

Lab Companion



Autoclaves
Baths & Circulators
Desiccators
Furniture
Hoods
Incubators
Ovens
Pumps
Recirculating Coolers (Chillers)
Refrigerators & Freezers
Rotator
Shakers
Heating & Cooling Blocks
Hotplates & Stirrers
Vortex Mixers
Temperature Chambers
Temperature & Humidity Chambers
Electrophoresis Systems
Pipettes
Ultrasonic Cleaners
Plasticware & Others
Appendixes



Since **1988,**

JEIO TECH aims to be the global leader in delivering the best laboratory equipment and service for reliable results. Based on our constant growth of management innovation and advanced technological investments, we promise to provide you differentiated solutions that help you make an impact in various research areas.



Best Products for Reliable Results



One Step Solution

Jeio Tech products are put through rigorous quality control from the most basic metal processing to final inspections.

Based on over 28 years of technical experience in instrument manufacturing, our highly integrated team of engineers strive to deliver outstanding quality to our clients.

Our professional know-how will always keep our reputation as 'the primary partner for the customers research needs'.



Standard Certificates

CE, UL, CSA, RoHS, GD(Good Design Award)

Jeio Tech(Lab Companion) obtained ISO 9001, ISO 13485.

FDA establishment registered company. FDA listed products.



Immaculate Service

We also endeavor to enhance customer value through immaculate service to maintain the first choice of our customers. Our ergonomically designed products minimizes maintenance and mechanical issues.

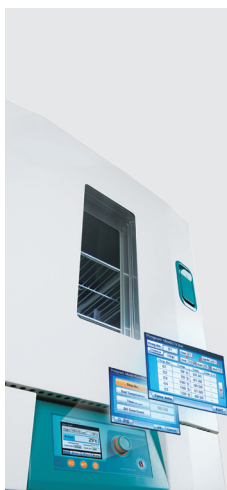
Our worldwide service teams, made up of highly trained service Engineers, are ready to provide you the best tailored customer service experience.



Global Leader 'Lab Companion'

Lab Companion is Jeio Tech's laboratory instrument brand. It has grown into an international brand thanks to its quality and service since 1989.

Our ultimate goal is to provide our clients with safe, high quality, and user-friendly products aimed at setting new standards for the global market.



Laboratory Equipment

Specialized and reliable laboratory equipment with accumulated professional know-how for over 28 years in laboratory equipment industry.

ISO 14644-1
DIN 12876 / DIN 12880

Heating / Cooling
Incubating / Filtering
Shaking / Stirring

Environmental Test Equipment

Reliable environmental test equipment designed and tested in accordance with the international standards.

IEC 60068-3-5 / DIN 12880

Temperature Chamber
Temperature &
Humidity Chamber



Medical Device

Licensed medical equipment with precise temperature control and strict safety systems to meet the strict requirements of international standards.

ISO 13485 / DIN 58371 /
DIN 58375 / DIN 58345

Blood Bank Refrigerator
Plasma Freezer
Pharmacy Refrigerator

Lab Essential

Various essential laboratory products for expanding customers' selection range.

Plasticware
Consumable Goods
Accessory



Features at a glance

Performance



Temp/Speed Calibration

Single or three point temperature calibration for increased accuracy and precise control.



Agitator

Patented agitator advances temperature stability by forming inner circulation.



One Mold Design

Enables virtually no leakage and exceptional durability.



Diffusing Muffler

Exclusive diffusing muffler structure forms high quality laminar flow.



Cartridge Chemical Filter

The simplest way to purify chemicals or extract hazardous fumes. It provides the best energy and space efficient filtering system.



Acid/Base Storage

Optimally designed to store Acid/Base materials by durable and corrosion-resistant structure with efficient ventilation system.



Dual Defrost

Efficient dual defrost system prevents frost formation. Auto-defrost system auto-activated on detecting amount of frost in the evaporator. Manual defrost operation for immediate frost removal.



500 rpm

Highly competitive shaking speed with low vibration satisfying various application needs.



Best Effort Run

Intelligently manages stirring speed to maintain operation even during workload is out of its capacity.

Convenience



Computer Interface

Convenient external control and data collection by connection to RS-232 or USB port. Optional RS-485 communication for operating multiple units.



Program Control

Executes a segment group based on the user input value of temperature or humidity or speed or time.



Dual Timer

Wait on/off Timer : Select each mode or utilize both timer modes for convenient operation.

Temp-related Wait on/off Timer : Set timer to start immediately after timer set or only after reaching the set temp.



Color Touch

Touch type color LCD controller provides and intuitively controls various essential information.

2



Digital IN/OUT control

Digital input and output function exchanges signals by interlocking external devices.



Smart Door System

UV light, Fluorescent light and Blower operations are smartly interlocked with door opening.



Dual Display

Located inside and outside of the workspace for user's convenience.



External Sensor

Real time temp. sensing and displaying by accurate temperature probe.



External Controller

Real time external monitor and control of the current operating condition without opening the door of the enclosure.



Level Indicator

Bright LED fluid level indicator is easily identified in the front.

Safety



CLS-CS

Custom Logical Safe Control System (Patent No. 0328729, 0397583)
Independent safety system to operate in environments that require perfect thermal safety.
[CPU safety feature and logic controlling safety features]



CFC-free Refrigerant

Eco-friendly HFC refrigerant use for protection of the ozone layer.



Over Temp. Protection

Warning alarms and automatically power off against high temperature limit.



Low Fluid Level

Warning alarms and automatically power off against low fluid level.



Auto Run

Automatically runs unit after power interruption.



UV Cut

Protects samples and users from UV exposure.



Backup Controllers

Two temperature backup controllers are designed to counteract any failure.



Auto Dial System

Auto-dialing remote alarm alerts abnormal temp. change or power failures.



Temp/Speed Deviation Alarm

Warning alarms when there is a gap between set value and actual value.



Stalled Platform Check

Warning alarms for stalled platform caused by foreign substances to shaking system.



Hot top warning indicator

Warning indicator blinks when the top plate temperature is over 50 °C.

3

Contents

21 sections with
230 reliable products

The contents of this catalogue are based on the following conditions unless otherwise specified:

1) Products without refrigerators.

- Under room temperature of 25°C and no load.
- Applicable operation temperature range: 15 to 40°C.

2) Products with refrigerators.

- Under room temperature of 20°C and no load.
- Applicable operation temperature range: 18 to 30°C. Especially for Temperature Chambers or Temperature & Humidity Chambers, see P.176-241.

3) All specifications may be changed without prior notice subject to performance improvement.

4) Our website includes detailed information of all Jeio Tech products with up-to-date technical data.



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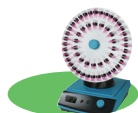
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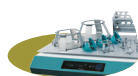
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Autoclaves (Vertical Type)

Microprocessor control with reliable safety functions guarantees optimum sterilization temperature.



ST-65G

- Standard accessories**
- Baskets (2ea), Heater cover, Exhaust tank, Drain bucket
- Optional accessories**
- Pressure sensor, Recorder

Performance

- Microprocessor controller and temperature calibration function allows for high precision temperature control.
 - Sterilization temperature at 110 to 123°C
 - Melting* temperature at 60 to 100°C
 - * Liquefaction of coagulated agar media.
- Automatic sterilization system for unattended operation.
 - Heating > Check safe > Sterilization > Sterilization safe > Exhausting > End
- Convenient operation modes for various uses.
 - Standard modes and program modes are listed in detail as below tables.
- Temperature calibration function.

Standard modes	Temp. (°C)	Time (min.)
Decontamination	121	35
Solids sterilization	121	20
Liquids sterilization	121	15
Melting	100	30

Program modes	Temp. (°C)	Time (min.)
Sterilization 1	110 to 123	1 to 999
Sterilization 2	110 to 123	1 to 999
Liquid sterilization	110 to 123	1 to 999
Melting	60 to 100	1 to 999



Convenience

- Conveniently monitored by an independent control display, sterilization process display, and pressure gauge.
- VFD for visualization of temp, pressure (optional), timer, warning alert checks.
- LED lamps for sterilization process check.
- Easy pressure check with the standard gauge attached to the front.
- Vertical type autoclaves which allow for top loading are suitable for high volume sterilization.
- Baskets are stackable two high or even more levels, which secure inside the chamber space requirements.
- Low-maintenance
- The chamber is constructed of stainless steel which is superiorly resistant to corrosion.
- Easy to replace silicone gasket.
- Convenient documentation with the optional data recorder.
- Dot type recorder(6 point) allows for precise documentation.

Safety

- Mechanical safety devices
- Over current protection.
- Over temperature protection by automatic power cutoff.
- Over pressure protection by automatic and manual safety valve.
- Safety warning systems
- Over temperature warning.
- Low temperature warning.
- Low water level warning.
- Low heat warning if the temperature does not reach the sterilization or melting temperature.
- Sterilization fail warning if the operation is unexpectedly stopped during sterilization process.
- Slide opening door with plastic cover of low thermal conductivity prevents burns from the contact.

Model		ST-50G	ST-65G	ST-85G
Control		Microprocessor PID control		
Chamber volume (L / cu ft)		50 / 1.8	65 / 2.3	85 / 3.0
Temperature ¹⁾	Sterilization temp. (°C / °F)	110 to 123 / 198 to 221.4		
	Melting temp. (°C / °F)	60 to 100 / 108 to 180		
Pressure	Sterilization at 121°C (kg/cm²)	1.1 to 1.2		
	Gauge range in analog (Mpa)	- 0.1 to 0.6		
Safety		Over temperature protector / Pressure safety valve / Over current protector		
Timer		Warning alert (over temp. / low temp. / low heat / sterilization fail / low water level)		
Dimension	No. of baskets (standard / max.)	2 / 2	2 / 2	2 / 2
	Load per baskets (Kg / lbs)	10 / 22.0		
	Basket (ØxH) (mm / inch)	380x180 / 14.9x7.1	380x230 / 14.9x9.1	380x330 / 14.9x13.0
	Interior (WxDxH) (mm / inch)	400x458 / 15.7x18.0	400x558 / 15.7x21.9	400x758 / 15.7x29.8
	Exterior (WxDxH) (mm / inch)	624x672x870 / 24.6x26.5x34.2	624x672x971 / 24.6x26.5x38.2	624x672x1083 / 24.6x26.5x42.6
	Exterior with exhaust tank (WxDxH) (mm / inch)	722x672x870 / 28.4x26.5x34.2	722x672x971 / 28.4x26.5x38.2	722x672x1083 / 28.4x26.5x42.6
	Net weight (Kg / lbs)	94.5 / 208.3	99.5 / 219.4	104 / 229.3
Electrical requirements (230V, 50 / 60 Hz)		14.3A	14.3A	14.3A
Cat. No.		AAHL1015K	AAHL1025K	AAHL1035K

1) Technical data according to EN 554 / BS EN 285:1997.

* Permissible environmental conditions: temperature (5-40°C) and relative humidity (10-80%).

* FDA establishment registered company. FDA listed products.

Max. Loading Capacity of Erlenmeyer Flask			
Capacity ml, (O.D.xH, mm)	ST-50G (ea x floor)	ST-65G (ea x floor)	ST-85G (ea x floor)
250 (82x132)	14x3	14x4	14x5
500 (101x176)	14x3	8x3	8x4
1000 (129x216)	5x2	5x2	5x3
2000 (160x268)	3x1	3x2	3x2

Max. Loading Capacity of Media Bottle			
Capacity ml, (O.D.xH, mm)	ST-50G (ea x floor)	ST-65G (ea x floor)	ST-85G (ea x floor)
250 (70x143)	20x3	20x3	20x5
500 (86x181)	14x2	14x3	14x4
1000 (101x230)	8x1	8x2	8x3
2000 (136x265)	5x1	5x1	5x2

Accessories & Options

Cat. No.	Description	Suitable for
AAAL1501	Recorder set; Recorder (dot type, 6 point) & Temp. sensor (double)	All models
AAAL1511	Pressure sensor (0~3.5 bar)	All models

Cat. No.	Description	Suitable for
ATC0002	Basket (stainless steel, Ø380x180mm)	ST-50G
ATC0003	Basket (stainless steel, Ø380x230mm)	ST-65G
ATC0004	Basket (stainless steel, Ø380x330mm)	ST-85G
AAAL1521	Exhaust Tank	All models
ATC0091	Drain Bucket (490x291x107mm)	All models

Baths & Circulators

Heating Baths

Shaking & Heating Baths

Viscometer Heating Baths

Heating Bath Circulators

Refrigerated &
Heating Bath Circulators

Cold Trap Bath



» General Applications

Heating Baths

Routine laboratory applications,
Coliform determinations, Sample thawing,
Bacteriological examinations,
Microbiological assays, Cell cultivation.

Bath Circulators

External/Internal temperature control,
Photometers, Refractometers, Polarimeters,
Viscometers, Fermentors, Electrophoresis chambers,
Chromatography columns, Rotary evaporators.

Product Name		Heating Baths (Economy)		Heating Baths (General Purpose)	Shaking & Heating Baths	Viscometer Heating Baths
Model		BW-B	BW-H (Dual)	BW-G	BS	VB-G
Bath volume (L)		3.5, 11.5, 20	3.5, 11.5, 20	5, 10, 20	17, 25, 37, 55	25, 40
Temp. control	Temp. range [°C/°F]	Amb. +7 to 100 / Amb. +12.6 to 212	Amb. +5 to 100 / Amb. +9 to 212	Amb. +5 to 100 / Amb. +9 to 212	Amb. +5 to 100 / Amb. +9 to 212	Amb. +5 to 150 / Amb. +9 to 302
	Temp. stability at 50 °C ¹⁾ [± °C/°F]	0.5 / 0.9	0.1 / 0.18	0.2 / 0.36	0.2 / 0.36	0.05, 0.1 / 0.09, 0.18
Control	Timer	-	-	Wait on/off	Wait on/off	Wait on/off
	Auto-tuning	-	0	0	0	0
	Program function	-	-	-	-	-
	Computer interface	-	-	-	-	RS-232 port
Safety	Over temp. limit	0	0	0	0	0
	Low fluid level alarm	-	-	0	-	0
	Over current limit	0	0	0	0	0
	Auto-run (power failure)	-	-	0	0	0

1) Technical data according to DIN 12876.

» Technical Benefits

Performance

- Designed and tested in accordance with the international standard DIN 12876.
- Microprocessor PID control for precise temperature control.
- Temperature calibration and auto-tuning functions for optimizing the unit to the various test environment.
- Bath circulators are suitable for both internal and external bath environments.
- Programmable models are specially designed for satisfying convenient sophisticated control.
 - Intelligent program and scheduler.
 - Digital input and output control.

Convenience

- Wide selection covers all of your application needs.
 - Temperature / Volume / Control type / Circulation.
- Easy maintenance design.
 - Rounded corners for easy cleaning.
 - Corrosion resistant, seamless, leak-proof, stainless steel interior bath.
 - Dirt-repellent external surface with power coating.
- User-friendly functions for easy operating.
 - Wait on/off dual timer.
(except for BW-B and BW-H / CTB)
 - Three commonly used temperature memories.
- Intuitive touch LCD controller with easy icons and logical menus for easy operating.(for programmable models)

Safety

- Patented CLS-CS
(Custom Logical Safe Control System)
 - Protection against low fluid level and dry running.
 - Automatic power cut-off system against overheating.
 - Protection system by fuses against overcurrent.
 - Automatic run or Manual run after power interruption.
- Eco-friendly CFC-free refrigerant use
(for refrigerated models)

Heating Bath Circulators (General)	Heating Bath Circulators (Programmable)	Refrigerated & Heating Bath Circulators (General)		Refrigerated & Heating Bath Circulators (Programmable)		Cold Trap Bath
CW3	CW3-P	RW3		RW3-P		CTB
5, 10, 20, 30	5, 10, 20, 30	5, 10, 20, 30		5, 10, 20, 30		4.8
Amb. +5 to 150 / Amb. +9 to 302	Amb. +5 to 150 / Amb. +9 to 302	-25 to 150 / -13 to 302	-35 to 150 / -31 to 302	-25 to 150 / -13 to 302	-35 to 150 / -31 to 302	Down to -40 / -40
0.05, 0.08 / 0.09, 0.14	0.05, 0.08 / 0.09, 0.14	0.05 / 0.09		0.05 / 0.09		-
Wait on/off	Wait on/off	Wait on/off		Wait on/off		-
0	0	0		0		-
-	0	-		0		-
RS-232 port (RS-232 to USB serial converter is provided)	RS-232 port (RS-232 to USB serial converter is provided)	RS-232 port (RS-232 to USB serial converter is provided)		RS-232 port (RS-232 to USB serial converter is provided)		-
0	0	0		0		0
0	0	0		0		-
0	0	0		0		0
0	0	0		0		-

Heating Baths (Economy-Analog)



Economical water baths for optimal temperature control.



BW-10B

with optional transparent PP gable cover

Optional accessories see page 28-29

- Stainless steel flat covers
- Open-ring covers, Test tube racks
- Spring wire racks, Half-shelf adjusters



Wide selection of accessories

Performance

- Temperature range from ambient +7 °C to 100 °C.
- On/off temperature control.

Convenience

- Simple and quick control panel.
- Corrosion-resistant stainless steel construction allowing other bath fluids as well as water and silicone fluids.
- Low-profile design with sloped control panel for easier access and better safety.
- Variety of accessories are available to meet application demands.

Safety

- Isolated design of heater, and sensor by a baffle plate to protect users and samples against direct contact.
- Complete safety protection system with warning alarms.
 - Over-temperature, over-current protection.
- Splash-proof keypad.



Simple and quick control

Model		BW-05B		BW-10B		BW-20B	
Bath volume (L / cu ft)		3.5 / 0.1		11.5 / 0.4		20 / 0.7	
Working temperature range (°C / °F)		Amb. +7 to 100 / Amb. +12.6 to 212					
Temperature stability ¹⁾ (±°C / °F)		0.5 / 0.9					
Dimension	Bath opening / depth (W×L, D) (mm / inch)	240×136, 115 / 9.4×5.4, 4.5		300×240, 165 / 11.8×9.5, 6.5		498×300, 165 / 19.6×11.8, 6.5	
	Exterior (W×L×H) (mm / inch)	303×242×245 / 11.9×9.5×9.6		357×330×290 / 14.1×13×11.4		564×392×290 / 22.2×15.4×11.6	
	Net weight (kg / lbs)	6.5 / 14.3		10 / 22		18.5 / 40.8	
Electrical requirements (230V)		60Hz, 3A 50Hz, 3A		60Hz, 4.3A 50Hz, 4.3A		60Hz, 8.7A 50Hz, 8.7A	
Cat. No.		AAH46011K	AAH46012K	AAH46021K	AAH46022K	AAH46031K	AAH46032K
Electrical requirements (120V)		60Hz, 5.8A		60Hz, 8.3A		60Hz, 8.3A	
Cat. No.		AAH46013U		AAH46023U		AAH46033U	

¹⁾ Technical data according to DIN 12876. (bath fluid : water at 50 °C)

* FDA establishment registered company. FDA listed products.



Performance

- Temperature range from ambient +5 °C to 100 °C.
- Microprocessor PID control / Automatic tuning / Calibration.
- Powerful circulation system using our patented agitator.

Convenience

- Two independently controlled reservoirs merged into a single unit for space saving. (for Dual models)
- Digital LED displays with quick adjustable dial knob. (0.1 °C resolution)
- Low-profile design with sloped control panel for easier access and better safety.

Safety

- Isolated design of heater, and sensor by a baffle plate to protect users and samples against direct contact.
- Complete safety protection system with warning alarms.
 - Over-temperature, over-current protection.
- Keypad lock function prevents accidental changes during operation.

Economical, digital heating baths.
Model selection between single and dual baths.



BW-10H / BW-0510H

with optional accessories

Optional accessories
see page 28-29

- Transparent PP gable covers
- Test tube racks, Open-ring covers



Powerful circulation by built in agitator



Accurate value setting and display

Digital Model		BW-05H		BW-10H		BW-20H			
Bath volume (L / cu ft)		3.5 / 0.1		11.5 / 0.4		20 / 0.7			
Working temperature range (℃ / °F)		Amb. +5 to 100 / Amb. +9 to 212							
Temperature stability ¹⁾ (±℃ / °F)		±0.1 / 0.18							
Dimension	Bath opening / depth (W×L, D) (mm / inch)	240×136, 150 / 9.4×5.4, 5.9		300×240, 200 / 11.8×9.5, 7.9		498×300, 200 / 19.6×11.8, 7.9			
	Exterior(W×L×H) (mm / inch)	307×216×266 / 12.1×8.5×10.5		364×316×318 / 14.3×14.4×12.5		564×372×318 / 22.2×14.6×12.5			
	Net weight (kg / lbs)	6.5 / 14.3		9.5 / 21		15.5 / 34.2			
Electrical requirements (230V, 50 / 60Hz)		3.0A		4.3A		8.7A			
Cat. No.		AAH45115K		AAH45125K		AAH45135K			
Electrical requirements (120V, 60Hz)		5.8A		8.3A		8.3A			
Cat. No.		AAH45113U		AAH45123U		AAH45133U			
Dual Model		BW-0505H		BW-0510H		BW-1010H		BW-1020H	
Bath volume (L / cu ft)		3.5 & 3.5 / 0.1 & 0.1		3.5 & 11.5 / 0.1 & 0.4		11.5 & 11.5 / 0.4 & 0.4		11.5 & 20 / 0.4 & 0.7	
Working temperature range (℃ / °F)		Amb. +5 to 100 / Amb. +9 to 212							
Temperature stability ¹⁾ (±℃ / °F)		±0.1 / 0.18							
Dimension	Bath opening / depth (W×L, D & W×L, D) (mm / inch)	240×136, 150per chamber		240×136, 150 & 300×240, 200		300×240, 200 per chamber		300×240, 200 & 498×300, 200	
		9.4×5.4, 5.9 per chamber		9.4×5.4, 5.9 & 11.8×9.5, 7.9		11.8×9.5, 7.9 per chamber		11.8×9.5, 7.9 & 19.6×11.8, 7.9	
	Exterior (W×L×H) (mm / inch)	590×216×265 / 23.2×8.5×10.4		544×316×318 / 21.4×12.4×12.5		706×300×318 / 27.8×11.8×12.5		844×372×318 / 33.2×14.6×12.5	
	Net weight (kg / lbs)	9.7 / 21.3		12.4 / 27.3		14 / 30.8		17.6 / 38.7	
Electrical requirements (230V, 50 / 60Hz)		3 & 3A		3 & 4.3A		4.3A & 4.3A		4.3A & 8.7A	
Cat. No.		AAH47115K		AAH47125K		AAH47135K		AAH47145K	
Electrical requirements (120V, 60Hz)		5.8A & 5.8A		5.8A & 8.3A		8.3A & 8.3A		8.3A & 8.3A	
Cat. No.		AAH47113U		AAH47123U		AAH47133U		AAH47143U	

1) Technical data according to DIN 12876. (bath fluid : water at 50°C)

* FDA establishment registered company. FDA listed products.

Heating Baths (General)



Outstanding temperature control water baths for diverse applications.



BW-05G

Standard accessories

- Stainless steel flat cover

Optional accessories

see page 28-29

- Open-rings covers, Test tube racks
- Spring wire racks, Half-shelf adjusters

Performance

- Temperature range from ambient +5 °C to 100 °C.
- Microprocessor PID control / Automatic tuning / Calibration.

Convenience

- Easy readout digital LED displays. (0.1 °C resolution)
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Programming functions are ideal for critical research quality control, and regulatory tests.
- Convenient memory function of up to three frequently set temperature.
- Corrosion-resistant stainless steel construction allowing other bath fluids as well as water and silicone fluids.
- Low-profile reservoir design.

Safety

- Isolated design of heater, and sensor by a baffle plate to protect users and samples against direct contact.
- Complete safety protection system with warning alarms.
 - Low fluid level and dry-running, over-temperature, over-current.
- Splash-proof keypad.

Model		BW-05G	BW-10G	BW-20G
Bath volume (L / cu ft)		5 / 0.2	10 / 0.4	20 / 0.7
Working temperature range (°C / °F)		Amb. +5 to 100 / Amb. +9 to 212		
Temperature stability ¹⁾ (± °C / °F)		0.2 / 0.36		
Dimension	Bath opening / depth (WxL, D) (mm / inch)	231×150, 160 / 9.1×5.9, 6.3	285×211, 180 / 11.2×8.3, 7.1	345×290, 200 / 13.6×11.4, 7.9
	Exterior with gable cover (WxLxH) (mm / inch)	355×260×334 / 14×10.2×13.1	410×311×354 / 16.1×12.2×14	471×390×374 / 18.5×15.4×14.7
	Net weight (kg / lbs)	10 / 22	14 / 31	18 / 40
Electrical requirements (230V, 50 / 60Hz)		3A	4.4A	8.7A
Cat. No.		AAH41405K	AAH41415K	AAH41425K
Electrical requirements (120V, 50 / 60Hz)		5.8A	8.3A	8.3A
Cat. No.		AAH41406U	AAH41416U	AAH41426U

¹⁾ Technical data according to DIN 12876. (bath fluid : water at 50 °C)

* FDA establishment registered company. FDA listed products.



Performance

- Temperature range from ambient +5 °C to 100 °C.
- Microprocessor PID control / Automatic tuning / Calibration.
- Separate control keys for shaker mechanism allows the unit also to be used as heating bath.

Convenience

- Multiple LED displays (0.1 °C and 1 rpm resolution) for setting various values.
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Minimal shock to the samples thanks to the shaker's gentle start feature.
- Spring wire rack is easy to equip and the height of the rack is easily adjustable.
- Gable cover minimizes the liquid loss and prevents dripping of the bath liquid into the samples.
- Silent and anti-vibration BLDC motor.
- SUS 304 spring wire rack (two tier rack with flexible crossed spring) provides various ways of glassware settings.

Safety

- Isolated design of agitator, heater, and sensor by a baffle plate to minimize the turbulence in the bath fluid and also to protect users and samples against direct contact.
- Complete safety protection system with warning alarms.
 - Over-temperature, over-current protection.



Specially designed inner gable cover for protection of sample contamination

Reciprocal shaking & heating baths.

Ideal for sample incubation conditions for DNA, tissue, or cell culture applications.



BS-31

Standard accessories

- Stainless steel gable cover
- Spring wire rack

Optional accessories

see page 27

- Universal platforms
- Dedicated platforms, Flask clamps

Model		BS-06	BS-11	BS-21	BS-31
Bath volume (L / cu ft)		17 / 0.6	25 / 0.9	37 / 1.3	55 / 1.9
Working temperature range (°C / °F)		Amb. +5 to 100 / Amb. +9 to 212			
Temperature stability ¹⁾ (± °C / °F)		0.2 / 0.36			
Shaking system	Motion / Speed range (rpm)	Reciprocating / 20 to 180			
	Recip stroke length (mm / inch)	25, 30, 35 / 1.0, 1.2, 1.4 available - Standard 30 / 1.2			
Dimension	Bath opening / depth (WxL, D) (mm / inch)	199x300, 235 / 7.8x11.8, 9.3	319x300, 235 / 12.6x11.8, 9.3	479x300, 235 / 18.9x11.8, 9.3	629x350, 235 / 24.8x13.8, 9.3
	Exterior (WxLxH) (mm / inch)	430x440x355 / 16.9x17.3x14	550x440x355 / 21.7x17.3x14	710x440x355 / 28x17.3x14.3	860x490x355 / 33.9x19.3x14
	Net weight (kg / lbs)	26 / 57	30 / 66	35 / 77	42 / 93
Electrical requirements (230V, 60Hz)		3.7A	4.6A	8.9A	8.9A
Cat. No.		AAH44061K	AAH44111K	AAH44211K	AAH44311K
Electrical requirements (230V, 50Hz)		3.7A	4.6A	8.9A	8.9A
Cat. No.		AAH44062K	AAH44112K	AAH44212K	AAH44312K
Electrical requirements (120V, 60Hz)		7.1A	8.8A	-	-
Cat. No.		AAH44063U	AAH44113U	-	-

1) Technical data according to DIN 12876. (bath fluid : water at 50 °C)

* FDA establishment registered company. FDA listed products.

Viscometer Heating Baths



Ultra precise temperature control with excellent visibility.



VB-40G

Standard accessories

- Stainless steel covers for holes on the top
- Cooling coil

Optional accessories

see page 29

- Viscometer tube holders
- Cooling Circulators

Performance

- Temperature range from ambient +5 °C to 150 °C.
- Microprocessor PID control / Automatic tuning / Calibration.
- Optimal temperature equilibrium achieved by a vane type stirrer with strong circulation power.

Convenience

- Easy readout digital LED displays.
(0.01 °C resolution at 0 to 99.9 °C / 0.1 °C resolution at 100 to 150 °C)
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Convenient memory function of up to three frequently set temperature.
- Clear visibility provided by double tempered safety glass windows in front and rear sides.
- Operations at below or slightly above ambient temperature allowed by stainless steel cooling coil.
(for operation from 10 °C, use an optional cooling circulator)
- Ø 51 mm holes (for glass capillary viscometer tubes) and a Ø12.6 mm hole. (for a thermometer)
- RS-232 interface for external control and data collection.

Safety

- Isolated design of agitator, heater, and sensor by a baffle plate to minimize the turbulence in the bath fluid and also to protect users and samples against direct contact.
- Complete safety protection system with warning alarms.
- Low fluid level and dry-running, over-temperature, over-current.



Ideal for application requiring high visibility



Easy holding of U-shaped viscometer glass tubes (optional)

Model		VB-25G		VB-40G	
Bath volume (L / cu ft)		25 / 0.9		40 / 1.4	
Working temperature range ²⁾ (°C / °F)		Amb. +5 to 150 / Amb. +9 to 302			
Temperature stability ¹⁾ (± °C / °F)		0.05 / 0.09		0.1 / 0.18	
Dimension	Bath opening / depth (WxL, D) (mm / inch)	145x265, 330 / 5.7x10.4, 13		295x265, 330 / 11.6x10.4, 13	
	Cover lids / Hole for thermometer (mm)	5ea / Ø51, 1ea / Ø12.6		8ea / Ø51, 1ea / Ø12.6	
	Exterior (WxLxH) (mm / inch)	492x374x536 / 19.4x14.7x21.1		642x374x536 / 25.3x14.7x21.1	
	Net weight (kg / lbs)	28 / 61.7		37 / 81.6	
Electrical requirements (230V)		60Hz, 13A		60Hz, 13A	50Hz, 13A
Cat. No.		AAH43301K		AAH43401K	AAH43402K

1) Technical data according to DIN 12876. (bath fluid : water at 50 °C)

2) If you want to operate the unit below Amb. + 5 °C, an optional cooling circulator is required.

The lowest temperature when using an optional cooling circulator is +10 °C. For ordering information, see page 22 to 25.

* FDA establishment registered company. FDA listed products.



Performance

- Temperature range from ambient +5 °C to 150 °C.
- Microprocessor PID control.
- Three point temperature calibration / Automatic tuning / Automatic run.
- Accurate, stable, and efficient temperature management by using a powerful variable-speed pump. (1 to 3 steps of pump for internal circulation and 4 to 5 steps for external circulation)
- Powerful pump pressure and flow rate throughout the whole temperature range.

Convenience

- Bright VFD display with quick adjustable dial knob. (0.1 °C resolution)
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Convenient memory function of up to three frequently set temperature.
- Corrosion-resistant, leak-proof, round-cornered, and easy-to-clean stainless steel bath with front access drain valve.
- RS-232 interface for external control and data collection. (RS-232 to USB serial converter is provided.)
- Side handles enables convenience handling and transport.

Safety

- Isolated design of agitator, heater, and sensor by a baffle plate to minimize the turbulence in the bath fluid and also to protect users and samples against direct contact
- Complete safety protection system with warning alarms.
 - Low fluid level and dry-running, over-temperature, over-current.
- Keypad lock function prevents accidental changes during operation.

External and internal circulation with powerful pumping capability



CW3-10

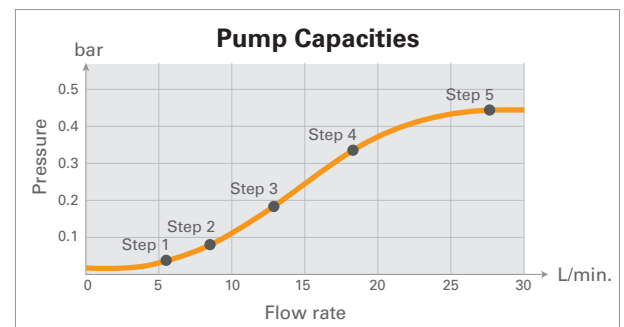
Standard accessories

- Stainless steel flat cover
- Silicone rubber tubing (1ft length / 12mm inner dia.)

Optional accessories

see page 28-29

- Test tube racks, Spring wire racks



* Bath fluid : Water at the normal temperature.

Model		CW3-05	CW3-10	CW3-20	CW3-30
Bath volume (L / cu ft)		5 / 0.2	10 / 0.4	20 / 0.7	30 / 1.1
Working temperature range ²⁾ (°C / °F)		Amb. +5 to 150 / Amb. +9 to 302			
Temperature stability ¹⁾ (± °C / °F)		0.05 / 0.09			
Pump	Max. pressure	5.9 PSI (406.8 millibar)			
	Max. flow rate	7.4 gallons / minute (28 liters / minute)			
Dimension	Bath opening / depth (W×L, D) (mm / inch)	150×99, 160 / 5.9×3.9, 6.3	211×154, 180 / 8.3×6.1, 7.1	290×214, 200 / 11.4×8.4, 7.9	300×264, 230 / 11.8×10.4, 9
	Exterior (W×L×H) (mm / inch)	228×395×424 / 8.9×15.6×16.7	289×450×444 / 11.4×17.7×17.5	368×510×464 / 14.5×20.1×18.3	378×560×494 / 14.9×22×19.4
	Net weight (kg / lbs)	12.5 / 27.6	15 / 33	17.5 / 38.6	19.5 / 43
Electrical requirements (230V, 50/60 Hz)		8.5A	8.5A	8.5A	8.5A
Cat. No.		AAH52341K	AAH52351K	AAH52361K	AAH52371K
Electrical requirements (120V, 60 Hz)		8.6A	8.6A	8.6A	8.6A
Cat. No.		AAH52342U	AAH52352U	AAH52362U	AAH52372U

1) Technical data according to DIN 12876. (bath fluid : water at 50 °C)

2) If you operate the unit in 1 to 3 steps of pump, the temperature range can be from Amb. +5 °C but in 4 and 5 steps, the range will be from Amb. +15 °C.

* FDA establishment registered company. FDA listed products.

Heating Bath Circulators (Programmable)

Highly intuitive user interface is insured by equipping the new smart programmable controller.



CW3-P models

Standard accessories

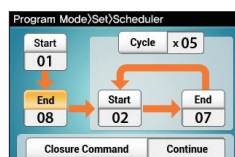
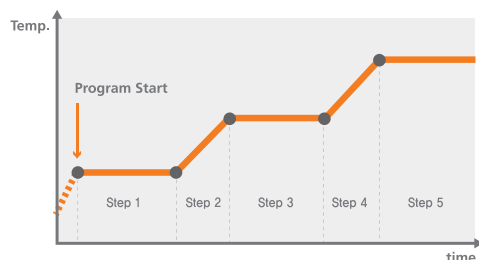
- Stainless steel flat cover
- Silicone rubber tubing (1ft length / 12mm inner dia.)

Optional accessories

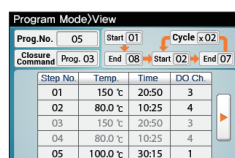
see page 28-29

- Test tube racks, Spring wire racks

Intelligent program control

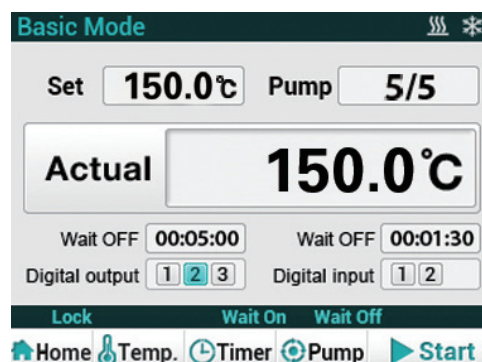


Convenient scheduler



Step No.	Temp.	Time	DO Ch.
01	150.0 °C	20:50	3
02	80.0 °C	10:25	4
03	150.0 °C	20:50	3
04	80.0 °C	10:25	4
05	100.0 °C	30:15	1

Program view at a glance



Touch LCD Controller



Intelligent program control

- 10 programs available for temperature ramp up and dwell control.
- 10 steps per a program and 99 hours 59 minutes per a step.
- Stored programs are easily linkable.
- Programs can be repeated up to 99 cycles.
- Pre-heating and heating time are settable before program starts.

Performance

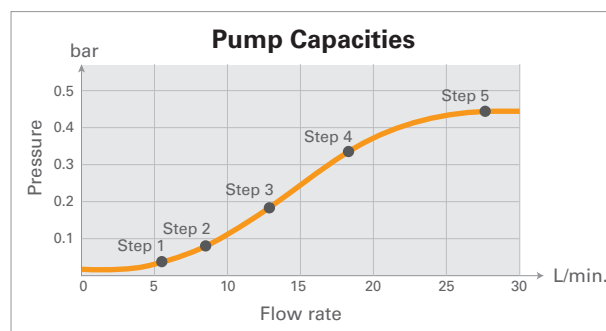
- Temperature range from ambient +5 °C to 150 °C.
- Microprocessor PID control.
- Three point temperature calibration / Automatic tuning / Automatic run.
- Accurate, stable, and efficient temperature management by using a powerful variable-speed pump. (1 to 3 steps of pump for internal circulation and 4 to 5 steps for external circulation)
- Powerful pump pressure and flow rate throughout the whole temperature range.

Convenience

- Intuitive touch screen LCD controller with easy icons and logical menus.
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Digital input and output control function for interlocking external devices.
- Corrosion-resistant, leak-proof, round-cornered, and easy-to-clean stainless steel bath with front access drain valve.
- RS-232 interface for external control and data collection. (RS-232 to USB serial converter is provided.)
- Built-in casters and side handles for easy transport and installation.

Safety

- Isolated design of agitator, heater, and sensor by a baffle plate to minimize the turbulence in the bath fluid and also to protect users and samples against direct contact.
- Complete safety protection system with warning alarms.
 - Low fluid level and dry-running, over-temperature, over-current.
- Keypad lock function prevents accidental changes during operation.
- Splash-proof keypad.



Pump Step	1	2	3	4	5
Max. pressure (psi)	0.5	1.1	2.4	4.9	5.9
Max. flow rate (L/min)	5.6	8.0	12.8	18.8	28.0

※ Bath fluid: water at the normal temperature.

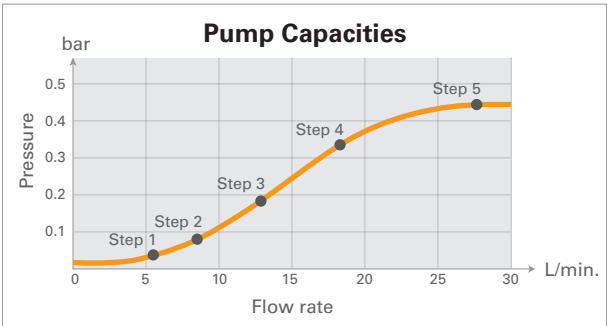
Model	CW3-05P	CW3-10P	CW3-20P	CW3-30P
Bath volume (L / cu ft)	5 / 0.2	10 / 0.4	20 / 0.7	30 / 1.1
Working temperature range ²⁾ (°C / °F)	Amb. +5 to 150 / Amb. +9 to 302			
Temperature stability ¹⁾ (± °C / °F)	0.05 / 0.09			0.08 / 0.14
Pump	Max. pressure	5.9 PSI (406.8 millibar)		
	Max. flow rate	7.4 gallons / minute (28 liters / minute)		
Dimension	Bath opening / depth (W×L, D) (mm / inch)	150×99, 160 / 5.9×3.9, 6.3	211×154, 180 / 8.3×6.1, 7.1	290×214, 200 / 11.4×8.4, 7.9
	Exterior (W×L×H) (mm / inch)	220×395×424 / 8.7×15.6×16.7	281×450×444 / 11.1×17.7×17.5	360×510×464 / 14.2×20.1×18.3
	Net weight (kg / lbs)	12.5 / 27.6	15 / 33	17.5 / 38.6
Electrical requirements (230V, 50/60 Hz)		8.5A	8.5A	8.5A
Cat. No.		AAH52741K	AAH52751K	AAH52761K
Electrical requirements (120V, 60 Hz)		8.6A	8.6A	8.6A
Cat. No.		AAH52742U	AAH52752U	AAH52762U

1) Technical data according to DIN 12876. (bath fluid : water at 50 °C)

2) If you operate the unit in 1 to 3 steps of pump, the temperature range can be from Amb. +5 °C but in 4 and 5 steps, the range will be from Amb. +15 °C.

※ FDA establishment registered company. FDA listed products.

Rapid heating and cooling throughout the entire temperature range.



Pump Step	1	2	3	4	5
Max. pressure (psi)	0.5	1.1	2.4	4.9	5.9
Max. flow rate (L/min)	5.6	8.0	12.8	18.8	28.0

※ Bath fluid: water at the normal temperature.

RW3-2025

- Standard accessories
- Stainless steel flat cover
 - Silicone rubber tubing (1ft length / 12mm inner dia.)
- Optional accessories
- see page 28-29
- Test tube racks, Spring wire racks



Easy maintenance of condenser by removable gridded vent



Condenser air-filter for refrigerating efficiency



Comfortable front access drain



Performance

- Temperature range.
 - RW3-35 models from -35 °C to 150 °C.
 - RW3-25 models from -25 °C to 150 °C.
- Microprocessor PID control.
- Three point temperature calibration / Automatic tuning / Automatic run.
- Suitable for both internal and external bath environments due to reduced turbulence by using five-speed adjustable pump and built-in cooling Coil. (1 to 3 steps of the pump for internal circulation and 4 to 5 steps for external circulation)

Convenience

- Bright VFD display with quick adjustable dial knob. (0.1 °C resolution)
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Convenient memory function of up to three frequently set temperature.

- Corrosion-resistant, leak-proof, round-cornered, and easy-to-clean stainless steel bath with front access drain valve.
- Detachable condenser air-filter for easy maintenance of refrigerating efficiency.
- CFC-free refrigerant (R-507, R-404A) and a double service valve for leakage prevention.
- Quick-release front grill for easy cleaning of the condenser.
- RS-232 interface for external control and data collection. (RS-232 to USB serial converter is provided.)
- Side handles enables convenience handling and transport.

Safety

- Isolated design of agitator, heater, and sensor by a baffle plate to minimize the turbulence in the bath fluid and also to protect users and samples against direct contact.
- Complete safety protection system with warning alarms.
 - Low fluid level and dry-running, over-temperature, over-current.
- Keypad lock function prevents accidental changes during operation.

for temperature range from -25 °C to 150 °C

Model	RW3-0525	RW3-1025	RW3-2025	RW3-3025
Bath volume (L / cu ft)	5 / 0.2	10 / 0.4	20 / 0.7	30 / 1.1
Working temperature range (°C / °F)	-25 to 150 / -13 to 302			
Temperature stability ¹⁾ (± °C / °F)	0.05 / 0.09			
Cooling capacity ²⁾ (bath fluid: ethanol)	at -20 °C (-4 °F), W	30	50	260
	at 0 °C (+32 °F), W	230	250	410
	at +20 °C (+68 °F), W	320	380	560
	Refrigerator	1/3 LBP, R-507	1/3 LBP, R-507	1/2 LBP, R-404A
Pump (bath fluid: water)	Max. pressure	5.9 PSI (406.8 millibar)		
	Max. flow rate	7.4 gallons / minute (28 liters / minute)		
Dimension	Bath opening / depth (WxL, D) (mm / inch)	150x99, 160 / 5.9x3.9, 6.3	211x154, 180 / 8.3x6.1, 7.1	290x214, 200 / 11.4x8.4, 7.9
	Exterior (WxLxH) (mm / inch)	309x480x733 / 12.2x18.9x28.9	367x532x780 / 14.4x20.9x30.7	387x602x825 / 15.2x23.7x32.5
	Net weight (kg / lbs)	38 / 83.8	44 / 97	60 / 132.2
	Net weight (kg / lbs)	67 / 147.7		
Electrical requirements (230V, 60Hz)	11A	11A	12.5A	13.5A
Cat. No.	AAH57041K	AAH57051K	AAH57061K	AAH57071K
Electrical requirements (230V, 50Hz)	11A	11A	12.5A	13.5A
Cat. No.	AAH57042K	AAH57052K	AAH57062K	AAH57072K
Electrical requirements (120V, 60Hz)	12.6A	12.6A		
Cat. No.	AAH57043U	AAH57053U	-	-

for temperature range from -35 °C to 150 °C

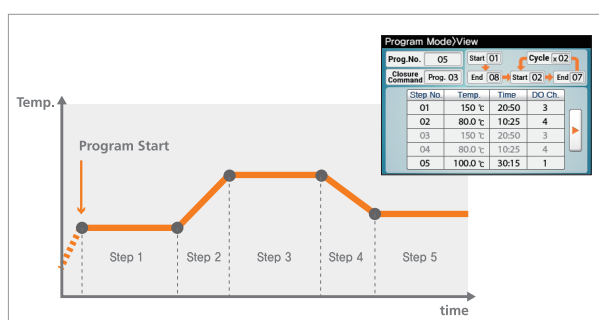
Model	RW3-0535	RW3-1035	RW3-2035	RW3-3035
Bath volume (L / cu ft)	5 / 0.2	10 / 0.4	20 / 0.7	30 / 1.1
Working temperature range (°C / °F)	-35 to 150 / -31 to 302			
Temperature stability ¹⁾ (± °C / °F)	0.05 / 0.09			
Cooling capacity ²⁾ (bath fluid: ethanol)	at -20 °C (-4 °F), W	80	150	400
	at 0 °C (+32 °F), W	150	330	660
	at +20 °C (+68 °F), W	280	450	800
	Refrigerator	1/2 LBP, R-404A	1/2 LBP, R-404A	3/4 LBP, R-404A
Pump (bath fluid: water)	Max. pressure	5.9 PSI (406.8 millibar)		
	Max. flow rate	7.4 gallons / minute (28 liters / minute)		
Dimension	Bath opening / depth (WxL, D) (mm / inch)	150x99, 160 / 5.9x3.9, 6.3	211x154, 180 / 8.3x6.1, 7.1	290x214, 200 / 11.4x8.4, 7.9
	Exterior (WxLxH) (mm / inch)	309x480x733 / 12.2x18.9x28.9	367x532x780 / 14.4x20.9x30.7	387x602x825 / 15.2x23.7x32.5
	Net weight (kg / lbs)	38 / 83.8	44 / 97	60 / 132.2
	Net weight (kg / lbs)	67 / 147.7		
Electrical requirements (230V, 60Hz)	12.5A	12.5A	13.5A	14.5A
Cat. No.	AAH57141K	AAH57151K	AAH57161K	AAH57171K
Electrical requirements (230V, 50Hz)	12.5A	12.5A	13.5A	14.5A
Cat. No.	AAH57142K	AAH57152K	AAH57162K	AAH57172K

1) Technical data according to DIN 12876. (bath fluid : ethanol at -10 °C)

2) The cooling capacity is measured under 230V / 60Hz electrical condition.

* FDA establishment registered company. FDA listed products.

Newly developed bath circulator with the Intelligent programmable controller brings the best intuitive control performance to your laboratory.



Intelligent program control

- 10 programs available for temperature ramp up and dwell control.
- 10 steps per a program and 99 hours 59 minutes per a step.
- Stored programs are easily linkable.
- Programs can be repeated up to 99 cycles.
- Pre-heating and heating time are settable before program starts.

RW3-0525P

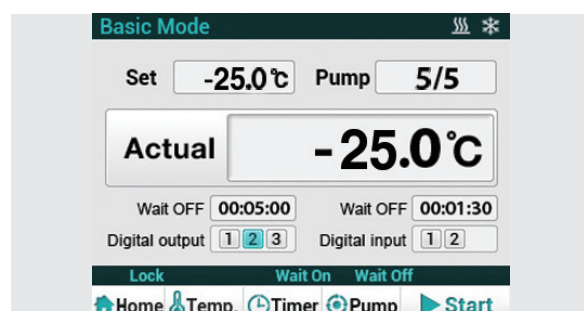
Standard accessories

- Stainless steel flat cover
- Silicone rubber tubing (1ft length / 12mm inner dia.)

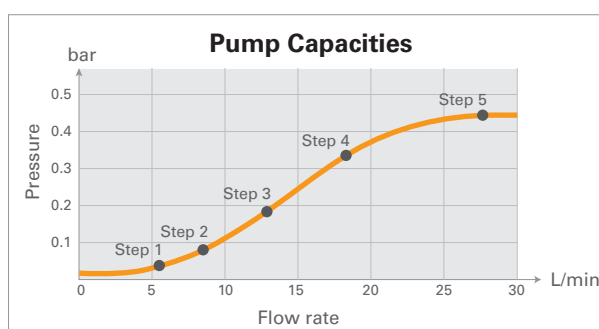
Optional accessories

see page 28-29

- Suction function for pumps
- Test tube racks, Spring wire racks



Touch LCD Controller



Pump Step	1	2	3	4	5
Max. pressure (psi)	0.5	1.1	2.4	4.9	5.9
Max. flow rate (L/min)	5.6	8.0	12.8	18.8	28.0

* Bath fluid: water at the normal temperature.



Performance

- Temperature range.
 - RW3-35P models from -35 °C to 150 °C.
 - RW3-25P models from -25 °C to 150 °C.
- Microprocessor PID control.
- Three point temperature calibration / Automatic tuning / Automatic run.
- Suitable for both internal and external bath environments due to reduced turbulence by using five-speed adjustable pump and built-in cooling coil. (1 to 3 steps of the pump for internal circulation and 4 to 5 steps for external circulation)

Convenience

- Intuitive touch screen LCD controller with easy icons and logical menus.
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Digital input and output control function for interlocking external devices.
- RS-232 interface for external control and data collection.
(RS-232 to USB serial converter is provided.)

- Corrosion-resistant, leak-proof, round-cornered, and easy-to-clean stainless steel bath with front access drain valve.
- Detachable condenser air-filter for easy maintenance of refrigerating efficiency.
- Usage of CFC-free refrigerant (R-507, R-404A) and a double service valve for leakage prevention.
- Quick-release front grill for easy cleaning of the condenser.
- Built-in casters and side handles for easy transport and installation.

Safety

- Isolated design of agitator, heater, and sensor by a baffle plate to minimize the turbulence in the bath fluid and also to protect users and samples against direct contact.
- Complete safety protection system with warning alarms.
 - Low fluid level and dry-running, over-temperature, over-current.
- Keypad lock function prevents accidental changes during operation.
- Splash-proof keypad.

for temperature range from -25 °C to 150 °C

Model	RW3-0525P	RW3-1025P	RW3-2025P	RW3-3025P
Bath volume (L / cu ft)	5 / 0.2	10 / 0.4	20 / 0.7	30 / 1.1
Working temperature range (°C / °F)	-25 to 150 / -13 to 302			
Temperature stability ¹⁾ (± °C / °F)	0.05 / 0.09			
Cooling capacity ²⁾ (bath fluid: ethanol)	at -20 °C (-4 °F), W	30	50	260
	at 0 °C (+32 °F), W	230	250	410
	at +20 °C (+68 °F), W	320	380	560
	Refrigerator	1/3 LBP, R-507	1/3 LBP, R-507	1/2 LBP, R-404A
Pump (bath fluid: water)	Max. pressure	5.9 PSI (406.8 millibar)		
	Max. flow rate	7.4 gallons / minute (28 liters / minute)		
Dimension	Bath opening / depth (WxL, D) (mm / inch)	150x99x160 / 5.9x3.9x6.3	211x154x180 / 8.3x6.1x7.1	290x214x200 / 11.4x 8.4x7.9
	Exterior (WxLxH) (mm / inch)	302x438x690 / 11.9x17.2x27.2	360x490x780 / 14.2x19.3x30.7	380x560x825 / 14.9x22x32.5
	Net weight (kg / lbs)	38 / 83.8	44 / 97	60 / 132.2
	Net weight (kg / lbs)	67 / 147.7		
Electrical requirements (230V, 60Hz)	11A	11A	12.5A	13.5A
Cat. No.	AAH57641K	AAH57651K	AAH57661K	AAH57671K
Electrical requirements (230V, 50Hz)	11A	11A	12.5A	13.5A
Cat. No.	AAH57642K	AAH57652K	AAH57662K	AAH57672K
Electrical requirements (120V, 60Hz)	12.6A	12.6A		
Cat. No.	AAH57643K	AAH57653U	-	-

for temperature range from -35 °C to 150 °C

Model	RW3-0535P	RW3-1035P	RW3-2035P	RW3-3035P
Bath volume (L / cu ft)	5 / 0.2	10 / 0.4	20 / 0.7	30 / 1.1
Working temperature range (°C / °F)	-35 to 150 / -31 to 302			
Temperature stability ¹⁾ (± °C / °F)	0.05 / 0.09			
Cooling capacity ²⁾ (bath fluid: ethanol)	at -20 °C (-4 °F), W	80	150	400
	at 0 °C (+32 °F), W	150	330	660
	at +20 °C (68 °F), W	280	450	800
	Refrigerator	1/2 LBP, R-404A	1/2 LBP, R-404A	3/4 LBP, R-404A
Pump (bath fluid: water)	Max. pressure	5.9 PSI (406.8 millibar)		
	Max. flow rate	7.4 gallons / minute (28 liters / minute)		
Dimension	Bath opening / depth (WxL, D) (mm / inch)	150x99x160 / 5.9x3.9x6.3	211x154x180 / 8.3x6.1x7.1	290x214x200 / 11.4x 8.4x7.9
	Exterior (WxLxH) (mm / inch)	302x438x690 / 11.9x17.2x27.2	360x490x780 / 14.2x19.3x30.7	380x560x825 / 14.9x22x32.5
	Net weight (kg / lbs)	38 / 83.8	44 / 97	60 / 132.2
	Net weight (kg / lbs)	67 / 147.7		
Electrical requirements (230V, 60Hz)	12.5A	12.5A	13.5A	14.5A
Cat. No.	AAH57741K	AAH57751K	AAH57761K	AAH57771K
Electrical requirements (230V, 50Hz)	12.5A	12.5A	13.5A	14.5A
Cat. No.	AAH57742K	AAH57752K	AAH57762K	AAH57772K

1) Technical data according to DIN 12876. (bath fluid : ethanol at -10 °C)

2) The cooling capacity is measured under 230V / 60Hz electrical condition.

* FDA establishment registered company. FDA listed products.

Cold Trap Bath



Effective capture of moisture or condensate. Also useful as quick cooling baths.



Performance

- Temperature control down to ambient to -40 °C.
- Built-in dissolving system to easily remove ice or solid matter stuck on the bath.

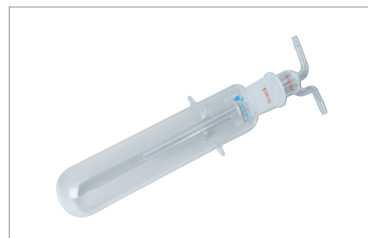
Convenience

- LED temperature display.
- Easy installation and maintenance of glass traps.
(two glass traps provided)
- Quick-release front grill for easy cleaning of the condenser.
- Compact size and silent operation.
- Durable stainless steel bath.
- Transparent acrylic lids on top of the glass trap to check condensate level in the trap.

Safety

- Complete safety protection system with warning alarms.
- Over-temperature, over-current protection.

Information of accessories



CTB-10

Standard accessories • U-type glass traps (2ea)

Cat. No.	Description
FCA1110	U-type glass trap (1ea)

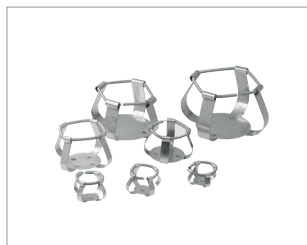
Model		CTB-10
Temperature range (°C / °F)		Down to -40 / -40
Material	Bath external	Stainless steel, 1.2t, Double painted & baked
	Bath up desk	Stainless steel, 1.5t
	Insulation	Polyurethane foam (30mm)
	Refrigerator	1/2 HP, R-404A (LBP)
Dimension	Volume (L / cu ft)	4.8 / 0.17
	Bath (ØxH, mm)	Dia, 210×204 / 8.3×8
	Exterior (WxDxH) (mm / inch)	360×465×555 / 14.1×18.3×21.9
	Net weight (kg / lbs)	46 / 101.4
Electrical requirements (230V, 60Hz)		4.5 A
Cat. No.		AAH62011K
Electrical requirements (230V, 50Hz)		4.5 A
Cat. No.		AAH62012K

* FDA establishment registered company. FDA listed products.

for Shaking & Heating Baths



Universal platforms



Flask clamps



Dedicated platforms



Test tube racks

Universal platforms & Flask clamps

The universal platforms provide flexibility for mixing different size test tubes and glassware on a single platform. Various clamps or racks can be interchanged or added easily using mounting holes on the platform.

Model		BS-06	BS-11	BS-21	BS-31
Universal platform	Cat. No.	AAA44521	AAA44522	AAA44523	AAA44524
Flask clamps	Erlenmeyer flask size	Max. mountable flask clamps			
	AAA23550 for 50mL	9	12	20	32
	AAA23551 for 100mL	3	9	15	24
	AAA23552 for 250ml	2	4	8	12
	AAA23556 for 300mL	2	4	8	12
	AAA23553 for 500ml	2	4	6	12
	AAA23554 for 1L	1	2	4	6
	AAA23555 for 2L [◇]	-	1	2	3
	AAA23557 for 2.8L [◇]	-	1	1	2

[◇] 2 and 2.8L flasks must be used due to height restrictions, respectively.

* Flask clamps for universal platforms are sold separately.

Dedicated platforms

When using glassware of the same size, dedicated platforms with preinstalled 250 mL or 500 mL clamps provide maximum capacity for each platform size. If you need to use different size glassware, purchase other suitable clamps separately.

Cat. No.	Description	Suitable for
AAA44531	Universal platform with 250mL flask clamps 2ea	BS-06
AAA44532	Universal platform with 500mL flask clamps 2ea	
AAA44541	Universal platform with 250mL flask clamps 4ea	
AAA44542	Universal platform with 500mL flask clamps 4ea	BS-11
AAA44551	Universal platform with 250mL flask clamps 8ea	
AAA44552	Universal platform with 500mL flask clamps 6ea	BS-21
AAA44561	Universal platform with 250mL flask clamps 12ea	
AAA44562	Universal platform with 500mL flask clamps 12ea	

* Dedicated platforms are sold with maximum number of flask clamps preinstalled.

Test tube racks

Highly durable stainless steel test tube racks feature adjustable angle and tube height support without requiring any base plate. You can easily mount and release test tube racks.

Cat. No.	Description	Insert capacity of racks*			
		BS-06	BS-11	BS-21	BS-31
AAA44581	for 86 test tubes	1EA	2EA	3EA	4EA
AAA44582	for 86 test tubes				
AAA44583	for 58 test tubes				
AAA44585	for 32 test tubes				
AAA44586	for 19 test tubes				

* No declination.

* Customized accessories to meet your specific requirements can be also provided. For inquiries, please contact your dealer.

Accessories & Options

for Heating Baths & Bath Circulators



Transparent polypropylene gable covers



Stainless steel flat covers



Open-rings covers

Transparent polypropylene gable covers

Designed to protect samples from contamination due to direct dripping of the bath liquid.

Cat. No.	Suitable for
AAA45531	BW-05H / BW-05B
AAA45532	BW-10H / BW-10B
AAA45533	BW-20H / BW-20B

Stainless steel flat covers

Made of stainless steel to prevent corrosion and rust.

Cat. No.	Suitable for
AAA45541	BW-05H / BW-05B
AAA45542	BW-10H / BW-05B
AAA45543	BW-20H / BW-05B

Open-rings covers

Beakers or Erlenmeyer flasks can be placed directly onto the perforated stainless steel half-shelf adjuster or water tank bottom.

By adjusting ring size for each glassware, liquid loss due to evaporation is minimized.

Cat. No.	Description	Suitable for
AAA45521	with 2 openings	BW-05H / BW-05B
AAA45524	with 1 opening	
AAA45522	with 4 openings	BW-10H / BW-10B
AAA45525	with 2 openings	
AAA45526	with 1 opening	BW-20H / BW-20B
AAA45523	with 8 openings	
AAA45527	with 6 openings	BW-05G
AAA45528	with 2 openings	
AAA41561	with 2 openings	BW-10G
AAA41564	with 1 opening	
AAA41562	with 4 openings	BW-20G
AAA41565	with 2 openings	
AAA41566	with 1 opening	BW-20G
AAA41563	with 6 openings	
AAA41567	with 4 openings	BW-20G
AAA41568	with 1 opening	

Test tube racks

Highly durable stainless steel test tube racks feature adjustable angle and tube height support without requiring any base plate.

You can easily mount and release test tube racks.

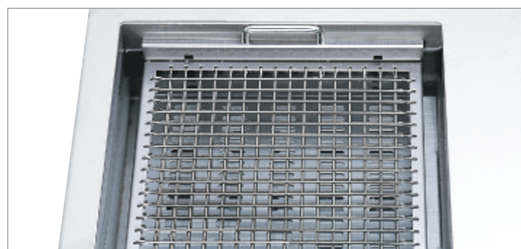
Cat. No.	Description		Insert Capacity of Racks*	
AAA44581	for 86 test tubes	ø8mm / ø0.3"	BW-10G CW-20G/P, 30G/P RW3-2025/P, 2040/P RW-33025/P, 3040/P	BW-20G
AAA44582	for 86 test tubes	ø10mm / ø0.4"		
AAA44583	for 58 test tubes	ø12mm / ø0.5"		
AAA44585	for 32 test tubes	ø16mm / ø0.6"		
AAA44586	for 19 test tubes	ø25mm / ø1.0"	2ea	3ea
AAA41531	for 50 test tubes	ø8mm / ø0.3"	BW-05H BW-05B BW-05G	RW3-1025/P RW3-1040/P CW3-10/P
AAA41532	for 50 test tubes	ø10mm / ø0.4"		
AAA41533	for 33 test tubes	ø12mm / ø0.5"		
AAA41535	for 16 test tubes	ø16mm / ø0.6"		
AAA41539	for 10 test tubes	ø25mm / ø1.0"		
AAA45551	for 176 test tubes	ø8mm / ø0.3"	BW-10H BW-10B	BW-20H BW-20B
AAA45552	for 176 test tubes	ø10mm / ø0.4"		
AAA45554	for 84 test tubes	ø12mm / ø0.5"		
AAA45556	for 68 test tubes	ø16mm / ø0.6"		
AAA45561	for 33 test tubes	ø25mm / ø1.0"	1ea	2ea

* No declination.

Spring wire racks

Ideal for holding a wide variety of tubes, flasks, and other glassware. All components are made of stainless steel.

Cat. No.	Suitable for
AAA45502	BW-10H / BW-10B
AAA45503	BW-20H / BW-20B
AAA41502	BW-10G
AAA41503	BW-20G
AAA51522	CW3-20/P / RW3-2025/P, 2040/P
AAA51523	CW3-30/P / RW3-3025/P, 3040/P

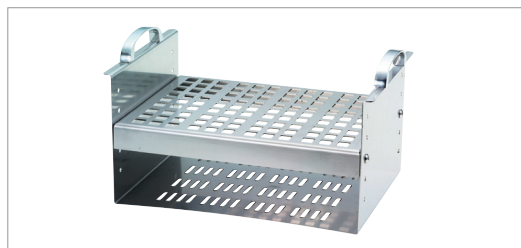


Spring wire racks (two tier rack with flexible crossed spring)

Half-shelf adjusters

Stainless steel perforated sample tray shelves with adjustable height support prevent leaks and guard against rust and contamination.

Cat. No.	Suitable for
AAA45511	BW-05H / BW-05B
AAA45512	BW-10H / BW-10B
AAA45513	BW-20H / BW-20B
AAA41551	BW-05G
AAA41552	BW-10G
AAA41553	BW-20G



Half-shelf adjusters

for Viscometer Heating Baths

Viscometer tube holders

Specially designed to hold a two-opening viscometer glass tube and made of Bakelite, renowned for its high thermal endurance.

Cat. No.	Suitable for
AAA43501	VB-25G (need max. 5 holders)
	VB-40G (need max. 8 holders)



Viscometer tube holders

Cooling circulators

The temperature range of viscometer heating baths can be lowered up to +10 °C (+50 °F) when used with an optional cooling circulator.

Cat. No.	Description	Suitable for
AAH57051K	RW3-1025 (230V, 60Hz)	VB-25G (230V, 60Hz)
AAH57651K	RW3-1025P (230V, 60Hz)	
AAH57052K	RW3-1025 (230V, 50Hz)	VB-25G (230V, 50Hz)
AAH57652K	RW3-1025P (230V, 50Hz)	
AAH57061K	RW3-2025 (230V, 60Hz)	VB-40G (230V, 60Hz)
AAH57661K	RW3-2025P (230V, 60Hz)	
AAH57062K	RW3-2025 (230V, 50Hz)	VB-40G (230V, 50Hz)
AAH57662K	RW3-2025P (230V, 50Hz)	

* Refer to p.22 to 25 for more information on the cooling circulators.

Desiccators

Vacuum Desiccators

Desiccators

Auto-desiccator Cabinets



Product Name	Vacuum Desiccator			Desiccator	Auto-desiccator Cabinet
	Cubic Model	Round Model	Cylindrical Model	Cubic Model	
Model	VDC	VDR	VDP	SDC	DC
Internal volume (L)	11, 23, 35, 45	6, 10, 20	16, 25	35, 50	150, 300, 600
Vacuum range	Maximum vacuum of 1 Torr (1.33×10 ⁻⁴ Mpa) for more than 72 hours.			-	-
Body material	Polycarbonate			Polycarbonate	Stainless steel, Powder coated steel
UV block model selection	0			0	-
Vacuum gauge	0	0 (optional)		-	-
Description	•High quality silicone gasket for greaseless airtight seal. •Three different shapes for storing various samples.			•Stackable space saving design. •Efficient internal space use by the provided shelves.	•Designed for storing humidity-sensitive samples. •Built in electronic dry unit for maintaining constant interior humidity without desiccant use.



Features

- Maximum vacuum of 1 Torr(1.33×10^{-4} Mpa) for more than 72 hours.
- High quality silicone gasket ensures greaseless airtight seal for the clean and cost effective test environment.
- Highly transparent, shatterproof, non-corrosive, and easy to clean polycarbonate construction.
- Three-way stopcock provides great convenience for consistent and uniform vacuum draw, vacuum release, or gas exchange. The barbed fitting on each side secures attachment of tubing.
- Maximized utilization of internal space using maximum four to six shelves depending on product sizes.
- Stackable space-saving design allowing efficient usage of cramped lab space.
- Easy vacuum level checking with the standard vacuum gauge attached to the front door.
- Minimizing damages or discoloration of light-sensitive samples. (for U models)
- Four built-in ports allowing easy attachment of tubing.

Integrally molded cubic box design enabling outstanding vacuum capability with virtually no leakage and exceptional durability.

Various models available with respect to sizes and UV-blocking effect.



VDC-31

Standard accessories
see page 35

- Vacuum gauge
- Drying agent tray
- Perforated sample trays
- Stopcock

* Above products design can be changed without prior notice.

Model ¹⁾		VDC-11/11U	VDC-21/21U	VDC-31/31U	VDC-41/41U
Internal volume (L / cu ft)		11 / 0.4	23 / 0.8	35 / 1.2	45 / 1.6
Gauge range (Mpa)		0 to -0.1			
Nozzle (mm / inch, Ø)		9.5 / 0.37			
Max. permissible vacuum (bodies)		1.33×10^{-4} Mpa			
Max. load (kg / lbs) per shelf		3 / 6.6	5 / 11		
Number of shelves (standard / max.)		2 / 4		3 / 5	3 / 6
Material	Body	Polycarbonate			
	Perforated sample tray				
	Drying agent tray / Locker	Polypropylene			
	Vacuum seal	Silicone rubber			
Dimension (WxDxH)	Interior (mm / inch)	248x254x238 / 9.8x10x9.4	346x365x246 / 13.6x14.4x9.7	355x375x345 / 14 x 14.8 x 13.6	355x374x445 / 14x14.7x17.5
	Exterior (mm / inch)	322x285x271 / 12.7x11.2x10.7	420x397x281 / 16.5x15.6x11.1	420x397x381 / 16.5x15.6x15	420x397x491 / 16.5x15.6x19.3
Net weight (kg / lbs)		4.2 / 9.3	8.2 / 18.1	10.8 / 23.8	12.2 / 26.9
Cat. No.	without UV block effect	AAAD4001	AAAD4021	AAAD4011	AAAD4031
	with UV block effect (U)	AAAD4101	AAAD4121	AAAD4111	AAAD4131

1) U models are translucent(amber-colored) vacuum desiccators with ultraviolet block effect.

* RoHS except for VDC-U models.

* FDA establishment registered company. FDA listed products.

Vacuum Desiccators (Round Models)



Round design featuring light weight yet high tensile strength.

High-quality silicone O-ring and specially designed 'Locking Clip' allowing outstanding vacuum capability with virtually no leakage.



Features

- Maximum vacuum of 1 Torr (1.33×10^{-4} Mpa) for more than 72 hours.
- High quality silicone gasket ensures greaseless airtight seal for the clean and cost effective test environment.
- Highly transparent, shatterproof, non-corrosive, and easy to clean polycarbonate construction.
- Three-way stopcock provides great convenience for consistent and uniform vacuum draw, vacuum release, or gas exchange. The barbed fitting on each side secures attachment of tubing.
- Flange lock holding the top and the bottom together during non-vacuum conditions.
- Various models available with respect to sizes and UV-blocking effect.
- Minimizing damages or discoloration of light-sensitive samples (for U/UG models).
- A vacuum gauge attachable at the center of the lid for easy vacuum level checking (for G/UG models).
- The top and bottom of round vacuum desiccators and cylindrical vacuum desiccators are compatible with each other for diverse use.

VDR-25G

Standard accessories
see page 35

- Drying agent tray
- Perforated sample trays
- Flange locker
- Stopcock

※ Above products design can be changed without prior notice.

Model ¹⁾		VDR-20/20G VDR-20U/20UG	VDR-25/25G VDR-25U/25UG	VDR-30/30G VDR-30U/30UG
Internal volume (L / cu ft)		6 / 0.2	10 / 0.4	20 / 0.7
Gauge range (Mpa)		0 to -0.1		
Nozzle (mm / inch, Ø)		9.5 / 0.37		
Max. permissible vacuum (Bodies)		1.33×10^{-4} Mpa		
Material	Lid / Bottom	Polycarbonate		
	Perforated sample tray	Polypropylene		
	Drying agent tray			
	Locker	Polypropylene		
	Vacuum seal	Silicone rubber		
Dimension (I.D. × H)	Exterior (mm / inch)	ø242×279(354) / ø9.5×11(13.9)	ø308×325(400) / ø12.1×12.8(15.7)	ø385×399(475) / ø15.2×15.7(18.7)
	Net weight (kg / lbs)	1.5 / 3.3	2.5 / 5.5	4.2 / 9.3
Cat. No.	Clear body	AAAD2011	AAAD2111	AAAD2211
	Clear body with vacuum gauge (G)	AAAD2021	AAAD2121	AAAD2221
	UV block effect body(U)	AAAD2031	AAAD2131	AAAD2231
	UV block effect body with Vacuum gauge(UG)	AAAD2041	AAAD2141	AAAD2241

1) G models come standard with a vacuum gauge

U models are translucent(amber-colored) vacuum desiccators with ultraviolet block effect.

※ RoHS except for VDR-U models.

※ FDA establishment registered company. FDA listed products.



Features

- Maximum vacuum of 1 Torr (1.33×10^{-4} Mpa) for more than 72 hours.
- High quality silicone gasket ensures greaseless airtight seal for the clean and cost effective test environment.
- Highly transparent, shatterproof, non-corrosive, and easy to clean polycarbonate construction.
- Three-way stopcock provides great convenience for consistent and uniform vacuum draw, vacuum release, or gas exchange. The barbed fitting on each side secures attachment of tubing.
- Flange lock holding the top and the bottom together during non-vacuum conditions.
- Various models available with respect to sizes and UV-blocking effect.
- Minimizing damages or discoloration of light-sensitive samples (for U/UG models).
- A vacuum gauge attachable at the center of the lid for easy vacuum level checking (for G/UG models).
- The top and bottom of cylindrical vacuum desiccators and round vacuum desiccators are compatible with each other for diverse use.

