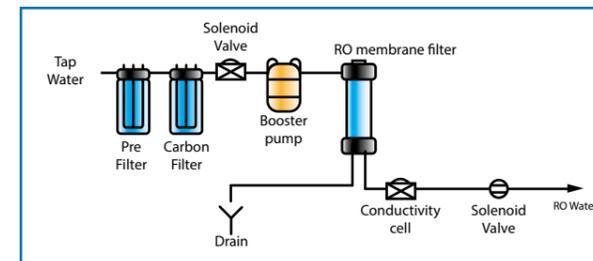


Wireless D.A.S

Pure Water Purification System



RO MAX-I



Features

- These compact purify water system for general laboratory use or as a feed source for ultrapure system, utilizing tap water for feed
- The control panel operates and monitors The main functions such as operation, stand-by, flush or warn you of a problem
- Built-in membrane protection system extends The life of The membrane

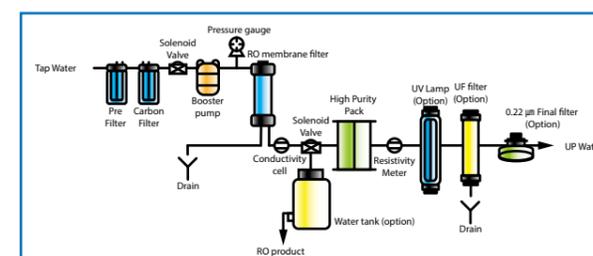
Specifications

Model	RO MAX-I	RO MAX-II	RO MAX-III
Product rate	Max. 15 L/hr	Max. 30 L/hr	Max. 45 L/hr
Resistivity	Pure water: 0.2 to 25.0 $\mu\text{S}/\text{cm}$		
Control	Microprocessor control & keypad set		
Display	Digital LCD backlight display (0.1 to 999.9 $\mu\text{S}/\text{cm}$)		
Functions	<ul style="list-style-type: none"> - Self diagnosis - Auto drain when The power on & off, and overfed resistivity - Settable the flushing time (1 to 99 min) - Display 3 of alarm messages for filter exchange 		
Safety	<ul style="list-style-type: none"> - Manual operating when the tap water is low pressure - Auto stop when low pressure, tank full, and supply the suspension of tap water - Auto adjusting according to the consumption of water 		
Filters	Pre filter, A/C filter, RO Membrane		
Power source	220VAC- 50/60Hz		
Overall	500W x 520D x 480H (mm)		
Weight	25 KG		

Ultrapure Water Purification System



PowerMax-I



Features

- This system produce that exceeds the resistivity up to 18 $\text{M}\Omega\text{-cm}$ and <5ppb Toc, utilizing tap water for feed
- Ideal system for 15-50L/hr for your most sensitive analytical procedures system recirculates water between The reservoir to ensure product water is continually available
- Digital LED display and monitoring system serve you to operate this system

Specifications

Model	PowerMax-I	PowerMax-II	PowerMax-III
Product rate	Max. 15 L/hr	Max. 30 L/hr	Max. 50 L/hr

Type	Basic	Plus	Bio	Multi
System	Basic Filters, Pre filter, A/C filter, RO membrane, HP pack			
	0.22 μm Final filter	O	O	O
	254/185nm UV lamp	O		O
	MV5000 UF filter		O	O
Water	Pure Water (RO) 2.2 to 25.0 $\mu\text{S}/\text{cm}$			
Quality	Ultrapure Water (UP) Up to 18.3 $\text{M}\Omega\text{-cm}$			
	TOC (ppb)	5-10	1-5	5-10
	Endotoxin (Eu/M ℓ)	NA	NA	<0.001
	Bacteria (cfu/M ℓ)	<1	<1	<1
	Particles (>0.22 μm)	<1 M ℓ	<1 M ℓ	<1 M ℓ
Display	Digital LED display			
Overall (WxDxH)	500x400x700 mm			
Power source	220VAC, 50/60Hz, 60W			

Option 1) Water tank

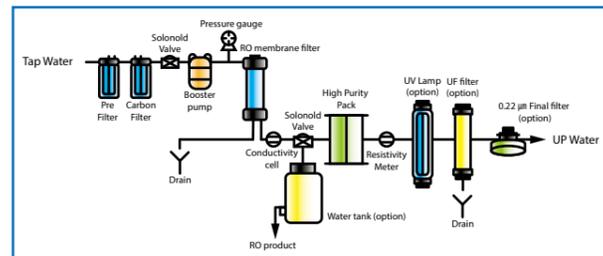
Water Purification System

Features

- Applications
 - Drinking water: hospital, school, company etc
 - Industry: food ,cosmetic, pharmacy, beverage, semiconductor
- Rejection Rate
 - Monovalent ion: 95-99%
 - Polyvalent ion: 98-99%
 - Microorganism: 99%
 - Particles: 99%
 - Polyvalent ion: 98-99%
 - Pyrogen: 99%
- RO Membrane

This water purifying method is to extract pure by applying the pressure into the RO membrane which contains 0.0001- 0.001 micro meter pore size and this is highly effective in removing several impurities around up to 95-99% from feed water

Size (µm)	0.0001	0.001	0.01	0.1	1.0	10	100µm
Membrane / Filter Size	RO Membrane	Nano filter	Ultra filter	Micro filter	Particle filter		
Material Size	Atomic Radius	Aqueous salt Metal Ion Sugar	Pyrogen Virus Protein	Point Bacteria	Pigment Yeast cell		Mist



PILOT RO-100P

Specifications

Model	PILOT RO-100P	PILOT RO-200P	PILOT RO-300P	PILOT RO-400P
Water quality	RO: 0 to 50µs/cm			
Model	PILOT RU-100P	PILOT RU-200P	PILOT RU-300P	PILOT RU-400P
Water quality	RO: 0 to 50µs/cm, UP: Up to 18.3 MΩ-cm			
Production rate	100 L/hr	200 L/hr	300 L/hr	400 L/hr
Display	LED digital display (RO: 0 to 200µs/cm, UP: Up to 18.3 MΩ-cm)			
Pressure gauge	Dia. 6.5mm, 0 to 20 kg/cm ²			
Control functions	1. Low pressure of tap water: Auto/manual operating modes 2. Automatic motor stop function: ① Low pressure ② Tank full ③ Suspension of tap water supply			
Accessories	Pre filter, A/C filter, R/O membrane, Level sensor			
Power source	220VAC, 50/60Hz			
Overall (WxDxH)	600x500x1250	600x500x1450	600x500x1450	850x650x1600
Weight (KG)	135	155	180	215

- Option**
- 1) Pretreatment System
 - 2) 254 nm UV sterilizer
 - 3) Ion-exchange Vessel
 - 4) Storage tank
200~2000 liter



Deionizing Water System

Features

- This unit designed for the production of high purity de ionized water for use as such or for further purification to ultrapure water, and the standard version is available with or without UV sterilizer
- The display / key pad unit completely new design for clear readability and maximum user convenience display
- Typical applications;
 - a. Rinsing of glassware
 - b. Preparing of diluting buffers, reagents and tissue culture media
 - c. Preparing samples for analytical methods such as flame AAS

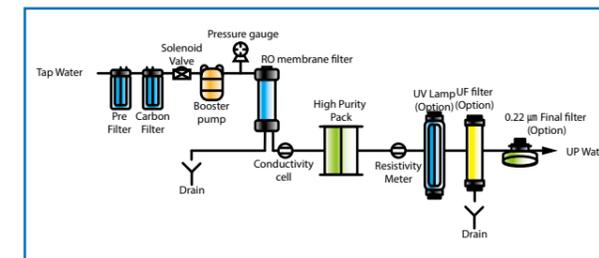
Specifications

Model	WDI-15 I	WDI-30 I	WDI-45
Production rate	15 liter/hr	30 liter/hr	45 liter/hr
Conductivity	0.067 - 0.1 (µm/cm) / 18.2 MΩ-cm		
Feed water	Tap water + Booster pump		
Filter system	Prefilter, Active carbon filter, RO membrane HP Pack (Ion Exchange)		
TOC value	< 30 ppb		
Bacteria	< 1 cfu/ml		
Control & display	Microprocessor & digital display		
Functions	Power,Start/Stop,Service mode, 5set value		
Power source	220VAC,50/60Hz		
Overall (WxDxH)	500x400x580mm		
Weight	28 KG		

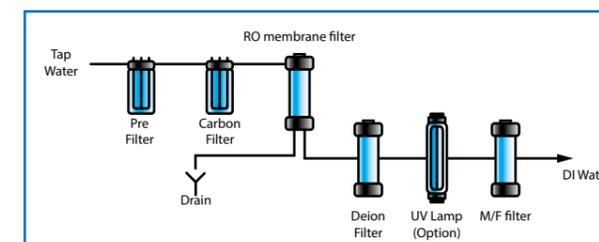
- Option**
- 1) UV sterilizer (TOC < 5 -10 ppb)
 - 2) UV sterilizer + Ultra fine filter (TOC < 2- 5 ppb)



WDI-15



ROMAX-04



Features

- Connect to tap water line to set-up easy
- Tap water supply : 2 kg/cm²
- Exchange the ion resin in the MB polisher every 3 - 4 months
- Economic price and simple design

Specifications

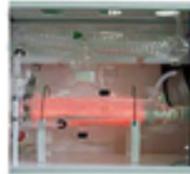
Model	ROMAX-04	ROMAX-08
Production flow rate	4 liter/hr	8 liter/hr
Conductivity (option)	01 - 25(µm/cm) / 18.2 MΩ-cm (Option)	
Feed water	Tap water : 2 kg/cm ²	
Filter system	Prefilter,A/C filter, RO membrane Deion Filter, M/F filter	
TOC value	< 50 ppb	
Control & display	Power on-off, Automatic water level switch	
Power source	220VAC, 50/60Hz	
Overall (WxDxH)	230x450x550mm	
Weight	20 KG	

- Option**
- 1) UV sterilizer (TOC < 5 -10 ppb)

Glass Water Still



GS-I



Inner view

Features

- Produce pure, pyrogen-free distillates with This full Automatic glass water still produce Max. 10 L/hr
- Built-in Automatic cleaning and draining device
- Optional water softener prevents scale formation
- Heaters are sheathed with borosilicale glassware and silica.
- Distilled water quality ;
 - 1) Pyrogen free : Reagent grade
 - 2) Resistivity : <3.5M-cm
 - 3) Conductivity : 2-5 $\mu\text{s/cm}$
 - 4) pH at 20°C : 7.0
 - 5) Silicate : Negative
 - 6) TDS: <1.0

Specifications

Model	GS-I	GS-II	GS-III
Capacity	3.5 liter / hr	7.0 liter / hr	10 liter / hr
Cooling water	30 liter	60 liter	90 liter
Pyrex heater	3 Kw	6 Kw	9 Kw
Material	Powder coated steel plate		
Safety device	1) Water pressure sw, 2) water level sensor, 3) Distilled water level sensor		
Control & display	Full automatic & digital display		
Power source	220VAC. 50/60Hz		
Overall (WxDxH)	650x400x430 mm	650x400x1000 mm	
Weight	28 KG	32 KG	45 KG

Features

- Designed compact and practical to save space
- Pyrogen free reagent grade and Pyrex glass ware
- High quality quarts heater
- Fully Automatic operation and LCD Digital display
- Application ;
 - 1) HPLC, ICP, AA, Spectroscopy
 - 2) Tissue & Cell culture
 - 3) Electrophoresis / Biotechnology
 - 4) Semiconductor manufacturing
 - 5) BOD measurement

Specifications

Model	GD-I	GD-II	GD-III
Capacity	3.5 liter / hr	7.0 liter / hr	10 liter / hr
Water Quality	Distill: 3.5M Ω -cm , Ultrapure: 18.3M Ω -cm		
Filtration System	Pre filter, Active carbon filter, Ultrapure filter , Final filter		
Pyrex Heater	1.5Kw x 2	1.5Kw x 4	1.5Kw x 6
Feed Pump	1.5 liter / min x 2 sets		
Ultrapure	TOC, TDS & Silicate< 5 -1 0 ppb,		
Water Data	Heavy metal <0.1 -1 ppb, Microorganism>0.001		
Control & Display	Full automatic & digital LED display		
Safety Device	Low water pressure switch, Tank full		
Power source	220VAC. 50/60Hz		
Overall (WxDxH)	650x400x1000 mm		
Weight	85 KG	105 KG	130 KG

- Option**
- 1) Water Tank
 - 2) UV sterilizer (TOC < 5 -10 ppb)



GD-I



WSB-04F

Basic Water Still

Features

- This general lab, water still remove most dissolved solids and pyrogen from tap water or pretreated water
- Water Still features a thermostat and a water level switch provides automatic operation
- Protect from over-heating by cut-off when feed water interrupted.
- Easy to clean by removing The condenser from The body
- The stainless steel double-walled chamber saves electricity

Specifications

Model	WSB-04F	WSB-08F
Capacity	3.5 ℓ / hour	7 ℓ / hour
Cooling water	30 ℓ / hour	60 ℓ / hour
Heater	3Kw	6Kw
Material	Stainless steel Interior & Steel sheet Exterior	
Safety Device	Water level float switch, Over temp. thermostat Water supply cut-off valve	
Power source	220VAC, 50/60Hz	
Overall (WxDxH)	400x225x545 mm	460x260x610 mm
Weight	20 KG	23 KG

Automatic Water Still

Features

- These water Still produce pure and pyrogen-free distillates with fully automatic boiler.
- Automatic operation switches unit off when reservoir is full
- Built-in stainless steel storage tank for distillation
- Sensing water level in boiling chamber to Protect heater from over heating
- Check water level in reservoir to start / stop distillation automatically
- East to use and maintenance free

Specifications

Model	WSA-04	WSA-08	WSA-12
Capacity	3.5 ℓ / hour	7.0 ℓ / hour	10 ℓ / hour
Cooling water	30 ℓ	60 ℓ	90 ℓ
Heater	3 Kw	6 Kw	9 Kw
Reservoir	11 liter	20 liter	25 liter
Power source	220VAC, 50/60Hz, Single phase		
Overall (WxDxH)	730x430x580 mm		
Weight	28 KG	35 KG	42 KG



WSA-04



Single Water Still



Double Water Still

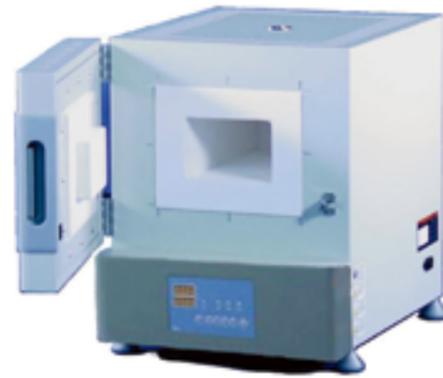
Model	WSA-04-D	WSA-08-D
Capacity	3.5 ℓ / hour	7.0 ℓ / hour
Cooling water	45 ℓ	90 ℓ
Heater	9 Kw	12 Kw
Material	Stainless steel Interior & Steel sheet Exterior	
Reservoir	11 liter	20 liter
Safety Device	Water level float switch, Over temp. thermostat Water supply cut-off valve	
Power source	220 VAC, 50/60Hz, Three phase	
Overall (WxDxH)	730x700x570 mm	
Weight	58 KG	60 KG

Digital Muffle Furnace

High Temperature Furnace



DMF-05



DMF-03



SF-05

Features

- These muffle furnace are made of ceramic mold insulation and double walled construction minimize exterior surface temperature and provides extended heating element life
- Microprocessor PID control with auto tune function prevents overshooting of set temperature
- 3 sides wall heating element maintain temperature uniformity $\pm 5^{\circ}\text{C}$
- An air vent on the top of furnace; an atmosphere inlet lets you purge inner gases and check temperature
- A door switch cut power to heating element when the door is opened minimizing you exposure to hot temperature

Specifications

Model	DMF-03	DMF-05	DMF-12	DMF-27	DMF-64	DMF-125
Capacity	2.9 liter	4.5 liter	12 liter	27 liter	64 liter	125 liter
Chamber (WxBxH, mm)	130x250x90	150x300x100	200x300x200	300x300x300	400x400x400	500x500x500
Temp.	Range 100 - 1200°C					
	Sensor K type thermocouple					
Timer	Digital / 99hr, 59min					
Heating	Element Electric sheath heater					
	Power	2.2 Kw	2.6 Kw	4.4 Kw	6.2 Kw	11.1 Kw
Material	Exterior Powder coated steel plate					
	Insulation Ceramic mold & board					
Door	Steel plate with ceramic mold					
Control & Display	Microprocessor control & LED display, Temp, Time, Heater On/Off					
	Over temp. limiter & alarm, Air vent on the top					
Power Source	220VAC, 50/60Hz, Single phase			220VAC, 50/60Hz, 3P		
Overall (WxDxH, mm)	410x485x510	420x560x535	500x550x580	580x590x740	670x630x850	880x890x1040
Weight (KG)	30	35	45	65	100	14

Option 1) Programmable microprocessor control

Features

- These muffle furnace are made of ceramic mold insulation and double walled construction minimize exterior surface temperature and provides extended heating element life
- Microprocessor PID control with auto tune function prevents overshooting of set temperature
- 3 sides wall heating element maintain temperature uniformity $\pm 5^{\circ}\text{C}$
- An air vent on the top of furnace; an atmosphere inlet lets you purge inner gases and check temperature
- A door switch cut power to heating element when the door is opened minimizing you exposure to hot temperature

Specifications

Model	SF-05	SF-12	SF-25
Capacity	4.5 liter	12 liter	25 liter
Chamber (WxBxH)	150x200x150 mm	200x300x200 mm	250x400x250 mm
Temp.	Range 300 - 1500°C (Operation 1400°C)		
	Sensor R type thermocouple		
Timer	Digital / 99hr, 59 min		
Heating	Element S type : SiC Heater		
	Power	6 Kw	8 Kw

Model	SKF-05	SKF-10	SKF-19
Capacity	4.5 liter	10 liter	18.7 liter
Chamber (WxBxH)	150x200x150 mm	200x250x200 mm	250x300x250 mm
Temp.	Range 300 - 1700°C (Operation 1600°C)		
	Sensor R type thermocouple		
Timer	Digital / 99hr, 59 min		
Heating	Element Super kantal (MoSi ²)		
	Power	10 Kw	15 Kw
Material	Exterior Powder coated steel plate		
	Insulation Ceramic mold & board		
Door	Steel plate with ceramic mold		
Control & Display	Programmable microprocessor control & LED display, Temp, Time,		
Safety Device	Heater On/Off, Over temp. limiter & alarm, Air vent on the top		
Power Source	220VAC, 50/60Hz, Single phase or 220/380VAC, 50/60Hz, 3P		
Overall (WxDxH)	560x640x860 mm	640x630x930 mm	720x670x1190 mm
Weight	60 KG	80 KG	110 KG

Tube Furnace



TF-120



Open Shape

Features

- Use these flow-through refrigerated chiller that either lack refrigeration or need additional cooling
- Built-in circulation pump, refrigerator and cooling water line
- Microprocessor PID controller make them idea for any application that requires accuracy and reliability

Specifications

Model	TF80	TF120	TF160
Chamber (IDxL, mm)	80x600	120x600	160x600
Tube Size (OD) mm	30 to 60	70 to 100	100 to 140
Temp. Range	100 - 1100 °C		
Operation	800 °C / Max. 1000 °C		
Sensor	CA type thermocouple		
Timer	Digital / 99hr,59 min		
Heating Element	2.8 Kw	4.4 Kw	5.2 Kw
Time	20 min.	22 min.	25 min.
Material Body	Powder coated steel plate		
Insulation	Ceramic fiber		
Control & Display	Microprocessor control & Digital display		
Safety Device	Over temp. limiter & alarm		
Power Source	220VAC, 50/60Hz, Single phase		

Air Jacket CO2 Incubator



CI-50-A

Features

- Digital infrared CO² sensor with auto temperature compensation and auto zero calibration
- Microprocessor digital PID control provides precise temp. control up to +60°C, timer alarm, auto tuning, over temp. and current protection capability ensure user safety

Option

- 1) Water Jacket type Model: CI-xxx-W series
- 2) Programmable controller
- 3) RS485 communication interface

Specifications

Model	CI-50-A	CI-100-A	CI-150-A	CI-324-A
Capacity	49 liter	101 liter	150 liter	324 liter
Chamber (WxBxH, mm)	350x360x405	450x450x500	495x515x600	600x600x900
Circulation	Natural convection			Circulation fan
CO² Range	0 to 20% ±0.1% at 37°C			
Sensor	Digital NDIR sensor			
Temperature	Amb. +5°C to 60°C ±0.2 at 37°C			
Material	Stainless steel + Powder coated steel plate			
Door	Tempered safety glass & magnetic packing			
Control & Display	Digital PID control & LED display			
Safety Device	Over temp. protector, Leakage breaker & Alarm function			
Power Source	220VAC, 50/60Hz			
Overall (WxDxH, mm)	500x495x785	600x600x900	660x645x1010	750x745x1250
Weight	55 KG	95 KG	130 KG	185 KG

High Temperature Tube Furnace



STF-80

Features

- These reliable tube furnace meet the specific needs of educational, governmental, and industrial laboratories
- Digital PID control to Prevent over-heating of set temperature
- Split hinge design permits convenient placement of the process tube
- Chamber is insulated with energy-efficient for quick heat-up and cool down rates

Specifications

Model	STF-80	STF-120	STF-160
Chamber (IDxL, mm)	80x600	120x600	160x600
Tube Size (OD) mm	30 to 60	70 to 100	100 to 140
Temp. Range	300 - 1500 °C		
Operation	1300 °C / Max. 1400 °C		
Sensor	R type thermocouple		
Timer	Digital / 99hr,59 min		
Heating Element	4.4 Kw	5.2 Kw	6.0 Kw
Material Body	Powder coated steel plate		
Insulation	Ceramic fiber		
Control & Display	Microprocessor control & Digital display		
Safety Device	Over temp. limiter & alarm		
Power Source	220VAC, 50/60Hz, Single phase		

Features

- This compact CO² & O² incubator is ideal for cell, tissue and plant culture when space is limited in the lab
- Programmable PID controller has LCD displays for temp. humidity, CO² & O² monitored by sensors

Specifications

Model	COI-130A	COI-130W
Capacity	130 liter / 445x470x620 mm	
Range O ²	2 to 20% ±0.1% / infrared sensor	
CO ²	0 to 20% ±1% / none dispersive infrared	
Temp. Range	Amb. +5 to 60°C	
Humidity Range	Up to 96% RH	
Jacket Type	Air, 60 liter	Water 65, liter
Door	Door heater, magnetic closure	
Shelves	Stainless steel x 3, Adjustable	
Control & Display	Programmable PID controller, LED display	
Utility	Blow drain, sample pot, access hole	
Material	Over temp. limiter, Gas & W/J monitor	
Power Source	220VAC, 50/60Hz	
Overall (WxDxH)	582x580x1015 mm	
Weight (KG)	125 KG	

CO2 & O2 Incubator



COI-130A

Digital Incubator



DI-54

DI-150

Features

- These versatile, general purpose digital incubators offer popular features at economical price
- Natural convection design reduces air movement, helping to prevent cross contamination of samples
- Independent microprocessor controller offers the added safety of over temperature protection
- These incubators are PID controlled and LED display, let you set temp. with a uniformity of $\pm 0.5^{\circ}\text{C}$ or better
- Inner glass window allows study of cell growth without comprising incubation environment
- 304 SS interior and adjustable shelves allow easy cleaning and decontamination

Specifications

Model	DI-56	DI-81	DI-150	DI-250	DI-432
Capacity	56 liter	81 liter	150 liter	250 liter	432 liter
Chamber (WxBxH, mm)	350x350x450	450x400x450	500x500x600	500x500x1000	600x600x1200
Temp Range	Amb.+5 to Max.70°C $\pm 0.2^{\circ}\text{C}$ / Uniformity $\pm 1^{\circ}\text{C}$				
Controller	Digital PID controller with PT 100 ohm sensor				
Timer	Digital, 99hr 59min				
Heater	300W	500W	800W	1000W	1200W
Material Interior	Stainless steel				
Exterior Exterior	Powder coated steel plate				
Insulation	Ceramic fiber				
Door & Shelves	Tempered safety glass, Polyester resin coated wire shelves				
Control & Display	Microprocessor digital PID control & LED display				
Safety Device	Over temp limiter, Over current protector				
Power Source	220VAC, 50/60Hz				
Overall (WxDxH, mm)	490x620x930	615x650x1040	665x765x1200	665x765x1600	760x740x1780
Weight	50 KG	60 KG	105 KG	150 KG	200 KG

Option 1) Programmable microprocessor control

BOD Incubator / Low Temp. Incubator



BI-81

LI-81

Features

- These incubators, ideal for BOD and COD decontaminations, cell and bacterial culture, and other applications requiring controlled temp. below and above ambient such as vaccine storage, fermentation studies, drug stability test
- Incubators have mechanical convection and features a microprocessor PID controller with LED display shows set temp. and actual temp. to within 0.1°C , and provides high/low limit protection set point
- 304 SS interior and adjustable shelves allow easy cleaning and decontamination
- Inner glass window allows study of cell growth without comprising incubation environment
- Compressor is protected from accidental overload by a relay, and bottom casters make installation and moving simple

Specifications

Model	BI-56	BI-81	BI-150	BI-250	BI-432
Temp Range	+5 to +70°C / Accuracy: $\pm 0.2^{\circ}\text{C}$, Uniformity $\pm 1^{\circ}\text{C}$				
Model	LI-56	LI-81	LI-150	LI-250	LI-432
Temp Range	-10 to +70°C / Accuracy: $\pm 0.2^{\circ}\text{C}$, Uniformity $\pm 1^{\circ}\text{C}$				
Capacity	56 liter	81 liter	150 liter	250 liter	432 liter
Chamber (WxBxH, mm)	350x350x450	450x400x450	500x500x600	500x500x1000	600x600x1200
Timer	Digital, 99hr 59min				
Heater	300W	500W	800W	1000W	1200W
Refrigerator	1/8 Hp	1/4 Hp	1/3 Hp		1/2 Hp
Material Interior	Stainless steel				
Exterior Exterior	Powder coated steel plate				
Insulation	Ceramic fiber				
Door & Shelves	Tempered safety glass, Polyester resin coated wire shelves				
Control & Display	Microprocessor digital PID control & LED display				
Safety Device	Over temp limiter, Over current protector				
Power Source	220VAC, 50/60Hz				
Overall (WxDxH, mm)	490x620x930	615x650x1040	665x765x1200	665x765x1600	760x740x1780
Weight	50 KG	60 KG	105 KG	150 KG	200 KG

Option 1) Programmable microprocessor control

Shaking Incubator



SI-100/R



SI-200/R

Features

- These shaking incubator/refrigerator handles heavy work loads, provides uniform agitation enables continuous 24 hours operation even at high speed
- Viewing-glass on incubators let you view samples without disturbing internal temperature
- Feature a motor and variable speed control by microprocessor PID controller
- Easy-to read digital LED display show temperature, speed and time
- Mechanical convection provides excellent temperature uniformity throughout the chamber
- Wide range of flask application by flask holder and spring wire rack optionally

Specifications

Model	SI-100	SI-100R	SI-200	SI-200R
Capacity	112 liter (23x250ml)		216 liter (36x250ml)	
Chamber (WxBxH)	530x560x380mm		750x720x400mm	
Temp. Range	Amb. +5°C to +60°C	+10°C to 60°C	Amb. +5°C to +60°C	+10°C to 60°C
Accuracy	±0.2°C at 37°C			
Controller	Digital PID & PT sensor			
Shaking Motion	Orbital			
Stroke	20 - 300 rpm			
Amplitude	20mm			
Drive	AC motor + Speed controller + Belt mechanism			
Timer	Digital , 99hr/59min			
Refrigerator	-	1/4 Hp	-	1/2 Hp
Material Body	Powder coated steel plate			
Door	Tempered safety glass with steel plate			
Platform	Anodized aluminium			
Safety Device	Auto stop when door opening			
Control & Display	Microprocessor PID control & digital LED display			
Power Source	110/220VAC, 50/60Hz, single phase			
Overall (WxDxH)	590x850x825 mm		1050x820x1000 mm	
Weight	145 KG	155 KG	185 KG	195 KG

Option

	Model	100ml	250ml	500ml	1000ml
1) Flask Clamp	SI-100(R)	32 ea	23 ea	16 ea	9 ea
	SI-200(R)	70 ea	36 ea	23 ea	18 ea
2) Spring Rack	SI-100(R)	475x475mm			
	SI-200(R)	650x700mm			



Flask Clamp



Spring Rack

Cleanroom Oven

Features

- This convection cleanroom oven are Designed to minimize air borne particles in critical environments
- Walls are fully encapsulated to prevent insulation material from becoming air borne
- Ovens Feature PID controller and digital display

Specifications

Model	CRO-150	CRO-300
Capacity	150 liter	300 liter
Chamber (WxBxH)	600x500x500 mm	600x500x1000 mm
Temp. Range	Ambient +5°C to 200°C	
Timer	Digital, 99hr / 59 min	
Heating	1 Kw	1.5 Kw
Blower	50Wx 1	60Wx 1
Filter efficiency	HEPA 0.3µm 99.97% or 99.997%	
Material Interior	Stainless steel plate	
Exterior	Powder coated steel plate	
Shelves	SUS x 2 ea SUS x 3 ea	
Control & display	Microprocessor digital PID & LCD display	
Safety device	Over temp. protector, Over load limiter	
Power source	220VAC, 50/60Hz	
Overall (WxDxH)	770x725x920 mm	770x725x1420 mm
Weight	75 KG	120 KG



CRO-150

Explosive Proof Oven

Features

- This explosive proof oven use to test heat-sensitive materials
- Flammable materials unit are Designed to completely insulate the material from chance of electric sparking
- Explosion proof unit are for use in hazardous location where explosive conditions could potentially exist external to the chamber.

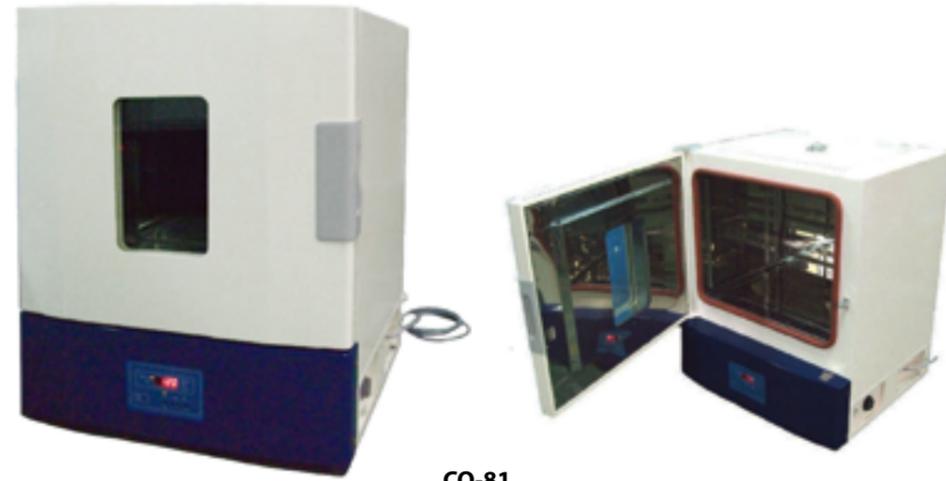
Specifications

Model	EPO-150	EPO-300
Capacity	150liter	300liter
Chamber (WxBxH)	600x500x500 mm	600x500x1000 mm
Temp. range	Amb. +5°C to 80°C / ±1°C	
Timer	Digital, 99hr / 59 min	
Heating	1 Kw	2 Kw
Explosion proof	Water Jacket type	
Material Interior	Stainless steel plate	
Exterior	Powder coated steel plate	
Shelves	SUS x 2 ea SUS x 3 ea	
Control & display	Microprocessor digital PID & LCD display	
Safety device	Over temp. protector	
Power source	220VAC, 50/60Hz	
Overall (WxDxH)	770x625x920 mm	760x640x1030 mm
Weight	85 KG	113 KG



EPO-150

Digital Convection Dry oven



CO-81

Features

- These convection ovens have microprocessor PID controller and 99hr/59min timer with hold function
- Ovens also Feature a K type temp. sensor and a balanced centrifugal blower for uniform air distribution
- Sturdy construction provides safety and convenience and double wall offers for good heat retention
- View-glass let you safety view samples during operation
- The high temp. silicon rubber packing prevent heat loss and stainless steel shelves are adjustable

Specifications

Model	CO-81	CO-150	CO-300	CO-630
Capacity	81 liter	150 liter	300 liter	630 liter
Chamber (WxBxH, mm)	450x400x450	600x500x500	600x500x1000	900x700x1000
Temp. Range	Max.250°C / Accuracy: ±0.2°C, Uniformity: ±1°C			
Controller	Digital PID control with PT 100 sensor			
Timer	Digital 99hr/59min			
Heating	Element Electric sheath heater			
Time	20 min heat-up to 100.C			
Blower	50W x 1		60W x 1	1/4 Hp x 1
Material	Interior: Stainless steel Exterior: Epoxy power coated steel plate Insulation: Ceramic fiber			
Door	Magnetic closure with silicon packing. Tempered safety glass inner door			
Shelves	Stainless steel. adjustable			
Control & Display	Microprocessor PID control and digital display			
Safety Device	Over temp.limiter. Over current breaker			
Power Source	220VAC .50/60Hz			
Overall (WxDxH, mm)	620x575x870	770x675x920	760x640x1030	1510x740x1430
Weight (KG)	70	95	130	220

Option 1) Programmable microprocessor digital PID control

High Temperature Convection Oven



HCO-42

Features

- High temp. convection ovens have microprocessor PID controller and 99hr/59min timer with hold function
- Ovens also Feature a K type temp. sensor and a balanced centrifugal blower for uniform air distribution
- Sturdy construction provides safety and convenience and double wall offers for good heat retention
- View-glass let you safety view samples during operation
- The high temp. silicon rubber packing prevent heat loss and stainless steel shelves are adjustable

Specifications

Model	HCO-42	HCO-81	HCO-150	HCO-250
Temp. Range	Max.350°C, Accuracy: ±0.2°C, Uniformity: ±1°C			
Model	HCO-42S	HCO-81S	HCO-150S	HCO-250S
Temp. Range	Max.500°C, Accuracy: ±0.2°C, Uniformity: ±1°C			
Capacity	45 liter	81 liter	150 liter	250 liter
Chamber (WxBxH, mm)	350x350x350	450x400x450	600x500x500	700x600x600
Timer	Digital 99 hr, 59 min			
Heating Output	800W	1200W	1500W	2000W
Time	15 - 20 min. up to 100°C			
Material	Interior: High temperature resistant stainless steel Exterior: Powder coated steel plate Insulation: Ceramic fiber			
Door	Magnetic closure with silicon packing			
Shelves	Stainless steel, adjustable			
Control & Display	Microprocessor digital PID control & LED display			
Safety Device	Over temp. limiter, Over current breaker			
Power Source	220VAC .50/60Hz			
Overall (WxDxH, mm)	1000x600x800	1100x650x900	1240x750x950	1240x750x1050
Weight	65 KG	85 KG	110 KG	150 KG

Option 1) Programmable microprocessor digital PID control

Digital Natural Dry Oven



DO-56

Digital Vacuum Oven



VO-64

Features

- Designed for general laboratory use, These ovens Feature a double wall for durability and excellent heat retention
- The high temp. silicone rubber packing prevent heat loss
- The temperature is controlled by microprocessor PID controller and displays digitally
- The stainless steel shelves are adjustable and the view glass let you the samples during operation
- The safety drain on the top of ovens protect from burst caused by malfunction or mis-operation

Specifications

Model	DO-35	DO-56	DO-150	DO-250
Capacity	35 liter	56 liter	150 liter	250 liter
Chamber (WxBxH, mm)	350x320x320	400x350x400	600x500x500	700x600x600
Temp. Range	Max.250°C, Accuracy: ±0.2°C, Uniformity: ±1°C			
Controller	Digital PID controller with PT 100 ohm sensor			
Timer	Digital / 99 hr, 59 min			
Heating Output	800W	1200W	1500W	2000W
Heating Time	15 - 20 min. up to 100°C			
Material Interior	Stainless steel			
Material Exterior	Powder coated steel plate			
Material Insulation	Ceramic fiber			
Door	Magnetic closure with silicon packing, Tempered safety glass window			
Shelves	Stainless steel, adjustable			
Control & Display	Microprocessor digital PID control & LED display			
Safety Device	Over temp. limiter, Over current breaker			
Power Source	220VAC,50/60Hz			
Overall (WxDxH, mm)	500x470x700	550x500x770	770x675x870	850x745x990
Weight (KG)	45	55	85	105

Option 1) Programmable microprocessor digital PID control

Features

- These vacuum ovens are accurate and reliable
- Large flat heater embedded right & left side wall and bed provides excellent temp. uniformity and quick heating time
- Ovens Feature PID controller and digital display
- Silicon door packing and positive door latch ensure a tight seal
- Vacuum and purge valve are located on top of oven for Easy access

Specifications

Model	VO-27	VO-64	VO-125	VO-216
Capacity	27 liter	64 liter	125 liter	216 liter
Chamber (WxBxH, mm)	300x300x300	400x400x400	500x500x500	600x600x600
Temp. Range	Ambient up to 200°C ±1°C			
Controller	Digital PID controller with PT 100 ohm sensor			
Timer	Digital/99 hr, 59 min			
Heating Output	1.5 Kw	2.1 Kw	4 Kw	6 KW
Heating Time	15 - 20 min. up to 100°C			
Vacuum Range	10 -760mmHg			
Material Interior	Stainless steel			
Material Exterior	Powder coated steel plate			
Material Insulation	Ceramic fiber			
Door	Magnetic closure with silicon packing, Tempered safety glass window			
Shelves	Stainless steel, adjustable			
Control & Display	Microprocessor digital PID control & LED display			
Safety Device	Over temp. limiter, Over current breaker			
Power Source	220VAC,50/60Hz			
Overall (WxDxH, mm)	500x470x700	550x500x770	770x675x870	850x745x990
Weight (KG)	45	55	85	105

Option 1) Vacuum Pump Model: MVP-06 (100 L/min)



Fermentor



Features

- Easy to Calibrate Temperature, pH, DO, Foam Sensors in use of Main Control Screen
- Easy control of external device by fermentation controller
- Intelligent self diagnostic system to maintain fermentation process from start to the end
- Operation method Touch Screen Controller and the easy way Compact design takes up only a small space, even a small laboratory space can be used efficiently
- Eight ways microprocessor controller system using parallel communication software Data Logging, Remote Control, including integrated control.
- Single Jacket / Double Jacket and can be used to select the drive motor
- Agitation, Temp, pH, DO, ORP, O₂, Antifoam, MFC, Feed Pump, Gas Mixer and additional parameters such as analog signals and can be controlled through a variety
- Feed function is linked to the Do Cascade and the culture of a variety of conditions that can be applied to the linked control program
- 4Gas signals available to send control signals to directly 4gas controller from main control system
- On PC or one Multi board can monitor and manage all of data by network even each controller is scattered. (1ch~6ch)

Specifications

Model	Bio Master Multi	
Vessel	Type	Single & Double 500ml ~ 14L Total Vol. STS316L Top plate Vessel, Borosilicate glass Autoclavable, pH, DO, Foam, Level, Pressure Probe, Addition Ports, Exhaust Port, Baffles 316L, Condenser
Aeration	Flow rate	Rota meters: 0~5LPM
	Option	Mass Flow Controller / Mass Flow Manual
	Sparger	Standard: Ring Sparger / Micro Sparger
	Inlet filter	0.2µm Disposable Hydrophobic Filter
Agitation	Drive	Direct Top Drive Servo Motor 200W~400W, BLDC Motor / Single Mechanical seal
	Range	10~1500rpm
	Impellers	Rushton Standard With Fermentation Pitched Blade Standard With Cell Culture Marine Blade or Spin Filter
Temperature	Thermostat system	0~150°C ±0.1°C / pt100Ω Probe Heating & Cooling PID Control / Built-in Heat / Exchanger / Automatic Cooling Water Valve
pH	Range / Sensor	0~14pH ±0.01 / InPro 3030 / Mettler Toledo temperature range 0~140°C, the maximum pressure - 6 bar
DO	Range / Sensor	0 to 200%, accuracy 1% or 4ppb, 0.0 ~ 100.0% O ₂ , maximum pressure - 12bar PID Control DO Cascade to Agitation, Mas Flow Control, Feeding Pump Control Polarographic Galvanic Oxygen Sensor -> Mettler Toledo
ORP	Range / Sensor	Measuring range -1000 ~ -1000mv, Temperature range: 0~140°C, the maximum, pressure - 2.5bar (Redox potential -> Oxidation of measurements) / Mettler Toledo
Anti Foam	Range / Sensor	Conductivity 0 ~ 300kΩ (Measuring the amount of foam)
OD (Optional)	Range / Sensor	Measuring range: 0 ... 100 EBC 0 ... 100EBC 0 ... 400FTU (Turbidity measurement)
MFM or MFC (Optional)	Range / Sensor	0~5L/min (Air flow measurement) / MFC (FCM-0005AIH61AN1K)
O₂, CO₂ (Optional)	Range / Sensor	Concentration ranges: 1. CO ₂ : 0-10 Vol.%, O ₂ : 0.1 ~25 Vol. % 2. CO ₂ : 0-25 Vol.%, O ₂ : 0.1~25 Vol. % 1. CO ₂ : 0-10 Vol.%, O ₂ : 0.1~50 Vol. % 4. CO ₂ : 0-25 Vol.%, O ₂ : 0.1~50 Vol. % Measuring principle: R(CO ₂), ZrO ₂ (O ₂) Temperature inside of the sensor unit: 580°C (O ₂ sensor unit)
Feed Control Mode	Control	Fed-Batch Culture by DO, pH, Interlock pump Control 4 x Built-in Feeding Pump (Watsorn-Malow: England) External pump 2ea
Level Control (Optional)	Control	Electrode type Hi/Low Level control
Balancer (Optional)	Control	9,999.99g / RS232C Measured by the amount of weight scale output
Power Source		AC110~220V, 50/60Hz, Single Phase, 500W (Free voltage)
Overall		188x530x620 mm
Weight		10 KG (Controller Only)

Fermentor Accessories

Single Vessel



- Basic vessel for micro organism
- High-speed agitation by applying durable
- Single glass type: Pyrex / Stainless 316
- Temperature control: Heater plae in underbody, coldfinger(from 3L) inside