Newly designed cylindrical desiccators are used by ideal for storing tall equipment, gas substitution, general drying and preserving.



VDP-30

Standard accessories see page 35

- Perforated sample trays
- Flange locker
- Stopcock

* Above products design can be changed without prior notice.

Model ¹⁾		VDP-25/25G VDP-25U/25UG	VDP-30/30G VDP-30U/30UG
Internal volume (L / cu ft)		16 / 0.6	25 / 0.9
Gauge range (Mpa)		0 to -0.1	
Nozzle (mm / inch, Ø)		9.5 / 0.37	
Max. permissible vacuum (Bodies)		1.33×10^{-4} Mpa	
Material	Body / Base	Polycarbonate	
	Perforated sample tray		
	Locker	Polypropylene	
	Vacuum seal	Silicone rubber	
Dimension (I.D. × H)	Exterior (mm / inch)	ø308×374(449) / ø12.1×14.7(17.7)	ø385×384(459) / ø15.2×15.1(18.1)
	Net weight (kg / lbs)	2.7 / 5.9	
Cat. No.	Clear body	AAAD3011	AAAD3021
	Clear body with Vacuum gauge (G)	AAAD3111	AAAD3121
	UV block effect body(U)	AAAD3211	AAAD3221
	UV block effect body with Vacuum gauge(UG)	AAAD3311	AAAD3321

1) G models come standard with a vacuum gauge

U models are translucent(amber-colored) vacuum desiccators with ultraviolet block effect.

* RoHS except for VDP-U models.

* FDA establishment registered company. FDA listed products.

Desiccators (Cubic Models)



Stackable unit design provides space efficiency in daily use.

Transparent polycarbonate desiccators are designed for easy viewing of desiccant and vessels.



Features

- One molded design enables virtually no leakage and exceptional durability.
- High quality silicone gasket ensures greaseless airtight seal for the clean and cost effective test environment.
- Highly transparent, shatterproof, non-corrosive, and easy to clean polycarbonate construction.
- Maximized utilization of internal space using maximum three to five shelves depending on product sizes.
- Stackable space-saving design allowing efficient usage of cramped lab space.
- Easy humidity level checking with the hygrometer attached to the front door.
- Minimizing damages or discoloration of light-sensitive samples. (for U models)

SDC-45

Standard accessories
see page 33

- Hygrometer
- Drying agent tray
- Perforated sample tray
- Perforated sample drawer

※ Above products design can be changed without prior notice.

Model ¹⁾		SDC-30/30U	SDC-45/45U
Internal volume (L / cu ft)		35 / 1.2	50 / 1.8
Max. load (kg / lbs) per shelf or drawer		5 / 11	
Number of shelves (Standard / max.)		1 / 3	2 / 5
Number of drawers (Standard / max.)		1 / 3	1 / 5
Material	Body	Polycarbonate	
	Perforated sample tray		
	Perforated sample drawer		
	Drying agent tray / Locker	Polypropylene / Stainless steel	
	Seal	Silicone rubber	
Dimension (WxDxH)	Internal (mm / inch)	322x367x302 / 12.7x14.4x11.9	322x367x422 / 12.7x14.4x16.6
	Exterior (mm / inch)	360x410x326 / 14.1x16.1x12.8	360x410x447 / 14.1x16.1x17.6
Net weight (kg / lbs)		4.9 / 10.8	6.2 / 13.7
Cat. No.	without UV block effect	AAAD5011	AAAD5021
	with UV block effect (U)	AAAD5111	AAAD5121

1) U models are translucent(amber-colored) desiccators with ultraviolet block effect.

※ FDA establishment registered company. FDA listed products.



Drying agent tray
for VDC



Perforated sample tray
for VDC



Drying agent tray
for VDR



Perforated sample tray
for VDR

for Vacuum Desiccators (Cubic models)

Cat. No.	Description	VDC-11/11U	VDC-21/21U	VDC-31/31U	VDC-41/41U
VDC0035	Perforated sample tray	•	-	-	-
VDC0003		-	•	•	•
VDC0037	Drying agent tray	•	-	-	-
VDC0005		-	•	•	•
VDC0032	Vacuum seal	•	-	-	-
VDC0033		-	•	-	-
VDC0015		-	-	•	-
VDC0034		-	-	-	•
AAAD4501	Stopcock	•	•	•	•
EDA4301	Vacuum gauge	•	•	•	•

for Vacuum Desiccators (Round & Cylindrical models)

Cat. No.	Description	VDR-20/20G VDR-20U/20UG	VDR-25/25G VDR-25U/25UG	VDR-30/30G VDR-30U/30UG	VDP-25/25G VDP-25U/25UG	VDP-30/30G VDP-30U/30UG
AAAD1501	Drying agent tray	•	-	-	-	-
AAAD1502		-	•	-	•	-
AAAD1503		-	-	•	-	•
AAAD1511	Perforated sample tray	•	-	-	-	-
AAAD1512		-	•	-	-	-
AAAD1513		-	-	•	-	-
AAAD3511		-	-	-	•	-
AAAD3512		-	-	-	-	•
VDR0001	Vacuum seal	•	-	-	-	-
VDR0002		-	•	-	•	-
VDR0003		-	-	•	-	•
VDR0015	Flange locker	•	-	-	-	-
VDR0016		-	•	-	•	-
VDR0017		-	-	•	-	•
AAAD1521	Stopcock	•	•	•	-	-
AAAD3501		-	-	-	•	•
EDA4302	Vacuum gauge	•	•	•	•	•

Auto-desiccator Cabinets

Humidity-sensitive samples are safely stored in our reliable auto-desiccator cabinet.

Suitable for storing various products such as historical document, optical lens and film, electronic components, seeds, all kinds of reference samples.



DC-11 / DC-41

Standard accessories

- Dry unit, Shelves (epoxy powder coated steel)
- Door key

Optional accessories

- Shelves (stainless steel)

see page 37

Relative Humidity & Application

Relative Humidity	Application
45 to 60% RH	Painting, Stamps, Photographs, Antiques, Documents, etc.
40 to 45% RH	Camera, Lens, Microscopes, Films, Telescopes, Computer commodities, Audiotapes, Videotapes, Sliders, CDs, DVDs, etc.
30 to 40% RH	Semiconductor, Electronic components, IC components, PCB, Precision instruments, Electrical materials, Chemical materials, Industrial materials, etc.
Below 30% RH	Semiconductor components, Ceramic powders, Seeds, Spices, Samples, Reagents, Laboratory samples, etc.



Height-adjustable shelves



Clear observation



Display



Casters



Door lock



Holes for stacking

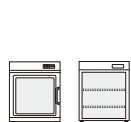
Performance

- Auto-electronic dry unit.
- Desiccant is not required at all. Interior humidity is automatically controlled by electronic dry unit, highly beneficial for easy maintenance.
- Constant low interior humidity in the range of 20% and 60%.
 - Humidity can be reached down to 20% RH within 8 hours. (under Ambient temperature of 25 °C, 60% RH and no load)
 - Setting humidity by 1% increment is available.

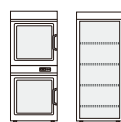
Convenience & Safety

- Temperature and humidity display.
- Interior temperature and humidity are indicated on display in real time.
 - * Temp. is only indicated, not for control. Humidity is indicated and also controlled as well.
- Easy installation and relocation.
- Casters for easy mobility during installation or relocation. (for DC-41)

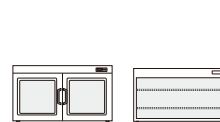
- Height-adjustable shelves.
- High-grade steel with corrosion resistant epoxy power coated surface.
- Maximized utilization of internal space by using height-adjustable shelves.
- Sturdy heavy load shelves sustain maximum 20kg sample loading.
- Clear observation of samples.
 - Transparent acryl window provides a clear view of samples in the chamber.
 - DC-11 has transparent acryl windows on three sides, beneficial for wider view of inner chamber.
- Space saving double-stacked cabinets. (for DC-11, DC-21S)
 - Foot holes on the top of the cabinet enables stable stacking.
 - Stackable space-saving design allowing efficient usage of cramped space.
- Built in door lock device for safe sample storage.



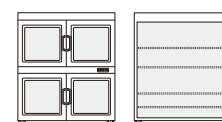
Outside / Inside



Outside / Inside



Outside / Inside



Outside / Inside

Model		DC-11	DC-21L	DC-21S	DC-41
Control range		20 to 60%RH (1% scale)			
Internal volume (L / cu ft)		150 / 5.3	300 / 10.6	300 / 10.6	600 / 21.2
Number of shelf		1	2	2	4
Stackable type		Yes	No	Yes	No
Quantity of shelves (standard/max.)		2 / 10	4 / 19	2 / 10	4 / 19
Distance of between shelves (mm / inch)		32 / 1.3	39 / 1.5	32 / 1.3	39 / 1.5
Max. load per shelf (kg / lbs)		20 / 44.1			
Dimension (WxDxH) (mm / inch)	Interior	470x499x500 / 18.5x19.6x19.7	470x599x561 / 18.5x23.6x22.1 (upper) 470x499x561 / 18.5x19.6x22.1 (lower)	1070x499x498 / 42.1x19.6x19.6	1070x599x561 / 42.1x23.6x22.1 (upper) 1070x499x561 / 42.1x19.6x22.1 (lower)
	Exterior	550x700x653 / 21.7x27.6x25.7	547x700x1280 / 21.5x27.6x50.4	1140x700x653 / 44.9x27.6x25.7	1140x700x1140 / 44.9x27.6x44.9
Net weight (kg / lbs)		36 / 79.4	56.5 / 124.6	58 / 127.9	110 / 242.5
Electrical requirements (230V, 50/60Hz)		2.0A	2.0A	2.0A	2.0A
Cat. No.		AAHF70115K	AAHF70215K	AAHF71215K	AAHF70415K
Electrical requirements (120V, 60Hz)		4.0A	4.0A	4.0A	4.0A
Cat. No.		AAHF70115U	AAHF70215U	AAHF71215U	AAHF70415U

* Temperature is only indicated in Celsius. Conversion to Fahrenheit is not available.

Accessories & Options

Cat. No.	Description		Suitable for
	Material	Dimension (WxD, mm / inch)	
AAAF7501	Shelves, Epoxy powder coated steel	462x479 / 18.2x18.9	DC-11
AAAF7502		462x579 / 18.2x22.8	DC-21L lower chamber ¹⁾
AAAF7503		1063x465 / 41.9x18.3	DC-21L upper chamber ¹⁾
AAAF7504		1063x550 / 41.9x21.7	DC-21S
AAAF7511	Shelves, Stainless steel	462x479 / 18.2x18.9	DC-41 lower chamber ¹⁾
AAAF7512		462x579 / 18.2x22.8	DC-41 upper chamber ¹⁾
AAAF7513		1063x465 / 41.9x18.3	DC-11
AAAF7514		1063x550 / 41.9x21.7	DC-21L lower chamber ¹⁾
			DC-21L upper chamber ¹⁾
			DC-21S
			DC-41 lower chamber ¹⁾
			DC-41 upper chamber ¹⁾

1) Due to the location of dry unit in the lower chamber, the size of shelves is different. (for DC-21L, DC-41)

Furniture

Filtering Storage Cabinets

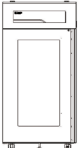
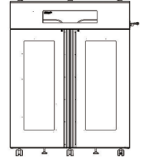
Acid/Corrosive Cabinets

General Storage Cabinets






Gas Cylinder Cabinets










Filtering Storage Cabinets








	FSC-120	FSC-200
		
Internal volume(L)	685	1145
Width(mm)	1000	1560
Height(mm)	2000	2025
Depth(mm)	635	635
Airflow rate (m ³ /min, CMM)	3.0	5.34

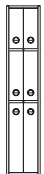

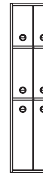
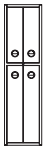







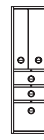
Acid/Corrosive Cabinets




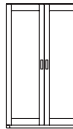




	SC-C1912D4	SC-C1912D2	SC-C1906D2	SC-C1906D1	SC-C0706D1
					
Internal volume(L)	852 (213 x 4 ea)	894 (447 x 2 ea)	426 (213 x 2 ea)	445	115
Width(mm)	1255		655		600
Height(mm)	1900				650
Depth(mm)	555				510

General Storage Cabinets



Base Cabinets	Tabletop type (DS-TT)			Tabletop type (DS-TW)			
							
Width(mm)	476	560	644	472	556	915	1083
Height(mm)	900			900			
Depth(mm)	700			-			
Model	09047-D2	09056-D2	09064-D2	-			
Depth(mm)	550			550			
Model	09047-N2	09056-N2	09064-N2	09047-N1	09055-N1	09091-N2	09108-N2

Base Cabinets	Under table type (DS-UT)			Under table type (DS-UD)			
							
Width(mm)	476	560	644	476	560		
Height(mm)	650			650			
Depth(mm)	700			700			
Model	06047-D2	06056-D2	06064-D2	06047-D2	06047-D3	06056-D2	06056-D3
Depth(mm)	550			550			
Model	06047-N2	06056-N2	06064-N2	06047-N2	06047-N3	06056-N2	06056-N3

Tall Cabinets	Stand type (DS-SL)			Stand type (DS-S)					Combi type (DS-C)			
												
Width(mm)	476	560	644	476	560	644	686	938	476	560		
Height(mm)	2400			1800					1800			
Depth(mm)	700			700					700			
Model	24047-D6	24056-D6	24064-D6	18047-D4	18056-D4	18064-D4	18068-D6	18093-D6	18047-D4	18047-D5	18056-D4	18056-D5
Depth(mm)	-			550					550			
Model	-			18047-N4	18056-N4	18064-N4	18068-N6	18093-N6	18047-N4	18047-N5	18056-N4	18056-N5

Tall Cabinets	Window type (DS-OW)				Open rack type (DS-OR)			
								
Width(mm)	472	556	915	1083	472	556	915	1083
Height(mm)	1800				1800			
Depth(mm)	-				550			
Model	-				18047-N1	18055-N1	18091-N2	18108-N2
Depth(mm)	550				550			
Model	18047-N1	18055-N1	18091-N2	18108-N2	18047-N1	18055-N1	18091-N2	18108-N2

Gas Cylinder Cabinets

	DS-GC	
		
Width(mm)	740	1070
Height(mm)	1800	
Depth(mm)	550	
Model	18074-N2	18107-N2

Filtering Storage Cabinets



Storing reagents in this filtering storage cabinet ensures clean lab environment for users.

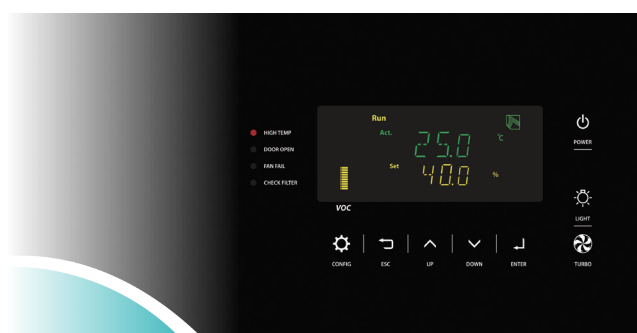
Feel free to install the cabinet anywhere without any concern of your existing exhaust system. Conveniently place and remove the reagents with the full-extension sliding drawers. Air purification inside the cabinet prevents heating and cooling loss caused by ducted air exhaust systems.



FSC-200 / FSC-120

Standard accessories see page 42

- Pre filter, LED lamp
- Slide drawers (5ea for FSC-120, 10ea for FSC-200)
- Spill tray (1ea for FSC-120, 2ea for FSC-200)
- Door key



BS 7989 2001

- Filtering capacity of our cabinet is tested by BS 7989, which describes specifications for the recirculatory filtration fume cupboards.

Cost-effective filtering system

Energy efficient and space saving filtering system.

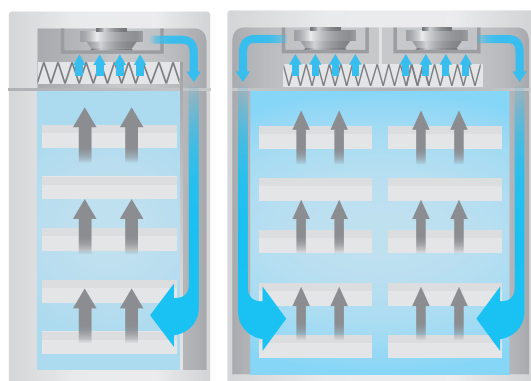
- Flexible installation of the cabinet is possible and cost-intensive exhaust air ducts are no longer necessary.
- Air circulation inside the cabinet prevents heating and cooling loss due to the exhaust air, which causes high energy consumption.

Customized filter configuration.

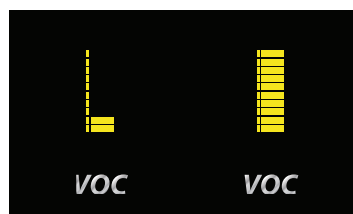
- ISO class 4 (US class 10) HEPA filter for optimal protection against cross-contamination. (optional)
- 0.3 μm and larger particulates are removed with 99.99% efficiency, leak-tight HEPA filter which satisfying class 10. (US Federal Standard 209E) (average life span of HEPA filter: 3 years– it depends on the test room conditions) (optional)
- High-quality polyester fiber pre-filter (with minimal pressure loss and 85% arrestant on the A.F.I. test) for trapping larger particles and increasing the life of the main HEPA filter.
- Activated Carbon Filters; VOC / MA / MB type. (optional)
- Convenient filter saturation check and easy filter replacement by an intelligent front cover design.

Multi-functional operation

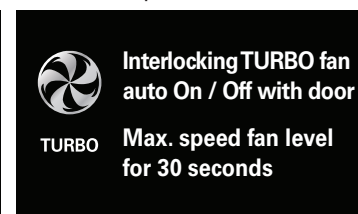
- User-friendly functions.
 - Auto run on/off; In case of power failure, the unit starts automatically when the unit gets the power back.
 - Set each function's value to best suit the users.
- Safety warning alarms with LED indicators.
 - High temp. alarm with automatic fan stop.
 - Fan fail alarm for abnormal fan stop.
 - Door open alarm to protect users and clean environment.
- Economical and ecofriendly sleep mode.
 - You can set the operating time from 8am to 6pm if your official working hour is from 9am to 6pm. It saves 60% of energy consumption and extends the life span of the fan and filter.
- VOC level indication.
 - Clear and symbolic VOC level bar indicates VOC measurement of the inner cabinet.
 - Real time detecting and displaying are available with VOC sensor inside the cabinet.
- Powerful air purification.
 - Simply push turbo fan button before opening the door to activate fan at the maximum speed level for protecting users from any remain hazardous gas inside.
 - This turbo fan function can also be interlocked with door opening.



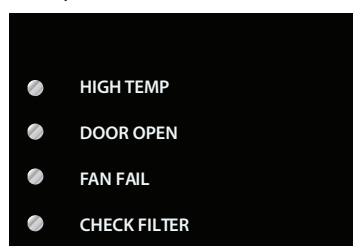
VOC level indication



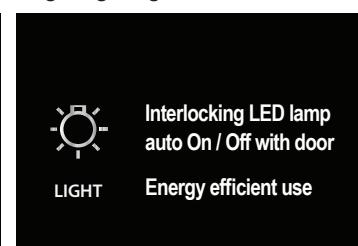
Powerful air purification



Safety features



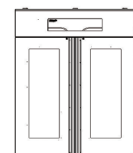
Bright lighting for clear view



Filtering Storage Cabinets

Convenient and safe storage

- Door and drawer tested in accordance with SEFA.
- It is designed and tested in accordance with SEFA for door hinge test and drawer static load test. The international standard guarantees users the quality and longer use of every unit. In addition, we autonomously conducted the overturning test for more safety.
- Max. 40kg heavy load sustainable inner chamber and drawers. Imagine that just one drawer can dramatically sustain a ten-year-old boy.
- Chemical resistant epoxy coated steel and transparent tempered glass door.
- Corrosion resistant epoxy coated steel for storage of toxic chemical samples.
- All parts of the unit are durably constructed of epoxy coated steel for prevention of corrosion.
- Tempered glass door provides clear observation of stored samples.
- Well designed full length handle let you feel totally relaxed by opening the door at any height.
- Wide inner space use.
- Wide inner space use with the provided extremely smooth full-extension sliding drawers.
- Spill tray and door lock key for clean and safe sample storage.



Model		FSC-120	FSC-200
Internal volume (L / cu ft)		685 / 24.2	1145 / 40.4
Capacity ¹⁾ (L / gal, 1L Bottle *ea)		120 / 31.7	200 / 52.8
Airflow rate (m³/min, CMM)		3.0	5.34
Pre-filter		Polyester fibers with filter efficiency of 85% (A-F-TEST)	
No. of drawer shelf, Slide (included / max.)		5 / 10	10 / 20
Max. load per shelf (kg / lbs)		40 / 88.2	40 / 88.2
Materials	Main body	Epoxy powder coated steel, Glass	
	Display	VFD (vacuum fluorescent display)	
	Lamp	LED	
Noise level (dB)		< 50	< 55
Dimension (WxDxH)	Internal (mm / inch)	835x575x1420 / 32.9x22.6x55.9	1395x578x1420 / 54.9x22.8x55.9
	External (mm / inch)	1000x635x2000 / 39.4x25.0x78.7	1560x635x2025 / 61.4x25.0x79.7
	Drawer (mm / inch)	655x500x100 / 25.8x19.7x3.9	575x500x100 / 22.6x19.7x3.9
	Spill tray (mm / inch)	710x530x35 / 27.9x20.9x1.4	600x530x35 / 23.6x20.9x1.4
	Net weight (kg / lbs)	320 / 705.5	495 / 1091.3
Electrical requirements (230V)		60Hz, 0.5A	50Hz, 0.5A
Cat. No.		AAHF1101K	AAHF1102K
Electrical requirements (120V)		60Hz, 1.0A	60Hz,
Cat. No.		AAHF1103U	AAHF1113U

1) Basic condition for above capacity is when five drawers are built in.

* Permissible environmental conditions: temperature (5-40°C) and relative humidity (up to 80%).

* FDA establishment registered company. FDA listed products.

Accessories & Options

Cat. No.	Description	Application
FSC-120	FSC-200	
FSC0051	Pre filter	Larger particles and increasing the life of main filter
FSC0048	Activated carbon filter (VOC + Acid + NH3)	Volatile organic compounds (VOC), Ammonia, Acidic solvents (MA), Alkaline solvents (MB)
FSC0049	HEPA filter	Biohazardous aerosols and other visible and non-visible particles (filtration efficiency: 99.99% at 0.3 microns)
FSC0050	Medium filter	Biohazardous aerosols and other visible and non-visible particles (filtration efficiency: 60% at 0.3 microns)

* Maximum installable filter quantity: 2 ea for FSC-120, 4 ea for FSC-200.

* Each filter should be ordered two for FSC-200.

Cat. No.	Description
AAAB2531	Gas detector (KITAGAWA AP-20)
AAAB1550	Gas detecting tube (Benzene, GASTEC-121SP (0.5-10ppm))
AAAB1551	Gas detecting tube (Toluene, GASTEC-122L (1-100ppm))
AAAB1552	Gas detecting tube (Acetic acid, GASTEC-81L (0.125-25ppm))
AAAB1553	Gas detecting tube (Chloroform, GASTEC-137 (4-400ppm))
AAAB1554	Gas detecting tube (Formaldehyde, GASTEC-91LL (0.05-1ppm))
AAAB1555	Gas detecting tube (Ammonia, GASTEC-3L (0.5-60ppm))



Safety cabinets for long-term storage of corrosive substances.

Durable metal structure with corrosion-resistant interior material.

Efficient ventilation system prevents noxious gas or chemical gas accumulation.



SC-C1906D1

Standard accessories

- Epoxy powder coated steel shelves (except for SC-C0706D1)
- Spill tray (except for SC-C0706D1)
- Epoxy powder coated steel bottom collecting sump (for SC-C0706D1)
- Door key

Optional accessories

see page 45

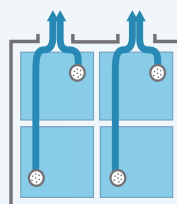
- Stainless steel shelves
- Stainless steel bottom collecting sump

Convenient and safe ventilation system.

- Built-in ventilation hole.
- Ventilation hole on the top and exhaust holes at the back prevent the accumulation of explosive gas.
- Exhaust system connection.
- Cabinet can be connected to an in-house laboratory exhaust system to efficiently exhaust the vapor inside of the cabinet. (except for SC-C0706D1)

Safe sample storage by independent gas-ventilation flow

Air-ventilation hole is independently built in each compartment to prevent gas mixture inside of cabinet. This structural benefit enables safe storage of your samples according to the characteristics of the stored samples.



Patent :
10-2015-0141043

Safe storage of corrosive substances.

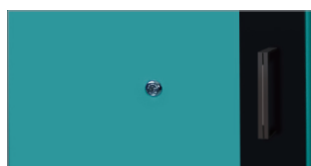
- Corrosion-resistant interior material.
- Phenol resin coated panel is suitable for long-term storage of acid / base substance.
- Robust metal structure.
- Sturdy steel frame prevents deformation.
- Epoxy coated surface provides excellent chemical resistance.
- Space-efficient interior design.
- Internal compartment structure is beneficial for practical and safe space use by organizing the inner space efficiently according to the characteristics of the stored samples. (except for SC-C0706D1)

Sturdy and secure shelf structure.

- Sturdy shelf structure.
- Max. 80kg heavy load sustainable shelf.
- Designed to perfectly fastened to both walls.
- Safe shelf design.
- Shelf with the height of 30mm blocks spreading leakage from accidental sample spillage.
- Optimum shelf selection according to the stored samples.
- The unit comes together with epoxy powder coated steel shelves and polypropylene spill tray for high chemical resistance. (except for SC-C0706D1)



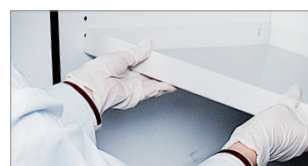
Bottom collecting sump or spill tray is provided for easy maintenance. (except for SC-C0706D1)



Built-in door lock for safe sample storage.



Antistatic ground connection for minimization of fire hazard.



Height-adjustable shelves



Ergonomic designed toe space allows for easy access to the inner space.



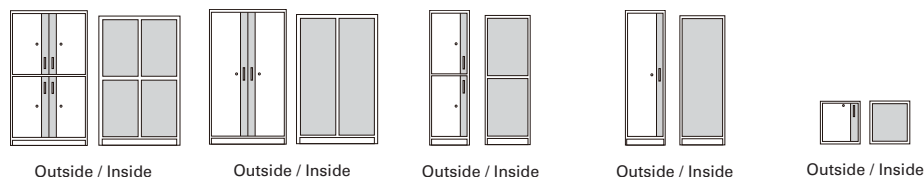
Specially designed forklift space and leveling feet for easy and stable installation.



Easy arrangement and finding of each sample with pictogram sticker.



Spill tray (polypropylene) (except for SC-C0706D1)



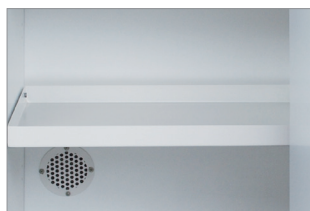
Model		SC-C1912D4	SC-C1912D2	SC-C1906D2	SC-C1906D1	SC-C0706D1 ¹⁾
Internal volume (L / cu ft)		213 / 7.5 x 4ea	447 / 15.9 x 2ea	213 / 7.5 x 2ea	445 / 15.7	115 / 4.1
No. of spill tray (standard)		4	2	2	1	-
No. of shelf (standard / max.)		4 / 8	6 / 12	2 / 4	3 / 6	-
Distance of between shelf (mm / inch)		120 / 4.7	100 / 3.9	130 / 5.1	100 / 3.9	-
Max. load per shelf (kg / lbs)		80 / 176.4				
Materials	Interior	Epoxy powder coated steel				
	Exterior	Phenol resin coated steel				
Dimension (WxDxH)	Interior (mm / inch)	561x466x818 x 4ea / 22.1x18.3x32.2 x 4ea	561x466x1712 x 2ea / 22.1x18.3x67.4 x 2ea	561x466x818 x 2ea / 22.1x18.3x32.2 x 2ea	558x466x1712 / 21.9xx18.3x67.4	505x421x542 / 19.9x16.6x21.3
	Exterior (mm / inch)	1255x555x1900 / 49.4x21.9x74.8	1255x555x1900 / 49.4x21.9x74.8	655x555x1900 / 25.8x21.9x74.8	655x555x1900 / 25.8x21.9x74.8	600x510x650 / 23.6x20.1x25.6
	Shelf	555x426x30 / 21.9x16.8x1.2				-
	Bottom collecting sump	-				502x420x40 / 19.8x16.5x1.6
	Tray (PP)	545x419x33 / 21.5x16.5x1.3				-
	Net weight (kg / lbs)	284 / 626.1	257 / 566.6	160 / 352.7	146 / 321.9	52 / 114.6
Cat. No.		AAAF60043	AAAF60025	AAAF60023	AAAF60011	AAAF60012

1) No shelf and spill tray for SC-C0706D1. Sample is directly stored on the bottom collecting sump. (max. load 80kg)

* It is recommended to use with an in-house ventilation system to efficiently exhaust the vapor inside of the cabinet.

Using it alone may cause product durability affected from inflammable vapor stayed inside during acid/corrosive sample storage.

Accessories & Options



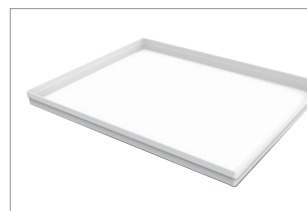
Shelf
(epoxy powder coated steel)



Bottom collecting sump
(epoxy powder coated steel)



Bottom collecting sump
(stainless steel)



Spill tray (polypropylene)

Cat. No.	Description	Dimension (WxDxH, mm/inch)	Suitable for
AAAF35011	Shelf (epoxy powder coated steel)	555x426x30 / 21.9x16.8x1.2	SC-C1912D4, SC-C1912D2, SC-C1906D2, SC-C1906D1
AAAF35001	Shelf (stainless steel)		
AAAF35212	Bottom collecting sump (epoxy powder coated steel)		
AAAF35211	Bottom collecting sump (epoxy powder coated steel)	502x420x40 / 19.8x16.5x1.6	SC-C0706D
AAAF35202	Bottom collecting sump (stainless steel)	555x465x86 / 21.9x18.3x3.4	SC-C1912D4, SC-C1912D2, SC-C1906D2, SC-C1906D1
AAAF35201	Bottom collecting sump (stainless steel)	502x420x40 / 19.8x16.5x1.6	
SCF0037	Spill tray (polypropylene)	545x419x33 / 21.5x16.5x1.3	SC-C1912D4, SC-C1912D2, SC-C1906D2, SC-C1906D1

Choice of shelf materials according to the stored samples.

* Epoxy powder coated steel for acid resistance sample storage.

* Stainless steel for basification sample storage.

* Use of both shelf with tray for strong acid and base sample storage.

Impressive range of cabinet models to choose from for creating the most ideal lab environments. (65 Duco - Slide storage cabinet)

Manufactured with PP trays and dividers



- 8 different tray dimensions.
- Impact resistant, durable, and excellent chemical resistance rating.
- Adjustable trays can be placed at different heights.
- The tray divider keeps stuff tidy and organized.

Locking mechanism



- Adopted self-lock handle convenient for keeping things secure, comes standard with lock for protection against unauthorized users.
- Comes standard with lock for protection against unauthorized personnel.

Easily removable name plates



- Convenient and useful for keeping track of inventory.
- 3 different sizes.

3 types of color choices.



Anchoring kit

- All tall cabinets include anchoring kits to fix the cabinet to the floor to prevent the cabinet from tipping over.

Gas cylinder storage



- Gas cylinder constructed for storage of gas cylinders inside building.
- DS-GC models.
- : Essentially convenient and standard safety functions are incorporated in the cabinets.

Ventilation system

- Hexagonal or trapezoidal ventilation space is formed between the innovatively designed cabinet side structures.

Scientific Equipment and Furniture Association



- The world professional organization for providing leadership in issues involving the design, specification and utilization of laboratory furniture and equipment.

Common features for Base Cabinets

Steel base cabinets are ideally convenient on top or underneath the lab benches. Also, these cabinets come with basic exhaust structures for safe storage of routinely used laboratory items.



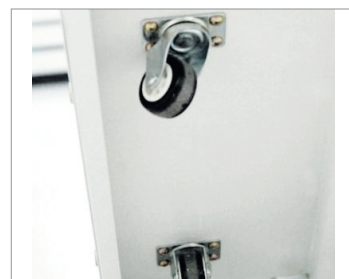
Fully-extendable slide out drawers useful for getting at stored lab items placed in the back of the drawer.



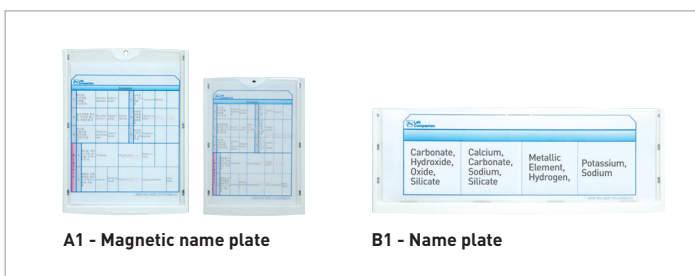
Superiorly chemical resistant PP trays included with the drawers keep lab material safely tidy and organized.



Tray comes standard with four tray dividers.



The moveable cabinets (DS-UT/DS-UD) are designed to fit under the lab bench, counter, fume hood.



The removable name plate comes included with the cabinet to keep track of inventory.

ADA solutions

- DS-UT / DS-UD (only depth 550mm / 21.65inch) are made cognizant by the Americans with Disabilities Act.

General Storage Cabinet (Base - DS-TT / DS-TW)

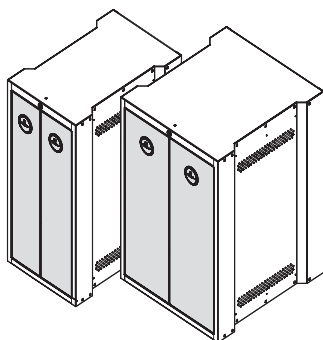
Table top type cabinets

Glass door cabinets and pull-out drawers can also be used as a table top storage unit.

DS-TT

Standard accessories

- Trays, Tray dividers
- Name plates, Door key

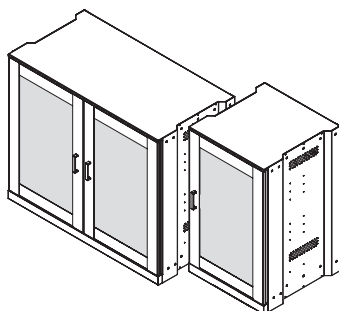


Exterior height (mm / inch)	900 / 35.4	900 / 35.4	900 / 35.4
Exterior width (mm / inch)	476 / 18.7	560 / 22.1	644 / 25.4
Each drawer width (mm / inch)	Left	194 / 7.6	278 / 10.9
	Right	194 / 7.6	278 / 10.9
No. of tray (standard / max.)	3 / 4	3 / 4	3 / 4
Max. load per tray (kg / lbs)	30 / 66.1	30 / 66.1	30 / 66.1
No. of name plate	2	2	2
Exterior depth (mm / inch)	700 / 27.6	700 / 27.6	700 / 27.6
Net weight (kg / lbs)	61 / 134.5	67 / 147.7	73 / 160.9
Model	DS-TT-09047D2	DS-TT-09056D2	DS-TT-09064D2
Cat. No.	AAAF1020	AAAF1021	AAAF1022
Exterior depth (mm / inch)	550 / 21.6	550 / 21.6	550 / 21.6
Net weight (kg / lbs)	54 / 119.0	59 / 130.1	64 / 141.1
Model	DS-TT-09047N2	DS-TT-09056N2	DS-TT-09064N2
Cat. No.	AAAF1023	AAAF1024	AAAF1025

DS-TW

Standard accessories

- Trays, Tray dividers, Name plates



Exterior height (mm / inch)	900 / 35.4	900 / 35.4	900 / 35.4	900 / 35.4
Exterior width (mm / inch)	472 / 18.6	556 / 21.9	915 / 36.0	1083 / 42.6
Each drawer width (mm / inch)	418 / 16.5	502 / 19.8	418 / 16.5	502 / 19.8
No. of tray (standard / max.)	3 / 4	3 / 4	3 / 4	3 / 4
Max. load per tray (kg / lbs)	30 / 66.1	30 / 66.1	30 / 66.1	30 / 66.1
No. of name plate	2	2	2	2
Exterior depth (mm / inch)	550 / 21.6	550 / 21.6	550 / 21.6	550 / 21.6
Net weight (kg / lbs)	61 / 134.5	65 / 143.3	110 / 242.5	119 / 262.4
Model	DS-TW-09047N1	DS-TW-09055N1	DS-TW-09091N2	DS-TW-09108N2
Cat. No.	AAAF1054	AAAF1055	AAAF1056	AAAF1057

Accessories & Options

Cat. No.	Description	Suitable for	
CBN0014	Tray (160x620x80mm / 6.3x24.4x3.1")	DS-TT-	09047D2, 09056D2
CBN0015	Tray (250x620x90mm / 9.8x 24.4x3.5")		09056D2, 09064D2
CBN0008	Tray (160x470x80mm / 6.3x18.5x3.1")		09047N2, 09056N2
CBN0009	Tray (250x470x90mm / 9.8x18.5x3.5")		09056N2, 09064N2
AAAF1501	Drawer set (epoxy painted steel, 388x504mm / 15.3x19.8")	DS-TW-	09047N1, 09091N2
AAAF1502	Drawer set (epoxy painted steel, 472x504mm / 18.6x19.8")		09055N1, 09108N2
AAAF1504	Drawer set (stainless steel, 388x504mm / 15.3x19.8")		09047N1, 09091N2
AAAF1505	Drawer set (stainless steel, 472x504mm / 18.6x19.8")		09055N1, 09108N2
CBN0016	Tray divider (160mm / 6.3" width)	DS-TT-	09047D2, 09056D2, 09047N2, 09056N2
CBN0017	Tray divider (250mm / 9.8" width)		09056D2, 09064D2, 09056N2, 09064N2
CBN0018	Tray divider (370mm / 14.6" width)	DS-TW-	09047N1, 09091N2
CBN0019	Tray divider (450mm / 17.7" width)		09055N1, 09108N2
AAAF1521	Magnetic name plate A1 (150x200mm / 5.9x7.9")	DS-TT-	09047D2, 09056D2, 09064D2, 09047N2, 09056N2, 09064N2
AAAF1523	Name plate B1 (320x115mm / 12.6x4.5")	DS-TW-	09047N1, 09091N2, 09055N1, 09108N2

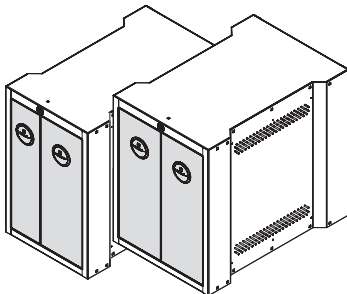
Under table type cabinets

Movable and compact storage units useful for underneath the lab bench.

DS-UT

Standard accessories

- Trays, Tray dividers
- Name plates, Door key

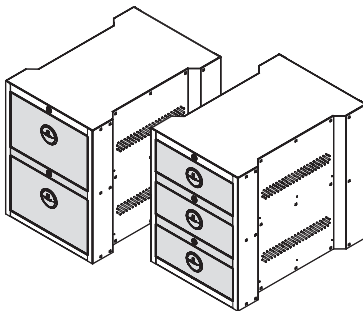


Exterior height (mm / inch)	650 / 25.6	650 / 25.6	650 / 25.6
Exterior width (mm / inch)	476 / 18.7	560 / 22.1	644 / 25.4
Each drawer width (mm / inch)	Left	194 / 7.6	278 / 10.9
	Right	194 / 7.6	278 / 10.9
No. of tray (standard / max.)	3 / 3	3 / 3	3 / 3
Max. load per tray (kg / lbs)	30 / 66.1	30 / 66.1	30 / 66.1
No. of name plate	2	2	2
Exterior depth (mm / inch)	700 / 27.6	700 / 27.6	700 / 27.6
Net weight (kg / lbs)	58 / 127.9	64 / 141.1	70 / 154.3
Model	DS-UT-06047D2	DS-UT-06056D2	DS-UT-06064D2
Cat. No.	AAAF1010	AAAF1011	AAAF1012
Exterior depth (mm / inch)	550 / 21.6	550 / 21.6	550 / 21.6
Net weight (kg / lbs)	50 / 110.2	55 / 121.3	60 / 132.3
Model	DS-UT-06047N2	DS-UT-06056N2	DS-UT-06064N2
Cat. No.	AAAF1013	AAAF1014	AAAF1015

DS-UD

Standard accessories

- Trays, Tray dividers
- Name plates, Door key



Exterior height (mm / inch)	650 / 25.6	650 / 25.6	650 / 25.6	650 / 25.6
Exterior width (mm / inch)	476 / 18.7	476 / 18.7	560 / 22.1	560 / 22.1
Each drawer width (mm / inch)	388 / 15.3	388 / 15.3	472 / 18.6	472 / 18.6
No. of tray (standard / max.)	1 / 1	1 / 1	1 / 1	1 / 1
Max. load per tray (kg / lbs)	30 / 66.1	30 / 66.1	30 / 66.1	30 / 66.1
No. of name plate	2	3	2	3
Exterior depth (mm / inch)	700 / 27.6	700 / 27.6	700 / 27.6	700 / 27.6
Net weight (kg / lbs)	50 / 110.2	61 / 134.5	57 / 125.7	69 / 152.1
Model	DS-UD-06047D2	DS-UD-06047D3	DS-UD-06056D2	DS-UD-06056D3
Cat. No.	AAAF1040	AAAF1041	AAAF1042	AAAF1043
Exterior depth (mm / inch)	550 / 21.6	550 / 21.6	550 / 21.6	550 / 21.6
Net weight (kg / lbs)	43 / 94.8	52 / 114.6	49 / 108	59 / 130
Model	DS-UD-06047N2	DS-UD-06047N3	DS-UD-06056N2	DS-UD-06056N3
Cat. No.	AAAF1044	AAAF1045	AAAF1046	AAAF1047

Accessories & Options

Cat. No.	Description	Suitable for	
CBN0014	Tray (160×620×80mm / 6.3×24.4×3.1")	DS-UT-	06047D2, 06056D2
CBN0015	Tray (250×620×90mm / 9.8×24.4×3.5")		06056D2, 06064D2
CBN0008	Tray (160×470×80mm / 6.3×18.5×3.1")		06047N2, 06056N2
CBN0009	Tray (250×470×90mm / 9.8×18.5×3.5")		06056N2, 06064N2
CBN0012	Tray (370×620×100mm / 14.6×24.4×3.9")	DS-UD-	06047D2, 06047D3
CBN0013	Tray (450×620×110mm / 17.7×24.4×4.3")		06056D2, 06056D3
CBN0010	Tray (370×470×100 / 14.6×18.5×3.9")		06047N2, 06047N3
CBN0011	Tray (450×470×110 / 17.7×18.5×4.3")		06056N2, 06056N3
CBN0016	Tray divider (160mm / 6.3" width)	DS-UT-	06047D2, 06056D2, 06047N2, 06056N2
CBN0017	Tray divider (250mm / 9.8" width)		06056D2, 06064D2, 06056N2, 06064N2
CBN0018	Tray divider (370mm / 14.6" width)	DS-UD-	06047D2, 06047D3, 06047N2, 06047N3
CBN0019	Tray divider (450mm / 17.7" width)		06056D2, 06056D3, 06056N2, 06056N3
AAAF1521	Magnetic name plate A1 (150×200mm / 5.9×7.9")	DS-UT-	06047D2, 06056D2, 06064D2, 06047N2, 06056N2, 06064N2
AAAF1522	Magnetic name plate A2 (120×165mm / 4.7×6.5")	DS-UD-	06047D2, 06056D2, 06047N2, 06056N2
		DS-UD-	06047D3, 06056D3, 06047N3, 06056N3

Common features for Tall Cabinets

Tall cabinet models are useful for storing large amounts of liquid and solid substances.



The fully extendable drawers can be accessed from either left or right side of the cabinets.



Hidden wheels under the lower drawer for DS-SL and DS-S models easily support 60kg.

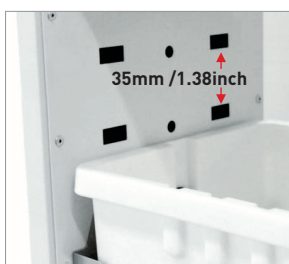


Connect multiple cabinets side by side to make the cabinets sturdy and balanced.

The air and vapor vented through both sides of the cabinet vent slits.



The removable name plates come included for keeping track of inventory.



Adjustable bracket mounts in the cabinet, designed for placing PP trays at any height.



Each tray comes standard with four tray dividers.



Four anchors are provided for ensuring the cabinet safely fixed on the floor.



Ordering Information

Cat. No.	Description
CBN0036	Anchor

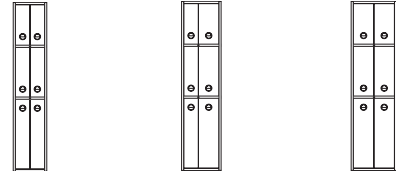
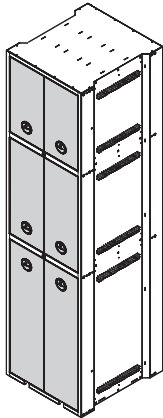
Stand type cabinets

Large and tall dimensions with 3 tier pull-out storage drawers.

DS-SL

Standard accessories

- Trays, Tray dividers
- Name plates, Anchors, Door key



Exterior height (mm / inch)		2400 / 94.5	2400 / 94.5	2400 / 94.5
Exterior width (mm / inch)		476 / 18.7	560 / 22.0	644 / 26.1
Each drawer width (mm / inch)	Left	194 / 7.6	194 / 7.6	278 / 10.9
	Right	194 / 7.6	278 / 10.9	278 / 10.9
No. of tray (standard / max.)	Upper	3 / 3	3 / 3	3 / 3
	Middle	3 / 4	3 / 4	3 / 4
	Lower	4 / 6	4 / 6	4 / 6
Max. load per tray (kg / lbs)	Upper, Middle	30 / 66.1	30 / 66.1	30 / 66.1
	Lower	60 / 132.3	60 / 132.3	60 / 132.3
No. of name plate		6	6	6
Exterior depth (mm / inch)		700 / 27.6	700 / 27.6	700 / 27.6
Net weight (kg / lbs)		181 / 399.0	196 / 432.1	212 / 467.4
Model		DS-SL-24047D6	DS-SL-24056D6	DS-SL-24064D6
Cat. No.		AAAF1080	AAAF1081	AAAF1082

Accessories & Options

Trays

Cat. No.	Description	Suitable for	
CBN0014	Tray (160×620×80mm / 6.3×24.4×3.1")	DS-SL-	24047D6, 24056D6
CBN0015	Tray (250×620×90mm / 9.8× 24.4×3.5")		24056D6, 24064D6

Tray dividers

Cat. No.	Description	Suitable for	
CBN0016	Tray divider (160mm / 6.3" width)	DS-SL-	24047D6, 24056D6
CBN0017	Tray divider (250mm / 9.8" width)		24056D6, 24064D6

Name plates

Cat. No.	Description	Suitable for	
AAAF1521	Magnetic name plate A1 (150×200mm / 5.9×7.9")	DS-SL-	24047D6, 24056D6, 24064D6

General Storage Cabinet (Tall - DS-S)

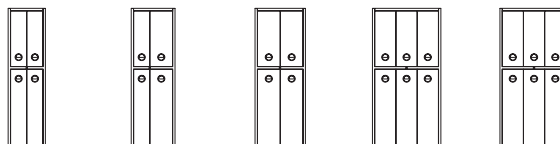
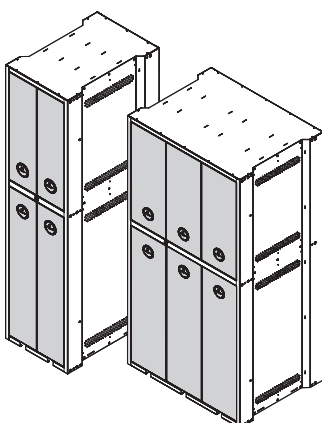
Stand type cabinets

General height with 2 tier pull-out storage drawers.

DS-S

Standard accessories

- Trays, Tray dividers
- Name plates, Anchors, Door key



Exterior height (mm / inch)	1800 / 70.9	1800 / 70.9	1800 / 70.9	1800 / 70.9	1800 / 70.9
Exterior width (mm / inch)	476 / 18.7	560 / 22.1	644 / 25.4	686 / 27.0	938 / 36.9
Each drawer width (mm / inch)	Left	194 / 7.6	194 / 7.6	278 / 10.9	194 / 7.6
	Middle	-	-	-	194 / 7.6
	Right	194 / 7.6	278 / 10.9	278 / 10.9	194 / 7.6
No. of tray (standard / max.)	Upper	3 / 4	3 / 4	3 / 4	3 / 4
	Lower	4 / 6	4 / 6	4 / 6	4 / 6
Max. load per tray (kg / lbs)	Upper	30 / 66.1	30 / 66.1	30 / 66.1	30 / 66.1
	Lower	60 / 132.3	60 / 132.3	60 / 132.3	60 / 132.3
No. of name plate	4	4	4	6	6
Exterior depth (mm / inch)	700 / 27.6	700 / 27.6	700 / 27.6	700 / 27.6	700 / 27.6
Net weight (kg / lbs)	124 / 273.4	137 / 302.0	146 / 321.9	172 / 379.2	206 / 454.2
Model	DS-S-18047D4	DS-S-18056D4	DS-S-18064D4	DS-S-18068D6	DS-S-18093D6
Cat. No.	AAAF1000	AAAF1001	AAAF1002	AAAF1003	AAAF1004
Exterior depth (mm / inch)	550 / 21.6	550 / 21.6	550 / 21.6	550 / 21.6	550 / 21.6
Net weight (kg / lbs)	107 / 235.9	119 / 262.4	126 / 277.8	148 / 326.3	178 / 392.4
Model	DS-S-18047N4	DS-S-18056N4	DS-S-18064N4	DS-S-18068N6	DS-S-18093N6
Cat. No.	AAAF1005	AAAF1006	AAAF1007	AAAF1008	AAAF1009

Accessories & Options

Trays

Cat. No.	Description	Suitable for	
CBN0014	Tray (160×620×80mm / 6.3×24.4×3.1")	DS-S-	18047D4, 18056D4, 18068D6
CBN0015	Tray (250×620×90mm / 9.8× 24.4×3.5")		18056D4, 18064D4, 18093D6
CBN0008	Tray (160×470×80mm / 6.3×18.5×3.1")		18047N4, 18056N4, 18068N6
CBN0009	Tray (250×470×90mm / 9.8×18.5×3.5")		18056N4, 18064N4, 18093N6

Tray dividers

Cat. No.	Description	Suitable for	
CBN0016	Tray divider (160mm / 6.3" width)	DS-S-	18047D4, 18056D4, 18068D6, 18047N4, 18056N4, 18068N6
CBN0017	Tray divider (250mm / 9.8" width)		18056D4, 18064D4, 18093D6, 18056N4, 18064N4, 18093N6

Name plates

Cat. No.	Description	Suitable for	
AAAF1521	Magnetic name plate A1 (150×200mm / 5.9×7.9")	DS-S-	18047D4, 18056D4, 18068D6, 18064D4, 18093D6, 18047N4, 18056N4, 18068N6, 18064N4, 18093N6

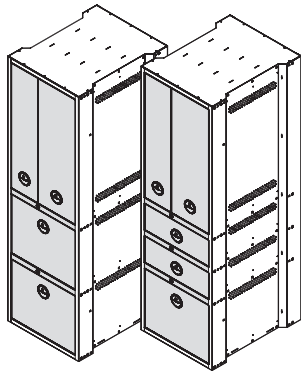
Combi type cabinets

Variety of different size drawers, narrow and wide.

DS-C

Standard accessories

- Trays, Tray dividers
- Name plates, Anchors, Door key



Exterior height (mm / inch)	1800 / 70.9	1800 / 70.9	1800 / 70.9	1800 / 70.9
Exterior width (mm / inch)	476 / 18.7	476 / 18.7	560 / 22.1	560 / 22.1
Each drawer width (mm / inch)	Left	194 / 7.6	194 / 7.6	194 / 7.6
	Right	194 / 7.6	194 / 7.6	278 / 10.9
No. of tray (standard / max.)	Upper	3 / 4	3 / 4	3 / 4
	Lower	1 / 1	1 / 1	1 / 1
Max. load per tray (kg / lbs)	30 / 66.1	30 / 66.1	30 / 66.1	30 / 66.1
No. of name plate	4	5	4	5
Exterior depth (mm / inch)	700 / 27.6	700 / 27.6	700 / 27.6	700 / 27.6
Net weight (kg / lbs)	114 / 251.3	126 / 277.8	127 / 279.9	140 / 380.6
Model	DS-C-18047D4	DS-C-18047D5	DS-C-18056D4	DS-C-18056D5
Cat. No.	AAAF1030	AAAF1031	AAAF1032	AAAF1033
Exterior depth (mm / inch)	550 / 21.6	550 / 21.6	550 / 21.6	550 / 21.6
Net weight (kg / lbs)	100 / 220.5	108 / 238.1	110 / 242.5	120 / 264.6
Model	DS-C-18047N4	DS-C-18047N5	DS-C-18056N4	DS-C-18056N5
Cat. No.	AAAF1034	AAAF1035	AAAF1036	AAAF1037

Accessories & Options

Trays

Cat. No.	Description	Suitable for
CBN0014	Tray (160×620×80mm / 6.3×24.4×3.1")	DS-C-
CBN0015	Tray (250×620×90mm / 9.8×24.4×3.5")	
CBN0012	Tray (370×620×100mm / 14.6×24.4×3.9")	
CBN0013	Tray (450×620×110mm / 17.7×24.4×4.3")	
CBN0008	Tray (160×470×80mm / 6.3×18.5×3.1")	
CBN0009	Tray (250×470×90mm / 9.8×18.5×3.5")	
CBN0010	Tray (370×470×100 / 14.6×18.5×3.9")	
CBN0011	Tray (450×470×110 / 17.7×18.5×4.3")	

Tray dividers

Cat. No.	Description	Suitable for
CBN0016	Tray divider (160mm / 6.3" width)	DS-C-
CBN0017	Tray divider (250mm / 9.8" width)	
CBN0018	Tray divider (370mm / 14.6" width)	
CBN0019	Tray divider (450mm / 17.7" width)	

Name plates

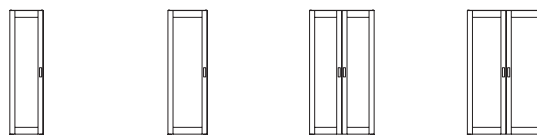
Cat. No.	Description	Suitable for
AAAF1521	Magnetic name plate A1 (150×200mm / 5.9×7.9")	DS-C-
AAAF1522	Magnetic name plate A2 (120×165mm / 4.7×6.5")	

General Storage Cabinet (Tall - DS-OW / DS-OR)

Open window type cabinet / Open rack type cabinets

Tempered glass cabinet door allow for easy viewing. (DS-OW)

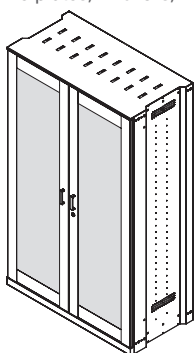
Multipurpose and stationary storage units. (DS-OR)



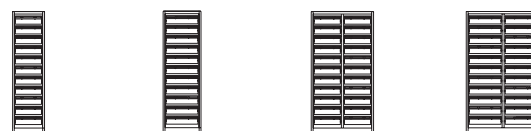
DS-OW

Standard accessories

- Trays, Tray dividers
- Name plates, Anchors, Door key



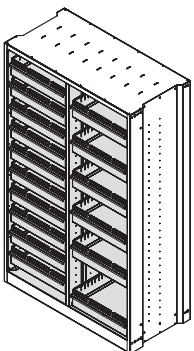
Exterior height (mm / inch)	1800 / 70.9	1800 / 70.9	1800 / 70.9	1800 / 70.9
Exterior width (mm / inch)	472 / 18.6	556 / 21.9	915 / 36.0	1083 / 42.6
Each drawer width (mm / inch)	418 / 16.5	502 / 19.8	418 / 16.5	502 / 19.8
No. of tray (standard / max.)	6 / 11	6 / 11	12 / 22	12 / 22
Max. load per tray (kg / lbs)	30 / 66.1	30 / 66.1	30 / 66.1	30 / 66.1
No. of name plate	6	6	12	12
Exterior depth (mm / inch)	550 / 21.6	550 / 21.6	550 / 21.6	550 / 21.6
Net weight (kg / lbs)	124 / 273.4	137 / 302.0	146 / 321.9	172 / 379.2
Model	DS-OW-18047N1	DS-OW-18055N1	DS-OW-18091N2	DS-OW-18108N2
Cat. No.	AAAF1050	AAAF1051	AAAF1052	AAAF1053



DS-OR

Standard accessories

- Trays, Tray dividers, Anchors

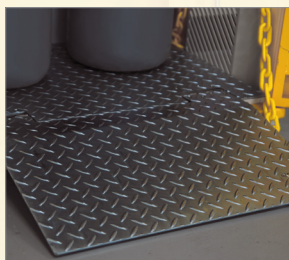


Exterior height (mm / inch)	1800 / 70.9	1800 / 70.9	1800 / 70.9	1800 / 70.9
Exterior width (mm / inch)	472 / 18.6	556 / 21.9	915 / 36.0	1083 / 42.6
Each drawer width (mm / inch)	418 / 16.5	502 / 19.8	418 / 16.5	502 / 19.8
No. of tray (standard / max.)	11 / 11	11 / 11	22 / 22	22 / 22
Max. load per tray (kg / lbs)	30 / 66.1	30 / 66.1	30 / 66.1	30 / 66.1
Exterior depth (mm / inch)	550 / 21.6	550 / 21.6	550 / 21.6	550 / 21.6
Net weight (kg / lbs)	110 / 242.5	120 / 264.6	215 / 473.9	244 / 537.9
Model	DS-OR-18047N1	DS-OR-18055N1	DS-OR-18091N2	DS-OR-18108N2
Cat. No.	AAAF1090	AAAF1091	AAAF1092	AAAF1093

Accessories & Options

Cat. No.	Description	Suitable for	
AAAF1501	Drawer set (epoxy painted steel, 388x504mm / 15.3x19.8")	DS-OW-	18047N1, 18091N2
AAAF1502	Drawer set (epoxy painted steel, 472x504mm / 18.6x19.8")		18055N1, 18108N2
AAAF1504	Drawer set (stainless steel, 388x504mm / 15.3x19.8")		18047N1, 18091N2
AAAF1505	Drawer set (stainless steel, 472x504mm / 18.6x19.8")		18055N1, 18108N2
AAAF1507	Drawer set (epoxy painted steel, 388x504mm / 15.3x19.8")	DS-OR-	18047N1, 18091N2
AAAF1508	Drawer set (epoxy painted steel, 472x504mm / 18.6x19.8")		18055N1, 18108N2
AAAF1509	Drawer set (stainless steel, 388x504mm / 15.3x19.8")		18047N1, 18091N2
AAAF1510	Drawer set (stainless steel, 472x504mm / 18.6x19.8")		18055N1, 18108N2
CBN0018	Tray divider (370mm / 14.6" width)	DS-OW-	18047N1, 18091N2
CBN0019	Tray divider (450mm / 17.7" width)		18055N1, 18108N2
CBN0018	Tray divider (370mm / 14.6" width)	DS-OR-	18047N1, 18091N2
CBN0019	Tray divider (450mm / 17.7" width)		18055N1, 18108N2
AAAF1523	Name plate B1 (320x115mm / 12.6x4.5")	DS-OW-	18047N1, 18055N1, 18091N2, 18108N2

Constructed progressively strong, and for storage of gas cylinders inside of buildings.



Large interior

Wide fold down ramp, safe and easy to maneuver gas cylinders in and out of the cabinet, easy to install gas fittings and pipes.



Spark-proof plastic chains

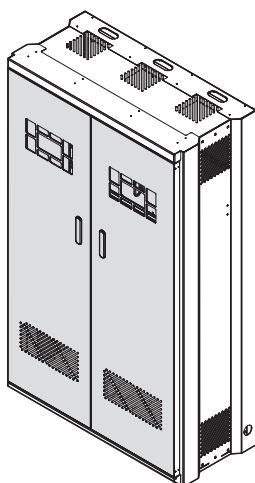
Convenient for securing gas cylinders in place, prevents gas cylinders from getting scratched.

Front and both side vent slits vents the cabinet effectively disperses the gas leak out of the cabinet in case there is damage to one of the gas cylinders.

DS-GC

Standard accessories

- Door key



Exterior height (mm / inch)	1800 / 70.9	1800 / 70.9
Exterior width (mm / inch)	740 / 29.1	1070 / 42.1
Max. storage capacity of Ø230mm gas cylinder	2	3
Exterior depth (mm / inch)	550 / 21.6	550 / 21.6
Net weight (kg / lbs)	107 / 235.9	140 / 308.6
Model	DS-GC-18074N2	DS-GC-18107N2
Cat. No.	AAAF1070	AAAF1071

Hoods

Clean Benches

Ductless Fume Hoods

Movable Extraction Arm Hoods

Extraction Arm Hoods

Bench Top Fume Hoods

PCR Workstations

UV Sterilization Cabinets



» General Applications

Clean Benches

Non-toxic IV solution, Preparation,
Plant tissue culture, Media plate preparation,
Electronics inspection, Medical device assembly,
Pharmacy drug preparation.

Fume Hoods

Chemical sampling, Chemical preparation,
Cosmetic Production, Numerous,
Vapor-generating laboratory processes,
Slide preparation, Welding fumes.

PCR Workstations

Medical device assembly, PCR, Staining
with volatile, Sterile media preparation,
Tissue fixation / Staining preparation.

UV Sterilization Cabinets

General sterilization in daily use.

Product Name		Clean Benches (Advanced)	Clean Benches (Basic)	Ductless Fume Hoods
Model		BC-H	BC-B	DLH-G
Description		Vertical laminar flow, Digital control	Vertical laminar flow, Analog control	Swing vane type, Digital control
Work space (W×D×H, mm)		945×570×670, 1245×570×670, 1845×570×670	945×570×670, 1245×570×670, 1845×570×670	880×640×800, 1180×640×800
Air volume (min. / max., cmh)		0 to 1020, 0 to 2040	0 to 1020, 0 to 2040	-
Airflow velocity (m/s)		0.3, 0.45	0.3, 0.45	Initial set point: 0.4m/s, 80fpm (face velocity)
Air flow				
Air cleanliness within workspace		ISO 14644-1 class 4 (US federal standard 209E class 10)		-
Filters (standard / optional)		Standard HEPA filter, Pre filter	Standard HEPA filter, Pre-filter	Standard HEPA filter, Pre-filter / Optional chemical filters
Construction	Work surface	Stainless steel grade 304, Hairline treatment	Stainless steel grade 304, Hairline treatment	Optional 6 different work surfaces
	UV lamp	0	0	-
Control	Display & Control interface	Dual, Digital-touch VFD	Analog-Switch, Knob	Digital-LED, Buttons
	Filter capacity check	Digital-Differential pressure sensor	Analog-Differential pressure guage	Analog-Gas detector (optional)
	Front access for filter replacement	0	0	0
	Diffusing muffler	0	0	-
	Blower speed adjustment	Digital	Analog	Digital
Safety	Door open level alarm	0	-	-
	Smart door system	0	-	-
	UV lamp auto off	0	0	-

» Effective Filtering System

Reliable international standard

ISO class 4 air cleanliness as per ISO 14644-1.

- Equivalent to Class 10 as per US Federal Standard 209E
- 99.99% efficient HEPA filter.

Chemical filters are selectable according to the application

- Activated carbon filter
- Acid filter
- Halogen compounds filter
- Formaldehyde filter
- Ammonia / Amines filter
- Pre filter

» Tips for Selection

Protection target

Clean benches / PCR workstations for sample protection.

HEPA-filtered environment protects the sample from air contamination.

UV light enables effective sterilization of the sample.

* Do not offer personnel protection.

Fume hoods for personnel protection.

Efficiently designed to protect the user from harmful and toxic fumes generated from wide range of applications.

* Ducted type and ductless type are available.



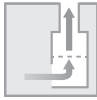
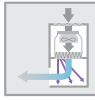

Usage environment

Ducted type for strong fume extraction.

In-lab exhaust system is essential to use the ducted fume hood. It guarantees strong and effective extraction of hazardous and toxic fumes.

Ductless type for easy installation and maintenance.

Ventilation system in your lab is not required at all. Ductless fume hood with chemical filters enables effective fume extraction.

Movable Extraction Arm Hoods (with Filter Box)		Extraction Arm Hoods (without Filter Box)		Bench Top Fume Hoods	PCR Workstations	UV Sterilization Cabinets
MAH		AH		PMH	PW	UVC
2 Joints	3 Joints	2 Joints	3 Joints	Compact size, Portable	Vertical laminar flow	UV lamp with timer control
Arm(LxØ,mm) 1040x75	Arm(LxØ,mm) 1680x75	Arm(LxØ,mm) 1040x75	Arm(LxØ,mm) 1680x75	Entrance(WxD,mm) 560x300	700x585x602, 880x585x602, 1180x585x602	433x500x468, 583x500x468, 880x500x468
-	-	-	-	-	167 to 557, 209 to 697, 279 to 929	-
140 m³/h	-	-	-	-	0.3 / 60	-
						
-	-	-	-	-	ISO 14644-1 class 4 (US federal standard 209E class 10)	-
Standard HEPA filter, Activated carbon filter, Pre-filter / Optional chemical filters		-	-	-	Standard HEPA filter, Pre-filter	-
-	-	-	-	Polyethylene	10mm thick acrylic resin (clear type)	Stainless steel grade 304
-	-	-	-	-	0	0
Analog-Button, Knob		-	-	-	Digital-LED, Buttons	Digital-VFD, Buttons
Analog-Gas detector (optional)		-	-	-	Analog-Gas detector (optional)	-
-	-	-	-	-	0	0
-	-	-	-	-	-	-
Analog		-	-	-	Digital	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	0	0

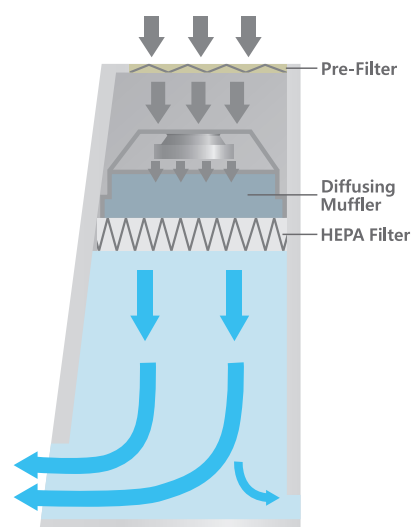
Clean Benches (Advanced)

Vertical laminar flow clean benches with advanced digital control and various convenient features.

ISO class 4 air cleanliness as per ISO 14644-1.

Class 10 as per US Federal Standard 209E.

Nominal down flow velocity. (max. 0.45 m/sec)



BC-11H

with optional stand and gas cock

Standard accessories
see page 61

- HEPA filter, Pre filter
- UV lamp, Fluorescent lamp
- Electrical socket



Interlocking smart door system (patent pending)



Performance

- ISO class 4 (US class 10) HEPA filter for optimal protection against cross-contamination.
- 0.3 µm and larger particulates are removed with 99.99% efficiency, leak-tight HEPA filter which satisfying class 10.
(US Federal Standard 209E)
(average life span of HEPA filter: 3 years – it depends on the test room conditions)
- High-quality polyester fiber pre filter (with minimal pressure loss and 85% arrestant on the A.F.I. test) for trapping larger particles and increasing the life of the main HEPA filter.
- Digital airflow rate sensor (microprocessor) for automated airflow speed control.
 - Offers continual airflow speed of same velocity and extends the HEPA filter life span.
- Exclusive diffusing muffler structure forms high quality laminar flow.
- Quiet and comfortable working environment. (less than 65dB)

Convenience

- Interlocking smart door system
 - Simply open the door while UV-lamp is on. Interlocking smart door system will automatically turn off UV-lamp, turn on fluorescent lamp and blower instead of your manual control.
- Two digital displays for the best convenience.
 - Even if any test is ongoing inside of the chamber, unit conditions such as velocity, temperature and humidity can be easily checked by the inner and outside displays.

- Digital differential pressure sensor allows for easy verification of HEPA filter condition great for knowing when to change HEPA filter.
- When UV light intensity is lower than 80%, UV warning lamp is automatically on to let users know when to change UV-lamp.
- Comfortable front access to cartridge type of filters for easy replacement.
- Highly durable, rust-free, and easy-to-clean grade 304 stainless steel work surface.
- The inner left side magnetic board allows some memos and small tools.

Safety

- UV-blocking and impact-resistant tempered glass door.
- If the sash is opened more than the recommended sash height level, during operation, warning alarm will activate and alarm users to lower the window to the recommended sash level to prevent contamination of samples.
- If the sash is opened during UV-lamp operation, UV lamp automatically turns off to protect users.
- Smoothly sliding front door stoppable at any height for user's safety and easy transport of equipment into the workspace.
- Protection against over-current.

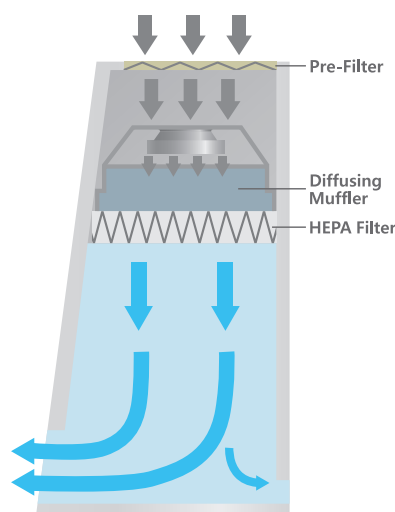
Model		BC-01H		BC-11H		BC-21H	
Air flow type		Vertical laminar flow					
Air volume (minimum / maximum)		0 to 1020 cmh / 0 to 600 cfm		0 to 2040 cmh / 0 to 1200 cfm			
Laminar airflow velocity (m / s / fpm)		0.3 / 59		0.45 / 89		0.3 / 59	
Air cleanliness within work space		ISO 14644-1 class 4, US Federal Standard 209E class 10					
Filters	HEPA filter	Typical efficiency of 99.99% on 0.3 μ m (US MIL-STD-282) ; Micro glass fiber Media, Particle board, AL separator, Neoprene gaskets					
	Pre filter	Polyester fibers with an filter efficiency of 85% (A-F-ITEST) ; Aluminum frame, Polyester fiber media					
Noise level		Typically < 65dB at blower speed					
Materials	Main body	Steel powder coating					
	Work surface	Stainless steel grade 304, Hairline treatment					
	Windows (front / side)	Colorless and transparent UV absorbing 5mm tempered glass					
Illumination	Intensity (lux)	> 650					
	Fluorescent lamp (w)	30 x 2ea				32 x 2ea	
		Electronically ballasted Fluorescent Lamp					
	UV lamp (w)	25 x 1ea		30 x 1ea		25 x 2ea	
Electronically ballasted UV Lamp							
Electric socket outlets		230V socket					
Dimension (WxDxH)	Interior (mm / inch)	945×570×670 / 37.2×22.4×26.4		1245×570×670 / 49.0×22.4×26.4		1845×570×670 / 72.6×22.4×26.4	
	Exterior without stand (mm / inch)	1135×647×1150 / 44.7×25.5×45.3		1435×647×1150 / 56.5×25.5×45.3		2035×647×1150 / 80.1×25.5×45.3	
	Exterior with stand (mm / inch)	1135×647×1870 / 44.7×25.5×73.6		1435×647×1870 / 56.5×25.5×73.6		2035×647×1870 / 80.1×25.5×73.6	
	Net weight (body) (kg / lbs)	140 / 308.6		185 / 407.9		225 / 496	
	Net weight (body + stand) (kg / lbs)	170 / 374.8		215 / 474		255 / 562.2	
Electrical requirements (230V, 1ph)		60Hz / 1.25 A	50Hz / 1.38 A	60Hz / 1.57 A	50Hz / 1.73 A	60Hz / 2.09 A	50Hz / 2.30 A
Cat. No.		AAHA5011K	AAHA5012K	AAHA5021K	AAHA5022K	AAHA5031K	AAHA5032K
Electrical requirements (120V, 1ph)		60Hz / 2.62 A		60Hz / 3.27 A		60Hz / 4.36 A	
Cat. No.		AAHA5013U		AAHA5023U		AAHA5033U	

* FDA establishment registered company. FDA listed products.

Vertical laminar flow clean benches offer quick operation by simple-adjustable analog control.

ISO class 4 air cleanliness as per ISO 14644-1. Class 10 as per US Federal Standard 209E.

Nominal down flow velocity. (max. 0.45 m/sec)



BC-11B

with optional stand

Standard accessories see page 61

- HEPA filter, Pre filter
- UV lamp, Fluorescent lamp
- Electrical socket
- Differential pressure gauge



Performance

- ISO class 4 (US class 10) HEPA filter for optimal protection against cross-contamination.
- 0.3 μm and larger particulates are removed with 99.99% efficiency, leak-tight HEPA filter which satisfying class 10. (US Federal Standard 209E)
(average life span of HEPA filter: 3 years – it depends on the test room conditions)
- High-quality polyester fiber pre filter (with minimal pressure loss and 85% arrestant on the A.F.I. test) for trapping larger particles and increasing the life of the main HEPA filter.
- Exclusive diffusing muffler structure forms high quality laminar flow.
- Quiet and comfortable working environment. (less than 65dB)

Convenience

- Built-in differential pressure gauge for easy checking HEPA filter condition.
- Comfortable front access to cartridge type of filters for easy replacement.

- Easy blower speed adjustment by the control panel.
- Highly durable, rust-free, and easy-to-clean grade 304 stainless steel work surface.
- The inner left side magnetic board allows some memos and small tools.

Safety

- UV-blocking and impact-resistant tempered glass door.
- If the sash is opened during UV-lamp operation, UV lamp automatically turns off to protect users.
- Lighting mode selection by 3-position toggle switch (UV / off / fluorescent) preventing harmful UV exposure.
- Smoothly sliding front door stoppable at any height for user's safety and easy transport of equipment into the workspace.
- Protection against over-current.

Model		BC-01B	BC-11B	BC-21B
Air flow type		Vertical laminar flow		
Air volume (minimum / maximum)		0 to 1020 cmh / 0 to 600 cfm		
Laminar airflow velocity (m / s / fpm)		0.3 / 59	0.45 / 89	0.3 / 59
Air cleanliness within work space		ISO 14644-1 class 4, US Federal Standard 209E class 10		
Filters	HEPA filter	Typical efficiency of 99.99% on 0.3 μ m (US MIL-STD-282) ; Micro glass fiber Media, Particle board, AL separator, Neoprene gaskets		
	Pre filter	Polyester fibers with an filter efficiency of 85% (A-F-I TEST) ; Aluminum frame, Polyester fiber media		
Noise level		Typically < 65dB at blower speed		
Materials	Main body	Steel powder coating		
	Work surface	Stainless steel grade 304, Hairline treatment		
	Windows (front / side)	Colorless and transparent UV absorbing 5mm tempered glass		
Illumination	Intensity (lux)	> 650		
	Fluorescent lamp (W)	30 x 2ea		32 x 2ea
		Electronically ballasted Fluorescent Lamp		
	UV lamp (W)	25 x 1ea	30 x 1ea	25 x 2ea
Electric socket outlets		230V socket		
Dimension (WxDxH)	Interior (mm / inch)	945x570x670 / 37.2x22.4x26.4	1245x570x670 / 49.0x22.4x26.4	1845x570x670 / 72.6x22.4x26.4
	Exterior without stand (mm / inch)	1135x647x1150 / 44.7x25.5x45.3	1435x647x1150 / 56.5x25.5x45.3	2035x647x1150 / 80.1x25.5x45.3
	Exterior with stand (mm / inch)	1135x647x1870 / 44.7x25.5x73.6	1435x647x1870 / 56.5x25.5x73.6	2035x647x1870 / 80.1x25.5x73.6
	Net weight (body) (kg / lbs)	140 / 308.6	185 / 407.9	225 / 496
	Net weight (body + stand) (kg / lbs)	170 / 374.8	215 / 474	255 / 562.2
Electrical requirements (230V, 1ph)		60Hz / 1.25 A	50Hz / 1.38 A	60Hz / 1.57 A
Cat. No.		AAHA6011K	AAHA6012K	AAHA6021K
Electrical requirements (120V, 1ph)		60Hz / 2.62 A	60Hz / 3.27 A	60Hz / 4.36 A
Cat. No.		AAHA6013U	AAHA6023U	AAHA6033U

* FDA establishment registered company. FDA listed products.

Accessories & Options



HEPA filter

- 99.99% efficient HEPA filter, industry standard size for economical replacement.



Stand with casters

- Stand with casters : Mobile stand made of powder-coated steel ideal for easy relocation.



Pre filter

- Easy-to-replace pre-filter for trapping larger particles and extending the life of HEPA filters.

Filters

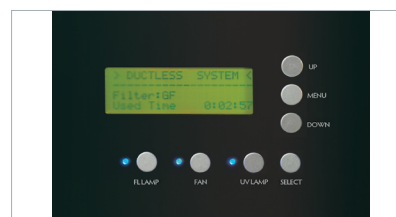
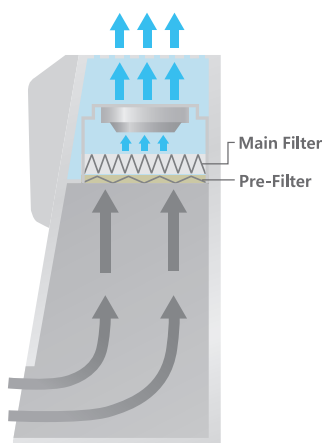
Cat. No.	Description	BC-01H/B	BC-11H/B	BC-21H/B
AAAB1601	HEPA filter	•	-	-
AAAB1602		-	•	-
AAAB1603		-	-	•
AAAB1611	Pre filter	•	-	-
AAAB1612		-	•	-
AAAB1613		-	-	•

Others

Cat. No.	Description	BC-01H/B	BC-11H/B	BC-21H/B
AAAB1621	Stand with casters	•	-	-
AAAB1622		-	•	-
AAAB1623		-	-	•
AAAB1631	UV lamp(230V)	•	-	-
AAAB1633		-	•	-
AAAB1635		-	-	•
AAAB1632	UV lamp(120V)	•	-	-
AAAB1634		-	•	-
AAAB1636		-	-	•
AAAB1561	Gas cock	•	•	•
AAAB1571	Differential pressure gauge (for BC-B)	•	•	•

Ductless Fume Hoods

Safe and energy-saving mobile workspace free from toxic vapors and fumes without the need of costly ductwork.



Digital controller



Anemometer



Front cover

DLH-01G

with optional work surface and stand

Standard accessories • Pre filter
see page 63 • Fluorescent lamp

* DLH series do not come with any work surface. Please place an order one work surface among 6 optional different work surfaces for proper use.

Performance

- A variety of filters and work surfaces available to suit your specific experimental needs. (refer to accessory section)
- High-quality polyester fiber pre-filter for trapping larger particles and increasing the life of the main HEPA filter.
- Large-capacity blower maintaining sufficient intake flow rate and reducing noise. (less than 55 dB under normal operation)
- Fluorescent light installed outside the workspace in order to prevent the airflow hindrance as well as the contamination while maintaining illumination intensity.

Convenience

- Easy monitoring of the internal airflow speed thanks to built-in anemometer.

- Comfortable front access to cartridge type of filters for easy replacement.
- Built-in utility hole for easily routing the cords or wires of the equipment placed inside the hood.
- Fully or half openable front door for convenient transport of experimental apparatuses and equipment into or out of the workspace.

Standards compliance

- Efficiency and capacity of activated carbon filters: BS 7989:2001
- Structure, electrical outlet, lighting, and sound level: BS 7258-1:1994
- Local smoke, large volume visualization, face velocity, and tracer gas: ANSI/ASHRAE 110-1995 and NF EN 14175-1



Model		DLH-01G		DLH-11G	
Controller		Microprocessor control			
Face velocity		Initial set point: 0.4m/s, 80fpm			
Air flow meter		Swing vane type			
Main filter		Chemical Filter (optional 6 different filters)			
Pre filter		Washable high efficiency nylon filter			
Materials	Main body, window (front / side)	2.0mm steel (epoxy powder-coated), 8mm / 6mm thick acrylic resin			
	Work surface	Optional 6 different work surfaces			
Fluorescent light intensity		> 600lux			
Noise level		55dB under normal operation			
Dimension (WxDxH)	Interior (mm / inch)	880×640×800 / 34.6×25.2×31.5		1180×640×800 / 46.5×25.2×31.5	
	Exterior without stand (mm / inch)	900×660×1250 / 35.4×26×49.2		1200×660×1250 / 47.2×26×49.2	
	Exterior with stand (mm / inch)	900×660×1985 / 35.4×26×78.1		1200×660×1985 / 47.2×26×78.1	
	Net weight (body) (kg / lbs)	100 / 220.5		118 / 260.1	
	Net weight (body + stand) (kg / lbs)	120 / 264.6		140 / 308.6	
Electrical requirements (230V)		50Hz, 0.6A	60Hz, 0.7A	50Hz, 0.6A	60Hz, 0.7A
Cat. No.		AAHB2002K	AAHB2001K	AAHB2012K	AAHB2011K
Electrical requirements (100V, 120V)		100V, 50Hz, 1.5A	120V, 60Hz, 1.3A	100V, 50Hz, 1.5A	120V, 60Hz, 1.3A
Cat. No.		AAHB2004U	AAHB2003U	AAHB2014U	AAHB2013U

* FDA establishment registered company. FDA listed products.

Accessories & Options

Filters

Cat. No.	Description	Application	DLH-01G	DLH-11G
EDA9191 EDA9192	Activated carbon filter	All common laboratory chemicals, especially VOC, Organic, Benzene, Toluene, etc	•	-
EDA9199 EDA9200	Acid filter ¹⁾	An acidic solvent ; Acetic acid, etc	•	-
EDA9201 EDA9202	Halogen compounds filter	Halogen compounds like Chlorine, Fluorine, Iodine, Bromine, Astatine, etc	•	-
EDA9203 EDA9204	Formaldehyde filter	Formadehyde applications	•	-
EDA9205 EDA9206	Ammonia / Amines filter	Ammonia/Amines by chemisorptions	•	-
EDA9193 EDA9194	HEPA filter	Biohazardous aerosols and other visible and non-visible particles (filtration efficiency: 99.99% at 0.3 microns)	•	-
EDA9196 EDA9198	Pre filter	-	•	-

1) Please do not use high percentage of reactive acid such as perchloric acid.

Work surfaces / Stands

Cat. No.	Description	DLH-01G	DLH-11G
AAAB2501 AAAB2502	Work surface (SUS #304)	•	-
AAAB2503 AAAB2504	Work surface (SUS #316)	•	-
AAAB2505 AAAB2506	Work surface (ceramite)	•	-
AAAB2507 AAAB2508	Work surface (polypropylene)	•	-
AAAB2509 AAAB2510	Work surface (bakelite)	•	-
AAAB2511 AAAB2512	Work surface (PVC)	•	-
AAAB2521 AAAB2522	Stand with casters	•	-

Gas detector / Gas detecting tubes

Cat. No.	Description	DLH-01G	DLH-11G
AAAB2531	Gas detector (KITAGAWA AP-20)	•	•
EAA1550	Gas detecting tube (benzene, GASTEC-121SP (0.5-10ppm))	•	•
EAA1551	Gas detecting tube (yoluene, GASTEC-122L (1-100ppm))	•	•
EAA1552	Gas detecting tube (acetic acid, GASTEC-81L (0.125-25ppm))	•	•
EAA1553	Gas detecting tube (chloroform, GASTEC-137 (4-400ppm))	•	•
EAA1554	Gas detecting tube (formaldehyde, GASTEC-91LL (0.05-1ppm))	•	•
EAA1555	Gas detecting tube (ammonia, GASTEC-3L (0.5-60ppm))	•	•

Movable Extraction Arm Hoods



Extraction arm hood with filter box.

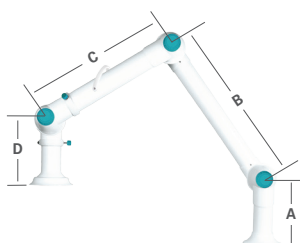
When the mobility is important, the simplest solution for fume extraction!



MAH-3100 with optional dome hood

Basic Components see page 65

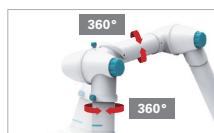
- Extraction arm, Basic hood
- Filter box
(pre-filter/HEPA filter/activated carbon filter)



Simple control panel



Quick tilt-adjustable knob



360° rotatable joint



Damper for airflow rate adjustment

Features

- In-lab ventilation system is no longer necessary with this movable extraction arm hood. MAH series can serve as the best mobile or fixed mounted fume extraction system.
- Chemical-resistant and heavy duty polypropylene extraction arm.
- 360-degree rotatable joints in the arms provide exceptional flexibility for easy positioning.
- Arm joints are easily removable for simple adjustment of length of the arm. (removable parts : B, C)
- Air flow rate is adjustable by the damper of the extraction arm.
- Durable BLDC motor provides quiet and comfortable working environment.
- Convenient air flow control.
- Gas detecting port for checking filter condition.
- Automatic fan malfunction warning alarm.
- Pre filter, HEPA filter, activated carbon filter are provided as standard accessories.
- Optional different types of the hoods are available for effective fume extraction.

Chemical Filters

Cat. No.	Description
AAAB6507	Pre filter
AAAB6506	HEPA filter
AAAB6502	Activated carbon filter
AAAB6501	Acid filter ¹⁾
AAAB6505	Halogen compounds filter
AAAB6504	Formaldehyde filter
AAAB6503	Ammonia/Amines filter

1) Please do not use high percentage of reactive acid such as perchloric acid.
* For chemical filters' application list and Gas Detector & Tubes ordering information, please refer to page 63.

Model	Joint	Length (mm / inch)					Ø (mm / inch)	Net weight (kg / lbs)	Cat. No.		
		A	B	C	D	Total			Electrical requirements		
									230V/60Hz, 1.5A	230V/50Hz, 1.5A	120V/60Hz, 3A
Polypropylene Extraction Arm Hood + Filter Box*											
Airflow rate Max.140m³/h											
MAH-2100	2 joints	250/9.8	-	530/20.9	260/10.2	1040/40.9	75/2.9	1.8/3.9	AAHB6111K	AAHB6112K	AAHB6113U
MAH-3100	3 joints		640/25.2						1680/66.1	AAHB6301K	AAHB6302K

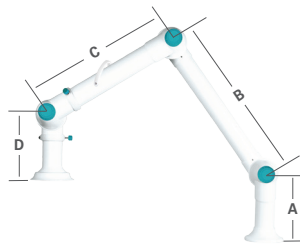
* Filter box dimensions (WxDxH, 500x500x850mm) (kg / lbs, 37.2 / 82.0)

Filter box comes with pre filter/HEPA filter/activated carbon filter.

* FDA establishment registered company. FDA listed products.

Features

- Mountable on any surface such as ceiling, wall only when you have a ventilation system in your lab.
- Chemical-resistant and heavy duty polypropylene extraction arm.
- 360-degree rotatable joints in the arms provide exceptional flexibility for easy positioning.
- Arm joints are easily removable for simple adjustment of length of the arm. (removable parts : B, C)
- Air flow rate is adjustable by the damper of the extraction arm.
- Optional different types of the hoods are available for effective fume extraction.
- One of the various brackets is essentially required for installing the extraction arm hood in your laboratory.



The best solutions for eliminating dust and fume hazards at source.



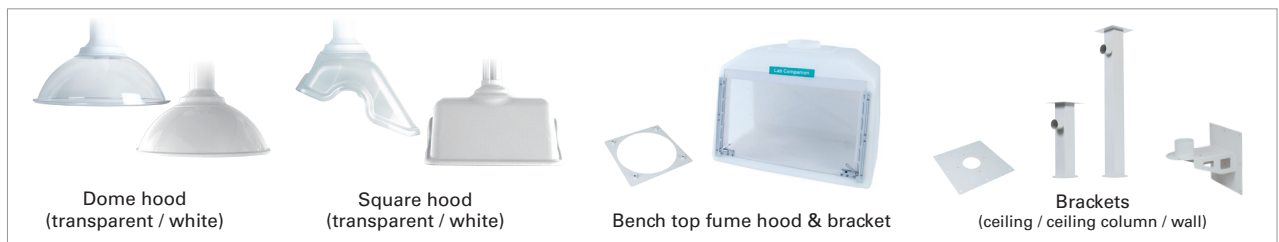
AH-75 (3 joints)
with optional bracket

Basic Components • Extraction arm, Basic hood
see page 65

Model	Joint	Length (mm / inch)				Ø (mm / inch)	Net weight (kg / lbs)	Cat. No.	
		A	B	C	D				Total
Polypropylene Extraction Arm Hood									
AH-75	2 joints	250/9.8	-	530/20.9	260/10.2	1040/40.9	75/2.9	1.8/3.9	AAAB6511
	3 joints		640/25.2			1680/66.1		2.4/5.3	AAAB6541

* Please make sure to place an order at least one bracket with AH series. * FDA establishment registered company. FDA listed products.

Accessories & Options



Cat. No.	Description	Dimension (WxDxH, mm / inch)
AAAB6221	Dome hood (polypropylene, white)	400x140 / 15.7x5.5 (ØxH, mm/inch)
AAAB6211	Dome hood (styrene butadiene copolymer, transparent)	
AAAB6241	Square hood (polypropylene, white)	494x390x245 / 19.4x15.4x9.6
AAAB6231	Square hood (styrene butadiene copolymer, transparent)	
AAAB5011	Bench top fume hood (PMH-720) ¹⁾	720x450x560 / 28.3x17.7x22
AAAB6411	Bracket for bench top fume hood	178x178x2 / 7x7x0.1

1) see page 66 for detailed information of bench top fume hood.

Cat. No.	Description	
	Type	Dimension (WxDxH, mm / inch)
AAAB6508	Ceiling bracket	260x260x2 / 10.2x10.2x0.1
AAAB6512	Ceiling column (extra side connection hole for Ø 75mm ventilation duct)	100x100x250 / 3.9x3.9x9.8
AAAB6513		100x100x500 / 3.9x3.9x19.7
AAAB6514		100x100x750 / 3.9x3.9x29.5
AAAB6515		100x100x1000 / 3.9x3.9x39.4
AAAB6516		100x100x1250 / 3.9x3.9x49.2
AAAB6517		100x100x1500 / 3.9x3.9x59.1
AAAB6510	Wall	158x259x81.7 / 6.2x10.2x3.2

* All the brackets listed above are suitable for Ø 75mm arms.
Exceptively ceiling column brackets are suitable for Ø 50/75/100mm arms.

Bench Top Fume hood

Ideal for use in limited laboratory spaces.

Cost-effective, fully portable alternative to metal hoods.



PMH-720

Information of accessories

In case of using bench top fume hood with extraction arm hood (MAH or AH), at least one bracket is required to order.



Cat.No.	Description	Dimension (WxDxH, mm / inch)
AAAB6411	Bracket for bench top fume hood	178x178x2 / 7x7x0.1

Features

- Compact design for easy moving and space saving.
- Transparent polycarbonate front door for observation.
- The door opens to five positions for comfort and convenience.
- One-piece molded design for leak-tight and exceptional durability.
- Chemical resistance and spark-less polyethylene.
- An exhaust motor is required. The unit can be connected to an in-house laboratory exhaust system. Either 150mm (6") dia flexible duct can be used.
- Rounded inner corners for continuous air flow and easy cleaning.



※ Bracket and extraction arm hood are optional purchase.

※ see page 64-65 for detailed information of extraction arm hood (MAH or AH).

Model		PMH-720
Permissible air velocity (m/s, fpm)		0.3 to 1 / 59.1 to 196.9
Permissible Environmental Condition		Temperature 2℃ to 60℃ Maximum relative humidity 80% Maximum altitude up to 2,000m
Material	Main body	Polyethylene
	Window	Polycarbonate
Dimension	Exterior (WxDxH, mm/inch)	720x450x560 / 28.3x17.7x22
	Entrance (WxD, mm/inch)	560x300 / 22x11.8
	Duct hole (O.D., mm/inch)	150 / 6
	Net weight (kg / lbs)	7 / 15.4
Cat. No.		AAAB5011

※ FDA establishment registered company. FDA listed products.



Performance

- ISO class 4 (US class 10) HEPA filter for optimal protection against cross-contamination.
(average life span of HEPA filter: 3 years – it depends on the test room conditions)
- High-quality polyester fiber pre-filter (with minimal pressure loss and 85% arrestant on the A.F.I. test) for trapping larger particles and increasing the life of the main HEPA filter.
- Effective sterilization using a long-life 254 nm UV lamp.
(average life span of UV lamp: 8,000 hours)
- Built in anti-glare fluorescent lamp minimizes shadows and relieves eye strain.

Convenience

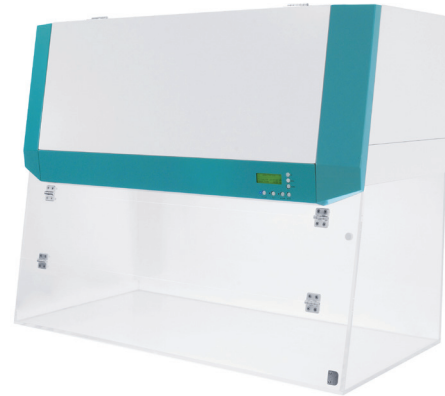
- User-friendly microprocessor-based control panel.
- Large capacity blower and easy blower speed adjustment by the control panel.
- Easy-settable digital timer for UV light exposure to deactivate DNA and RNA contaminants. (wait off, max. 30min.)
- Comfortable front access to cartridge type of filters for easy replacement.

Safety

- Interlocking safety door system shuts off UV light automatically when opening the door.
- UV-blocking door and side panels made of transparent acrylic resin provides clear inside view.
- UV over-exposure alarm and over-current protection.

Specially designed to minimize the sample contamination during PCR

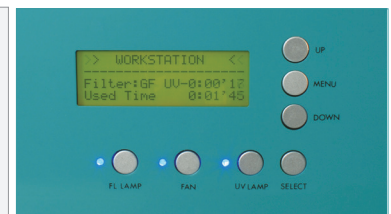
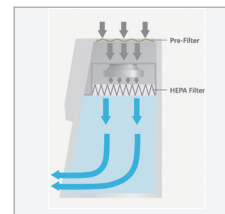
applications by combining ISO class 4 (US class 10) clean air environment.



PW-11

Standard accessories
see page 69

- HEPA filter
- Pre filter
- UV lamp
- Fluorescent lamp



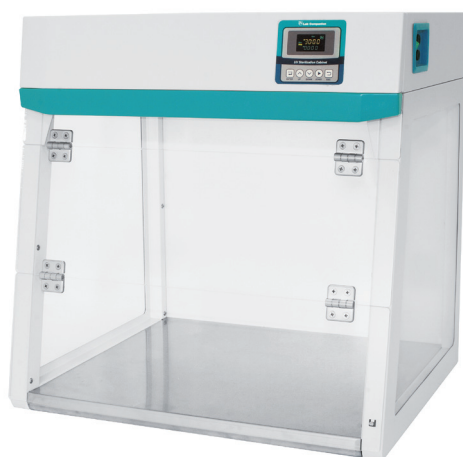
Model			PW-01		PW-11		PW-21			
Air flow type			Vertical							
Max. air volume (cmh / cfm)			557 / 327		697 / 408		929 / 546			
Min. air volume (cmh / cfm)			167 / 97		209 / 121		279 / 162			
Laminar airflow velocity (m / s / fpm)			0.3 / 60							
Filter	Air cleanliness		ISO 14644-1 class 4							
	HEPA filter		Typical efficiency of 99.99% at 0.3 μm US MIL-STD-282 ; Micro glass fiber media, Particle board, Aluminum separator, Neoprene gaskets							
	Pre filter		Polyester fibers with an efficiency of 85% (A-F-I TEST); AL frame, Polyester fiber media							
Noise level (dBA)			Typically < 60 dBA at blower speed							
Material	Work surface		10mm thick acrylic resin (clear type)							
	Window (front, side / back)		8mm / 10mm thick acrylic resin (clear type)							
Illumination	Intensity	Fluorescent lamp (lux)	>1000							
		UV density (μW / cm ²)	165		185		330			
	Capacity	Fluorescent lamp (w)	15 × 1ea		20 × 1ea		30 × 1ea			
		UV lamp (w)	15 × 1ea		20 × 1ea		30 × 1ea			
Dimension (WxDxH)	Interior (mm / inch)		700×585×602 / 27.5×23×23.7		880×585×602 / 34.6×23×23.7		1180×585×602 / 46.5×23×23.7			
	Exterior (mm / inch)		720×605×964 / 28×24×38		900×605×964 / 35.4×24×38		1200×605×964 / 47.2×24×38			
	Net weight (Body) (kg / lbs)		56.2 / 123.9		64.2 / 141.5		77.8 / 171.5			
Electrical requirements (230V)			60Hz, 1.3A		50Hz, 1.3A		60Hz, 1.4A		50Hz, 1.4A	
Cat. No.			AAHB3001K		AAHB3002K		AAHB3011K		AAHB3012K	
Electrical requirements (120V)			60Hz, 2.2A		60Hz, 2.7A		60Hz, 1.5A		50Hz, 1.5A	
Cat. No.			AAHB3003U		AAHB3013U		AAHB3021K		AAHB3022K	
			AAHB3003U		AAHB3013U		AAHB3023U			

* FDA establishment registered company. FDA listed products.

UV Sterilization Cabinets



Ideal for effective decontamination of apparatus before carrying out PCR experiments using a high-quality UV lamp with timer control.



UVC-11

Standard accessories see page 69

- UV lamp
- Fluorescent lamp



Performance

- Effective sterilization using a long-life 254 nm UV lamp. (average life span of UV lamp: 8,000 hours)
- Built in anti-glare fluorescent lamp minimizes shadows and relieves eye strain.

Convenience

- User-friendly microprocessor-based control panel.
- Digital UV light timer for convenient use.
- Easy-settable digital timer for UV light exposure to deactivate DNA and RNA contaminants. (wait off, max. 30min.)
- Easy-to-clean grade 304 stainless steel work surface with high chemical resistance against various organic solvents.

Safety

- Interlocking safety door system shuts off UV light automatically when opening the door.
- UV-blocking door and side panels made of transparent acrylic resin provides clear inside view.
- UV over-exposure alarm and over-current protection.

Model		UVC-01		UVC-11		UVC-21		
Illumination	Intensity	Fluorescent lamp (Lux)	>800	>900	>1000			
		UV density ($\mu W / cm^2$)	300 \pm 10%	350 \pm 10%	300 \pm 20%			
	Capacity	Fluorescent lamp (W)	8×1ea	15×1ea	20×1ea			
		UV lamp (254nm, W)	8×1ea	15×1ea	20×1ea			
Material	Work surface		Stainless steel grade 304					
	Window (front, back / side)		5 mm thick acrylic resin					
Dimension (W×D×H)	Interior (mm / inch)		433×500×468 / 17.0×19.7×18.4	583×500×468 / 23×19.7×18.4		880×500×468 / 34.6×19.7×18.4		
	Exterior (mm / inch)		450×509×610 / 17.7×20×24	600×509×610 / 23.6×20×24		900×509×610 / 35.4×20×24		
	Net weight (kg / lbs)		15 / 33.1	17.5 / 38.6		20 / 44.1		
Electrical requirements (230V)			60Hz, 0.1A	50Hz, 0.1A	60Hz, 0.2A	50Hz, 0.2A	60Hz, 0.3A	50Hz, 0.3A
Cat. No.			AAHB4001K	AAHB4002K	AAHB4011K	AAHB4012K	AAHB4021K	AAHB4022K
Electrical requirements (120V)			60Hz, 0.2A		60Hz, 0.4A		60Hz, 0.6A	
Cat. No.			AAHB4003U		AAHB4013U		AAHB4023U	

* FDA establishment registered company. FDA listed products.

for PCR workstaions / UV sterilization cabinets

General UV dose and time required

Pathogen	Average UV dose required ($\mu\text{W} \cdot \text{s}/\text{cm}^2$)	Average UV time required ($\mu\text{W}/\text{cm}^2/\text{sec.}$)					
		PW-01	UVC-01	PW-11	UVC-11	PW-21	UVC-21
		165	150	185	385	330	450
S. enteritidis	4,000	25	27	22	10	13	9
B. megatherium sp. (spores)	2,730	17	18	15	7	9	6
B. subtilis	7,100	43	47	39	18	22	16
Eberthella typhosa	2,140	13	14	12	6	7	5
Escherichia coli (E. coli)	3,000	19	20	17	8	10	7
Micrococcus candidus	6,050	37	40	33	16	19	13
Proteus vulgaris	2,640	16	18	15	7	8	6
Pseudomonas aeruginosa	5,500	34	37	30	14	17	12
Pseudomonas aeruginosa	3,500	22	23	19	9	11	8
S. typhimurium	8,000	49	53	44	21	25	18
Shigella paradysenteriae	1,680	101	11	10	4	6	4
Spirillum rubrum	4,400	27	29	24	11	14	10
Staphylococcus albus	1,840	12	12	10	5	6	4

* Above listed applications are for general purpose use.



HEPA filter (for PW)



Fluorescent lamp



UV lamp

for PCR workstations

Cat. No.	Description	PW-01	PW-11	PW-21
EDA9219	HEPA filter	•	-	-
EDA9220		-	•	-
EDA9221		-	-	•
CHE4436	Fluorescent lamp	•	-	-
CHE4410		-	•	-
CHE4409		-	-	•
CHE4431	UV lamp	•	-	-
CHE4427		-	•	-
CHE4423		-	-	•

for UV sterilization cabinets

Cat. No.	Description	UVC-01	UVC-11	UVC-21
CHE4435	Fluorescent lamp	•	-	-
CHE4436		-	•	-
CHE4410		-	-	•
CHE4434	UV lamp	•	-	-
CHE4431		-	•	-
CHE4427		-	-	•

Incubators

Incubators

Low Temperature Incubators

Incubated Shakers

Mini Incubators

Hybridization Oven

» General Applications

Incubators & Low Temp. Incubators

Antibody testing, Clinical science,
Hematological testing, Microbiological
determinations, Microorganism, Organism
germs for life science, Organism pharmacy,
Tissue culturing.

Incubated Shakers

Molecular biology, Plant and animal cells culture,
Fermentation, Hybridization studies,
Genetic research and drug discovery protocols.



Product Name		Incubators (General Model)	Incubators (Economy Model)	Incubators (2/4-Chamber Model)
Model		IB-G	IB-E	IB-G-C
Description		Natural convection (air-Jacket)	Natural convection, Film type heater	Forced convection, Multi chambers
Chamber volume (L)		60, 102, 151	65, 150, 205	60 x 2 Chambers, 60 x 4 Chambers
Temp. control	Temp. range (°C/°F)	Amb. +5 to 70 / Amb. +9 to 158	Amb. +3 to 60 / Amb. +5.4 to 140	Amb. +5 to 70 / Amb. +9 to 158
	Temp. fluctuation (±°C/°F)	0.1, 0.2 at 37°C / 0.18, 0.36 at 98.6°F	0.2, 0.3, 0.1 at 37°C / 0.36, 0.54, 0.18 at 98.6°F	0.1 at 37°C / 0.18 at 98.6°F
	Temp. variation (±°C/°F)	0.6, 0.2 at 37°C / 1.08, 0.36 at 98.6°F	0.6, 0.8, 1.1 at 37°C / 1.08, 1.44, 1.98 at 98.6°F	0.6 at 37°C / 1.08 at 98.6°F
Control	Timer	Wait on /off	Wait on /off	Wait on /off
	Auto-tuning	0	0	0
	Program function	-	-	-
	Adjustable fan speed	-	-	-
	Computer interface	RS-232 port	-	-
Safety	Over temp. limit	0	0	0
	Door open alarm	0	0	0
	Over current limit	0	0	0
	Auto-run (power failure)	0	0	0

Product Name		Incubated Shaker (Benchtop Model)	Incubated Shaker (Floor Standing Model)	Incubated Shaker (Chamber Model)
Model		IST / IST-R	ISF / ISF-R	ISS / ISS-R
Platform size (WxD, mm)		350x350, 450x450	755x520	350x350, 450x450
Chamber volume (L)		53, 83	270	80, 150
Temp. control	Temp. range (°C/°F)	IST; Amb. +5 to 80 / Amb. +9 to 176 IST-R; Amb. -15 (min. +15) to 80 / Amb. -27 (min. +27) to 176	ISF; Amb. +5 to 80 / Amb. +9 to 176 ISF-R; Amb. -20 (min. +4) to 80 / Amb. -36 (min. +72) to 176	ISS; Amb. +5 to 80 / Amb. +9 to 176 ISS-R; Amb. -20 (min. +4) to 80 / Amb. -36 (min. +72) to 176
	Temp. fluctuation (±°C/°F)	0.1 / 0.18	0.1 / 0.18	0.1 / 0.18
	Temp. variation (±°C/°F)	0.5 / 0.90	0.5 / 0.90	0.5 / 0.90
RPM control	Motion	Orbital	Orbital	Orbital
	Diameter (mm)	19.1	25.4, 50.8	19.1
	Speed range (rpm)	20 to 500	30 to 500 ¹⁾	20 to 500 (stackable : 250)
Control	PID feedback control	0	0	0
	Timer	Wait off	Wait off	Wait off
	Auto-tuning	0	0	0
	Computer interface	RS-232 port, USB port	RS-232 port, USB port	RS-232 port, USB port
Safety	Over temp. limit	0	0	0
	Door open alarm	0	0	0
	Over current limit	0	0	0
	Auto-run (power failure)	0	0	0
	Temp / Shaking deviation limit	0	0	0
	Best effort run	0	0	0

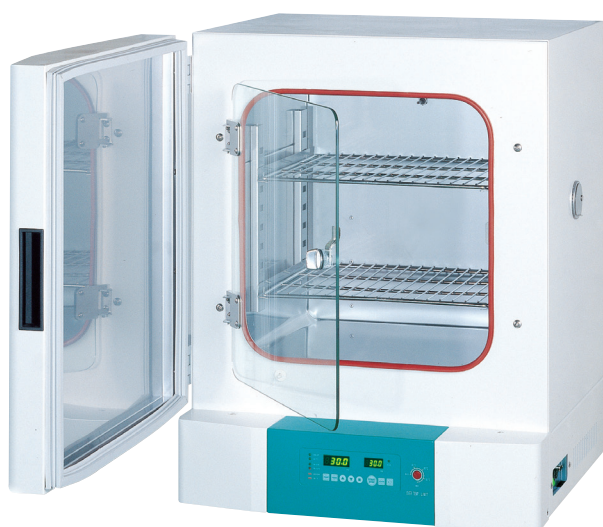
1) Max. rpm is dependable by amplitude size.

Low Temp. Incubators (Forced Convection Model)	Low Temp. Incubators (Air-jacketed Model)	Low Temp. Incubators (Personal Model)	Low Temp. Incubators (2/4-Chamber Model)	Mini Incubator	Hybridization Oven
IL	IL -A	ILP	IL-C	IM	HO
Forced convection	Natural convection (air-Jacket)	Forced convection, Peltier technology	Forced convection, Multi chambers	Forced convection	Forced convection, Rocking shaking
150, 244	162, 254	14, 48	150 x 2 chambers, 150 x 4 chambers	10	10
0 to 60 / 32 to 140	4 to 60 / 39.2 to 140	+10 to 40 at ambient temperature of 25°C	0 to 60 / 32 to 140	Amb. +5 to 65 / Amb. +9 to 140	Amb. +5 to 65 / Amb. +9 to 140
0.1 at 25°C / 0.18 at 77°F	0.2 at 25°C / 0.36 at 77°F	0.1 at 25°C / 0.18 at 77°F	0.1 at 25°C / 0.18 at 77°F	0.5 at 37°C / 0.9 at 98.6°F	0.5 at 50°C, 9rpm / 0.9 at 122°F. 9rpm
0.5 at 25°C / 0.9 at 77°F	0.5 at 25°C / 0.9 at 77°F	0.5 at 25°C / 0.9 at 77°F	0.5 at 25°C / 0.9 at 77°F	0.5 at 37°C / 0.9 at 98.6°F	0.5 at 50°C, 9rpm / 0.9 at 122°F. 9rpm
Wait on /off	Wait on /off	Wait on /off	Wait on /off	-	-
0	0	0	0	-	-
0	0	0	0	-	0
0	0	0	0	-	-
RS-232 port	RS-232 port	RS-232 port	-	-	-
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	-	-

Incubators (General)



Versatile air-jacketed natural convection incubators.



IB-05G

Standard accessories

- Wire shelves (2ea)

Optional accessories

see page 88

- Perforated shelves
- Stacking kits for stackable chambers

Performance

- Temperature range from ambient +5°C to 70°C.
- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Vibration-free design ideal for yeast cultivation.
 - Air-jacked natural convection is beneficial for Uniform temperature distribution and minimal sample contamination caused by external air intrusion.
- Durable incoloy heating element with radiator fans for efficient heat dissipation.

Convenience

- Intuitive control panel with bright LED display. (0.1°C resolution)
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Convenient preset function for 3 most commonly used temperature settings.
- Convenient sample monitoring without affecting chamber temperature via the inner tempered-glass door.
- Rounded inner chamber corners for easy cleaning and optimal airflow.
- Fully insulated dual-wall door with magnetic rubber gasket.
- Built-in cable port to use other instruments inside the chamber. (diameter: 38mm, provided silicon or rubber cap)
- RS-232 interface for external control and data collection.
- Stackable up to 2 units using the optional stacking kit. (optional)

Safety

- Automatic run after power interruption.
- Keypad lock function prevents accidental changes during operation.
- Over-temperature and over-current protection.
- Audible and visible open door alarms.

Model		IB-05G	IB-15G	IB-25G
Chamber volume (L / cu ft)		60 / 2.1	102 / 3.6	151 / 5.3
Temperature	Range (°C / °F)	Amb. +5 to 70 / Amb. +9 to 158		
	Fluctuation ¹⁾ at 37°C (±°C / °F)	0.1 / 0.18	0.1 / 0.18	0.2 / 0.36
	Variation ¹⁾ at 37°C (±°C / °F)	0.6 / 1.08	0.2 / 0.36	0.6 / 1.08
Dimension (WxDxH)	Interior (mm / inch)	400×360×420 / 15.7×14.2×16.5	480×410×520 / 18.9×16.1×20.5	610×460×540 / 24×18×21.3
	Exterior (mm / inch)	595×555×745 / 23×22×29	675×605×855 / 27×24×34	805×655×885 / 32×26×35
	Net weight (Kg / lbs)	45 / 99	55 / 121	62 / 136
Electrical requirements (230V, 50 / 60Hz)		1.3A	2.2A	3.1A
Cat. No.		AAH21162K	AAH21172K	AAH21182K
Electrical requirements (120V, 50 / 60Hz)		2.8A	4.6A	6.4A
Cat. No.		AAH21166U	AAH21176U	AAH21186U

¹⁾ Technical data according to DIN 12880.

* FDA establishment registered company. FDA listed products.



Performance

- Temperature range from ambient +3°C to 60°C.
- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Vibration-free design ideal for yeast cultivation.
 - Free from noise, vibration, and mechanical troubles by film type heating method.

Convenience

- Intuitive control panel with bright LED display. (0.1°C resolution)
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Convenient preset function for 3 most commonly used temperature settings.
- Convenient sample monitoring without affecting chamber temperature via the inner tempered-glass door.
- Rounded inner chamber corners for easy cleaning and optimal airflow.
- Stackable up to 2 units using the optional stacking kit. (optional)

Safety

- Automatic run after power interruption.
- Keypad lock function prevents accidental changes during operation.
- Over-temperature and over-current protection.
- Audible and visible open door alarms.

Affordable yet exceptionally reliable incubators featuring film type heaters.



IB-01E

Standard accessories

- Wire shelves (2ea)

Optional accessories

see page 88

- Perforated shelves
- Stacking kits for stackable chambers

Model		IB-01E	IB-11E	IB-21E
Chamber volume (L / cu ft)		65 / 2.3	150 / 5.3	205 / 7.2
Temperature	Range (°C / °F)	Amb. +3 to 60 / Amb. +5.4 to 140		
	Fluctuation ¹⁾ at 37°C (±°C / °F)	0.2 / 0.36	0.3 / 0.54	0.1 / 0.18
	Variation ¹⁾ at 37°C (±°C / °F)	0.6 / 1.08	0.8 / 1.44	1.1 / 1.98
Dimension (W×D×H)	Interior (mm / inch)	423×355×445 / 16.7×14×17.5	500×515×585 / 19.7×20.3×23	632×515×630 / 24.9×20.3×24.8
	Exterior (mm / inch)	533×475×725 / 21×18.7×28.5	595×630×865 / 23.5×24.8×34	740×630×910 / 29.1×24.8×35.8
	Net weight (Kg / lbs)	33 / 72.8	47 / 103.6	57 / 125.7
Electrical requirements (230V, 50 / 60Hz)		1.1A	2.2A	2.4A
Cat. No.		AAH26015K	AAH26025K	AAH26035K
Electrical requirements (120V, 50 / 60Hz)		2.1A	4.2A	4.6A
Cat. No.		AAH26016U	AAH26026U	AAH26036U

¹⁾ Technical data according to DIN 12880.

* FDA establishment registered company. FDA listed products.

Incubators (2 / 4-Chamber)



Suitable for conducting independent experiment in two or four chamber incubators.



IB-02G-4C

Standard accessories • Wire shelves (2ea per chamber)

Optional accessories • Perforated shelves
see page 88

Performance

- Temperature range from ambient +5 °C to 70 °C.
- Independent temperature and timer control of each chamber using microprocessor PID.
- Temperature calibration.
- Automatic tuning.
- Forced air convection generated by a noiseless and powerful sirocco fan ensuring optimal air circulation, temperature uniformity.

Convenience

- Two or four independently controlled 60L chambers merged into a single unit for space saving.
- Intuitive control panel with bright LED display. (0.1 °C resolution)
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Three most commonly used temperature settings programmable.
- Corrosion-resistant incoloy sheath heating element and stainless steel interior.
- Rounded inner chamber corners for easy cleaning and optimal airflow.
- Built-in cable port to use other instruments inside the chamber.
- Built-in casters for easy transport and installation.

Safety

- Automatic run after power interruption.
- Keypad lock function prevents accidental changes during operation.
- Over-temperature and over-current protection.
- Audible and visible open door alarms.

Model		IB-02G-2C	IB-02G-4C
Chamber volume (L / cu ft)		60 / 2.1 x 2 chambers	60 / 2.1 x 4 chambers
Temperature	Range (°C / °F)	Amb. +5 to 70 / Amb. +9 to 158	
	Fluctuation ¹⁾ at 37 °C (± °C / °F)	0.1 / 0.18	
	Variation ¹⁾ at 37 °C (± °C / °F)	0.6 / 1.08	
Dimension (WxDxH)	Interior (mm / inch)	400×360×420 / 15.7×14.2×16.5 x 2 chambers	400×360×420 / 15.7×14.2×16.5 x 4 chambers
	Exterior (mm / inch)	570×640×1360 / 22.4×25.2×53.5	1170×640×1360 / 46.1×25.2×53.5
	Net weight (Kg / lbs)	110 / 242.5	168 / 370.4
Electrical requirements (230V, 50 / 60Hz)		4.1A	4.1A x 2EA
Cat. No.		AAH2A115K	AAH2A015K
Electrical requirements (120V, 50 / 60Hz)		7.5A	7.5A x 2EA
Cat. No.		AAH2A116U	AAH2A016U

¹⁾ Technical data according to DIN 12880.

* FDA establishment registered company. FDA listed products.



Performance

- Temperature range from 0°C to 60°C.
- Silent cooling system reduces water evaporation within the chamber.
- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Adjustable three-step fan speed with defrosting time and period control.
- Forced air convection using an optimal cross flow fan for chamber temperature uniformity.

Convenience

- Large chamber volume: maximum 244L.
- Intuitive control panel with bright LED display. (0.1 °C resolution)
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Convenient preset function for 3 most commonly used temperature settings.
- Up to 9 temperature steps and maximum 200 cycles of repetition programmable for each profile.
- Built-in electrical outlet with a safety cover inside the chamber.
- Convenient sample monitoring without affecting chamber temperature via the inner tempered-glass door.
- Rounded inner chamber corners for easy cleaning and optimal airflow.
- RS-232 interface for external control and data collection.

Safety

- Automatic run after power interruption.
- Keypad lock function prevents accidental changes during operation.
- Over-temperature and over-current protection.
- Audible and visible open door alarms.

Superb low temperature incubation by noiseless compressor cooling system.



IL-21

Standard accessories

- Wire shelves (2ea for IL-11, 3ea for IL-21)

Optional accessories

- Perforated shelves

see page 88

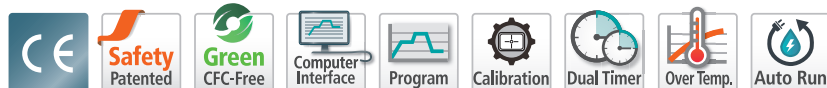
Model		IL-11		IL-21	
Chamber volume (L / cu ft)		150 / 5.32		244 / 8.6	
Refrigerator (Hp)		1 / 8 HBP		1 / 6 HBP	
Temperature	Range (°C / °F)	0 to 60 / +32 to 140			
	Fluctuation ¹⁾ at 25°C (±°C / °F)	0.1 / 0.18			
	Variation ¹⁾ at 25°C (±°C / °F)	0.5 / 0.9		0.4 / 0.72	
Dimension (W×D×H)	Interior (mm / inch)	600×500×500 / 24×20×20		500×520×940 / 20×20.5×37	
	Exterior (mm / inch)	735×742×1010 / 28.9×29×40		635×740×1630 / 25×29×64	
	Net weight (Kg / lbs)	100 / 220		135 / 297	
Electrical requirements (230V)		60Hz, 4.5A	50Hz, 4.5A	60Hz, 6.4A	50Hz, 6.4A
Cat. No.		AAH22041K	AAH22042K	AAH22051K	AAH22052K
Electrical requirements (120V)		60Hz, 8.3A		60Hz, 10.6A	
Cat. No.		AAH22046U		AAH22056U	

1) Technical data according to DIN 12880.

* Temperature change may occur during automatic defrost.

* FDA establishment registered company. FDA listed products.

Low Temp. Incubators (Air-jacketed)



Specially designed for optimal temperature control as well as minimal sample contamination caused by external air intrusion.



IL-11A

Standard accessories • Wire shelves (2ea for IL-11A, 3ea for IL-21A)

Optional accessories • Perforated shelves
see page 88

Performance

- Temperature range from 4°C to 60°C.
- Microprocessor PID control /Temperature calibration / Automatic tuning.
- Natural convection within the chamber induced by the heater and the fan located inside the air jacket.
- Adjustable three-step fan speed with defrosting time and period control.

Convenience

- Large chamber volume: maximum 254L.
- Intuitive control panel with bright LED display. (0.1 °C resolution)
- Dual delayed on/off timer modes. (1 min. to 99 hr. 59 min.)
- Convenient preset function for 3 most commonly used temperature settings.
- Up to 9 temperature steps and maximum 200 cycles of repetition programmable for each profile.
- Built-in electrical outlet with a safety cover inside the chamber.
- Convenient sample monitoring without affecting chamber temperature via the inner tempered-glass door.
- Rounded inner chamber corners for easy cleaning and optimal airflow.
- RS-232 interface for external control and data collection.

Safety

- Automatic run after power interruption.
- Keypad lock function prevents accidental changes during operation.
- Over-temperature and over-current protection.
- Audible and visible open door alarms.

Model		IL-11A		IL-21A	
Chamber volume (L / cu ft)		162 / 5.7		254 / 9	
Refrigerator (Hp)		1 / 6 HBP		1 / 4 HBP	
Temperature	Range (°C / °F)	+4 to 60 / +39.2 to 140			
	Fluctuation ¹⁾ at 25°C (±°C / °F)	0.2 / 0.36			
	Variation ¹⁾ at 25°C (±°C / °F)	0.5 / 0.9			
Dimension (W×D×H)	Interior (mm / inch)	600×540×500 / 24×21.3×20		500×540×940 / 20×21.3×37	
	Exterior (mm / inch)	770×772×1060 / 30×30×42		670×760×1680 / 26×30×66	
	Net weight (Kg / lbs)	108 / 238.1		145 / 319.7	
Electrical requirements (230V)		60Hz, 6.9A	50Hz, 6.9A	60Hz, 8.4A	50Hz, 8.4A
Cat. No.		AAH22061K	AAH22062K	AAH22071K	AAH22072K
Electrical requirements (120V)		60Hz, 10.2A		60Hz, 12.3A	
Cat. No.		AAH22063U		AAH22073U	

1) Technical data according to DIN 12880.

* Temperature change may occur during automatic defrost.

* FDA establishment registered company. FDA listed products.



Performance

- Temperature range from ambient +10 °C to 40 °C.
- Contrary to conventional compressor-cooled incubators, peltier cooling technology generates little vibration, noise, and heat.
- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Adjustable 3-step fan speed with defrosting time and period control.

Convenience

- Space-saving design allows even the smaller (14L) unit to hold two 1000mL Erlenmeyer flasks.
- Intuitive control panel with bright LED display. (0.1 °C resolution)
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Convenient preset function for 3 most commonly used temperature settings.
- Up to 9 temperature steps and maximum 200 cycles of repetition programmable for each profile.
- Convenient sample monitoring without affecting chamber temperature via the inner tempered-glass door.
- Environment-friendly insulation material (EPDM) used for safety and convenience. (compliant with ASTM-C534 specification)
- RS-232 interface for external control and data collection.

Safety

- Automatic run after power interruption.
- Keypad lock function prevents accidental changes during operation.
- Over-temperature and over-current protection.
- Audible and visible open door alarms.

Compact, stackable, energy-efficient, and yet exceptionally reliable low temperature incubators using peltier technology.



ILP-02
stackable unit

Standard accessories • Wire shelves (1ea for ILP-02, 2ea for ILP-12)

Optional accessories • Perforated shelves
see page 88

Model		ILP-02		ILP-12	
Chamber volume (L / cu ft)		14 / 0.5		48 / 1.7	
Temperature	Range (℃ / °F)	+10 to 40℃ (50~104°F) at ambient temperature of 25℃			
	Fluctuation ¹⁾ at 25℃ (±℃ / °F)	0.1 / 0.18			
	Variation ¹⁾ at 25℃ (±℃ / °F)	0.5 / 0.9		0.4 / 0.72	
Dimension (W×D×H)	Interior (mm / inch)	315×200×230 / 12.4×7.9×9.1		334×334×430 / 13.1×13.1×17	
	Exterior (mm / inch)	430×495×400 / 17×19.4×15.7		430×665×620 / 17×26.2×24.4	
	Net weight (Kg / lbs)	27.5 / 60.6		49 / 108	
Electrical requirements (230V)		60Hz, 1.8A	50Hz, 1.8A	60Hz, 3.5A	50Hz, 3.5A
Cat. No.		AAH24031K	AAH24032K	AAH24041K	AAH24042K
Electrical requirements (120V)		60Hz, 3.4A		60Hz, 6.7A	
Cat. No.		AAH24033U		AAH24043U	

1) Technical data according to DIN 12880.

* FDA establishment registered company. FDA listed products.

Two or four incubation chambers in a single unit.

Designed to offer an ideal and cost-effective solution for laboratories with limited space and budget.



IL-11-4C

Standard accessories • Wire shelves (2ea per chamber)

Optional accessories • Perforated shelves
see page 88



Performance

- Temperature range from 0 °C to 60 °C.
- Silent cooling system reduces water evaporation within the chamber.
- Microprocessor PID control.
- Temperature calibration.
- Automatic tuning.
- Adjustable 3-step fan speed with defrosting time and period control.

Convenience

- Intuitive control panel with bright LED display. (0.1 °C resolution)
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Convenient preset function for 3 most commonly used temperature settings.
- Up to 9 temperature steps and maximum 200 cycles of repetition programmable for each profile.
- Convenient sample monitoring without affecting chamber temperature via the inner tempered-glass door.
- Rounded inner chamber corners for easy cleaning and optimal airflow.
- Built-in casters for easy transport and installation.

Safety

- Automatic run after power interruption.
- Keypad lock function prevents accidental changes during operation.
- Over-temperature and over-current protection.
- Audible and visible open door alarms.

Efficient lab space use with multi-chamber incubator

- Designed to offer an ideal and cost-effective solution for laboratories with limited space and budget.
- Two or four 150L chambers merged into a single unit.
- Optimum model selection between two and four chamber unit according to application demand.
- Suitable for conducting each different experiment at once.
- Independent temperature and timer control of each chamber using microprocessor PID.



Model		IL-11-2C	IL-11-4C
Chamber volume (L / cu ft)		150 / 5.3 x 2 chambers	150 / 5.3 x 4 chambers
Refrigerator (Hp)		1/8 HBP x 2EA	1/8 HBP x 4EA
Temperature	Range (°C / °F)	0 to 60 °C / +32 to 140 °F	
	Fluctuation ¹⁾ at 25 °C (± °C / °F)	0.1 / 0.18	
	Variation ¹⁾ at 25 °C (± °C / °F)	0.5 / 0.9	
Dimension (WxDxH)	Interior (mm / inch)	600x500x500 / 23.6x19.7x19.7 x 2 chambers	600x500x500 / 23.6x19.7x19.7 x 4 chambers
	Exterior (mm / inch)	760x760x1690 / 29.9x29.9x66.1	1500x760x1690 / 59.1x29.9x66.1
	Net weight (Kg / lbs)	180 / 397	350 / 772
Electrical requirements (230V, 60Hz)		9A	9A x 2EA
Cat. No.		AAH28111K	AAH28011K
Electrical requirements (230V, 50Hz)		9A	9A x 2EA
Cat. No.		AAH28112K	AAH28012K
Electrical requirements (120V, 60Hz)		16.5A	16.5A x 2EA
Cat. No.		AAH28113U	AAH28013U

1) Technical data according to DIN 12880.

* Temperature change may occur during automatic defrost.

* FDA establishment registered company. FDA listed products.

Digital incubating/ refrigerating benchtop shakers.

Transparent lid offers great visibility and gas spring supports ensure hand-down handling of the samples by allowing immediate and easy access to your samples.



Gas spring lid



IST-3075 / IST-4075R

with optional dedicated platform and universal attachment

Optional accessories • Universal platforms, Rubber mats
see page 89-91 • Flask clamps, Funnel clamps, Test tube racks

* Above products design can be changed without prior notice.

Control display





Performance

- Temperature range:
 - Ambient +5°C to 80°C for IST-3075 / 4075.
 - Ambient -15°C (Min. +15) to 80°C for IST-3075R / 4075R.
- Competitive high shaking speed up to 500 rpm.
- Orbital shaking motion in 19mm diameter.
- Microprocessor PID control.
- Three point temperature calibration / Automatic tuning.
- Wide speed range even with heavy workload.
 - Equipped with a maintenance-free BLDC motor to generate smooth, quiet, uniform, and yet powerful shaking motion.
- Best effort run function intelligently manages its rpm to keep shaking even workload is out of its capacity.
 - Automatic shaking speed adjustment in case of excessive workload such as unbalanced load placement, unusual vibrations caused from unstable floor or external shock.
- Pleasant test environment by the smooth acceleration and deceleration control.
 - Smooth start and smooth stop function prevents chemical spills from flasks or test tubes.
- High-velocity fan ensures uniform temperature distribution and rapid thermal recovery after door open.
- Air-tight silicone door seal to provide excellent temperature uniformity.

Convenience

- Intuitive touch screen LCD controller with easy icons and logical menus.
- Easy-set digital timer for shaking operation.
(1 min. to 999 hr. 59 min.)
- Wide sample monitoring and convenient sample loading.
 - Convenient sample monitoring without affecting inside environment thanks to the three side transparent acrylic lid with bright LED lamps.
 - Gas spring lid supports providing smooth motion, soft opening and closing.
- Repetitive task can be easily performed as the platform stops where it starts.
 - Stopping the shaking platform always at the same position is highly beneficial for automated dosing or sampling process.
- Corrosion resistance stainless steel interior.
- Built-in RS-232 port and USB port for external control and data collection.

Safety

- Automatic run after power interruption.
- Temperature and shaking speed deviation alarm.
- Over-current protection, Stalled platform check.
- Mechanical over-temperature protection device.
- Environment-friendly CFC-free refrigerant. (for IST-3075R / 4075R)

Model		IST-3075		IST-3075R		IST-4075		IST-4075R	
Temperature	Range (°C / °F)	Amb. +5 to 80 / Amb. +9 to 176		Amb. -15 (Min. +15) to 80 / Amb. -27 (Min. +27) to 176		Amb. +5 to 80 / Amb. +9 to 176		Amb. -15 (Min. +15) to 80 / Amb. -27 (Min. +27) to 176	
	Fluctuation at 37°C in flask (±°C / °F)	0.1 / 0.18							
	Variation at 37°C in flask (±°C / °F)	0.5 / 0.90							
	Refrigerator (Hp)	-	1 / 6 HBP		-		1 / 6 HBP		
Shaking system	Motion type	Orbital							
	Amplitude size (mm / inch, dia.)	19.1 / 0.75							
	Speed range (RPM)	20 to 500							
	Accuracy	±1 % of set speed (≥100rpm) / ±1 (≤100rpm)							
	Timer	1 min. to 999 hr 59 min.							
	Max. load (kg / lbs)	10 / 22.0 at 500 rpm 15 / 33.1 at 400 rpm				14 / 30.9 at 500 rpm 21 / 46.3 at 400 rpm			
Dimension	Volume (L / cu ft)	53 / 1.9				83 / 2.9			
	Platform (WxD) (mm / inch)	350×350 / 13.8×13.8				450×450 / 17.7×17.7			
	Interior (WxDxH) (mm / inch)	410×410×320 / 16.1×16.1×12.6				510×510×320 / 20.1×20.1×12.6			
	Exterior (WxDxH) (mm / inch)	440×785×510 / 17.3×30.9×20.1				540× 890 x510 / 21.3×35×20.1			
	Net weight (Kg / lbs)	65 / 143.3		73 / 160.9		81 / 178.6		90 / 198.4	
Electrical requirements (230V)		60Hz, 4A		50Hz, 4A		60Hz, 5.5A		50Hz, 5.5A	
Cat. No.		AAH23411K	AAH23422K	AAH23511K	AAH23522K	AAH23611K	AAH23622K	AAH23711K	AAH23722K
Electrical requirements (120V)		60Hz, 7.5A		60Hz, 10.1A		60Hz, 7.5A		60Hz, 10.1A	
Cat. No.		AAH23465U		AAH23565U		AAH23665U		AAH23765U	

* FDA establishment registered company. FDA listed products.

Incubated Shakers (Floor Standing)

Large capacity up to five 6L flasks and heavy workload shaking with rapid heating and cooling performance.

Exclusive drive mechanism with ergonomic design delivers years of trouble-free service.

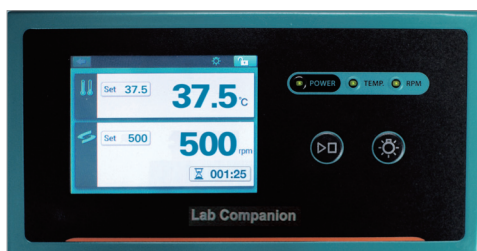


ISF-7100R

Optional accessories • Universal/Dedicated platforms
see page 89-91 • Spring wire racks, Microplate holders

※ Above products design can be changed without prior notice.

Control display



Com. ports & Temp. limiters





Performance

- Temperature range:
 - Ambient +5°C to 80 °C for ISF-7100 / 7200
 - Ambient -20°C (Min. +4) to 80°C for ISF-7100R / 7200R
- Competitive high shaking speed up to 500 rpm.
 - Speed range: 30 to 500 rpm.
- Orbital shaking motion in various diameter.
 - 25.4mm for ISF-7100/R
 - 50.8mm for ISF-7200/R
- Microprocessor PID control.
- Three point temperature calibration / Automatic tuning.
- Wide speed range even with heavy workload.
 - Ideal DD(Direct Drive) brushless motor and triple cam system support heavy load, quiet, maintenance free operation and deliver high torque at high speeds and smooth rotation.
- Best effort run function intelligently manages its rpm to keep shaking even workload is out of its capacity.
 - Automatic shaking speed adjustment in case of excessive workload such as unbalanced load placement, unusual vibrations caused from unstable floor or external shock.
- Pleasant test environment by the smooth acceleration and deceleration control.
 - Smooth start and smooth stop function prevents chemical spills from flasks or test tubes.
- High-velocity fan ensures uniform temperature distribution and rapid thermal recovery after door open.
- Air-tight silicone door seal with lockable door for safe storage of samples.

Convenience

- Intuitive touch screen LCD controller with easy icons and logical menus.

- Easy-set digital timer for shaking operation. (1 min. to 999 hr. 59 min.)
- Easy sample monitoring and convenient sample loading.
 - Clear observation of samples without affecting inner chamber's environment thanks to the transparent top viewing window with bright LED lamps.
 - The lid is inclined gently towards the front for easy observation of samples in the chamber.
 - Gas spring lid supports providing smooth motion, soft opening and closing.
- Repetitive task can be easily performed as the platform stops where it starts.
 - Stopping the shaking platform always at the same position is highly beneficial for automated dosing or sampling process.
- Corrosion resistance stainless steel interior.
- Easy-access drain system with a quick disconnect valve offers great convenience to clean up of spills.
- Built-in RS-232 port and USB port for external control and data collection.
- Sturdy foot caster, beneficial for easy mobility during installation or relocation.

Safety

- Automatic run after power interruption.
- Temperature and shaking speed deviation alarm.
- Over-current protection.
- Triple independent temperature monitor system.
 - Temperature deviation alarm (High/Low)
 - Electronic temperature limiter (High/Low)
 - Mechanical over-temperature limiter (High)
- Environment-friendly CFC-free refrigerant. (for ISF-7100R / 7200R)

Model		ISF-7100		ISF-7100R		ISF-7200		ISF-7200R					
Temperature	Range (°C / °F)	Amb. +5 to 80 / Amb. +9 to 176		Amb. -20 (Min. +4) to 80 / Amb. -36 (Min. +7.2) to 176		Amb. +5 to 80 / Amb. +9 to 176		Amb. -20 (Min. +4) to 80 / Amb. -36 (Min. +7.2) to 176					
	Fluctuation at 37°C in flask (±°C / °F)	0.1 / 0.18											
	Variation at 37°C in flask (±°C / °F)	0.5 / 0.90											
	Refrigerator (Hp)	-	1/6Hp		-		1/6Hp						
Shaking system	Motion type	Orbital											
	Amplitude size (mm / inch, dia.)	25.4 / 1				50.8 / 2							
	Speed range (rpm)	30 to 500				30 to 300							
	Accuracy	±1% of set speed (≥100rpm) / ±1 (≤100rpm)											
	Timer	1 min. to 999 hr 59 min.											
	Max. load (kg / lbs)	15 / 33.1 at 500 rpm 25 / 55.1 at 400 rpm 35 / 77.2 at 300 rpm				20 / 44.1 at 300 rpm 35 / 77.2 at 200 rpm							
Dimension	Volume (L / cu ft)	270 / 9.5											
	Platform (WxD) (mm / inch)	755×520 / 29.7×20.5											
	Interior (WxDxH) (mm / inch)	894×634×480 / 35.2×25×18.9											
	Exterior (WxDxH) (mm / inch)	1128×854×1035 / 44.4×33.6×40.8											
	Net weight (Kg / lbs)	277 / 610.7		287 / 632.7		277 / 610.7		287 / 632.7					
Electrical requirements (230V)		50 / 60Hz, 5A		60Hz, 7.2A		50Hz, 7.2A		50 / 60Hz, 5A		60Hz, 7.2A		50Hz, 7.2A	
Cat. No.		AAH23342K		AAH23542K		AAH23541K		AAH23442K		AAH23642K		AAH23641K	
Electrical requirements (120V)		60Hz, 9.5A		60Hz, 13.9A		60Hz, 9.5A		60Hz, 13.9A					
Cat. No.		AAH23375U		AAH23575U		AAH23475U		AAH23675U					

* Temp. change may occur during automatic defrost. (for ISF-7100R/7200R)

* FDA establishment registered company. FDA listed products.

Specially designed to be double-stacked on the floor or located on the lab benches for space saving.

Multi-purpose incubated shakers feature a wide range of temperature control and large chamber volume.



ISS-4075R / ISS-3075

with optional accessories

Standard accessories

- Wire shelves (2ea)

Optional accessories

see page 89-91

- Universal platforms, Universal attachments, Flask clamps
- Retractable foot caster, Stacking kits for stackable chambers

※ Above products design can be changed without prior notice.

Control display





Performance

- Temperature range:
 - Ambient +5°C to 80°C for ISS-3075 / 4075.
 - Ambient -20°C (Min. +4) to 80°C for ISS-3075R / 4075R.
- Competitive high shaking speed up to 500 rpm.
(Stackable up to 250rpm)
- Orbital shaking motion in 19.1mm diameter.
- Microprocessor PID control.
- Three point temperature calibration / Automatic tuning.
- Wide speed range even with heavy workload.
 - Equipped with a maintenance-free BLDC motor to generate smooth, quiet, uniform, and yet powerful shaking motion.
- Best effort run function intelligently manages its rpm to keep shaking even workload is out of its capacity.
 - Automatic shaking speed adjustment in case of excessive workload such as unbalanced load placement, unusual vibrations caused from unstable floor or external shock.
- Pleasant test environment by the smooth acceleration and deceleration control.
 - Smooth start and smooth stop function prevents chemical spills from flasks or test tubes.
- High-velocity fan ensures uniform temperature distribution and rapid thermal recovery after door open.
- Air-tight silicone door seal to provide excellent temperature uniformity.

Convenience

- Intuitive touch screen LCD controller with easy icons and logical menus.
- Easy-set digital timer for shaking operation. (1 min. to 999 hr. 59 min.)

- Wide sample monitoring.
 - Clear observation of samples without affecting inner chamber's environment thanks to the transparent viewing window with bright LED lamps.
- Repetitive task can be easily performed as the platform stops where it starts.
 - Stopping the shaking platform always at the same position is highly beneficial for automated dosing or sampling process.
- Two adjustable-height shelves provided allow static incubation or refrigeration, which increase storage capacity.
- Built-in electrical outlet with a safety cover inside the chamber.
- Corrosion resistance stainless steel interior.
- Easy-access drain system with a quick disconnect valve offers great convenience to clean up of spills.
- Built-in RS-232 port and USB port for external control and data collection.
- Retractable foot caster, beneficial for easy mobility during installation or relocation. (optional)
- Chambers stackable, up to two levels.

Safety

- Automatic run after power interruption.
- Temperature and shaking speed deviation alarm.
- Over-current protection, Stalled platform check.
- Triple independent temperature monitor system.
 - Temperature deviation alarm (High/Low)
 - Electronic temperature limiter (High/Low)
 - Mechanical over-temperature limiter (High)
- Environment-friendly CFC-free refrigerant. (for ISS-3075R / 4075R)

Model		ISS-3075		ISS-3075R		ISS-4075		ISS-4075R	
Temperature	Range (°C / °F)	Amb. +5 to 80 / Amb. +9 to 176		Amb. -20 (Min. +4) to 80 / Amb. -36 (Min. +72) to 176		Amb. +5 to 80 / Amb. +9 to 176		Amb. -20 (Min. +4) to 80 / Amb. -36 (Min. +72) to 176	
	Fluctuation at 37°C in flask (±°C / °F)	0.1 / 0.18							
	Variation at 37°C in flask (±°C / °F)	0.5 / 0.90							
	Refrigerator (Hp)	-	1/6Hp		-		1/6Hp		
Shaking system	Motion type	Orbital							
	Amplitude size (mm / inch, dia.)	19.1 / 0.75							
	Speed range (rpm)	20 to 500 (stackable : 20 to 250)							
	Accuracy	±1% of set speed (≥100rpm) / ≤1 (<100rpm)							
	Timer	1 min. to 999 hr 59 min.							
	Max. Load (kg / lbs)	10 / 22.0 at 500 rpm 15 / 33.1 at 400 rpm 15 / 33.1 at 250 rpm (stacked)				10 / 22.0 at 500 rpm 21 / 46.3 at 400 rpm 21 / 46.3 at 250 rpm (stacked)			
Dimension	Volume (L / cu ft)	80 / 2.8				150 / 5.3			
	Platform (WxD, mm / inch)	350×350 / 13.8×13.8				450×450 / 17.7×17.7			
	Interior (WxDxH, mm / inch)	440×440×418 / 17.3×17.3×16.5				540×540×518 / 21.3×21.3×20.4			
	Exterior (WxDxH, mm / inch)	578×815×854 / 22.8×32.1×33.6				678×895×934 / 26.7×35.2×36.8			
	Shelves (Standard / Max)	2 / 8				2 / 11			
	Net weight (kg / lbs)	153 / 337.3		160 / 352.7		183 / 403.4		190 / 418.9	
Electrical requirements (230V)		60Hz, 5.2A 50Hz, 5.2A		60Hz, 7A 50Hz, 7A		60Hz, 5.2A 50Hz, 5.2A		60Hz, 7.6A 50Hz, 7.6A	
Cat. No.		AAH23431K AAH23432K		AAH23531K AAH23532K		AAH23631K AAH23632K		AAH23731K AAH23732K	
Electrical requirements (120V)		60Hz, 9.9A		60Hz, 13.5A		60Hz, 9.9A		60Hz, 14.7A	
Cat. No.		AAH23415U		AAH23515U		AAH23615U		AAH23715U	

* Temp. change may occur during automatic defrost. (for ISS-3075R/4075R)

* FDA establishment registered company. FDA listed products.

Mini Incubator



Compact design for efficient lab space use.

Maximum 8 microplates can be inserted to inner chamber for ELISA.



Performance

- Temperature range from ambient +5 to 65 °C.
- Microprocessor PID feedback control of the heater and the fan ensuring temperature uniformity.
- Automatic temperature calibration.

Convenience

- Ease-of-operation provided by a bright VFD (vacuum fluorescent display), responsive touch buttons, and a jog dial.
- Wire shelves are provided for space saving of inner chamber. Maximum 4 wire shelves supporting 8 microplates is especially suitable for ELISA.
- Push buttons for easy opening of door.
- Transparent polycarbonate window providing a clear view of the chamber interior.
- Compact design for space saving of laboratory of the chamber interior.

Safety

- Open door alarm.
- Over-temperature protection, Over-current protection.

IM-10

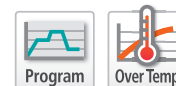
Standard accessories • Wire shelves (2ea)

Optional accessories • Perforated shelves
see page 88

Model		IM-10
Temperature	Range (°C / °F)	Amb. +5 to 65 / Amb. +9 to 149
	Fluctuation at 37 °C (±°C / °F)	0.5 / 0.9
	Variation at 37 °C (±°C / °F)	0.5 / 0.9
Dimension	Volume (L / cu ft)	10 / 0.4
	Wire shelf (WxD) (mm / inch)	247 x 247 / 9.7 x 9.7
	Interior (WxDxH) (mm / inch)	278 x 262 x 160 / 11 x 10.4 x 6.3
	Exterior (WxDxH) (mm / inch)	400 x 410 x 264 / 15.7 x 16.1 x 10.4
	Net weight (Kg / lbs)	12.8 / 28.2
Electrical requirements (230V, 50/60Hz)		1.0A
Cat. No.		AAH24315K
Electrical requirements (120V, 50Hz)		2.1A
Cat. No.		AAH24316U

1) Technical data according to DIN 12880.

* FDA establishment registered company. FDA listed products.



Performance

- Temperature range from ambient +5 to 65 °C
- Rocking motion: Tilt 8.5°.
- Speed range: 5 to 50 rpm.
- Microprocessor PID feedback control of the heater and the fan ensuring temperature uniformity.
- Automatic temperature calibration.