Volume	Description
Single 1.5L	I.D 115mm, V.H 170mm, 1:1.5
Single 3L	I.D 133mm, V.H 220mm, 1:1.7
Single 5L	I.D 170mm, V.H 220mm, 1:1.3
Single 7L	I.D 170mm, V.H 310mm, 1:1.8
Single 10L	I.D 190mm, V.H 355mm, 1:1.8

Double Vessel



- Double Vessel type vessel
- Circulating water in double jacket for effective temperature control by large contact surface
- Connected to extra Water Bath for temperature control

Volume	Description
Double 1.5L	I.D 110mm, V.H 150mm, 1:1.3
Double 3L	I.D 130mm, V.H 220mm, 1:1.7
Double 5L	I.D 145mm, V.H 300mm, 1:1.2
Double 7L	I.D 160mm, V.H 330mm, 1:1.7

Single Round Vessel



- Single round vessel: round type under body
- Temperature control: Glass surrounding heating blanket
- Usually applied in animal cell fermentation

Volume	Description
Single 2L	I.D 115mm
Single 3L	I.D 133mm
Single 5L	I.D 170mm
Single 7L	I.D 170mm

Rushton Turbine Impeller



- Rushton turbine impeller is located from middle to bottom and basically used to agitate liquid in vessel
- It makes the flow to the same direction with turnig radius and has features of paddle and propeller types to be available for high-speed rotation by minimizing resistance
- General model to be used due to the highest ventilation eddiciency

Marine Impeller



- Applied to damageable cell
- It stirs liquid from down to up rotating in low-speed since it has the large surface of wings

500ml Single Vessel



- Small vessel for micro organism
- High-speed agitation by applying durable tob Drive motor
- Single glass type: Pyrex / Stainless 316
- Temperature control: Heater plae in underbody, coldfinger(from 3L) inside
- Applied pH, DO, Inoculum port on side wall

Volume	Description
Single 500ml	I.D 85mm, V.H 120mm

Bowl Vessel



- Stainless Double Jacket in upper body, single Glass in under body
- Circulating water in double jacket for effective temperature control by large contact surface
- Connected to extra Water Bath for temperature control

Volume	Description
Bowl 10L	I.D 190mm, V.H 355mm, 1:1.8
Bowl 14L	I.D 190mm, V.H 500mm, 1:2.6

PBR Single Vessel



- Single vessel type, LED Bar inside to make growth by exposing light into algae
- LED inside / flourscent jacked

Volume	Description
Single 1.5L	I.D 115mm, V.H 170mm, 1:1.5
Single 3L	I.D 133mm, V.H 220mm, 1:1.7
Single 5L	I.D 170mm, V.H 220mm, 1:1.3
Single 7L	I.D 170mm, V.H 310mm, 1:1.8
Single 10L	I.D 190mm, V.H 355mm, 1:1.8

Foam Breaker



- Installed in upper side of inside shaft, used in bursting fermentation foam
- It is not used in the case of animal cell fermentation since there is barely any foam
- 1 ea / 1 vessel

Hollowed Paddle Impeller



- It stirs liquid from down to up rotating in low-speed since it has the large surface of wings
- Extra additional it

Vacuum Freeze Dryer / Lyophilizer



FDE-0250/0350

FDI-0950

FDS-1250

Features - FDE series

- From drying and to defrosting, the comfortable function of one touch operation make it easy to operate
- It is equipped with an automated purge system to protect samples by preventing of counter-flow of vacuum pump oil
- At times of dissolving in vacuum to collect the sample in flask after freeze-drying, it has been safely designed and manufactured to prevent contamination of samples by inserting sterile air or nitrogen gas

Features - FDS series

- Shell freezing of the flask rolling type for freezing at a temperature below eutectic point
- The complete elimination of effervescence and dissolution of sample
- Preliminary freezing of membrane form suppress hardening of sample's surface, concentration and aging
- During desiccation, the display of degree of vacuum must be clear to recognize the sample temperature accurately

Specifications

Model	FDE-0250	FDE-0350	FDI-0650	FDI-0950	FDI-1250
Capacity	2 liter	3 liter	6 liter	9 liter	12 liter
Chamber (DxH)	250x230 mm	250x280	250x350 mm	250x400 mm	
Refrigeration system	Compressor 1/3 Hp Temperature -50°C / Option : -75 to -85°C		1/2Hp		
Vacuum Pump	100L/min		200L/min	400L/min	
Defrosting system	Heater system				
Control & Display	Microprocessor control & digital LED display				
Power source	220VAC, 50/60Hz				
Overall (WxDxH)	550x550x420mm	600x600x880mm		700x725x880 mm	
Weight	100 KG	110 KG	125 KG	130 KG	135 KG

Model	FDS-0650	FDS-0950	FDS-1250
Capacity	6 liter	9 liter	12 liter
Chamber (DxH)	250x280 mm	250x350 mm	250x400 mm
Refrigeration system	Compressor 1/3 Hp Temperature -50°C / Option : -75 to -85°C		1/2 Hp
Vacuum Pump	200L/min	400L/min	
Defrosting system	Heater system		
Control & Display	Microprocessor control & digital LED display		
Power source	220VAC, 50/60Hz		
Shell freezing system	Bath 176Wx325Bx150H(mm) Compressor 1/3HP Temperature -40°C Flask 300ml, 600ml, 900ml x 1 each		
Overall (WxDxH)	1000x725x880 mm		
Weight	180 KG	185 KG	190 KG

Vacuum Freeze Dryer / Lyophilizer



(Table Type) FDPT05-0050



(Up right type) FDP05-3050



FDPP0030

Features

- All the procedures can be performed on one-touch auto control system
- Safety maintains an experiment by back-fill, auto purging and alarm system
- The interior of stainless steel resists corrosion and contamination
- Apply to both individual vial and bulk scale at the same time
- Optionally mounted with stoppering apparatus which makes auto control of freeze drying
- The experiment data of the process can be obtained easy and economy
- Choose a variety of accessories and install the various sample container

Specifications

Model	FDPT05-0050	FDP05-0050	FDP05-3050	FDP05-3085
Capacity	5 liter			
Chamber (WxBxH)	330x370x240 mm			
Shelf (WxL)	300x350mm			
Refrigerator	1/3 Hp		1/2 Hp	
Temp. Range	Amb. To -50°C		-30 to -50°C	
Cold trap	-50°C / Option: -80°C			
Vacuum pump	200 liter/min 1 x 10-3 Torr			
Defrosting	Heated door defrosting			
Control & display	Microprocessor digital control & LED display			
Safety device	Back-fill system ,auto purge system			
Power source	220VAC, 50,60Hz, 1.5Kw			
Overall (WxDxH)	840x725x610mm		840x725x950mm	
Weight	175 KG		180 KG	

Option

- 1) Vacuum pump
- 2) Vacuum controller
- 3) Stoppering system

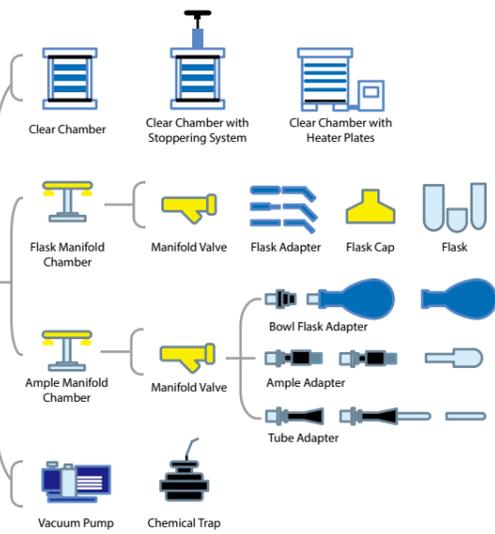
Specifications

Model	FDPP0010	FDPP0030	FDPP0050	FDPP0100
Condenser capacity	10 liter	30 liter	50 liter	100 liter
Condenser area	0.54m ²	1.8m ²	2.52m ²	5.04m ²
Condenser temp	-50°C or -85°C			
Refrigerator	2 x 2Hp	2 x 3Hp	2 x 5Hp	2 x 7.5Hp
Vacuum system	410L/min	650L/min	840L/min	1600L/min
Shelf temperature	Amb. to +80°C or -50°C to -85°C			
No.of Shelves	3x400x450	5x450x800	7x800x450	7x800x900
NO.of Tray	3x400x450x40	10x400x450x40	14x400x450x40	28x400x450x40
Defrosting	Heated door defrosting			
Control & display	Microprocessor digital control & LED display			
Safety device	Back-fill system ,auto purge system			
Power source	220VAC, 50,60Hz,			
Overall (WxDxH)	110x190x190mm	110x190x190mm	180x220x190mm	180x250x190mm
Weight	215 KG	250 KG	290 KG	350 KG

Option

- 1) Vacuum pump
- 2) Vacuum controller
- 3) Stoppering system

Systemic Diagram



Vacuum Pump & Accessories

Model	Specification
MVP-06	100 L/min
MVP-12	200 L/min
MVP-24	400 L/min
MVP-36	600 L/min
Vacuum: 1.5x10 ⁻³ Torr	

Soda Acid Trap
HEPA filter
Inlet Filter
Exhaust Filter

Clear Dry Chamber

General Use	
Model	Specification
CG3	Bulk tray unit x 3

Heating Plate	
Model	Specification
CH3	Bulk tray unit x 3 Heating plate x 4 Temp. control unit Temp. sensor x 3

Stoppering System	
Model	Specification
CS2	Bulk tray unit x 2 Sealing device Stoppering press

Dry Chamber

Drum Dry Chamber	
Model	Specification
FDC-12	12 port x 1/2" valve 230 Dia. x 275H(mm)
FDC-18	18 port x 3/4" valve 300 Dia. x 320H(mm)

Manifold Dry Chamber	
Flask	Ample
FMC4 / 4ea	AMC24 / 24ea
FMC8 / 8ea	
FMC12 / 12ea	

Flask & Flask Accessories

Flask Valve / FV34 (3/4")
Adapter (Band / Straight / Ample)

Complete Flask	
Model	Specification
CF40	40ml
CF80	80ml
CF120	120ml
CF150	150ml
CF300	300ml
CF600	600ml
CF900	900ml
CF1200	1200ml
CF2000	2000ml



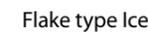
VS-625NS



Snow type Ice



IF-100



Flake type Ice

Features

- These units product flaked or snow type ice for laboratory
- The unit turn off automatically when the storage bin is full and when there is no water
- Model VS-625NS of rolling curve the form of snow ice
- Model IF-100 of screw turbine system provides uniform flakes and minimize liquid residue during

Specifications

Model	VS-625NS	IF-100
Ice type	Snow type	Flake type
Production capacity	50 KG / day	150 KG / day
Chamber (WxBxH)	300x410x200 mm	450x450x500 mm
Storage	25 liter	100 liter
Refrigerator	1/3 Hp	1/2 Hp
Water supply	External / internal supply	
Material	Stainless&Steel+ABS	Stainless & Steel
Door	Front glass door	Front sliding
Safety device	Power breaker, Water & Inventory level alarm	
Power source	220VAC, 50/60Hz, 1HP	
Overall (WxDxH)	360x475x615 mm	1000x600x1000 mm
Weight	33 KG	180 KG

Ice Cube Maker



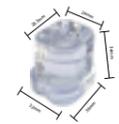
SCI-035



SCI-050 /090



SCI-120A



Features

- Approved CE&ETL and sanitation, easy volume adjustment controlled by microprocessor
- Crystal clear ice production and clean storage.
- High density urethane foaming insulation keep the ice for long and durable stainless steel exterior

Specifications

Model	SCI-035	SCI-050	SCI-090	SCI-120A
Production capacity	35 KG	55 KG	95 KG	125 KG
Storage Capacity	10 KG	13 KG	45 KG	45 KG
Compressor	0.37HP	0.55HP	0.75HP	1.0HP
Refrigerant	R-134A		R-404A	
Refrigerant	Air cooled			
Material	Stainless steel, Durable & Rust less SUS304			
Power source	220VAC, 50/60Hz, 1PH			
Power Consumption	400W	800W	1100W	1400W
Overall (WxDxH, mm)	403x460x757	523x635x902	758x648x1125	750x656x1136
Weight	50 KG	58 KG	90 KG	102 KG

High Speed Centrifuge

Large Capacity Centrifuge



ULTRA 5.0



SUPRA 22K



MEGA 17R

Features

- One Chip microprocessor control
- Exclusive application using versatile fixed angle rotors, swing bucket, vertical & horizontal continuous flow rotors.
- Display and control RCF integral running , RCF/RPM calculation and rotor recognition.
- Input of temp. limit ensure proper temp. control, and feed back control system for automatic half-Vacuum

Specifications

Model	Ultra 5.0	Supra 30K	Supra 22K	Mege-17R
Max. Speed	50,000 rpm	30,000 rpm	22,000 rpm	17,000 rpm
Max. RCF	254,435 xg	100,620 xg	53,029 xg	31,050 rpm
Max. Capacity	250ml x 6	1000ml x 4		85ml x 6
Temp. Range	-10°C to +40°C			
Timer	99hrs, 59 min, 59 sec, Hold			
Accel / Decel	10 segments			
Programmability	100 memories, 10 rotors	100 memories, 15 rotors	10 memories, 10 rotors	
Digital Display	RPM, RCF, Time, Tepm., Temp. limit, Program, Accel/Decel time, Rotor Number, Rotor Radius, Jw2df, Self Test			
Power Source	220VAC, 50/60Hz, 4.0 Kw / 3.9 Kw / 3.4 Kw / 1.2 Kw			
Overall (WxDxH)	710x1000x1260 mm	668x801x891 mm	550x600x865 mm	
Weight	430 KG	330 KG	230 KG	140 KG

Option: Angle Rotor (Tube Capacity / Tube per Rotor)

Ultra 5.0	Mega-17R	Supra 30K, 22K	Adaptor
1.5/2.0ml x 24	1.5/2.0ml x 36	1.5/2.0ml x 36	0.2ml, 0.5ml
10ml x 12	10ml x 12	10ml x 12	
13.5ml x 8	15ml x 12	15ml x 12	
13.5ml x 12	15ml x 12	15ml x 12	(Falcon tube)
38.5ml x 6	50ml x 6	50ml x 6	(Falcon tube)
38.5ml x 8	50ml x 6	50ml x 6	15(16)ml, 50ml
50ml x 8	50ml x 8	50ml x 8	
94ml x 6	85ml x 6	85ml x 6	
250ml x 6		250ml x 6	
		250ml x 4	
		500ml x 6	
		1000ml x 4	



Continent 512R



Combi-514R



Combi-408

Features

- Using bucket style 750ml high-capacity
- Ergonomically arranged control and display
- Eco-friendly CFC free freezing system
- Door lock, emergency lock recognition and auto rotor recognition.
- 10 steps for acceleration and deceleration for delicate liquid experiment
- Spin down (Pulse function)
- RPM/RCF auto calculation
- Memory for saving experiment condition
- lid latch by motor

Specifications

Model	Continent 512R	Combi-514R	Combi-408
Max. Speed	Swing rotor 4,500 rpm	4,500 rpm	4,000 rpm
	Angle rotor -	15,000 rpm	8,000 rpm
Max. RCF	Swing rotor 5,096 xg	4,392 xg,	3,515 xg
	Angle rotor -	24,878 xg	8,279 xg
Max. Capacity	Swing rotor 6 x 750 ml	4 x750 ml	4 x750 ml
	Angle rotor -	6 x 250 ml	6 x 85 ml
Temp. Range	-10°C to +40°C		
Timer	99hrs, 59 min, 59 sec		
Accel / Decel	10 segments		
Digital Display	RPM, RCF, Time, Program, Accel/Decel time, Rotor Number, Rotor Radius		
Power Source	220VAC, 50/60Hz, 3.4 Kw / 2.0 Kw / 1.5 Kw		
Overall (WxDxH)	668x801x891 mm	723x665x387 mm	530x676x400 mm
Weight	230 KG	112 KG	70 KG

Option: Rotor & Accessories

Continent 512R	Combi-514R / Combi-408
1) Wind shield Swing Rotor (6 x 750ml)	1) Swing rotors (4 x 500ml, 4 x 750ml)
2) Round bucket set (750 ml)	2) Round bucket set (500, 750ml)
3) Adapter (F=falcon tube)	3) Adapter (F=falcon tube)
5ml x 26	For 4 x 500ml For 4 x 750ml
10ml x 26	5ml x 9 5ml x 26
15ml x 19	10ml x 9 10ml x 26
50ml x 7	15ml x 9 15ml x 19
250ml x 1	50ml x 4 50ml x 7
500ml x 1	100(85ml) x 1 250ml x 1
50ml x 5 (F)	250ml x 1 500ml x 1
15ml x 14 (F)	500ml x 1 50ml x 5 (F)
	15ml x 14 (F)
3) Sealing cap	7) Sealing cap
4) Micro Titer Plate rack + MTP	8) Micro Titer Plate rack + MTP
	9) Angle Rotor (F=falcon tube)
	0.2ml x 48
	1.5/2.0ml x 24 0.2ml, 0.5ml Adapter
	1.5/2.0ml x 36 0.2ml, 0.5ml Adapter
	10ml x 12
	15ml x 12 (F)
	15ml x 12
	50ml x 6 (F)
	50ml x 6
	50ml x 8
	85ml x 6
	85ml x 10
	250ml x 6
	500ml x 6
	1000ml x 4
	1000ml x 6

Multipurpose Centrifuge

Mirco Centrifuge



Fleta-5

Fleta-40

Fleta-40P

Features

- Digital display of RPM, RCF, Temp., Temp Limit, program Brake and Time
- Extensive choice of versatile rotors
- Maintenance-free, quiet operation and brush less motor
- Input of the Temp. Limit ensure proper Temp. Control Interlocking door for safety, gentle start-up and braking
- Display of abnormality, imbalance, door-open, setting failure and over speed.

Specifications

Model	Fleta-5	Fleta-40	Fleta-40P
Max. Speed	Swing rotor 5,500 rpm	Angle rotor 4,000 rpm	4,000 rpm
Max. RCF	Swing rotor 6,131 xg	Angle rotor 2,790 xg	3,088 xg
Max. Capacity	Swing rotor 32 x 15 ml	Angle rotor 24 x 15 ml	6 x 50 ml 4 x 85 ml
Motor	BLDC 700W	AC induction 400W	
Timer	99hrs, 59 min, 59 sec		
Accel / Decel	10 segments	20 sec / 20 sec	
Digital Display	RPM, RCF, Time, Program, Accel/Decel time, Rotor Number, Rotor Radius		
Power Source	220VAC, 50/60Hz, 1.0 Kw / 0.5 Kw / 0.5 Kw		
Overall (WxDxH)	570x475x325 mm	448x531x286 mm	
Weight	40 KG	18 KG	

Option: Rotor & Accessories

Fleta-5

- 1) Swing rotor (32 x 15 ml)
- 2) Rack Holder
- 3) Adapter (F=falcon tube)
 - 15ml x 4 (F)
 - 15(16)ml x 8
 - 50ml x 1 (F)
 - 50ml x 1
 - 50ml x 2
 - 3ml x 20
 - 5ml x 14
 - 10ml x 12

Fleta-40, 40P

- 1) Angle Rotor
 - 15ml x 12
 - 15ml x 24
 - 15/85ml x 4
- 2) Swing Rotor (6 x 50ml)
- 3) Bucket



- 4) Swing rotor for Micro Titer Rack, Cell Culture, DWP



Smart -R17

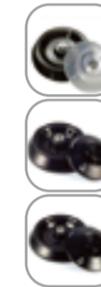


Features

- Detecting over speed, over heat, system error and door opening
- Patented compressor technology reduces vibrations and protects your sample
- Exceptionally quiet operation, with or without rotor lid
- Easy to read interface displays both speed (rpm) and force (rcf)
- Easy to use knobs



Smart -15

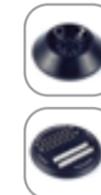


Features

- Ergonomically arranged and designed
- Speedy acceleration and deceleration
- Detecting imbalance
- Applied aluminium steel chamber to reduce rotational friction heat



Micro-12



Features

- Electron sensitive non-contacting door sensor
- Avoidance of contamination by carbon powder from motor
- Changeable RPM during operation
- Patented air-flow cooling design to minimize noise and heat

Specifications

Model	Smart-R17	Smart-15	Micro-12
Speed	17,000rpm	15,000 rpm	13,500 rpm
Max. RCF	23,005 xg	21,055 xg	12,032 xg
Rotor	24 x 1.5/2.0ml / 18 x 1.5/2.0ml		12 x 1.5/2.0ml
	32 x PCR 0.2ml		4PCR strip(16) x 0.2ml
Temp. range	-10 to +40°C	-	-
Timer	99min, 59sec, Pulse, Free run		15 min
Display	Rpm, rcf, Time, Acc/Dec, Rotor number, Prog		Analog Dial
Program	10 memory		-
Driven motor	AC Induction Motor / 400W		AC Induction Motor / 65W
Power Source	220VAC, 50/60Hz, 0.7 Kw	0.6 Kw	0.5 Kw
Overall (WxDxH)	295x553x282 mm	293x380x242 mm	190x202x129 mm
Weight	30 KG	15 KG	1.5 KG

Blood Separation Centrifuge



Option: Rotor & Accessories

- 1) WS.Swing Rotor (6 x 2,400ml)
- 2) Bucket (2,400ml, 1,600ml)
- 3) Blood Bag Adapter (400ml, 320ml)



Features

- Microprocessor control and LED display
- Maintenance-free, noiseless, and high efficiency AC induction motor
- Positive action brake system and interlocking door for safety
- Set condition can be changed while spinning
- Display of abnormality: imbalance, door open, Set failure, over speed

Specifications

Model	Component 12R
Max. Speed	4,800 rpm
Max. RCF	7,212 xg
Capacity	6 x 2400ml
Temp. range	-10 to +40°C
Timer	99hr, 99min, 59sec
Deceleration	10 steps
Programmability	10 memory, 10 rotor
Display	RPM, RCF, Time, Temperature, Program, Accel/Decel, Rotor number, Rotor Radius
Power source	220VAC, 50/60Hz, single phase, 3 Kw
Overall (WxDxH)	840x980x970mm
Weight	510 KG

Hematocrit Centrifuge



Features

- Designed for centrifugation for sample in the capillary tubes
- Economic price, simple design and analog timer
- Aluminum alloy rotor and dynamic electronic brake system
- The unit maintains stability during operation and the interlock lid is safe

Specifications

Model	HA200
Max. Speed	11,800 rpm
Max. RCF	14,800 xg
Max. Capacity	24 x 0.07ml
Capillary tubes	1.75φ x 75 mm
Timer	0~30 minutes
Motor	High torque DC Motor
Control & display	Analog control & display
Cooling type	Air-cooling
Rotation	Counterclockwise
Power source	220VAC, 50/60Hz, 1P, 80W
Overall (WxDxH)	255x310x220mm
Weight	10.5 KG

- Accessories** | 1) Rotor 2) Reader

Rotary Evaporator



HS-2005S-N



HS-2005V-N



HS-5SP

Features

- Visual display of rotating speed, temperature of the water bath and vapor
- Excellent in durability of the body and every area of contacting vapor
- PTFE sealing method is adopted for glass contacted area
- Easy for washing and removal of viscous material with evaporating flask of dia. 100mm

Specifications

Model	HS-2005S-N	HS-2005V-N	HS-10SP	HS-20SP
Rotational Range	20 - 280 rpm		10 - 180 rpm	
Drive System	Brushless DC motor			
Lift System	Motorized automatic			
Glass Material	Pyrex			
Evaporating Capacity	50 - 3000ml		10L	20L
Receiving Capacity	50 - 3000ml		5L	10L
Pressure & Vacuum	0~101.3 bar & 710 mmHg		710~760mmHg	
Bath Capacity	4.3 liter			
Bath Temperature	20 - 180°C			
Control & Display	Digital LED display			
Safety Device	Over temp. limiter, Over current protection			
Power source	220VAC, 50/60Hz, 2.5A			
Overall (WxDxH, mm)	730x410x630	620x410x870	1000x550x1900	
Weight (KG)	19.5	19.5	78	

Accessories

- 1) Water Bath / Model : HS-3001
- 2) 1 liter of glass set

Option

- 1) Electric Aspirator / Model: HS-3000
- 2) Cooling Water Circulator / Model: HS-3005 N
- 3) Cold Trap Bath / Model: HS-3003
- 4) Vacuum Controller / Model: HS-0245
- 7) Diaphragm Vacuum Pump / Model: HS-0153
- 8) Oil Rotary Vacuum Pump / HS-3004
- 9) Electric Aspirator / Model: HS-3000

Rotary Evaporator Accessories

Rotary Evaporator Glass Set

Rotary Evaporator

HumanLab Inc.