Convenience

- Ease-of-operation provided by a bright VFD, responsive touch buttons, and a jog dial.
- Memory function of programs allowing relevant parameters (such as temperature, rocking speed, time, etc.) of each program step to be stored.
 - Up to 10 program allowed for memory storage.
 - Up to 10 steps allowed for each program.
- Built-in sliding shelf for quick and convenient insertion or removal of samples.
- Sticky pad on sliding shelf for preventing accidental movement or spills of samples during operation.
- Drying function for the hybridization and washed membranes or strips.
- Transparent polycarbonate window providing a clear view of the chamber interior.
- Compact design for efficient lab space utilization.

Equipped with a precise rocker, this unit is offering ideal reproducibility for various molecular biology applications.



HO-10

Standard accessories • Water tray

Safety

- Audible and visual alarms are activated as:
 - Preset temperature limit is reached.
 - Each step of any programmed mode is terminated.
 - Low humidity level is detected by the sensor.
 - Door is open.
- Over-temperature protection, Over-current protection.

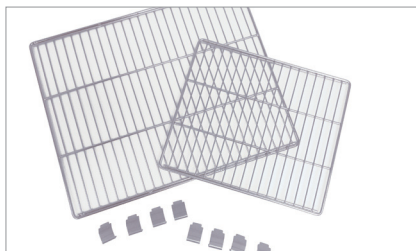
Model		HO-10
Temperature	Range (°C / °F)	Amb. +5 to 65 / Amb. +9 to 149
	Fluctuation at 50 °C, 9RPM (±°C / °F)	0.5 / 0.9
	Variation at 50 °C, 9RPM (±°C / °F)	0.5 / 0.9
Shaking system	Motion type	Rocking Motion
	Speed range (RPM)	5 to 50
	Tilt angle	8.5°±1
	Max. load (kg / lbs)	1 / 2.2
Dimension	Volume (L / cu ft)	10 / 0.4
	Sliding shelf (WxD) (mm / inch)	256 x 198 / 10.1 x 7.8
	Interior (WxDxH) (mm / inch)	278 x 262 x 160 / 11 x 10.4 x 6.3
	Exterior (WxDxH) (mm / inch)	400 x 410 x 264 / 15.7 x 16.1 x 10.4
	Net weight (Kg / lbs)	14 / 30.9
Electrical requirements (230V, 60Hz)		1.2A
Cat. No.		AAH1B011K
Electrical requirements (230V, 50Hz)		2.4A
Cat. No.		AAH1B012K

1) Technical data according to DIN 12880.

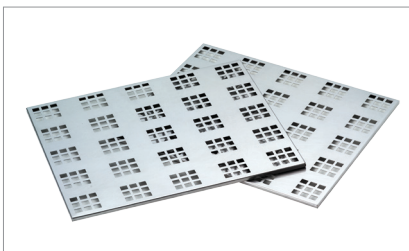
* FDA establishment registered company. FDA listed products.

Accessories & Options

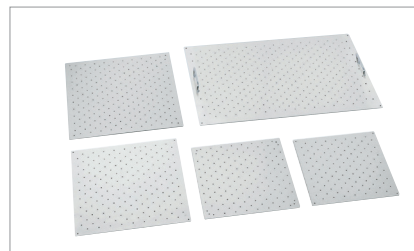
for Incubators



Wire shelves



Perforated shelves



Universal platforms

Wire shelves

Stainless steel and electro-polished shelves are readily removed without using tools for easy cleaning.

Cat. No.	Description			Suitable for
	Included	Maximum	WxL (mm / inch)	
EDA8136	2	7	366×316 / 14.4×12.4	IB-05G
EDA8135	2	11	446×366 / 17.6×14.4	IB-15G
EDA8137	2	11	576×419 / 22.7×16.5	IB-25G
EDA8136	2	10	366×316 / 14.4×12.4	IB-01E
EDA8220	2	13	466×490 / 17.6×19.3	IB-11E
EDA8219	2	14	566×466 / 22.3×17.6	IB-21E
EDA8136	4	14	366×316 / 14.4×12.4	IB-02G-2C
	8	28		IB-02G-4C
EDA8219	2	11	566×466 / 22.3×17.6	IL-11/11A
	4	22		IL-11-2C
	8	44		IL-11-4C
EDA8220	3	25	466×490 / 17.6×19.3	IL-21/21A
EDA8223	1	5	195×310 / 7.7×12.2	ILP-02
EDA8221	2	10	305×299 / 12×11.8	ILP-12
EDA8235	2	8	416×406 / 16.4×16.0	ISS-3075/R
EDA8233	2	11	516×506 / 20.3×19.9	ISS-4075/R
EDA8244	2	5	247×247 / 9.7×9.7	IM-10

Perforated shelves

Stainless steel shelves are readily removed without using tools for easy cleaning.

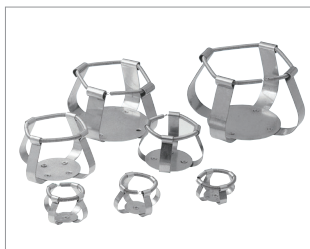
Cat. No.	Description		Suitable for
	Maximum	WxL (mm / inch)	
AAA12531	7	366×316 / 14.4×12.4	IB-05G
AAA12532	11	446×366 / 17.6×14.4	IB-15G
AAA12535	11	576×419 / 22.7×16.5	IB-25G
AAA12531	10	366×316 / 14.4×12.4	IB-01E
AAA22522	13	466×490 / 17.6×19.3	IB-11E
AAA22521	14	566×466 / 22.3×17.6	IB-21E
AAA12531	14	366×316 / 14.4×12.4	IB-02G-2C
	28		IB-02G-4C
AAA22521	11	566×466 / 22.3×17.6	IL-11/11A
	22		IL-11-2C
	44		IL-11-4C
AAA22522	25	466×490 / 17.6×19.3	IL-21/21A
AAA24501	5	195×310 / 7.7×12.2	ILP-02
AAA24502	10	305×299 / 12×11.8	ILP-12
AAA24511	5	247×247 / 9.7×9.7	IM-10

Stacking kits

Stackable up to 2 units using exclusive stacking kits for space saving.

Cat. No.	Description	Suitable for
AAA21521	Stacking kits for stackable chambers	IB-05G
AAA21522	Stacking kits for stackable chambers	IB-15G
AAA21523	Stacking kits for stackable chambers	IB-25G
AAA26501	Stacking kits for stackable chambers	IB-01E
AAA26502	Stacking kits for stackable chambers	IB-11E
AAA26503	Stacking kits for stackable chambers	IB-21E

for Incubated Shakers



Flask clamps



Plastic clamps (plastic)



Funnel clamps



Dedicated platforms

Universal platforms / Flask clamps / Funnel clamps

Universal platforms provide flexibility for mixing assortments of test tubes and glassware of varying sizes on a single platform. Various clamps for Erlenmeyer flasks and separatory funnels are available.

Description			IST-3075/R	IST-4075/R	ISF-7100/R ISF-7200/R	ISS-3075/R	ISS-4075/R
Cat. No.	Universal platform		AAA23501-V3	AAA23502-V3	AAA23503-V3	AAA23501-V3	AAA23502-V3
-	Flask clamps (Stainless steel)	Erlenmeyer flask size	Max. mountable flask clamps				
AAA23550		for 50 mL	36	49	88	36	49
AAA23551		for 100 mL	24	39	68	24	39
AAA23552		for 250 mL	14	20	39	14	24
AAA23556		for 300 mL	14	20	39	14	24
AAA23553		for 500 mL	9	16	28	9	16
AAA23554		for 1L	6	9	18	6	9
AAA23555		for 2L	4	5	11	4	6
AAA23557		for 2.8L	2	4	8	2	5
AAA23558		for 4L	-	-	6	-	4
AAA23559		for 6L	-	-	5	-	2
-	Flask clamps (plastic)	Erlenmeyer flask size	Max. mountable flask clamps				
AAA30570		for 50 mL	36	49	88	36	49
AAA30571		for 100 ~ 125 mL	19	29	48	19	29
AAA30572		for 200 mL	13	21	35	13	21
AAA30573		for 250 mL	13	19	35	13	19
AAA30574		for 300 mL	12	19	35	12	19
AAA30575		for 500 mL	9	12	24	9	12
AAA30576		for 1L	4	9	12	5	9
AAA30577		for 2L	2	4	8	4	5
-	Funnel clamps	separatory funnel size	Max. mountable funnel clamps				
AAA23562		for 250 mL	4	6	15	4	6
AAA23563		for 500 mL	2	4	10	3	4
AAA23564		for 1L	-	3	7	-	3
AAA23565		for 2L	-	-	5	-	-

※ Above accessories need to be mounted on a universal platform which is sold separately.

Dedicated platforms

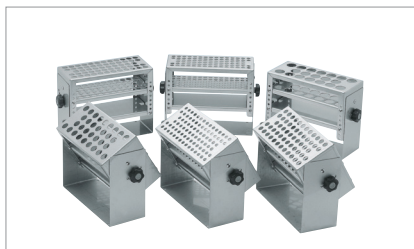
When using a single flask size only, the dedicated platforms with pre-installed clamps provide maximum capacity. 250mL and 500mL clamps are standard but other sizes can be available.

Description	IST-3075/R	IST-4075/R	ISF-7100/R ISF-7200/R	ISS-3075/R	ISS-4075/R
Universal platform & 250mL flask clamps	AAA23611-V1	AAA23623-V1	AAA23634	AAA23611-V1	AAA23623-V1
No. of flask clamps	14	20	39	14	20
Universal platform & 500mL flask clamps	AAA23612-V1	AAA23622-V1	AAA23635	AAA23612-V1	AAA23622-V1
No. of flask clamps	9	16	28	9	16

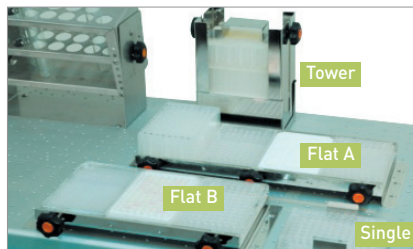
* A dedicated platform is sold with setting each max. mountable amount of flask clamps on.

Accessories & Options

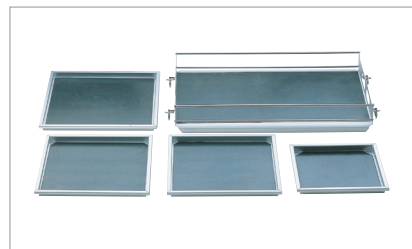
for Incubated Shakers



Test tube racks



Microplate holders



Rubber mats

Test tube racks

Easy to release and mount racks made of durable stainless steel with adjustable angle and tube height support. Test tube racks are used with an optional universal platform.

Description		IST-3075/R	IST-4075/R	ISF-7100/R ISF-7200/R	ISS-3075/R	ISS-4075/R
Cat.No.	Universal platform	AAA23501-V3	AAA23502-V3	AAA23053-V3	AAA31501-V3	AAA23502-V3
-	Test tube size	Mountable capacity of rack*				
AAA23581	for 86 test tubes, ø8mm / ø0.3"	2	4	7	2	4
AAA23582	for 86 test tubes, ø10mm / ø0.4"					
AAA23583	for 58 test tubes, ø12mm / ø0.5"					
AAA23584	for 58 test tubes, ø14mm / ø0.6"					
AAA23585	for 32 test tubes, ø17mm / ø0.7"					
AAA23586	for 19 test tubes, ø25mm / ø1.0"					
AAA23587	for 10 test tubes, ø30mm / ø1.2"					
AAA23594	for 10 test tubes, ø35mm / ø1.4"					
AAA23593	for 4 test tubes, ø50mm / ø1.9"					

* No declination

※ We can manufacture other size of test tube racks to meet your specific requirements. Contact us for details.

Microplate holders

Available in three styles: tower type, flat type (small and large), and single type. Tower type holder is for 10 standard or deep well plates. Large flat holder is for 4 standard or deep well plates. Small flat holder is for 3 standard or deep well plates. Single type holder is for 1 standard or deep well plate. (standard well plates' height: 14.7mm)

Description		IST-3075/R	IST-4075/R	ISF-7100/R ISF-7200/R	ISS-3075/R	ISS-4075/R
Cat.No.	Universal platform	AAA23501-V3	AAA23502-V3	AAA23053-V3	AAA31501-V3	AAA23502-V3
-	Microplate holder type	Max. mountable microplate holders				
AAA23654	Single	8	15	25	8	15
AAA23651	Tower	5	8	21	6	10
AAA23652	Flat A(large)	-	2	4	-	2
AAA23653	Flat B(small)	2	2	6	2	3

* Microplate holders need to be mounted on an universal platform which is sold separately.

Rubber mats

Designed for low-speed applications, non-skid rubber mats allow quick addition or removal of flasks, plates or tubes.

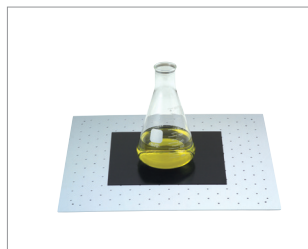
Description	IST-3075/R	IST-4075/R	ISF-7100/R ISF-7200/R	ISS-3075/R	ISS-4075/R
Cat. No.	AAA23531	AAA23532	AAA23534	AAA31531	AAA31532



Spring wire racks
(two tier rack with flexible crossed spring)



Universal attachments



Lab sticker



Retractable foot caster

Spring wire racks

Ideal for holding a wide variety of tubes, flasks, and other glassware. All components are made of stainless steel.

Description	IST-3075/R	IST-4075/R	ISF-7100/R ISF-7200/R	ISS-3075/R	ISS-4075/R
Cat. No.	AAA23521-V1	AAA23522-V2	AAA23514	AAA31521-V1	AAA31522-V1
-	Erlenmeyer flask size	Max. inserting flasks			
for 50 mL	16	25	45	16	25
for 100 mL	9	16	28	9	16
for 250 mL	4	9	18	4	9
for 300 mL	4	9	18	4	9
for 500 mL	4	5	15	4	5
for 1L	2	4	10	2	4
for 2L	1	2	6	1	2
for 2.8L	1	2	4	1	2

Universal attachments (utility carriers)

Several adjustable clamping bars for quickly securing a variety of glassware or tubes on non-skid rubber mats. Suitable for flat-bottomed flasks of various sizes.

Description	IST-3075/R	IST-4075/R	ISF-7100/R ISF-7200/R	ISS-3075/R	ISS-4075/R
Cat. No.	AAA23511-V1	AAA23512-V1	AAA23505	AAA23511-V1	AAA23512-V1

Lab sticker

An alternative method for securing vessels to a shaker platform. Ideal for containers such as bottles and dishes that cannot be held on the universal platform with conventional flask clamps. For safe operation, gradual RPM increase is recommended.

Cat. No.	Description (WxDxH) (mm / inch)
AAA30551	200×200×5 / 7.9×7.9×0.2

Retractable foot caster

Highly beneficial for easy mobility during installation or relocation.

Cat. No.	Description (WxDxH) (mm / inch)	Suitable for
AAA23801	700×733×145 / 27.6×28.9×5.7	ISS-3075 / 3075R
AAA23802	800×813×225 / 31.5×32×8.9	ISS-4075 / 4075R

Stacking kits

Stackable up to 2 units using exclusive stacking kits for space saving. (only for ISS)

Cat. No.	Description	Suitable for
AAA23811	Stacking kits for stackable chambers	ISS-3075 / 3075R
AAA23812	Stacking kits for stackable chambers	ISS-4075 / 4075R

Ovens

Forced Convection Ovens

Natural Convection Ovens

Vacuum Ovens



» General Applications

Forced Convection Ovens

General aging and curing, Agricultural genetic, Digestion of proteins and starches, General heating/drying, Stability and QC/Batch testing, Sterilization.

Natural Convection Ovens

Annealing, Drying of plant tissue, Drug metabolism, Fine chemical precipitation, General heating/ drying, Serum protein analysis, Sterilization.

Vacuum Ovens

Agricultural genetic, Annealing, Desiccating, Out-gassing solids and liquids, Vacuum embedding, Volatile resins and polymers testing.

Product Name		Forced Convection Ovens (Programmable Models)	Forced Convection Ovens (General Models)	Forced Convection Ovens (General Models, Large)	
Model		OF-P	OF-G	OF3-P, OF3-HP	OF3, OF3-H
Chamber volume (L)		60, 102, 151	60, 102, 151	314, 450, 760	314, 450, 760
Temp. control	Temp. range (°C/°F)	Amb. +10 to 250 / Amb. +18 to 482	Amb. +10 to 250 / Amb. +18 to 482	Amb. +10 to 200 / Amb.+18 to 392 (OF3-P / OF3), Amb. +10 to 300 / Amb.+18 to 572 (OF3-HP / OF3-H)	
	Temp. fluctuation at 100 °C (±°C/°F)	0.5, 0.6, 0.8 / 0.9, 1.08, 1.44	0.5, 0.6, 0.8 / 0.9, 1.08, 1.44	0.2 / 0.36	0.2 / 0.36
	Temp. variation at 100 °C (±°C/°F)	1, 1.3, 1.7 / 1.8, 2.3, 3.1	1, 1.3, 1.7 / 1.8, 2.3, 3.1	0.8, 1.5, 1.6 / 1.4, 2.7, 2.9	0.8, 1.5, 1.6 / 1.4, 2.7, 2.9
Control	Timer	Wait on/off	Wait on/off	Wait on/off	Wait on/off
	Auto-tuning	0	0	0	0
	Program function	0	-	0	-
	Computer interface	RS-232 port	RS-232 port	RS-232 port, USB port	RS-232 port, USB port
Safety	Over temp. limit	0	0	0	0
	Door open alarm	0	0	0	0
	Over current limit	0	0	0	0
	Auto-run (power failure)	0	0	0	0

» Technical Benefits

Performance

- Designed and tested in accordance with the international standard DIN 12880.
 - Increase in reliability of accurate temperature implementation and test results. (27 points measurement data)
- Microprocessor PID control for precise temperature control.
- Temperature calibration and auto-tuning functions for optimizing the unit to the various test environment.
- Intelligent program and scheduler for satisfying any sophisticated control. (for OF-P)

Convenience

- Wide selection ovens cover all of your application needs.
 - Air flow type (Forced Convection / Natural Convection)
 - Heating type (General / Vacuum)
 - Temperature (Ambient +5 °C to 300 °C)
 - Sizes (28 Liters to 760 Liters)
- Easy maintenance design.
 - Rounded corners for easy cleaning.
 - Corrosion resistant stainless steel interior chamber.
 - Dirt-repellent external surface with power coating. (except for OV)
- User-friendly functions for easy operating.
 - Wait ON/OFF dual timer.
 - Three commonly used temperature memories.

Safety

- Patented CLS-CS (Custom Logical Safe Control System)
 - Automatic power cut-off system against overheating.
 - Protection system by fuses against overcurrent. (except for OF-G/H-large type)
 - Automatic Run or Manual Run after power interruption.
- Fully insulated oven chamber maintains the exterior at a safe temperature.
- Safe door open system to minimize heat loss and protect the user.
 - Audible and visible open door alarms. (except for OV)
 - Automatic heater and fan stop (for OF) when door opening.

Forced Convection Ovens (2 / 4-Chamber Models)	Forced Convection Ovens (Economy Models)	Natural Convection Ovens (General Models)	Natural Convection Oven (Economy Models)	Vacuum Ovens
OF-G-C	OF-E	ON-G	ON-E	OV
60 x 2 chambers, 60 x 4 chambers	52, 100, 150	52, 91, 135	52, 100, 150	28, 65
Amb. +10 to 200 / Amb. +18 to 392	Amb. +10 to 220 / Amb. +18 to 428	Amb. +15 to 250 / Amb. +27 to 482	Amb. +15 to 220 / Amb. +27 to 428	Amb. +5 to 250 / Amb. +9 to 482
0.5 / 0.9	0.4 / 0.72	0.3 / 0.54	0.3, 0.4, 0.5 / 0.54, 0.72, 0.9	0.1, 0.3 / 0.18, 0.54
1.0 / 1.8	3.3, 2.3 / 5.94, 4.14	5.9, 7.5, 6.9 / 10.62, 13.5, 12.42	6.5, 4.1, 7.3 / 11.7, 7.38, 13.14	3.7 / 6.66
Wait on/off	Wait on/off	Wait on/off	Wait on/off	Wait on/off
0	0	0	0	0
-	-	-	-	-
-	-	RS-232 port	-	RS-232 port
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

Forced Convection Ovens (Programmable)



Unattended operation is absolutely available with the intelligent programmable controller.



Intelligent program control

- 10 programs available for temperature ramp up and dwell control.
- 10 steps per a program and 99 hours 59 minutes per a step.
- Stored programs are easily linkable.
- Programs can be repeated up to 99 cycles.
- Pre-heating and heating time are settable before program starts.

Performance

- Temperature range from ambient +10°C to 250°C.
- Microprocessor PID control.
- Three point temperature calibration / Automatic tuning.
- Forced air convection ensures optimal air circulation, temperature uniformity, and short heat-up time.
- Adjustable dual slide vents for inner vapor circulation.

Convenience

- Intuitive touch screen LCD controller with easy icons and logical menus.
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Digital input and output control function for interlocking external devices.
- Corrosion-resistant incoloy sheath heating element and stainless steel interior.
- RS-232 interface for external control and data collection.

OF-12P

with optional viewing window

Standard accessories • Wire shelves (2ea)

Optional accessories • Tempered viewing window
see page 104 • Perforated shelves

Safety

- Keypad lock function prevents accidental changes during operation.
- Automatic run after power interruption.
- Over-temperature and over-current protection.
- Audible and visible open door alarms.

Model		OF-02P	OF-12P	OF-22P
Chamber volume (L / cu ft)		60 / 2.1	102 / 3.6	151 / 5.3
Temperature	Range (°C / °F)	Amb. +10 to 250 / Amb. +18 to 482		
	Fluctuation ¹⁾ at 100°C (±°C / °F)	0.5 / 0.9	0.6 / 1.08	0.8 / 1.44
	Variation ¹⁾ at 100°C (±°C / °F)	1 / 1.8	1.3 / 2.3	1.7 / 3.1
Dimension (WxDxH)	Interior (mm / inch)	400×360×420 / 15.7×14.2×16.5	480×410×520 / 18.9×16.1×20.5	550×460×600 / 22×18×23.6
	Exterior (mm / inch)	577×642×760 / 22.7×25.3×30	657×692×870 / 25.9×27.2×34.3	727×742×974 / 28.7×29.2×38.3
	Net weight (Kg / lbs)	53 / 117	63 / 139	72.5 / 160
Electrical requirements (230V, 50 / 60Hz)		4.4A	6.1A	7.4A
Cat. No.		AAH12555K	AAH12565K	AAH12575K
Electrical requirements (120V, 60Hz)		6.8A	8.4A	10.1A
Cat. No.		AAH12553U	AAH12563U	AAH12573U

1) Technical data according to DIN 12880.

* FDA establishment registered company. FDA listed products.



Performance

- Temperature range from ambient +10°C to 250°C.
- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Forced air convection ensures optimal air circulation, temperature uniformity, and short heat-up time.
- Fan speed control by an analog dial prevents powdered samples from blowing away. (optional)
- Adjustable dual slide vents for inner vapor circulation.

Convenience

- Intuitive control panel with bright LED displays. (0.1°C resolution)
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Convenient presetting function for 3 most commonly used temperature settings.
- Rounded inner chamber corners for easy cleaning and optimal airflow.
- Corrosion-resistant incoloy sheath heating element and stainless steel interior.
- Threefold tempered-glass window provides clear inside view of the chambers. (optional)
- RS-232 interface for external control and data collection.

Safety

- Keypad lock function prevents accidental changes during operation.
- Automatic run after power interruption.
- Over-temperature and over-current protection.
- Audible and visible open door alarms.

Superb air dispersion and uniform temperature distribution.

Provide superb drying performance especially suitable for samples with high moisture content.



OF-22G

with optional viewing window

Standard accessories

- Wire shelves (2ea)

Optional accessories see page 104

- Tempered viewing window
- Fan speed adjuster
- Perforated shelves

Model		OF-02G	OF-12G	OF-22G
Chamber volume (L / cu ft)		60 / 2.1	102 / 3.6	151 / 5.3
Temperature	Range (°C / °F)	Amb. +10 to 250 / Amb. +18 to 482		
	Fluctuation ¹⁾ at 100°C (±°C / °F)	0.5 / 0.9	0.6 / 1.08	0.8 / 1.44
	Variation ¹⁾ at 100°C (±°C / °F)	1 / 1.8	1.3 / 2.3	1.7 / 3.1
Dimension (WxDxH)	Interior (mm / inch)	400×360×420 / 15.7×14.2×16.5	480×410×520 / 18.9×16.1×20.5	550×460×600 / 22×18×23.6
	Exterior (mm / inch)	577×642×760 / 22.7×25.3×30	657×692×870 / 25.9×27.2×34.3	727×742×974 / 28.7×29.2×38.3
	Net weight (Kg / lbs)	53 / 117	63 / 139	72.5 / 160
Electrical requirements (230V, 50 / 60Hz)		4.4A	6.1A	7.4A
Cat. No.		AAH12155K	AAH12165K	AAH12175K
Electrical requirements (120V, 50 / 60Hz)		6.8A	8.4A	10.1A
Cat. No.		AAH12166U	AAH12166U	AAH12176U

1) Technical data according to DIN 12880.

* FDA establishment registered company. FDA listed products.

Forced Convection Ovens (Programmable / General)

Specially designed for large volume and fast drying application. (max. 760L and 300 °C)

Offering rapid heating performance as well as uniform temperature distribution, these heavy-duty ovens are ideal for obtaining quick test results.



OF3-75P/PH, OF3-75/H

with optional viewing window

Standard accessories

- Wire shelves (2ea for 314L chambers, 3ea for 450/760L chambers)

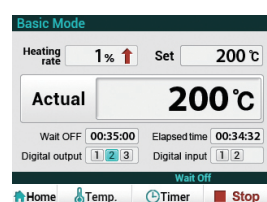
Optional accessories

see page 104

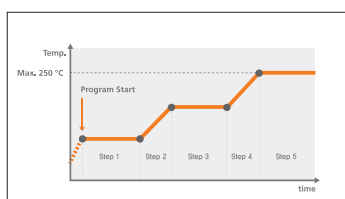
- Perforated shelves
- Digital recorders

Programmable model (OF3-P/PH)

for intelligent program control



Color touch LCD display



- 10 programs available for temperature ramp up and dwell control.
- 10 steps per a program and 99 hours 59 minutes per a step.
- Stored programs are easily linkable.
- Programs can be repeated up to 99 cycles.
- Pre-heating and heating time are settable before program starts.

General model (OF3/H)

for simple and quick control



Bright VFD display and quick adjustable dial knob

- Designed for offering the simplest control by user-friendly control panel.
- Set value and present value are shown on display at once.
- Easy adjustable knob for convenient set values and select functions.



Performance

- Rapid heating performance up to maximum 300 °C
- Microprocessor PID control.
- Three point temperature calibration / Automatic tuning.
- Forced air convection generated by two noiseless and powerful sirocco fans ensures optimal air circulation, temperature uniformity, and short heat-up time.
- Adjustable 5-speed fan for inner circulation rate.
- Adjustable dual slide vents for inner vapor circulation.
- Energy efficiency is achieved thanks to optimization of the insulation system.
 - Even if the unit is operating at max. temperature, the surface of the unit doesn't allow high temperatures.

Convenience

- Optimum model selection is available according to two different types of control panel.
 - Intuitive touch screen LCD controller with easy icons and logical menus. (for OF3P/HP)
 - Bright VFD display with quick adjustable dial knob. (for OF3/H)

- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Convenient presetting function for 3 most commonly used temperature settings.
- Rounded inner chamber corners for easy cleaning and optimal airflow.
- Corrosion-resistant incoloy sheath heating element and stainless steel interior.
- Threefold tempered-glass window provides clear inside view of the chamber. (optional)
- USB port and RS-232 port for external control and data collection.
- Casters for easy mobility during installation or relocation.

Safety

- Keypad lock function prevents accidental changes during operation.
- Automatic run after power interruption.
- Over-temperature and over-current protection.
- Audible and visible open door alarms.

Programmable Model		OF3-30P	OF3-45P	OF3-75P	OF3-30HP	OF3-45HP	OF3-75HP
Chamber volume (L / cu ft)		314 / 11.1	450 / 15.9	760 / 26.8	314 / 11.1	450 / 15.9	760 / 26.8
Temperaure	Range (°C / °F)	Amb. +10 to 200 / Amb.+18 to 392			Amb. +10 to 300 / Amb.+18 to 572		
	Fluctuation ¹⁾ at 100 °C (± °C / °F)	0.2 / 0.36			0.2 / 0.36		
	Variation ¹⁾ at 100 °C (± °C / °F)	0.8 / 1.44			0.8 / 1.44		
Dimension (WxDxH)	Interior (mm / inch)	645x750x650 / 25.4x29.5x25.6	645x750x930 / 25.4x29.5x36.6	745x850x1200 / 29.3x33.5x47.2	645x750x650 / 25.4x29.5x25.6	645x750x930 / 25.4x29.5x36.6	745x850x1200 / 29.3x33.5x47.2
	Exterior (mm / inch)	850x1100x1235 / 33.5x43.3x48.6	850x1100x1525 / 33.5x43.3x60	950x1200x1785 / 37.4x47.2x70.3	850x1100x1235 / 33.5x43.3x48.6	850x1100x1525 / 33.5x43.3x60	950x1200x1785 / 37.4x47.2x70.3
	Net weight (Kg / lbs)	200 / 440.9	240 / 529.1	300 / 661.4	200 / 440.9	240 / 529.1	300 / 661.4
Shelves	No. of wire shelf (standard / max.)	2 / 5	3 / 8	3 / 11	2 / 5	3 / 8	3 / 11
	Max. load per shelf (kg / lbs)	25 / 55.1			25 / 55.1		
Electrical requirements (230V, 50/60Hz, A)		1P, 13.2	3P, 10.3	3P, 14.1	3P, 10.3	3P, 14.1	3P, 17.1
Cat No.	Solid door	AAH18615K	AAH186213K	AAH186313K	AAH196113K	AAH196213K	AAH196313K
	Window door	AAH18715K	AAH187213K	AAH187313K	AAH197113K	AAH197213K	AAH197313K
Electrical requirements (380V, 50/60Hz, A)			3P, 6.7	3P, 9.0	3P, 6.7	3P, 9.0	3P, 10.8
Cat No.	Solid door	-	AAH186214K	AAH186314K	AAH196114K	AAH196214K	AAH196314K
	Window door	-	AAH187214K	AAH187314K	AAH197114K	AAH197214K	AAH197314K
General Model		OF3-30	OF3-45	OF3-75	OF3-30H	OF3-45H	OF3-75H
Chamber volume (L / cu ft)		314 / 11.1	450 / 15.9	760 / 26.8	314 / 11.1	450 / 15.9	760 / 26.8
Temperaure	Range (°C / °F)	Amb. +10 to 200 / Amb.+18 to 392			Amb. +10 to 300 / Amb.+18 to 572		
	Fluctuation ¹⁾ at 100 °C (± °C / °F)	0.2 / 0.36			0.2 / 0.36		
	Variation ¹⁾ at 100 °C (± °C / °F)	0.8 / 1.44			0.8 / 1.44		
Dimension (WxDxH)	Interior (mm / inch)	645x750x650 / 25.4x29.5x25.6	645x750x930 / 25.4x29.5x36.6	745x850x1200 / 29.3x33.5x47.2	645x750x650 / 25.4x29.5x25.6	645x750x930 / 25.4x29.5x36.6	745x850x1200 / 29.3x33.5x47.2
	Exterior (mm / inch)	850x1100x1235 / 33.5x43.3x48.6	850x1100x1525 / 33.5x43.3x60	950x1200x1785 / 37.4x47.2x70.3	850x1100x1235 / 33.5x43.3x48.6	850x1100x1525 / 33.5x43.3x60	950x1200x1785 / 37.4x47.2x70.3
	Net weight (Kg / lbs)	200 / 440.9	240 / 529.1	300 / 661.4	200 / 440.9	240 / 529.1	300 / 661.4
Shelves	No. of wire shelf (standard / max.)	2 / 5	3 / 8	3 / 11	2 / 5	3 / 8	3 / 11
	Max. load per shelf (kg / lbs)	25 / 55.1			25 / 55.1		
Electrical requirements (230V, 50/60Hz, A)		1P, 13.2	3P, 10.3	3P, 14.1	3P, 10.3	3P, 14.1	3P, 17.1
Cat No.	Solid door	AAH18215K	AAH182213K	AAH182313K	AAH192113K	AAH192213K	AAH192313K
	Window door	AAH18315K	AAH183213K	AAH183313K	AAH193113K	AAH193213K	AAH193313K
Electrical requirements (380V, 50/60Hz, A)			3P, 6.7	3P, 9.0	3P, 6.7	3P, 9.0	3P, 10.8
Cat No.	Solid door	-	AAH182214K	AAH182314K	AAH192114K	AAH192214K	AAH192314K
	Window door	-	AAH183214K	AAH183314K	AAH193114K	AAH193214K	AAH193314K

1) Technical data according to DIN 12880.

* CE for 380V, 50/60hz. * FDA establishment registered company. FDA listed products.

Two or four 60L forced convection chambers in a single unit.

Designed to offer an ideal and cost-effective solution for laboratories with limited space and budget.



OF-02G-2C/4C

Standard accessories • Wire shelves (2ea per chamber)

Optional accessories • Perforated shelves
see page 104



Performance

- Temperature range from ambient +10°C to 200°C.
- Microprocessor PID control.
- Temperature calibration.
- Automatic tuning.
- Forced air convection generated by a noiseless and powerful sirocco fan ensures optimal air circulation, temperature uniformity, and short heat-up time.
- Adjustable slide vents for inner vapor circulation.

Convenience

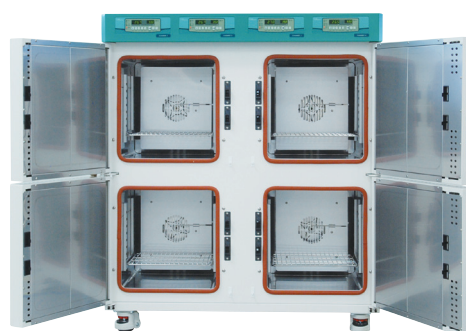
- Intuitive control panel with bright LED displays. (0.1°C resolution)
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Convenient presetting function for 3 most commonly used temperature settings.
- Rounded inner chamber corners for easy cleaning and optimal airflow.
- Corrosion-resistant incoloy sheath heating element and stainless steel interior.
- Built-in casters for easy transport and installation.

Safety

- Keypad lock function prevents accidental changes during operation.
- Automatic run after power interruption.
- Over-temperature and over-current protection.
- Audible and visible open door alarms.

Efficient lab space use with multi-chamber oven

- Designed to offer an ideal and cost-effective solution for laboratories with limited space and budget.
 - Two or four 60L ovens merged into a single unit.
- Optimum model selection between two and four chamber unit according to application demand.
- Suitable for conducting each different experiment at once.
 - Independent temperature and timer control of each chamber using microprocessor PID.



Model		OF-02G-2C	OF-02G-4C
Chamber volume (L / cu ft)		60 / 2.1 x 2 chambers	60 / 2.1 x 4 chambers
Temperature	Range (°C / °F)	Amb. +10 to 200 / Amb. +18 to 392	
	Fluctuation ¹⁾ at 100°C (±°C / °F)	0.5 / 0.9	
	Variation ¹⁾ at 100°C (±°C / °F)	1 / 1.8	
Dimension (WxDxH)	Interior (mm / inch)	400×360×420 / 15.7×14.2×16.5x 2 Chambers	400×360×420 / 15.7×14.2×16.5x 4 Chambers
	Exterior (mm / inch)	570×640×1340 / 22.4×25.2×52.8	1170×640×1340 / 46.1×25.2×52.8
	Net weight (Kg / lbs)	110 / 242.5	170 / 374.8
Electrical requirements (230V, 50 / 60Hz)		8.4A	8.4A x 2EA
Cat. No.		AAH1A115K	AAH1A015K
Electrical requirements (120V, 50 / 60Hz)		16.7A	16.7A x 2EA
Cat. No.		AAH1A116U	AAH1A016U

1) Technical data according to DIN 12880.

* FDA establishment registered company. FDA listed products.

Forced Convection Ovens (Economy)



Affordable multi-functional fast drying ovens with vertical airflow.



Performance

- Temperature range from ambient +10 °C to 220 °C.
- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Forced air convection generated by a circular fan provides high and uniform drying performance.
- Adjustable dual slide vents for inner vapor circulation.

Convenience

- Intuitive control panel with bright LED displays. (0.1 °C resolution)
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Convenient presetting function for 3 most commonly used temperature settings.
- Corrosion-resistant incoloy sheath heating element and stainless steel interior.
- Easy-to-grip circular door handle.

Safety

- Keypad lock function prevents accidental changes during operation.
- Automatic run after power interruption.
- Over-temperature and over-current protection.
- Audible and visible open door alarms.

OF-11E

Standard accessories • Wire shelves (2ea)

Optional accessories • Perforated shelves
see page 104

Model		OF-01E	OF-11E	OF-21E
Chamber volume (L / cu ft)		52 / 1.8	100 / 3.5	150 / 5.3
Temperature	Range (°C / °F)	Amb. +10 to 220 / Amb. +18 to 428		
	Fluctuation ¹⁾ at 100 °C (±°C / °F)	0.4 / 0.72		
	Variation ¹⁾ at 100 °C (±°C / °F)	3.3 / 5.94	3.3 / 5.94	2.3 / 4.14
Dimension (WxDxH)	Interior (mm / inch)	375×370×370 / 14.8×14.6×14.6	455×430×510 / 18×17×20	585×460×555 / 23×18.1×21.9
	Exterior (mm / inch)	530×535×737 / 20.9×21.1×29	610×595×877 / 24×23.4×34.5	740×625×922 / 29.1×24.6×36.3
	Net weight (Kg / lbs)	36 / 79.4	47 / 103.6	59 / 130
Electrical requirements (230V, 50 / 60 Hz)		4.3A	6A	7.4A
Cat. No.		AAH14012K	AAH14022K	AAH14032K
Electrical requirements (120V, 50 / 60 Hz)		6.8A	8.4A	10.1A
Cat. No.		AAH14016U	AAH14026U	AAH14036U

1) Technical data according to DIN 12880.

* FDA establishment registered company. FDA listed products.



Performance

- Temperature range from ambient +15 °C to 250 °C
- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Gravity flow convection for uniform sample heating.
 - Ideal for all sterilization, drying, and high-temperature storage tasks that do not require high drying performance or airflow.
- Adjustable dual slide vents for inner vapor circulation.

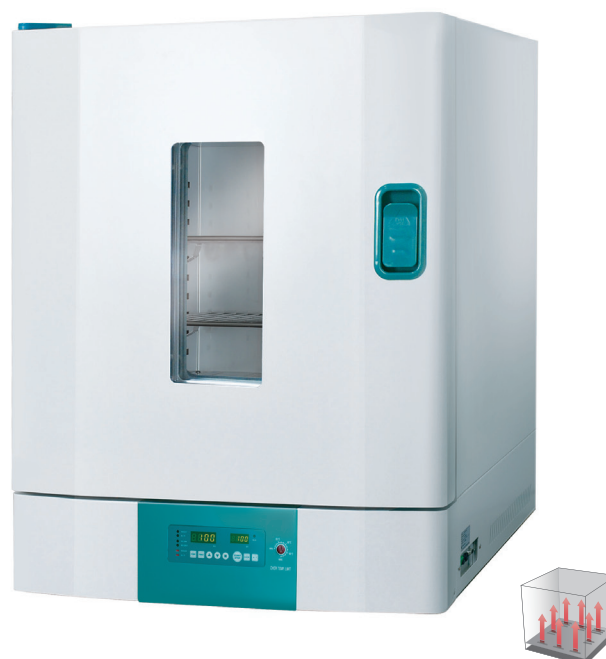
Convenience

- Intuitive control panel with bright LED displays. (1 °C resolution)
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Convenient presetting function for 3 most commonly used temperature settings.
- Rounded inner chamber corners for easy cleaning and optimal airflow.
- Corrosion-resistant incoloy sheath heating element and stainless steel interior.
- Fully insulated dual-wall door with 180 degree hinges and a pull-down handle.
- Threefold tempered-glass window provides clear inside view of the chambers. (optional)
- RS-232 interface for external control and data collection.

Safety

- Keypad lock function prevents accidental changes during operation.
- Automatic run after power interruption.
- Over-temperature and over-current protection.
- Audible and visible open door alarms.

Specially designed for applications requiring gentle airflow.



ON-22G

with optional viewing window

Standard accessories

- Wire shelves (2ea)

Optional accessories

see page 104

- Tempered viewing windows
- Perforated shelves

Model		ON-02G	ON-12G	ON-22G
Chamber volume (L / cu ft)		52 / 1.8	91 / 3.2	135 / 4.8
Temperature	Range (°C / °F)	Amb. +15 to 250 / Amb. +27 to 482		
	Fluctuation ¹⁾ at 100°C (±°C / °F)	0.3 / 0.54		
	Variation ¹⁾ at 100°C (±°C / °F)	5.9 / 10.62	7.5 / 13.5	6.9 / 12.42
Dimension (WxDxH)	Interior (mm / inch)	400×360×365 / 15.7×14.2×14.4	480×410×465 / 18.9×16.1×18.3	610×460×485 / 24×18×19
	Exterior (mm / inch)	577×542×760 / 22.7×21.3×30	657×592×870 / 25.9×23.3×34.3	785×642×897 / 30.9×25.3×35.3
	Net weight (Kg / lbs)	49 / 108	59 / 130	68 / 150
Electrical requirements (230V, 50 / 60 Hz)		4.3A	6A	7.4A
Cat. No.		AAH11135K	AAH11145K	AAH11155K
Electrical requirements (120V, 50 / 60 Hz)		6.7A	8.3A	10A
Cat. No.		AAH11136U	AAH11146U	AAH11156U

1) Technical data according to DIN 12880.

* FDA establishment registered company. FDA listed products.

Natural Convection Ovens (Economy)



Economical multi-function ovens with gentle airflow.



Performance

- Temperature range from ambient +15 °C to 220 °C.
- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Gravity flow convection for uniform sample heating.
- Adjustable dual slide vents for inner vapor circulation.

Convenience

- Intuitive control panel with bright LED displays. (1 °C resolution)
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Convenient presetting function for 3 most commonly used temperature settings.
- Corrosion-resistant incoloy sheath heating element and stainless steel interior.
- Moderately sized, an easy to clean spacious chamber, and an easy to grip circular door handle.

Safety

- Keypad lock function prevents accidental changes during operation.
- Automatic run after power interruption.
- Over-temperature and over-current protection.
- Audible and visible open door alarms.

ON-11E

Standard accessories • Wire shelves (2ea)

Optional accessories • Perforated shelves
see page 104

Model		ON-01E	ON-11E	ON-21E
Chamber volume (L / cu ft)		52 / 1.8	100 / 3.5	150 / 5.3
Temperature	Range (°C / °F)	Amb. +15 to 220 / Amb. +27 to 428		
	Fluctuation 1) at 100 °C (± °C / °F)	0.3 / 0.54	0.4 / 0.72	0.5 / 0.9
	Variation 1) at 100 °C (± °C / °F)	6.5 / 11.7	4.1 / 7.38	7.3 / 13.14
Dimension (WxDxH)	Interior (mm / inch)	375×370×370 / 14.8×14.6×14.6	455×430×510 / 18×17×20	585×460×555 / 23×18.1×21.9
	Exterior (mm / inch)	530×535×737 / 20.9×21.1×29	610×595×877 / 24×23.4×34.5	740×625×922 / 29.1×24.6×36.3
	Net weight (Kg / lbs)	34 / 75	46 / 101.4	59 / 130
Electrical requirements (230V, 50 / 60 Hz)		4.3A	6 A	7.4A
Cat. No.		AAH15015K	AAH15025K	AAH15035K
Electrical requirements (120V, 50 / 60 Hz)		6.7A	8.3A	10A
Cat. No.		AAH15016U	AAH15026U	AAH15036U

1) Technical data according to DIN 12880.

* FDA establishment registered company. FDA listed products.



Performance

- Temperature range from ambient +5 °C to 250 °C
- Vacuum range: 0 to 0.1 MPa. (analog vacuum gauge)
 - Drying a solvent in vacuum lowers its boiling point, thereby making the separation process easier and eliminating the need to use high temperatures.
- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Uniform heat distribution from block type heater attached to the chamber exterior to the anodized aluminum shelves.

Convenience

- Intuitive control panel with bright LED displays. (1 °C resolution)
- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Convenient presetting function for 3 most commonly used temperature settings.
- Viton (fluorine rubber) door gasket also available for acidic applications. (optional)
- Heat tempered glass window provides clear inside view of the chambers
- Tight vacuum seal thanks to spring-loaded glass door, silicone gasket, and a push-button latch handle.
- Separate vacuum and vent ports.
- RS-232 interface for external control and data collection.

Safety

- Keypad lock function prevents accidental changes during operation.
- Automatic run after power interruption.
- Over-temperature and over-current protection.

Optimally constructed for separating solvents from solutions or drying solvents with high boiling points.



OV-11

Standard accessories

- Plate shelves (2ea for OV-11, 3ea for OV-12)

Optional accessories

see page 105

- Safety cover, Viton gasket
- Vacuum pumps and oil mist trap
- Cold trap baths and U-type class trap

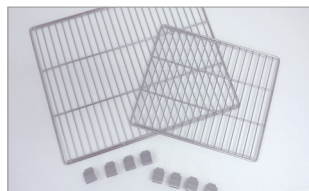
Model		OV-11	OV-12
Chamber volume (L / cu ft)		28 / 1	65 / 2.3
Vacuum range		0~0.1MPa, Analog	
Nozzle size (mm / inch)		Vacuum ø10 / 0.4, Vent ø10 / 0.4	
Temperature	Range (°C / °F)	Amb. +5 to 250 / Amb. +9 to 482	
	Fluctuation ¹⁾ (± °C / °F at 100 °C)	0.1 / 0.18	0.3 / 0.54
	Variation ¹⁾ (± °C / °F at 100 °C)	3.7 / 6.66	
Dimension (WxDxH)	Interior (mm / inch)	302×305×302 / 11.9×12×11.9	402×405×402 / 15.8×15.9×15.8
	Exterior (mm / inch)	680×453×495 / 26.8×17.8×19.5	780×557×595 / 30.7×21.9×23.4
	Net weight (Kg / lbs)	63 / 139	103 / 227
Electrical requirements (230V, 50 / 60 Hz)		5.3A	6.1A
Cat. No.		AAH13115K	AAH13125K
Electrical requirements (120V, 50 / 60 Hz)		10A	11.7A
Cat. No.		AAH13116U	AAH13126U

1) Technical data according to DIN 12880.

* FDA establishment registered company. FDA listed products.

Accessories & Options

for Forced / Natural convection ovens



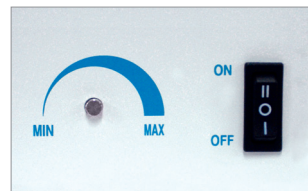
Wire shelves



Perforated shelves



Tempered viewing windows



Fan speed adjuster

Wire shelves

Stainless steel and electro-polished shelf system is removed easily without using tools for easy cleaning.

Cat. No.	Description			Suitable for
	Included	Maximum	WxL (mm / inch)	
EDA8136	2	7	366×316 / 14.4×12.4	OF-02G/P
	4	14		OF-02G-2C
	8	28		OF-02G-4C
EDA8135	2	11	446×366 / 17.6×14.4	OF-12G/P
EDA8134	2	13	516×416 / 20.3×16.4	OF-22G/P
EDA8136	2	9	366×316 / 14.4×12.4	OF-01E, ON-01E
EDA8135	2	13	446×366 / 17.6×14.4	OF-11E, ON-11E
EDA8137	2	14	576×419 / 22.7×16.5	OF-21E, ON-21E
RTD1196	2	16	708×608 / 27.9×23.9	OF3-30/P/H/HP
	3	25		OF3-45/P/H/HP
RTD1197	3	34		OF3-75/P/H/HP
EDA8136	2	7	366×316 / 14.4×12.4	ON-02G
EDA8135	2	11	446×366 / 17.6×14.4	ON-12G
EDA8137	2	13	576×419 / 22.7×16.5	ON-22G

Perforated shelves

Stainless steel shelf system is removed easily without using tools for easy cleaning.

Cat. No.	Description		Suitable for
	Maximum	WxL (mm / inch)	
AAA12531	7	366×316 / 14.4×12.4	OF-02G/P
	14		OF-02G-2C
	28		OF-02G-4C
AAA12532	11	446×366 / 17.6×14.4	OF-12G/P
AAA12533	13	516×416 / 20.3×16.4	OF-22G/P
AAA12531	9	366×316 / 14.4×12.4	OF-01E, ON-01E
AAA12532	13	446×366 / 17.6×14.4	OF-11E, ON-11E
AAA12535	14	576×419 / 22.7×16.5	OF-21E, ON-21E
AAA18501	16	708×608 / 27.9×23.9	OF3-30/P/H/HP
	25		OF3-45/P/H/HP
AAA18502	34		OF3-75/P/H/HP
AAA12531	7	366×316 / 14.4×12.4	ON-02G
AAA12532	11	446×366 / 17.6×14.4	ON-12G
AAA12535	13	576×419 / 22.7×16.5	ON-22G

Tempered viewing windows

Optimized sample monitoring with threefold, tempered safety glass window. (for OF-G/P, ON-G)

Cat. No.	Description		Suitable for
	Thickness, WxL (mm / inch)		
AAA12611	5, 150×280 / 0.2, 5.9×11		OF-02G/P, ON-02G
AAA12612	5, 150×380 / 0.2, 5.9×15		OF-12G/P, 22G/P, ON-12G, 22G

Fan speed adjuster

Adjustable inner air circulation speed, which protects spreading out powder sample. (for OF-G)

Cat. No.	Description	Suitable for
AAA12701	Analog dial control	OF-02G, 12G, 22G

Recorders

Easy recognizable digital recorders for efficient temperature indicating.

Cat. No.	Description	Suitable for
AAA8T500	Recorder (6 point)	OF3-30/P/H/HP OF3-45/P/H/HP
AAAE1503	Recorder (thermal line type)	OF3-75/P/H/HP

for Vacuum ovens



Safety covers



Viton gaskets



Vacuum pumps



Cold trap baths

Safety covers

In case of the glass is destroyed, the netted steel frame and polycarbonate sheet cover prevent user from glass splinters.

Cat. No.	Description	Suitable for
AAA13603	Safety cover	OV-11
AAA13604	Safety cover	OV-12

Gaskets

Viton (fluorine rubber) door gaskets can be provided upon request.

Cat. No.	Description	Suitable for
FAA5146	Silicone gasket	OV-11
FAA5187	Viton (fluorine rubber) gasket	
FAA5147	Silicone gasket	OV-12
FAA5188	Viton (fluorine rubber) gasket	

Vacuum pumps

Rotary vacuum pumps with directly connected oil seal prevent air reflux and provide high vacuum pressure for vacuum ovens.

Cat. No.	Description
BEH73205K	W2V10 (230V, 50/60Hz)
BEH73206U	W2V10 (120V, 60Hz)
BEA700351	Oil mist trap (PC)
BEA700355	Oil mist trap (metal)
BEA700353	Vacuum pump oil (1L)
BEA700354	Vacuum pump oil (20L)

* In order to get rid of evaporated oil or to block oil in-flow, an optional oil mist trap is recommended. (refer to page 107 for additional information.)

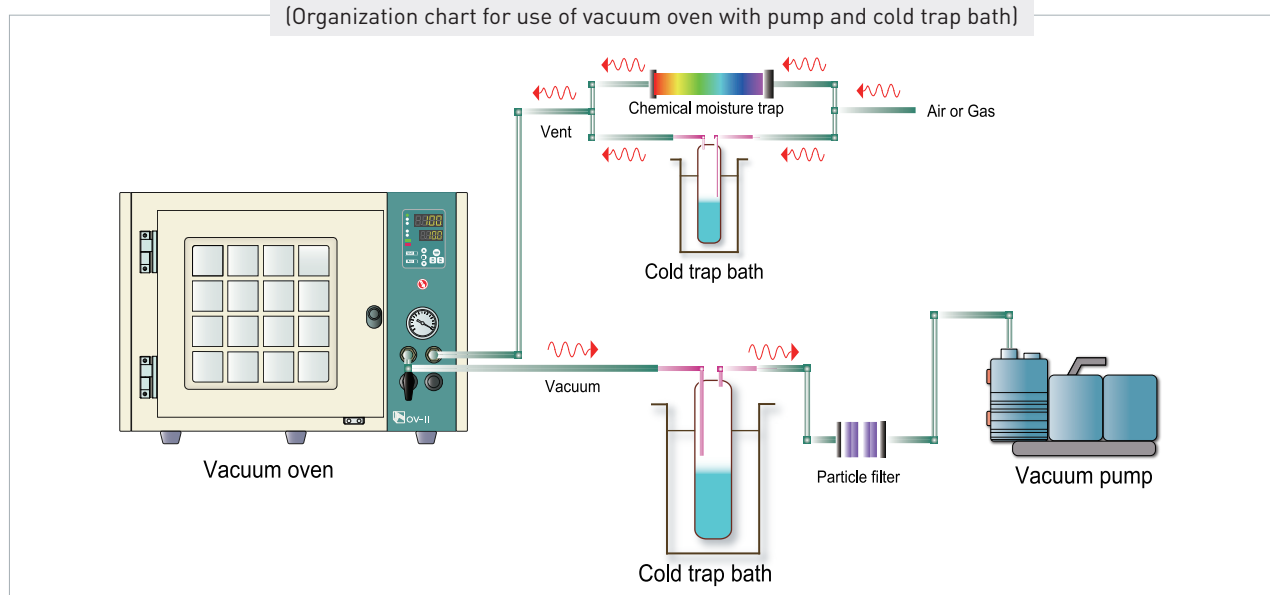
Cold trap baths

CTB-10 cold trap baths equipped with two U-type glass traps prevent a vacuum pump from vapors or contamination.

Cat. No.	Description
AAH62011K	CTB-10 (230V, 60Hz)
AAH62012K	CTB-10 (230V, 50Hz)
FCA1110	U-type glass trap (1ea)

Related products for vacuum ovens

(Organization chart for use of vacuum oven with pump and cold trap bath)

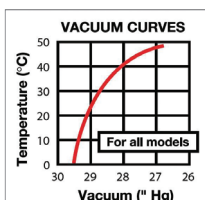


* In addition to standard accessories, we can also provide customized accessories to meet your specific requirements. Please contact your local dealer for more details.

Pumps

Select the optimum model between two different types of pump.

Both are suitable for rotary vacuum evaporation, decompression distillation, and vacuum filtering. Especially rotary vacuum pump provides more powerful pumping ideal for vacuum drying.



VE-11

with optional vacuum gauge / regulator

Standard accessories

- Water tank, aspirator pump, tank closure
- Two aspirators
- Two 20cm long \varnothing 6mm (0.2\") silicone rubber tubes
- One 100cm long \varnothing 8mm (0.3\") silicone rubber tube



W2V10

Optional accessories

- Oil mist traps



Electrical Aspirator Pump

- Portable dual-channel water-jet aspirator pumps
- Creating a vacuum by means of venturi effect, aspirator pumps are suitable for rotary vacuum evaporation, decompression distillation, vacuum drying, and vacuum filtering.
- Built-in circulating pump and water tank make the unit portable.
- Circulating pump continuously pumps water quietly across a set of aspirators, and is therefore clean and efficient.
- Built-in check valve prevents backflow of water into the aspirator pump.
- Corrosion-resistant construction of all wetted parts with 304 stainless steel, polypropylene, silicone, or nickel-coated brass.
- Water tank features a drain port and a spigot for easy changing of water.

Accessories & Options

- Vacuum gauge with regulator: to monitor and control the vacuum pressure. (between 0.0267~0.0998MPa / 7.9~29.5" Hg)
- Cooling coil: to prevent vacuum from decreasing due to temperature increase.



Cooling coil



Aspirators

Description	Cat. No.
Vacuum gauge with regulator	AAA71531
Cooling coil	AAA71501
Aspirator (1 ea)	EFA9111
Aspirator (10 ea)	AAH71122

Model	VE-11		
Bath volume (L / cu ft)	9.5 / 0.3		
Max. vacuum (Mpa / mmHg)	0.0906 / 680		
Free-air capacity	18L / minute (0.6 cfm) ×2ea		
Material (bath / aspirator)	Polypropylene / Nickel-coated brass × 2ea		
Bath interior (W×L, D) (mm / inch)	298×210, 227 / 11.7×8.3, 8.9		
Exterior (W×L×H) (mm / inch)	330×265×390 / 13×10.4×15.4		
Inhale nozzle	External Ø9.5mm (0.4") ×2ea		
Drain cock, Over flow nozzle (Ø, mm / inch)	17 / 0.7		
Net weight (kg / lbs)	5.7 / 12.6		
Electrical requirements	230V, 60Hz / 0.7A	230V, 50Hz / 0.7A	120V, 60Hz / 1.4A
Cat. No.	AH71011K	AAH71015K	AAH71016U

* FDA establishment registered company. FDA listed products.



Rotary Vacuum Pump

- Rotary vacuum pump equipped with direct connect oil seal prevents air reflux, essentially used with vacuum ovens to achieve a higher level of vacuum pressure.
- Oil mist trap, an optional feature, prevents oil in-flow.

Accessories & Options

Cat. No.	Description
BEA700351	Oil mist trap (PC)
BEA700355	Oil mist trap (metal)
BEA700353	Vacuum pump oil (1L)
BEA700354	Vacuum pump oil (20L)

Model	W2V10	
Pumping speed (L/min / gal/min)	100 / 26.4	
Max. pressure	Gas ballast open	5X10-3 Torr (6.7 Pa)
	Gas ballast closed	1X10-3 Torr (1.3X10-1 Pa)
Motor power (W / Hp)	400 / 0.5	
Motor speed (rpm)	1,700	
Oil capacity (cc / L)	500 / 0.5	
Inlet	Standard	NW25
	Nipple (Ø, mm)	AL, Ø12
Exterior (W×L×H) (mm / inch)	150×392×250 / 5.9×15.4×9.8	
Net weight (kg / lbs)	22.5 / 49.6	
Electrical requirements	230V, 50/60Hz	120V, 60Hz
Cat. No.	BEH73205K	BEH73206U

Recirculating Coolers (chillers)

General Recirculating Coolers

Low Temp. Recirculating Coolers

Advanced Low Temp. Recirculating Coolers

High Temp. Recirculating Coolers

Compact Recirculating Cooler

» General Applications

Recirculating Cooler (HX)

Warming reagents, Routine laboratory applications, Coliform determinations, Sample thawing, Bacteriological examinations, Microbiological assays, Cell cultivation.

Recirculating Cooler (HL/HS/HH)

Temperature control, Incubations, Material testing, Increasing solubility rates, Corrosion tests, Cell cultivation, Histological studies.

Recirculating Cooler (RC)

Viscosity measurements, Fecal coliform testing, Plasma thawing, Histological studies.



Product Name		General Recirculating Coolers		Low Temp. Recirculating Coolers	
Model		HX	HX-H	HL	HL-H
Description		-	-	-	-
Temp. control (°C/°F)		3 to 40 / 37.4 to 104		-20 to 40 / -4 to 104	
Temp. stability at 15°C (±°C/°F)		1 / 1.8		1 / 1.8	
Cooling capacity at 20°C (Kw)		1.9, 2.4	1.9, 2.4, 3.6, 4.7, 7.1	0.6, 0.7, 1.45, 1.8	1.45, 1.8, 2.5, 3.3, 6.5, 7.1
Heating capacity at 20°C (Kw)		-	-	-	-
Pump (50Hz)	Max. flow rate (L / min)	40	28	50	40, 70
	Max. pressure (bar)	1.58	4.3	1	3.3, 6
Dimension	Max. filling capacity (L)	35, 45		7.5, 13.5, 25, 39	
	for tubing dia. (mm / inch)	20		20	
Control	Display & Control interface	VFD, Buttons		VFD, Touch buttons, Knob	
	Computer interface	-		-	
Safety	Over temp. limit	-		-	
	Low fluid level alarm	0		0	
	External sensor	-		-	

» Technical Benefits

Wide model selection covers all of your application needs

- Excellent heating and cooling control from -20 to 80%.
- Cooling capacity of up to 7.7kW
- Circulating pumps up to 70 L/min and 6 bar.
- Energy-effective by-pass model and cost-effective general model.

Stand alone cooling performance



Adjusting amount of refrigerant evaporation loss
Microprocessor PID heating control

HH models

- Broad cooling and heating task from -20 °C to 80 °C.
- Quick heat up time with the intergrated heater.
- Superb temperature stability of ± 0.1 °C by microprocessor PID control.



Microprocessor PID cooling control

HS models

- Smart cooling performance from with high temperature stability.
- No heater equipped, high temperature stability of ± 0.2 °C is guaranteed with only using a refrigerating system.
- Cooling capacity of refrigerator is adjustable from 1% to 100% by high-tech microprocessor PID control. (patent pending)

Advanced Low Temp. Recirculating Coolers		High Temp. Recirculating Coolers		Compact Recirculating Cooler
HS	HS-H	HH	HH-H	RC
• Precise temperature stability without heater.		• Broad temp. range. • Quick heat up time and precise temp. stability with intergrated heater.		• Compact size.
-20 to 40 / -4 to 104		-20 to 80 / - 4 to 176		-20 to 30 / -4 to 86
0.2 / 0.36		0.1 / 0.2		1 / 1.8
1.45, 1.8, 2.5, 3.3, 6.5, 7.1	6.5, 7.1	1.45, 1.8, 2.5, 3.3	6.5, 7.1	0.58
-	-	2, 4	8.4	-
40	70	40	70	26
3.3	6	3.3	6	0.7
13.5, 25, 39		13.5, 25, 39		5
20		20		9.5
VFD, Touch buttons, Knob		VFD, Touch buttons, Knob		LCD, Buttons
RS-232 port, Alarm output port		RS-232 port, Alarm output port		-
-		0		-
0		0		0
0 (optional)		0 (optional)		-

Providing a constant temperature control and high cooling efficiency.



Performance

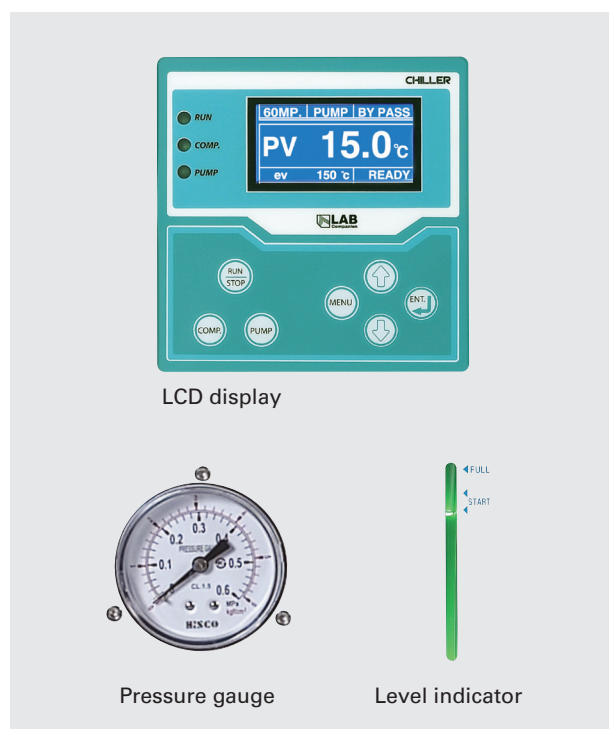
- Temperature range from 3 °C to 40 °C.
- High cooling capacity up to 7.1kW at 20 °C.
- Powerful circulating pumps up to 40L/min., 4.3 bar.
- Refrigerating system is designed to reduce energy consumption and maximize refrigerating efficiency.
- Pump pressure can be controlled using a by-pass function. (for H type)

Convenience

- Clear and easy-to-use LCD display. (resolution 0.1 °C)
- Bright LED water level indicator can be seen from a distance.
- Built in pressure gauge for checking pump pressure at a glance.
- High/low pressure gauges for condition diagnosis of refrigerating system at a glance. (for H type)
- Wide filling inlet for easy and safe pouring of solution into the unit.
- Suitable model is selectable between magnetic pump, centrifugal pump.
- Double service valve prevents refrigerant leakage for easy maintenance.
- Removable gridded vent for easy maintenance of condenser.
- Built-in casters for easy transport and installation.

Safety

- Self-diagnostic function identifying errors.
- Complete safety protection system with warning alarms.
 - Low fluid level and dry-running protection; when triggered shows an error symbol on the display and an audible buzzer sound.
 - Over-temperature protection; If the equipment operates at over maximum temperature due to external environment, user can simply identify the error with a visual signal or an audible buzzer sound.
 - Over-current circuit breaker.
- Eco-friendly R-404A refrigerant use for environmental protection.
- Splash-proof keypad.



LCD display



Pressure gauge



Level indicator

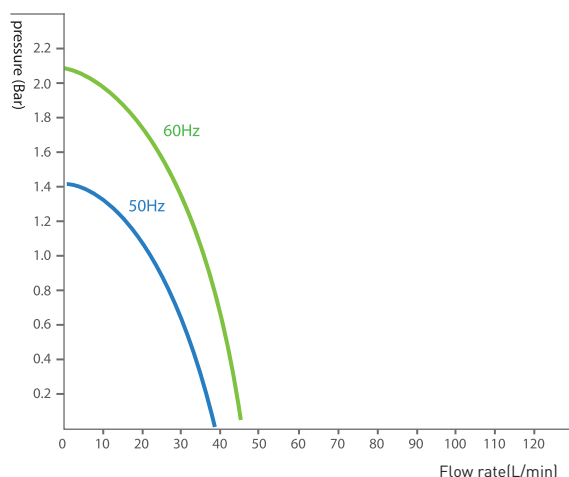
Testing in accordance with **DIN EN 12876**

Standard accessories • 3/4" male to 3/4" male adapters (2ea)
 see page 120-121 • Ball valves (2ea)



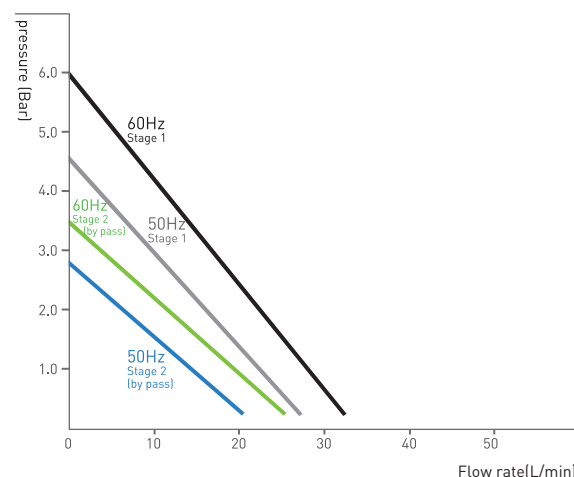
Pumping capacities (bath fluid: water)

Magnetic pump



• HX-20, 25

Centrifugal pump



• HX-20H, 25H, 35H, 45H, 55H

Model		HX-20	HX-25	HX-20H	HX-25H	HX-35H	HX-45H ²⁾	HX-55H ²⁾
Temperature ¹⁾ (bath fluid : water)	Working temperature range (°C / °F)	+3 to 40 / +37.4 to 104						
	Temperature stability at 15°C (±°C / °F)	1 / 1.8						
Cooling capacity (bath fluid : water)	at 20°C (kW)	1.9	2.4	1.9	2.4	3.6	4.7	7.1
	at 10°C (kW)	1.4	1.7	1.4	1.7	3.1	3.6	5.1
	at 5°C (kW)	1	1.4	1	1.4	2.4	2.9	4.2
Pump	Max. flow rate (L / min, gal / min)	40 / 10.6		28 / 7.39				
	Max. pressure (bar / psi)	1.43 / 20.74		4.3 / 62.37				
Dimension	Max. filling capacity (L / cu ft)	35 / 1.24				45 / 1.59		
	For tubing dia. (mm / inch)	20 / 3/4						
	Filling inlet (Ø, mm / inch)	50 / 1.9						
	Overall (W×L×H, mm / inch)	620×785×990 / 24.4×30.9×39				745×800×1095 / 29.3×31.5×43.1		
	Net weight (kg / lbs)	93 / 205	101 / 223	97 / 214	105 / 231	120 / 265	130 / 287	140 / 309
Electrical requirements (230V, 60Hz)		8.5A	9A	9.3A	9.8A	15A	19A	
Cat. No.		AAH64011K	AAH64021K	AAH64111K	AAH64121K	AAH64131K	AAH64141K	-
Electrical requirements (230V, 50Hz)		7A	7.6A	7.9A	8.8A	14A		
Cat. No.		AAH64012K	AAH64022K	AAH64112K	AAH64122K	AAH64132K	-	-
Electrical requirements (120V, 60Hz)		17A	22A					
Cat. No.		AAH64013U	AAH64023U	-	-	-	-	-
Electrical requirements (380V, 60Hz)							10A	11.5A
Cat. No.		-	-	-	-	-	AAH64149K	AAH64159K
Electrical requirements (380V, 50Hz)							7A	8.5A
Cat. No.		-	-	-	-	-	AAH64148K	AAH64158K

1) Technical data according to DIN 12876

2) HX-45H, 55H is recorded by 380V, 60Hz.

* Above specification value is recorded by 50Hz.

* Product performance may be affected by ambient temperatures.

* FDA establishment registered company. FDA listed products.

Powerful recirculating coolers.

Provide a wide range of cooling capacities with temperature reliability.



Performance

- Temperature range from -20 °C to 40 °C.
- High cooling capacity up to 7.1kW at 20 °C.
- Powerful circulating pumps up to 70L/min., 6 bar.
- Refrigerating system is designed to reduce energy consumption and maximize refrigerating efficiency.

Convenience

- Designed to simplify operation with a touch screen type display.
 - Easy-to-read VFD display with interactive touch keys.
 - Setting and resolution indication 0.1 °C/°F.
 - Quick keypad lock prevents accidental parameter changes.
 - Signal indicator for operation status.
- Bright LED water level indicator can be seen from a distance.
- Built in pressure gauge for checking pump pressure at a glance.
- High/low pressure gauges for condition diagnosis of refrigerating system at a glance. (for H type)
- Wide filling inlet for easy and safe pouring of solution into the unit.
- Double service valve prevents refrigerant leakage for easy maintenance.
- Removable gridded vent for easy maintenance of condenser.
- Built-in casters for easy transport and installation.

Safety

- Self-diagnostic function identifying errors.
- Complete safety protection system with warning alarms.
 - Low fluid level and dry-running protection; when triggered shows an error symbol on the display and an audible buzzer sound.
 - Over-temperature protection; If the equipment operates at over maximum temperature due to external environment, user can simply identify the error with a visual signal or an audible buzzer sound.
 - Over-current circuit breaker.
- Eco-friendly R-404A / R-507 refrigerant use for environmental protection.
- Splash-proof keypad.