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Cooling Water Circulator / HS-3005N

Capacity	4ℓ
Bath Dimension (DxH)	φ190x200
Circulator Pump	Magnet 20W Max. flow 15ℓ/min
Temp.Range	Down to ~ -20°C
Controller	FND Controller
Refrigerator	1/3HP
Refrigerant	134A
Power source	AC 230V 50/60Hz, 334W
Overall (WxDxH)	250x510x510
Weight (KG)	28

Cold Trap Bath / HS-3003

Capacity	4ℓ
Bath Dimension(DxH)	φ190x200
Type	Glass Trap
Temp.Range	Down to ~ -40°C
Controller	FND Controller
Refrigerator	1/3HP
Refrigerant	134A
Power source	AC 230V 50/60Hz, 334W
Overall (WxDxH)	250x510x510
Weight (KG)	28

Diaphragm Vacuum Pump / HS-0153

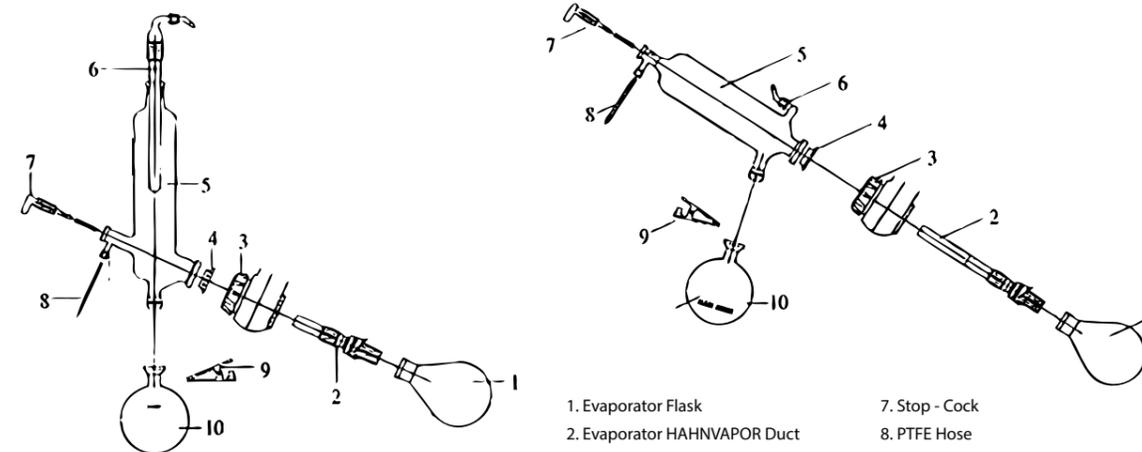
Delivery(L/min)	20
Ultimate vacuum (mmHg)	750
Connectors for tube (mm)	OxD 10
Operating current	0.5A
Material	PTFE or PE
Power source	230V/50Hz, 120W
Overall (WxDxH)	180x220x130
Weight (KG)	9.3

Electric Aspirator / HS-3000

Pump Capacity	18ℓ/minx2EA
Bath Capacity	8ℓ
Motor Power	150W
Material of Bath	Polypropylene
Material of Aspirator	Metal 2 pcs
Safety	Fuse
Power source	AC 220V 50/60Hz 0.7A
Overall (WxDxH)	320x240x350
Weight (KG)	6

Vacuum Controller / HS-0245

Vacuum Control Range	1mmHg and 760mmHg (±3%)
Control&Display	Digital, Vacuum pump On/Off
Power source	AC 220V 50/60Hz 0.7A
Overall (WxDxH)	160x130x95
Weight (KG)	1.8



- 1. Evaporator Flask
- 2. Evaporator HAHNVAPOR Duct
- 3. Flange Screw Coupling
- 4. Vacuum Seal
- 5. Evaporator Condenser
- 6. Vacuum Connector
- 7. Stop - Cock
- 8. PTFE Hose
- 9. Receiver Flask Clamp
- 10. Receiver Flask
- 11. Cooling Finger
- 12. Condenser Cover



- 1. HAHNVAPOR duct (24/40)
ℓ=312mm Model: HS-0100
HAHNVAPOR duct (24/40)
ℓ=200mm Model: HS-0150
- 2. Bulbs for flask (24/40)
100mℓ Model: HS-0200
250mℓ Model: HS-0201
- 3. Four bulbs for flask (24/40, 14/20)
Model: HS-0300
- 4. Stop cock (19/38)
ℓ=450mm / 590mm Model: HS-0400
- 5. Connecting adapters
(up) 24/40, (down) 14/20 or (up) 24/40, (down) 24/40
Model: HS-0500
- 6. Evaporating flask (24/40)
Capacity 50mℓ Model: HS-0605
100mℓ Model: HS-0610
250mℓ Model: HS-0625
500mℓ Model: HS-0650
1ℓ Model: HS-0700
2ℓ Model: HS-0800
3ℓ Model: HS-0900
- 7. Receiving flask (35/20)
Capacity 100mℓ Model: HS-0930
250mℓ Model: HS-0940
500mℓ Model: HS-0950
1ℓ Model: HS-0960
2ℓ Model: HS-0970
3ℓ Model: HS-0980



Rotary Evaporator

HumanLab Inc.

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Digital Water Bath



DWB-11

Features

- Economy utility bath are safe and easy to use
- Stainless steel tank and epoxy coated exterior are corrosion resistant
- PID control with digital LED display shows set & actual temperature
- Over temp. protection cut-off provides built-in safety

Specifications

Model	DWB-11	DWB-22
Capacity	11 liter	22 liter
Chamber (WxBxH)	240x300x150 mm	500x290x150 mm
Temp. Range	Amb.+5 to +100°C / ±0.1°C at 37°C	
Timer	Digital / 48hr or continuous	
Material	Stainless steel + Powder coated steel plate	
Safety device	Over temp. protector, over current breaker	
Control & display	Microprocessor PID control & digital display	
Power Source	220VAC, 50/60Hz, 800W / 1500W	
Overall (WxDxH)	270x350x210 mm	570x360x210 mm
Weight (KG)	8 KG	13 KG

Features

- Two or three chambers have independent control at different temp.
- Seamless stainless steel bath capacity of 11 liter
- Precise temp. control and built in safety and convenience

Specifications

Model	MWB-11-2	MWB-11-3
Capacity	2 x 11 liter	3 x 11 liter
Chamber (WxBxH, mm)	2x(302x240x150)	3x(302x240x150)
Temp. Range	Amb.+5 to 99°C ±0.1°C	
Timer	Digital, 99hr/59min	
Material	Stainless steel bath & powder coated steel	
Safety device	Over temp. limiter	
Control & display	Microprocessor PID control & digital display	
Power Source	220VAC, 50/60Hz, 700W x 2 or 3	
Overall (WxDxH)	600x450x350 mm	970x450x350 mm
Weight	25 KG	35 KG

Features

- Precision digital PID controller provides high accuracy and uniformity
- Stainless steel bath and ceramic fiber insulation stands high temperature
- Over temp. and Over current breaker ensure user safety

Specifications

Model	HOB-11	HOB-22
Capacity	11 liter	22 liter
Chamber (WxBxH)	300x250x150 mm	500x300x200 mm
Temp. Range	Amb. +5 to 250°C ±1.0°C / uniformity: ±3°C	
Timer	Digital / 99hr,59min or continuous	
Circulation	Pump with AC Motor	
Material	Stainless steel + Powder coated steel plate	
Safety device	Over temp. protector, over current breaker	
Control & display	Microprocessor PID control & digital display	
Power Source	220VAC, 50/60Hz, 2000W / 3000W	
Overall (WxDxH)	500x300x450 mm	630x330x420 mm
Weight	15 KG	20 KG

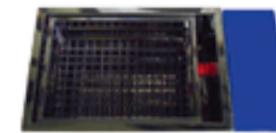


HOB-11

Shaking Water Bath



SHWB-30



Spring wire rack with platform

Option

- 1) Spring wire rack with platform
- 2) Flask clamp (100, 250, 500, 1000, 2000ml) with platform

Features

- Economical digital shaking water bath has adjustable temperature, stroke length, and speed give you value and versatility.
- Seamless, corrosion resistant stainless steel chamber
- View actual temp, set points and shaking rpm on display

Specifications

Model	SHWB-30	SHWB-45
Capacity	30 liter	45 liter
Chamber (WxBxH)	500x300x200 mm	600x300x250 mm
Temp. Range	Amb. to +100°C ±0.5°C	
Timer	Digital, 99hr, 59min	
Material	Stainless steel + Powder coated steel plate	
Control & Display	Microprocessor PID control & digital display	
Stroke & speed	Reciprocating 30mm / 20 -180 time/min	
Safety Device	Over temp. limiter, Over current breaker	
Power Source	220VAC, 50/60Hz	
Overall (WxDxH)	650x450x350 mm	770x450x400 mm
Weight	30 KG	38 KG

Features

- Artificial intelligence system maintains precise thermostatic control
- Patented DC motor provides low noise and no vibration
- LED display indicates temp. speed and state of power failure

Specifications

Model	NB-303	NB-304
Motion	Orbital	Reciprocating
Bath Capacity	Max 10 liter, Level 6.5 liter	
Chamber (WxBxH)	250x320x150mm with spring rack	
Temp. Range	Amb. +5 to +80°C / ± 0.3°C at 37°C	
Timer	up to 47h 59min & continuous	
Stroke & Speed	25mm / 30 to 200rpm, Plate Type Brushless DC motor	
Material	Stainless steel + Powder coated steel plate	
Control & display	Microprocessor PID control & digital display	
Power Source	220VAC,50/60Hz, 300W	
Overall (WxDxH)	315x345x260 mm	
Weight	14 KG	

- Option** 1) Lid for high temperature



NB-303

Refrigerated Bath Circulator

Features

- Rapid heating and cooling throughout the entire temperature.
- Refrigerated circulating Bathes feature Digital PID temperature control with drift and adjustable high temp. cut-off.
- LED temperature display with a resolution of 0.1 °C is clear and easy to read.
- Pump Pressure is adjustable, warning system for low liquid level.

Specifications

Model	RBC-11	RBC-22
Capacity	11 liter	22 liter
Chamber (WxBxH)	130x245x150 mm	330x300x150 mm
Temp. Range	-20 to +100°C ±0.5°C at 37°C	
Timer	Digital, 99 hr 59 min	
Heating Output	600W	1200W
Circulation Pump	6 - 8 liter/min	
Refrigerator	1/4Hp	1/2Hp
Material	Interior: Stainless steel Exterior: Powder coated steel plate Insulation: Ceramic fiber	
Control & Display	Microprocessor PID control & digital display	
Safety Device	Over temp. limiter, Low level switch	
Power Source	220VAC, 50/60Hz, 1700W	
Overall (WxDxH)	420x360x700mm	650x460x830mm
Weight	35 KG	45 KG

Option | 1) Programmable microprocessor controller



RBC-11

Heated Bath Circulator

Features

- Digital controller bath features ±0.5 °C stability and 100 °C temp. limit
- Pump pressure is adjustable
- Features Digital PID Temp. control with drift compensation temperature
- Warning system for low level and high temperature cut-off.

Specifications

Model	HBC-11	HBC-22
Capacity	11 liter	22 liter
Chamber (WxBxH)	300x250x150 mm	500x300x150 mm
Temp. Range	Amb. +5 to 99°C ±0.5°C at 37°C	
Timer	Digital, 99 hr 59 min.	
Heating Output	800W	1200W
Circulation Pump	6 - 8 liter/min	
Material	Interior: Stainless steel Exterior: Powder coated steel plate Insulation: Ceramic fiber	
Control & Display	Microprocessor PID control & digital display	
Safety Device	Over temp. limiter, Low level switch	
Power Source	220VAC, 50/60Hz	
Overall (WxDxH)	340x290x450 mm	540x340x450 mm
Weight	15 KG	20 KG

Option | 1) Programmable microprocessor controller



HBC-11

Soxhlet Water Bath

Features

- This soxhelt water bath are designed to gently warm samples, evaporate liquids, and melt solids such as agar.
- Concentric ring can be removed from inner cover to accommodate various vessel shapes and sizes
- Four or Six holes model provide bath temperature up to 98°C

Specifications

Model	SWB-4	SWB-D-4	SWB-6	SWB-D-6
Type	4 Hole opening		6 Hole opening	
Capacity	11 Liter		22 Liter	
In Size (WxDxH)	330x320x100 mm		890x150x100 mm	
Heater Capacity	1000 W		2000 W	
Temp Range	Amb to 98°C			
Controller	Electronic Controller Digital PID Controller (SWB-D Type)			
Timer Range	99 Min 59 Sec (SWB-D Type)			
Controller	Digital Display (SWB-D Type)			
SenSor	PT-100Ω (SWB-D Type)			
Material Bath	Stainless Steel			
Out	Steel Plate With Powder Coating			
Heater	Stainless Steel			
Safety Device	Over Current Circuit Breaker			
Power Source	220VAC, 50/60Hz			
Overall (WxDxH)	370x330x280 mm		960x260x250 mm	
Weight	12 KG		13 KG	

Option | 1) Programmable microprocessor controller



SWB-4



SWB-6

Extraction Mantle, Bath

Features

- These extraction mantle are designed for use in distillation, extraction and kjeldahl works
- Each opening has temp. regulator by bimetallic thermo controller
- The casing is made of stainless steel with excellent chemical resistance
- Moulded silica insulation is achieved The surface temperature are very low

Specifications

Model	Capacity	Heating	Dimension (mm)	Weight (KG)
EAM-9201-03	100ml x 3	80W x 3	450x240x80	4.6
EAM-9202-03	250ml x 3	150W x 3	520x260x95	5.8
EAM-9203-03	500ml x 3	260W x 3	580x280x105	6.7
EAM-9204-03	1000ml x 3	380W x 3	670x310x115	7.9
EAM-9201-06	100ml x 6	80W x 6	950x240x80	9.2
EAM-9202-06	250ml x 6	150W x 6	1040x260x95	11.6
EAM-9203-06	500ml x 6	260W x 6	1150x280x105	13.5
EAM-9204-06	1000ml x 6	380W x 6	1340x310x150	15.8

- Max. temp. range: 450 °C
- Max. stirring speed: 100 - 1200 rpm (EAMS series only)

Option | 1) Glassware set
2) With stirring function (EAMS series)
3) Digital display (EAMD series)



EAM-9201-03



EAM-9201-06

Viscosity Bath Circulator

Features

- Precision Digital PID Controller provides high accuracy and uniformity
- Seamless stainless steel Bath and durable powder coated case
- Corrosion resistant stainless steel Bath and durable powder coated case
- Powerful circulation Pump enhance Temp. uniformity.

Specifications

Model	VB-30	VB-52
Capacity	30 liter	52 liter
Chamber (WxBxH)	350x300x300mm	500x300x350mm
Temp. range	Amb. +5 to 99°C ±0.3°C at 37°C	
Timer	Digital, 99hr/59min & continuous	
Material	Interior	Stainless_steel
	Exterior	Powder coated steel plate
	Window	Tempered safety pair glass
Circulation pump	Magnetic drive, Max. 30 liter/min	
Heater	2 Kw	3 Kw
Control & display	Microprocessor PID control & digital display	
Safety device	Over temp protector, over current breaker	
Power Source	220VAC, 50/60Hz	
Overall (WxDxH)	575x400x380mm	725x400x430mm
Weight	35 KG	45 KG



VB-30

Features

- Precision Digital PID Controller provide high accuracy and uniformity
- Front and back Glass window for sample viewing
- Corrosion resistant stainless steel Bath and durable powder coated case
- Powerful circulation Pump enhance Temp. uniformity.

Specifications

Model	WVB-30	WVB-52
Capacity	30 liter	52 liter
Chamber (WxBxH)	350x300x300mm	500x300x350mm
Temp. range	Amb. +5 to 100°C ±0.1°C / ± 0.2°C uniformity	
Timer	Digital, 99hr/59min & continuous	
Material	Interior	Stainless_steel
	Exterior	Powder coated steel plate
	Window	Tempered safety pair glass
Circulation pump	Magnetic drive, Max. 30 liter/min	
Heater	2 Kw	3 Kw
Control & display	Microprocessor PID control & digital display	
Safety device	Over temp protector, over current breaker	
Power Source	220VAC, 50/60Hz	
Overall (WxDxH)	590x380x420mm	730x380x470mm
Weight	40 KG	50 KG

Option | 1) Viscometer Holder



WVB-30



Flat Lid with Viscometer Holder



Viscometer Holder

Orbital Flask Shaker

Features

- Wide platform and stable orbital motion
- Possible to operate in cold chambers and incubators
- Maintains precise speed and time control by microprocessor
- Powerful AC motor drive system



OS-160

Option

1) Flask Clamp



Model	100ml	250ml	500ml	1000ml
OS-160	28ea	14ea	10ea	6ea
OS-420	70ea	36ea	28ea	14ea

- 2) Spring wire rack OS-160 (375x375mm) / OS-420 (675x575mm)
 3) Universal plate OS-160 (375x375mm) / OS-420 (675x575mm)

Specifications

Model	OS-160	OS-420
Motion	Orbital	
Platform (WxL)	370x370mm	670x570mm
Speed range	20 - 300 rpm ±1 %	
Amplitude	30 (standard)mm	
Timer	59min/59 sec or continuous	
Drive system	AC motor & belt drive	
Control & display	Microprocessor digital & LED display	
Power source	220VAC, 50/60Hz	
Overall (WxDxH)	400x430x200mm	700x630x200mm
Weight	28 KG	35 KG

Features

- Maintain precise speed and time control by microprocessor
- Digital LED display indicates temperature, time and power failure
- Powerful AC motor drive system
- Possible to operate up to 20 - 300 rpm, 30mm amplitude
- Selectable various shakers in our shaker line
- Stacker is made of steel plate or aluminum profile (option)

Specifications

Model	OS-160 x 4	OS-420 x 3
Speed range	20 - 300 rpm ±1 %	
Amplitude	30 (standard)mm	
Timer	59min/59 sec or continuous	
Drive system	AC motor & belt drive	
Stacker material	Steel plate / Option: Aluminum profile	
Control & display	Microprocessor digital & LED display	
Power source	220VAC, 50/60Hz	
Overall (WxDxH)	700x650x1950mm	1000x750x1450mm
Weight	150 KG	180 KG



OS-160x4

Separately Funnel Shaker



J-MSFS

Option

- 1) Shaking rack for flask(clamp type)
- 2) Shaking rack for test tube(spring type)
- 3) Shaking rack for bottles or flasks(bar type)
- 4) Safety cover and rubber foot(4 ea) are included with shaking rack
- 5) Funnel flask holders (max. additional 4ea : 250mℓ)

Features

- This shaker use for cultivation, maximizing, extraction, stirring applications which require the use of separately funnel or flask,
- Mix your samples at low speeds for a gentle perpendicularly motion, or at higher speed for vigorous action
- Digital time setting & display and analog speed control
- Order hold cartridge for flask, test tube and funnel.

Specifications

Model	J-MSFS	
Shaking type	Reciprocating type (vertical or horizontal shaking)	
Plat form size (WxD)	300x400 mm	
Shaking	Controller	Dial knob / digital display
	Speed	60 ~ 350 rpm / Stroke: 40mm
	Timer	99min. or infinity
	Capacity	Separatory funnel 250, 500, 1000mℓ (250/500/1,000mℓx6ea) Erlenmeyer flask holder 250 x12ea
Motor (BLDC)	60W	
Function	Speed controller and timer	
Funnel holders	Standard	6 funnel holders included(3 per side) additional 4 funnel holders can be installed (option)
	Capacity	Under 1,000 mℓ : 6 ea (3 per side)
Material	Body	Steel plate with powder coated finish
	Flask holder	Stainless steel plate
Power Source	AC 230V 50/60Hz 1phase 0.3A	
Overall (WxDxH)	660x500 mm / 515x480 mm	
Weight	48 KG	

Refrigerator Chiller

Features

- Use these flow-through refrigerated chiller that either lack refrigeration or need additional cooling
- Built-in circulation pump, refrigerator and cooling water line
- Microprocessor PID controller make them idea for any application that requires accuracy and reliability

Specifications

Model	HB-207S	HB-207M
Chamber (WxBxH)	18 Liter (300x300x200)	36 Liter (350x350x300)
Temp.range	-20 to + 20°C	
Pump Capacity	15 Liter/min	30 Liter/min
Refrigerator	1/3 Hp, 800 Kcal/hr	1/2 Hp, 1500Kcal/hr
Inlet / Outlet	ID 10 mm silicon tube	
Timer	Digital, 99hr/59min or continuous	
Material	Stainless steel interior and powder coated steel	
Control&display	Microprocessor PID control & digital display	
Safety device	Over current limiter, Low water cut-off, Alarm	
Power source	220VAC, 50/60Hz	
Overall (WxDxH)	450x600x650mm	500x650x750mm
Weight	35 KG	50 KG



HB-207S

Sieve Shaker



J-VSS



J-SRT

Features

- J-VSS
- Economical sieve shaker produces constant, accurate result
 - For use with material coarse than 100 mesh
 - Digital hertz control permits a quiet and reliable operation
- J-SRT
- Reproduce The rotating and tapping motions of hand-sieving but with more uniform motion
 - Shaker is actuated by a built-in analog timer and timing belt
 - This roto-tap sieve shaker for 203 dia. sieves hold up to 6 -full height with top cover and receiving pan

Specifications

Model	J-VSS	J-SRT
Shaking method	Vibration	Roto-Tap
Shaking speed	130 cycles/min	240 nos/min
No of sieves	(203Dx41 H) x 7	(203Dx41 H) x 6
Motion	Interval, 4 modes	Hammer tap
Timer	Digital, 60min	Analog
Drive	Magnet 500W	DC 1/3Hp
Material	Steel casting Steel plate	
Control & display	Digital & LED display Analog	
Power Source	220VAC, 50/60Hz, 2.3A / 1.2A	
Overall (WxDxH)	360x460x620 mm	680x530x670 mm
Weight	25 KG	75 KG

- Option** | 1) Sieves: 203 dia. x 41 H(mm) / 20 - 850 μm

Cold Trap

Features

- Realized constructive precision, low noise, small size of the body
- Very effective moisture capture and frozen ices discharge easily
- Temp. indicates Digital LED and effective moisture capture
- 2 glass traps are supplied as option

Specifications

Model	CT-05-40	CT-05-70
Bath volume	4.8 liter (200Dx220L)	
Temp. range	Down to -40 °C	Down to -70 °C
Refrigerator	1/2 Hp with non CFC refrigerant	
Safety device	Over current breaker	
Material	Stainless steel + epoxy coated steel plate	
Insulation	Polyurethane foam	
Power source	220VAC,50/60Hz	
Overall (WxDxH)	300x400x610mm	380x540x610mm
Weight	45 KG	75 KG



CT-05-40

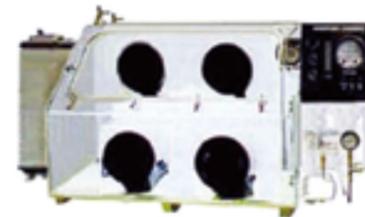
Glove box



SK-G001-AUTO



SK-G001-STD



SK-G005-B2-AUTO



SK-G005-B2-STD



SK-G007



SK-G008

Features - Anaerobic Glove Box

- Typically designed for gas purge is achieved by pass box
- Equipped with a large size of detachable window to allow a big size of instrument into the chamber
- Pass box installed to introduce an auxiliary instrument and specimen etc without change of the environment

Specifications

Model	SK-G001-AUTO	SK-G001-STD
Chamber	770Wx470Dx470H(ID) / 800Wx500Bx500H(OD)	
Pass Box	260Wx240Dx240H(ID) / 260Wx240Bx240H(OD)	
Glove	Latex, 170Dx640L	
Vacuum	Pass box, 1 Torr	
Material	PMMA	
Control	Auto. pressure control	Manual valve control

Features - Vacuum Glove box

- Equipped with a big size of front door to be more convenience for inner observation and to allow test instrument and appliances
- A big size of pass box installed on the right to keep vacuum condition upto 1 Torr and carry test instrument into the chamber
- The filter for removal of humidity and residual oxygen with option

Specifications

Model	SK-G005-B2-AUTO	SK-G005-B2-STD
Chamber	1170Wx770Dx770H(ID) / 1200Wx800Dx800H(OD)	
Pass Box	410Wx380Dx430H(ID) / 460Wx430Dx480H(OD)	
Glove	Neoprene, 220Dx800Lx2	
Vacuum	Pass box, 1 Torr	
Material	PMMA	
Control	Auto. pressure control	Manual valve control

Features - Table Top Glove Box

SK-G007 : Useful for gas purge and sterile box

- Easy to carry large size f specimen or test instrument into the chamber
- Compact FL lamp and UV lamp Built-in to Sterilize the chamber

SK-G008 : Useful for sterile box and desiccator

- A big size of front door convenient to carry a large size of specimen
- Utilize for an environment free of contaminants and humidity which is provided by such desiccator as silica gel,molecular sieves with a blower

Specifications

Model	SK-G007	SK-G008
Dry Filter	-	Silica gel cup & blower
Chamber	800Wx550Bx500H (OD)mm	
Pass Box	240Wx220Bx220H (ID)mm	
Lamp	FL20W x1 , UV15Wx 1	
Glove	Latex, 170Dx650L	
Material	PMMA	
Utility	220V x 1, 110V x 1	



SK-C015



SK-C023



SK-C016



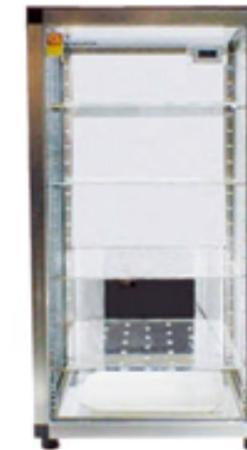
SK-C036



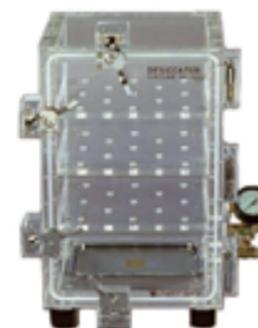
SK-C013



SK-C012



SK-C003



SK-V002



SK-V006

Features

- Automatically operate 24 hr-timer and to range 20-50% humidity(SK-C015)
- Designed for const. temp. +5 to 60°C (SK-C016)
- Typical auto.desiccator with hygrometer (SK-C23)
- Designed for humidity chamber (SK-C036)

Specifications

Model	Description
SK-C015	Auto Desiccator 600W x 3550 x 320H(mm) Humidity : 20 - 50%, Shelf x 2
SK-C016	Temperature Desiccator 620W x 3550x 345H(mm) Shelfx 2
SK-C023	STD Desiccator 475W x 3650 x 320H(mm) Shelf x 2, Tray x 1
SK-C036	Humidity Desiccator 475W x 3650 x 320H(mm) SUS Net x 5

Features

- Constructed aluminum frame and PMMA
- Convenience for use shelves,which are adjustable at interval of 50mm height
- Automatically humidity control (SK-C003)
- Designed to allow attachment of variety accessories
- Bigger size and the door is tightly sealed by catch

Specifications

Model	Description
SK-C013	575W x 5200x 770H(mm) Shelf x 2, Gel tray x 1
SK-C012	575W x 5200x 1020H(mm) Shelf x 4, Gel tray x 1
SK-C003	575W x 5200 x 1020H(mm) Shelf x 2 , gel tray x1 20% - Room Humidity

Features

- Useful for testing in the various condition and usable for desiccator alone
- Designed to reduce pressure up to 1 Torr and utilized for the vacuum storage

Specifications

Model	Description
SK-V002 - A	260W x 2800 x 41 OH(mm)
-B	300W x 2800 x 510H(mm) with Shelf x 3, Gel tray x 1
SK-V006 - A	260W x 1800 x 260H(mm)
-B	260W x 2000 x 360H(mm)
-C	260W x 180D x 460H(mm) with Shelf x 2, Gel tray x 1

Desiccator

Hot Plate & Magnetic Stirrer



HS-18



MS-18

Features

- Take This compact magnetic stirrer vigorous sample stirring
- Or, use it in the lab and eliminate the need for cumbersome extension cords
- Stirrer features step less speed control knob, ceramic coated top plate and corrosion resistant epoxy coated metal case
- Offered 2 models of different function each

Specifications

Model	HS-18	HS-30	MS-18	MS-30	MS500
Function	Hot Plate & Magnetic Stirrer		Magnetic Stirrer		
Top plate (WxL, mm)	180x180	300x300	180x180	300x300	110x110
Heater Capacity	680W	1400W			
Temp. Range	Max. 380°C	Max. 350°C			
Stirring Capacity	up to 5L	up to 15L	up to 5L	up to 15L	up to 10L
Stirring Speed(rpm)	100-1500	100-1300	100-1500	100-1300	up to 1500
Power Source	110/220VAC,50/60Hz				
Overall (WxDxH, mm)	200x310x107	310x430x120	200x310x107	310x430x120	110x135x50
Weight	3.6 KG	6.8 KG	3.4 KG	5.8 KG	0.5 KG

Multi-position Hot plate & Stirrer



HSD-326-01



HSD-120-03P

Features

- Systemized multi-position, independent heat and stirring
- Ceramic coated top plate resist acid and chemicals
- Accurate temp.control by high performance microprocessor
- Feed back control of temperature on the hot plate

Specifications

Model	HSD334-01	HSD326-01	HSD120-03P	HSD150-03P
No. of Position	4	6	3 individual	
Top plate (WxL, mm)	300x300	300x210	3x120x120	3x150x150
Heater Power	1400W	1200W	350W x 3	480W x 3
Stirring Capacity	4 x 1 liter	6 x 500ml	3 x 1 liter	3 x 2 liter
Stirring Range	100 - 1500 rpm			
Temp. Range	Max.350°C, Accuracy ±1°C		Max.350°C, Accuracy ±1°C	
Timer	Digital 99hr,59min			
Function	Clock / Anti-Clock wise, Auto reverse rotation			
Top plate Material	Ceramic coated aluminum plate			
Control & Display	Microprocessor feed back control & digital display			
Power Source	110 or 220VAC, 50/60Hz			
Overall (WxDxH, mm)	310x430x120	310x340x120	480x260x125	510x300x125
Weight (KG)	8	7	7.5	8.5

Digital Hot Plate & Magnetic Stirrer



HSD-180

Features

- High performance microprocessor Digital feed back control
- Feed back control of the temp. on ceramic
- Max. 380°C and ±1°C control accuracy by optional PT sensor
- Feed back control of speed & Digital display
- Included 99hr/59min digital timer
- The set value storage function; temp. rpm and timer
- Locking mode for experimental safety supported

Specifications

Model	HSD-180	HSD-330
Top plate (WxL)	180x180 mm	300x300 mm
Heater Capacity	680W	1400W
Temp. Range	Max. 380°C	Max. 350°C
Timer	Digital, 99hr/59min	
Stirring Capacity	up to 5L	up to 15L
Stirring Speed (rpm)	100-1500	100-1300
Control & display	M/processor feed back & digital display	
Power Source	110/220VAC, 50/60Hz	
Overall (WxDxH)	200x310x107 mm	310x430x120 mm
Weight	3.6 KG	6.8 KG

Option | 1) Temperature sensor set

Multi-position Magnetic Stirrer



MSM-204D



MSM-208D

Features

- Synchronous operation of 4 or 8 stirring points
- Increasing speed effectively by microprocessor control
- Ideal for use on incubators and climatic chambers
- Smooth start and change of the stirring speed

Specifications

Model	MSM-204D	MSM-208D
No. of Place	4 x 110	8 x 110
Top plate (WxL)	210x250 mm	210x470 mm
Stirring Capacity	4 x 500ml	8 x 500ml
Stirring Range	100 - 1500 rpm	
Drive Motor	Brushless DC motor 20W	
Timer	Digital 99hr,59min	
Top plate Material	Stainless steel	
Function	Clock / Anti-clock wise, Auto reverse rotation	
Control & Display	Microprocessor feed back control & digital display	
Power Source	110 or 220VAC, 50/60Hz	
Overall (WxDxH)	215x330x80 mm	215x550x80 mm
Weight	4.5 KG	7 KG

Heating Mantle



Specifications

Model	Capacity	Watt	Overall (WxDxH)	Internal	Weight
MS-E-101	100ml	80	162x256x134	45	1.2
MS-E-102	250ml	150	162x256x147	60	1.3
MS-E-103	500ml	260	192x276x162	75	1.6
MS-E-104	1000ml	380	214x298x172	85	1.9
MS-E-105	2000ml	500	248x332x199	115	2.5
MS-E-106	3000ml	600	274x358x205	125	3.2
MS-E-107	5000ml	800	316x400x229	145	3.6
MS-E-108	10000ml	1300	Ø395xH265		8
MS-E-109	20000ml	2000	Ø460xH290		11.4

1) Temperature : Max.450 °C
 2) Option: Support rod (Dia.12.7x400L) with clamp
 3) Bottom hole type (EH series)

Specifications

Model	Capacity	Watt	Overall (WxDxH)	Internal	Weight
MS-DM-602	250ml	150	162x256x162	60	1.6
MS-DM-603	500ml	260	192x276x177	75	1.9
MS-DM-604	1000ml	380	214x298x187	85	2.2
MS-DM-605	2000ml	380	248x332x214	115	2.8
MS-DM-606	3000ml	600	274x358x220	125	3.5
MS-DM-607	5000ml	800	316x400x244	145	3.9
MS-DM-608	10000ml	1300	390x470x250		
MS-DM-609	20000ml	2000	460x540x290		

1) Temperature : Max.450 °C
 2) Option: Support rod (Dia.12.7x400L) with clamp

Specifications

Model	Capacity	Watt	Overall (WxDxH)	Internal	Weight
MS-ES-302	250ml	150	162x256x162	60	2.2
MS-ES-303	500ml	260	192x276x177	75	2.5
MS-ES-304	1000ml	380	214x298x187	85	2.8
MS-ES-305	2000ml	500	248x332x214	115	3.4
MS-ES-306	3000ml	600	274x358x220	125	4.1
MS-ES-307	5000ml	800	316x400x244	145	4.5
MS-ES-308	10000ml	1300	390x470x300		
MS-ES-309	20000ml	2000	460x540x340		

1) Temperature : Max.450 °C
 2) Option: Support rod (Dia.12.7x400L) with clamp

Specifications

Model	Capacity	Watt	Overall (WxDxH)	Internal	Weight
MS-ESB-301	100ml	80	162x256x149	45	2.1
MS-ESB-302	250ml	150	162x256x167	60	2.2
MS-ESB-303	500ml	260	162x256x182	80	2.5
MS-ESB-304	1000ml	380	192x276x203	100	2.8
MS-ESB-305	2000ml	500	214x298x233	130	3.4
MS-ESB-306	3000ml	600	248x332x254	150	4.1
MS-ESB-307	5000ml	800	274x358x289	185	4.5

1) Temperature : Max.450 °C
 2) Stirring speed: 100 - 1500 rpm
 3) Option: Support rod (Dia.12.7x400L) with clamp

Specifications

Model	Capacity	Watt	Overall (WxDxH)	Internal	Weight
MHT 403C	500ml	470	220x150	75	2.2
MHT 404C	1000ml	600	245x150	85	2.4
MHT 405C	2000ml	850	285x170	115	2.8
MHT 406C	3000ml	950	310x180	125	3.5
MHT 407C	5000ml	1400	345x200	145	5.1

1) Temperature : Max.450 °C
 2) Option: Support rod (Dia.12.7x400L) with clamp

Digital Heating Block / Reactor



HB-200

Option

- 1) Plain heating block (Standard) / 100x75x50Hmm
- 2) 0.5ml x 24hole, 1.5ml x 24hole
- 3) 10Ø x 20hole, 13Ø x 20hole, 16Ø x 12hole, 18Ø x 12hole, 20Ø x 12hole, 24Ø x 6hole

Features

- Designed multi-functional digital dry bath heater for reaction, incubation
- Factory set to maintain 150 °C ,or dial in any temp. from 100 to 150 °C
- Reagent vial neck and caps reach a temp. of approx. 85 °C

Specifications

Model	HB-100	HB-200
Capacity	200W x 1 block	220W x 2 block
Temp. range	Amb. to +150°C ±0.2°C	
Warm-up time	25 - 30 min upto +150°C	
Timer	Digital ,99hr/59min	
Material	Body: Stainless steel & epoxy power coated steel	Block: Aluminum with silver anodized
Control & display	Microprocessor PID control & digital display	
Safety device	Over temp. limiter, Alarm / Error & time over	
Power Source	220VAC, 50/60Hz	
Overall (WxDxH)	230x245x100 mm	230x325x100 mm
Weight	5 KG	5.5 KG

Jumbo Hot Plate



HP-630D



HP-320D



HP-330D

Features

- Ideal for general laboratory, sample drying and liquid evaporation
- Heavy duty aluminum top plate provides excellent heat transfer
- High density Ceramic coated top plate gives perfect chemical resistance
- Digital PID control provides precise temp. control and LCD display

Specifications

Model	HP-320(D)	HP-330(D)	HP-630(D)
Top plate (WxL)	300x210mm	300x300mm	600x300mm
Temp. Range	Max. 380°C		Max. 320°C
Control	PID control		
Heater	1.2 Kw	1.4 Kw	2Kw
Material	Top plate: Ceramic coated aluminum plate	Case: Powder coated steel plate	
Display	Scale (standard) / D : Digital		
Safety device	Over temp. limiter, Over current breaker		
Power Source	110 or 220VAC, 50/60Hz		
Overall (WxDxH, mm)	310x340x120	310x430x120	600x320x120
Weight	5 KG	6 KG	12 KG

Slide Warmer



SW-128

Features

- This unit facilitates issue mounting and slide staining procedures
- Perform non-adhesive section mountings on teflon coated warm deck

Specifications

Model	SW-100	SW-128
Plate size (WxL)	400x250mm	640x200mm
Temp. Range	Amb. to +65°C ±0.5°C at 37°C	
Timer	Digital 99hr,59min	
Material	Top: Stainless steel with teflon coating	Body: Epoxy power coated steel plate
Control & display	Microprocessor PID control & digital display	
Safety device	Over temp. limiter, Over current breaker	
Power Source	220VAC,50/60Hz	
Overall (WxDxH)	420x350x90 mm	660x250x90 mm
Weight	10 KG	13 KG

Jar Tester



SF-06



SF-04

Features

- The Use of a timing belt synchronizes the revolutions of the size paddles so that relative errors are eliminated
- Digital display of the rpm ,and forward ,reverse & automatic control
- Low noise at the high speed of brush less DC motor

Specifications

Model	SF-04	SF-06
Paddle	Dia.40mm x 4	Dia.40mm x 6
Blade	1" x 3", Stainless steel	
RPM	20 to 300	
Drive	Brushless DC motor 60W	
Timer	Digital, 99hr, 59min, 59sec	
Illumination	FL 20W x 2	
Control & display	Microprocessor & digital LED display	
Power Source	220VAC, 50/60Hz	
Overall (WxDxH, mm)	320x320x390	900x250x450
Weight	10 KG	22 KG

Jar Mill



J-BM2-S



Jars



J-BMM

Features

J-BMM

- Universal jar mill is ideal for grinding laboratory or high-purity samples
- Mill provides quiet and smooth operation with direct DC motor
- Select your speed range 30 - 100 rpm with front control knob

J-BM2-S

- Two tier laboratory mill incorporate all-welded steel frame and rotate several jars at one time to save horizontal space
- The long-wearing, chemical-resistant rollers are self-centering and resistant static build up