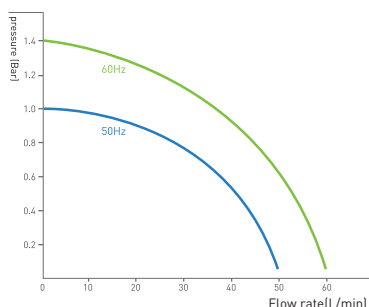
Testing in accordance with **DIN EN 12876**

Standard accessories • 3/4" male to 3/4" male adapters (2ea)
see page 120-121 • Ball valves (2ea)

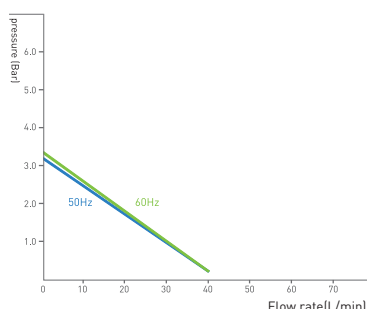


Pumping capacities (Bath fluid : ethylene glycol mix 1:1 water)

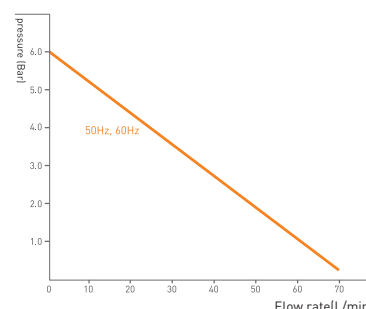
Submersible pump



• HL-05, 10, 15, 2



• HL-15H, 20H, 25H, 35H



• HL-45H, 55H

Model		HL-05	HL-10	HL-15	HL-20	HL-15H	HL-20H	HL-25H	HL-35H	HL-45H ²⁾	HL-55H ²⁾	
Temperature ¹⁾ (bath fluid : ethylene glycol mix 1:1 water)	Working temp. range (°C / °F)	-20 to 40 / -4 to 104										
	Temp. stability at 15°C, (± °C / °F)	1 / 1.8										
Cooling capacity (bath fluid : ethylene glycol mix 1:1 water)	at 20°C (kw)	0.6	0.7	1.45	1.8	1.45	1.8	2.5	3.3	6.5	7.1	
	at 10°C (kw)	0.5	0.6	1.15	1.5	1.15	1.5	1.8	2.3	4.5	6	
	at 0°C (kw)	0.35	0.42	0.86	1.15	0.86	1.15	1.1	1.7	3	4.1	
	at -10°C (kw)	0.18	0.32	0.62	0.85	0.62	0.85	0.65	1	2.1	2.5	
	at -20°C (kw)	0.04	0.14	0.3	0.40	0.3	0.4	0.4	0.55	1.2	1.5	
Pump	Max. flow rate (L / min, gal / min)	50 / 13.2				40 / 10.57				70 / 18.49		
	Max. pressure (bar / psi)	1 / 14.5				3.3 / 479				6 / 87		
Dimension	Max., filling Capacity (L, cu ft)	7.5 / 0.26		13.5 / 0.47				25 / 0.88		39 / 1.37		
	For tubing dia. (mm / inch)	20 / 3/4										
	Filling inlet (Ø, mm / inch)	120 / 4.7										
	Overall (WxLxH, mm / inch)	405×620×710 / 15.9×24.4×28			515×715× 835 / 20.3×28.1×32.9				550×900×1140 / 21.7×35.4×44.9		605×1045×1300 / 23.8×41.4×51.2	
	Net weight (kg / lbs)	62.85 / 138.6	64.85 / 143	86.5 / 190.7	87.35 / 192.9	91.8 / 202.4	92.65 / 204.3	141.3 / 310.9	146.3 / 321.9	171 ±10 / 377 ±22	176 ±10 / 388 ±22	
Electric requirement (230V, 60Hz)		5A	5.5A	6.5A	7.5A	6.5A	7.5A	9.5A	13.5A			
Cat. No.		AAH65001K	AAH65011K	AAH65021K	AAH65031K	AAH65121K	AAH65131K	AAH65141K	AAH65151K	-	-	
Electric requirement (230V, 50Hz)		4.5A	5A	6A	7A	6A	7A	7.5A	12.5A			
Cat. No.		AAH65002K	AAH65012K	AAH65022K	AAH65032K	AAH65122K	AAH65132K	AAH65142K	AAH65152K	-	-	
Electric requirement (120V, 60Hz)		10A	11A	13A	15A							
Cat. No.		AAH65003U	AAH65013U	AAH65023U	AAH65033U	-	-	-	-	-	-	
Electric requirement (380V, 60Hz)										5.5A	7A	
Cat. No.		-	-	-	-	-	-	-	-	AAH65169K	AAH65179K	
Electric requirement (380V, 50Hz)										5A	6A	
Cat. No.		-	-	-	-	-	-	-	-	AAH65168K	AAH65178K	

1) Technical data according to DIN 12876.

2) HL-45H, 55H is recorded by 380V, 60Hz.

* Above specification value is recorded by 50Hz.

* Product performance may be affected by ambient temperatures.

* CE except for HL-45H/55H.

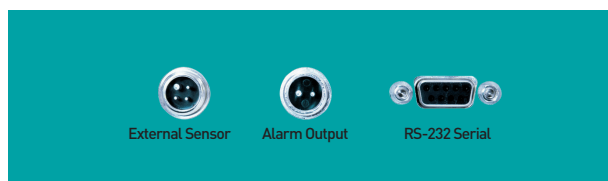
* FDA establishment registered company. FDA listed products.

Adjustable, precise PID temperature controller beneficial

for various cooling tasks in the science, research, and industrial laboratories.



Digital controller



RS-232 serial port & etc

Performance

- Temperature range from -20 °C to 40 °C.
- High cooling capacity up to 7.1kW at 20 °C.
- Powerful circulating pumps up to 70L/min., 6 bar.
- Precise temperature stability ± 0.2 °C (at 15 °C) without heater.
 - Innovative and exclusive controller can adjust the cooling capacity from 1% to 100%.
- Refrigerating system is designed to reduce energy consumption and maximize refrigerating efficiency.

Convenience

- Designed to simplify operation with a touch screen type display.
 - Setting and resolution indication 0.1 °C/°F.
 - Quick keypad lock prevents accidental parameter changes.
- Bright LED water level indicator can be seen from a distance.
- Optional external sensor can be connected for more actual temperature control.
- Built in pressure gauge for checking pump pressure at a glance.
- High/low pressure gauges for condition diagnosis of refrigerating system at a glance. (for H type)
- Wide filling inlet for easy and safe pouring of solution into the unit.
- Double service valve prevents refrigerant leakage for easy maintenance.
- Removable gridded vent for easy maintenance of condenser.
- Built-in casters for easy transport and installation.
- RS-232 interface for external control and data collection.

Safety

- Self-diagnostic function identifying errors.
- Complete safety protection system with warning alarms.
 - Low fluid level and dry-running protection; when triggered shows an error symbol on the display and an audible buzzer sound.
 - Over-temperature protection; If the equipment operates at over maximum temperature due to external environment, user can simply identify the error with a visual signal or an audible buzzer sound.
 - Over-current circuit breaker.
- Eco-friendly R-404A / R-507 refrigerant use for environmental protection.
- Splash-proof keypad.

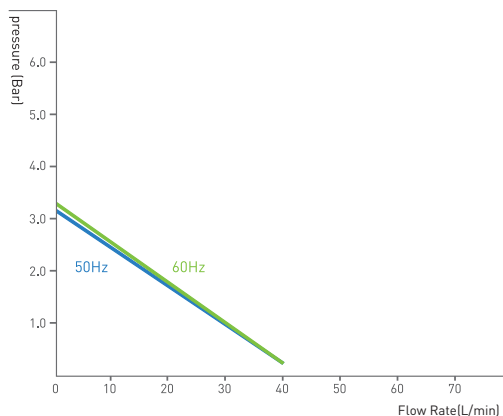
Testing in accordance with **DIN EN 12876**

Standard accessories see page 120-121

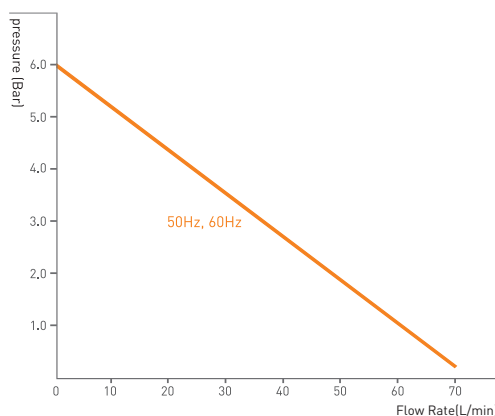
- 3/4" male to 3/4" male adapters (2ea)
- Ball valves (2ea)

Pumping capacities (bath fluid: water)

Submersible pump



• HS -15, 20, 25, 35, 45, 55



• HS - 45H, 55H

Model		HS-15	HS-20	HS-25	HS-35	HS-45	HS-55	HS-45H ²⁾	HS-55H ²⁾
Temperature ¹⁾ (bath fluid : ethylene glycol mix 1:1 water)	Working temperature range (°C / °F)	-20 to 40 / -4 to 104							
	Temperature stability at 15°C, (±°C / °F)	0.2 / 0.36							
Cooling capacity (bath fluid : ethylene glycol mix 1:1 water)	at 20°C (kw)	1.45	1.8	2.5	3.3	6.5	7.1	6.5	7.1
	at 10°C (kw)	1.15	1.5	1.8	2.3	4.5	6	4.5	6
	at 0°C (kw)	0.86	1.15	1.1	1.7	3	4.1	3	4.1
	at -10°C (kw)	0.62	0.85	0.65	1	2.1	2.5	2.1	2.5
	at -20°C (kw)	0.3	0.4	0.4	0.55	1.2	1.5	1.2	1.5
Pump	Max. flow rate (L / min, gal / min)	40 / 10.57						70 / 18.49	
	Max. pressure (bar / psi)	3.3 / 47.86						6 / 87	
Dimension	Max. filling Capacity (L, cu ft)	13.5 / 0.47		25 / 0.88		39 / 1.37			
	For tubing dia. (mm / inch)	20 / 3/4							
	Filling inlet (Ø, mm / inch)	37 / 1.4							
	Overall (W×L×H, mm / inch)	515×715× 835 / 20.3×28.1×32.9		550×900×1140 / 21.7×35.4×44.9		605×1045×1300 / 23.8×41.4×51.2			
	Net weight (kg / lbs)	91.8 / 202.4	92.65 / 204.3	141.3 / 310.9	146.3 / 321.9	168 ±10 / 370 ±22	173±10 / 381 ±22	171 ±10 / 377 ±22	176 ±10 / 388 ±22
Electric Requirement (230V, 60Hz)		6.5 A	7.5 A	9.5 A	13.5 A				
Cat. No.		AAH66011K	AAH66021K	AAH66031K	AAH66041K	-	-	-	-
Electric Requirement (230V, 50Hz)		6 A	7 A	7.5 A	12.5 A				
Cat. No.		AAH66012K	AAH66022K	AAH66032K	AAH66042K	-	-	-	-
Electric Requirement (380V, 60Hz)						5.5 A	7 A	5.5 A	7 A
Cat. No.		-	-	-	-	AAH66259K	AAH66469K	AAH66359K	AAH66569K
Electric Requirement (380V, 50Hz)						5 A	6 A	5 A	6 A
Cat. No.		-	-	-	-	AAH66258K	AAH66468K	AAH66358K	AAH66568K

1) Technical data according to DIN 12876.

2) HS-45H, 55H is recorded by 380V, 60Hz.

* Above specification value is recorded by 50Hz.

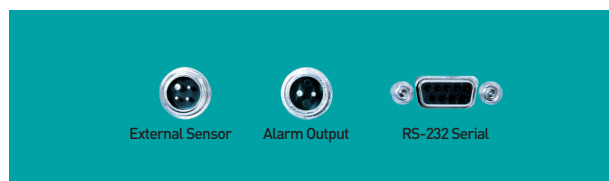
* Product performance may be affected by ambient temperatures.

* FDA establishment registered company. FDA listed products.

Broad temperature ranging up to 80 °C for various applications. Also integrated heaters greatly provides high temperature stability.



Digital controller



Temp. limit & RS-232 serial & etc

Performance

- Wide temperature range from -20 °C to 80 °C.
- High cooling capacity up to 7.1kW at 20 °C.
- Powerful circulating pumps up to 70L/min., 6 bar.
- Precise temperature stability ± 0.1 °C (at 15 °C) with integrated heaters.
- Refrigerating system is designed to reduce energy consumption and maximize refrigerating efficiency.

Convenience

- Designed to simplify operation with a touch screen type display.
 - Setting and resolution indication 0.1 °C/°F.
 - Quick keypad lock prevents accidental parameter changes.
- Bright LED water level indicator can be seen from a distance.
- Optional external sensor can be connected for more actual temperature control.
- Built in pressure gauge for checking pump pressure at a glance.
- High/low pressure gauges for condition diagnosis of refrigerating system at a glance. (for H type)
- Wide filling inlet for easy and safe pouring of solution into the unit.
- Double service valve prevents refrigerant leakage for easy maintenance.
- Removable gridded vent for easy maintenance of condenser.
- Built-in casters for easy transport and installation.
- RS-232 interface for external control and data collection.

Safety

- Self-diagnostic function identifying errors.
- Complete safety protection system with warning alarms.
 - Low fluid level and dry-running protection; when triggered shows an error symbol on the display and an audible buzzer sound.
 - Over-temperature protection; If the equipment operates at over maximum temperature due to external environment, user can simply identify the error with a visual signal or an audible buzzer sound.
 - Over-current circuit breaker.
- Eco-friendly R-404A / R-507 refrigerant use for environmental protection.
- Splash-proof keypad.

Testing in accordance with **DIN EN 12876**

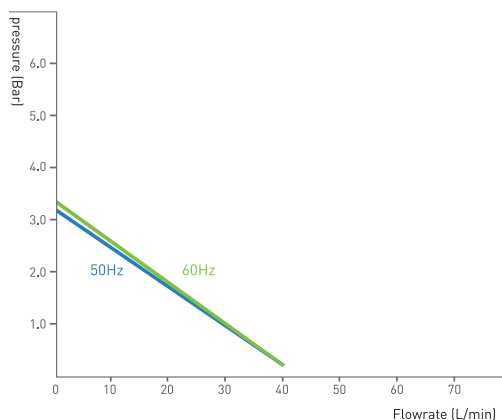
Standard accessories see page 120-121

- 3/4" male to 3/4" male adapters (2ea)
- Ball valves (2ea)

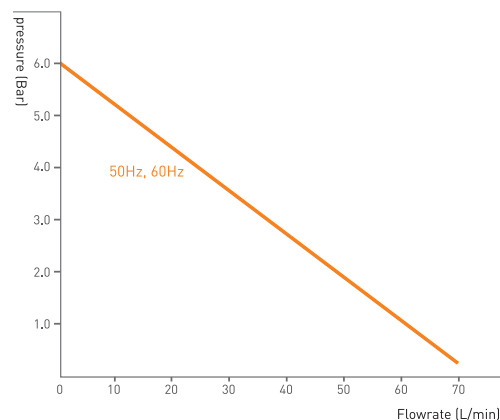


Pumping capacities (bath fluid : ethylene glycol mix 1:1 water)

Submersible pump



• HH - 15, 20, 25, 35



• HH - 45H, 55H

Model		HH-15	HH-20	HH-25	HH-35	HH-45H ²⁾	HH-55H ²⁾
Temperature ¹⁾ (bath fluid : ethylene glycol mix 1:1 water)	Working temperature range (℃ / °F)	-20 to 80 / - 4 to 176					
	Temperature stability at 15℃ (±℃ / °F)	0.1 / 0.2					
Cooling capacity (bath Fluid : ethylene glycol mix 1:1 water)	at 80℃ (kw)	2	2.5	3.5	4	6	7.5
	at 40℃ (kw)	0.9	1	2.4	2.5	4.5	5
	at 20℃ (kw)	1.45	1.8	2.5	3.3	6.5	7.1
	at 0℃ (kw)	0.86	1.15	1.1	1.7	3	4.1
	at -20℃ (kw)	0.3	0.4	0.4	0.55	1.2	1.5
Heating capacity(kw)		2		4		8.4	
Pump	Max. flow rate (L / min, gal / min)	40 / 10.6				70 / 18.5	
	Max. pressure (bar / psi)	3.3 / 47.9				6 / 87.02	
Dimension	Max. filling capacity (L, cu ft)	13.5 / 0.47		25 / 0.88		39 / 1.37	
	For tubing dia. (mm / inch)	20 / 3/4					
	Filling inlet (Ø, mm / inch)	120 / 4.7					
	Overall (WxDxH, mm / inch)	515×715× 835 / 20.3×28.1×32.9		550×900×1140 / 21.7×35.4×44.9		605×1045×1300 / 23.8×41.4×51.2	
	Net weight (kg / lbs)	92 / 202.8	93 / 205	142 / 313	147 / 324	171±10 / 377±22	176±10 / 388±22
	Electric requirement (230V, 60Hz)		15A	16A	27A	31A	
Cat. No.		AAH67011K	AAH67021K	AAH67031K	AAH67041K	-	-
Electric requirement (230V, 50Hz)		14.5A	15.5A	25A	30A		
Cat. No.		AAH67012K	AAH67022K	AAH67032K	AAH67042K	-	-
Electric requirement (380V, 60Hz)						18.3	19.8
Cat. No.		-	-	-	-	AAH67159K	AAH67169K
Electric requirement (380V, 50Hz)						17.8	19.3
Cat. No.		-	-	-	-	AAH67158K	AAH67168K

1) Technical data according to DIN 12876.

2) HH-45H, 55H is recorded by 380V, 60Hz.

* Above specification value is recorded by 50Hz.

* Product performance may be affected by ambient temperatures.

* Under the condition of no-load operation, cooling capacity should be lower than heating capacity.

* FDA establishment registered company. FDA listed products.

This compact designed model is ideal for cooling small laboratory equipment in daily use.



Performance

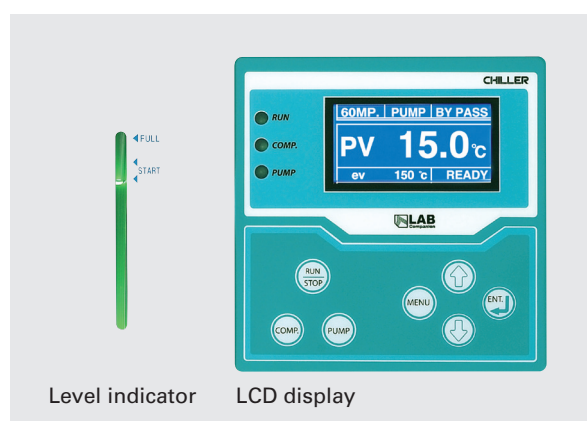
- Temperature range from -20 °C to 30 °C.
- Refrigerating system is designed to reduce energy consumption and maximize refrigerating efficiency.

Convenience

- Clear and easy-to-use LCD display. (resolution 0.1 °C)
- Bright LED water level indicator can be seen from a distance.
- Wide filling inlet for easy and safe pouring of solution into the unit.
- Double service valve prevents refrigerant leakage for easy maintenance.
- Removable gridded vent for easy maintenance of condenser.
- Compact design for space saving. The unit is suitable for stable temperature cooling compact devices such as rotary evaporators in laboratory.
- Variety of accessories are available to meet application demands.

Safety

- Self-diagnostic function identifying errors.
- Complete safety protection system with warning alarms.
 - Low fluid level and dry-running protection; when triggered shows an error symbol on the display and an audible buzzer sound.
 - Over-temperature protection; If the equipment operates at over maximum temperature due to external environment, user can simply identify the error with a visual signal or an audible buzzer sound.
 - Over-current circuit breaker.
- Eco-friendly R-507 refrigerant use for environmental protection.
- Splash-proof keypad.



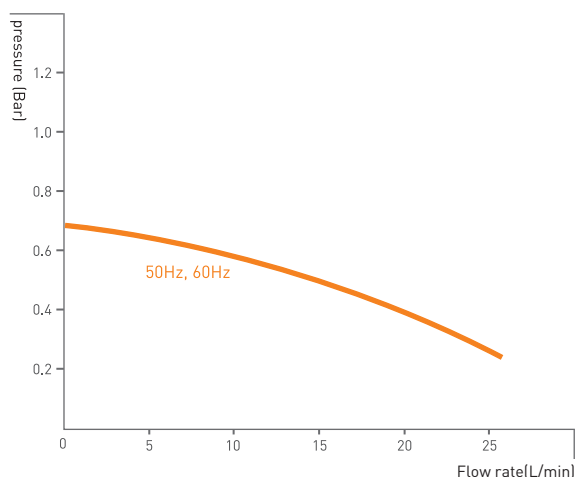
Testing in accordance with **DIN EN 12876**

Optional accessories see page 120-121

- Adapters
- Tubing, Insulations
- Tube clamps
- Bath fluid

Pumping capacities (bath fluid: ethanol)

Magnetic pump



• RC-05



Model		RC-05
Temperature ¹⁾	Working temperature range (°C / °F)	-20 to 30 / -4 to 86
	Temperature stability at 15°C (±°C / °F) (bath fluid : water)	1 / 1.8
Cooling capacity (bath fluid : ethanol)	at 20°C (kW)	0.58
	at 10°C (kW)	0.45
	at 0°C (kW)	0.35
	at -10°C (kW)	0.27
	at -20°C (kW)	0.11
Pump	Max. flow rate (L / min, gal / min)	26 / 6.87
	Max. pressure (bar / psi)	0.7 / 10.15
Dimension	Max. filling capacity (L / cu ft)	5 / 0.18
	For tubing dia. (mm / inch)	9.5 / 3/8
	Filling inlet (Ø, mm / inch)	37 / 1.4
	Overall (W×L×H, mm / inch)	300×550×530 / 11.8×21.7×20.9
	Net weight (kg / lbs)	45 / 99.2
Electrical requirements (230V, 60Hz)		4A
Cat. No.		ACH651011K
Electrical requirements (230V, 50Hz)		4A
Cat. No.		ACH651012K

1) Technical data according to DIN 12876.

* Above specification value is recorded by 60Hz.

* Product performance may be affected by ambient temperatures.

Accessories & Options

Barbed fittings

Cat. No.	Description
HXE1066	3/4" male to barbed fitting for tubing 1" inner dia.
HXE1067	3/4" male to barbed fitting for tubing 3/4" inner dia.
HXE1068	3/4" male to barbed fitting for tubing 5/8" inner dia.
HXE1069	3/4" male to barbed fitting for tubing 1/2" inner dia.
HXE1070	3/4" male to barbed fitting for tubing 3/8" inner dia.
AAA64501	1" barbed fittings set with ball valve
AAA64502	3/4" barbed fittings set with ball valve
AAA64503	5/8" barbed fittings set with ball valve
AAA64504	1/2" barbed fittings set with ball valve
AAA64505	3/8" barbed fittings set with ball valve
AAA64506	1" barbed fittings set with gate valve
AAA64507	3/4" barbed fittings set with gate valve
AAA64508	5/8" barbed fittings set with gate valve
AAA64509	1/2" barbed fittings set with gate valve
AAA64510	3/8" barbed fittings set with gate valve



Barbed fittings

Geared for quick connecting of various size type tubes using pipe fittings, tube fittings, and hose fittings without tools.

Connectors / Adapters

Cat. No.	Description
HXE1105	3/4" male to 3/4" female
HXE1106	3/4" male to 5/8" female
HXE1107	3/4" male to 1/2" female
HXE1108	3/4" male to 3/8" female
HXE1109	3/4" male to 3/4" male
HXE1110	3/4" male to 5/8" male
HXE1111	3/4" male to 1/2" male
HXE1112	3/4" male to 3/8" male



Connectors / Adapters

Connect tubing or other devices.

One touch adapters set

Cat. No.	Description
HXE1075	12mm one touch adapter
HXE1076	10mm one touch adapter
HXE1077	8mm one touch adapter
HXE1078	6mm one touch adapter
AAA64531	12mm adapters set with ball valve
AAA64532	10mm adapters set with ball valve
AAA64533	8mm adapters set with ball valve
AAA64534	6mm adapters set with ball valve

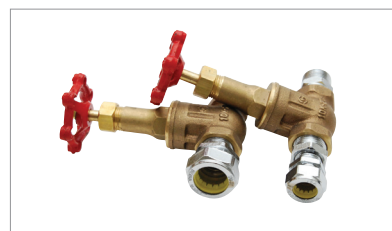


One touch adapters set

Convenient to connect and exchange tubing.

Flexible fittings

Cat. No.	Description
HXE1071	3/4" male to 3/4" flexible fitting
HXE1072	3/4" male to 1/2" female with 1/2" male to 1/2" flexible fitting
AAA64521	3/4" flexible fittings set with ball valve
AAA64522	1/2" flexible fittings set with ball valve
AAA64523	3/4" flexible fittings set with gate valve
AAA64524	1/2" flexible fittings set with gate valve



Flexible fittings

Stainless steel tubing designed for superior flexibility and with good chemical resistance.

Tubings

Cat. No.	Description	
HXE1079	1m 12mm urethane tubing	ID. 9mm, OD. 12mm
HXE1080	1m 10mm urethane tubing	ID. 6.5mm, OD. 10mm
HXE1081	1m 8mm urethane tubing	ID. 5.5mm, OD. 8mm
HXE1082	1m 6mm urethane tubing	ID. 4mm, OD. 6mm
HXE1083	1m 1" PVC tubing with thread	ID. 25mm, OD. 31mm
HXE1084	1m 3/4" PVC tubing with thread	ID. 19mm, OD. 24mm
HXE1085	1m 5/8" PVC tubing with thread	ID. 16mm, OD. 20.5mm
HXE1086	1m 1/2" PVC tubing with thread	ID. 12mm, OD. 16.0mm
HXE1087	1m 3/8" PVC tubing with thread	ID. 10mm, OD. 14mm
HXE1088	1m 1" PVC tubing with wire	ID. 25mm, OD. 33mm
HXE1089	1m 3/4" PVC tubing with wire	ID. 19mm, OD. 26mm
HXE1090	1m 5/8" PVC tubing with wire	ID. 15mm, OD. 22mm
HXE1091	1m 1/2" PVC tubing with wire	ID. 12mm, OD. 18mm
HXE1092	1m 3/8" PVC tubing with wire	ID. 9mm, OD. 15mm



Tubings

Excellent heat resistance and corrosion resistance urethane tubing.

Tubing insulations

Cat. No.	Description	
HXE1093	EPDM insulation, 16mm inner dia. (9T)	
HXE1094	EPDM insulation, 19mm inner dia. (9T)	
HXE1095	EPDM insulation, 25mm inner dia. (9T)	
HXE1096	EPDM insulation, 28mm inner dia. (9T)	
HXE1097	EPDM insulation, 35mm inner dia. (9T)	



Tubing insulations

EPDM insulation is used to reduce heat loss and condensation from cold water plumbing, chilled water, and refrigeration lines.

Flexible tubing

Cat. No.	Description	
HXE1073	3/4" flexible tubing (SUS 304, m)	
HXE1074	1/2" flexible tubing (SUS 304, m)	

Tube clamps

Cat. No.	Description	
HXE1098	1" clamp	
HXE1099	3/4" clamp	
HXE1100	5/8" clamp	
HXE1101	1/2" clamp	
HXE1102	3/8" clamp	



Tube clamps

Corrosion resistant stainless steel clamps

Bath fluid

Cat. No.	Description	
HXE1113	Distilled water (20L)	
HXE1114	Ethylene glycol (4L)	
HXE1115	Ethylene glycol (20L)	

Distributing fittings

Cat. No.	Description	
AAA64541	3-way distributing barbed fittings set (1/4")	
AAA64542	3-way distributing barbed fittings set (3/8")	



Distributing fittings

Distributing fittings connect even with small tubes with barb fittings.

External sensor (for HS, HH)

Cat. No.	Description	
CFA1946	3m cable for Pt 100 sensor	

Refrigerators & Freezers

Laboratory Refrigerators

Laboratory Freezers

Blood Bank Refrigerators

Plasma Freezers

Pharmacy Refrigerators

» General Applications

Laboratory Cooling

Chemical, Reagents, Culture storage.
Temperature Sensitive Material, Enzyme storage,
Pre-Freezing.

Medical Cooling

Valuable blood and blood plasma storage in life science.
Sensitive pharmaceutical products and vaccine
storage in clinics, hospitals, retail pharmacies.



Product Name		Laboratory Refrigerators	Laboratory Freezers			
Model		CLG	FDG	FCG	FMG	FHG
International standard		DIN 58345	DIN 58375			
Chamber volume (L)		156, 303, 603, 805, 1327	303, 647	154, 303, 647		
Temp. control	Min. temp. (°C/°F)	2 / 35.6	-50 / -58	-35 / -31	-25 / -13	-15 / 5
	Max. temp. (°C/°F)	10 / 50	-35 / -31	-25 / -13	-15 / 5	0 / 32
Door type		Selectable - Solid door or Glass door	Solid door			
Shelf	Wire	0	0	0	0	0
	Wire, Slide	0 (optional)	-	-	0 (optional)	-
	Drawer, Slide	0 (optional)	-	-	0 (optional)	-
Recorder		0 (optional)	0 (optional)	0 (optional)	0 (optional)	0 (optional)
Cable port		0 (except for 156L)	-	-	-	-
Battery backup		-	-	-	-	-
Electronic remote alarm		0 (optional)	0 (optional)	0 (optional)	0 (optional)	0 (optional)

» Technical Benefits

Performance

- Reliable cooling storage of laboratory and medical samples.
 - Designed and tested in accordance with the international standard DIN 58345 / DIN 58375.
 - Satisfied the strict requirements of the International medical standards. (ISO13485 / DIN 58371)
- Optimizing temperature control system for high temperature stability.
 - Automatic defrost and intelligent dual refrigeration system minimizes temperature change. Manual defrost system is also available for immediate control. (except for CLG)
- Shock absorbing door construction.
 - Magnetic door seal and air-tight silicone door seal for absorbing impact from opening and closing the door.
- Fully insulated chamber ensures minimal chamber temperature fluctuation.

Convenience

- Wide selection covers all of your application needs.
 - Storage sample (lab / medical)
 - Temperature down to 50 °C
 - Chamber size (154L to 1327L)
- Easy maintenance design.
 - Rounded corners for easy cleaning.
 - Corrosion resistant stainless steel interior chamber.
 - Dirt-repellent external surface with power coating.
- Intuitive and easy operation by VFD display with touch-sensitive buttons and jog dial.
- Clear view of the storage samples without opening the door. (for the models with glass doors only)
- Precise and easy documentation.
 - Chart type recorder is built in the medical cooling devices.
 - Optional three types of recorder. (dot / chart / thermal line recorder)

Safety

- Essential safety protection system.
 - High and low temperature limit alert.
 - Automatic power cut-off system against overheating.
 - Protection system by fuses against overcurrent.
 - Built-in door lock for safe sample storage.
 - Keypad lock button prevents inadvertent parameter changes.
- Advanced safety system to meet strict requirements of the medical cooling devices.
 - Dual temperature controllers.
 - Battery backup system.
 - Built in auto-dialing remote alarm to alert abnormal temperature change.
- Safe door open system to minimize heat loss and protect the stored sample.
 - Audible and visible open door alarms.
 - Automatic fan stop when door opening.
- Eco-friendly refrigerant protects the global environment.

Blood Bank Refrigerators	Plasma Freezers	Pharmacy Refrigerators
BSR	BSF	PSR
ISO13485 / DIN 58371	DIN 58375	DIN 58345
303 to 614	303 to 647	303 to 614
4 / 39.2	-40 / -40	0 / 32
	-25 / -13	10 / 50
Glass door	Solid door	Glass door
-	-	0 (optional)
-	-	0 (optional)
0	0	0
0	0	0
-	-	-
0	0	0
0	0	0

Ideal for research and industrial laboratories.

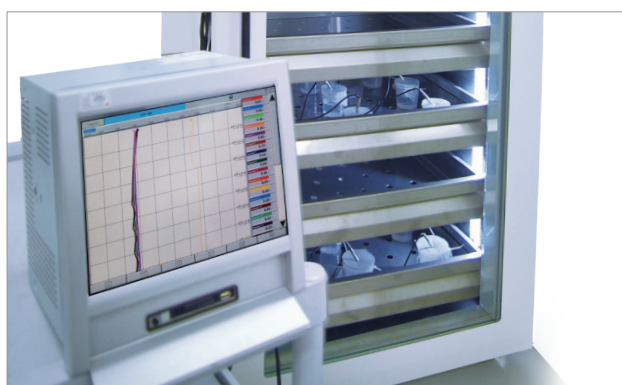
Your laboratory space is efficiently managed with our various different size models.



CLG models with optional recorder

- Standard accessories**
- Wire shelves, Door key
 - Cable port (except for 150L chamber)

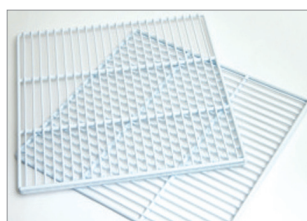
- Optional accessories**
see page 132-133
- Slid wire shelves, Slid drawers



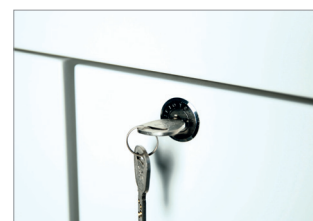
Reliable temperature control



Display



Wire shelves



Door key lock



Performance

- Fully insulated chamber ensuring minimal chamber's temperature fluctuation.
- High thermal efficiency evaporation system, made of low corrosive materials.
- Optimizing defrost systems
 - Innovative auto-defrost system automatically activated
 - Innovation auto-defrost system automatically activated on detecting amount of frost accumulated in the evaporator for CLG-150, 300, 650.
 - None defrost system needed for CLG-850, 1400 due to its dual refrigerating system.

Convenience

- Intuitive and easy-to-operate control panel with VFD and touch-sensitive buttons.
 - Easy temperature unit conversion between °C and °F
- Clear observation of stored samples.
 - Tempered glass door with built in heating wire. (for the models with glass doors only)
 - Built-in bright fluorescent lighting. (except for CLG-150)

- High-quality 304 grade stainless steel interior.
- Efficient internal space use with height adjustable wire shelves.
- Built-in 50mm diameter cable port for external probes or wires. (except for CLG-150)
- Dedicated stand with casters and stacking kit for CLG-150 for use in labs with limited space. (optional)
- Three types of recorders to choose from (optional)
 - Dot recorder (6 point)
 - Chart recorder (6", 24hr/7days)
 - Thermal line recorder

Safety

- High/low temperature protection, Over current protection.
- Open door alarm and automatic fan stop interlocked with door opening for minimization of heat loss.
- Keypad lock function, Built in door lock with a key.

Model		CLG-150	CLG-300	CLG-650	CLG-850	CLG-1400
Chamber volume (L / cu ft)		156 / 5.5	303 / 10.7	603 / 21.3	805 / 28.4	1327 / 46.9
Temperature range (°C / °F)		2 to 10 / 35.6 to 50				
Refrigerator (Hp)		1/8	1/6	1/4	1/6×2ea	1/4×2ea
No. of wire shelf (standard / max.)		2 / 6	3 / 11	3 / 17	3 / 17	6 / 34
No. of wire shelf, slide (max., optional)		4	7	11	11	22
No. of drawer shelf, slide (max., optional)		3	5	8	8	16
Max. load per shelf (kg / lbs)		26 / 57.3		30 / 66.1		
Material	Interior	Stainless steel #304				
	Exterior	Steel, 1 mm, powder coating				
	Insulation	60mm, Polyurethane foam				
Dimension (W×D×H)	Interior (mm / inch)	550×580×490 / 21.7×22.8×19.3	550×550×1000 / 21.7×21.7×39.4	650×640×1450 / 25.6×25.2×57.1	750×740×1450 / 29.5×29.1×57.1	1430×640×1450 / 56.3×25.2×57.1
	Exterior (mm / inch)	683×791×870 / 26.9×31.1×34.4	670×770×1515 / 26.4×30.3×59.6	770×865×1965 / 30.3×34.1×77.4	870×965×1965 / 34.3×37.9×77.4	1550×865×1965 / 61×34.1×77.4
	Net weight (kg / lbs)	100 / 220.4	130 / 286.6	210 / 463	260 / 573.2	350 / 771.6
Electrical requirements (230V, 60Hz)		2A	2.3 A	4A	5A	6A
Cat. No.	Solid door type	AAHE1001K	AAHE1011K	AAHE1021K	AAHE1031K	AAHE1041K
	Glass door type	AAHE1101K	AAHE1111K	AAHE1121K	AAHE1131K	AAHE1141K
Electrical requirements (230V, 50Hz)		2A	2.3 A	4A	5A	6A
Cat. No.	Solid door type	AAHE1002K	AAHE1012K	AAHE1022K	AAHE1032K	AAHE1042K
	Glass door type	AAHE1102K	AAHE1112K	AAHE1122K	AAHE1132K	AAHE1142K
Electrical requirements (120V, 60Hz)		4A	4.5 A	6.5 A	9A	13A
Cat. No.	Solid door type	AAHE1003U	AAHE1013U	AAHE1023U	AAHE1033U	AAHE1043U
	Glass door type	AAHE1103U	AAHE1113U	AAHE1123U	AAHE1133U	AAHE1143U

* Technical data according to DIN 58345.

* FDA establishment registered company. FDA listed products.

A variety of freezer models for subzero degree storage of your sensitive lab material with innovative defrost system.



FDG/FCG/FMG/FHG models

with optional recorder

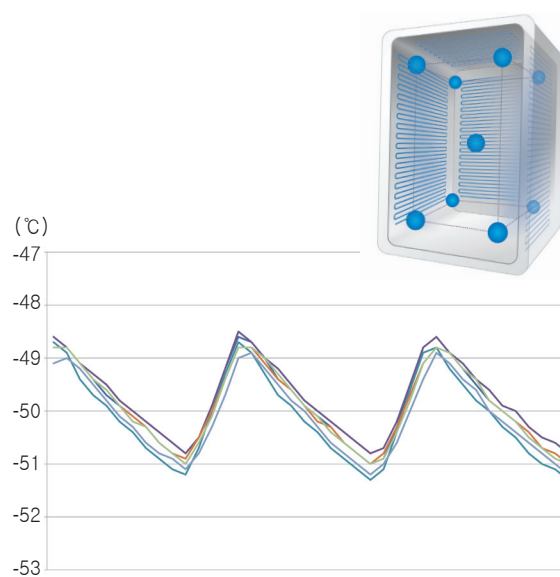
Standard accessories

- Wire shelves, Door key
- Cable port (except for 150L chamber)

Optional accessories

see page 132-133

- Three type recorders
(dot / chart / thermal line)



Reliable temperature control



Performance

- Excellent freezing control down to minimum -50°C (model dependent)
 - FDG model down to -50°C
 - FCG model down to -35°C
 - FMG model down to -25°C
 - FHG model down to -15°C
- Fully insulated chamber ensuring minimal chamber's temperature fluctuation.
- High thermal efficiency evaporation system, made of low corrosive materials.
- Dual defrost systems
 - Innovation auto-defrost system automatically activated on detecting amount of frost accumulated in the evaporator.
 - Additional manual defrost system for immediate frost removal.

Convenience

- Four-temperature different freezing models cover various storage application.
- Intuitive and easy-to-operate control panel with VFD and touch-sensitive buttons.
 - Easy temperature unit conversion between °C and °F

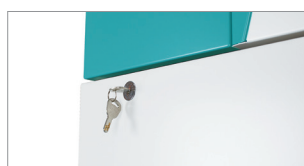
- Air-tight door seal and lockable door latch enhances tightness to door closure.
- High-quality 304 grade stainless steel interior.
- Efficient internal space use with height adjustable wire shelves.
- Dedicated stand with casters and stacking kit for FHG/FMG/FCG- 150 for use in labs with limited space. (optional)
- Three types of recorders to choose from (optional)
 - Dot recorder (6 point)
 - Chart recorder (6", 24hr/7 days)
 - Thermal line recorder

Safety

- High/low temperature protection, Over current protection.
- Open door alarm and automatic fan stop interlocked with door opening for minimization of heat loss.
- Keypad lock function, Built in door lock with a key.



Door open button



Door key lock



Display



Enough storage space

Laboratory Freezers

FDG models (for temperature range from -50°C to -35°C)

Model		FDG-300	FDG-650
Chamber volume (L / cu ft)		303 / 10.7	647 / 22.8
Temperature range (°C / °F)		-50 to -35 / -58 to -31	
Refrigerator (Hp)		1/3 x 2	1/2 x 2
No. of wire shelf (standard / max.)		3 / 11	3 / 17
Max. load per shelf (kg / lbs)		26 / 57.3	30 / 66.1
Material	Interior / Exterior	Stainless steel #304 / Steel, 1 mm, powder coating	
	Insulation	120mm, Polyurethane foam	
Dimension (WxDxH)	Interior (mm / inch)	550x550x1000 / 21.7x21.7x39.4	700x675x1370 / 27.6x26.6x53.9
	Exterior (mm / inch)	805x800x1690 / 31.7x31.5x66.5	955x925x2060 / 37.6x36.4x81.1
	Net weight (kg / lbs)	180 / 396.8	280 / 617.3
Electrical requirements (230V, 60Hz)		5.0A	6.5A
Cat. No.		AAHE2411K	AAHE2421K
Electrical requirements (230V, 50Hz)		5.0A	6.5A
Cat. No.		AAHE2412K	AAHE2422K

1) Technical data according to DIN 12880.

* Permissible environmental conditions: temperature (18 to 30°C) and relative humidity (up to 85%).

FCG models (for temperature range from -35°C to -25°C)

Model		FCG-150	FCG-300	FCG-650
Chamber volume (L / cu ft)		154 / 5.4	303 / 10.7	647 / 22.8
Temperature range (°C / °F)		-35 to -25 / -31 to -13		
Refrigerator (Hp)		3/4	1	1-1/2
No. of wire shelf (standard / max.)		2 / 6	3 / 11	3 / 17
Max. load per shelf (kg / lbs)		26 / 57.3		30 / 66.1
Material	Interior / Exterior	Stainless steel #304 / Steel, 1 mm, powder coating		
	Insulation	100mm, Polyurethane foam		
Dimension (WxDxH)	Interior (mm / inch)	550x570x490 / 21.7x22.4x19.3	550x550x1000 / 21.7x21.7x39.4	700x675x1370 / 27.6x26.6x53.9
	Exterior (mm / inch)	763x815x1055 / 30x32.1x41.5	765x760x1650 / 30.1x29.9x64.9	915x885x2020 / 36x34.8x79.5
	Net weight (kg / lbs)	123 / 271.2	155 / 341.7	238 / 524.7
Electrical requirements (230V, 60Hz)		6A	7.5A	10.5A
Cat. No.		AAHE2301K	AAHE2311K	AAHE2321K
Electrical requirements (230V, 50Hz)		6A	7.5A	10.5A
Cat. No.		AAHE2302K	AAHE2312K	AAHE2322K

FMG models (for temperature range from -25°C to -15°C)

Model		FMG-150	FMG-300	FMG-650
Chamber volume (L / cu ft)		154 / 5.4	303 / 10.7	647 / 22.8
Temperature range (°C / °F)		-25 to -15 / -13 to 5		
Refrigerator (Hp)		1/2	1/2	3/8
No. of wire shelf (standard / max.)		2 / 6	3 / 11	3 / 17
No. of wire shelf, slide (max., optional)		4	7	11
No. of drawer shelf, slide (max., optional)		3	5	8
Max. load per shelf (kg / lbs)		26 / 57.3		30 / 66.1
Material	Interior / Exterior	Stainless steel #304 / Steel, 1 mm, powder coating		
	Insulation	100mm, Polyurethane foam		
Dimension (WxDxH)	Interior (mm / inch)	550x570x490 / 21.7x22.4x19.3	550x550x1000 / 21.7x21.7x39.4	700x675x1370 / 27.6x26.6x53.9
	Exterior (mm / inch)	763x815x1055 / 30x32.1x41.5	765x760x1650 / 30.1x29.9x64.9	915x885x2020 / 36x34.8x79.5
	Net weight (kg / lbs)	120 / 264.6	150 / 330.7	233 / 513.7
Electrical requirements (230V, 60Hz)		4.5A	4.8A	5.5A
Cat. No.		AAHE2201K	AAHE2211K	AAHE2221K
Electrical requirements (230V, 50Hz)		4.5A	4.8A	5.5A
Cat. No.		AAHE2202K	AAHE2212K	AAHE2222K

FHG models (for temperature range from -15°C to 0°C)

Model		FHG-150	FHG-300	FHG-650
Chamber volume (L / cu ft)		154 / 5.4	303 / 10.7	647 / 22.8
Temperature range (°C / °F)		-15 to 0 / 5 to 32		
Refrigerator (Hp)		1/3	1/3	1/3
No. of wire shelf (standard / max.)		2 / 6	3 / 11	3 / 17
No. of wire shelf, slide (max., optional)		4	7	11
No. of drawer shelf, slide (max., optional)		3	5	8
Max. load per shelf (kg / lbs)		26 / 57.3		30 / 66.1
Material	Interior / Exterior	Stainless steel #304 / Steel, 1 mm, powder coating		
	Insulation	100mm, Polyurethane foam		
Dimension (WxDxH)	Interior (mm / inch)	550x570x490 / 21.7x22.4x19.3	550x550x1000 / 21.7x21.7x39.4	700x675x1370 / 27.6x26.6x53.9
	Exterior (mm / inch)	763x815x1055 / 30x32.1x41.5	765x760x1650 / 30.1x29.9x64.9	915x885x2020 / 36x34.8x79.5
	Net weight (kg / lbs)	120 / 264.6	150 / 330.7	230 / 507.1
Electrical requirements (230V, 60Hz)		3.5A	3.8A	3.8A
Cat. No.		AAHE2101K	AAHE2111K	AAHE2121K
Electrical requirements (230V, 50Hz)		3.5A	3.8A	3.8A
Cat. No.		AAHE2102K	AAHE2112K	AAHE2122K

* Technical data according to DIN 58375. * FDA establishment registered company. FDA listed products.



Performance

- Fully insulated chamber ensuring minimal chamber's temperature fluctuation.
- High thermal efficiency evaporation system, made of low corrosive materials.
- Auto-defrost system for automatic frost removal and manual defrost system for immediate frost removal.

Convenience

- Intuitive and easy-to-operate control panel with VFD and touch-sensitive buttons.
 - Easy temperature unit conversion between °C and °F
- Air-tight door seal and lockable door latch enhances tightness to door closure.
- High-quality 304 grade stainless steel interior.
- Easy to store samples with smooth full-extension sliding drawers.
- Precise documentation is available by the provided chart type recorder.
- Clear observation of stored samples.
 - Tempered glass door with built in heating wire.
 - Energy efficiency, long life span LED lighting.

Safety Features

- Dual temperature controllers for safe blood storage.
 - If one controller fails to adjust temperature, then the other automatically activates to counteract the failure.
- Battery backup for emergency caused by power failures.
- Built in auto-dialing remote alarm to alert abnormal temperature changes or power failures.
- High/low temperature protection, Over current protection.
- Open door alarm and automatic fan stop interlocked with door opening for minimization of heat loss.
- Keypad lock function, Built in door lock with a key.

Ideal for safe storage of precious blood samples.

Precise temperature uniformity with various safety functions to meet the strict requirements of the International medical standards. (ISO13485 / DIN 58371)



BSR-300

Standard accessories
see page 132-133

- Chart type recorder
- Auto dialing remote system
- Slide drawers, Door key

Model		BSR-300	BSR-650
Chamber volume (L / cu ft)		303 / 10.7	614 / 21.7
Temperature range (°C / °F)		4 / 39.2	
Refrigerator (Hp)		1/6	1/3
No. of drawer shelf, slide (standard / max.)		4 / 4	6 / 6
Max. load per shelf (kg / lbs)		26 / 57.3	30 / 66.1
Material	Interior	Stainless steel #304	
	Exterior	Steel, 1 mm, powder coating	
	Insulation	60mm, Polyurethane foam	
Dimension (WxDxH)	Interior (mm / inch)	550x550x1000 / 21.7x21.7x39.4	700x640x1370 / 27.6x25.2x53.9
	Exterior (mm / inch)	670x770x1515 / 26.4x30.3x59.6	820x860x1885 / 32.3x33.9x74.2
	Net weight (kg / lbs)	130 / 286.6	210 / 463
Electrical requirements (230V)		50/60Hz, 2.8A	50Hz, 3.8A 60Hz, 3.8A
Cat. No.		AAHE4105K	AAHE4112K AAHE4111K
Electrical requirements (120V)		60Hz, 5.5A	60Hz, 7.5A
Cat. No.		AAHE4103U	AAHE4113K

* Technical data according to DIN 58371.

* FDA establishment registered company. FDA listed products.

Plasma Freezers



The most suitable environments for sensitive plasma freezing.

Wide temperature range down to -40°C and high advanced safety functions satisfying the high medical standards. (DIN 58375)



BSF-650

Standard accessories
see page 132-133

- Chart type recorder
- Auto dialing remote system
- Slide drawers, Door key

Performance

- Fully insulated chamber ensuring minimal chamber's temperature fluctuation.
- High thermal efficiency evaporation system, made of low corrosive materials.
- Auto-defrost system for automatic frost removal and manual defrost system for immediate frost removal.

Convenience

- Intuitive and easy-to-operate control panel with VFD and touch-sensitive buttons.
 - Easy temperature unit conversion between °C and °F
- Air-tight door seal and lockable door latch enhances tightness to door closure.
- High-quality 304 grade stainless steel interior.
- Easy to store samples with smooth full-extension sliding drawers.
- Precise documentation is available by the provided chart type recorder.

Safety

- Dual temperature controllers for safe blood storage.
 - If one controller fails to adjust temperature, then the other automatically activates to counteract the failure.
- Battery backup for emergency caused by power failures.
- Built in auto-dialing remote alarm to alert abnormal temperature changes or power failures.
- High/low temperature protection, Over current protection.
- Open door alarm and automatic fan stop interlocked with door opening for minimization of heat loss.
- Keypad lock function, Built in door lock with a key.

Model		BSF-300		BSF-650	
Chamber volume (L / cu ft)		303 / 10.7		647 / 22.8	
Temperature range (°C / °F)		-40 to -25 / -40 to -13			
Refrigerator (Hp)		1		1-1/2	
No. of drawer shelf, slide (standard / max.)		4 / 4		6 / 6	
Max. load per shelf (kg / lbs)		26 / 57.3		30 / 66.1	
Material	Interior	Stainless steel #304			
	Exterior	Steel, 1 mm, powder coating			
	Insulation	100mm, Polyurethane foam			
Dimension (WxDxH)	Interior (mm / inch)	550x550x1000 / 21.7x21.7x39.4		700x675x1370 / 27.6x26.6x53.9	
	Exterior (mm / inch)	765x760x1650 / 30.1x29.9x64.9		915x885x2020 / 36x34.8x79.5	
	Net weight (kg / lbs)	150 / 331		240 / 529	
Electrical requirements (230V)		50Hz, 5.5A	60Hz, 5.5A	50Hz, 7.5A	60Hz, 7.5A
Cat. No.		AAHE5102K	AAHE5101K	AAHE5112K	AAHE5111K
Electrical requirements (120V)		60Hz, 11A			
Cat. No.		AAHE5103U		-	

* Technical data according to DIN 58375.

* FDA establishment registered company. FDA listed products.



Performance

- Fully insulated chamber ensuring minimal chamber's temperature fluctuation.
- High thermal efficiency evaporation system, made of low corrosive materials.
- Auto-defrost system for automatic frost removal and manual defrost system for immediate frost removal.

Convenience

- Intuitive and easy-to-operate control panel with VFD and touch-sensitive buttons.
 - Easy temperature unit conversion between °C and °F
- High-quality 304 grade stainless steel interior.
- Easy to store samples with smooth full-extension sliding drawers.
- Precise documentation is available by the provided chart type recorder.
- Clear observation of stored samples.
 - Tempered glass door with built in heating wire.
 - Energy efficiency, long life span LED lighting.

Safety

- Dual temperature controllers for safe pharmaceutical storage.
 - If one controller fails to adjust temperature, then the other automatically activates to counteract the failure.
- Battery backup for emergency caused by power failures.
- Built in auto-dialing remote alarm to alert abnormal temperature changes or power failures.
- High/low temperature protection, Over current protection.
- Open door alarm and automatic fan stop interlocked with door opening for minimization of heat loss.
- Keypad lock function, Built in door lock with a key.

Ideal for pharmaceutical, clinical laboratories

Eco-friendly lab refrigeration systems with advanced safety features providing stable refrigerated environments (DIN 58345)



PSR-300

Standard accessories
see page 132-133

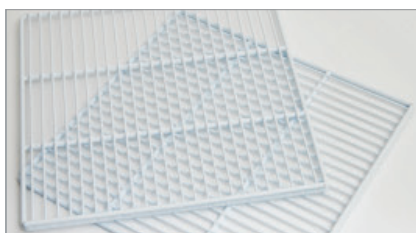
- Chart type recorder
- Auto dialing remote system
- Slide drawers, Door key

Model		PSR-300	PSR-650	
Chamber volume (L / cu ft)		303 / 10.7	614 / 21.7	
Temperature range (°C / °F)		2 to 10 / 35.6 to 50		
Refrigerator (Hp)		1/6	1/3	
No. of drawer shelf, slide (standard / max.)		4 / 4	6 / 6	
Max. load per shelf (kg / lbs)		26 / 57.3	30 / 66.1	
Material	Interior	Stainless steel #304		
	Exterior	Steel, 1 mm, powder coating		
	Insulation	60mm, Polyurethane foam		
Dimension (WxDxH)	Interior (mm / inch)	550x550x1000 / 21.7x21.7x39.4	700x640x1370 / 27.6x25.2x53.9	
	Exterior (mm / inch)	670x770x1515 / 26.4x30.3x59.6	820x860x1885 / 32.3x33.9x74.2	
	Net weight (kg / lbs)	130 / 286.6	210 / 463	
Electrical requirements (230V)		50/60Hz, 2.8A	50Hz, 3.8A	60Hz, 3.8A
Cat. No.		AAHE6015K	AAHE6022K	AAHE6021K
Electrical requirements (120Hz)		60Hz, 5.5A	60Hz, 7.5A	
Cat. No.		AAHE6013U	AAHE6023U	

* Technical data according to DIN 58345.

* FDA establishment registered company. FDA listed products.

Accessories & Options



Wire shelves



Wire shelves (slide type)



Drawer shelves (slide type)



Dot recorder



Chart recorder



Thermal line recorder

for Laboratory Cooling

Cat. No.	Description	CLG-150	CLG-300	CLG-650	CLG-850	CLG-1400
AAAE1511	Wire shelves - flat type (included shelf bracket)	•	•	-	-	-
AAAE1512		-	-	•	-	•
AAAE1513		-	-	-	•	-
AAAE1514	Wire shelves - slide type (included guide rail)	•	•	-	-	-
AAAE1515		-	-	•	-	•
AAAE1516		-	-	-	•	-
AAAE1517	Drawer shelves - slide type (included guide rail)	•	•	-	-	-
AAAE1518		-	-	•	-	•
AAAE1519		-	-	-	•	-
AAA8T500	Recorder (dot type , 6 point)	•	•	•	•	•
AAAE1501	Recorder (chart type, 6", 24hr / 7day)	•	•	•	•	•
AAAE1502	Chart recorder paper (6", 60ea/1 package)	•	•	•	•	•
AAAE1503	Recorder (thermal line type)	•	•	•	•	•
AAAE1521	Cable port	-	•	•	•	•
AAAE1531	Electric outlet (120V-US style)	-	•	•	•	•
AAAE1532	Electric outlet (230V-Korea style)	-	•	•	•	•

Cat. No.	Description	FHG-150 / FMG-150	FHG-300 / FMG-300	FHG-650 / FMG-650	FCG-150	FCG-300 / FDG-300	FCG-650 / FDG-650
AAAE1511	Wire shelves - flat type (included shelf bracket)	•	•	-	•	•	-
AAAE1512		-	-	•	-	-	•
AAAE1514	Wire shelves - slide type (included guide rail)	•	•	-	-	-	-
AAAE1515		-	-	•	-	-	-
AAAE1517	Drawer shelves - slide type (included guide rail)	•	•	-	-	-	-
AAAE1518		-	-	•	-	-	-
AAA8T500	Recorder (dot type , 6 point)	•	•	•	•	•	•
AAAE1501	Recorder (chart type, 6", 24hr / 7day)	•	•	•	•	•	•
AAAE1502	Chart recorder paper (6", 60ea/1 package)	•	•	•	•	•	•
AAAE1503	Recorder (thermal line type)	•	•	•	•	•	•

for Medical Cooling

Cat. No.	Description	BSR-300	BSR-650
AAAE1517	Drawer shelves - slide type (included guide rail)	•	-
AAAE1518		-	•
AAAE1501	Recorder (chart type, 6", 24hr / 7day)	•	•
AAAE1502	Chart recorder paper (6", 60ea/1 package)	•	•
AAAE1551	Auto dialing remote system	•	•

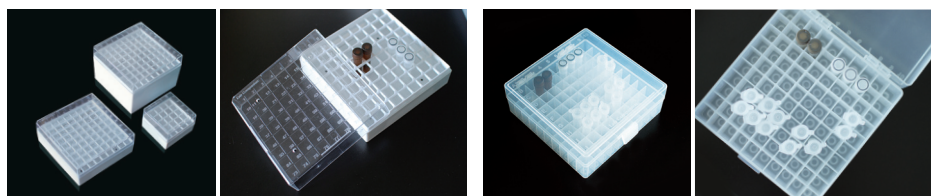
Cat. No.	Description	BSF-300	BSF-650
AAAE1517	Drawer shelves - slide type (included guide rail)	•	-
AAAE1518		-	•
AAAE1501	Recorder (chart type, 6", 24hr / 7day)	•	•
AAAE1502	Chart recorder paper (6", 60ea/1 package)	•	•
AAAE1551	Auto dialing remote system	•	•

Cat. No.	Description	PSR-300	PSR-650
AAAE1511	Wire shelves - flat type (included shelf bracket)	•	-
AAAE1512		-	•
AAAE1514	Wire shelves - slide type (included guide rail)	•	-
AAAE1515		-	•
AAAE1517	Drawer shelves - slide type (included guide rail)	•	-
AAAE1518		-	•
AAAE1501	Recorder (chart type, 6", 24hr / 7day)	•	•
AAAE1502	Chart recorder paper (6", 60ea/1 package)	•	•
AAAE1551	Auto dialing remote system	•	•

Cryo box / Storage box

Cryo box is designed for ultra-low temperature storage of biological materials. (heat resistance : -196℃ to 121℃)

Storage box is suitable for storage of samples in general conditions. (heat resistance: 20℃ to 121℃)



Cryo box

Storage box

Cat. No.	Description	Dimension (WxDxH) (mm / inch)
AAAJ7001	Cryo box (PC, 1.2 to 2.0ml tubes x 25)	77×77×53 / 3.0×3.0×2.1
AAAJ7002	Cryo box (PC, 1.2 to 2.0ml tubes x 81)	132×132×54 / 5.2×5.2×2.1
AAAJ7003	Cryo box (PC, 5ml tubes x 81)	132×132×96 / 5.2×5.2×3.8
AAAJ7011	Storage box (PP, 1.2 to 2.0ml tubes x 100)	140×140×53 / 5.5×5.5×2.1

Rotator

Effective mixing of biological samples in a variety of vials.
Ideal for immune precipitations, prevention of blood coagulation,
latex diagnostics etc.



CRT-350

with optional accessories

Optional accessories

- Tube holders
- Erlenmeyer flask clamp holders (disk for flask clamp & flask clamp)
- Post (tube holder fixture for double stacking)



Fully adjustable angle



Quick installable and removable disk (optional)



Max. mountable tubes when double stacking

Tube	Quantity (ea)
1.5ml	120
5ml	36
15ml	36
50ml	24



Performance

- Microprocessor PID control.
- Adjustable speed range from 2 to 70 rpm.
- Fully adjustable tilt angle up to 90°.
 - Horizontal for minimal mixing and vertical for full end-over-end mixing.
- Digital speed control providing gentle rotating even at low speed.
- Low-profile design with rubber feet for minimal vibration and noise.

Convenience

- Simple fixture of accessories equipped to disk for quick installation and removal.
- Various selection of optional tubes and flask clamp holder disks to accommodate most application.

- Available to rotary maximum 108 test tubes simultaneously with use of two tube holders by optional dual holder accessory.
- Vivid and colorful vacuum fluorescent display (VFD) with touch-sensitive keypad.
- One-touch timer range: 1 min. to 99 hr. 59 min.
- Compact and lightweight design allow for use in cold rooms or incubators.

Safety

- Stepping motor with self-protection function for advanced durability.
- Self-diagnostic function identifying errors.
- Its polypropylene main body is highly chemical-resistant and easy-to-clean.
- Over-current protection.

Model		CRT-350
Control system		PID feedback control
Display		VFD
Shaking system	Motion type	Orbital
	Speed range (rpm)	2 to 70
	Tilt angle	0 to 90°
	Max. load (kg / lbs)	4 / 8.8
Material	Disk (optional)	Aluminum
	Body	PP (polypropylene)
Dimension	Exterior with disk (optional) (WxDxH) (mm / inch)	320x325x463 / 12.6x12.8x18.2
	Net weight with disk (optional) (kg / lbs)	7.5 / 16.5
Electrical requirements		AC 100 to 240 V, 50/60 Hz
Cat. No.	KR plug	AAH3E115K
	US plug	AAH3E115U

※ Permissible environmental conditions: temperature (5-40°C) and relative humidity (up to 80%).

Tube holder set with disk

Description	Max. mountable tube	Cat. No.
1.5ml (Ø10mm / Ø0.39")	60	AAA3E501
5ml (Ø12mm / Ø0.47")	18	AAA3E502
15ml (Ø16.5mm / Ø0.65")	18	AAA3E503
50ml (Ø29mm / Ø1.14")	12	AAA3E504



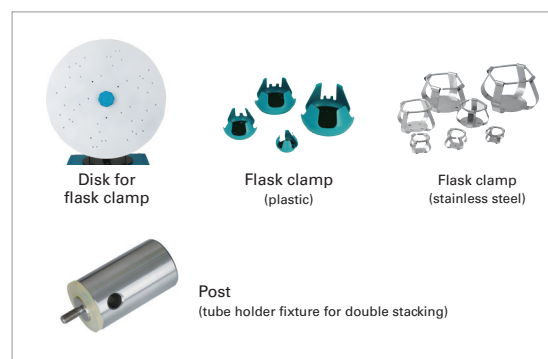
Tube holders (1.5ml / 5ml / 15ml / 50ml)

Erlenmeyer flask clamp holders

Description	Max. mountable tube		Cat. No.
Disk for flask clamp	N/A		AAA3E511
	50ml	13	AAA23550
	100ml	8	AAA23551
Flask clamp (stainless steel)	300ml	6	AAA23556
	50ml	13	AAA30570
	100ml to 125ml	8	AAA30571
Flask clamp (plastic)	300ml	6	AAA30574

Tube holder fixture for double stacking

Description	Cat. No.
Post	AAA3E521



Shaker

Open-air Shakers

(Dual-action/General/Advanced Models)

Mini Shaker

Microplate Shaker

Rocking Shaker

Waving Shaker

Heating Shaker

Separatory Funnel Shaker

» General Applications

Shakers

General mixing, Drug analysis, ELISA, Enzyme immunoassays, Staining and Destaining, Protein synthesis.

Heating Shaker

Useful for a variety of molecular biology applications.

Separatory Funnel Shaker

Intensive vertical reciprocating agitation for quick solvent extraction.



Product name		Open-air Shakers (Dual-action Model)	Open-air Shakers (General Model)	Open-air Shakers (Advanced Model)
Model		OS	OS	SKC
Platform size (WxD, mm)		320x260, 350x350	450x450, 755x520	580x520, 660x520, 755x520, 885x520
RPM control	Motion	Orbital, Reciprocating	Orbital	Orbital
	Amplitude size (mm)	12.7, 19.1, 25.4	19.1, 25.4, 50.8	19.1, 25.4, 50.8
	Speed range (rpm)	20 to 500	20 to 500 ¹⁾	30 to 500
Control	PID feedback control	0	0	0
	Timer	Wait off	Wait off	Wait on/off
	Program function	-	-	0
	Computer interface	RS-232 port, USB port	RS-232 port, USB port	-
Safety	Over current limit	0	0	0
	Auto-run (power failure)	0	0	-
	Shaking speed deviation limit	0	0	-
	Automatic shaking speed adjustment	0	0	0

1) Max. and Min. rpm is dependable by amplitude size.

2) Max. rpm is dependable by loaded block.

» Technical Benefits

Shaker (OS / SKC)

Performance

- Incomparable 500 rpm even with heavy workload.
- Microprocessor PID control ensuring consistent shaking motion and precision accuracy.
- Smooth start and smooth stop function for pleasant test environment.
- In case of excessive workload, it automatically controls the shaking speed to the optimum rpm before safety system activation not to stop the operation in the middle of the test.

Convenience

- Easy maintenance design.
 - Corrosion resistant stainless steel platform. (Optional)
 - Waterproof designed control panel.
- RS-232 port and USB port for simple external control and data collection. (for OS)

Safety

- Patented CLS-CS (Custom Logical Safe Control System)
 - Protection system against overcurrent and stalled platform check.
 - Automatic Run or Manual Run after power interruption.
- Real time shaking speed deviation alarm (for OS).

Shaker (CMS / CPS / CRS / CWS)

Performance

- Microprocessor PID control ensuring consistent shaking motion and precision accuracy.
- Smooth start and smooth stop function for pleasant test environment.

Convenience

- Bright VFD display with responsive touch buttons.
 - One-touch timer for time-dependent shaking operations.
- Compact and lightweight design allowing for use inside chambers.

Safety

- Patented CLS-CS (Custom Logical Safe Control System)
 - Protection system against overcurrent.

Mini Shaker	Microplate Shaker	Rocking Shaker	Waving Shaker	Heating Shaker	Separatory Funnel Shaker
CMS-350	CPS-350	CRS-350	CWS-350	CBS-350	RS-1
250×250	269×185 (Tray)	276×276 (dimpled mat)	276×276 (dimpled mat)	-	6 funnel holders
Oribital	Oribital	Rocking	Waving	Oribital	Vertical reciprocating
13	3	Adjustable tilt 7° to 13°	Adjustable tilt 0° to 13°	2	40
50 to 300	150 to 1200	5 to 100	8 to 100	150 to 1500 ²⁾	50 to 300
0	0	0	0	0	-
Wait off	Wait off	Wait off	Wait off	Wait on/off	Wait off
-	-	-	-	0	-
-	-	-	-	-	-
0	0	0	0	0	0
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

Shaker Series

Lab Companion's wide ranged shakers are covering almost all of your applications. Find a shaker suitable for your needs.





Performance

- Dual-action shaking motion: Orbital / Reciprocating.
- Microprocessor PID control / Shaking speed calibration.
- Competitive high shaking speed up to 500 rpm.
- Shaking motion in various amplitude.
 - 12.7mm or 19.1mm for OS-2000
 - 19.1mm or 25.4mm for OS-3000
- Wide speed range even with heavy workload.
 - Equipped with a maintenance-free BLDC motor to generate smooth, quiet, uniform, and yet powerful shaking motion.
- Best effort run function intelligently manages its rpm to keep shaking even workload is out of its capacity.
- Pleasant test environment by the smooth acceleration and deceleration control.
- Low-profile design minimizes vibration or sliding caused by the high speed shaking motion.

Convenience

- User friendly control panel.
 - Lab Companion's unique VFD-bright, clear, easy to read.
 - Durable membrane touch switch and control knob.
- Easy-set digital timer. (1 min. to 999 hr. 59 min.)
- Repetitive task can be easily performed as the platform stops where it starts.
 - Stopping the shaking platform always at the same position is highly beneficial for automated dosing or sampling process.
- Speed is basically set and displayed in increments of 1 rpm. Also speed increment interval can be set among 1, 5, 10 rpm according to users preference.
- RS-232 port and USB port for external control and data collection.

Safety

- Automatic run after power interruption.
- Shaking speed deviation alarm.
- Over-current protection, Stalled platform check.

Dual-action benchtop platform shakers accommodate flask up to 6L.

The most versatile shakers at a reasonable price offer an ideal solution for your mixing needs.



OS-3000

with optional dedicated platform

Optional accessories
see page 150-151

- Rubber mats, Universal attachments
- Funnel clamps, Test tube racks

Control panel



Model		OS-2000	OS-3000
Shaking system	Motion type	Orbital or Reciprocating motion selectable	
	Amplitude size (mm / inch, dia.)	12.7, 19.1 / 0.5, 0.8 (standard 19.1 / 0.75)	19.1, 25.4 / 0.8, 1 (standard 19.1 / 0.75)
	Speed range ²⁾ (rpm)	20 to 500	
	Accuracy	±1 % of set speed (≥100rpm) / ±1 (≤100rpm)	
	Timer	1 min. to 999 hr. 59 min.	
Max. load (kg / lbs)		10 / 22.0 at 500 rpm in orbital shaking motion 8.5 / 18.7 at 500 in reciprocating shaking motion	
Dimension	Platform (WxD) (mm / inch)	320x260 / 12.6x10.2	350x350 / 13.8x13.8
	Body (WxDxH) (mm/inch) ¹⁾	354x388x146/ 13.9x15.3x5.7	409x508x141/ 16.1x20x5.6
	Net weight (Kg / lbs)	22 / 48.5	28 / 61.7
Electrical requirements (230V, 50 / 60Hz)		0.3A	0.3A
Cat. No.		AAH3D1115K	AAH3D1215K
Electrical requirements (120V, 50 / 60Hz)		0.6A	0.6A
Cat. No.		AAH3D1165U	AAH3D1265U

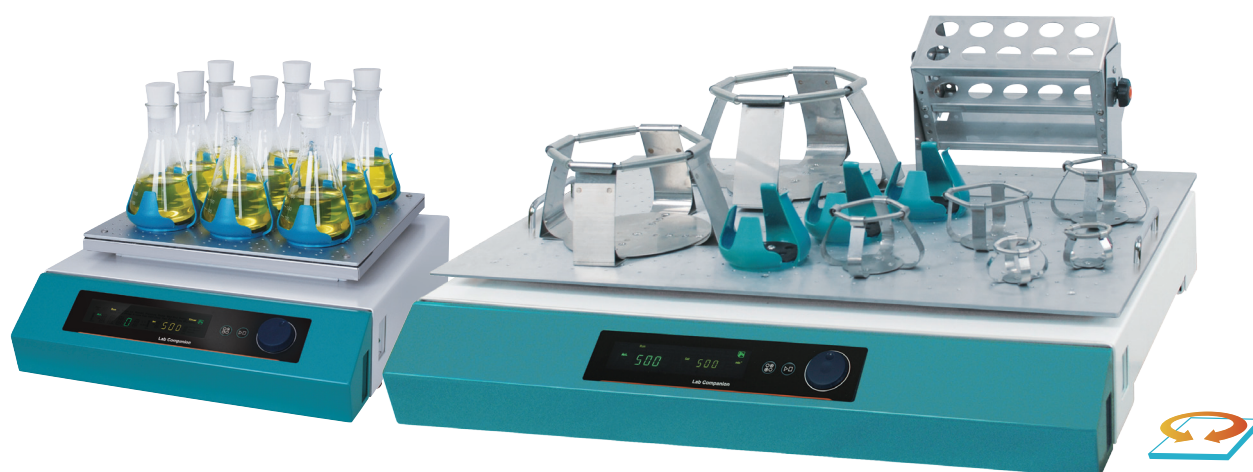
1) Main body dimension without accessories.

2) In case of operating at high speed (350 to 500 rpm), it is recommended to use optional attachments to be fixed on the working surface.

* FDA establishment registered company. FDA listed products.

Powerful driving system with a durable body structure increases shaking capacity.

Suitable for larger or heavier workloads requiring accurate and reproducible results.



OS-4000 / OS-7100

with optional accessories

Optional accessories
see page 150-151

- Dedicated platforms, Universal platforms
- Flask clamps, Test tube racks



Various accessories installable



Control panel



Computer interface



Performance

- Microprocessor PID control.
 - Intelligent speed controller enables reproducible results.
- Shaking speed calibration enables matching the displayed rpm to the reference point.
- Competitive high shaking speed up to 500 rpm.
- Orbital shaking motion in various diameter.
 - 19.1mm or 25.4mm for OS-4000
 - 25.4mm for OS-7100
 - 50.8mm for OS-7200
- Wide speed range even with heavy workload.
 - Ideal DD(Direct Drive) Brushless Motor and triple cam system support heavy load, quiet, maintenance free operation and deliver high torque at high speeds and smooth rotation. (for OS-7100/7200)
 - Equipped with a maintenance-free BLDC motor to generate smooth, quiet, uniform, and yet powerful shaking motion. (for OS-4000)
- Best effort run function intelligently manages its rpm to keep shaking even workload is out of its capacity.
 - Automatic shaking speed adjustment in case of excessive workload such as unbalanced load placement, unusual vibrations caused from unstable floor or external shock.
- Pleasant test environment by the smooth acceleration and deceleration control.
 - Smooth start and smooth stop function prevent chemical spills from flasks or test tubes.
- Low-profile design minimizes vibration or sliding caused by the high speed shaking motion.