Specifications

Model	J-BMM	J-BM2-S
Tiers	Variable	2
Roller (mm)	75 dia.x750L	60 dia.x 300L
Jar size	Variable	1-1.5 liter
Max. load	50KG	30 KG
Speed range	30 - 100 rpm	70 - 80 rpm
DC motor	1/2 Hp	1/4 Hp
Control&display	SSR control & digital LCD display	
Power source	220VAC,50/60Hz	
Overall (WxDxH)	450x950x300mm	515x310x875mm
Weight	45 KG	60 KG

Option 1) Milling jar 2) Grinding media

Homogenizer with controller



Option

- Homogenizer Dispersing Tool
 - 1) HT1008, Rotor Φ 6, Stator Φ 8mm, 1~50ml
 - 2) HT1010, Rotor Φ 7.96, Stator Φ 10mm, 1~100ml
 - 3) HT1018, Rotor Φ 12.8, Stator Φ 18mm, 10~1000ml
 - 4) HT1025, Rotor Φ 20, Stator Φ 25mm, 50~2500ml
- Clamp for Homogenizer
 - 1) CL200, Cast Aluminum, Grip Capacity Φ 23mm for Stadrn/Rod - Plate Stand
 - 2) ST110, Standard Plate Stand for Homogenizer, Φ 16 x h800 mm Rod, 20 x 35 cm Plate with Silicone Pad
 - 3) ST120, Wide Plate Stand for Homogenizer Φ 16 x h1000 mm Rod, 30 x 40 cm Plate with Silicone Pad

Features

- High speed , high quality and low noise at max. 27,000 rpm
- Speed & power control optimized for the sample
- The dispensing tool made of stainless steel and PTFE
- High efficiency and economical price

Specifications

Model	HG-15A	HG-15D
Work range	1 - 2,500ml	
Speed range	2,000 - 27,000 rpm, 10 rpm-Control	
Speed resolution	Step less	10 rpm
Speed control	Digital Feedback Controller	
Usable tool	HT1018	HT1025
Drive system	Motor / 160W	
Safety device	Over load&Heat protector	
Power Source	220VAC, 50/60Hz, 160W	
Overall (WxDxH)	60x75x215 mm	
Weight	2.5 KG	

Ordering HG15A+HT1018+CL100+ST110
HG15D+HT1018+CL100+ST110

Homo Mixer & Homo Disper



HM-1200D

HD-1200D

Features

- High speed , high quality and low noise at max.
- Speed & power control optimized for the sample
- The tool made of stainless steel and PTFE
- High efficiency and economical price

Specifications

Model	HM-1200D	HD-1200D
Work range	500 - 2000ml	500 - 5000ml
Speed range	1000 - 11000 rpm	1000 - 12000 rpm
Speed control	Feed back & Scale	
Speed display	Digital	
Usable tool	Stator: Dia.20/30mm, Rotor: Dia.15/23mm	
Drive system	Motor / 142W	
Safety device	Over load protector	
Power Source	220VAC, 50/60Hz, 142W	
Overall (WxDxH)	70x180x170 mm	
Weight	3.2 KG	2.8 KG

Ordering 1) Vessel clamp
HM-1200D +Stand + Clamp

Ultrasonic Cleaner / Analog



KSU-200

KSU-300

KSU-600

Features

- Study, non-corrosive units handle all models of cleaning tasks
- Operating at 40KHz, these units provide aggressive cleaning powder stainless steel bath have no corner welds and other dirt-coating surfaces
- Models have analog timer, heater and drain valve (KSU-300/400)
- The heat-up temperature is Max. 60 °C
- Set the cleaning cycle up to 60 min.

Specifications

Model	KSU-100	KSU-200	KSU-300	KSU-400	KSU-600
Capacity	1.8 liter	3.3 liter	6.6 liter	10 liter	20 liter
Bath (WxBxH, mm)	140x135x100	240x140x100	295x150x150	295x240x150	498x298x150
Temp. Range	Ambient to +60°C				
Timer	0 - 60 min				
Wave system	BLT40KHz, 60W	100W	150W	200W	600W
Drain valve	No			Yes	
Control & Display	Control knob & analog				
Material	ABS + Stainless steel			Stainless steel	
Power Source	220VAC, 50/60Hz				
Overall (WxDxH, mm)	160x145x200	260x160x200	320x160x290	320x260x300	520x320x320
Weight (KG)	5.5	8	12	18	25

Ultrasonic Cleaner / Digital



400 series



500 series



Powersonic 603

Features

- Built-in microprocessor controller
- Finished functions are ultrasonic power, set time, elapsed time, set temperature, current temperature, heater operation status etc
- Selectable use with ultrasonic strength controller (3 steps)
- Built-in a digital thermometer and timer to Set a condition for cleaning
- Easy to read operation status on digital display
- Built-in drain valve

Specifications

Model	Powersonic 405	Powersonic 410	Powersonic 420	Powersonic 603
Capacity	5.7	10	20.7	3.3
Bath (WxBxH, mm)	300x155x150	300x240x150	500x300x150	240x140x100
Temp. Range	Digital, 0 - 70°C			
Timer	Digital, 1 - 99 min			
Transducer	Industrial BLT 40 KHz			
Display	400 series - Digital, 500 series - LCD screen			LED screen
Function	Thermostat			Degas
Material	Engineering plastic exterior & stainless steel bath			ABS + SUS
Power Source	220VAC, 50/60Hz, 350W / 400W / 700W / 200W			
Overall (WxDxH, mm)	500x285x255	510x375x275	800x510x370	325x225x255
Weight (KG)	7	9	14	5.5

Option

- Tray (Solid / Perforated)
- 1) 240x140x150H(mm) for 405/505
 - 2) 255x200x100H(mm) for 410/510
 - 3) 500x300x150H(mm) for 420/520
 - 4) 240x135x105H(mm) for 603



Features

- Simultaneous rotating and rocking action provides fast and mixing
- All rollers are made of plastic for non-slip and easily wiped clean
- The quiet motor, durable plastic gears and stainless steel baseplate

Specifications

Model	205RM	210RM
No. of roller	5 ea	10 ea
Speed	40 rpm	
Roller length	325mm	
Power source	110/220VAC, 50/60Hz	
Overall (WxDxH)	480x220x110mm	480x420x110mm
Weight	4.5 KG	205RM 8.5 KG

Features

- Two mode operation : Touch the mixing surface and the unit energizes the switch to continuous and the unit operates in continuous
- Full range speed control to match your contents and tube requirements
- Suction cut feet to protect work surface and prevent walking

Specifications

Model	VM3000
Description	Test tube head (standard) or Flat head (option)
Speed range	0 to 3000 rpm
Material	ABS & Aluminum die casting
Power source	110/220VAC, 50/60Hz
Overall (WxDxH)	130x170x160 mm
Weight	5 KG

Features

- Low speed rocking motion provides even mixing
- Textured nonslip platform securely holds petri dishes, culture borrlers and flasks

Specifications

Model	RK-303T
Tray size	305 x 290 (WxD)mm
Speed Range	0 -100RPM
Control	Solid state feed back controller
Motor	Unique bit plate molor
Angle	25° - 48° dia-circular adjustable type
Material	Siainess steel (SCP-I)
Power source	110/220VAC, 50/60Hz, 0.1 Kw
Overall (WxDxH)	285x290x100 mm
Weight	15 KG

Features

- This counter features just touch the petri dish with any marker to achieve the counting mechanism
- Counter confirms each mark with an audible signal

Specifications

Model	DCC-560
Counting	Integral pressure sensor
Read-out	4 digits LED display
Dish Holder	Petri dish up to 15cm
Illumination	Ring shaped lamp
Count Control	Push button, Needle point probe, Marking pen
Power source	220VAC, 50/60Hz
Overall (WxDxH)	275x335x175 mm
Weight	5 KG

Roller Mixer



Vortex Mixer



Rocker



Digital Colony Counter



Accessories

- 1) Magnifier (2.5x) & Stand x 1
- 2) Needle point probe x 1
- 3) Marking pen x 1
- 4) Petri dish holder(10cm) x 1



HR200

Features

- Large Weighing Chamber holds up to a 250mm flask
- Wide Angle LCD Display
- Conformity to GLP with 1.0 . and serial number output
- Multi-Functional Weighing: %, PCS, g, mg, oz ozt dwt, ct, mom, GN, t, TL ' Full Range Tare
- Range Key: Suppresses least significant digit for faster speed & better stability when required
- Maximizes accuracy with ACAR
- Standard Under hook
- Body & frame constructed of die-cast aluminum alloy
- standard WinCT Software

Specifications

Model	HR202 i	HR200	HR300 i
Capacity	42g/210g	210g	310g
Gram (g)	0.00001g/0.0001g		0.0001g
Milligram (mg)	0.01mg		0.1mg
Percentage Min		0.01%,0.1%	
Counting Min		0.1mg	
Linearity	±0.00003/±0.0002g	±0.0002g	±0.0003g
Repeatability	0.00002g/0.0001g	0.0001g	0.0002g
Stable Time	8/3.5 sec	3 sec	3.5 sec
Display Refresh		5 time/sec,10time/sec	
Pan size		φ 90 mm	
Physical Dimension		213(w) x 319(d) x 301(h) mm	
Breeze Dimension		180(w) x 192(h) x 200(h) mm	
Sense Drift		± 2ppm/°C (10°C~30°C)	
Operating Temp		5°C~40°C/41°F~104°F RH less than 85%	
Weight		Approximately 8.2 kg/5.7 kg	
Calibration Mass		100g/200 g	
Power		110 / 220 Volt 50~60 Hz(AC Adaptor)	
Stand Accessories		Manual, AC Adaptor, Fuse, Display plastic Cover	

Option

- 1) RS-232 to USB converter kit
- 2) Density Determination Kit
- 3) Rechargeable Battery Pack
- 4) Multi-Function Printer
- 5) Granite Isolator 13 x 15 inch



Features

- Backlight LCD for easy viewing and menu navigations
- Pre-programmed applications include weighting, counting, percent weighting, totalization and display hold.
- Programmable filtering to compensate for vibrations and other disturbances
- 1/30,000 - 1/12,000 resolutions

Specifications

Model	JW-1				
Maximum Capacity	200 g	300 g	600 g	2000 g	3000 g
Minimum Graduation	0.01 g	0.01 g	0.02 g	0.1 g	0.1 g
Maximum Tare	- 200 g	- 300 g	- 600 g	- 2000 g	- 3000 g
A/D Conversion Speed	3 times / 1 second				
Display	Liquid Crystal Display 6 digits				
Auxiliary Displays	Zero, Stable, Tare, Batt				
Weighing Pan Size	Dia.123 mm		Dia.180 mm		
Modes	g , pcs , % , C.t , oz , lb , dwt , GN , kg , toz				
Overall	280x250x65 mm				
Power source	Power Adapter DC 9 V / 300mA or Dry Cell 1.5V x 6EA				

Option

- 1) RS-232C for PC, Printer
- 2) Battery Pack



Features

- Gross, Tare, Net function
- Industrial strength housing designed for robust environments
- 1 sec response time
- Balance automatically calibrates with internal calibration

Specifications

Model	PC-100W			
Maximum Capacity	5 kg / 10 lb	10 kg / 20 lb	20 kg / 50lb	20 kg
Minimum Graduation	0.5g / 0.001 lb	1g / 0.002 lb	2g / 0.005 lb	1 g
Display resolution		1 / 10,000		1 / 20,000
Maximum Tare	Full tare			
A/D Conversion Speed	9 times / sec.			
Display (digit)	VFD Weight (5)			
Designators (g↔lb version)	Zero, Net, Stable, Hold, (g, lb)			
Platter size	350x270 mm			
Overall	365x365x160 mm			
Power source	115/220 VAC,50/60Hz			

Option

- 1) RS-232C for PC, Printer
- 2) Battery Pack

Electronic High Precision Balance



Features

- Compact B5 size
- Fast stabilization speed - Just 1 second
- Multiple weighing units
- Standard RS-232C interface
- USB interface - driver installation not
- Ethernet interface with WinCT-Plus software
- GLP, GMP, GCP, ISO compliant
- Statistical calculation function
- Comparator function
- Hold function for Animal weighing
- Large bright Vacuum Fluorescent Display
- Under hook for suspended weighing
- Standard Breeze break for 1 mg resolution models
- Data memory function
- Counting function with ACAI

Specifications

Model	FX-120i	FX-200i	FX-300i	FX-1200i	FX-2000i	FX-3000i
Weighing capacity	122 g	220 g	320 g	1220 g	2200 g	3200 g
Maximum display	122.084 g	220.084 g	320.084 g	1220.84 g	2200.84 g	3200.84 g
Minimum weighing value (1 digit)		0.001 g			0.01 g	
Repeatability (Standard deviation)		0.001 g			0.01 g	
Linearity		±0.002 g			±0.02 g	
Stabilization time (typical at FAST)	Approx. 1 second					
Sensitivity drift	±2 ppm/°C (10°C-30°C/50°F-86°F)					
Operating environment	5°C to 40°C (41°F to 104°F), 85%RH or less (No condensator 5 times/second, 10 times/second or 20 times/second					
Counting mode	Minimum unit mass	0.001 g				0.01 g
	Number of samples	5, 10, 25, 50 or 100 pieces				
Percent mode	Minimum 100% reference mass	0.100 g				1.00 g
	Minimum 100% display	0.01%, 0.1%, 1% (Depends on the reference mass stored.)				
Weighing pan diameter		130 mm				150 mm
Net weight	Approx. 2.5 kg					
External dimensions	193 (W) x 262.5 (D) x 84.5 (H) mm					
AC adapter	Confirm that the adapter type is correct for the local voltage and power receptacle type					
Power consumption	Approx. 11VA (supplied to the AC adapter)					
Interface	RS-232C					

Option

- 1) Quick USB interface, Uni-directional
- 2) 9 pin RS232 to USB Converter
- 3) Built-in Rechargeable Battery
- 4) Large Breeze Break 7.9 inches high
- 5) AD-8121B Multi-Function Printer

Moisture Determination Balance / Safety Cabinet / Class II



Features

- Three heating mode - quick mode applies high heat initially, then ramps down to protect the sample from burning ; step mode provides multiple temperature changes over programmed time periods; and standard operation mode provides constant temperature
- Vacuum fluorescent display (VFD) shows moisture content, solid content, weight, atro moisture, and atro solid
- Programmable memory allows you to store up to 20 sample parameters for model MS-70 & MX-50

Specifications

Model	MS-70	MX-50	MF-50	ML-50
Sample weight	71g	51g		
Readability	(g) 0.0001g	0.001g	0.002g	0.005g
	(%) 0.001/0.01/0.1%	0.01/0.1%	0.05%/0.1%/1%	0.1/1%
Temp Humidity	5 - 40°C / >85% RH			
Heating	400W Halogen lamp / 50 - 200°C			
Function	Quick / Timer / Auto / Manual			
Mode	Measure	Moisture content / Dry content / Ratio / Weight		
	Heating	Standard / Quick / Step / Ramp		
Display	Output VFD panel 1 RS-232 interface			
Pattern & Data	20/100	10/50	5/30	
Pan size	Dia. 85mm			
Power Source	110/220VAC, 50/60Hz, 400W			
Overall	(WxDxH)	215x320x173mm		
Weight	(KG)	6 Kg		

Option

- 1) RS-232 to USB converter kit
- 2) Glass Fiber sheet
- 3) Halogen Lamp
- 4) Multi-Function Printer

DO Meter



DO-300L



DO-350L



DO-30N

Features

- Fast, accurate and easy to use, RS 232C communication
- Simultaneous display of DO(O²/Air/pO²), temp and current time.
- Automatic compensation for Temp, Alarm sound at high/low limit
- Using high sensitive polarographic type DO sensor
- Automatic compensation for salinity and barometric pressure
- Wide and Clear Color Graphic LCD illuminated

Specifications

Model		DO-30N	DO-300L	DO-350L
DO	Range		0.00 to 19.99 mg/L	
	Resolution		0.01 / 0.1	
	Relative Accuracy		±0.5mg/L	
O ₂	Range		0.0 to 60.0%	
	Resolution	0.1%	0.001	0.1%
	Relative Accuracy		±1 digit	
Air Saturation	Range		0.0 to 199.9%	
	Resolution		0.1%	
	Relative Accuracy		±1 digit	
Temperature	Range		-10 to 60°C	
	Resolution		0.1°C	
	Relative Accuracy	±1 digit		±0.4°C
Salinity Correction			0 to 70 ppt	
Altitude Correction			0 to 4000m	
Temperature Compensation			Auto	
Calibration			Auto	
Datalog		100 Points		500 Point
Print Capability			Yes	
Display		Backlight LCD s	Backlight LCD	Color Graphic LCD
Inputs		BNC, 8PIN(ATC)	BNC, ATC, RS232C	
Outputs	(Computer / Printer)	RS232C	Recorder, RS232C	
Power Source		AC/DC Power Adaptor, Rechargeable Battery for DO-30N		
Overall	(WxDxH)	220x80x40 mm	200x260x90 mm	
Weight		0.45 KG	0.96 KG	

Accessories

- 1) DO Polarographic Electrode / ATC Probe
- 2) Spare DO Membrane & Filling Solution

Option

- 1) DO Membrane Kit
- 2) RS232C Interface Cable
- 3) Exterior Thermal Printer
- 4) BOD Adaptor
- 5) Luxury Third-Arm Stand / DO-300L, 350L
- 6) Carrying Case / DO-30N

Conductivity / TDS Meter



EC-400L



EC-470L



EC-40N

Features

- Extremely short response time and easy-to use
- Simultaneous display of EC(Salinity/tds), Temp and current time
- Automatic compensation for Temperature
- Precise Measurement with Cell constant Designation
- RS 232C communication, Auto Hold
- Wide & Clear backlit custom LCD

Specifications

Model		EC-40N	EC-400L	EC-470L
Conductivity	Range		0 to 199,999µS/cm	
	Resolution		0.01 / 0.1	0.01 / 0.1 (Auto)
	Relative Accuracy		±0.5%	
TDS	Range	0 to 1999mg/	-	0 to 1,999mg/L
	Resolution	1mg/L	-	1mg/L
	Relative Accuracy	±0.2%	-	±2%
Salinity	Range		0.0 to 80.0ppt	
	Resolution		0.1	
	Relative Accuracy		±0.1	
Temperature	Range		-10 to 110°C	
	Resolution		0.1°C	
	Relative Accuracy	±0.1°C		±0.4°C
Resistivity		-	-	5Ω * cm to 100MΩ * cm
Temperature Compensation			Auto	
Calibration			Auto	
Datalog		100 Points		500 Points
Print Capability			Yes	
Display		Backlight LCD	Custom LCD	Color Graphic LCD
Inputs		BNC, 8PIN(ATC)	BNC, ATC, RS232C	
Outputs	(Computer / Printer)	RS232C	Recorder, RS232C	
Power Source		AC/DC Power Adaptor, Rechargeable Battery for DO-30N		
Overall	(WxDxH)	220x80x40 mm	200x260x90 mm	
Weight		0.45 KG	0.96 KG	

Accessories

- 1) Conductivity Cell(K=1.0) / ATC Probe
- 2) Conductivity Standard Solution(1413µS/cm)125ml

Option

- 1) Conductivity Cell/ATC Probe(K=1.0, K=0.1, K=0.01, K=10)
- 2) Conductivity Standard Solution
- 3) RS232C Interface Cable
- 4) Exterior Thermal Printer
- 5) Luxury Third-Arm Stand / EC-400L, 470L
- 6) Carrying Case / EC-40N



pH-240L



pH-270L



pH-20N

Features

- Fast, accurate and easy to use, RS 232C communication
- Simultaneous display of pH(mV), temp and current time
- Auto(Manual) calibration with choice of buffer (3points)
- Automatic compensation for Temperature
- Available measure by using latest calibration data
- Wide & clear backlit custom LCD display

Specifications

Model	pH-20N	pH-240L	pH-270L
pH			
Range	-2.00 to 19.99	-2.000 to 19.999	
Resolution	0.01	0.001 / 0.01 / 0.1	
Relative Accuracy	±0.02	±0.002	
Auto-Buffer-Recognition		pH : 4.00, 7.00, 10.00	
Concentration			
Range	-	0.0001 to 19999mg/ℓ	
Resolution	-	±one least significant	
Relative Accuracy	-	±0.25% of reading	
Temperature			
Range		-10 to 100°C	
Resolution		0.1°C	
Relative Accuracy		±0.4°C	
Millivolts			
Range		±1999.9mV	
Resolution		±0.1mV	
Relative Accuracy		±0.1mV	
Temperature Compensation		Auto	
Calibration		Auto (3 Points) / Manual (3 Points)	
Datalog		100 Points	500 Point
Print Capability		Yes	
Display		Backlight LCD	Custom LCD Color Graphic LCD
Inputs		BNC, 8PIN(ATC)	BNC, ATC, RS232C
Outputs	(Computer / Printer)	RS232C	Recorder, RS232C
Power Source		AC/DC Power Adaptor, Rechargeable Battery for pH-20N	
Overall	(WxDxH)	220x80x40 mm	200x260x90 mm
Weight	(KG)	0.45	0.95

Accessories

- 1) Combination pH Electrode / ATC Probe / PH-20N
- 2) Buffer Solution (pH 4.00, 7.00, 10.00) 125ml

Option

- 1) Buffer Solutions (pH 4.00, 7.00, 10.00) 475ml
- 2) Electrode Storage Solution
- 3) Electrode Filling Solution
- 4) RS232C Interface Cable
- 5) Exterior Thermal Printer
- 6) Luxury Third-Arm Stand / pH-240L, 270L
- 7) Carrying Case / pH-20N