Convenience

- User friendly control panel.
 - Lab Companion's unique VFD-bright, clear, easy to read.
 - Durable membrane touch switch and control knob.
- Easy-set digital timer. (1 min. to 999 hr. 59 min.)
- Repetitive task can be easily performed as the platform stops where it starts.
 - Stopping the shaking platform always at the same position is highly beneficial for automated dosing or sampling process.
- Speed is basically set and displayed in increments of 1 rpm. Also speed increment interval can be set among 1, 5, 10 rpm according to users preference.
- Built-in RS-232 port and USB port for external control and data collection.
- Variety of accessories are available to meet application demands.

Safety

- Automatic run after power interruption.
- Shaking speed deviation alarm.
- Over-current protection, Stalled platform check. (stalled platform check is for OS-4000)

Model		OS-4000		OS-7100	OS-7200
Control system		PID feedback control			
Display		VFD			
Shaking system	Motion type	Orbital			
	Amplitude size (mm / inch, dia.)	19.1 / 0.75 (standard)	25.4 / 1 (adjustable)	25.4 / 1	50.8 / 2
	Speed range ²⁾ (rpm)	20 to 500	20 to 450	30 to 500	30 to 300
	Accuracy	±1% of set speed (≥100rpm) / ±1 (≤100rpm)			
	Timer	1 min. to 999 hr. 59 min.			
Max. load (kg / lbs)		14 / 30.9 at 500 rpm 21 / 46.3 at 400 rpm	10 / 22.0 at 450 rpm 21 / 46.3 at 300 rpm	10 / 22.0 at 500 rpm 25 / 55.1 at 400 rpm	23 / 50.7 at 300 rpm 35 / 77.2 at 200 rpm
Dimension	Platform (WxD) (mm / inch)	450×450 / 17.7×17.7		755×520 / 29.6×20.5	
	Body ¹⁾ (WxDxH) (mm/inch)	510×632×156 / 20.1×24.9×6.1		755×627×151 / 29.7×24.7×5.9	
	Net weight (Kg / lbs)	43 / 94.8		117 / 257.9	
Electrical requirements (230V, 50 / 60Hz)		0.3A		0.4A	
Cat. No.		AAH3D1315K		AAH3D1415K	AAH3D1515K
Electrical requirements (120V, 50 / 60Hz)		0.6A		0.8A	
Cat. No.		AAH3D1365U		AAH3D1465U	AAH3D1565U

1) Main body dimension without accessories.

2) In case of operating at high speed (350 to 500 rpm), it is recommended to use optional attachments to be fixed on the working surface.

* Permissible environmental conditions: temperature (5-40°C) and relative humidity (up to 80%).

* CSA for OS-4000. * FDA establishment registered company. FDA listed products.

Innovative triple-cam shaking mechanism with offering reliable performance across a wide speed range.

Specially designed to carry out heavy-duty and trouble-free operations continuously.



SKC - 7075

with optional slide type dedicated platform

Optional accessories

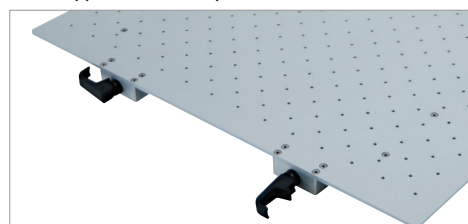
see page 152

- Dual universal platforms, Rubber mats, Universal attachments
- Flask clamps, Funnel clamps, Test tube racks, Spring wire racks

Control panel

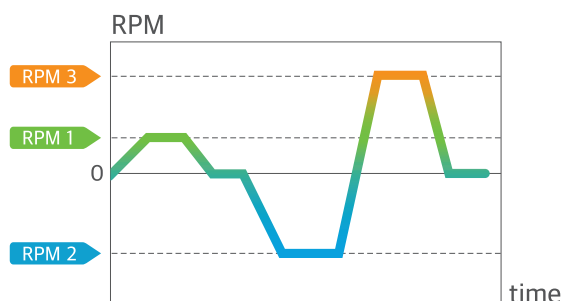


Slide type universal platform (optional)





Progressive program operation



Programming parameters			
Max. number of segments in one(1) pattern (cycle)		20	
Max. number of patterns (cycle) saved		20	
Shaking motion - Forward & Backward, Pause	Time	1min. to 99hr. 59min.	
	rpm	30 to 500	

Performance

- Microprocessor PID control maintaining constant speed
- Competitive high shaking speed up to 500 rpm.
- Orbital shaking motion in various diameter.
 - 19mm for SKC-6075/7075
 - 25mm for SKC-6100/7100
 - 50mm for SKC-6200/7200
- Wide speed range even with heavy workload.
 - Ideal DD(Direct Drive) Brushless Motor and triple cam system support heavy load, quiet, maintenance free operation and deliver high torque at high speeds and smooth rotation.

- Best effort run function intelligently manages its rpm to keep shaking even workload is out of its capacity.
- Automatic shaking speed adjustment in case of excessive workload such as unbalanced load placement, unusual vibrations caused from unstable floor or external shock.
- Pleasant test environment by the smooth acceleration and deceleration control.
- Smooth start and smooth stop function prevent chemical spills from flasks or test tubes.
- Exceptional low-profile design (only 12cm from bottom to platform) minimizes vibration or sliding caused by the high speed shaking motion.

Convenience

- User friendly control panel.
 - Lab Companion's unique VFD-bright, clear, easy to read.
 - Durable membrane touch switch and control knob.
- Easy-exchangeable slide type universal platform reduces physical fatigue when handling the heavy load samples. (optional)
- Repetitive task can be easily performed as the platform stops where it starts.
- Stopping the shaking platform always at the same position is highly beneficial for automated dosing or sampling process.
- Variety of accessories are available to meet application demands.

Safety

- Shaking speed deviation alarm.
- Over-current protection.

Model			SKC-6075		SKC-6100		SKC-6200		SKC-7075		SKC-7100		SKC-7200	
Control system			PID feedback control											
Display			VFD											
Shaking system	Motion type		Orbital											
	Amplitude size (mm / inch, dia)		19 / 0.75		25 / 1		50 / 2		19 / 0.75		25 / 1		50 / 2	
	Speed range ²⁾ (rpm)		30 to 500											
	Accuracy at 100 rpm		±1											
Dimension	Platform (WxD) (mm / inch)	Small	580×520 / 22.8×20.5						755×520 / 29.7×20.5					
		Large	660×520 / 26×20.5						885×520 / 34.8×20.5					
	Body ¹⁾ (WxD×H) (mm / inch)		582.8×618 ×122.2						754.8×662×122.2					
			22.9×24.3×4.8						29.7×26.1×4.8					
	Net weight (kg / lbs)		65 / 143.3						75 / 165.4					
Electric requirements (230V, 50 / 60Hz)			0.4A											
Cat. No.			AAH30105K		AAH30115K		AAH30125K		AAH30205K		AAH30215K		AAH30225K	
Electric requirements (120V, 60Hz)			0.8A											
Cat. No.			AAH30106U		AAH30116U		AAH30126U		AAH30206U		AAH30216U		AAH30226U	

1) Main body dimension without accessories.

2) In case of operating at high speed (350 to 500 rpm), it is recommended to use optional attachments to be fixed on the working surface.

* Permissible environmental conditions: temperature (5-40°C) and relative humidity (up to 80%).

* FDA establishment registered company. FDA listed products.

Mini Shaker



Compact and lightweight design for space saving and portability with real-time responsive speed control knob.



CMS-350

with optional universal platform, flask clamp

Optional accessories
see page 150-153

- Spring wire racks, Microplate tray
- Test tube racks, Funnel clamps

Performance

- Suitable for low rpm sensitive applications.
 - Hybridization, immunocytochemistry, gel staining/destaining, and other bioscience applications.
- Microprocessor PID control.
- Wide speed range from 50 to 300 rpm.
- Orbital shaking motion in 13mm diameter.
- Equipped with a maintenance-free BLDC motor to generate smooth, quiet, uniform, and yet powerful shaking motion.

Convenience

- Vivid and colorful vacuum fluorescent display (VFD) with touch-sensitive keypad.
- One-touch timer for time-dependent shaking operation. (1 min. to 99 hr. 59 min.)
- Removable tray for easy transport of well-plates (max. 6 ea) and dishes. (optional)
- Compact and lightweight design allow for use in cold rooms or incubators.
- Variety of accessories are available to meet application demands.

Safety

- Self-diagnostic function identifying errors.
- Its polypropylene main body is highly chemical-resistant and easy-to-clean.
- Over-current protection.

Model		CMS-350
Control system		PID feedback control
Display		VFD
Shaking system	Motion type	Orbital
	Speed range (rpm)	50 to 300
	Accuracy at 100 rpm	±5
	Timer	1min. to 99hr. 59min.
	Orbit size (mm / inch, dia)	13 / 0.51
	Max. load (kg / lbs)	up to 5.2 / 11.46
Dimension	Tray (WxD) (mm / inch)	276×276 / 10.87×10.87
	Platform (WxD) (mm / inch)	250×250 / 9.8×9.8
	Body ¹⁾ (WxDxH) (mm / inch)	249×325×109 / 9.8×12.8×4.3
	Net weight (kg / lbs)	8 / 17.6
Electrical requirements		AC 100 ~ 240 V, 50 / 60 Hz
Cat. No.	KR Plug	AAH3B1115K
	US Plug	AAH3B1115U

1) Main body dimension without accessories.

* Permissible environmental conditions: temperature (5-40°C) and relative humidity (up to 80%).

* FDA establishment registered company. FDA listed products.



Performance

- Optimally designed to shake four microplates simultaneously.
- Ideal for applications that demand precise and repeatable mixing.
- Microprocessor PID control.
- Wide speed range from 150 to 1,200 rpm
- Orbital shaking motion in 3mm diameter.
- Smooth start feature to avoid sample contamination.
- Equipped with a maintenance-free BLDC motor to generate smooth, quiet, uniform, and yet powerful shaking motion.

Convenience

- Vivid and colorful vacuum fluorescent display (VFD) with touch-sensitive keypad.
- One-touch timer for time-dependent shaking operation. (1 min. to 99 hr. 59 min.)
- Compact and lightweight design allow for use in cold rooms or incubators.
- Variety of accessories are available to meet application demands.
- Optional tube racks also available for 1.5ml micro-tubes, 15ml conical tubes, and 50ml conical tubes.

Safety

- Self-diagnostic function identifying errors.
- Its polypropylene main body is highly chemical-resistant and easy-to-clean.
- Over-current protection.

Fitted with 4 microplates and wider speed range to accommodate various sample testing.



CPS-350
with optional micro-tube rack

Optional accessories see page 153

- Conical tube racks (1.5ml, 15ml, 50ml)

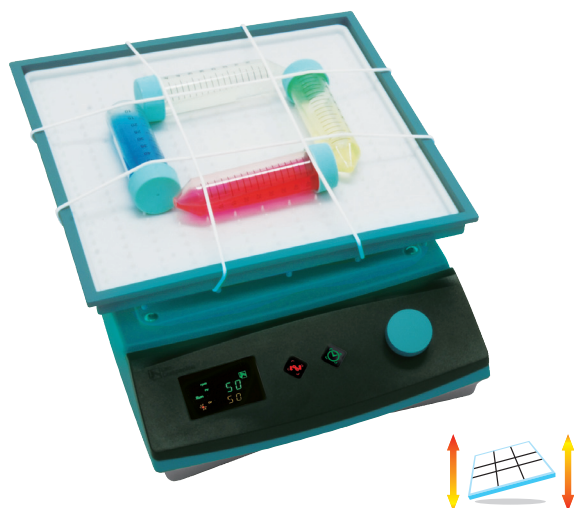
Model		CPS-350
Control system		PID feedback control
Display		VFD
Shaking system	Motion type	Orbital
	Speed range (rpm)	150 to 1,200
	Accuracy at 500 rpm	±15
	Timer	1 min. to 99hr. 59min.
	Orbit size (mm / inch, dia)	3 / 0.12
	Max. load (kg / lbs)	4 / 8.8
Dimension	Tray (WxD) (mm /inch)	269×185 / 10.6×7.3
	Body ¹⁾ (WxDxH) (mm /inch)	269×325×128 / 10.6×12.8×5.0
	Net weight (kg / lbs)	7.7 / 17
Electrical requirements		AC 100 ~ 240 V, 50/60 Hz
Cat. No.	KR Plug	AAH3C1115K
	US Plug	AAH3C1115U

1) Main body dimension without accessories.
* Permissible environmental conditions: temperature (5-40°C) and relative humidity (up to 80%).
* FDA establishment registered company. FDA listed products.

Rocking Shaker



Adjustable tilt angle and precise digital speed control providing desired rocking motion.



Performance

- Microprocessor PID control.
- Digital speed control providing gentle to vigorous motion.
 - Rocking shaker: 5 to 100 rpm
- Easy to adjust tilt angle.
 - Rocking shaker: 7 to 13°
- Smooth, quiet, uniform, and yet powerful shaking motion.

Convenience

- Vivid and colorful vacuum fluorescent display (VFD) with touch-sensitive keypad.
- One-touch timer for time-dependent shaking operation. (1 min. to 99 hr. 59 min.)
- Compact and lightweight design allow for use in cold rooms or incubators.
- Three types of removable tray for easy transport of well-plates, test tubes, etc. (standard dimpled mat, and optional rubber mat and universal harness)
- Variety of accessories are available to meet application demands.
 - Accommodates to be used in a variety of test tube size, beakers, vials, micro-well plates, culture dishes, plastic/glass trays.

CRS-350

Standard accessories

- Dimpled mat (tray, silicone pad)
- Rubber bands (2ea)

Optional accessories

see page 153

- Rubber mat (tray, sticky pad)
- Universal harness (tray, sticky pad, 6 rubber bands)

Safety

- Self-diagnostic function identifying errors.
- Its polypropylene main body is highly chemical-resistant and easy-to-clean.
- Over-current protection.

Model		CRS-350
Control system		PID feedback control
Display		VFD
Shaking system	Motion type	Rocking
	Speed range (rpm)	5 to 100
	Accuracy at 100 rpm	±5
	Tilt angle	7 to 13°
	Max. load (kg / lbs)	5 / 11.02
Material	Dimpled mat (standard)	PP (polypropylene), Silicone
	Body	PP (polypropylene)
Dimension	Tray (W×D) (mm / inch)	276×276 / 10.87×10.87
	Body ¹⁾ (W×D×H) (mm / inch)	249×325×138 / 9.8×12.8×5.4
	Net weight (kg / lbs)	3.7 / 8.16
Electrical requirements		AC 100 ~ 240 V, 50/60 Hz
Cat. No.	KR Plug	AAH391115K
	US Plug	AAH391115U

¹⁾ Main body dimension without accessories.

* Permissible environmental conditions: temperature (5-40°C) and relative humidity (up to 80%).

* FDA establishment registered company. FDA listed products.



Performance

- Microprocessor PID control.
- Digital speed control providing gentle to vigorous motion.
 - Waving shaker: 8 to 100 rpm
- Easy to adjust tilt angle.
 - Waving shaker: 0 to 13°
- Smooth, quiet, uniform, and yet powerful shaking motion.

Convenience

- Vivid and colorful vacuum fluorescent display (VFD) with touch-sensitive keypad.
- One-touch timer for time-dependent shaking operation. (1 min. to 99 hr. 59 min.)
- Compact and lightweight design allow for use in cold rooms or incubators.
- Three types of removable tray for easy transport of well-plates, test tubes, etc. (standard dimpled mat, and optional rubber mat and universal harness)
- Variety of accessories are available to meet application demands.
 - Accommodates to be used in a variety of test tube size, beakers, vials, micro-well plates, culture dishes, plastic/glass trays.

Enhanced conveniences for tilt adjustment, removable tray, and digital control.



Safety

- Self-diagnostic function identifying errors.
- Its polypropylene main body is highly chemical-resistant and easy-to-clean.
- Over-current protection.

CWS-350

Standard accessories

- Dimpled mat (tray, silicone pad)
- Rubber bands (2ea)

Optional accessories

see page 153

- Rubber mat (tray, sticky pad)
- Universal harness (tray, sticky pad, 6 rubber bands)

Model		CWS-350
Control system		PID feedback control
Display		VFD
Shaking system	Motion type	Waving
	Speed range (rpm)	8 to 100
	Accuracy at 100 rpm	±5
	Tilt angle	0 to 13°
	Max. load (kg / lbs)	5 / 11.02
Material	Dimpled mat (standard)	PP(polypropylene), Silicone
	Body	PP(polypropylene)
Dimension	Tray (W×D) (mm / inch)	276×276 / 10.87×10.87
	Body ¹⁾ (W×D×H) (mm / inch)	249×325×138 / 9.8×12.8×5.4
	Net weight (kg / lbs)	3.7 / 8.16
Electrical requirements		AC 100 ~ 240 V, 50/60 Hz
Cat. No.	KR Plug	AAH381115K
	US Plug	AAH381115U

1) Main body dimension without accessories.

* Permissible environmental conditions: temperature (5-40°C) and relative humidity (up to 80%).

* FDA establishment registered company. FDA listed products.

Heating Shaker



Useful for a variety of molecular biology applications.

Interval mix function in program mode can be properly set according to user's experimental conditions.



CBS-350

with optional tube block

Optional accessories
see page 153

- 96-well tube block set with cover
- Tube block set with cover

Performance

- Microprocessor PID control ensuring consistent shaking motion and precision accuracy.
- Wide speed range from 150 to 1500 rpm (block dependent)
- Automatic temperature calibration.

Convenience

- Bright VFD display with responsive touch buttons.
- Memory function of programs allowing relevant parameters (such as temp., rpm, time) of each program step to be stored.
 - Up to 10 programs allowed for memory storage.
 - Up to 10 steps allowed for each program.
 - Interval mix function (continuous switching between shaking and phasing)
- Advanced dual wait on/off timer modes.
 - User can set timer to starts immediately after the timer setting or only after reaching the set temp.
- Optimal heat transfer is achieved by the tight coupling design of the main body and the corrosion-resistant anodized aluminum blocks.

Safety

- Self-diagnostic function identifying errors.
- Its polypropylene main body is highly chemical-resistant and easy-to-clean.
- Low-profile design with rubber feet for minimal vibration and noise.
- Over-current protection.

Model		CBS-350	
Control		PID feedback control	
Display		VFD (0.1°C resolution)	
Temperature	Range (°C / °F)	Amb. +5 to 100 / 41 to 212	
	Fluctuation at 80°C (±°C / °F)	0.5 / 0.9	
	Variation at 80°C (±°C / °F)	0.15 / 0.27	
	Heating power (W)	360	
Safety	Over temp.	Heating plate	
		PCB	
	Over current	Current limit protection	
Shaking system (WxDxH)	Motion type	Orbital	
	Speed range (rpm)	96-well tube block	150 to 1500
		0.5ml tube block	150 to 1000
		1.5ml tube block	150 to 1000
		15ml tube block	150 to 900
		Ø12 tube block	150 to 850
		Ø13 tube block	150 to 850
		50ml tube block	150 to 800
	Orbit size (mm / inch, dia.)	2 / 0.08	
Dimension (WxDxH)	Body ¹⁾ (mm/inch)	249 x 325 x 120 / 9.8 x 12.8 x 4.7	
	Net weight (Kg / lbs)	8.3 / 18.3	
Electrical requirements (230V,50Hz/60Hz)		1.7A	
Cat. No.		AAHJ4015K	
Electrical requirements (120V,60Hz)		3.4A	
Cat. No.		AAHJ4013U	

1) Main body dimension without accessories.

* Permissible environmental conditions: temperature (5-40°C) and relative humidity (up to 80%).

* FDA establishment registered company. FDA listed products.

Performance

- Shaking up to 10 samples in identical conditions for any series or comparative protocols in chemistry, biotech, and medical labs.
- Wide speed range from 50 to 300 rpm is suitable for most applications.
- Vertical reciprocating motion with maximum stroke length of 40mm.

Convenience

- Digital LED speed display.
- Simple and quick control panel.
- Quick adjustable timer for time-dependent shaking operation. (1 min. to 60m.)
- Easily adjustable funnel holders accommodate various capacity of funnels.

Safety

- Audible alarm and automatic shut down at the end of each shaking session.
- Over-current protection.

Intensive vertical reciprocating agitation for quick solvent extraction.



RS-1

Standard accessories • Funnel holders (6ea)

Max. funnel capacity (per each side)

Capacity	Round type funnel	Slim type funnel
under 500ml	3 to 5	5
500ml	3	3
1L	-	3



Information of accessories

Max. 5 funnel holders can be installed on each side of the unit.

Cat. No.	Description
AAA32501	Funnel holder (1ea)

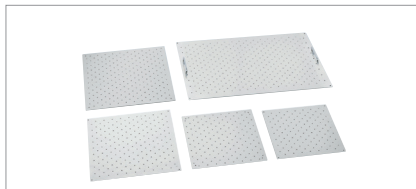
Model		RS-1	
Shaking system	Motion type	Vertical reciprocating	
	Speed range (rpm)	50 to 300	
	Timer	60 min or continuous operation	
	Vertical stroke length (mm / inch)	40 / 1.6	
Dimension	Exterior (WxDxH) (mm / inch)	445×730×505 / 17.5×28.7×19.9	
	Max. load per each side (kg / lbs)	3 / 6.6	
	Net weight (Kg / lbs)	53 / 116.8	
Electrical requirements (230V)		50Hz, 0.4A	60Hz, 0.4A
Cat. No.		AAH32012K	AAH32015K

* Permissible environmental conditions: temperature (5-40°C) and relative humidity (up to 80%).

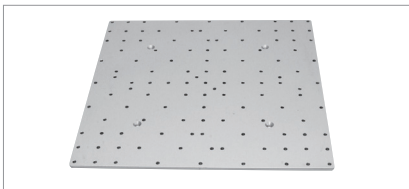
* FDA establishment registered company. FDA listed products.

Accessories & Options

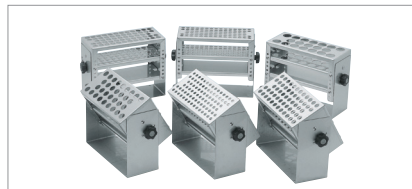
for Open-air Shakers (OS models) / Mini Shaker



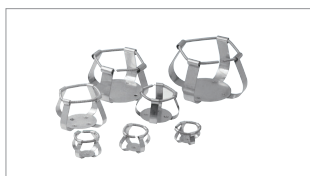
Universal platforms (OS models)



Universal platform (CMS-350)



Test tube racks



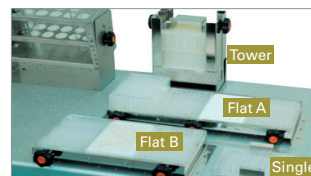
Flask clamps (stainless steel)



Flask clamps (plastic)



Funnel clamps



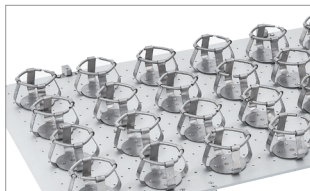
Microplate holders

Description			OS-2000	OS-3000	OS-4000	OS-7100 OS-7200	CMS-350
Cat.No.	Universal platform		AAA3A501-V2	AAA23501-V3	AAA23502-V3	AAA23503-V3	AAA3B501
-	Flask clamps (Stainless steel)	Erlenmeyer flask size	Max. mountable flask clamps				
AAA23550		for 50 ml	20	36	49	88	16
AAA23551		for 100 ml	16	28	39	68	9
AAA23552		for 250 ml	8	14	24	39	9
AAA23556		for 300 ml	8	14	24	39	9
AAA23553		for 500 ml	6	10	16	28	5
AAA23554		for 1L	3	6	9	18	4
AAA23555		for 2L	-	4	6	11	1
AAA23557		for 2.8L	-	3	5	8	-
AAA23558		for 4L	-	1	4	6	-
AAA23559	for 6L	-	1	3	5	-	
-	Flask clamps (plastic)	Erlenmeyer flask size	Max. mountable flask clamps				
AAA30570		for 50 ml	20	36	49	88	16
AAA30571		for 100 ~ 125 ml	12	19	29	48	9
AAA30572		for 200 ml	8	13	21	35	9
AAA30573		for 250 ml	8	13	19	35	9
AAA30574		for 300 ml	6	12	19	35	9
AAA30575		for 500 ml	6	9	12	24	5
AAA30576		for 1L	3	5	9	12	4
AAA30577		for 2L	-	4	5	8	1
-	Funnel clamps	Separating funnel size	Max. mountable funnel clamps				
AAA23562		for 250 ml	4	4	6	15	3
AAA23563		for 500 ml	3	3	4	10	2
AAA23564		for 1L	3	3	3	7	2
AAA23565		for 2L	-	2	2	5	-
-	Test Tube Racks ¹⁾	Test tube size	Mountable capacity of racks				
AAA23581		for 86 test tubes, ø8mm	2	2	4	7	2
AAA23582		for 86 test tubes, ø10mm					
AAA23583		for 58 test tubes, ø12mm					
AAA23584		for 58 test tubes, ø14mm					
AAA23585		for 32 test tubes, ø17mm					
AAA23586		for 19 test tubes, ø25mm					
AAA23587		for 10 test tubes, ø30mm					
AAA23594		for 10 test tubes, ø35mm					
AAA23593		for 4 test tubes, ø50mm					
-	Microplate holders						
AAA23654		Single	6	8	15	25	6
AAA23651		Tower	4	6	10	21	6
AAA23652		Flat A (large)	-	-	2	4	-
AAA23653		Flat B (small)	1	2	3	6	-

1) No declination.

* Above accessories need to be mounted on a universal platform which is sold separately.

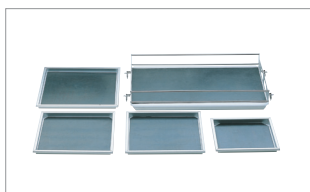
for Open-air Shakers (OS models) / Mini Shaker



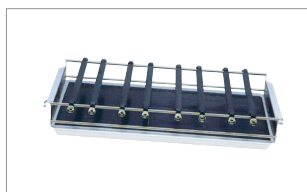
Dedicated platform



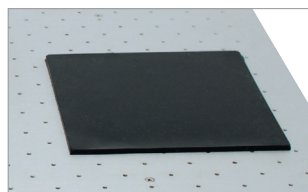
Spring wire racks



Rubber mats (SK, SKF)



Universal attachment



Lab sticker (200x200, mm)



Rubber mat (CMS-350)



Dual stacking tray



Large tray



Stage rack (OS models)

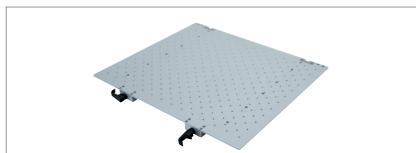
Description		OS-3000	OS-4000	OS-7100 OS-7200
Dedicated platform	Universal platform +250ml flask clamps	AAA23611-V1	AAA23621-V1	AAA23634
	No. of flask clamps	14	24	39
	Universal platform +500ml flask clamps	AAA23613-V1	AAA23622-V1	AAA23635
	No. of flask clamps	10	16	28

* A dedicated platform is sold with setting each max. mountable amount of flask clamps on.

Description		OS-2000	OS-3000	OS-4000	OS-7100 OS-7200	CMS-350
Spring wire racks	-	AAA3A521	AAA31521-V1	AAA31522-V1	AAA23514	AAA3B511
	Erlenmeyer flask size	Max. inserting flasks				
	for 50 ml	15	16	25	45	15
	for 100 ml	9	9	16	28	9
	for 250 ml	4	4	9	18	4
	for 300 ml	4	4	9	18	4
	for 500 ml	4	4	5	15	4
	for 1L	2	2	4	10	2
	for 2L	-	1	2	6	-
	for 2.8L	-	1	2	4	-
Rubber mat		AAA3A531-V1	AAA31531	AAA31532	AAA23534	AAA38501
Universal attachments		AAA3A511-V1	AAA23511-V1	AAA23512-V1	AAA23505	AAA3B521
Lab sticker		AAA30551				
Dimpled mat		AAA3A532	-	-	-	AAA38502
Microplate tray	Dual stacking	AAA3A541	-	-	-	AAA3B531
	Large tray	AAA3A542	-	-	-	AAA3B532
Stage racks	4 stage rack	-	AAA31541-V1	AAA31542-V1	AAA31702-V1	-
	3 stage rack	-	-	-	AAA31703-V1	-

Accessories & Options

for Open-air Shakers (SKC models)



Universal platforms



Dual universal platforms



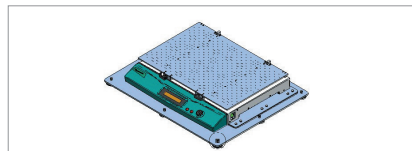
Spring wire racks
(two tier rack with flexible crossed spring)



Universal attachments



Rubber mats



Weight increaser

Description		SKC - 6000 models				SKC - 7000 models	
		Small	Large		Small	Large	
Cat.No.	Universal platform	Single Dual ¹⁾	AAA30501	AAA30503	AAA30502	AAA30504	
			-	-	AAA30541	AAA30542	
-	Flask Clamps (stainless steel)	Erlenmeyer flask size	Max. mountable flask clamps				
AAA23550		for 50 ml	84	96	108	126	
					108 per each step	126 per each step	
AAA23551		for 100 ml	54	66	72	84	
					72 per each step	84 per each step	
AAA23552		for 250 ml	33	39	42	51	
					42 per each step	51 per each step	
AAA23556		for 300 ml	28	32	36	40	
AAA23553		for 500 ml	20	24	27	30	
AAA23554		for 1L	14	16	18	20	
AAA23555		for 2L	8	11	12	13	
AAA23557	for 2.8L	6	7	9	11		
AAA23558	for 4L	4	6	8	9		
AAA23559	for 6L	3	4	6	7		
-	Flask clamps (plastic)	Erlenmeyer flask size	Max. mountable flask clamps				
AAA30570		for 50 ml	56	64	72	80	
AAA30571		for 100 ~ 125 ml	42	48	54	60	
AAA30572		for 200 ml	25	39	30	32	
AAA30573		for 250 ml	25	30	30	32	
AAA30574		for 300 ml	25	30	30	32	
AAA30575		for 500 ml	20	20	24	28	
AAA30576		for 1L	10	12	12	15	
AAA30577		for 2L	6	6	6	9	
-	Funnel clamps	Separating funnel size	Max. mountable funnel clamps				
AAA23562		for 250 ml	14	16	18	20	
AAA23563		for 500 ml	9	10	11	14	
AAA23564		for 1L	7	8	9	12	
AAA23565		for 2L	5	6	7	8	
-	Test Tube Racks ²⁾	Test tube size	Mountable capacity of racks				
AAA23581		for 86 test tubes, ø8mm	8	9	9	12	
AAA23582		for 86 test tubes, ø10mm					
AAA23583		for 58 test tubes, ø12mm					
AAA23584		for 58 test tubes, ø14mm					
AAA23585		for 32 test tubes, ø16mm					
AAA23586		for 19 test tubes, ø25mm					
AAA23594		for 10 test tubes, ø35mm					
-	Microplate holders	Holder type					Max. mountable microplate holders
AAA23654		Single	20	23	25	28	
AAA23651		Tower	16	19	22	25	
AAA23652		Flat A(large)	3	4	4	5	
AAA23653		Flat B(small)	4	5	6	7	

1) Universal platform attachments are mounted on the dual universal platform, Under the dual universal platform are mounted only 50ml, 100ml 250ml

- Refer to the above chart (Distance between platforms is 175mm).

2) No declination

* Above accessories need to be mounted on a universal platform which is sold separately.

Description	SKC - 6000 models		SKC - 7000 models	
	Small	Large	Small	Large
Spring wire rack	AAA30521	AAA30522	AAA30523	AAA30524
Universal attachment	AAA30511	AAA30512	AAA30513	AAA30514
Rubber mat	AAA30531	AAA30532	AAA30533	AAA30534

Description	SKC - 6000 models		SKC - 7000 models	
	Small	Large	Small	Large
Lab Sticker	AAA30551			
Weight increaser	AAA30562		AAA30561	

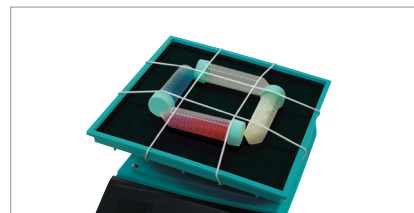
for Rocking Shaker / Waving Shaker / Mini Shaker



Rubber mat



Dimpled mat



Universal harness

Cat. No.	Description	Component
AAA38501	Rubber mat	Tray, Sticky pad
AAA38502	Dimpled mat	Tray, Silicone pad
AAA38503	Universal harness	Tray, Sticky pad, Rubber band (6ea)

for Microplate Shaker



1.5ml Micro-tube rack



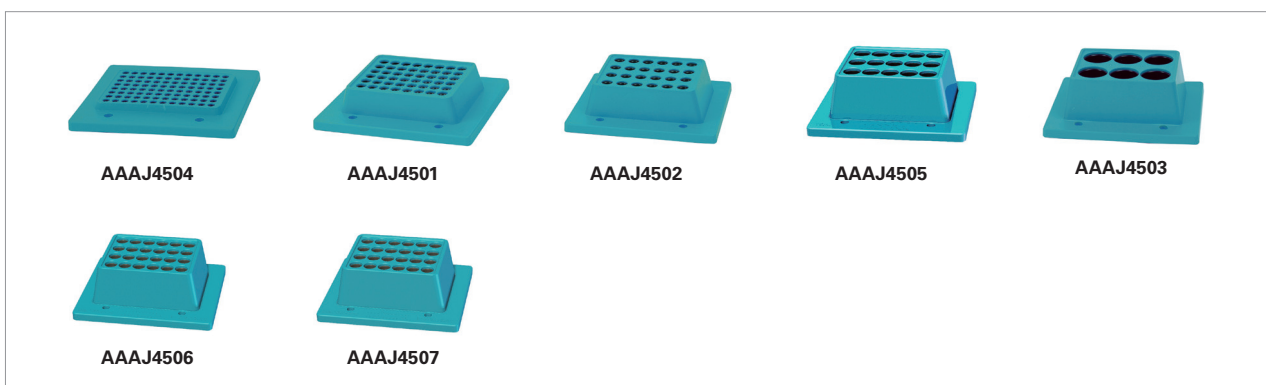
15ml Conical tube rack



50ml Conical tube rack

Cat. No.	Description	Max. mountable tube
AAAJ2311	1.5ml Micro-tube rack with cap	80 (5 x 16)
CPS0011	15ml Conical tube rack	30 (3 x 10)
CPS0012	50ml Conical tube rack	12 (2 x 6)

for Heating Shaker



Cat. No.	Description	Max. mountable tube
AAAJ4504	96-well Tube block with cover	0.2ml x 96 holes (micro tube)
AAAJ4501	0.5ml Tube block with cover	0.5ml x 48 holes (micro tube)
AAAJ4502	1.5ml Tube block with cover	1.5ml x 24 holes (micro tube)
AAAJ4505	15ml Tube block with cover	15ml x 15holes (centrifuge tube)
AAAJ4503	50ml Tube block with cover	50ml x 6 holes (centrifuge tube)
AAAJ4506	ø12 Tube block with cover	ø12 x 24holes
AAAJ4507	ø13 Tube block with cover	ø13 x 24holes

Heating & Cooling Blocks

Indispensable for incubation and activation of cultures, culture enrichment, enzyme reactions, immunoassay, etc.



Heating & Cooling Block
with optional block



Heating Blocks
with optional block



Performance

- Wide temperature control range from amb. -20 to 95°C with rapid cool down and heat-up times.
- Precision accuracy of $\pm 0.1^\circ\text{C}$ is ensured by PID controller.
- Temperature calibration.
- Memory function of programs allowing relevant parameters of each program step to be stored.
 - Up to 10 programs allowed for memory storage.
 - Up to 10 steps allowed for each program.
- Optimal heat transfer is achieved by the tight coupling design of the main body and the corrosion-resistant anodized aluminum blocks.
- Cooling is controlled by peltier elements for an energy efficient compact design.

Convenience

- Bright VFD display with responsive touch buttons.
- Advanced dual wait on/off timer modes.
 - User can set timer to starts immediately after the timer setting or only after reaching the set temperature.
- Transparent lid allows easy sample monitoring and even temperature distribution.
- Blocks can be easily interchanged by the included block lifter.

Safety

- Self-diagnostic function identifying errors.
- Over-temperature and over-current protection.
- Its polypropylene main body is highly chemical-resistant and easy-to-clean.

Outstanding temp. compensation function for precise temperature control.

Rapid cooling and heating in centrifuge tubes, sample vials, micro tubes within the broad temperature range.



CCB-350

with optional block

Standard accessories • Block lifters (2ea)

Optional accessories • Tube blocks
see page 157

Model		CCB-350
Control system		Feedback control PID
Display		VFD (0.1°C resolution)
Temperature	Range (°C / °F)	Amb. -20 to 95 / Amb. -36 to 203
	Fluctuation at 37°C ($\pm^\circ\text{C}$ / °F)	0.55 / 0.99
	Variation at 37°C ($\pm^\circ\text{C}$ / °F)	0.10 / 0.18
Safety	Over temp.	Heating plate PCB
	Over current	Current limit protection
Dimension (WxDxH)	Interior (mm / inch)	99 x 77.5 x 36 / 3.9 x 3.1 x 1.4
	Exterior (mm / inch)	249x330x168 / 9.8x13x6.6
	Net weight (kg / lbs)	5.0 / 11.0
Electrical requirements (230V, 50 / 60Hz)		2 A
Cat. No.		AAHJ5015K
Electrical requirements (120V, 60Hz)		4 A
Cat. No.		AAHJ5013U

* FDA establishment registered company. FDA listed products.

Heating Blocks



Ideal for simultaneous sample heating of multiple vials or test tubes with uniform and precise temperature control.



CHB-350S / CHB-350T

with optional block

Standard accessories • Block lifters (2ea)

Optional accessories • Tube blocks
see page 157

Performance

- Precision accuracy of $\pm 0.1^{\circ}\text{C}$ is ensured by PID controller from ambient + 5°C to 130°C .
- Its built-in temperature limit setting feature (with max. 0.2°C overshooting) allows you to perform highly temp. sensitive reactions such as isothermal amplifications.
- Optimal heat transfer is achieved by the tight coupling design of the main body and the corrosion-resistant anodized aluminum blocks.

Convenience

- Bright VFD display with responsive touch buttons.
- Advanced dual wait on/off timer modes.
 - User can set timer to starts immediately after the timer setting or only after reaching the set temperature.
- Transparent lid allows easy sample monitoring and even temperature distribution.
- Blocks can be easily interchanged by the included block lifter.

Safety

- Self-diagnostic function identifying errors.
- Automatic power cutoff.
 - If the temperature of the main body exceeds 150°C .
 - If the internal circuit is overheated.
- Its polypropylene main body is highly chemical-resistant and easy-to-clean.

Model		CHB-350S	CHB-350T
Control system		Feedback control PID	
Display		VFD (0.1 $^{\circ}\text{C}$ resolution)	
Temperature	Range ($^{\circ}\text{C}$ / $^{\circ}\text{F}$)	Amb. +5 to 130 / Amb. +41 to 266	
	Fluctuation at 80°C ($\pm^{\circ}\text{C}$ / $^{\circ}\text{F}$)	0.55 / 0.99	
	Variation at 80°C ($\pm^{\circ}\text{C}$ / $^{\circ}\text{F}$)	0.10 / 0.18	
Safety	Over temp.	Heating plate	
	Over current	PCB	
Dimension (WxDxH)	Interior (mm / inch)	154x99x37 / 6.1x3.9x1.5	
	Exterior (mm / inch)	249x330x125 / 9.8x13x4.9	249x330x250 / 9.8x12.8x9.8
	Net weight (kg / lbs)	3.9 / 8.6	4.3 / 9.5
Electrical requirements (230V, 50 / 60Hz)		3.5A	
Cat. No.		AAHJ1015K	AAHJ1115K
Electrical requirements (120V, 60Hz)		6.7A	
Cat. No.		AAHJ1013U	AAHJ1113U

※ FDA establishment registered company. FDA listed products.

Block	Cat. No.	Description	Max. Mountable Tube	WxDxH (mm, inch)	Mountable Capacity of Blocks		
					CHB-350S	CHB-350T	CCB-350
	CHB0030	96-well Tube block (micro-tube)	0.2ml x 96 holes	153×98×41 / 6×3.9×1.6	1	1	-
	CHB0029	0.5 ml Tube block (micro-tube)	0.5ml x 48 holes	98×76.5×41 / 3.9×3×1.6	2	2	1
	CHB0045	1.5/2.0 ml Tube block (micro-tube)	1.5/2.0ml x 30 holes	98×76.5×41 / 3.9×3×1.6	2	2	1
	CHB0028	1.5/2.0 ml Tube block (micro-tube)	1.5/2.0ml x 48 holes	153×98×41 / 6×3.9×1.6	1	1	-
	CHB0031	15 ml Tube block (centrifuge tube)	15ml x 15 holes	98×76.5×51 / 3.9×3×2	2*	2	1*
	CHB0032	50 ml Tube block (centrifuge tube)	50ml x 6 holes	98×76.5×51 / 3.9×3×2	2*	2	1*
	CHB0033			98×76.5×87 / 3.9×3×3.4	2*	2	1*
	CHB0034	ø10 Tube block	ø10 x 35 holes	98×76.5×51 / 3.9×3×2	2*	2	1*
	CHB0035	ø12 Tube block	ø12 x 24 holes		2*	2	1*
	CHB0036	ø13 Tube block	ø13 x 24 holes		2*	2	1*
	CHB0037	ø15 Tube block	ø15 x 20 holes		2*	2	1*
	CHB0038	ø16 Tube block	ø16 x 16 holes		2*	2	1*
	CHB0039	ø18 Tube block	ø18 x 12 holes		2*	2	1*
	CHB0040	ø20 Tube block	ø20 x 12 holes		2*	2	1*

* Available to use only when the lid is opened.

Hotplates & Stirrers

Hotplates

Hotplate Stirrers

Magnetic Stirrers

Overhead Stirrers

» General Applications

Hotplates

Acid and base digestions, trace metal analysis, sample drying, general reagent heating, heating TLC plates, evaporation

Hotplate Stirrers

Various heating and mixing applications that require accuracy, stability, and repeatability.

Magnetic Stirrers

Crystallization, solvent evaporation, chemical reactions, titration, distillation, media dissolution, food processing

Overhead Stirrers

Chemical and petrochemical applications, beverage production, dairy production, food processing, sugar and candy production



Product Name		Hotplates		Hotplate Stirrers (Basic)		Hotplate Stirrers (Advanced)	
Model		T-S, R	T-Q	TM-SB, RB	TM-Q	TS-S	TS-Q
Top plate	Material	Ceramic coated aluminum		Ceramic coated aluminum		Ceramic coated aluminum	
	Dimension (Ø or WxD, mm)	140, 170 Round top	180x180 Square top	140, 170 Round top	180x180 Square top	140, 170 Round top	180x180 Square top
Temp. Control	Max. temp. (°C/°F)	350 / 662		350 / 662		350 / 662	
	Heating power (W)	600	800	600	800	600	800
Speed control	Speed range (rpm)	-		50 to 2000		30 to 2000	
	Stirring position (250ml flask)	-		1		1	
	Capacity (L, H ₂ O)	-		20		20	
Control	Display & Control interface	LED digital (0.1°C resolution)		Analog-knob		LED digital (0.1°C resolution)	
	PID feedback control	0		-		0	
	Timer	Wait on/off		-		Wait on/off	
	Auto-tuning	0		-		0	
	External temperature probe	-		-		0 (PT100, max.250°C)	
Safety	Over temp. limit	0		0		0	
	Over current limit	0		0		0	
	Hot top warning lamp at 50 °C	0		0		0	
	High/Low temperature limit	0		-		0	
	Protection class (DIN EN 60529)	-		-		-	

Product Name		Overhead Stirrers (Analog)	Overhead Stirrers (Digital)	Overhead Stirrers (Advanced)	
Model		MSA	MSD	MSH	
Speed control	Speed range (rpm)	80 to 2000	80 to 2000	50 to 1200	50 to 2000
	Stirring capacity, Max. (L, H2O)	20	20	100	60
	Torque, Max. (N·cm)	19	19	41.6	20.8
	Motor rating output (W)	40	40	48	
	Viscosity, Max. (cP) (using 3-bladed propeller impeller, Ø50)	5,000 (~2000 rpm) 10,000 (~1200 rpm) 30,000 (~300 rpm) 50,000 (~200 rpm)	5,000 (~2000 rpm) 10,000 (~1200 rpm) 30,000 (~300 rpm) 50,000 (~200 rpm)	5,000 (~1200 rpm) 10,000 (~1200 rpm) 30,000 (~1200 rpm) 50,000 (~700 rpm)	5,000 (~2000 rpm) 10,000 (~1600 rpm) 30,000 (~600 rpm) 50,000 (~300 rpm)
	Chuck range (mm)	3 to 10	3 to 10	3 to 10	
Control	Display & Control interface	Touch FND, Analog knob	Touch FND, Digital knob	Touch LCD, knob	
	PID feedback control	0	0	0	
	Timer	-	Wait off	Wait off	
	External controller	-	-	0	
	Computer interface	-	USB port	USB port	
Safety	Over temp. limit	0	0	0	
	Over current limit	0	0	0	
	Motor temp. warning	-	0	0	
	Best effort run	-	0	0	
	Protection class (DIN EN 60529)	IP 30	IP 30	IP 30	

Hotplate Stirrers (Multi-position)		Magnetic Stirrers (Scale)		Magnetic Stirrers (Digital)	Magnetic Stirrers (Multi-position)
MS-33MH	MS-53MH	MS-B	MS-T	MS-G	MS-M
Aluminum		Polypropylene with non-slip silicon cover		Polypropylene with non-slip silicon cover	Aluminum
385x328	385x493	120, 170, 200	115, 165	170, 220	-
120 / 248		-		-	-
600	1000	-		-	-
30 to 2000		150 to 2500		30 to 2000	30 to 2000
9	15	1		1	2x3, 3x2, 3x3, 5x1, 5x2, 5x3
0.5 per each point		2, 4, 5		4, 5	250ml per each point
VFD, LED position indicator, Knob		No display, Knob		VFD, Touch buttons, Knob	VFD, LED position indicator, Touch buttons, Knob
0		-		0	0
Wait off		-		Wait off	Wait off
-		-		-	-
-		-		-	-
0		-		-	-
0		0		0	0
-		-		-	-
-		-		-	-
-		IP42		IP42	IP 21

Hotplates



Superior temperature control with various safety functions.

Two different shapes of top plate are available for your optimum use



T-17S/14R

T-18Q

Optional accessories
see page 166-167

- Heating bath (for T-S/R)
- Transparent shield (for T-S/R)
- Support rods, Magnetic stirring bars

Performance & Convenience

- Microprocessor PID temperature control.
- Auto-tuning and temperature calibration functions.
- Multi-functional temperature control modes.
(optimal / fast / slow / user / point)
- Optimum heating level is adjustable from 0 to 100%.
- Integrated design of the heater and the top plate provides exceptional heat transfer rate and quick heat up capability.
- Precise temperature is set by digital display and optimum heating level is adjustable.
- Advanced dual wait on/off timer modes.
 - User can set timer to starts immediately after the timer setting or only after reaching the set temp.
- Separate operation RUN/STOP button.
- Non-slip heating bath with concavo-convex bottom prevents unintentional slips of the bath. (optional)
- A transparent safety shield protects users from liquid splashes. (optional)
- Support rod allows for diverse flexibility in configuring other test equipment and accessories. (optional)

Safety

- Built in thermal shut off and current limit protection.
- High and low temperature limit setting for user convenience and safety.
- Hot top warning indicator for preventing accidental injuries.
- Keypad lock function prevents accidental changes during operation.

Model		T-14S	T-14R	T-17S	T-17R	T-18Q
Heating	Temperature range (℃ / °F)	Max. 350 / 662				
	Control	Feedback control with PID				
	Display	LED digital (0.1℃ resolution)				
	Heating power (W)	600		800		
Safety	Hot top indicator (℃ / °F)	Warning lamp (50 / 122)				
	Over temp.	Top plate / Main body / PCB				
	Over current	Current limit protection				
Timer		2 type, 1min. to 99 hr. 59 min.				
Load, Max. (kg / lbs)		25 / 55.1				
Top plate	Shape	Round type				Square type
	Material	Ceramic coated aluminum				
	Dimension (Ø or WxD) (mm / inch)	140 / 5.5		170 / 6.7		180x180 / 7.08x7.08
Body	Shape	Straight body	Round handles	Straight body	Round handles	Straight body
	Material	Aluminum				
	Dimension (WxDxH) (mm / inch)	161x290x100 / 6.34x11.42x3.94	210x294x99 / 8.27x11.57x3.90	191x330x101 / 7.52x12.99x3.98	240x324x100 / 9.45x12.76x3.94	209x326x102 / 8.22x12.83x4.0
Net weight (kg / lbs)		2.2 / 4.9	2.4 / 5.3	2.9 / 6.4	3 / 6.6	3.8 / 8.37
Electrical requirements (230V, 50/60Hz)		3.0 A		4.0 A		
Cat. No.		AAH35015K	AAH35115K	AAH35025K	AAH35125K	AAH35035K
Electrical requirements (120V, 60Hz)		5.0 A		6.7 A		
Cat. No.		AAH35013U	AAH35113U	AAH35023U	AAH35123U	AAH35033U

* Permissible environmental conditions: temperature (5 - 40°C) and relative humidity (up to 80%).

* CSA except for T-18Q. * RoHS for T-14S.

* FDA establishment registered company. FDA listed products.



Performance & Convenience

- Integrated design of the heater and the top plate provides exceptional heat transfer rate and quick heat up capability.
- Fast and precise stirring operations are enabled by BLDC motor and special magnet with extremely strong magnetic coupling power.
- Instant halt of the stirring operation due to the exceptionally fast response characteristics.
- Smooth-start mechanism provides virtually no decoupling of stir bars even with viscous media.
- Large stirring capacity up to 20 liter in case of water.
- Non-slip heating bath with concavo-convex bottom prevents unintentional slips of the bath. (optional)
- A transparent safety shield protects users from liquid splashes. (optional)
- Support rod allows for diverse flexibility in configuring other test equipment and accessories. (optional)

Easy to control with simple dial knobs for general lab heating and stirring applications.



Safety

- Built in thermal shutdown and current limit protection.
- Hot top warning Indicator for preventing accidental injuries.



TM-14RB/17SB TM-18Q

Optional accessories
see page 166-167

- Heating bath (for TM-SB/RB)
- Transparent shield (for TM-SB/RB)
- Support rods, Magnetic stirring bars

Model ¹⁾		TM-14SB	TM-14RB	TM-17SB	TM-17RB	TM-18Q
Heating	Temperature range (℃ / °F)	Max. 350 / 662				
	Control	Scale				
	Heating power (W)	600	800			
Stirring	Speed range (rpm)	50 to 2,000				
	Capacity (L / cu ft, H ₂ O)	20 / 0.71				
	Magnetic bar, Max. (ØxL, mm / Inch)	8 x 40 / 0.31 x 1.57				
Safety	Hot top indicator (℃ / °F)	Warning lamp (50 / 122)				
	Over temp.	Top plate / Main body / PCB				
	Over current	Current limit protection				
Motor		BLDC motor				
Load, Max. (kg / lbs)		25 / 55.12				
Top plate	Shape	Round type				Square type
	Material	Ceramic coated aluminum				
	Dimension (Ø or WxD) (mm / inch)	140 / 5.51			170 / 6.69	
Body	Shape	Straight body	Round handles	Straight body	Round handles	Straight body
	Material	Aluminum				
	Dimension (WxDxH) (mm / inch)	161x290x100 / 6.34x11.42x3.94	210x294x99 / 8.27x11.57x3.9	191x330x101 / 7.52x12.99x3.98	240x324x100 / 9.45x12.76x3.94	209x326x102 / 8.22x12.83x4.0
Net weight (kg / lbs)		2.8 / 6.17	3 / 6.61	3.5 / 7.72	3.6 / 7.94	3.8 / 8.37
Electrical requirements (230V, 50/60Hz)		3.0 A			4.0 A	
Cat. No.		AAH34215K	AAH34315K	AAH34225K	AAH34325K	AAH34235K
Electrical requirements (120V, 60Hz)		5.0 A			6.7A	
Cat. No.		AAH34213U	AAH34313U	AAH34223U	AAH34323U	AAH34233U

* Permissible environmental conditions: temperature (5-40°C) and relative humidity (up to 80%).

* CSA except for TM-18Q. * RoHS for TM-14SB.

* FDA establishment registered company. FDA listed products.

Hotplate Stirrers (Advanced)



Digital heating and stirring control with high advanced features such as auto-tuning and various control modes.



TS-17S

TS-18Q

Standard accessories
see page 166-167

- Temperature probe (PT100, max. 250 °C)

Performance & Convenience

- Microprocessor PID temperature control.
- Feedback control allows constant stirring speed.
- Auto-tuning and temperature calibration functions.
- Multi-functional temperature control modes. (optimal / fast / slow / user / point)
- Optimum heating level is adjustable from 0 to 100%.
- Integrated design of the heater and the top plate provides exceptional heat transfer rate and quick heat up capability.
- Fast and precise stirring operations are enabled by BLDC motor and special magnet with extremely strong magnetic coupling power.
- Smooth-start mechanism provides virtually no decoupling of stir bars even with viscous media.
- Instant halt of the stirring operation.
- Precise temperature is set by digital display and optimum heating level is adjustable.
- Advanced dual wait on/off timer modes.
 - User can set timer to starts immediately after the timer setting or only after reaching the set temp.
- Separate operation RUN/STOP button.
- Provided temperature probe detects the actual temperature of media in real time. (PT100, max. 250 °C, SN-8-4 connector sensor)

Safety

- Hot top warning Indicator, built in thermal shut off, current limit protection.
- High and low temperature limit setting for user convenience and safety.

Model ¹⁾		TS-14S	TS-17S	TS-18Q
Heating	Temperature range (°C / °F)	Max. 350 / 662		
	Control	Feedback control with PID		
	Display	LED digital (0.1 °C resolution)		
Stirring	Heating power (W)	600	800	800
	Speed range (rpm)	30 to 2,000		
	Capacity (L / cu ft, H ₂ O)	20 / 0.71		
	Magnetic bar, Max. (ØxL, mm / Inch)	8 x 40 / 0.31 x 1.57		
Safety	Hot top indicator (°C / °F)	Warning lamp (50 / 122)		
	Over temp.	Top plate / Main body / PCB		
	Over current	Current limit protection		
Motor		BLDC motor		
Timer		2 type, 1 min. to 99 hr. 59 min.		
Load, Max (kg / lbs)		25 / 55.1		
Top plate	Shape	Round type		Square type
	Material	Ceramic coated aluminum		
	Dimension (Ø or WxD) (mm / inch)	140 / 5.51	170 / 6.69	180x180 / 7.08x7.08
Body	Shape	Straight body		
	Material	Aluminum		
	Dimension (WxDxH) (mm / inch)	161x290x100 / 6.34x11.42x3.94	191x330x101 / 7.52x12.99x3.98	209x326x102 / 8.22x12.83x4.0
Net weight (kg / lbs)		2.8 / 6.17	3.5 / 7.72	3.8 / 8.37
Electrical requirements (230V, 50/60Hz)		3.0 A		4.0 A
Cat. No.		AAH34415K	AAH34425K	AAH34435K
Electrical requirements (120V, 60Hz)		5.0 A		6.7A
Cat. No.		AAH34413U	AAH34423U	AAH34433U

* Permissible environmental conditions: temperature (5-40 °C) and relative humidity (up to 80%).

* CSA except for TS-18Q. * RoHS except for TS-17S, 18Q.

* FDA establishment registered company. FDA listed products.



Performance & Convenience

- Ideal for the multiple sample testing under the same condition.
- Maximum 15 independently controlled stirring positions on one heated top plate.
- User-friendly operation and time setting modes allowing various ways of multi-position stirring to meet users' demands: single point, multiple point, whole row, whole column, etc.
- Integrated design of the heater and the top plate provides exceptional heat transfer rate and quick heat up capability.
- Fast and precise stirring operations are enabled by BLDC motor and special magnet with extremely strong magnetic coupling power.
- Smooth-start mechanism provides virtually no decoupling of stir bars even with viscous media.
- Instant halt of the stirring operation.
- Easy-to-read VFD and intuitive control panel.
- Bright and vivid LED stirring position indicating lamps and heating operation lamp for stable operations.
- High heat transfer aluminum top-plate.

Simultaneous independent stirring is available at max. 15 points with stable heating.



Safety

- Unit is safely designed to protect internal components from accidental spills.
- Non-slip silicon plate mat is attached on the top plate to prevent unintended slips
- Built in thermal shut off and current limit protection.

MS-33MH / MS-53MH

Optional accessories
see page 166-167

- Magnetic stirring bars
- Plastic retrievers

Model		MS-33MH	MS-53MH
Heating	Temperature range (°C / °F)	Max. 120 / 248	
	Control	Scale	
	Heating power (W)	600	1000
Stirring	Speed range (rpm)	30 to 2,000	
	Control	Feedback control with PID	
	Stirring position	9	15
	Stirring point distance (WxD, mm / inch)	117x90 / 4.61x3.54	
	Timer	1min. to 99 hr. 59 min.	
	Motor	BLDC motor	
	Motor rating input / output (W) per each point	2.9/1.6	
	Magnetic bar, Max. (ØxL, mm / inch)	8x30 / 0.31x1.18	
	Over temp.	Top plate	
Safety	Over current	Current limit protection	
	Load, Max (kg / lbs)	30 / 66.14	
Top plate	Material	Aluminum	
	Dimension (WxD) (mm / inch)	385x328 / 15.16x12.91	385x493 / 15.16x19.41
Body	Material	Powder coated steel	
	Dimension (WxDxH) (mm / inch)	395x450x104 / 15.55x17.72x4.09	395x614x104 / 15.55x24.17x4.09
Net weight (kg / lbs)		10 / 22.05	15 / 33.06
Electrical requirements (230V, 50/60Hz)		4.1 A	5.8 A
Cat. No.		AAHK34015K	AAHK34025K
Electrical requirements (120V, 60Hz)		8.0 A	11.2 A
Cat. No.		AAHK34013U	AAHK34023U

※ FDA establishment registered company. FDA listed products.

Powerful magnets and motors guarantee a high-speed and a good-management of the devices.



MS-B / T



MS-G



MS-M with optional plate mat

All models (MS-B/T, MS-G, MS-M)

- Ergonomic designed, lightweight, easy to operate, and low profile.
- Best-in-the-class with broad speed range and suitable for high-speed rotation experimental environment.
- Spark-less, silent and durable BLDC motor.
- Wide top plate.
- Two non-slip silicon plate covers (white & black) provided for MS-B, T, G.
- Non-slip strength rubber feet.
- Strong magnetic coupling to ensure constant stirring.

Digital models (MS-G)

- Digital PID feedback control for reproducible stirring results.
- Convenient program control.
- Gradual start-up to protect users against splashing of samples.
- Bright and vivid VFD and responsive touch buttons.
- Easy-settable digital timer (1 min. to 99hr. 59min.)
- M10 threaded hole to hold a support rod.

Multi-position models (MS-M)

- Digital PID feedback control for every single point, separately.
- User-friendly operation and time setting modes allowing various ways of multi-position stirring to meet users' demands: single point, multiple point, whole row, whole column, etc.
- Easy-to-read VFD and intuitive control panel.
- Bright and vivid LED position indicating lamps.
- Non-slip see-through silicon plate mat. (optional)
- Chemical-resistant #304 grade stainless steel top-plate.

Safety

- Unit is safely designed to protect internal components from accidental spills.
- Built-in thermal shutdown and current limit protection.

Standard accessories (except for MS-M)

- Plate covers(white & black)
- Magnetic stirring bar

Optional accessories see page 166-167

- Silicone plate mats
- Plastic retrievers



Model			MS-12B	MS-12T	MS-17B	MS-17T	MS-22B
Technical data	Speed control		Electronic speed control				
	Stirring capacity (Liter, H ₂ O)		2			4	5
	Speed range (rpm)		150 to 2,500				
	Speed display		None				
	Motor rating input / output (W)		2.9 / 1.6				
	Magnetic bar, Max. (Ø×L) (mm / inch)		8×30 / 0.31×1.18	8×30 / 0.31×1.18	8×40 / 0.31×1.57	8×30 / 0.31×1.18	10×50 / 0.39×1.97
Load, max (kg / lbs)		15 / 33.07	10 / 22.05	20 / 44.09	20 / 44.09	25 / 55.12	
Top plate	Material		Polypropylene with non-slip silicon cover				
	Dimension (Ø, mm / inch)		120 / 4.72	115 / 4.53	170 / 6.69	165 / 6.5	220 / 8.66
General data	Body shape		Round type	Triangle type	Round type	Triangle type	Round type
	Body material		Polypropylene				
	Dimension (W×D×H) (mm / inch)		130×133×65 / 5.1×5.2×2.56	181×176×64 / 7.1×6.9×2.5	180×186×65 / 7.1×7.3×2.6	246×243×64 / 9.7×9.6×2.5	230×235×65 / 9.1×9.3×2.6
	Net weight (kg / lbs)		0.6 / 1.32			0.9 / 1.98	1.1 / 2.43
	Electrical requirements		AC 100 ~ 240V, 50 / 60Hz with power adapter				
	Power consumption (W)		5			6	
	Protection class (DIN EN 60529)		IP42				
Cat. No.	Persian blue	KR plug	AAH330115BK	AAH333115BK	AAH330215BK	AAH333215BK	AAH330315BK
		US plug	AAH330115BU	AAH33316BU	AAH330215BU	AAH33326BU	AAH330315BU
	Yellow	KR plug	AAH330115YK	-	AAH330215YK	-	AAH330315YK
		US plug	AAH330115YU	-	AAH330215YU	-	AAH330315YU
	Orange	KR plug	-	AAH333115RK	-	AAH333215RK	-
		US plug	-	AAH33316RU	-	AAH33326RU	-

* RoHS except for MS-T.

* FDA establishment registered company. FDA listed products.



Model		MS-17G	MS-22G
Technical data	Speed control	Feedback control with PID	
	Stirring capacity (Liter, H ₂ O)	4	5
	Speed range (rpm)	30 to 2,000	
	Speed display	VFD	
	Motor rating input / output (W)	2.9 / 1.6	
	Magnetic bar, Max. (Ø×L) (mm / inch)	8×40 / 0.31×1.57	10×50 / 0.39×1.97
Top plate	Load, Max (kg / lbs)	20 / 44.09	25 / 55.12
	Material	Polypropylene with non-slip silicon cover	
General data	Dimension (Ø, mm / inch)	170 / 6.69	220 / 8.66
	Body material	Polypropylene	
	Dimension (W×D×H) (mm / inch)	210×280×72 / 8.3×11×2.8	260×355×72 / 10.2×14×2.8
	Net weight (kg / lbs)	1.35 / 2.98	1.75 / 3.86
	Electrical requirements	AC 100 ~ 240V, 50 / 60Hz	
	Power consumption (W)	6	
	Protection class (DIN EN 60529)	IP42	
Cat. No.	Persian blue	KR plug	AAH331215BK
		US plug	AAH331215BU
	Yellow	KR plug	AAH331215YK
		US plug	AAH331215YU

* FDA establishment registered company. FDA listed products.



Model		MS-23M	MS-32M	MS-33M	MS-51M	MS-52M	MS-53M
Technical data	Speed control	Feedback control with PID					
	Stirring	Position	6	9	5	10	15
		Speed range (rpm)	30 to 2,000				
	Stirring point distance (W×D) (mm / inch)		117×170 / 4.6×6.69	117×90 / 4.6×3.54	117×90 / 4.6×3.54	90 / 3.54	117×90 / 4.6×3.54
	Timer		1 min. to 99 hr. 59 min.				
	Speed display		VFD				
	Motor rating input / output (W) per each point		2.9 / 1.6				
	Load, Max (kg / lbs)		30 / 66.14				
General data	Dimension (W×D×H) (mm / inch)		377×434×81 / 14.8×17.1×3.2	254×434×81 / 10×17.1×3.2	377×434×81 / 14.8×17.1×3.2	130×591×75 / 5.1×23.3×2.9	251×591×75 / 9.88×23.27×2.9
	Weight (kg / lbs)		6 / 13.23	5 / 11.02	7 / 15.43	4 / 8.82	8 / 17.64
	Electrical requirements		AC 100 ~ 240V, 50 / 60Hz				
	Power consumption (W)		45	45	54	45	85
	Protection class (DIN EN 60529)		IP 21				
Cat. No.	KR plug		AAH332115K	AAH332215K	AAH332315K	AAH332415K	AAH332515K
	US plug		AAH332115U	AAH332215U	AAH332315U	AAH332415U	AAH332515U

* FDA establishment registered company. FDA listed products.

Accessories & Options

Magnetic stirring bars



Octahedral magnetic stirring bar



Cylindrical magnetic stirring bar



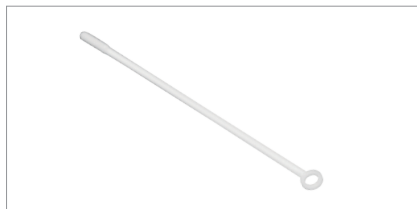
Oval magnetic stirring bar

Cat. No.	Ø (mm / inch)	L (mm / inch)
BCW1513	8 / 0.31	13 / 0.51
BCW1515	8 / 0.31	15 / 0.59
BCW1522	8 / 0.31	22 / 0.86
BCW1525	8 / 0.31	25 / 0.98
BCW1528	8 / 0.31	28 / 0.10
BCW1538	8 / 0.31	38 / 1.49
BCW1541	8 / 0.31	41 / 1.61
BCW1551	8 / 0.31	51 / 2.00
BCW155110	10 / 0.39	51 / 2.00

Cat. No.	Ø (mm / inch)	L (mm / inch)
BCW11138	8 / 0.31	13 / 0.51
BCW11156	6 / 0.23	15 / 0.59
BCW11208	8 / 0.31	20 / 0.78
BCW11258	8 / 0.31	25 / 0.98
BCW11308	8 / 0.31	30 / 1.18
BCW1140	8 / 0.31	40 / 1.57
BCW1150	8 / 0.31	50 / 1.96

Cat. No.	Ø (mm / inch)	L (mm / inch)
BCW1610	5 / 0.19	10 / 0.39
BCW1615	6 / 0.23	15 / 0.59
BCW1620	10 / 0.39	20 / 0.78
BCW162510	10 / 0.39	25 / 0.98
BCW1630	16 / 0.63	30 / 1.18
BCW1635	16 / 0.63	35 / 1.38
BCW1640	20 / 0.78	40 / 1.57
BCW1650	20 / 0.78	50 / 1.96

Plastic retrievers



Plastic retriever (PP)



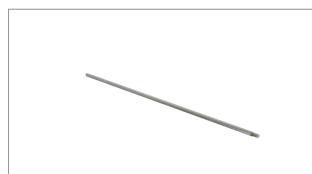
Plastic retriever (PTFE)

Cat. No.	Ø (mm / inch)	L (mm / inch)
BCW41300	10 / 0.39	300 / 11.81
BCW41350	10 / 0.39	350 / 13.77
BCW41450	10 / 0.39	450 / 17.71

Cat. No.	Ø (mm / inch)	L (mm / inch)
BCW4150	10 / 0.39	150 / 5.90
BCW4250	10 / 0.39	250 / 9.84
BCW4350	10 / 0.39	350 / 13.77
BCW4450	10 / 0.39	450 / 17.71



Support rod / Clamp holders



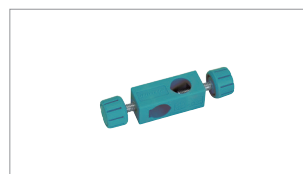
Support rod (M10)



Clamp holder (C-10)



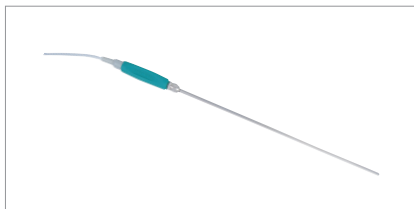
Clamp holder (C-7)



Clamp holder (C-5)

Cat. No.	Description
MTT0132	Support rod, M10 (Ø12x400mm / Ø0.47x15.75")
AAA37512	Clamp holder, C-10 (Al body, Ø17mm / Ø0.66")
AAA37513	Clamp holder, C-7 (Al body, Ø12mm / Ø0.47")
AAA37514	Clamp holder, C-5 (PP body, Ø12mm / Ø0.47")
BEA1000014	2 Prong clamp (60mm / 2.36" grip)

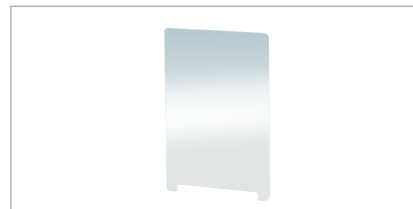
for Hotplates / Hotplate Stirrers



Temperature probe



Heating bath



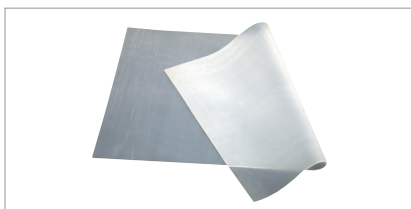
Transparent safety shield

Cat. No.	Description	Suitable for
AAA34501	Temperature Probe (PT 100, Max. 250 °C, SN-8-4 connector sensor)	TS series
AAA34502	Temperature Probe (PT 100, Max. 350 °C, SN-8-4 connector sensor)	
HPS0012	Heating Bath	T-14S/R, TM-14SB/RB, TS-14S
HPS0015	Heating Bath	T-17S/R, TM-17SB/RB, TS-14S
HPS0059	Transparent Safety Shield (PC)	T-14S/R, TM-14SB/RB, TS-14S
HPS0039	Transparent Safety Shield (PC)	T-17S/R, TM-17SB/RB, TS-17S
HPS0137	Sensor Holder (PP body, Hole 1: Ø11mm / Ø0.43", Hole 2: Ø10mm / Ø0.39", Hole 3: Ø4.2mm / Ø0.16")	TS series

for Magnetic Stirrers



Plate covers (black & white)



Silicone pad



Power divider (5 channels*)

Cat. No.	Description	Suitable for
MTT0144	Plate cover (White color, Silicone Ø115mm / Ø4.53")	MS-12T
MTT0146	Plate cover (White color, Silicone Ø165mm / Ø6.49")	MS-17T
MTT0002	Plate cover (White color, Silicone Ø120mm / Ø4.72")	MS-12B
MTT0003	Plate cover (White color, Silicone Ø170mm / Ø6.69")	MS-17B/G
MTT0004	Plate cover (White color, Silicone Ø220mm / Ø8.66")	MS-22B/G
MTT0143	Plate cover (Black color, Silicone Ø115mm / Ø4.53")	MS-12T
MTT0145	Plate cover (Black color, Silicone Ø165mm / Ø6.49")	MS-17T
MTT0005	Plate cover (Black color, Silicone Ø120mm / Ø4.72")	MS-12B
MTT0006	Plate cover (Black color, Silicone Ø170mm / Ø6.69")	MS-17B/G
MTT0007	Plate cover (Black color, Silicone Ø220mm / Ø8.66")	MS-22B/G
MTS0015	Silicone pad (355×475×1mm / 13.98×18.70×0.04")	MS-53M
MTS0016	Silicone pad (235×475×1mm / 9.25×18.70×0.04")	MS-52M
MTS0017	Silicone pad (115×475×1mm / 4.53×18.70×0.04")	MS-51M
MTS0041	Silicone pad (235×310×1mm / 9.25×12.20×0.04")	MS-32M
MTS0042	Silicone pad (355×310×1mm / 13.98×12.20×0.04")	MS-23M/33M
MTT0001	Power adapter (100–240V, 50/60Hz)	MS-12B/T, MS-17B/T
AAH33501	Power divider(5 channels) ¹⁾ with M10 rod, adapter(100–240V, 50/60Hz), five DC plugs	

1) Power supply to max. five units at the same time.



Powerful stirring and simple operation with sustainable economic benefits.



Performance & Convenience

- Years of vibration-free and silent operation.
- Equipped with a maintenance-free BLDC motor to generate smooth, quiet, and yet powerful stirring.
- Powerful torque capable of handling high viscosity tasks.
- Maintenance of constant motor speed by PID feedback control system even under conditions of changing viscosity.
- Prevention of accidental spills or splashes thanks to micro-processor controlled smooth start and stop functions.
- Designed for simple and quick operation.
- Well illuminated digital display panel with sensitive touch buttons.
- Set/present rpm, power ratio (%) are visible together on one screen.
- Compact and slim head design for diverse flexibility in configuring other test equipment and accessories. (optional)

Safety

- Sturdy aluminum main body efficiently absorbing and emitting the heat generated by the motor.
- Safety features against overload and overheating for continuous operation.