PDC-700L

Features

- Wide and clear backlit graphic color LCD display
- Measure and display of pH(ISE) and DO and EC simultaneously
- Fast, Accurate and easy to install, Auto buffer choice
- Automatic compensation for Temp and barometric pressure
- Self diagnostics, RS 232C communication
- Internal Diagnosis for normal Operation Check
- Ion Concentration Measurement in mg/L
- Most recent Calibration Data use for direct Measurement
- Automatic Temperature Compensation (ATC)
- Using high sensitive polarographic type DO sensor
- Automatic pH buffer Recognition

Specifications

Model	PD-60N	PDC-700L
pH		
Range / Resolution / Auto-Buffer-Recognition	-2.000 to 19.999 / 0.001,0.01,0.1 / ±0.002 pH : 2.00, 4.00, 7.00, 10.00, 12.00	
Concentration		
Range / Resolution / Accuracy	0.0001 to 19999mg/ℓ ±i least significant / ±0.25% of reading	
Millivolts		
Range / Resolution / Accuracy	±1999.9 / 0.1 / ±0.1	
DO		
Range / Resolution / Accuracy	0.00 to 19.99mg/L / 0.1, 0.01 / ±0.5mg/L	
O₂		
Range / Resolution / Accuracy	0.0 to 60.0% / 0.1% / ±1 digit	
Air Saturation		
Range / Resolution / Accuracy	0.0 to 199.9% / 0.1% / ±1 digit	
Salinity Correction		0 to 70ppt
Altitude Correction		0 to 4000m
Conductivity		
Range / Resolution / Accuracy	- 0 to 199,999µS/cm / 0.01, 0.1µS/cm / ±0.5%	
TDS		
Range / Resolution / Accuracy	- 0 to 1999mg/L / 1mg/L / ±2%	
Salinity		
Range	- 0.0 to 80.0ppt / 0.1 / ±0.1	
Temperature		
Range / Resolution / Accuracy	pH/mV/ISE: -10 to 110°C / ±0.1°C / ±0.4°C	
Resistivity		
	- EC : 5Ω * cm to 100MΩ * cm	
Temperature Compensation		Auto
Calibration		pH/mV : Auto(5 Pts) / Manual(5 Points) / ISE/EC : Auto
Datalog	100 Point	500 Point
Print Capability	Custom LCD	Yes
Display	Auto	Color Graphic LCD
Inputs	BNC, 8PDIN(ATC)	Triple BNC, Triple ATC, RS232C
Outputs	(Computer / Printer)	RS232C
Power Source		Adaptor
Overall	(WxDxH)	220x80x40 200x260x90
Weight	(KG)	0.45 0.96

Accessories

- 1) Combination pH Electrode / ATC Probe
- 2) Conductivity Cell(K=1.0) / ATC Probe / PDC-700L
- 3) DO Polarographic Electrode / ATC Probe
- 4) Buffer Solution (pH 4.00, 7.00, 10.00) 125ml
- 5) Conductivity Standard Solution 125ml / PDC-700L
- 6) Luxury Third-Arm Stand / PDC-700L
- 7) SDIS(Serial Data Interface Software) & RS232C Interface Cable / PDC-700L

Option

- 1) DO Membrane Kit
- 2) pH Electrode Storage Solution
- 3) pH Electrode Filling Solution
- 4) Buffer Solution (pH 4.00, 7.00, 10.00) 475ml
- 5) RS232C Interface Cable
- 6) Printer

Grain Moisture Meter



Features

- Measure of grains moisture content with auto. temp. compensation
- East to use,quick to read-out and compact size with CE mark
- Microprocessor control with resistance,and indicates battery-low

Specifications

Model	GMK-303
Rice, Brown Rice	9.8 - 26%
Paddy, Unhulled Barley	9.8 - 26%
Naked Barely	8.5 - 25%
Wheat	9.0 - 30%
Accuracy	±0.5% below 20%
Operation Temp.	-10 to +40°C
Display	Digital LCD / Resolution : 0.1 %
Power Source	Battery 1.5V x 4 ea
Overall	95x165x40 mm
Weight	Approx. 1.5 Kg

Features

- Measure moisture content in wood, tobacco or hay in accuracy and fast
- East to use,quick to read-out and compact size with CE mark
- Microprocessor control with resistance,and indicates battery-low

Specifications

Model	GMK-1010
Application	Wood, Plywood, Tobacco, Hay
Measuring range	9 - 50% ± 0.5%
Sensor	Hammer / SEN-57
Power Source	Battery 9V x 1 ea
Overall	150x70x25 mm
Weight	Approx. 2.5 KG

Features

- Hammer sensor attached for various kinds of woods
- Measure moisture content in wood, tobacco or hay in accuracy and fast
- Keep the same moisture content to prevent deterioration and decay

Specifications

Model	GMK-701AC
Application	Juices,Soft drink,Coffee,Milk,Tomato,Ketchup
Sample volume	Approx. 0.5ml
Measuring Range	Brix 0.0 - 45.0%
Time / Temp.	Time : Approx. 3 sec / Temp. : 5 - 40°C
Power Source	Battery 9V x 1 ea
Overall	155x110x45 mm
Weight	Approx. 780 g

Infrared Thermometer



Features

- Simple One Handed operation, Laser Targeting
- LCD With Back Light, °C/°F Select Switch
- Laser ON/OFF Switch, Automatic Power Off, Display Hold Function

Specifications

Model	Center 352
Temp. range	-20 to 500 °C / -4 to 932 °F
Accuracy	±2% or ±2 °C (3 °F)
Resolution	0.5 °C (1 °F)
Distance to Spot	0.500694444
Response Time	500 m.sec
Operation Temp.	0- 50 °C (32 - 122 °F), 10-90% RH
Battery	9V, 0006P, IEC6F22
Overall	157.5Wx36Bx115H(mm)
Weight	200g

Features

- Dual input, triple display and RS232 interface
- Functions : REL, HOLD, MAX, MIN
- Auto power off
- Resolution : 0.1 °C / 0.1 °F / 0.1%RH

Specifications

Model	Center 311
Temp. range	-20 to 60 °C ±0.7 °C / -4 to 140 °F ±1.4 °F
Humidity range	0 to 100%RH ±2.5%RH
Input Protection	60VDC or 24Vrms AC Max
Battery	9V
Overall	Meter 160x65x30mm Probe 15 Dia. X 190L (mm)
Weight	320 g

Option

Option	Probe
TPK-01 Bead Probe	
TPK-02 Immersion Probe	
TPK-03 Surface Probe	
TPK-04 Piercing Probe	

Hygro Thermometer





DN-20A



DN-20B

Features

- Simple design and convenience to handle
- Transferable video and Digital signal
- Built-in A/D convertor
- Monitoring the Image to connect to port



Specifications

Model	DN-20A	DN-20B
Sensor	C-MOS Sensor	
Image device	C-MOS Chip	
Digital Resolution	1,300,000 pixels	
Camera System	Outside Digital Camera System	Inside Digital Camera System
White Balance	Automatic	
B.L.C	Automatic	
Data Transfer Adapter	USB2.0 or IEEE1394	
Operating System	Window 98, ME, 2000, XP	
Image Driving Software	Yes	
Data Format	bmp, jpg, avi (for recording)	
Operation Temperature	-10°C to 70 °C	
Storage Temperature	-10°C to 70 °C	
Objective	Semi-Plan Achromatic 4x,10x,40x(s),100x(s,oil)	
Stage	Mechanical Stage 140x140mm / 75x50mm	
Condenser	Abbe NA1.25	
Illumination	Halogen Lamp 6V30W	

Option

- 1) 5,000,000 Pixel CMOS Camera System (DN-20A)
- 2) 2,000,000 Pixel CMOS Camera System (DN-20A)
- 3) Infinite Plan Achromatic Objective System
- 4) Quintuple Nosepiece
- 5) Turret Phase Contrast Kit
- 6) Polarization Set
- 7) Dry, Oil Dark Field Condenser



JSB-502



JSB-503



NSB-80T

Features

- Its optical system is characteristic of infinite system. adopting advanced modular technical design, this microscope has a seidentopf viewing head, inward quadruple nosepiece, inserted collector stand, critical and kolher illumination.
- This microscope can be equipped with various optional accessories to realize bright field, darkfield, phase contrast, CCD monitor system, epi-fluorescent, polarization and digital camera system.

Specifications

Model	JSB-502	JSB-503	NSB-80T
Head	Binocular	Trinocular	Trinocular
	Siedentopf Head inclined at 30°, rotatable 360° Interpupillary Distance 50-75mm		Head inclined at 30°, rotatable 360° Interpupillary distance adjustable: 48 -75mm
Magnification	40X-1000X		40X-1000X
Eyeiece	WF 10X/20(paired)		High point and wide field EW10x/20
Objective	Infinite Plan Achromatic Objective 4X, 10X, 40X(Spring), 100X(Spring, Oil)		Infinite Plan Achromatic 4X10, 10. 10X0.25, 40X065(S), 100X/1.25(S, Oil)
Nosepiece	Reversed quadruple nosepiece, Click-stop of each objectives		Backward quintuple nosepiece Click stop of each objectives
Focusing	Coaxial coarse and fine focus adjustment with tension control range: 23mm, Division of fine focus adjustment-0.002 mm		Coaxial coarse and fine focusing adjustment, tension control adjustment on coarse focusing.: 30n and focusing stopper.
Stage	Mechanical, size: 188x150mm XN movement range: 78x54mm Coaxial control by right hand side, scale division: 0.1 mm		Square graduated double layers stage, size : 185x142mm Coaxial XN control knob, X/Y movement range : 75x55mm
Condenser	Abbe N.A. 1.25 with Iris Diaphragm and filter holder Rack & Pinion Adjustment		Abbe N.A 0.9/0.25 with Iris Diaphragm an filt holder Rack & Pinion Adjustment
Illuminator	12V/20W halogen lamp, regular collector with field diaphragm, On/Off Switch and intensity controller, Input power: AC 220v 60Hz		6V/30W halogen lamp, collector with field diaphragm with an intensity controller and On/Off switch, Input power: AC 220v 60Hz

Option

- 1) WF15X115 (pair) (JSB-502,503)
 - 2) CCD Camera System (JSB-503, NSB-80T)
 - 3) Digital Camera System (JSB-503, NSB-80T)
 - 4) Image Analysis System (JSB-503, NSB-80T)
 - 5) Phase Contrast Attachment (NSB-80T)
 - 6) Epi-fluorescent Attachment (NSB-80T)
 - 7) Polarization Set (NSB-80T)
- * Turret annular phase condenser, Centering telescope, Green filter
* Infinitive plan-achromatic phase contrast objective(PH10X, 20X(S), 40X(S), 100X(S))

Inverted Microscope



CSB-IH5



NSI-100

Features

- Excellent Optical Function with Infinite Optical system
 - Innovative Stand Structure, Sharp Image Display
 - Convenient Operation
 - Special Design for Viewing Incubating Cell Tissue
- This inverted microscope assembled specially long working distance plan achromatic objectives and long working distance condenser is widely applied in many departments

Specifications

Model	CSB-IH5	NSI-100
Magnification	40X - 600X	40 - 600X
Eyeiece	WF 10X, 15X(paired/each)	High-point, Extra Wide Field Eyepiece WF10X/22, WF15X/15
Objective	Plan achromatic PC4X, Long working distance plan achromatic: LWD Plan 10X/0.25, 25X/0.40, 40X/0.60	Long Working Distanse Infinite Plan Achromatic 4X/0.1(WD18mm), 10X/0.25(WD10mm), 20X/0.40(WD5.1mm)
Head	Binocular head, interpupillary distance adjustment: 55-75mm, diopter adjustable	Trinocular head inclined at 30°, Interpupillary(48-75mm)
Photo-tube	Photo lever for optional CCD camera or digital camera	-
Stage	Mechanical stage, coaxial X/Y control knob X/Y movement range: 75x50mm	Plan Stage 160X250mm, Glass Insert, Auxiliary Stage 70X180mm
Nosepiece	Quadruple revolving nosepiece	
Illuminator	Halogen lamp 6V 20W, intensity controller	Halogen lamp 6V 30W, Brightness adjustable
Condenser	Abbe N.A. 0.30, working distance 55.2mm	ELWD Condenser N.A. 0.3, LWD 72mm(without condenser 150mm)
Focusing	Coaxial coarse and fine focusing knobs, coarse stroke 10mm, fine movement 0.2mm/rotation	Coaxial Coarse and Fine Adjustment, Vertical Objective Movement Coarse Stroke: 37.7mm per Rotation, Fine Stroke: 0.2mm per Rotation
Input power	AC 220V, 50/60Hz.	
Filter	Yellow, green, blue, grey	Dia. 45mm, Blue, Green and Ground Glass
Accessories	-	Dust cover, Spare lamp, Terasaki Holder, Petri Dish Holder(Dia. 35mm), Slide Glass Holder(Dia. 54mm)

Option

- 1) CCD Monitor system (CCD Color camera, C-Mount adaptor, Video cable, 14" color monitor)
- 2) Digital camera system (Digital camera, Relay lens with C-Mount adaptor)
- 3) Phase contrast set
- 4) Micrometer set (WF10X with 0.1mm micrometer, 0.01mm stage micrometer)
- 5) Image Analysis System (Image Analysis S/W, Frame Grabber)

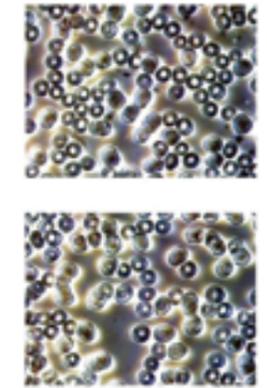
Blood Microscope



CSB-H3A



NSB-50T



Features

- This blood microscope is very suitable to observe blood cell at the laboratory
- High performance phase contrast and High quality Image
- Connectable personal computer and television monitor

Specifications

Model	CSB-H3A	NSB-50T
Head	Trinocular head , inter pupillary range: 55-77mm	
Magnification	40X-1000X	
Eyeiece	WF 10X/20(paired)	EW10X/20
Objective	Infinity achromatic 4X, 10X, 100X(Spring, Oil). Phase contrast S-Micro 40X/0.65	
Nosepiece	Reversed quadruple nosepiece, Click-stop of each objectives	
Stage	Mechanical, size: 120x120mm X/Y movement range: 60x30mm Coaxial control by right hand side,	Mechanical, size: 140x140mm X/Y movement range: 75x50mm Coaxial control by right hand side,
Condenser	Turret type : Phase contrast 40X,Bright filed, Dark filed	
Illuminator	6V/20W halogen lamp, regular collector with field diaphragm, On/Off Switch and intensity controller, Input power: AC 220V, 50/60Hz	Halogen Lamp 6V30W External Illumination, Aspherical Collector
CCD Camera	CCD color camera. C-mount adaptor, DC12V power	
Accessories	Aluminum carrying case, Spare lamp, Vinyl cover	Spare lamp, Vinyl cover

Option



1) CCD color camera



2) Aluminum carrying case

Phase Contrast Microscope

Fluorescent Microscope



NSB-PH80

JSB-PH303

NSB-PH50

Features

- This phase contrast microscope is an optical microscopy illumination technique in which small phase shifts in the light passing through a transparent specimen are converted into amplitude or contrast changes in the image
- View transparent specimen in the waste water treatment, dairy, and water purification applications.

Specifications

Model	NSB-PH80	JSB-PH303	NSB-PH50
Viewing Head	Compensation Free Trinocular Head Interpupillary Distance 55-77mm		
Eyepiece	High-point, Extra Wide Field Eyepiece EW10X/22	WF 10X/20	High point and Wide Field Eyepiece EW10X/20
Phase Contrast kit	Turret annular phase condenser, Centering telescope, Green filter, Infinity plan-achromatic phase contrast objective PH10x,PH20x,PH40x(s),PH100x(s,oil)		
Nosepiece	Backward Quadruple Nosepiece		
Stage	Mechanical Stage 185X142mm / 75X55mm	Mechanical Stage 135x150mm / 76x50mm	Mechanical Stage 140x140mm / 75x50mm
Focusing	Coaxial Coarse & Fine Focus Adjustment System Range 20mm, Fine Division 0.002mm		Coaxial Coarse & Fine Focus Adjustment System Range 23mm, Fine Division 0.002mm
Condenser	Turret Annular Phase Condenser	Abbe NA1.25 with Iris Diaphragm and Filter, Rack & Pinion Adjustment	
Illumination	External Illumination, Aspherical Collector Halogen Lamp 12V30W	Halogen Lamp 6V20W Brightness Adjustable	Halogen Lamp 6V30W Brightness Adjustable

Option

- 1) CCD Monitor system(for JSM-3T): CCD Color camera, C-Mount adaptor, 14" monitor
- 2) Digital camera system(for JSM-3T): Digital camera, Relay lens with C-Mount adaptor
- 3) Micrometer set : 0.01 mm stage micrometer, WF10X with 0.1 mm micrometer
- 4) Image Analysis System: Image frame grabber, Image analysis software
- 5) Dry, Oil Dark Field Condenser(with 100x Objective for Dark Field)



NSB-F80

NSB-F100

Features

- Excellent fluorescent Image with High resolution fluorescent Objective
- Protect the light leak with advanced lamp housing
- More stable power supply, digital display and timer

Specifications

Model	NSB-F80	NSB-F100		
Magnification	40X-1000X	40X-400X		
Eyepiece	High-point, Extra Wide Field Eyepiece EW10X/22			
Objective	Infinite Plan Achromatic 4X, 10X, 20X, 40X(S), 100X(S, Oil)	Long Working Distance Infinite Plan Achromatic 4X/0.1(WD18mm), 10X/0.25(WD10mm), 20X/0.40(WD5.1mm), 40X/0.60(WD2.6mm)		
Nosepiece	Quintuple Nosepiece			
Head	Compensation Free Trinocular Head, Inclined at 30°, Interpupillary 48-75mm, Diopter Adjustable			
Stage	Double-layer Mechanical Stage 185X142mm Moving Range 75X55mm	Plan Stage 160X250mm, Glass insert, Auxiliary Stage 70X180mm Mechanical Stage, X-Y Coaxial control, Moving range 120X78mm		
Condenser	Swing Condenser N.A. 0.9/0.25	ELWD Condenser N.A. 0.3, LWD 72mm(without condenser 150mm)		
Transmitted Illumination	External Illumination, Aspherical Collector, Halogen Lamp 12V30W	Halogen Lamp 6V30W, Brightness adjustable		
Reflected Illumination	100W HBO Ultra Hi-voltage spherical Mercury Lamp			
Reflected Light Source	Excitation	Dichroic Mirror	Barrier Filter	
	Blue Excitation	BP460~490	DM500	BA520
	Green Excitation	BP480~550	DM570	BA590
Protection Barrier	Barrier to resist the ultraviolet Light			
Power Supplier	AC 220V, 50/60Hz			

Option

- 1) Ultraviolet Excitation Filter & Violet Excitation Filter
- 2) CCD Camera System
(CCD Camera, C-mount Adaptor, Power Supply, Video Cable, Video Capture Board)
- 3) Digital Camera System (Digital Camera, Relay lens with C-mount, Accessories)
- 4) Image Analysis System (Image Analysis S/W, Frame Grabber)

Zoom Stereo Microscope



JSZ-7XT



HSS-5XT

Features

- Convenient for use with zoom lens and eyepiece with built-in diopter adjuster.
- Magnification ranges from 8X-200X(depending on lens)
- These are available to analyze and store an image with mounting CCD camera or Digital camera.

Specifications

Model	JSZ-7XB	JSZ-7XT	HSS-5XB	HSS-5XT
Head	Binocular head interpupillary distance adjustable 52-75mm 45° inclined	Trinocular head	Binocular Interpupillary distance adjustable: 55-75mm Main body 360° rotatable	Trinocular
Magnification	8X - 200X depending on eyepiece and objective		10X - 160X	
Eyepiece	WF 10X/22 with built-in diopter adjuster WF 20X/12.5 with built-in diopter adjuster		WF 10X, 20X (paired/each)	
Zoom lens	0.8X - 5X / 6.3 : 1		1X - 4X	
Auxillary objective	2X		2X	
Working distance	With zoom lens - 115mm With 2X auxillary objective - 43.5mm		With zoom lens: 82mm With additional lens: 27mm	
Field of view	27.5mm - 1.3mm		Dia. 24mm - 1.76mm	
Illuminator	Reflected: Built in ring LED lamp Transmitted: LED lamp		Reflected: 12V 10W halogen lamp with reflector Transmitted: 12V 10W halogen lamp	

Option

- 1) CCD Monitor system(for JSP-20T): CCD Color camera, C-Mount adaptor, 14" monitor
- 2) Digital camera system(for JSP-20T): Digital camera, Relay lens with C-Mount adaptor
- 3) Micrometer set : 0.01mm stage micrometer, WF10X with 0.1mm micrometer
- 4) Image Analysis System: Image frame grabber, Image analysis software
- 5) Widefield 15X Eyepiece(paired)
- 6) Fiber optic illuminator (with dual branch, self-supporting light guide, length - 50cm)
- 7) LED illuminator (White, Constant current method, Life100,000HR, Max.120mW/EA), (JSZ series)
- 8) Annular illuminator (220V 9W annular fluorescent lamp, Adapter: dia. 30-60mm)
- 9) Ball Bearing Stand / Boom Stand (JSZ series)
- 10) Flex Arm & Clamp Mount (JSZ series)
- 11) Auxillary objective : 0.5X (JSZ series)

Metallographic Microscope



JSM-3M



JSM-3B

Features

- This upright microscope has adjustable built-in illuminator, adjustable field diaphragm and aperture diaphragm.
- Trinocular model can be attached optional CCD camera or Digital camera system.

Specifications

Model	JSM-3M	JSM-3B	JSM-3T
Head	Monocular head 45° inclined	Binocular head Interpupillary distance and Diopter adjustable	Trinocular head
Magnification	40X - 600X		
Eyepiece	WF 10X, 15X		
Objective	Achromatic 4X, 10X, Plan achromatic 40X		
Illuminator	6V 20W halogen lamp, the filament of lamp is adjustable Provided with intensity controller and on/off switch Vertical illuminator adaptor : with aperture diaphragm and field diaphragm the field diaphragm is adjustable		
Focusing	Coaxial coarse and fine focusing adjustment with tension adjustment ring		
Stage	Mechanical stage, coaxial controller, Size: 132 x 142mm. Movement range: 76 x 52mm		
Nosepiece	Triple, 360° rotatable, click-stop of each objectives		
Input power	AC 220V, 50/60Hz.		

Option

- 1) CCD Monitor system(for JSM-3T): CCD Color camera, C-Mount adaptor, 14" monitor
- 2) Digital camera system(for JSM-3T): Digital camera, Relay lens with C-Mount adaptor
- 3) Micrometer set : 0.01mm stage micrometer, WF10X with 0.1mm micrometer
- 4) Image Analysis System: Image frame grabber, Image analysis software
- 5) Pressing device



Exicycler



MyGenie 96

Features

- This transmitted polarization microscope is the very suitable microscope used in single polarization, orthogonal polarization and micro-photography.
- Equipped with gyps A board, mica A/4 board, quartz wedge and mechanical stages

Specifications

Model	JSP-20M	JSP-20B	JSP-20T
Head	Monocular head	Binocular head	Trinocular head
	Interpupillary distance adjustable, 54 - 74mm, diopter adjustable		
Magnification	40X - 630X		
Eyepiece	WF10X(Cross hair)		
Objective	Achromatic 4X/0.10, 10X/0.25, 25X/0.40, 40X/0.65(S), 63X/0.85(S)		
Adaptor tube	Slot for analyzer or compensation plate		
Illuminator	6V 20W halogen lamp, Provided with an intensity controller and on/off switch, Condenser with iris diaphragm and swing out lens		
Focusing	Coaxial coarse and fine focusing adjustment with tension adjustment ring		
Stage	Circular graduated stage, rotatable 360° horizontally, Can be fixed at a specific position, dia.160mm, Attachable mechanical stage available, 30x40mm		
Nosepiece	Centering quadruple nosepiece, with slot		
Compensator	Gyps λ board, Mica λ/4 board, Quartz wedge		
Input power	AC 220V 60Hz.		

Option

- 1) CCD Monitor system(for JSP-20T): CCD Color camera, C-Mount adaptor, 14" monitor
- 2) Digital camera system(for JSP-20T): Digital camera, Relay lens with C-Mount adaptor
- 3) Micrometer set : 0.01 mm stage micrometer, WF10X with 0.1 mm micrometer
- 4) Image Analysis System: Image frame grabber, Image analysis software
- 5) Widefield 15X Eyepiece(paired)
- 6) Reticle plate
- 7) Mechanical stage

Features

- Multiplexing with four different fluorophores and reproducible results
- Multi applications for DNA, RNA and virus copy number quantification or qualitative analysis, target identification, genotyping etc
- High sensitive and wide dynamic detection range and self diagnostics for system maintenance
- High resolution and useful melting curve analysis for target identification
- Simultaneous fluorescence detection and High throughput processing of sample in well plates
- Broad range of excitation and emission wave lengths
- Uniform and exquisite thermal gradient

Specifications

Model	Exicycler	MyGenie 96
Sample capacity	96 well 20-50ul	96 well 0.2ml tube
Heating & Cooling	Peltier	
Temperature range	4°C ~ 99°C	
Operation temperature	15°C ~ 30°C ±0.3°C	
Lid temperature	90°C ~ 120°C	
Temp/Time increment	9.9°C / 60 sec	
Operation humidity	20% - 80%	
Gradient range	40°C - 75°C in 10°C - 20°C	
Ramping range	Max. 2.5°C in 0.1°C / sec	
No. of program/steps	-	150/40
No. of repeated cycle	-	99
Display	PC Monitor by user	20 x 4 Character LCD
Operation system	MS WindowXP	20 Keypad
Communication port	USB2.0	RS232
Power source	110/220VAC, 50/60Hz	
Overall (WxDxH)	355x540x470(mm)	238x235x297(mm)
Weight (KG)	30	8
Light source	UHP short arc lamp / 120W	-
Detector	2D CCD	-
Excitation filters	5 sets 1 490-640nm	-
Emission filters	5 sets 1 520-670nm	-



3220UV



UV-3300

Features

- More powerful in information technologies in your lab.
- USB ports for user-friendly programming updates and other accessory connections.
- Universal sample cell holder holds 8 cells.
- Rotating cell holder (8 cells and one blank)
- Superb optics for maximized accuracy.
- Exceptional precision and reliability.
- User-friendly software with scanning and time course capacities.
- Versatile data processing and Better in holding memories.

Specifications

Model	Optizen 3220UV	UV-3300
Description	Scanning UV-VIS	Scanning UV-VIS
Bandwidth	< 1.0 nm	1 nm
Wave length	190 - 1100 nm	190 - 1100 nm
accuracy	±0.3 nm at 656.1 nm	±0.2 nm
repeatability	±0.1nm	±0.05 nm
Scanning speed	Max. 3000 nm/min	Max. 1000nm/min
Photometric system	Double beam photometric system	Single beam photometric system
accuracy	±0.004Abs (STD) at 0.1 Abs	±0.004 Abs(0.5 to 1.0Abs)
repeatability	±0.002 Abs (STD) at 0.1 Abs	≤0.002 Abs
Stray light	<0.05% at 340 nm	<0.05% at 340 nm
Source lamp	Pre-aligned tungsten & Deuterium lamp	Halogen & Deuterium lamp
Display	17" color monitor with soft ware	Graphic LCD
Detector	2 silicon photodiodes	High sensitive silicon photodiode
Output	PC,USB,USB Memory, serial printer	PC,USB,RS232 & Serial printer
Power source	220VAC,50/60Hz	
Overall (WxDxH)	600x400x250mm	440x425x225 mm
Weight	35 KG	15 KG

Option



- | | | |
|---|--|---|
| 1) Temperature cell holder
Temp.range;
Water/oil type: circulator
Peltier type : 5 - 80 °C | 2) Micro volume cell holder
≤1000µl single cell holder
Path length: 10nm
Center height: 8.5nm | 3) Film cell holder-Wide
Sample limit;
Thickness: 5mm
WxH: 60 x 45mm |
| 4) Film cell holder-Small
Sample limit
Thickness: 2mm
WxH: 10 x 30mm | 5) Round cell holder
Single cell holder
for test tube
16mm/25mm depth | 6) Sipper system
RS232 interface
Intake volume: ≥70µl |

Conversion Table

● Length

Units	cm	m	in	ft	yd	miles
cm	1	0.01	0.3937	0.0328	0.0109	2.17e-8
m	100	1	39.37	3.2808	1.0936	0.00062
in	2.54	0.0254	1	0.0883	0.0278	1.58e-5
ft	30.48	0.3048	12	1	0.3333	0.00019
yd	91.438	0.9144	36	3	1	0.00059
miles	160930	1609.3	63360	5280	1760	1

● Mass

Units	mg	g	in	ton	oz	lb
mg	1	0.001	0.000001	1.0e-9	0.000035	2.204e-6
g	1000	1	0.001	0.000001	0.03527	0.0022
kg	1000000	1000	1	0.001	35.273	2.20459
ton	1.0e9	1000000	1000	1	35273	220459
oz	28349.5	28.3495	0.02835	0.000028	1	0.0625
lb	453592	453.592	0.45359	0.00045	16	1

● Area

Units	m ²	cm ²	in ²	ft ²	ha	Py
m ²	1	0.0001	0.155	0.001076	2.2e-14	0.00003
cm ²	10000	1	1550	10.764	0.0001	0.3025
in ²	6.4516	0.00064	1	0.006944	6.45e-8	0.000195
ft ²	929.030	0.092903	144	1	0.000009	0.028109
ha	1.0e8	10000	1.55e7	107639	1	3025.6
Py	33051.2	3.3058	5122.95	35.576	33051	1

● Volume

Units	cu.cm	cu.m	ℓ	cu.in	cu.ft	gal
cu.cm	1	0.0000001	0.001	0.06102	0.00003	0.00026
cu.m	1000000	1	1000	61027	35.3165	264.186
ℓ	1000	0.001	1	61.027	0.03531	0.26418
cu.in	16.387	0.000016	0.01638	1	0.00057	0.00432
cu.ft	28316.8	0.02831	28.3169	1728	1	7.48051
gal	3785.43	0.00378	3.78543	231	0.16368	1

● Pressure

Units	atm	bar	mmHg(torr)	mH ₂ O	psi(lb/ft ²)	kgf/cm ²	Pa
atm	1	1.01325	760	10332.2	14.6956	1.03323	101325
bar	0.986923	1	750.06	10197.1	14.504	1.01972	100000
mmHg(torr)	0.001316	0.001333	1	13.595	0.01934	0.00136	0.01333
mH ₂ O	0.000097	0.000098	0.073556	1	0.001422	0.0001	9.80669
psi(lb/ft ²)	0.068046	0.068948	51.715	703.066	1	0.070307	6894.757
kgf/cm ²	0.967841	0.980665	735.559	10000	14.2233	1	98066.5
Pa	0.00001	0.00001	0.007502	0.101971	0.000145	0.000011	1

● Energy

Units	J(N.m)	kcal	kW.h	kgf.m	ft.lbf	BTU
J(N.m)	1	0.000239	0.0000003	0.101972	0.737562	0.000948
kcal	4186.75	1	0.001163	426.93	3087.99	3.97093
kW.h	3600000	859.855	1	367098	2655224	3414.43
kgf.m	9.80665	0.002343	0.000003	1	7.23301	0.009301
ft.lbf	1.35582	0.000324	0.0000004	0.138255	1	0.001286
BTU	1054.35	0.25183	0.000293	107.514	777.649	1

Conversion Table

● Force

Units	hp	kgf.m/s	W(J.s)	kW	kcal/s	BTU/s
hp	1	76.04	745.7	0.7457	0.1782	0.7073
kgf.m/s	13.15e-3	1	9.807	9.807e-3	2.344e-3	9.296e-3
W(J.s)	1.342e-3	0.102	1	0.001	2.3884e-4	9.484e-4
kW	1.341	102	1000	1	0.239	0.9484
kcal/s	5.614	426.9	4187	4.187	1	3.968
BTU/s	1.415	107.6	1055	1.055	0.252	1

● Velocity

Units	m/s	km/hr	in/s	ft/s	miles/hr	knots
m/s	1	3.6	39.37	3.281	2.237	1.944
km/hr	0.2778	1	10.936	0.9113	0.6214	0.54
in/s	0.0254	0.0914	1	0.833	0.0568	0.0494
ft/s	0.3048	1.0973	12	1	0.6818	0.0293
miles/hr	0.447	1.6093	17.6	1.4667	1	0.869
knots	0.5144	1.852	20.254	1.6878	1.1508	1

● Angular

Units	deg.	s	min	radians	quad	cycles
deg.	1	3600	60	0.017453	0.011111	0.002778
s	0.000278	1	0.016667	4.848e-6	3.086e-6	7.716e-7
min	0.016667	60.	1	2.909e-4	1.852e-4	4.63e-5
radians	57.2958	206264	3437.75	1	0.63662	0.159155
quad	90	324000	5400.	1.5708	1	0.25
cycles	360	1296000	21600	6.28319	4	1

● Flow Rate

Units	ℓ/s	ℓ/min	cm ³ /s	m ³ /hr	ft ³ /min	gal/min
ℓ/s	1	60	1000	3.6	2.11887	15.851
ℓ/min	0.016667	1	16.6667	0.06	0.035314	0.26418
cm ³ /s	0.001	0.06	1	0.0036	0.002119	0.01585
m ³ /hr	0.277778	16.6667	277.778	1	0.598575	4.40295
ft ³ /min	0.47195	28.317	471.95	1.69902	1	7.4807
gal/min	0.063089	3.78534	63.089	0.22712	0.131677	1

● Density

Units	g/cm ³ (s.g)	g/ℓ	kg/m ³	lb/m ³	lb/ft ³	lb/gal
g/cm ³ (s.g)	1	1000	1000	0.036124	62.422	8.34516
g/ℓ	0.001	1	1	0.000036	0.062422	0.008345
kg/m ³	0.001	1	1	0.000036	0.062422	0.008345
lb/m ³	27.6826	27682.6	27682.6	1	1728	231.015
lb/ft ³	0.01602	16.02	16.02	0.000579	1	0.13369
lb/gal	0.11983	119.83	119.83	0.004329	7.48003	1

● Acceleration

Units	cm/s ²	m/s ²	in/s ²	ft/s ²	gal	g
cm/s ²	1	0.01	0.393701	0.032808	1	0.00102
m/s ²	100	1	39.3701	3.28084	100	0.101971
in/s ²	2.54	0.0254	1	0.083333	2.54	0.00259
ft/s ²	30.48	0.3048	12	1	30.48	0.031081
gal	1	0.01	0.393701	0.032808	1	0.00102
g	980.665	9.80665	386.089	32.1741	980.665	1

Conversion Table

● Illuminance

Units	lux	foot-candle	lumen/ft ²	lumen/m ²	phot
lux	1	0.092903	0.92903	1	0.0001
foot-candle	10.76391	1	1	10.76391	0.001076
lumen/ft ²	10.76391	1	1	10.76391	0.001076
lumen/m ²	1	0.092903	0.92903	1	0.0001
phot	10000	929.03	929.03	10000	1

● Brightness

Units	candela/in ²	candela/m ²	foot-lambert	lambert	stilb
candela/in ²	1	1550.003	452.389	0.486948	0.1550003
candela/m ²	0.000645	1	0.000188	0.000314	0.0001
foot-lambert	0.00221	3.42626	1	0.001076	0.000343
lambert	2.05361	3183.1	929.03	1	0.31831
stilb	6.4516	10000	2918.63	3.1415915	1

● Concentration

Units	%	ug/ℓ	mg/ℓ	g/ℓ	ppm	ppb
%	1	1e8	10000	10	10000	1e8
ug/ℓ	1e-7	1	0.001	0.000001	0.001	1
mg/ℓ	0.0001	1000	1	0.001	1	1000
g/ℓ	0.1	1e7	0.001	0.000001	0.001	1e7
ppm	0.0001	1000	1	0.001	1	1000
ppb	1e-7	1	0.001	0.000001	0.001	1

● Viscosity

Units	cP	P(g/cm.s)	gmf.s/cm ²	lbf.s/in ²	mPa.s	N.s/m ²
cP	1	0.01	1.02e-7	1.45e-7	1	0.001
P(g/cm.s)	100	1	1.02e-6	1.45e-5	100	0.1
gmf.s/cm ²	98039.2	980.392	1	0.014219	98039.2	98.0392
lbf.s/in ²	6894757	68947.57	70.3265	1	6894757	6894.76
mPa.s	1	0.01	1.02e-7	1.45e-7	1	0.001
N.s/m ²	1000	10	0.0102	1.45e-4	1000	1

● Dynamic Viscosity

Units	cSt	St	cm ² /s	m ² /hr	in ² /s	ft ² /s
cSt	1	0.01	0.01	0.0036	0.00155	1.076e-5
St	100	1	1	0.36	0.155039	0.001076
cm ² /s	100	1	1	0.36	0.155039	0.001076
m ² /hr	277.778	2.77778	2.77778	1	0.430663	0.00299
in ² /s	645	6.45	6.45	2.322	1	0.006943
ft ² /s	92903	929.03	929.03	334.451	144.036	1

● Typical index of Conductivity

Samples	Conductivity
Pure Water	0.055 μS/cm
Distilled Water	0.5 μS/cm
Industrial Water	1.0 μS/cm
Mineral Water	1.0 μS/cm
Tap Water	50 μS/cm
Drinking Water	1055 μS/cm
0.01N KCL	1409 μS/cm
Sea Water	53 ms/cm
10% NaCH	355 ms/cm
10% H ₂ SO ₄	432 ms/cm
31% HNO ₃	865 ms/cm

● Typical index of viscosity valve

Typical liquid	Centipoise (cp)	Centistokes (cSt)	Saybolt Second Universal (SSU)
Water	1	1	31
Milk	3.2	4	40
Number 4 fuel oil	12.6	15.7	80
Cream	16.5	20.6	100
Vegetable oil	34.6	43.2	200
SAE 10 oil	88	110	500
Tomato juice	176	220	1000
SAE 30 oil	352	440	2000
Glycerine	880	1100	5000
SAE 50 oil	1561	1735	8000
Honey	1760	2200	10,000
Glue	3000	4500	20,000
Mayonnaise	5000	6250	28,000
Molasses B	8640	10,800	50,000
Sour cream	15,200	19,000	86,000
SAE 70 oil	17,640	19,600	90,000

Periodic Table of the Elements

PERIODIC TABLE OF THE ELEMENTS KEY

- METAL (Blue)
- SEMIMETAL (Orange)
- NONMETAL (Light Green)
- ALKALI METAL (Purple)
- HALOGEN (Dark Green)
- NOBLE GAS (Light Yellow)
- ALKALINE EARTH METAL (Light Purple)
- TRANSITION METAL (Light Blue)
- LANTHANIDE SERIES (Pink)
- ACTINIDE SERIES (Red)

STANDARD STATE

- He GAS
- Li SOLID
- Br LIQUID
- Tc SYNTHETIC

GROUP ILLUSTRATION:

- GROUP I: H (1.0079)
- GROUP II: He (4.0026)
- GROUP III: B (10.811)
- GROUP IV: C (12.011)
- GROUP V: N (14.007)
- GROUP VI: O (15.999)
- GROUP VII: F (18.998)
- GROUP VIII: Ne (20.180)
- GROUP IX: Ar (39.948)
- GROUP X: Kr (83.80)
- GROUP XI: Xe (131.29)
- GROUP XII: Rn (222)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 IA H 1.0079 Hydrogen	2 IIA Li 6.941 Lithium Be 9.0122 Beryllium	3 IIIB Na 22.990 Sodium Mg 24.305 Magnesium	4 IIB K 39.098 Potassium Ca 40.078 Calcium	5 IIB Sc 44.956 Scandium Ti 47.867 Titanium V 50.942 Vanadium Cr 51.996 Chromium Mn 54.938 Manganese Fe 55.845 Iron Co 58.933 Cobalt Ni 58.693 Nickel Cu 63.546 Copper Zn 65.39 Zinc	6 IIB Y 88.906 Yttrium Zr 91.224 Zirconium Nb 92.906 Niobium Mo 95.94 Molybdenum Tc 98 Technetium Ru 101.07 Ruthenium Rh 102.91 Rhodium Pd 106.42 Palladium Ag 107.87 Silver Cd 112.41 Cadmium	7 IIB La-Lu 89-103 Lanthanide Series	8 IIB Hf 104 Hafnium Ta 106 Tantalum W 108 Tungsten Re 106 Rhenium Os 108 Osmium Ir 106 Iridium Pt 106 Platinum Au 106 Gold Hg 106 Mercury	9 IIB Rf 104 Rutherfordium Db 105 Dubnium Sg 106 Seaborgium Bh 107 Bohrium Hs 108 Hassium Mt 109 Meitnerium Uun 110 Ununium Uuu 111 Ununium Uuq 112 Ununium	10 IIB In 72 Indium Sn 72 Tin Sb 72 Antimony Te 72 Tellurium I 72 Iodine Xe 72 Xenon	11 IIB Tl 72 Thallium Pb 72 Lead Bi 72 Bismuth Po 72 Polonium At 72 Astatine Rn 72 Radon	12 IIB Uuq 114 Ununquadium	13 IIB Uub 116 Ununhexium	14 IIB Uuo 118 Ununoctium	15 IIB Uuo 118 Ununoctium	16 IIB Uuo 118 Ununoctium	17 IIB Uuo 118 Ununoctium	18 IIB Uuo 118 Ununoctium

LANTHANIDE SERIES

57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
La Lanthanum (227) 90	Ce Cerium (227) 90	Pr Praseodymium (227) 91	Nd Neodymium (227) 92	Pm Promethium (227) 93	Sm Samarium (227) 94	Eu Europium (227) 95	Gd Gadolinium (227) 96	Tb Terbium (227) 97	Dy Dysprosium (227) 98	Ho Holmium (227) 99	Er Erbium (227) 100	Tm Thulium (227) 101	Yb Ytterbium (227) 102	Lu Lutetium (227) 103

ACTINIDE SERIES

89	90	91	92	93	94	95	96	97	98	99	100	101	102	103
Ac Actinium (227) 89	Th Thorium (227) 90	Pa Protactinium (227) 91	U Uranium (227) 92	Np Neptunium (227) 93	Pu Plutonium (227) 94	Am Americium (227) 95	Cm Curium (227) 96	Bk Berkelium (227) 97	Cf Californium (227) 98	Es Einsteinium (227) 99	Fm Fermium (227) 100	Md Mendelevium (227) 101	No Nobelium (227) 102	Lr Lawrencium (227) 103