MSA-0420

Optional accessories
see page 172-173

- Impellers
- Stands, Support rods
- Clamps, Stirring seals

Model		MSA-0420
Speed control		PID feedback control
Speed range (rpm)		80 to 2,000
Chuck range (mm / inch, dia)		3 to 10 / 0.1 to 0.4
Stirring capacity, Max. (L, H ₂ O)		20
Viscosity, Max. (cP) ¹⁾		5,000 (~2,000rpm) / 10,000 (~1,200rpm) / 30,000 (~300rpm) / 50,000 (~200rpm)
Torque, Max. (N-cm)		19
Motor rating input / output (W)		70 / 40
Material	Body / Cover / Motor	Powder coated aluminum / Polypropylene / BLDC
Dimension	Overall (WxDxH) (mm / inch)	75x215x150/ 2.9x8.5x5.9
	Net weight (Kg / lbs)	2.8 / 6.2
Protection class (DIN EN 60529)		IP30
Electrical requirements (230V 50/60Hz)		0.5A
Cat. No.		AAH373325K
Electrical requirements (120V 60Hz)		0.5A
Cat. No.		AAH373325U

1) Silicone oil with using 3-bladed propeller impeller(Ø50) under room temperature of 26 °C, 60%RH, no load.

* Permissible environmental conditions: temperature (5-40 °C) and relative humidity (up to 80%).

* Main body comes together with chuck handle and attaching rod.

* Above specifications can be changed without prior notice.



Performance & Convenience

- Years of vibration-free and silent operation.
 - Equipped with a maintenance-free BLDC motor to generate smooth, quiet, and yet powerful stirring.
- Powerful torque capable of handling high viscosity tasks.
- Maintenance of constant motor speed by PID feedback control system even under conditions of changing viscosity.
- Best effort function intelligently manages its stirring speed to keep stirring even workload is out of its capacity.
- Prevention of accidental spills or splashes thanks to micro-processor controlled smooth start and stop functions.
- Well illuminated digital display panel with sensitive touch buttons.
 - Set/present rpm, power ratio (%) and run time are visible together on one screen.
- Stirring directions are selectable depending on each impeller's shape.
- Built-in USB port for external control and data collection.
 - Lab Companion software and USB cable are provided.
- Compact and slim head design for diverse flexibility in configuring other test equipment and accessories. (optional)

Safety

- Sturdy aluminum main body efficiently absorbing and emitting the heat generated by the motor.
- Safety features against overload and overheating for continuous operation.
- Keypad lock function prevents accidental changes.

Ideal for digital controlled high performance stirring task.

Intelligent speed controller enables reproducible results under varying viscosity condition.



MSD-0420

Optional accessories
see page 172-173

- Impellers
- Stands, Support rods
- Clamps, Stirring seals

Model		MSD-0420
Speed control		PID feedback control
Speed range (rpm)		80 to 2,000
Chuck range (mm / inch, dia)		3 to 10 / 0.1 to 0.4
Stirring capacity, Max. (L, H ₂ O)		20
Viscosity, Max. (cP) ¹⁾		5,000 (~2,000rpm) / 10,000 (~1,200rpm) / 30,000 (~300rpm) / 50,000 (~200rpm)
Torque, Max. (N·cm)		19
Motor rating input / output (W)		70 / 40
Material	Body / Cover / Motor	Powder coated aluminum / Polypropylene / BLDC
Dimension	Overall (WxDxH) (mm / inch)	75x215x150 / 2.9x8.5x5.9
	Net weight (Kg / lbs)	2.8 / 6.2
Protection class (DIN EN 60529)		IP30
Electrical requirements (230V 50/60Hz)		0.5A
Cat. No.		AAH373225K
Electrical requirements (120V 60Hz)		0.5A
Cat. No.		AAH373225U

1) Silicone oil with using 3-bladed propeller impeller(Ø50) under room temperature of 26°C, 60%RH, no load.

* Permissible environmental conditions: temperature (5-40°C) and relative humidity (up to 80%).

* Main body comes together with chuck handle and attaching rod.

* Above specifications can be changed without prior notice.

Ideally perform your professional stirring tasks requiring high functionality, safety, and longevity.

Prestige touch LCD controller and practical external controller add it's superiority.



MSH-0512 with optional external controller

Optional accessories
see page 172-173

- External controller (cable type)
- Impellers, Stands, Support rods
- Clamps, Stirring seals



Performance

- Years of vibration-free and silent operation.
 - Equipped with a maintenance-free BLDC motor to generate smooth, quiet, and yet powerful stirring.
- Powerful torque capable of handling high viscosity tasks.
- Maintenance of constant motor speed by PID feedback control system even under conditions of changing viscosity.
- Best effort function intelligently manages its stirring speed to keep stirring even workload is out of its capacity.
- Prevention of accidental spills or splashes thanks to micro-processor controlled smooth start and stop functions.

Convenience

- Touch type LCD controller.
 - Various essential information are visible at once and intuitively controlled.
 - Set/present rpm and run time view, simple timer set. (max. 99 hr. 59 min.)
 - Varying motor torque is indicated on display in real time.
 - Motor temperature condition is indicated on display by three different colors to protect motor.
 - Stirring directions are selectable depending on each impeller's shape.
- Built-in USB port for external control and data collection.
 - Useful for PC control and data management task.
 - Lab Companion software and USB cable are provided as standard.

- Practical external controller.
 - Intuitive and easy control with color touch LCD.
 - It enables convenient and safe external control without opening the sash of the fume hood or safety cabinet.
- Compact and slim head design for diverse flexibility in configuring other test equipment and accessories. (optional)

Safety

- Sturdy aluminum main body efficiently absorbing and emitting the heat generated by the motor.
- Safety features against overload and overheating for continuous operation.
 - When it comes to heavy workload, it tries to activate best effort function. But if it determines that performing the work is harmful for it, than it stops stirring.
 - Equipped with a mini fan inside to minimize overheating of the motor.
- Separated adapter from the main body minimizes the risks of electrical hazards to the users.
- Screen lock function prevents accidental changes during operation.

Model		MSH-0512	MSH-0520
Speed control		PID feedback control	
Speed range (rpm)		50 to 1,200	50 to 2,000
Chuck range (mm / inch, dia)		3 to 10 / 0.1 to 0.4	
Stirring capacity, Max. (L, H ₂ O)		100	60
Viscosity, Max. (cP) ¹⁾		5,000 (~1,200rpm) 10,000 (~1,200rpm) 30,000 (~1,200rpm) 50,000 (~700rpm)	5,000 (~2,000rpm) 10,000 (~1,600rpm) 30,000 (~600rpm) 50,000 (~300rpm)
Torque, Max. (N·cm)		41.6	20.8
Motor rating input / output (W)		71 / 48	
Material	Body / Cover / Motor	Powder coated aluminum / Polypropylene / BLDC	
Dimension	Overall (WxDxH) (mm / inch)	80x185x235 / 3.1x7.3x9.3	
	Net weight (Kg / lbs)	3.1 / 6.8	
Protection class (DIN EN 60529)		IP30	
Electrical requirements		AC 100 to 240V, 50/60Hz with power adapter	
Power consumption (W)		5.0 A	5.0 A
Cat. No.	KR Plug	AAH371415K	AAH371515K
	US Plug	AAH371415U	AAH371515U

1) Silicone oil with using 3-bladed propeller impeller(Ø50) under room temperature of 26℃, 60%RH, no load.

* Permissible environmental conditions : temperature (5-40℃) and relative humidity (up to 80%).

* Main body comes together with chuck handle and attaching rod.

* Above specifications can be changed without prior notice.

Impellers

Propeller impellers

Standard grade stainless steel with Teflon shaft produces an-axial flow stir between the bot-tom and top levels of a sample with local shearing force. Used at medium or high speeds for mixing normal range level viscosity samples.

Turbine impellers

A radial flowing stir from the top and bottom levels of a sample with a powerful, high shearing turbulent force. Used ideally for the gassing of liquids and mixing medium to high range level viscosity samples.

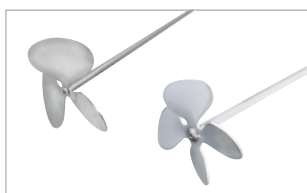
Half-moon impellers / Centrifugal impellers

Tiltable moon-shaped and blade shaft produces a normal axial flow percentage mixing of samples. Used with round bo-ttom shaped containers, medium mixing speed, and samples ranging from low to medium visco-sity levels.

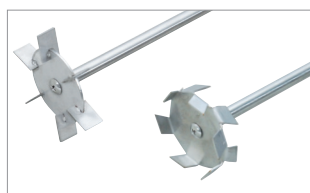
Anchor impellers / Paddle impellers

An anchored shaft that produces a strong tangential flow with a high shearing percentage force on samples with medium to high viscosity level with speed setting in the low to medium range.

Stainless steel impellers



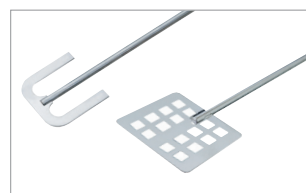
Propeller (3-bladed / 4-bladed)



Turbine / Dissolver



Half-moon / Centrifugal

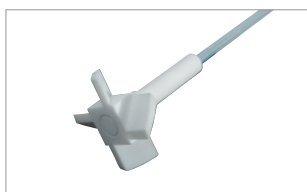


Anchor / Paddle

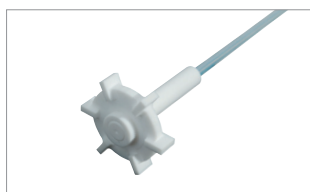
Cat. No.	Blade (WxH, mm / inch)	Shaft (Ø, mm / inch)	Length (mm / inch)
3-bladed propeller			
AAA37521	50 / 1.97	8 / 0.31	400 / 15.75
AAA37522	70 / 2.76	8 / 0.31	400 / 15.75
AAA37523	100 / 3.94	8 / 0.31	400 / 15.75
4-bladed propeller			
AAA37531	50 / 1.97	8 / 0.31	400 / 15.75
AAA37532	70 / 2.76	8 / 0.31	400 / 15.75
AAA37533	100 / 3.94	8 / 0.31	400 / 15.75
Turbine			
AAA37561	40 / 1.57	8 / 0.31	500 / 19.69
AAA37562	70 / 2.76	8 / 0.31	500 / 19.69
Dissolver			
BEA0570031	55 / 2.17	8 / 0.31	350 / 13.78
BEA0570032	75 / 2.95	8 / 0.31	350 / 13.78

Cat. No.	Blade (WxH, mm / inch)	Shaft (Ø, mm / inch)	Length (mm / inch)
Half-moon			
AAA37541	65x20 / 2.56x0.79	8 / 0.31	300 / 11.81
AAA37542	90x25 / 3.54x0.98	8 / 0.31	500 / 19.69
Centrifugal			
AAA37551	50x15 / 1.97x0.59	8 / 0.31	500 / 19.69
AAA37552	80x15 / 3.15x0.59	8 / 0.31	500 / 19.69
Anchor			
AAA37571	45x45 / 1.77x1.77	8 / 0.31	300 / 11.81
AAA37572	60x60 / 2.36x2.36	8 / 0.31	500 / 19.69
Paddle A			
AAA37581	70x70 / 2.76x2.76	8 / 0.31	500 / 19.69

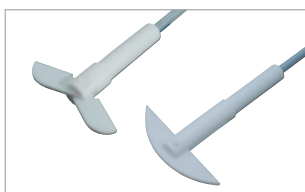
PTFE coated impellers



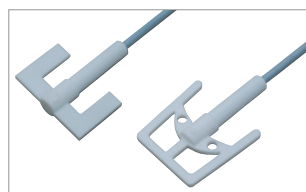
Propeller (4-bladed)



Turbine



Half-moon / Centrifugal



Anchor / Paddle

Cat. No.	Blade (WxH, mm / inch)	Shaft (Ø, mm / inch)	Length (mm / inch)
4-bladed propeller			
BEA0570081	50 / 1.97	8 / 0.31	500 / 19.69
BEA0570082	70 / 2.76	8 / 0.31	500 / 19.69
Turbine			
BEA0570131	70 / 2.76	8 / 0.31	500 / 19.69

Cat. No.	Blade (WxH, mm / inch)	Shaft (Ø, mm / inch)	Length (mm / inch)
Half-moon			
BEA0570091	60x18 / 2.36x0.71	8 / 0.31	500 / 19.69
Centrifugal			
BEA0570101	76x17 / 2.99x0.67	8 / 0.31	500 / 19.69
Anchor			
BEA0570111	80x50 / 3.15x1.97	8 / 0.31	500 / 19.69
BEA0570121	80x40 / 3.15x1.57	8 / 0.31	500 / 19.69
Paddle			
BEA0570141	70 / 2.76	8 / 0.31	500 / 19.69
Paddle A			
BEA0570151	78x80 / 3.07x3.15	8 / 0.31	500 / 19.69

External controller for MSH

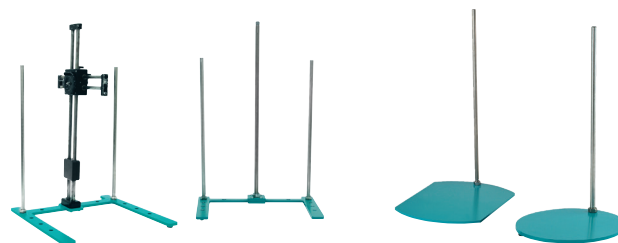


External controller for practical external control.

Real time external monitor and control of the current operating condition without opening the door of the enclosure.

Cat. No.	Description
AAA37591	External controller (3m cable) (WxDxH, 60x16x120 / 2.4x0.6x4.7")

Stands / Support rods



Dial stand / Basic stand 1
with two optional support rods

Basic stand 2
Basic stand 3

Cat. No.	Description
AAA37501	Dial stand (WxDxH, 400x400x700 / 15.75x15.75x27.56")
AAA37502	Basic stand 1 (WxDxH, 400x400x700 / 15.75x15.75x27.56")
AAA37503	Basic stand 2 (WxDxH, 300x400x700 / 11.81x15.75x27.56")
AAA37504	Basic stand 3 (WxDxH, 250x350x700 / 9.84x13.78x27.56")
MSS0051	Support Rod, M14 (Ø15x500mm / Ø0.59x19.68")
MSS0052	Support Rod, M14 (Ø18x500mm / Ø0.71x19.68")
MSS0053	Support Rod, M14 (Ø20x500mm / Ø0.79x19.68")

Clamps / Others



Cat. No.	Description	Cat. No.	Description
BEA1000001	Utility clamp 3 prong	AAA37512	Clamp holder, C-10 (Al body, Ø17mm / 0.67")
BEA1000002	Utility clamp plat	AAA37511	Clamp holder, C-20 (Al body, Ø27mm / 1.06")
BEA1000011	3 prong clamp (80mm / 3.15" grip)	BEA0570191	Flexible coupling
BEA1000012	3 prong clamp (60mm / 2.36" grip)	BEA0570161	PTFE stirring seals (24 / 40)
BEA1000013	3 prong clamp (20mm / 0.79" grip)	BEA0570162	PTFE stirring seals (29 / 42)
BEA1000014	2 prong clamp (60mm / 2.36" grip)	BEA0570163	PTFE stirring seals (34 / 45)
BEA0570181	Fixing clamp		

Vortex Mixers

Low profile design and highly touch sensitive sensor reduce wrist stresses when pushing and holding experiment tools resulting in less fatigue and less unpleasant feeling.



VM-96T / VM-96A

※ Microplate tray in above picture is optional.

High-sensitive platform (standard accessory)



Rapid vortex formation even touching anywhere on top plate.



Available to handle the several tubes at the same time.



Various shape tubes can be used. (centrifuge tube, conical tube, test tube, etc.)



Features

- Well-balanced design and optimized safety features.
- Low-profile with small footprint ideal for use on lab benches and within fume hoods or clean benches.
- On touch operation mode, real-time and dynamic mixing made even with gentle touch.
 - Every point of the top surface is highly reactive to gentle touch due to widely built in sensitive sensors.
- Selective mixing modes with variable speed control knob.
 - VM-96A: Touch / Continuous / High-continuous.
 - VM-96T: Touch / Continuous.
- Built-in LED lamps in case of VM-96A for easy recognition of the mixing mode selected.
- Sparkless BLDC motor adopted for safety, quick acceleration, and low maintenance.
- Built-in safety features against overload and over current.
- Chemically resistant polypropylene molded exterior.
- Wide range of accessories available.

Model		VM-96A	VM-96T	
Speed range (rpm)		Max. 3000		
Speed control		Scale		
Operating mode		Touch / Continuous / High-continuous	Touch / Continuous	
Motion		Orbital		
Orbit size (mm, inch, dia.)		4 / 0.16		
Max. load (kg / lbs)		0.5 / 1.1		
Motor rating input / output (W)		12 / 6		
Material	Platform	Silicone		
	Body	Polypropylene		
	Motor type	BLDC (Brushless Direct Current)		
Dimensions	Platform (WxD) (mm / inch)	76x76 / 3x3		
	Exterior ¹⁾ (WxDxH) (mm / inch)	154×210×84 / 6.1x8.3x3.3		148x159x77 / 5.8x6.3x3
	Net weight (kg / lbs)	3 / 6.6		2.6 / 5.7
Protection class (DIN EN 60529)		IP 42		-
Electrical requirements		AC 100V to 240V, 50/60Hz		
Cat. No.	KR plug	AAH360215K	Persian blue AAH361215BK	Orange AAH361215RK
	US plug	AAH360215U	Persian blue AAH361215BU	Orange AAH361215RU

1) Exterior dimension without accessories.

* Permissible environmental conditions: temperature (5-40℃) and relative humidity (up to 80%)

* Protection class according to DIN EN 60529: Waterproof, dust production index based on the test level.

* RoHS except for VM-T.

* FDA establishment registered company. FDA listed products.

Accessories & Options



Platform (standard)



Platform (pop-off)

Microplate tray

Cat. No.	Description
VMS0058	Platform (standard)
VMS0011	Platform (pop-off)
VMS0008	Microplate tray
AAA36520	Tube holder with tray (up to Φ50mm)
AAA36521	Tube holder with tray (Φ10mm x 16ea)
AAA36522	Tube holder with tray (Φ12mm x 9ea)
AAA36523	Tube holder with tray (Φ15mm x 9ea)
AAA36524	Tube holder with tray (Φ20mm x 5ea)
AAA36525	Tube holder with tray (Φ25mm x 4ea)
AAA36526	Tube holder with tray (Φ8mm x 18ea & Φ10mm x 28ea)



Tube holders with adhesive tray for stable vortexing.

Temperature Chambers

Heating Chambers
(Floor Standing Models)

Heating & Cooling Chambers
(Floor Standing Models)

Heating & Cooling Chambers
(Tabletop Models)

» General Applications

Test for reliability, durability, climatic, freezing resistance, quality assurance, thermal endurance.

- Testing for electric and electronic component, sensors.
- Testing for semiconductor, PCB, LCD & LED.
- Pharmaceutical tests.
- Mechanical / Military / Aircraft engineering.
- Automobile, Transport / automobile supply industries.
- Chemical / Petrochemical industries.
- Construction materials / Plastic / Textile industries.
- Testing, liquor, cigar, paintings.
- Testing metal related industries like plating.

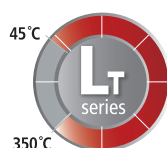
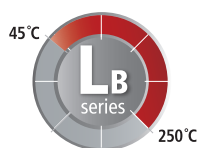


Product Name		Heating & Cooling Chambers (Floor Standing Models)		
Model		KBD	KMV	JMV
Air flow		Horizontal airflow	Horizontal airflow	Vertical airflow
Chamber volume (L)		125, 253, 420	125, 253, 420, 720, 1000	125, 253, 420, 720, 990
Temp. control	Operating temp. range (°C/°F)	-70 to 180 / -94 to 356	-35 to 180 / -31 to 356	-35 to 180 / -31 to 356
	Fluctuation at 100 °C (±°C/°F)	0.2 / 0.36	0.4, 0.3, 0.2 / 0.72, 0.54, 0.36	0.5, 0.3, 0.4 / 0.9, 0.54, 0.72
	Variation at 100 °C (±°C/°F)	1.2, 1.0 / 2.16, 1.8	1.0, 0.9 / 1.8, 1.62	1.0, 0.8, 1.2, 0.9 / 1.8, 1.44, 2.16, 1.62
Control	Timer	Wait on/off	Wait on/off	Wait on/off
	Auto-tuning	0	0	0
	Program function	0	0	0
	Computer interface	RS-232 port, RS-485 port (optional)	RS-232 port, RS-485 port (optional)	RS-232 port, RS-485 port (optional)
Safety	Over temp. limit	0	0	0
	Door open alarm	0	0	0
	Over current limit	0	0	0
	Auto-run (power failure)	0	0	0

Product Name		Heating Chambers (Floor Standing Models)	
Model		LBV	LTV
Air flow		Horizontal airflow	Horizontal airflow
Chamber volume (L)		125, 253, 420, 720, 1000	125, 253, 420, 720, 1000
Temp. control	Operating temp. range (°C/°F)	Amb. +45 to 250 / Amb. +81 to 482	Amb. +45 to 350 / Amb. +81 to 662
	Fluctuation at 100 °C (±°C/°F)	0.3 / 0.54	0.4, 0.3, 0.5 / 0.72, 0.54, 0.90
	Variation at 100 °C (±°C/°F)	0.4, 1.3, 0.5 / 0.72, 2.34, 0.9	0.5, 0.6, 0.7, 0.4 / 0.9, 1.08, 1.26, 0.72
Control	Timer	Wait on/off	Wait on/off
	Auto-tuning	0	0
	Program function	0	0
	Computer interface	RS-232 port, RS-485 port (optional)	RS-232 port, RS-485 port (optional)
Safety	Over temp. limit	0	0
	Door open alarm	0	0
	Over current limit	0	0
	Auto-run (power failure)	0	0

Heating & Cooling Chambers (Floor Standing Models)				Heating & Cooling Chambers (Tabletop Models)	
PBV	PMV	LCH / LCH-G	LCH-2C / LCH-G-2C	TC-KE	TC-ME
Horizontal airflow	Horizontal airflow	Horizontal airflow		Vertical airflow	
125, 250, 400, 700, 1000	125, 250, 400, 700, 1000	150, 255, 485	150 x 2 chambers	25, 65, 100	
-25 to 100 / -13 to 212	-5 to 100 / 23 to 212	-20 to 100 / -4 to 212 (LCH / LCH-G), 0 to 100 / 32 to 212 (LCH-2C / LCH-G-2C)		-40 to 150 / -40 to 302	-20 to 120 / -4 to 248
0.3, 0.4, 0.2 / 0.54, 0.72, 0.36	0.3 / 0.54	0.3 / 0.54		0.5 / 0.9 at 50 °C	0.4, 0.3 / 2.0, 1.9
0.6, 0.7, 0.8 / 1.08, 1.26, 1.44	1.0, 0.8, 0.7 / 1.8, 1.44, 1.26	0.8 / 1.44 at 80 °C		1.0 / 1.8 at 50 °C	2.0, 1.9, 1.8 / 3.6, 3.42, 3.24
Wait on/off	Wait on/off	Wait on/off		Wait on/off	
0	0	0		0	
0	0	0		0	
RS-232 port, RS-485 port (optional)	RS-232 port, RS-485 port (optional)	RS-232 port		RS-232 port, RS-485 port (optional)	
0	0	0		0	
0	0	0		0	
0	0	0		0	
0	0	0		0	

Heating Chambers (Floor Standing - LBV / LTV)



LBV-040 / LTV-040

with optional recorder

Standard accessories

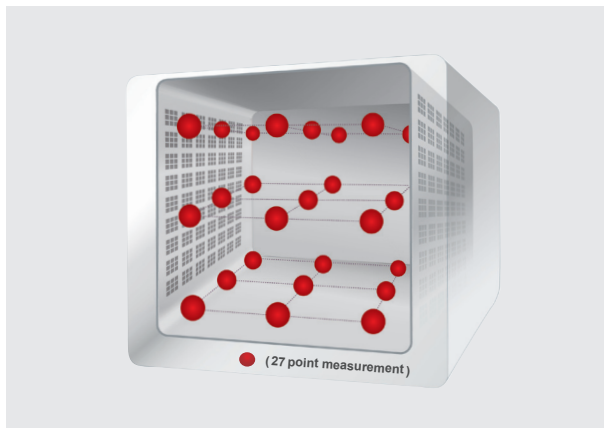
- Wire shelves, Door key

Optional accessories

see page 207

- Recorder, Interface converter, Warning signal lamps
- Perforated shelves (max. load 40kg)

Reliable international standard

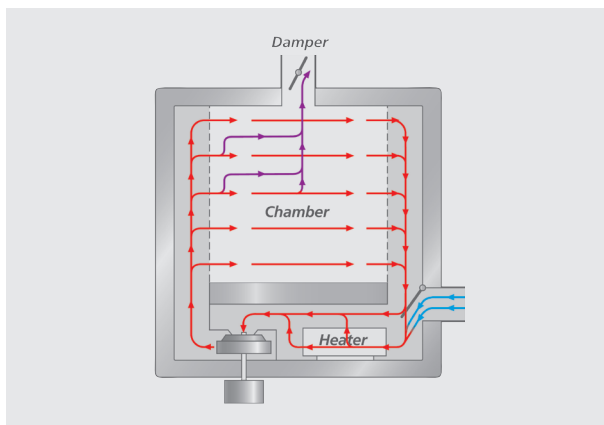


Designed and tested in accordance with the international standards.

Temperature values of all chambers are measured according to DIN 12880 and IEC 60068-3-5.

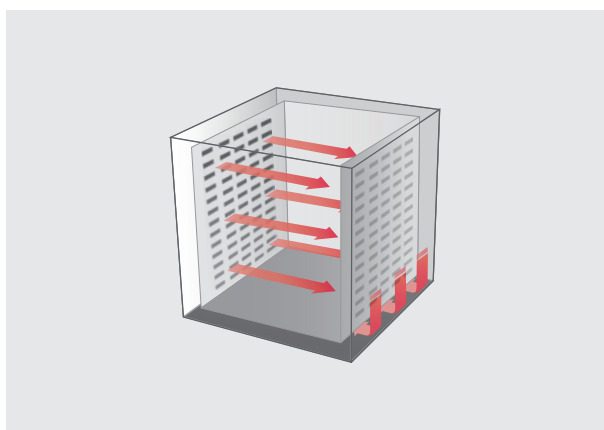
- Increase in reliability of accurate temperature implementation and test results. (27 point measurement data)

Uniform air circulation



An unrivalled designed air circulation system boosts a uniform temperature distribution.

- Horizontal forced convection increases temperature uniformity by flowing heated air throughout the whole chamber.
- Air intake and exhaust damper rapidly cools-down and ventilates chamber.
- Various applications are available for higher air exchange.
 - Freely control of air volume by adjusting the air flap position with damper handle based on individual application needs.
- Safe damper guard protect users from overheated damper.



Horizontal airflow

LBV series

- Amb.+45°C to 250°C / Amb. +113°F to 482°F
- Horizontal airflow

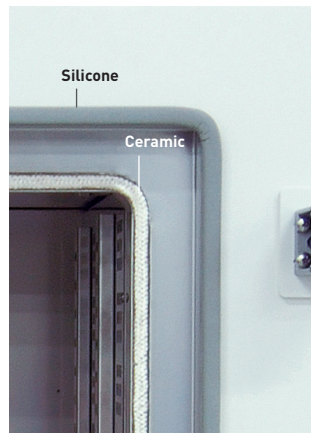
LTV series

- Amb.+45°C to 350°C / Amb. +113°F to 662°F
- Horizontal airflow

L - SERIES



Two-point door latch



Double sealed packings
(for LTV models)



Warning signal lamp
(optional)



Stainless steel chamber



Individual over temperature limiter

Performance

- Suitable for specific use such as heat treatment and drying process.
- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Air-tight door closure with double sealed Packing.
 - Heat-resistant silicone double packing completely blocks high heat leakage from the inner chamber. (for LBV)
 - Non-conducting ceramic and heat-resistant silicone packing completely blocks high heat leakage from the inner chamber. (for LTV)
 - Two-point door latch also enhances tightness to door closure.
- Energy efficiency is achieved thanks to optimization of the insulation system.
 - Even if the unit is operating at max. temperature, the surface of the unit doesn't allow high temperatures of over 51 °C. (DIN EN 563)
- Reliable design and production of door is guaranteed.
 - Evaluates the results after opening the door by 90 degrees and applying 50kg load to the point of 30cm from hinges.

Safety

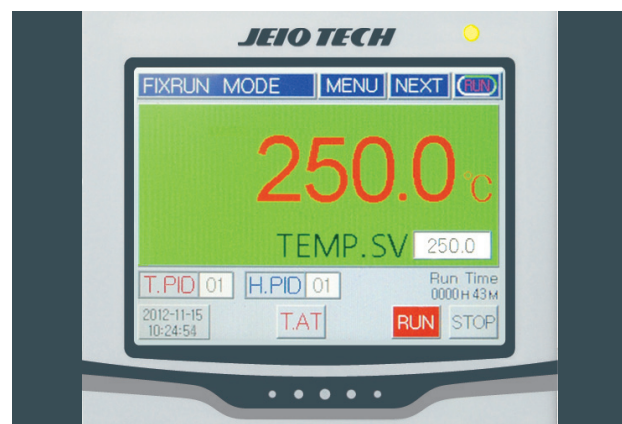
- User selectable operation mode after power interruption
 - ether Automatic run or Manual run.
- Over-temperature protection.
- Over-current and current leakage protection. (ELCB, earth leakage circuit breaker)
- Independent safety fuse.
 - Important parts such as controller and heaters are highly secured from short circuit. Especially each heater has an individual fuse to completely break a short circuit.
- Reversed-phase protection.
 - Electrical connection error indicator helps user to rapidly fix the connection.
- Over-current protection of motor.
 - Automatic shut-off in situations where there is over-current to the motor.
- Open door warning.
 - Heater and fan stop when the door is the open state.
- Electric wiring panel access warning.
 - Automatic stop if the cover of electric wiring panel is opened.
- Built in door lock with a key.

Convenience

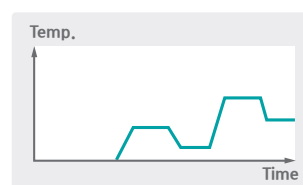
- Corrosion resistance stainless steel inner chamber.
- Space efficient and easy loading chamber design.
 - Included two shelves for loading of large amounts of samples.
 - Heavy load shelving, rated for 40kg are also available. (optional)
- User friendly LCD controller.
 - Colorful interactive touch type LCD controller.
 - Set point temperature and present temperature are clearly shown together on display.
 - Sufficient programmable control support.
 - Operating progress can be shown in graph mode for better data understanding.
 - Automatic start/stop can be programmed for unattended operations.
 - Display indicates abnormal temperature changes or power failures.
 - Three different language support. (English / Chinese / Korean)
 - Temperature and other operating parameters can be recorded using a six channel digital recorder.(optional)
- Computer interface.
 - RS-485 communication port (optional) enables connection up to maximum 32 units. Simultaneous monitoring and operating of multiple units is an available feature.
 - Program patterns are simple to set with the use of our software.
 - Easy to check status of real-time operations. Graph data supports easy understanding.
 - Storage and documentation of programs.
 - Data with saving capabilities in excel and text format.
 - Storage of program information, backup of value settings, recovery, and temperature values.
 - RS-232 communication port as standard offer.

Description	No
Programmable pattern capacity	100
Pattern repeat time	999
Part repeat time	255
Max. segments per a pattern	100
Available max. segments*	6000
Programmable process time per a segment	0 to 99 hr. 59 min.

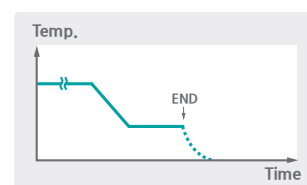
* Even though the max. segments per pattern are 100, the total available segments are up to 6000 not 10000, therefore arrangement of the number of segment and patterns will need to be done properly.



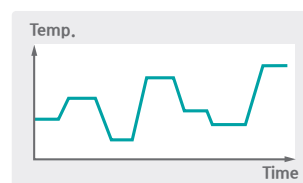
Color LCD controller



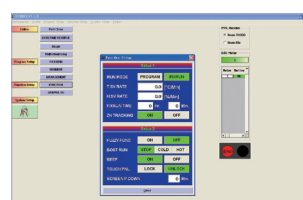
Automatic start



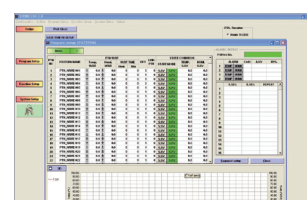
End of program



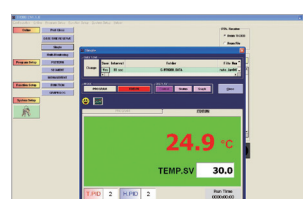
Program control



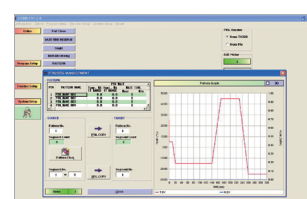
Function setup



Program setup



Operating status



Graph display

Heating Chambers (Floor Standing - LBV / LTV)

Model		LBV-012	LBV-025	LBV-040	LBV-070	LBV-100
Chamber volume (L / cu ft)		125 / 4.4	253 / 8.9	420 / 14.8	720 / 25.4	1000 / 35.3
Controller		Programmable, Touch screen type controller (3.5" color monitor)				
Temperature range (°C / °F)	intake/damper 100% close	Amb.+45 to 250 / Amb. +81 to 482				
	intake/damper 100% open	Max. 80 / Max. 176	Max. 80 / Max. 176	Max. 120 / Max. 248	Max. 80 / Max. 176	Max. 140 / Max. 284
Temperature fluctuation ^{1) 2)} at 100°C (±°C / °F)		0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54
Temperature variation ²⁾ (±°C / °F)	at 100°C	0.4 / 0.72	0.4 / 0.72	1.3 / 2.34	0.5 / 0.90	0.5 / 0.90
	at 150°C	0.7 / 1.26	0.7 / 1.26	2.3 / 4.14	0.7 / 1.26	0.8 / 1.44
	at 200°C	1.1 / 1.98	1.1 / 1.98	3.2 / 5.76	1.1 / 1.98	1.2 / 2.16
	at 250°C	1.7 / 3.06	1.7 / 3.06	4.1 / 7.38	1.5 / 2.70	1.7 / 3.06
Heating time ²⁾ (min.) from Amb. to 250°C		51	51	51	55	60
Recovery time ²⁾ after door was opened (min.)	at 100°C	10.5	10.5	8	6.5	8
	at 150°C	8	8	9	8	9.5
	at 200°C	4.5	4.5	8.5	7	8.5
	at 250°C	5	5	9.5	5.5	9.5
Air change rate (approx, x/h)		213	266	173	233	193
Air circulation (approx, x/h)		374	590	294	348	220
Exhaust air volume flow (approx, L/min)		380	1240	1400	1910	1560
Air flow velocity (m/s)		0.2 to 0.6	0.2 to 0.6	0.2 to 0.6	0.2 to 0.6	0.2 to 0.6
No. of wire shelves (standard / max.)		2 / 12	2 / 17	2 / 22	2 / 29	2 / 32
Distance of between shelves (mm / inch)		30 / 1.2				
Max. load per shelf (kg / lbs)		15 / 33.1	20 / 44.1	30 / 66.1	40 / 88.2	45 / 99.2
Permitted total load (kg / lbs)		50 / 110.2	70 / 154.3	90 / 198.4	120 / 264.6	150 / 330.7
Dimension (WxDxH)	Interior (mm / inch)	500×500×500 / 19.7×19.7×19.7	600×650×650 / 23.6×25.6×25.6	750×700×800 / 29.5×27.6×31.5	900×800×1000 / 35.4×31.5×39.4	1000×910×1100 / 39.4×35.8×43.3
	Exterior (mm / inch)	1100×745×1362 / 43.3×29.3×53.6	1200×995×1559 / 47.2×39.2×61.4	1350×1045×1712 / 53.1×41.1×67.4	1500×1145×1912 / 59×45.1×75.3	1600×1255×2012 / 62.9×49.4×79.2
	Net weight (kg / lbs)	170 / 374.8	260 / 573.2	320 / 705.5	390 / 859.8	440 / 970
Interface port		Basically RS-232C [RS-485(maximum 32 units control)-optional]				
Electrical requirements (230V, 60Hz)		1ph / 14A	1ph / 21.3A			
Cat. No.		AAHK1011K	AAHK1021K	-	-	-
Electrical requirements (230V, 50Hz)		1ph / 14A	1ph / 21.3A	3ph / 16.2A	3ph / 20.7A	3ph / 24.6A
Cat. No.		AAHK1012K	AAHK1022K	AAHK10312K	AAHK10412K	AAHK10512K
Electrical requirements (380V, 50Hz)				3ph / 9.4A	3ph / 12A	3ph / 14.2A
Cat. No.		-	-	AAHK1038K	AAHK1048K	AAHK1058K

1) According to IEC 60068-3-5

2) According to DIN 12880

※ Above specification value is recorded by 230V/60Hz, 380V/50Hz.

※ Above specifications can be changed without prior notice.

※ FDA establishment registered company. FDA listed products.

Model		LTV-012	LTV-025	LTV-040	LTV-070	LTV-100
Chamber volume (L / cu ft)		125 / 4.4	253 / 8.9	420 / 14.8	720 / 25.4	1000 / 35.3
Controller		Programmable, Touch screen type controller (3.5" color monitor)				
Temperature range (°C / °F)	intake/damper 100% close	Amb.+45 to 350 / Amb. +81 to 662				
	intake/damper 100% open	Max. 115 / Max. 239	Max. 115 / Max. 239	Max. 180 / Max. 356	Max. 150 / Max. 302	Max. 210 / Max. 410
Temperature fluctuation ^{1) 2)} at 100°C (±°C / °F)		0.4 / 0.72	0.4 / 0.72	0.3 / 0.54	0.5 / 0.90	0.4 / 0.72
Temperature variation ²⁾ (±°C / °F)	at 100°C	0.5 / 0.90	0.5 / 0.90	0.6 / 1.08	0.7 / 1.26	0.4 / 0.72
	at 150°C	0.7 / 1.26	0.7 / 1.26	1.0 / 1.80	1.1 / 1.98	0.6 / 1.08
	at 200°C	1.1 / 1.98	1.1 / 1.98	1.7 / 3.06	1.9 / 3.42	1.1 / 1.98
	at 250°C	1.6 / 2.88	1.6 / 2.88	2.5 / 4.5	2.7 / 4.86	1.6 / 2.88
	at 300°C	2.4 / 4.32	2.4 / 4.32	3.4 / 6.12	3.4 / 6.12	2.4 / 4.32
	at 350°C	3.4 / 6.12	3.4 / 6.12	3.4 / 6.12	4.1 / 7.38	3.2 / 5.76
Heating time ²⁾ (min.) from Amb. to 350°C		41	41	43	40	45
Recovery time ²⁾ after door was opened (min.)	at 100°C	8.5	8.5	6	6	7.5
	at 150°C	8.5	8.5	9	7.5	9.5
	at 200°C	3.5	3.5	8.5	8.5	8.5
	at 250°C	5	5	11.5	8.5	9.5
	at 300°C	7.5	7.5	12.5	8.5	9
	at 350°C	8.5	8.5	12.5	10	10
Air change rate (approx, x/h)		213	266	173	233	193
Air circulation (approx, x/h)		374	590	294	348	220
Exhaust air volume flow (approx, L/min)		380	1240	1400	1910	1560
Air flow velocity (m/s)		0.2 to 0.6	0.2 to 0.6	0.2 to 0.6	0.2 to 0.6	0.2 to 0.6
No. of wire shelves (standard / max.)		2 / 12	2 / 17	2 / 22	2 / 29	2 / 32
Distance of between shelves (mm / inch)		30 / 1.2				
Max. load per shelf (kg / lbs)		15 / 33.1	20 / 44.1	30 / 66.1	40 / 88.2	45 / 99.2
Permitted total load (kg / lbs)		50 / 110.2	70 / 154.3	90 / 198.4	120 / 264.6	150 / 330.7
Dimension (WxDxH)	Interior (mm / inch)	500×500×500 / 19.7×19.7×19.7	600×650×650 / 23.6×25.6×25.6	750×700×800 / 29.5×27.6×31.5	900×800×1000 / 35.4×31.5×39.4	1000×910×1100 / 39.4×35.8×43.3
	Exterior (mm / inch)	1100×745×1362 / 43.3×29.3×53.6	1200×995×1559 / 47.2×39.2×61.4	1350×1045×1712 / 53.1×41.1×67.4	1500×1145×1912 / 59×45.1×75.3	1600×1255×2012 / 62.9×49.4×79.2
	Net weight (kg / lbs)	170 / 374.8	260 / 573.2	320 / 705.5	390 / 859.8	440 / 970
Interface port		Basically RS-232C [RS-485(maximum 32 units control)-optional]				
Electrical requirements (230V, 60Hz)		1ph / 276A				
Cat. No.		AAHK2011K	-	-	-	-
Electrical requirements (230V, 50Hz)		1ph / 276A	3ph / 24.1A	3ph / 32A	3ph / 40.3A	3ph / 48.2A
Cat. No.		AAHK2012K	AAHK20212K	AAHK20312K	AAHK20412K	AAHK20512K
Electrical requirements (380V, 50Hz)			3ph / 13.9A	3ph / 18.5A	3ph / 23.4A	3ph / 27.9A
Cat. No.		-	AAHK2028K	AAHK2038K	AAHK2048K	AAHK2058K

1) According to IEC 60068-3-5

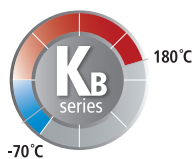
2) According to DIN 12880

* Above specification value is recorded by 380V/50Hz.

* Above specifications can be changed without prior notice.

* FDA establishment registered company. FDA listed products.

Heating & Cooling Chambers (Floor Standing - KBD)



KBD-040

with optional recorder

Standard accessories

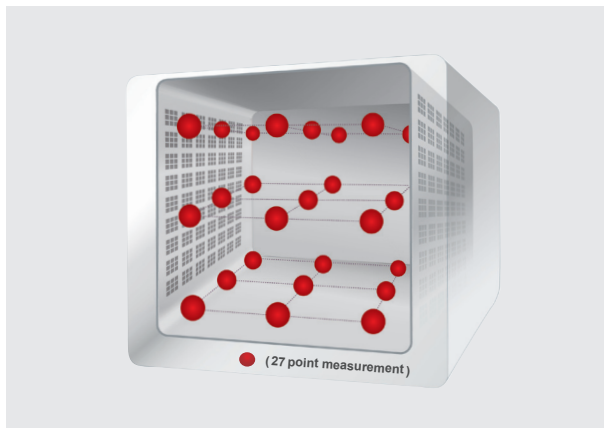
- Wire shelves, Door key
- Cable port
(Ø50mm for 012/025 models or Ø80mm for 040/070/100 models)

Optional accessories

see page 207

- Recorder, Interface converter, Warning signal lamps
- Perforated shelves (max. load 40kg)

Reliable international standard

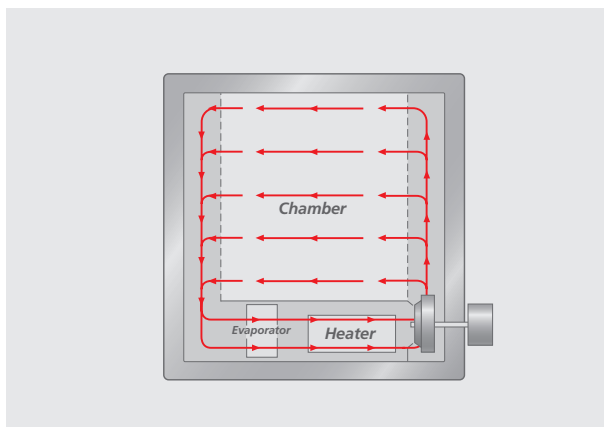


Designed and tested in accordance with the international standards.

Temperature values of all chambers are measured according to IEC 60068-3-5 and DIN 12880.

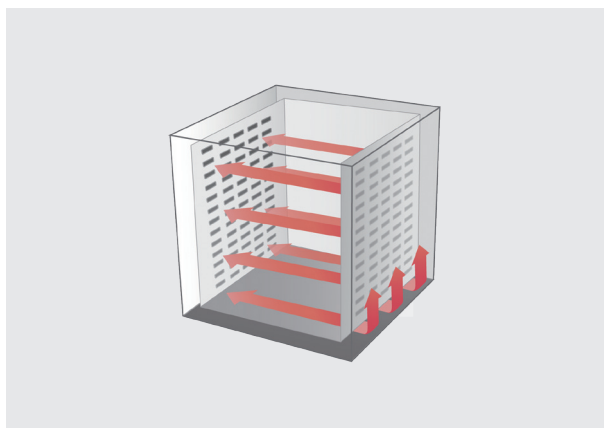
- Increase in reliability of accurate temperature implementation and test results. (27 point measurement data)

Uniform air circulation



An unrivalled designed air circulation system boosts a uniform temperature distribution.

- Horizontal forced convection increases temperature uniformity by flowing heated air throughout the whole chamber.

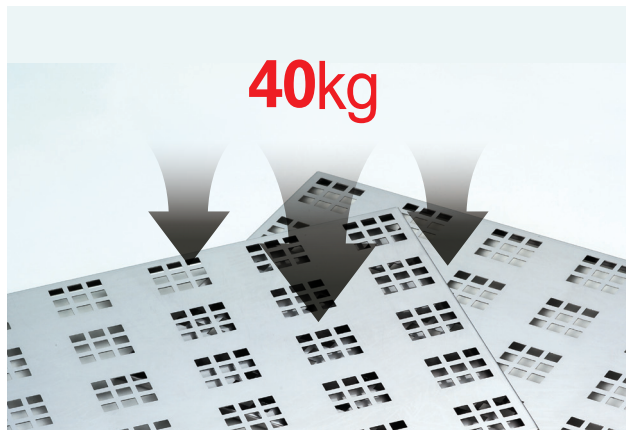


Horizontal airflow

KBD series

- -70°C to 180°C / -94°F to 356°F
- Horizontal airflow

K - SERIES



Perforated shelves for heavy load (optional)



Stainless steel chamber



Two-point door latch



Individual over temperature limiter



Warning signal lamp (optional)

Performance

- Suitable for specific use such as heat treatment and drying process.
- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Air-tight door closure with double sealed packing.
 - Heat-resistant silicone double packing completely blocks high heat leakage from the inner chamber.
 - Two-point door latch also enhances tightness to door closure.
- Energy efficiency is achieved thanks to optimization of the insulation system.
 - Even if the unit is operating at max. temperature, the surface of the unit doesn't allow high temperatures of over 51 °C. (DIN EN 563)
- Reliable design and production of door is guaranteed.
 - Evaluates the results after opening the door by 90 degrees and applying 50kg load to the point of 30cm from hinges.

Safety

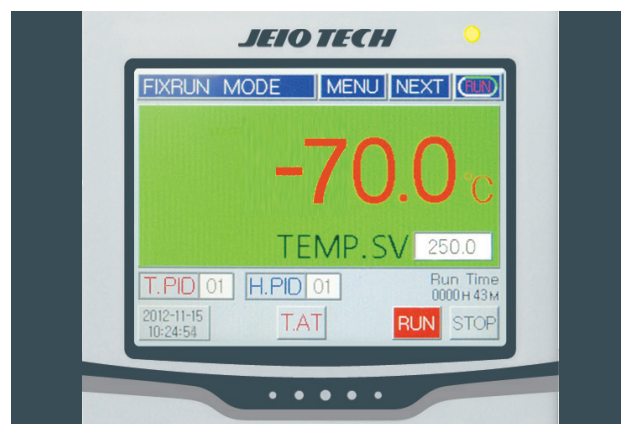
- User selectable operation mode after power interruption
 - either Automatic run or Manual run.
- Over-temperature protection.
- Over-current and current leakage protection.
 - (ELCB, earth leakage circuit breaker)
- Independent safety fuse.
 - Important parts such as controller and heaters are highly secured from short circuit. Especially each heater has an individual fuse to completely break a short circuit.
- Reversed-phase protection.
 - Electrical connection error indicator helps user to rapidly fix the connection.
- Over-current protection of motor.
 - Automatic shut-off in situations where there is over-current to the motor.
- Open door warning.
 - Heater and fan stop when the door is the open state.
- Electric wiring panel access warning.
 - Automatic stop if the cover of electric wiring panel is opened.
- Built in door lock with a key.

Convenience

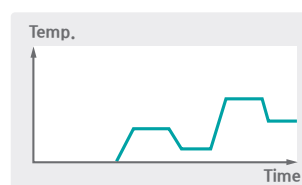
- Corrosion resistance stainless steel inner chamber.
- Space efficient and easy loading chamber design.
 - Included two shelves for loading of large amounts of samples.
 - Heavy load shelving, rated for 40kg are also available. (optional)
- User friendly LCD controller.
 - Colorful interactive touch type LCD controller.
 - Set point temperature and present temperature are clearly shown together on display.
 - Sufficient programmable control support.
 - Operating progress can be shown in graph mode for better data understanding.
 - Automatic start/stop can be programmed for unattended operations.
 - Display indicates abnormal temperature changes or power failures.
 - Three different language support. (English / Chinese / Korean)
 - Temperature and other operating parameters can be recorded using a six channel digital recorder. (optional)
- Computer interface.
 - RS-485 communication port(optional) enables connection up to maximum 32 units. Simultaneous monitoring and operating of multiple units is an available feature.
 - Program patterns are simple to set with the use of our software.
 - Easy to check status of real-time operations. Graph data supports easy understanding.
 - Storage and documentation of programs.
 - Data with saving capabilities in excel and text format.
 - Storage of program information, backup of value settings, recovery, and temperature values.
 - RS-232 communication port as standard offer.

Description	No
Programmable pattern capacity	100
Pattern repeat time	999
Part repeat time	255
Max. segments per a pattern	100
Available max. segments*	6000
Programmable process time per a segment	0 to 99 hr. 59 min.

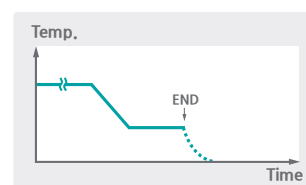
* Even though the max. segments per pattern are 100, the total available segments are up to 6000 not 10000, therefore arrangement of the number of segment and patterns will need to be done properly.



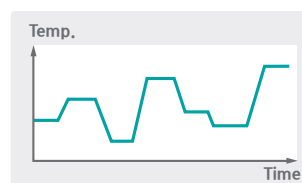
Color LCD controller



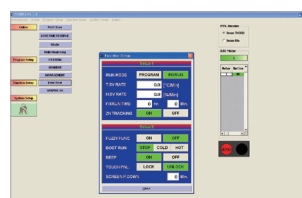
Automatic start



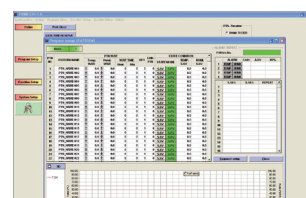
End of program



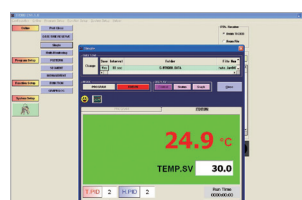
Program control



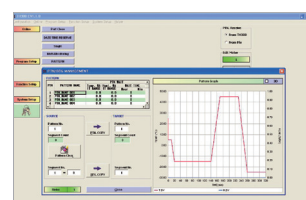
Function setup



Program setup



Operating status



Graph display

Heating & Cooling Chambers (Floor Standing - KBD)

Model		KBD-012	KBD-025	KBD-040
Chamber volume (L / cu ft)		125 / 4.4	253 / 8.9	420 / 14.8
Controller		Programmable, Touch screen type controller (5.7" color monitor)		
Temperature range (°C / °F)		-70 to 180 / -94 to 356		
Temperature fluctuation ^{1) 2)} at 25°C (±°C / °F)		0.2 / 0.36	0.2 / 0.36	0.2 / 0.36
Temperature variation ²⁾ (±°C / °F)	at -70°C	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54
	at -50°C	0.4 / 0.72	0.5 / 0.90	0.4 / 0.72
	at -25°C	0.5 / 0.9	0.4 / 0.72	0.4 / 0.72
	at -10°C	0.5 / 0.9	0.4 / 0.72	0.5 / 0.9
	at 25°C	0.5 / 0.9	0.4 / 0.72	0.4 / 0.72
	at 70°C	0.4 / 0.72	0.7 / 1.26	0.6 / 1.08
	at 100°C	1.2 / 2.16	1.0 / 1.80	1.0 / 1.80
	at 150°C	1.1 / 1.98	1.1 / 1.98	1.0 / 1.80
	at 180°C	1.2 / 2.16	1.2 / 2.16	1.1 / 1.98
Heating time ²⁾ (min.) from 25 to 180°C		60	60	60
Cooling time ²⁾ (min.) from 25°C to -70°C		100	100	100
Recovery time ²⁾ after door was opened (min.)	at -70°C	10	10	10
	at -50°C	10	10	9
	at -25°C	8	7	7
	at -10°C	7	5	6
	at 25°C	-	-	-
	at 70°C	5	6	6
	at 100°C	8	7	9
	at 150°C	9	8	10
	at 180°C	9	8	10
Program control	Temperature range (°C / °F)	-50 to 120 / -58 to 248		
	Heating rate (°C / °F per min.) from -50°C to 120°C	3.0 / 5.4	3.0 / 5.4	3.0 / 5.4
	Cooling rate (°C / °F per min.) from 120°C to -50°C	1.7 / 3.06	1.7 / 3.06	1.7 / 3.06
No. of wire shelves (standard / max.)		2 / 13	2 / 18	2 / 23
Distance of between shelves (mm / inch)		30 / 1.2		
Max. load per shelf (kg / lbs)		15 / 33.1	20 / 44.1	30 / 66.1
Permitted total load (kg / lbs)		50 / 110.2	70 / 154.3	90 / 198.4
Dimension (WxDxH)	Interior (mm / inch)	500×500×500 / 19.7×19.7×19.7	600×650×650 / 23.6×25.6×25.6	750×700×800 / 29.5×27.6×31.5
	Exterior (mm / inch)	1114×1360×1208 / 43.9×53.6×47.6	1240×1525×1308 / 48.8×60.0×51.5	1424×1600×1509 / 56.1×62.9×59.4
	Net weight (kg / lbs)	170 / 374.8	260 / 573.2	320 / 705.5
Interface port		Basically RS-232C (RS-485(maximum 32 units control)-optional)		
Electrical requirements (230V, 50Hz)		3ph / 16.7A	3ph / 21.8A	3ph / 31.6A
Cat. No.		AAHKC1112K	AAHKC2112K	AAHKC3112K
Electrical requirements (380V, 50Hz)		3ph / 9.7A	3ph / 12.6A	3ph / 18.3A
Cat. No.		AAHKC1114K	AAHKC2114K	AAHKC3114K

1) According to IEC 60068-3-5

2) According to DIN 12880

* Above specification value is recorded by 380V/50Hz.

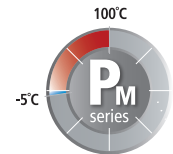
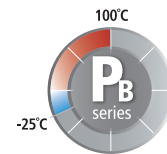
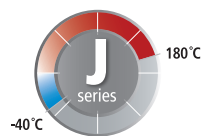
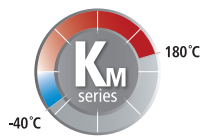
* Above specifications can be changed without prior notice.

* FDA establishment registered company. FDA listed products.



Please visit **JEIOTECH.com**

For further information on Jeio Tech's Temperature Chamber products Information is readily available on our website.



K / J / P series

with optional recorder

Standard accessories

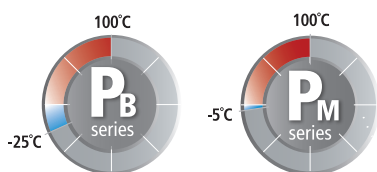
- Wire shelves, Door key
- Cable port (Ø50mm for 012/025 models or Ø80mm for 040/070/100 models)

Optional accessories

see page 207

- Recorder, Interface converter, Warning signal lamps
- Perforated shelves (max. load 40kg)

Heating & Cooling Chambers (Floor Standing - KMV / JMV / PBV / PMV)



PBV-040 / PMV-040

with optional recorder

Standard accessories

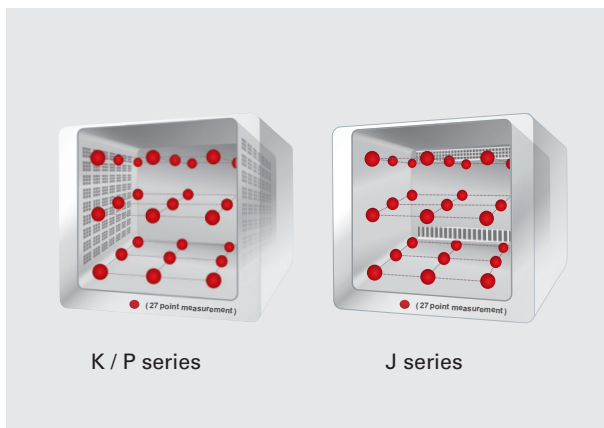
- Wire shelves, Door key
- Cable port (Ø50mm for 012/025 models or Ø80mm for 040/070/100 models)

Optional accessories

see page 207

- Recorder, Interface converter, Warning signal lamps
- Perforated shelves (max. load 40kg)

Reliable international standard

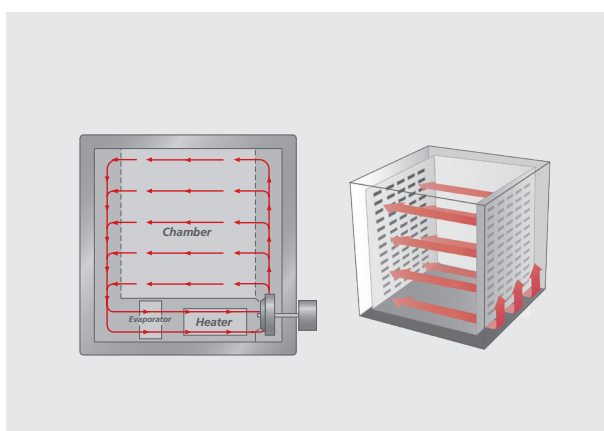


Designed and tested in accordance with the international standards.

Temperature values of all chambers are measured according to IEC 60068-3-5 and DIN 12880.

- Increase in reliability of accurate temperature implementation and test results. (27 point measurement data)

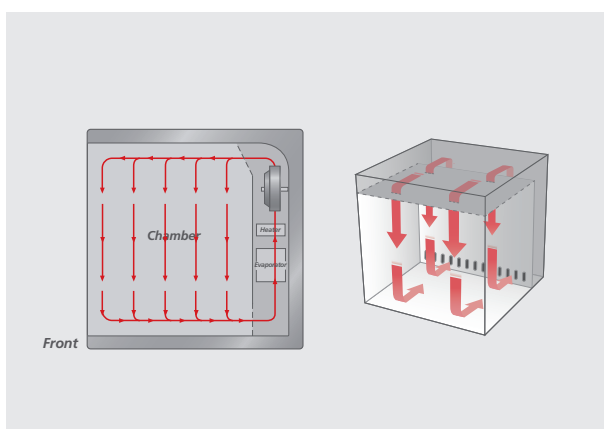
Uniform air circulation



Horizontal airflow (K / P series)

Horizontal airflow and vertical airflow models can be selected depending on the volume and loading type of the sample.

- Forced convection increases temperature uniformity by flowing heated air throughout the whole chamber and all around samples.



Vertical airflow (J series)

KMV series

- -35°C to 180°C / -31°F to 356°F
- Horizontal airflow

JMV series

- -35°C to 180°C / -31°F to 356°F
- Vertical airflow

PBV / PMV series

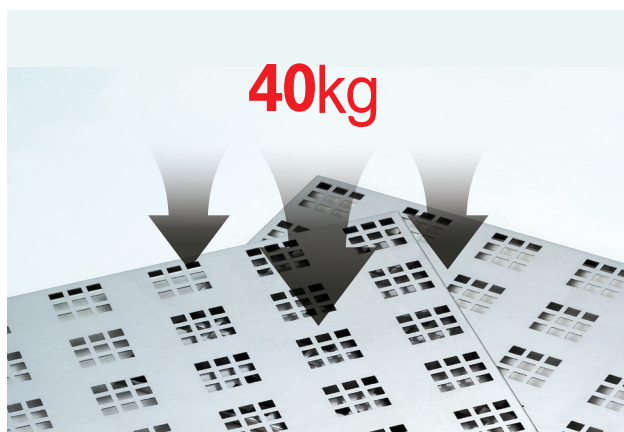
- -25°C to 100°C / -13°F to 212°F
- -5°C to 100°C / 23°F to 212°F
- Horizontal airflow

K / J / P - SERIES



Two-point door latch

Stainless steel chamber



Perforated shelves for heavy load (optional)



Individual over temperature limiter

Performance

- Suitable for specific use such as heat treatment and drying process.
- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Heat-resistant silicone packing completely blocks high heat leakage from the inner chamber.
- Two-point door latch also enhances tightness to door closure.
- Energy efficiency is achieved thanks to optimization of the insulation system.
 - Even if the unit is operating at max. temperature, the surface of the unit doesn't allow high temperatures of over 51 °C. (DIN EN 563)
- Reliable design and production of door is guaranteed.
 - Evaluates the results after opening the door by 90 degrees and applying 50kg load to the point of 30cm from hinges.

Safety

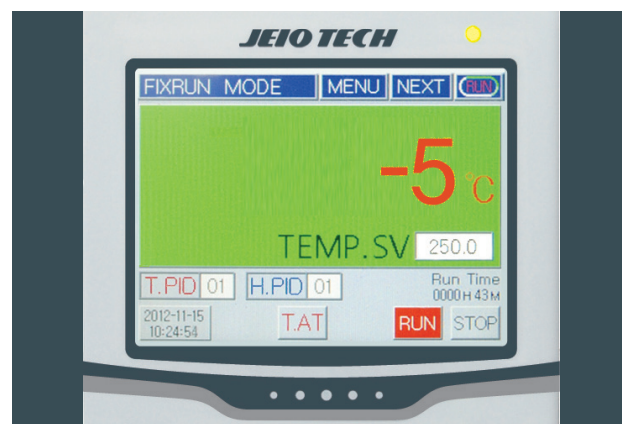
- User selectable operation mode after power interruption
 - either Automatic run or Manual run.
- Over-temperature protection.
- Over-current and current leakage protection.
(ELCB, earth leakage circuit breaker)
- Independent safety fuse.
 - Important parts such as controller and heaters are highly secured from short circuit. Especially each heater has an individual fuse to completely break a short circuit.
- Reversed-phase protection.
 - Electrical connection error indicator helps user to rapidly fix the connection.
- Over-current protection of motor.
 - Automatic shut-off in situations where there is over-current to the motor.
- Open door warning.
 - Heater and fan stop when the door is the open state.
- Electric wiring panel access warning.
 - Automatic stop if the cover of electric wiring panel is opened.
- Built in door lock with a key.

Convenience

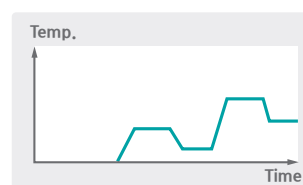
- Corrosion resistance stainless steel inner chamber.
- Space efficient and easy loading chamber design.
 - Included two shelves for loading of large amounts of samples.
 - Heavy load shelving, rated for 40kg are also available. (optional)
- User friendly LCD controller.
 - Colorful interactive touch type LCD controller.
 - Set point temperature and present temperature are clearly shown together on display.
 - Sufficient programmable control support.
 - Operating progress can be shown in graph mode for better data understanding.
 - Automatic start/stop can be programmed for unattended operations.
 - Display indicates abnormal temperature changes or power failures.
 - Three different language support. (English / Chinese / Korean)
 - Temperature and other operating parameters can be recorded using a six channel digital recorder. (optional)
- Computer interface.
 - RS-485 communication port (optional) enables connection up to maximum 32 units. Simultaneous monitoring and operating of multiple units is an available feature.
 - Program patterns are simple to set with the use of our software.
 - Easy to check status of real-time operations. Graph data supports easy understanding.
 - Storage and documentation of programs.
 - Data with saving capabilities in excel and text format.
 - Storage of program information, backup of value settings, recovery, and temperature values.
 - RS-232 communication port as standard offer.

Description	No
Programmable pattern capacity	100
Pattern repeat time	999
Part repeat time	255
Max. segments per a pattern	100
Available max. segments*	6000
Programmable process time per a segment	0 to 99 hr. 59 min.

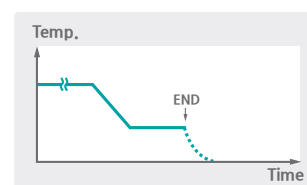
* Even though the max. segments per pattern are 100, the total available segments are up to 6000 not 10000, therefore arrangement of the number of segment and patterns will need to be done properly.



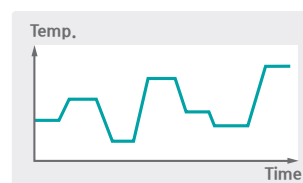
Color LCD controller



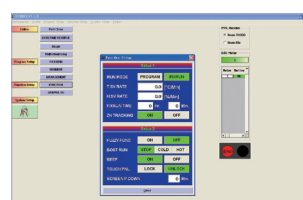
Automatic start



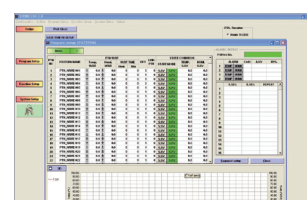
End of program



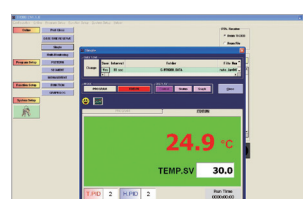
Program control



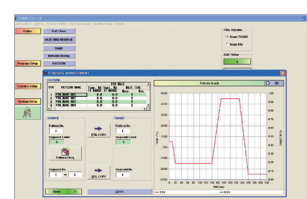
Function setup



Program setup



Operating status



Graph display

Heating & Cooling Chambers (Floor Standing - KMV / JMV / PBV / PMV)

Model		KMV-012	KMV-025	KMV-040	KMV-070	KMV-100
Chamber volume (L / cu ft)		125 / 4.4	253 / 8.9	420 / 14.8	720 / 25.4	1000 / 35.3
Controller		Programmable, Touch screen type controller (3.5" color monitor)				
Temperature range (°C / °F)		-35 to 180 / -31 to 356				
Temperature fluctuation ¹⁾²⁾ at 25°C (±°C / °F)		0.4 / 0.72	0.4 / 0.72	0.3 / 0.54	0.2 / 0.36	0.2 / 0.36
Temperature variation ²⁾ (±°C / °F)	at -35°C	0.6 / 1.08	0.6 / 1.08	0.7 / 1.26	0.4 / 0.72	0.4 / 0.72
	at -25°C	0.6 / 1.08	0.6 / 1.08	0.7 / 1.26	0.5 / 0.9	0.5 / 0.9
	at -10°C	0.8 / 1.44	0.8 / 1.44	0.7 / 1.26	0.5 / 0.9	0.5 / 0.9
	at 25°C	0.8 / 1.44	0.8 / 1.44	0.5 / 0.9	0.5 / 0.9	0.5 / 0.9
	at 70°C	0.8 / 1.44	0.8 / 1.44	0.9 / 1.62	0.8 / 1.44	0.8 / 1.44
	at 100°C	1.0 / 1.8	1.0 / 1.8	0.9 / 1.62	1.0 / 1.8	0.9 / 1.62
	at 150°C	1.1 / 1.98	1.1 / 1.98	1.7 / 3.06	1.6 / 2.88	0.9 / 1.62
	at 180°C	1.6 / 2.88	1.6 / 2.88	2.0 / 3.6	1.9 / 3.42	1.0 / 1.8
Heating time ²⁾ (min.) from 25°C to 180°C		64	64	66	51	78
Cooling time ²⁾ (min.) from 25°C to -35°C		56	56	60	62	96
Recovery time ²⁾ after door was opened (min.)	at -35°C	8.0	8.0	6.5	7.0	6.0
	at -25°C	3.5	3.5	7.5	6.0	7.0
	at -10°C	2.5	2.5	6.5	6.5	6.5
	at 25°C	4.0	4.0	5.5	4.5	5.0
	at 70°C	4.0	4.0	5.5	5.0	8.0
	at 100°C	4.0	4.0	6.5	6.0	6.0
	at 150°C	4.0	4.0	4.5	4.5	3.5
	at 180°C	11.5	11.5	6.0	5.0	4.0
Program control	Temperature range (°C / °F)	-25 to 120 / -13 to 248				
	Heating rate (°C / °F per min.) from -25°C to 120°C	2.3 / 4.14	2.3 / 4.14	2.2 / 3.96	2.8 / 5.04	1.7 / 3.06
	Cooling rate (°C / °F per min.) from 120°C to -25°C	2.0 / 3.6	2.0 / 3.6	2.0 / 3.6	1.9 / 3.42	1.9 / 3.42
No. of wire shelves (standard / max.)		2 / 13	2 / 18	2 / 23	2 / 30	2 / 33
Distance of between shelves (mm / inch)		30 / 1.2				
Max. load per shelf (kg / lbs)		15 / 33.1	20 / 44.1	30 / 66.1	40 / 88.2	45 / 99.2
Permitted total load (kg / lbs)		50 / 110.2	70 / 154.3	90 / 198.4	120 / 264.6	150 / 330.7
Dimension (WxDxH)	Interior (mm / inch)	500×500×500 / 19.7×19.7×19.7	600×650×650 / 23.6×25.6×25.6	750×700×800 / 29.5×27.6×31.5	900×800×1000 / 35.4×31.5×39.4	1000×910×1100 / 39.4×35.8×43.3
	Exterior (mm / inch)	1070×775×1385 / 42.1×30.5×54.5	1170×925×1585 / 46.1×36.4×62.4	1370×975×1780 / 53.9×38.4×70.1	1495×1625×1650 / 58.9×63.9×64.9	1595×1725×1800 / 62.8×67.9×70.9
	Net weight (kg / lbs)	170 / 374.8	260 / 573.2	320 / 705.5	390 / 859.8	440 / 970
Interface port		Basically RS-232C [RS-485(maximum 32 units control)-optional]				
Electrical requirements (230V, 60Hz)		1ph / 19.2A	1ph / 26A			
Cat. No.		AAHK9011K	AAHK9021K	-	-	-
Electrical requirements (230V, 50Hz)		1ph / 19.2A	1ph / 26A	3ph / 21.6A	3ph / 31.1A	3ph / 33.5A
Cat. No.		AAHK9012K	AAHK9022K	AAHK90312K	AAHK90412K	AAHK90512K
Electrical requirements (380V, 50Hz)				3ph / 12.5A	3ph / 18A	3ph / 19.4A
Cat. No.		-	-	AAHK9038K	AAHK9048K	AAHK9058K

1) According to IEC 60068-3-5

2) According to DIN 12880

* Above specification value is recorded by 230v/50Hz, 380/50Hz.

* Above specifications can be changed without prior notice.

* FDA establishment registered company. FDA listed products.

Model		JMV-012	JMV-025	JMV-040	JMV-070	JMV-100
Chamber volume (L / cu ft)		125 / 4.4	253 / 8.9	420 / 14.8	720 / 25.4	990 / 34.9
Controller		Programmable, Touch screen type controller (3.5" color monitor)				
Temperature range (°C / °F)		-35 to 180 / -31 to 356				
Temperature fluctuation ^{1) 2)} at 25°C (±°C / °F)		0.5 / 0.9	0.5 / 0.9	0.3 / 0.54	0.4 / 0.72	0.3 / 0.54
Temperature variation ²⁾ (±°C / °F)	at -35°C	0.7 / 1.26	0.7 / 1.26	0.5 / 0.9	1.0 / 1.8	0.7 / 1.26
	at -25°C	0.7 / 1.26	0.7 / 1.26	0.6 / 1.08	1.1 / 1.98	0.8 / 1.44
	at -10°C	0.8 / 1.44	0.8 / 1.44	0.6 / 1.08	1.2 / 2.16	0.9 / 1.62
	at 25°C	0.8 / 1.44	0.8 / 1.44	0.5 / 0.9	0.8 / 1.44	0.9 / 1.62
	at 70°C	0.9 / 1.62	0.9 / 1.62	0.7 / 1.26	1.2 / 2.16	0.8 / 1.44
	at 100°C	1.0 / 1.8	1.0 / 1.8	0.8 / 1.44	1.2 / 2.16	0.9 / 1.62
	at 150°C	1.2 / 2.16	1.2 / 2.16	1.3 / 2.34	1.1 / 1.98	1.1 / 1.98
	at 180°C	1.4 / 2.52	1.4 / 2.52	1.5 / 2.7	1.3 / 2.34	1.4 / 2.52
Heating time ²⁾ (min.) from 25°C to 180°C		67	67	46	44	60
Cooling time ²⁾ (min.) from 25°C to -35°C		48	48	35	35	58
Recovery time ²⁾ after door was opened (min.)	at -35°C	6.0	6.0	6.0	6.5	9.0
	at -25°C	5.0	5.0	6.5	7.0	6.5
	at -10°C	6.5	6.5	6.5	8.5	6.5
	at 25°C	5.5	5.5	4.5	2.0	7.0
	at 70°C	8.5	8.5	8.0	9.5	7.5
	at 100°C	5.5	5.5	4.5	6.0	5.5
	at 150°C	6.5	6.5	7.0	9.0	3.5
	at 180°C	6.5	6.5	6.5	8.0	4.0
Program control	Temperature range (°C / °F)	-25 to 120 / -13 to 248				
	Heating rate (°C / °F per min.) from -25°C to 120°C	2.0 / 3.6	2.0 / 3.6	3.1 / 5.58	3.4 / 6.12	2.4 / 4.32
	Cooling rate (°C / °F per min.) from 120°C to -25°C	2.1 / 3.78	2.1 / 3.78	2.3 / 4.14	2.7 / 4.86	1.6 / 2.88
No. of wire shelves (standard / max.)		2 / 13	2 / 18	2 / 23	2 / 30	2 / 33
Distance of between shelves (mm / inch)		30 / 1.2				
Max. load per shelf (kg / lbs)		15 / 33.1	20 / 44.1	25 / 55.1	40 / 88.2	40 / 88.2
Permitted total load (kg / lbs)		50 / 110.2	70 / 154.3	75 / 165.3	100 / 220.5	100 / 220.5
Dimension (WxDxH)	Interior (mm / inch)	500×500×500 / 19.7×19.7×19.7	600×650×650 / 23.6×25.6×25.6	750×700×800 / 29.5×27.6×31.5	900×800×1000 / 35.4×31.5×39.4	1000×910×1100 / 39.4×35.8×43.3
	Exterior (mm / inch)	890×1000×1200 / 35.0×39.4×47.2	990×1230×1350 / 38.9×48.4×53.1	1140×1380×1590 / 44.9×54.3×62.6	1290×1480×1940 / 50.8×58.3×76.4	1390×1580×2040 / 54.7×62.2×80.4
	Net weight (kg / lbs)	170 / 374.8	260 / 573.2	320 / 705.5	390 / 859.8	440 / 970
Interface port		Basically RS-232C [RS-485(maximum 32 units control)-optional]				
Electrical requirements (230V, 60Hz)		1ph / 19.2A	1ph / 26A			
Cat. No.		AAHKB011K	AAHKB021K	-	-	-
Electrical requirements (230V, 50Hz)		1ph / 19.2A	1ph / 26A	3ph / 21.6A	3ph / 31.1A	3ph / 33.5A
Cat. No.		AAHKB012K	AAHKB022K	AAHKB0312K	AAHKB0412K	AAHKB0512K
Electrical requirements (380V, 50Hz)				3ph / 12.5A	3ph / 18A	3ph / 19.4A
Cat. No.		-	-	AAHKB038K	AAHKB048K	AAHKB058K

1) According to IEC 60068-3-5

2) According to DIN 12880

* Above specification value is recorded by 230v/50Hz, 380/50Hz.

* Above specifications can be changed without prior notice.

* FDA establishment registered company. FDA listed products.

Heating & Cooling Chambers (Floor Standing - KMV / JMV / PBV / PMV)

Model		PBV-012	PBV-025	PBV-040	PBV-070	PBV-100
Chamber volume (L / cu ft)		125 / 4.4	250 / 8.8	400 / 14.1	700 / 24.7	1000 / 35.3
Controller		Programmable, Touch screen type controller (3.5" color monitor)				
Temperature range (°C / °F)		-25 to 100 / -13 to 212				
Temperature fluctuation ¹⁾²⁾ at 25°C (±°C / °F)		0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.4 / 0.72	0.2 / 0.36
Temperature variation ²⁾ (±°C / °F)	at -25°C	0.3 / 0.54	0.3 / 0.54	0.4 / 0.72	0.4 / 0.72	0.4 / 0.72
	at -15°C	0.3 / 0.54	0.3 / 0.54	0.4 / 0.72	0.4 / 0.72	0.4 / 0.72
	at -10°C	0.3 / 0.54	0.3 / 0.54	0.4 / 0.72	0.4 / 0.72	0.4 / 0.72
	at 25°C	0.3 / 0.54	0.3 / 0.54	0.4 / 0.72	0.4 / 0.72	0.4 / 0.72
	at 70°C	0.4 / 0.72	0.4 / 0.72	0.6 / 1.08	0.6 / 1.08	0.6 / 1.08
	at 100°C	0.6 / 1.08	0.6 / 1.08	0.7 / 1.26	0.8 / 1.44	0.8 / 1.44
Heating time ²⁾ (min.) from 25°C to 100°C		34	34	52	35	38
Cooling time ²⁾ (min.) from 25°C to -25°C		44	44	34	33	42
Recovery time ²⁾ after door was opened (min.)	at -25°C	5.0	5.0	5.0	4.0	7.0
	at -15°C	4.5	4.5	3.5	5.5	5.0
	at -10°C	6.0	6.0	4.5	4.0	5.0
	at 25°C	5.0	5.0	4.0	5.5	3.5
	at 70°C	5.0	5.0	9.5	5.0	7.5
	at 100°C	5.5	5.5	9.0	6.0	7.0
Program control	Temperature range (°C / °F)	-12.5 to 87.5 / 9.5 to 189.5				
	Heating rate (°C / °F per min.) from -12.5°C to 87.5°C	2.6 / 4.68	2.6 / 4.68	1.5 / 2.7	2.7 / 4.86	2.0 / 3.6
	Cooling rate (°C / °F per min.) from 87.5°C to -12.5°C	2.1 / 3.78	2.1 / 3.78	2.8 / 5.04	2.5 / 4.5	2.4 / 4.32
No. of wire shelves (standard / max.)		2 / 13	2 / 18	2 / 23	2 / 30	2 / 33
Distance of between shelves (mm / inch)		30 / 1.2				
Max. load per shelf (kg / lbs)		15 / 33.1	20 / 44.1	30 / 66.1	40 / 88.2	45 / 99.2
Permitted total load (kg / lbs)		50 / 110.2	70 / 154.3	90 / 198.4	120 / 264.6	150 / 330.7
Dimension (WxDxH)	Interior (mm / inch)	500×500×500 / 19.7×19.7×19.7	600×650×650 / 23.6×25.6×25.6	750×700×800 / 29.5×27.6×31.5	900×800×1000 / 35.4×31.5×39.4	1000×910×1100 / 39.4×35.8×43.3
	Exterior (mm / inch)	1060×702×1340 / 41.7×27.6×52.8	1154×852×1540 / 45.4×33.5×60.6	1304×902×1724 / 51.3×35.5×67.9	1454×1540×1628 / 57.2×60.6×64.1	1720×1650×1534 / 67.7×64.9×60.4
	Net weight (kg / lbs)	160 / 352.7	260 / 573.2	320 / 705.5	390 / 859.8	440 / 970
Interface port		Basically RS-232C [RS-485(maximum 32 units control)-optional]				
Electrical requirements (230V, 60Hz)		1ph / 15.5A	1ph / 25.2A			
Cat. No.		AAHK5011K	AAHK5021K	-	-	-
Electrical requirements (230V, 50Hz)		1ph / 15.5A	1ph / 25.2A	3ph / 17.4A	3ph / 26.7A	3ph / 29A
Cat. No.		AAHK5012K	AAHK5022K	AAHK50312K	AAHK50412K	AAHK50512K
Electrical requirements (380V, 50Hz)				3ph / 10A	3ph / 15.4A	3ph / 16.8A
Cat. No.		-	-	AAHK5038K	AAHK5048K	AAHK5058K

1) According to IEC 60068-3-5

2) According to DIN 12880

※ Above specification value is recorded by 230V/50Hz, 380V/50Hz.

※ Above specifications can be changed without prior notice.

※ FDA establishment registered company. FDA listed products.

Model		PMV-012	PMV-025	PMV-040	PMV-070	PMV-100
Chamber volume (L / cu ft)		125 / 4.4	250 / 8.8	400 / 14.1	700 / 24.7	1000 / 35.3
Controller		Programmable, Touch screen type controller (3.5" color monitor)				
Temperature range (°C / °F)		-5 to 100 / 23 to 212				
Temperature fluctuation ¹⁾²⁾ at 25°C (±°C / °F)		0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54
Temperature variation ²⁾ (±°C / °F)	at -5°C	0.4 / 0.72	0.4 / 0.72	0.4 / 0.72	0.4 / 0.72	0.3 / 0.54
	at 0°C	0.4 / 0.72	0.4 / 0.72	0.4 / 0.72	0.4 / 0.72	0.3 / 0.54
	at 25°C	0.2 / 0.36	0.2 / 0.36	0.3 / 0.54	0.4 / 0.72	0.3 / 0.54
	at 40°C	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.4 / 0.72	0.3 / 0.54
	at 60°C	0.5 / 0.90	0.5 / 0.90	0.4 / 0.72	0.4 / 0.72	0.4 / 0.72
	at 80°C	0.7 / 1.26	0.7 / 1.26	0.6 / 1.08	0.5 / 0.90	0.5 / 0.90
	at 100°C	1.0 / 1.80	1.0 / 1.80	0.8 / 1.44	0.7 / 1.26	0.7 / 1.26
Heating time ²⁾ (min.) from 25°C to 100°C		45	45	48	52	56
Cooling time ²⁾ (min.) from 25°C to -5°C		44	44	43	39	39
Recovery time ²⁾ after door was opened (min.)	at -5°C	8.0	8.0	6.5	5.0	5.0
	at 0°C	6.0	6.0	6.0	6.0	8.0
	at 25°C	0.5	0.5	4.0	6.0	6.0
	at 40°C	2.5	2.5	2.5	2.5	2.5
	at 60°C	4.0	4.0	4.5	5.0	6.0
	at 80°C	5.0	5.0	5.0	5.5	6.0
	at 100°C	7.0	7.0	7.0	6.5	8.0
Program control	Temperature range (±°C / °F)	5.5 to 89.5 / 9.9 to 161.1				
	Heating rate (°C / °F per min.) from 5.5°C to 89.5°C	1.7 / 3.06	1.7 / 3.06	1.6 / 2.88	1.5 / 2.7	1.3 / 2.34
	Cooling rate (°C / °F per min.) from 89.5°C to 5.5°C	0.9 / 1.62	0.9 / 1.62	0.9 / 1.62	0.9 / 1.62	0.9 / 1.62
No. of wire shelves (standard / max.)		2 / 13	2 / 18	2 / 23	2 / 30	2 / 33
Distance of between shelves (mm / inch)		30 / 1.2				
Max. load per shelf (kg / lbs)		15 / 33.1	20 / 44.1	30 / 66.1	40 / 88.2	45 / 99.2
Permitted total load (kg / lbs)		50 / 110.2	70 / 154.3	90 / 198.4	120 / 264.6	150 / 330.7
Dimension (W×D×H)	Interior (mm / inch)	500×500×500 / 19.7×19.7×19.7	600×650×650 / 23.6×25.6×25.6	750×700×800 / 29.5×27.6×31.5	900×800×1000 / 35.4×31.5×39.4	1000×910×1100 / 39.4×35.8×43.3
	Exterior (mm / inch)	1060×702×1340 / 41.7×27.6×52.8	1154×852×1540 / 45.4×33.5×60.6	1304×902×1724 / 51.3×35.5×67.9	1454×1540×1628 / 57.2×60.6×64.1	1720×1650×1534 / 67.7×64.9×60.4
	Net weight (kg / lbs)	160 / 352.7	260 / 573.2	320 / 705.5	390 / 859.8	440 / 970
Interface port		Basically RS-232C [RS-485(maximum 32 units control)-optional]				
Electrical requirements (230V, 60Hz)		1ph / 9.7A	1ph / 13.2A	1ph / 15.5A	1ph / 21.7A	
Cat. No.		AAHK4011K	AAHK4021K	AAHK4031K	AAHK4041K	-
Electrical requirements (230V, 50Hz)		1ph / 9.7A	1ph / 13.2A	1ph / 15.5A	1ph / 21.7A	3ph / 11A
Cat. No.		AAHK4012K	AAHK4022K	AAHK4032K	AAHK4042K	AAHK40512K
Electrical requirements (380V, 50Hz)						3ph / 6A
Cat. No.		-	-	-	-	AAHK4058K

1) According to IEC 60068-3-5

2) According to DIN 12880

※ Above specification value is recorded by 230V/50Hz, 380V/50Hz.

※ Above specifications can be changed without prior notice.

※ FDA establishment registered company. FDA listed products.

Heating & Cooling Chambers (Floor Standing - LCH / LCH-G)

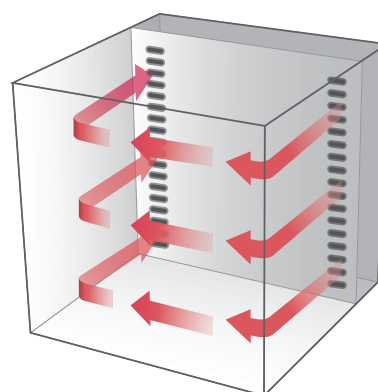


High-performance horizontal air flow provides excellent uniformity and fast heat-up time.



Control range

- Temperature range from -20 to 100 °C
from 0 to 100 °C



LCH-21 / LCH-11G-2C

with optional recorder

Standard accessories • Wire shelves, Cable port (Ø80mm)

Optional accessories • Warning signal lamps, Perforated shelves
see page 207

Performance

- Microprocessor PID control.
- Temperature calibration / Automatic tuning.
- Adjustable three-step fan speed with defrosting time and period control.
- Forced air convection using an optimal cross flow fan for chamber temperature uniformity.
- Energy efficiency is achieved thanks to optimization of the insulation system. The surface of the unit doesn't allow high temperatures of over 60 °C.

Convenience

- Two independently controlled chambers merged into a single unit for space saving.
- Intuitive control panel with bright LED display (0.1 °C resolution) and touch-sensitive keypad.

- Dual wait on/off timer modes. (1 min. to 99 hr. 59 min.)
- Convenient preset function for 3 most commonly used temperature settings.
- Up to 9 temperature steps and maximum 200 cycles of repetition programmable for each profile.
- Built-in cable port to use other instruments inside the chamber. (diameter: 80mm)
- RS-232 interface for external control and data collection.

Safety

- Automatic shut off after overheat alarm.
- Power supply leakage breaker.
- Over current protection.
- Open door alarm.

for temperature range from -20 °C to 100 °C

Model		LCH-11	LCH-21	LCH-31	LCH-11-2C
Chamber volume (L / cu ft)		150/5.3	255/9.0	485/17.1	150/5.3 x 2 chambers
Temperature	Range (°C / °F)	-20 to 100 / -4 to 212			
	Fluctuation (±°C / °F) ¹⁾	0.3 / 0.54			
	Variation at 80°C (±°C / °F) ¹⁾	0.8 / 1.44			
Time	Heating (min.)	80 (from 20°C to 100°C)			
	Cooling (min.)	60 (from 100°C to 40°C)			
No. of wire shelves (standard / max.)		2 / 12	2 / 24	2 / 29	2 / 12 per chamber
Distance of between shelves (mm / inch)		30 / 1.2			
Max. load per shelf (kg / lbs)		15 / 33.1	20 / 44.1	20 / 44.1	15 / 33.1
Permitted total load (kg / lbs)		50 / 110.2	70 / 154.3	70 / 154.3	50 / 110.2 per chamber
Dimension (WxDxH)	Interior (mm / inch)	600x500x500 / 23.6x19.7x19.7	600x500x850 / 23.6x19.7x33.5	700x680x1020 / 27.6x26.8x40.2	600x500x500 / 23.6x19.7x19.7
	Exterior (mm / inch)	794x1070x1280 / 31.3x42.1x50.4	794x1070x1630 / 31.3x42.1x64.2	894x1250x1800 / 35.2x49.2x70.9	794x1070x1900 / 31.3x42.1x74.8
	Net weight (kg / lbs)	125/275.6	185/407.9	225/496.0	195/429.9
Cable Port (mm / inch)		ø 80 / ø 3.15			
Interface port		RS-232C			
Electrical requirements (230V,60Hz)		6.3A	9.2A	11.1A	12.6A
Cat. No.		AAHK6111K	AAHK6211K	AAHK6311K	AAHK6411K
Electrical requirements (230V,50Hz)		6.6A	9.6A	11.6A	13.2A
Cat. No.		AAHK6112K	AAHK6212K	AAHK6312K	AAHK6412K
Electrical requirements (120V,60Hz)		11.6A			23.2A
Cat. No.		AAHK6113U	-	-	AAHK6413U

1) According to IEC 60068-3-5

for temperature range from 0 °C to 100 °C

Model		LCH-11G	LCH-21G	LCH-31G	LCH-11G-2C
Chamber volume (L / cu ft)		150/5.3	255/9.0	485/17.1	150/5.3 x 2 chambers
Temperature	Range (°C / °F)	0 to 100 / 32 to 212			
	Fluctuation (±°C / °F) ¹⁾	0.3 / 0.54			
	Variation at 80°C (±°C / °F) ¹⁾	0.8 / 1.44			
Time	Heating (min.)	80 (from 20°C to 100°C)			
	Cooling (min.)	60 (from 100°C to 40°C)			
No. of wire shelves (standard / max.)		2 / 12	2 / 24	2 / 29	2 / 12 per chamber
Distance of between shelves (mm / inch)		30 / 1.2			
Max. load per shelf (kg / lbs)		15 / 33.1	20 / 44.1	20 / 44.1	15 / 33.1
Permitted total load (kg / lbs)		50 / 110.2	70 / 154.3	70 / 154.3	50 / 110.2 per chamber
Dimension (WxDxH)	Interior (mm / inch)	600x500x500 / 23.6x19.7x19.7	600x500x850 / 23.6x19.7x33.5	700x680x1020 / 27.6x26.8x40.2	600x500x500 / 23.6x19.7x19.7
	Exterior (mm / inch)	740x1032x1280 / 29.1x40.6x50.4	740x1032x1630 / 29.1x40.6x64.2	840x1212x1800 / 33.1x47.7x70.9	740x1032x1900 / 29.1x40.6x74.8
	Net weight (kg / lbs)	120/264.6	180/396.8	220/485.0	190/418.9
Cable Port (mm / inch)		ø 80 / ø 3.15			
Interface port		RS-232C			
Electrical requirements (230V,60Hz)		7.1A	10.6A	13.8A	14.2A
Cat. No.		AAHK6121K	AAHK6221K	AAHK6321K	AAHK6421K
Electrical requirements (230V,50Hz)		7.4A	11.1A	14.4A	14.8A
Cat. No.		AAHK6122K	AAHK6222K	AAHK6322K	AAHK6422K
Electrical requirements (120V,60Hz)		13A			26A
Cat. No.		AAHK6123U	-	-	AAHK6423U

1) According to IEC 60068-3-5.

* FDA establishment registered company. FDA listed products.

Heating & Cooling Chambers (Tabletop - TC-KE)

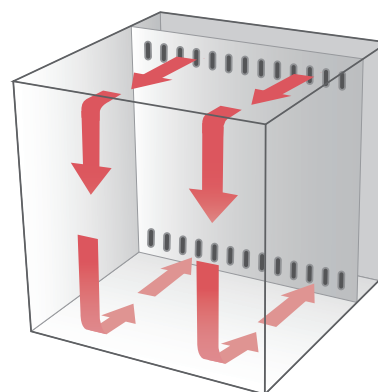


The best choice for the limited laboratory space.
Tabletop chamber is beneficial for space efficiency.



Control range

- Temperature range from -40 to 150 °C



TC-KE-25/65/100

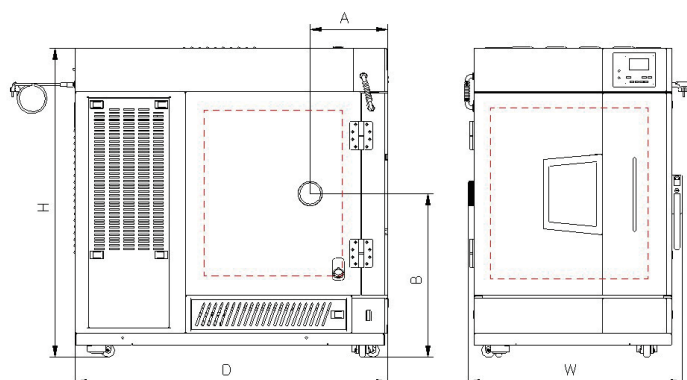
TC-KE

Standard accessories • Viewing window, Wire shelves, Cable port (Ø50mm), Door key

Optional accessories • Recorders, Two step stands, Perforated shelves
see page 206

※ Above products design can be changed without prior notice.

※ Inner glass door is not equipped to the unit since 2013.



Dimension

Model	TC-KE-25	TC-KE-65	TC-KE-100
Capacity	25L (0.9 cu ft)	65L (2.3 cu ft)	100L (3.53 cu ft)
W	522mm (20.6")	602mm (23.7")	760mm (29.9")
D	878mm (34.6")	1048mm (41.3")	1108mm (43.6")
H	919mm (36.2")	1056mm (41.6")	1096mm (43.1")
A	211mm (8.3")	276mm (10.9")	276mm (10.9")
B	495mm (19.5")	580mm (22.8")	580mm (22.8")

Performance

- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Uniform temperature control guarantees reliable test result.
- Air-tight door closure with perfect sealed packing.
 - Heat-resistant silicone packing completely blocks high heat leakage from the inner chamber.
- Clear observation of samples.
 - Tempered glass window with wire heater and lighting provides a clear view of samples in the chamber, beneficial for during testing.

Safety

- Built in door lock with a key.
- Automatic shut off after overheat alarm.
- Power supply leakage breaker.
- Over current protection.
- Open door alarm

Convenience

- Compact design and quiet operation.
- Three different size models are available to suit user's need.
- Corrosion resistance stainless steel chamber.
- Operating condition is clearly noticed by front LED indicator.
 - Three different colored lights show each status of running, stop, and power off condition.
- Cable port for introduction of external probes or wires.
 - 50mm diameter cable port comes standard on the left side of the unit.
 - Additional 50mm or 80mm diameter cable ports, custom ordered. (optional)
- Two step stands for space-saving. (optional)
 - Single stand with a drawer provides enough storage space.
 - Two step stand accepts loading two units to save limited space.
- User friendly LCD controller.
 - Set value and present value are clearly visible together on display.
 - Operating progression visible in graph mode allow for direct data interpretation.
 - Temperature and other operating parameters recorded with use of an optional recorder. (optional)
- Sufficient programmable control support.

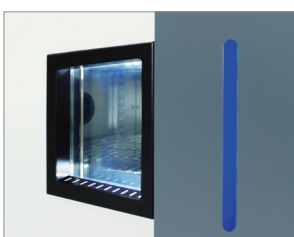
Description	No
Programmable pattern capacity	10
Pattern repeat time	999
Max. segments per a pattern	100
Available max. segments*	100
Programmable process time per a segment	0 to 99 hr. 59 min.

* Even though the max. segments per a pattern are 100, available total segments are up to 300 not 3000, so you need to arrange the number of segment and patterns properly.

- Computer interface.
 - RS-485 communication port enables connection of up to maximum 9 units. Simultaneous monitoring and operating of multiple units is an available feature. (optional)
 - Program patterns are simple to set with the use of our software.
 - Storage of program information, backup of value settings, recovery, temperature, humidity values.
 - RS-232 communication port comes standard



LCD controller



Viewing window



Stand with caster (optional)

Heating & Cooling Chambers (Tabletop - TC-KE)

Model		TC-KE-025	TC-KE-065	TC-KE-100
Chamber volume (L / cu ft)		25 / 0.9	65 / 2.3	100 / 3.53
Controller		PID control (LCD Type)		
Temperature ¹⁾	Range (°C / °F)	-40 to 150 / -40 to 302		
	Fluctuation ²⁾ at 50°C (±°C / °F)	0.5 / 0.9		
	Variation ²⁾ at 50°C (±°C / °F)	1.0 / 1.8		
Time	Heating ³⁾ (min.)	60 (-35°C to 100°C)		
	Cooling ³⁾ (min.)	70 (25°C to -35°C)		
Refrigeration	System	Mechanical single stage refrigerator system (air-cooled condenser)		
	Refrigerant	R-507A		
No. of wire shelves (standard / max.)		2 / 7	2 / 10	2 / 10
Distance of between shelves (mm / inch)		20 / 1.6	20 / 1.6	20 / 1.6
Max. load per shelf (kg / lbs)		25 / 55.1	25 / 55.1	25 / 55.1
Permitted total load (kg / lbs)		65 / 143.3	65 / 143.3	65 / 143.3
Dimension (WxDxH)	Interior (mm / inch)	348×220×353 / 13.7×8.7×13.9	398×330×498 / 15.7×13×19.6	498×390×538 / 19.6×15.4×21.2
	Exterior (mm / inch)	552×878×919 / 21.7×34.6×36.2	602×1048×1056 / 23.7×41.2×41.6	760×1108×1096 / 29.9×43.6×43.1
	Viewing window (mm / inch)	220×300 / 8.7×11.8		
	Net weight (kg / lbs)	110 ±10 / 242.5 ±22	140 ±10 / 308.6 ±22	150 ±10 / 330.7 ±22
Cable port		Basically one hole provided / ø50mm (2") Optionally max. two holes available / ø50 or 80mm (2 or 3.2")		
Interface port		Basically RS-232C, [RS-485:optional]		
Electrical requirements	AC230V, 1ph, 60Hz	7.4A	8.8A	10.8A
		AAH86111K	AAH86121K	AAH86131K
	AC230V, 1ph, 50Hz	7.1A	8.4A	10.3A
		AAH86112K	AAH86122K	AAH86132K

1) All specifications are under ambient temperature 20°C (68°F), no load.

2) Technical data according to DIN 12880, IEC 60068.

3) Up to 98% of the set value.

* 80mm cable access hole is NOT available for 25L chamber (TC-ME-025).

* Above the dimensions are NOT included size of attached accessories.

* Permissible environmental conditions: temperature (18 to 30°C) and relative humidity (up to 85%).

→ Recommended ambient temperature : +20°C (68°F).

* FDA establishment registered company. FDA listed products.



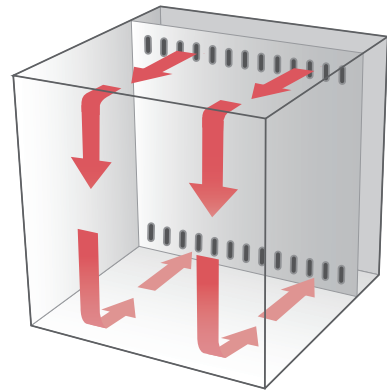
Light weight and compact design with high performance.

Built-in viewing window and operating LED indicator for the advanced convenience.



Control range

- Temperature range from -20 to 120 °C



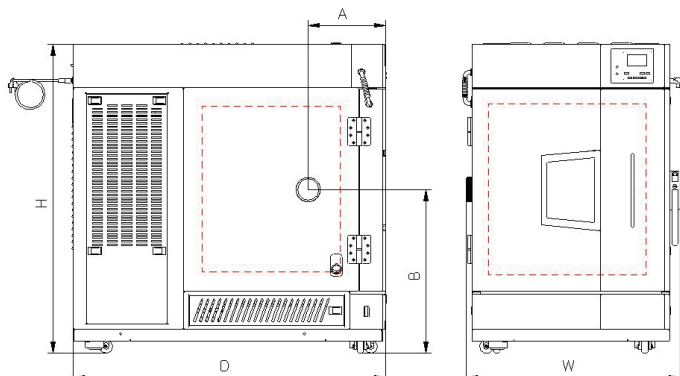
TC-ME-25/65/100

TC-ME

Standard accessories • Viewing window, Wire shelves, Cable port (Ø50mm), Door key

Optional accessories • Recorders, Two step stands, Perforated shelves, etc.
see page 206

- ※ Above products design can be changed without prior notice.
- ※ Inner glass door is not equipped to the unit since 2013.



Dimension

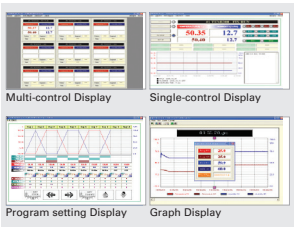
Model	TC-ME-25	TC-ME-65	TC-ME-100
Capacity	25L (0.9 cu ft)	65L (2.3 cu ft)	100L (3.53 cu ft)
W	522mm (20.6")	602mm (23.7")	760mm (29.9")
D	878mm (34.6")	1048mm (41.3")	1108mm (43.6")
H	919mm (36.2")	1056mm (41.6")	1096mm (43.1")
A	211mm (8.3")	276mm (10.9")	276mm (10.9")
B	495mm (19.5")	580mm (22.8")	580mm (22.8")

Performance

- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Uniform temperature control guarantees reliable test result.
- Air-tight door closure with perfect sealed packing.
 - Heat-resistant silicone packing completely blocks high heat leakage from the inner chamber.
- Clear observation of samples.
 - Tempered glass window with wire heater and lighting provides a clear view of samples in the chamber, beneficial for during testing.

Safety

- Built in door lock with a key.
- Automatic shut off after overheat alarm.
- Power supply leakage breaker.
- Over current protection.
- Open door alarm



Computer interface



LCD controller



Stainless steel chamber



Viewing window

Convenience

- Compact design and quiet operation.
- Three different size models are available to suit user’s need.
- Corrosion resistance stainless steel chamber.
- Operating condition is clearly noticed by front LED indicator.
 - Three different colored lights show each status of running, stop, and power off condition.
- Cable port for introduction of external probes or wires.
 - 50mm diameter cable port comes standard on the left side of the unit.
 - Additional 50mm or 80mm diameter cable ports, custom ordered. (optional)
- Two step stands for space-saving. (optional)
 - Single stand with a drawer provides enough storage space.
 - Two step stand accepts loading two units to save limited space.
- User friendly LCD controller.
 - Set value and present value are clearly visible together on display.
 - Operating progression visible in graph mode allow for direct data interpretation.
 - Temperature and other operating parameters recorded with use of an optional recorder. (optional)
- Sufficient programmable control support.

Description	No
Programmable pattern capacity	10
Pattern repeat time	999
Max. segments per a pattern	100
Available max. segments*	100
Programmable process time per a segment	0 to 99 hr. 59 min.

* Even though the max. segments per a pattern are 100, available total segments are up to 300 not 3000, so you need to arrange the number of segment and patterns properly.

- Computer interface.
 - RS-485 communication port enables connection of up to maximum 9 units. Simultaneous monitoring and operating of multiple units is an available feature. (optional)
 - Program patterns are simple to set with the use of our software.
 - Storage of program information, backup of value settings, recovery, temperature, humidity values.
 - RS-232 communication port comes standard.

Model		TC-ME-025	TC-ME-065	TC-ME-100
Chamber volume (L / cu ft)		25 / 0.9	65 / 2.3	100 / 3.53
Controller		Program controller (LCD type)		
Temperature	Range (°C / °F)	-20 to 120 / -4 to 248		
	Fluctuation ¹⁾ (±°C / °F) at 100°C	0.4 / 0.72	0.3 / 0.55	0.3 / 0.55
	Variation ¹⁾ (±°C / °F) at 100°C	2.0 / 3.60	1.9 / 3.42	1.8 / 3.24
Time	Heating (min.)	55 From -15°C to 120°C (5°F to 248°F)		
	Cooling (min.)	60 From 20°C to -15°C (68°F to 5°F) on single point control *		
Refrigeration	System	Mechanical single stage refrigerator system (air-cooled condenser)		
	Refrigerant	R-507A		
No. of wire shelves (standard / max.)		2 / 7	2 / 10	2 / 10
Distance of between shelves (mm / inch)		20 / 1.6	20 / 1.6	20 / 1.6
Max. load per shelf (kg / lbs)		25 / 55.1	25 / 55.1	25 / 55.1
Permitted total load (kg / lbs)		65 / 143.3	65 / 143.3	65 / 143.3
Dimension (WxDxH)	Interior (mm / inch)	348×220×353 / 13.7×8.7×13.9	398×330×498 / 15.7×13×19.6	498×390×538 / 19.6×15.4×21.2
	Exterior (mm / inch)	552×878×919 / 21.7×34.6×36.2	602×1048×1056 / 23.7×41.2×41.6	760×1108×1096 / 29.9×43.6×43.1
	Viewing window (mm / inch)	220×300 / 8.7×11.8		
	Net weight (kg / lbs)	80±5 / 176±11	110±5 / 242±11	130±5 / 286±11
Cable port		Basically one hole provided / ø 50mm (2") Optionally max. two holes available / ø 50 or 80mm (2 or 3.2")		
Interface port		Basically RS-232C (RS-485 (maximum 9 units control) - optional)		
Electrical requirements	AC230V, 1ph, 60Hz	5.3A	6.1A	6.8A
		AAH86011K	AAH86021K	AAH86031K
	AC230V, 1ph, 50Hz	5.1A	6A	6.5A
		AAH86012K	AAH86022K	AAH86032K

1) Technical data according to DIN 12880, IEC 60068.

* 80mm cable access hole is NOT available for 25L chamber (TC-ME-025).

* Above the dimensions are NOT included size of attached accessories.

※ Permissible environmental conditions: temperature (18 to 30°C) and relative humidity (up to 85%).

※ All specifications are under ambient temperature 20°C (68°F), no load.

※ FDA establishment registered company. FDA listed products.

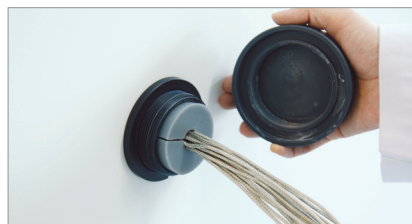
Accessories & Options



Recorder



Stand



Cable port

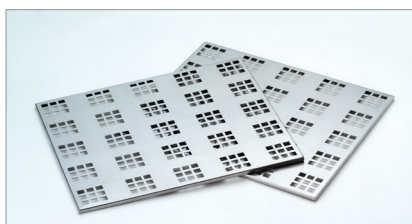
for Tabletop Chambers

Cat. No.	Description	TC-KE			TC-ME		
		25L	65L	100L	25L	65L	100L
AAA8T504	Portable recorder (6 points)	•	•	•	•	•	•
AAA8T506	Portable recorder (digital, 6 channels)	•	•	•	•	•	•
AAA8T540	Interface converter (RS - 485 → 232) included a cable (5m / 16.4ft)	•	•	•	•	•	•
AAA8T542	Interface cable (5m / 16.4ft)	•	•	•	•	•	•
AAA80550	Warning signal lamp	•	•	•	•	•	•
RTD679	Wire shelf (195×310mm / 7.7×12.2")	•	-	-	•	-	-
RTD680	Wire shelf (280×360mm / 11×14.2")	-	•	-	-	•	-
RTD681	Wire shelf (330×460mm / 13×18.1")	-	-	•	-	-	•
AAA80602-6	Perforated shelf (195×310mm / 7.7×12.2")	•	-	-	•	-	-
AAA80602-7	Perforated shelf (280×360mm / 11×14.2")	-	•	-	-	•	-
AAA80602-8	Perforated shelf (330×460mm / 13×18.1")	-	-	•	-	-	•
AAA8T612	Cable port (Ø 50mm / 2.0")	-	-	-	•	•	•
AAA8T613	Cable port (Ø 80mm / 3.2")	-	-	-	•	•	•
AAA8T610	Cable port (Ø 50mm / 2.0")	•	•	•	-	-	-
AAA8T611	Cable port (Ø 80mm / 3.2")	•	•	•	-	-	-
AAA80631	Stand for TC-KE/ME-025	•	-	-	•	-	-
AAA80632	Stand for TC-KE/ME-065	-	•	-	-	•	-
AAA80633	Stand for TC-KE/ME-100	-	-	•	-	-	•
AAA80634	Two step stand for TC-KE/ME-025	•	-	-	•	-	-
AAA80635	Two step stand for TC-KE/ME-065	-	•	-	-	•	-
CFA1910	Temperature sensor (RTD type)	•	•	•	•	•	•

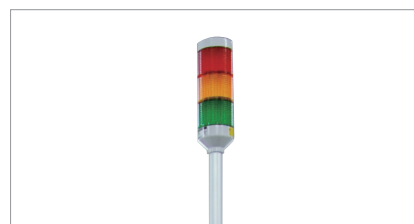
※ 80mm cable access hole is NOT available for 25L chamber.



Digital recorder



Perforated shelf



Warning signal lamp

for Floor Standing Chambers

Cat. No.	Description	Models						
		LBV	LTV	KBD	KMV	JMV	PBV/PMV	LCH
AAA8T505	Recorder (digital, 6 channels)	•	•	•	•	•	•	•
AAA8T540	Interface converter (RS - 485 → 232) included a cable (5m / 16.4ft)	•	•	•	•	•	•	-
AAA80550	Warning signal lamp	•	•	•	•	•	•	•
LTV0052	Wire shelf for LBV/LTV/KBD/KMV/JMV/PBV/PMV-012 (462x470mm / 18.2x18.5")	•	•	•	•	•	•	-
LTV0053	Wire shelf for LBV/LTV/KBD/KMV/JMV/PBV/PMV-025 (562x620mm / 22.1x22.4")	•	•	•	•	•	•	-
LTV0029	Wire shelf for LBV/LTV/KBD/KMV/JMV/PBV/PMV-040 (712x670mm / (28.0x26.4")	•	•	•	•	•	•	-
LTV0030	Wire shelf for LBV/LTV/KBD/KMV/JMV/PBV/PMV-070 (862x770mm / 33.9x30.3")	•	•	•	•	•	•	-
LTV0054	Wire shelf for LBV/LTV/KBD/KMV/JMV/PBV/PMV-100 (962x880 / 37.9x34.6")	•	•	•	•	•	•	-
EDA8219	Wire shelf for LCH-11 models (566x466 / 22.3x17.6")	-	-	-	-	-	-	•
EDA8220	Wire shelf for LCH-21 models (466x490 / 17.6x19.3")	-	-	-	-	-	-	•
AAAK6531	Wire shelf for LCH-31 models (620x663 / 24.4x26.1")	-	-	-	-	-	-	•
AAAK1501	Perforated shelf for LBV/LTV/KBD/KMV/JMV/PBV/PMV-012 (462x470mm / 18.2x18.5") (max. load 40kg)	•	•	•	•	•	•	-
AAAK1502	Perforated shelf for LBV/LTV/KBD/KMV/JMV/PBV/PMV-025 (562x620mm / 22.1x22.4") (max. load 40kg)	•	•	•	•	•	•	-
AAAK1503	Perforated shelf for LBV/LTV/KBD/KMV/JMV/PBV/PMV-040 (712x670mm / (28.0x26.4") (max. load 40kg)	•	•	•	•	•	•	-
AAAK1504	Perforated shelf for LBV/LTV/KBD/KMV/JMV/PBV/PMV-070 (862x770mm / 33.9x30.3") (max. load 40kg)	•	•	•	•	•	•	-
AAAK1505	Perforated shelf for LBV/LTV/KBD/KMV/JMV/PBV/PMV-100 (962x880 / 37.9x34.6") (max. load 40kg)	•	•	•	•	•	•	-
AAA22521	Perforated shelf for LCH-11 models	-	-	-	-	-	-	•
AAA22522	Perforated shelf for LCH-21 models	-	-	-	-	-	-	•
AAAK6532	Perforated shelf for LCH-31 models	-	-	-	-	-	-	•

Temperature & Humidity Chambers

Temp. & Humid. Chambers (Floor Standing)

Temp. & Humid. Chambers (Table Top)

Pharmaceutical Stability Test Chambers

Clean Temp. & Humid. Chamber

Plant Growth Chambers



» General Applications

Temperature & Humidity Chambers

Test for reliability, durability, climatic, freezing resistance, quality assurance, thermal endurance.

Specific Purpose Chambers

- **Pharmaceutical Stability Test Chambers**
Stability test in accordance with ICH Guideline Q1A (R2) and Q1B (option 2)
- **Clean Environmental Test Chamber**
Designed for the process requiring environmental test in the clean condition.
(ISO class 5 air cleanliness as per ISO 14644-1)
- **Plant Growth Chambers**
Optimal photosynthesis condition for plant growth.

Product Name		Temperature & Humidity Chambers (Floor Standing Models)		
Model		TH-G	TH-I	TH-KH
Chamber volume (L)		189, 302, 408, 800, 1000, 1540	189, 302, 408	189, 302, 408
Temp. control	Operating temp. range (°C/°F)	-40 to 150 / -40 to 302	-40 to 150 / -40 to 302	-70 to 150 / -94 to 302
	Fluctuation (±°C/°F)	0.3 / 0.54 at 40°C/75%RH	0.3 / 0.54 at 40°C/75%RH	0.3 / 0.54 at 40°C/75%RH
	Variation (±°C/°F)	0.5 / 0.9 at 40°C/75%RH	0.5 / 0.9 at 40°C/75%RH	0.5 / 0.9 at 40°C/75%RH
Humid. control	Operating humid. full range (%RH)	25 to 95	20 to 95	25 to 95
	Fluctuation (±%RH)	0.4, 1.0, 2.0 at 75%RH/40°C	0.4 at 75%RH/40°C	0.4 at 75%RH/40°C
	Variation (±%RH)	3.0 at 75%RH/40°C	3.0 at 75%RH/40°C	3.0 at 75%RH/40°C
Control	Timer	Wait on/off	Wait on/off	Wait on/off
	Auto-tuning	0	0	0
	Program function	0	0	0
Computer interface		RS-232 port, RS-485 port (optional)	RS-232 port, RS-485 port (optional)	RS-232 port, RS-485 port (optional)
Safety	Over temp. limit	0	0	0
	Door open alarm	0	0	0
	Over current limit	0	0	0
	Auto-run (power failure)	0	0	0

Temperature & Humidity Chambers

Product Name		Pharmaceutical Stability Test Chambers	Clean Temp. & Humid. Chamber	Plant Growth Chambers
Model		TH-ICH	TH-CR	GC
Chamber volume (L)		300, 760	270	300, 1000
Temp. control	Operating temp. range (°C/°F)	-5 to 85 / 23 to 185	-35 to 100 / -31 to 212	5 to 50 / 41 to 122 - Lamp off 10 to 50 / 50 to 122 - Lamp on
	Fluctuation (±°C/°F)	0.3 / 0.54 at 40°C/60%RH	0.5 / 0.9 at 40°C/60%RH	0.1 / 0.18 at 25°C
	Variation (±°C/°F)	0.5, 0.7 / 0.9, 1.3 at 40°C/60%RH	0.5 / 0.9 at 40°C/60%RH	0.8 / 1.43 at 25°C
Humid. control	Operating humid. full range (%RH)	20 to 85	30 to 90	40 to 90
	Fluctuation ¹⁾ (±%RH)	3.0 at 60%RH/40°C	3.0 at 60%RH/40°C	3 at 60% RH
	Variation ¹⁾ (±%RH)	5.0 at 60%RH/40°C	3.0 at 60%RH/40°C	-
Control	Timer	Wait on/off	Wait on/off	Wait on/off
	Auto-tuning	0	0	0
	Program function	0	0	0
Safety	Computer interface	RS-232 port, RS-485 port (optional)	RS-232 port, RS-485 port (optional)	-
	Over temp. limit	0	0	0
	Door open alarm	0	0	0
	Over current limit	0	0	0
	Auto-run (power failure)	0	0	0

Temperature & Humidity Chambers (Floor Standing Models)		Temperature & Humidity Chambers (Tabletop Models)	
TH-TG		TH-KE	TH-ME
180, 314, 419	770, 997, 1540	25, 65, 100	TH-PE
-5 to 100 / 23 to 212		-40 to 150 / -40 to 302	-20 to 150 / -4 to 302
0.3 / 0.54 at 40°C/60%RH		0.4, 0.3 / 0.72, 0.54 at 50°C/60%RH	0.3, 0.2 / 0.54, 0.36 at 25°C/60%RH
0.5 / 0.9 at 40°C/60%RH		0.3, 0.4 / 0.54, 0.72 at 50°C/60%RH	0.6, 0.2 / 1.08, 0.36 at 25°C/60%RH
10 to 95	20 to 95	20 to 95	30 to 95
2.0 at 60%RH/40°C		4.1, 2.8, 1.8 at 60%RH/50°C	2.0, 2.7 at 60%RH/55°C
3.0 at 60%RH/40°C		0.9, 1.0, 1.2 at 60%RH/50°C	0.6, 1.1, 1.2 at 60%RH/55°C
Wait on/off		Wait on/off	
0		0	
0		0	
RS-232 port, RS-485 port (optional)		RS-232 port, RS-485 port (optional)	
0		0	
0		0	
0		0	
0		0	

Temperature & Humidity Chambers (Floor Standing - TH-G)



Standard environmental test chamber.

Highly interactive LCD controller, beneficial for sophisticated long-term test cycles.



TH-G

with optional recorder

Standard accessories

- Viewing window, Wire shelves, Cable port (Ø50mm)
- Water container, Door key

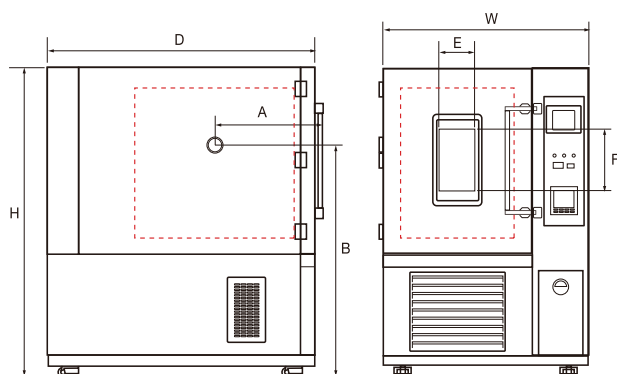
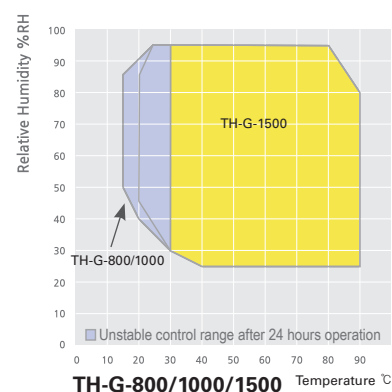
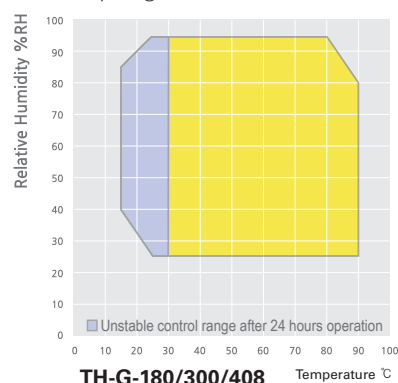
Optional accessories

see page 238

- Interface converter, Water purifiers, Direct water system

Control range

- Temperature range from -40 to 150 °C
- Humidity range from 25 to 95% RH



Dimension

Model	TH-G-180	TH-G-300	TH-G-408
Capacity	189L (7.4cu ft)	302L (11.9cu ft)	408L (14.4cu ft)
W	1003mm (39.5")	1103mm (43.4")	1103mm (43.4")
D	1139mm (44.8")	1139mm (44.8")	1359mm (53.5")
H	1468mm (57.8")	1668mm (65.7")	1668mm (65.7")
A	412mm (16.2")	432mm (17.0")	532mm (20.9")
B	1110mm (43.7")	1246mm (49.0")	1246mm (49.0")

Dimension

Model	TH-G-800	TH-G-1000	TH-G-1500
Capacity	800L (28.3cu ft)	1000L (35.3cu ft)	1540L (54.4cu ft)
W	1503mm (59.2")	1503mm (59.2")	1603mm (63.1")
D	1319mm (51.9")	1519mm (59.8")	1960mm (77.2")
H	1968mm (77.5")	1968mm (77.5")	1950mm (76.8")
A	509mm (20.0")	609mm (23.9")	609mm (23.9")
B	1465mm (57.7")	1465mm (57.7")	1350mm (53.1")

Performance

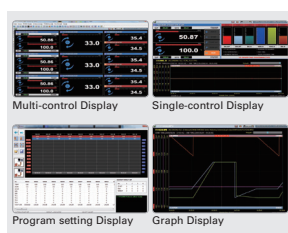
- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Advanced performance of low and high temperature and humidity control, achieved by adapting the humidification tank exterior to the chamber, added benefit for long term test.
- Water recycling and filtering system reduce water consumption for longer operation.
- Air-tight door closure with perfect sealed packing.
 - Heat-resistant silicone packing completely blocks high heat leakage from the inner chamber.
 - Two-point door latch also enhances tightness to door closure.
- Energy efficiency is achieved by optimization of the insulation system.
 - Even if the unit is operating at max. temperature, the surface of the unit doesn't allow high temperatures of over 60 °C.

Safety

- Built in door lock with a key.
- Automatic shut off after overheat alarm.
- Low and empty water level alarm.
- Power supply leakage breaker.
- Over current protection.
- Open door alarm.



Color LCD controller



Computer interface



Door handle



Portable water container

Convenience

- Spacious chamber volume with a maximum capacity of 1500L.
 - Various volume sizes, available to suit any users' need.
- Corrosion resistance stainless steel chamber and electric polished humidification tank.
- Maintenance of water supply are easily performed with a front water tank.
 - Portable water container makes supplying water convenient.
- Water supply during operation is also available for long term test purposes.
- Direct water system provides user great convenience when performing long-term tests. (optional)
- Clear observation of samples.
 - Tempered glass door with built in heating wire.
 - Energy efficient, long life span LED lighting.
 - Wider view, inner glass door is available for monitoring of samples. (optional)
- Cable port for introduction of external probes or wires.
 - 50mm diameter cable port comes standard on the left side of the unit.
 - Additional 50mm or 80mm diameter cable ports, custom ordered. (optional)
- Casters for easy mobility during installation or relocation.
- User friendly LCD controller.
 - 5.7 inch colorful interactive touch type LCD controller.
 - Set value and present value are clearly visible together on display.
 - Operating progress visible in graph mode allow for direct data interpretation.
 - Built-in SD card drive.
 - Trilingual support. (English / Chinese / Korean)
 - Temperature and other operating parameters recorded with use of selectable recorder. (optional)
 - Sufficient programmable control support.

Description	No
Programmable pattern capacity	120
Pattern repeat time	999
Max. segments per a pattern	100
Available max. segments*	1200
Programmable process time per a segment	0 to 999hr. 59 min. 59 sec.

* Even though the max. segments per a pattern are 100, available total segments are up to 1200 not 12000, so you need to arrange the number of segment an patterns properly.

- Computer interface.
 - RS-485 communication port enables connection of up to maximum 9 units. Simultaneous monitoring and operating of multiple units is an available feature. (optional)
 - Program patterns are simple to set with the use of our software.
 - Storage of program information, backup of value settings, recovery, temperature, humidity values.
 - RS-232 communication port comes standard.

Temperature & Humidity Chambers (Floor Standing - TH-G)

Model		TH-G-180	TH-G-300	TH-G-408	TH-G-800	TH-G-1000	TH-G-1500
Chamber volume (L / cu ft)		189 / 7.4	302 / 11.9	408 / 14.4	800 / 28.3	1000 / 35.3	1540 / 54.4
Controller		Programmable, Touch screen type controller (5.7" color monitor)					
Temperature	Range (℃ / °F)	-40 to 150 / -40 to 302 without humidity, 15 to 90 / 59 to 194 with humidity * Best programmable control range : -30 to 140 / -22 to 284					
	Fluctuation ¹⁾ (±℃ / °F) at 40℃ / 75%RH	0.3 / 0.54					
	Variation ¹⁾ (±℃ / °F) at 40℃ / 75%RH	0.5 / 0.9					
Time	Heating - without humidity (min.)	70 from -40℃ to 120℃ (40°F to 248°F)			70 from -40℃ to 120℃ (40°F to 248°F)		90 from -40℃ to 120℃ (40°F to 248°F)
	Cooling - without humidity (min.)	75 from 20℃ to -40℃ (68°F to -40°F)			85 from 20℃ to -40℃ (68°F to -40°F)		90 from 20℃ to -40℃ (68°F to -40°F)
Humidity	Range (%RH)	25 to 95 ※ See page 210 for more detailed humidity range check.					
	Fluctuation ¹⁾ (±%RH) at 75%RH / 40℃	0.4			1.0		2.0
	Variation ¹⁾ (±%RH) at 75%RH / 40℃	3					
Refrigeration	System	Mechanical single stage refrigerator system (air-cooled condenser)			Mechanical dual stage refrigerator system (air-cooled condenser)		
	Refrigerant	R-507					
Water Supply	Capacity	15L (0.53cu ft) - Cartridge type					
	Water quality	pH6.2 to 7.2 / Electrical conductivity 20 ^{µS} /cm to below					
No. of wire shelves (standard / max.)		2 / 9	2 / 10	2 / 10	2 / 14	2 / 14	2 / 14
Distance of between shelves (mm / inch)		40 / 1.6	40 / 1.6	40 / 1.6	40 / 1.6	40 / 1.6	40 / 1.6
Max. load per shelf (kg / lbs)		20 / 44.1	25 / 55.1	25 / 55.1	40 / 88.2	40 / 88.2	40 / 88.2
Permitted total load (kg / lbs)		50 / 110.2	65 / 143.3	65 / 143.3	100 / 220.5	100 / 220.5	100 / 220.5
Dimension (WxDxH)	Interior (mm / inch)	500×630×600 / 19.7×24.8×23.6	600×630×800 / 23.6×24.8×31.5	600×850×800 / 23.6×33.5×31.5	1000×800×1000 / 39.4×31.5×39.4	1000×1000×1000 / 39.4×39.4×39.4	1100×1000×1400 / 43.3×39.4×55.1
	Exterior (mm / inch)	1003×1139×1468 / 39.5×44.8×57.8	1103×1139×1668 / 43.4×44.8×65.7	1103×1359×1668 / 43.4×53.5×65.7	1503×1319×1968 / 59.2×51.9×77.5	1503×1519×1968 / 59.2×59.8×77.5	1603×1960×1950 / 63.1×77.2×76.8
	Viewing windows (mm / inch)	200×330 / 7.9×13			270×330 / 10.6×13		
	Net weight (kg / lbs)	320 / 705.5	385 / 848.8	410 / 903.9	620 / 1366.9	680 / 1499.1	860 / 1895.9
Cable port		Basically one hole provided / ø50mm (2") - Optionally max. two holes available / ø 50 or 80mm (2 or 3.2")					
Interface port		Basically RS-232C [RS-485-optional]					
Electrical requirements (230V, 60Hz)		1ph / 26.3A	1ph / 26.7A		1ph / 35.5A		
Cat. No.		AAH80011K	AAH80021K	AAH80031K	AAH80041K	AAH80051K	-
Electrical requirements (230V, 50Hz)		3ph / 15.3A	3ph / 15.6A		3ph / 20.6A		3ph / 26.3A
Cat. No.		AAH80012K	AAH80022K	AAH80032K	AAH80042K	AAH80052K	AAH80072K
Electrical requirements (380V, 50Hz)		3ph / 9.1A	3ph / 9.2A		3ph / 12.2A		3ph / 15.5A
Cat. No.		AAH80018K	AAH80028K	AAH80038K	AAH80048K	AAH80058K	AAH80078K

1) Technical data according to DIN 12880, IEC 60068.

※ Permissible environmental conditions: temperature (18 to 30°C) and relative humidity (up to 85%).

※ All specifications are under ambient temperature 20°C (68°F), No load.

※ FDA establishment registered company. FDA listed products.

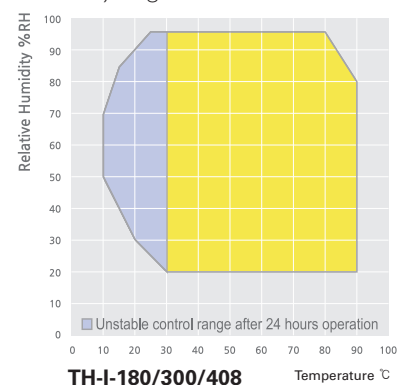


Great low temperature and humidity control performance.



Control range

- Temperature range from -40 to 150 °C
- Humidity range from 20 to 95% RH



TH-I

with optional recorder

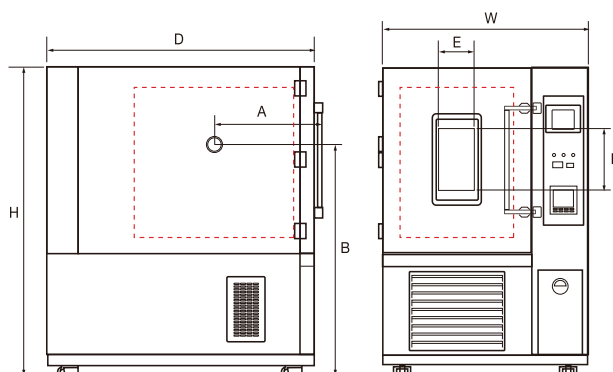
Standard accessories

- Viewing window, Wire shelves, Cable port (Ø50mm)
- Water container, Door key

Optional accessories

see page 238

- Interface converter, Water purifiers, Direct water system



Dimension

Model	TH-I-180	TH-I-300	TH-I-408
Capacity	189L (7.4cu ft)	302L (11.9cu ft)	408L (14.4cu ft)
W	1003mm (39.5")	1103mm (43.4")	1103mm (43.4")
D	1139mm (44.8")	1139mm (44.8")	1359mm (53.5")
H	1468mm (57.8")	1668mm (65.7")	1668mm (65.7")
A	412mm (16.2")	432mm (17.0")	532mm (20.9")
B	1110mm (43.7")	1246mm (49.0")	1246mm (49.0")

Performance

- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Advanced performance of low and high temperature and humidity control, achieved by adapting the humidification tank exterior to the chamber, added benefit for long term test.
- Water recycling and filtering system reduce water consumption for longer operation.
- Air-tight door closure with perfect sealed packing.
 - Heat-resistant silicone packing completely blocks high heat leakage from the inner chamber.
 - Two-point door latch also enhances tightness to door closure.
- Energy efficiency is achieved by optimization of the insulation system.
 - Even if the unit is operating at max. temperature, the surface of the unit doesn't allow high temperatures of over 60°C.

Safety

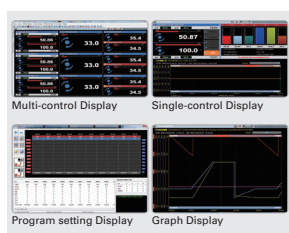
- Built in door lock with a key.
- Automatic shut off after overheat alarm.
- Low and empty water level alarm.
- Power supply leakage breaker.
- Over current protection.
- Open door alarm.

Convenience

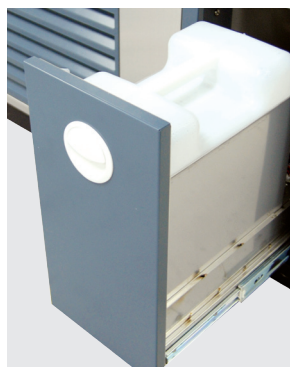
- Three different volume sizes are available to suit any users'needs.
- Corrosion resistance stainless steel chamber and electric polished humidification tank.
- Maintenance of water supply are easily performed with a front water tank.
 - Portable water container makes supplying water convenient.
- Water supply during operation is also available for long term test purposes.
- Direct water system provides user great convenience when performing long-term tests. (optional)
- Clear observation of samples.
 - Tempered glass door with built in heating wire.
 - Energy efficient, long life span LED lighting.
 - Wider view, inner glass door is available for monitoring of samples. (optional)
- Cable port for introduction of external probes or wires.
 - 50mm diameter cable port comes standard on the left side of the unit.
 - Additional 50mm or 80mm diameter cable ports, custom ordered. (optional)
- Casters for easy mobility during installation or relocation.
- User friendly LCD controller.
 - 5.7 inch colorful interactive touch type LCD controller.
 - Set value and present value are clearly visible together on display.
 - Operating progress visible in graph mode allow for direct data interpretation.
 - Built-in SD card drive.
 - Trilingual support. (English / Chinese / Korean)
 - Temperature and other operating parameters recorded with use of an selectable recorder. (optional)
 - Sufficient programmable control support.



Color LCD controller



Computer interface



Portable water container



Door handle

Description	No
Programmable pattern capacity	120
Pattern repeat time	999
Max. segments per a pattern	100
Available max. segments*	1200
Programmable process time per a segment	0 to 999hr 59 min 59 sec

* Even though the max. segments per a pattern are 100, available total segments are up to 1200 not 12000, so you need to arrange the number of segment an patterns properly.

- Computer interface.
 - RS-485 communication port enables connection of up to maximum 9 units. Simultaneous monitoring and operating of multiple units is an available feature. (optional)
 - Program patterns are simple to set with the use of our software.
 - Storage of program information, backup of value settings, recovery, temperature, humidity values.
 - RS-232 communication port comes standard.

Model		TH-I-180	TH-I-300	TH-I-408
Chamber volume (L / cu ft)		189 / 7.4	302 / 11.9	408 / 14.4
Controller		Programmable, Touch screen type controller (5.7" color monitor)		
Temperature	Range (°C / °F)	-40 to 150 / -40 to 302 without humidity, 15 to 90 / 59 to 194 with humidity * Best programmable control range : -30 to 140 / -22 to 284		
	Fluctuation ¹⁾ (±°C / °F) at 40°C / 75%RH	0.3 / 0.54		
	Variation ¹⁾ (±°C / °F) at 40°C / 75%RH	0.5 / 0.9		
Time	Heating - without humidity (min.)	70 from -40°C to 120°C (-40°F to 248°F)		
	Cooling - without humidity (min.)	75 from 20°C to -40°C (68°F to -40°F)		
Humidity	Range (%RH)	20 to 95 ※ See page 213 for more detailed humidity range check.		
	Fluctuation ¹⁾ (±%RH) at 75%RH / 40°C	0.4		
	Variation ¹⁾ (±%RH) at 75%RH / 40°C	3		
Refrigeration	System	Mechanical single stage refrigerator system (air-cooled condenser)		
	Refrigerant	R-507		
Water Supply	Capacity	15L (0.53cu ft) - Cartridge type		
	Water quality	pH6.2 to 7.2 / Electrical conductivity 20µS / cm to below		
No. of wire shelves (standard / max.)		2 / 9	2 / 10	2 / 10
Distance of between shelves (mm / inch)		40 / 1.6	40 / 1.6	40 / 1.6
Max. load per shelf (kg / lbs)		20 / 44.1	25 / 55.1	25 / 55.1
Permitted total load (kg / lbs)		50 / 110.2	65 / 143.3	65 / 143.3
Dimension (WxDxH)	Interior (mm / inch)	500×630×600 / 19.7×24.8×23.6	600×630×800 / 23.6×24.8×31.5	600×850×800 / 23.6×33.5×31.5
	Exterior (mm / inch)	1003×1139×1468 / 39.5×44.8×57.8	1103×1139×1668 / 43.4×44.8×65.7	1103×1359×1668 / 43.4×53.5×65.7
	Viewing windows (mm / inch)	200×330 / 7.9×13		
	Net weight (kg / lbs)	320 / 705.5	385 / 848.8	410 / 903.9
Cable port		Basically one hole provided / ø50mm (2") - Optionally max. two holes available / ø 50 or 80mm (2 or 3.2")		
Interface port		Basically RS-232C IRS-485-optional		
Electrical requirements (230V, 60Hz)		1ph / 26.3A	1ph / 26.7A	
Cat. No.		AAH80111K	AAH80121K	AAH80131K
Electrical requirements (230V, 50Hz)		3ph / 15.3A	3ph / 15.6A	
Cat. No.		AAH80112K	AAH80122K	AAH80132K
Electrical requirements (380V, 50Hz)		3ph / 9.1A	3ph / 9.2A	
Cat. No.		AAH80118K	AAH80128K	AAH80138K

1) Technical data according to DIN 12880, IEC 60068.

※ Permissible environmental conditions: temperature (18 to 30°C) and relative humidity (up to 85%).

※ All specifications are under ambient temperature 20°C (68°F), No load.

※ FDA establishment registered company. FDA listed products.

Temperature & Humidity Chambers (Floor Standing - TH-KH)

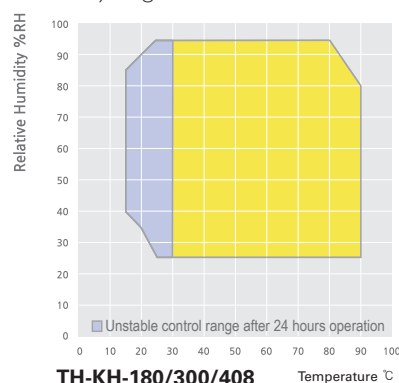


Wide temperature range down to -70°C and high advanced safety features for quality and reliability.



Control range

- Temperature range from -70 to 150°C
- Humidity range from 25 to 95% RH



TH-KH

with optional recorder

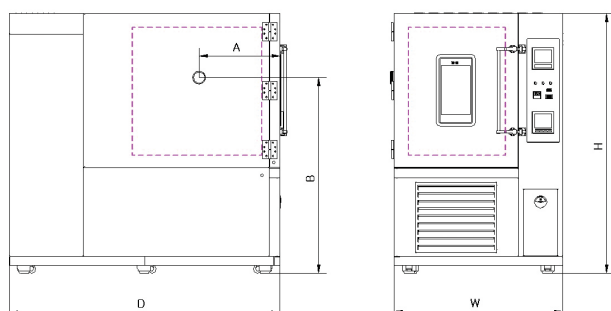
Standard accessories

- Viewing window, Wire shelves, Cable port ($\varnothing 50\text{mm}$)
- Water container, Door key

Optional accessories

see page 238

- Interface converter, Water purifiers, Direct water system



Dimension

Model	TH-KH-180	TH-KH-300	TH-KH-408
Capacity	189L (7.4cu ft)	302L (11.9cu ft)	408L (14.4cu ft)
W	1043mm (41.1")	1143mm (45.0")	1143mm (45.0")
D	1613mm (63.5")	1833mm (72.2")	2053mm (80.8")
H	1558mm (61.3")	1758mm (69.2")	1758mm (69.2")
A	550mm (21.7")	570mm (22.4")	670mm (26.4")
B	1225mm (48.2")	1325mm (52.2")	1325mm (52.2")

Performance

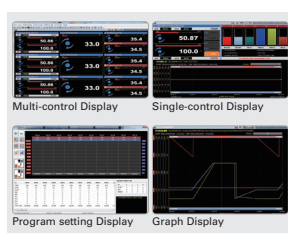
- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Advanced performance of low and high temperature and humidity control, achieved by adapting the humidification tank exterior to the chamber, added benefit for long term test.
- Water recycling and filtering system reduce water consumption for longer operation.
- Air-tight door closure with perfect sealed packing.
 - Heat-resistant silicone packing completely blocks high heat leakage from the inner chamber.
 - Two-point door latch also enhances tightness to door closure.
- Energy efficiency is achieved by optimization of the insulation system.
 - Even if the unit is operating at max. temperature, the surface of the unit doesn't allow high temperatures of over 60°C.

Safety

- Built in door lock with a key.
- Automatic shut off after overheat alarm.
- Low and empty water level alarm.
- Power supply leakage breaker.
- Over current protection.
- Open door alarm.



Color LCD controller



Computer interface



Door handle



Portable water container

Convenience

- Three different volume sizes are available to suit any users' needs.
 - Various volume sizes, available to suit any users' need.
- Corrosion resistance stainless steel chamber and electric polished humidification tank.
- Maintenance of water supply are easily performed with a front water tank.
 - Portable water container makes supplying water convenient.
- Water supply during operation is also available for long term test purposes.
- Direct water system provides user great convenience when performing long-term tests. (optional)
- Clear observation of samples.
 - Tempered glass door with built in heating wire.
 - Energy efficient, long life span LED lighting.
 - Wider view, inner glass door is available for monitoring of samples. (optional)
- Cable port for introduction of external probes or wires.
 - 50mm diameter cable port comes standard on the left side of the unit.
 - Additional 50mm or 80mm diameter cable ports, custom ordered. (optional)
- Casters for easy mobility during installation or relocation.
- User friendly LCD controller.
 - 5.7 inch colorful interactive touch type LCD controller.
 - Set value and present value are clearly visible together on display.
 - Operating progress visible in graph mode allow for direct data interpretation.
 - Built-in SD card drive.
 - Trilingual support. (English / Chinese / Korean)
 - Temperature and other operating parameters recorded with use of selectable recorder. (optional)
 - Sufficient programmable control support.

Description	No
Programmable pattern capacity	120
Pattern repeat time	999
Max. segments per a pattern	100
Available max. segments*	1200
Programmable process time per a segment	0 to 999hr 59 min 59 sec

* Even though the max. segments per a pattern are 100, available total segments are up to 1200 not 12000, so you need to arrange the number of segment in patterns properly.

- Computer interface.
 - RS-485 communication port enables connection of up to maximum 9 units. Simultaneous monitoring and operating of multiple units is an available feature. (optional)
 - Program patterns are simple to set with the use of our software.
 - Storage of program information, backup of value settings, recovery, temperature, humidity values.
 - RS-232 communication port comes standard.

Temperature & Humidity Chambers (Floor Standing - TH-KH)

Model		TH-KH-180	TH-KH-300	TH-KH-408
Chamber volume (L / cu ft)		189 / 7.4	302 / 11.9	408 / 14.4
Controller		Programmable, Touch screen type controller (5.7" color monitor)		
Temperature	Range (°C / °F)	-70 to 150 / -94 to 302 without humidity, 15 to 90 / 59 to 194 with humidity * Best programmable control range : -60 to 140 / -76 to 284		
	Fluctuation ¹⁾ (±°C / °F) at 40°C / 75%RH	0.3 / 0.54		
	Variation ¹⁾ (±°C / °F) at 40°C / 75%RH	0.5 / 0.90		
Time	Heating - without humidity (min.)	70 from -70°C to 120°C (96°F to 248°F)		
	Cooling - without humidity (min.)	80 from 20°C to -70°C (68°F to -96°F)		
Humidity	Range (%RH)	25 to 95 ※ See page 216 for more detailed humidity range check.		
	Fluctuation ¹⁾ (±%RH) at 75%RH / 40°C	0.4		
	Variation ¹⁾ (±%RH) at 75%RH / 40°C	3.0		
Refrigeration	System	Mechanical dual stage refrigerator system (air-cooled condenser)		
	Refrigerant	R-507, R-23		
Water supply	Capacity	15L (0.53cu ft) - Cartridge type		
	Water quality	pH6.2 to 7.2 / Electrical conductivity 20µS /cm to below		
No. of wire shelves (standard / max.)		2 / 9	2 / 10	2 / 10
Distance of between shelves (mm / inch)		60 / 2.4	60 / 2.4	60 / 2.4
Max. load per shelf (kg / lbs)		20 / 44.1	25 / 55.1	25 / 55.1
Permitted total load (kg / lbs)		50 / 110.2	65 / 143.3	65 / 143.3
Dimension (WxDxH)	Interior (mm / inch)	500×630×600 / 19.7×24.8×23.6	600×630×800 / 23.6×24.8×31.5	600×850×800 / 23.6×33.5×31.5
	Exterior (mm / inch)	1043×1613×1558 / 41.1×63.5×61.3	1143×1833×1758 / 45.0×72.2×69.2	1143×2053×1758 / 45.0×80.8×69.2
	Viewing windows (mm / inch)	200×330 / 7.9×13		
	Net weight (kg / lbs)	320 / 705.5	385 / 848.8	410 / 903.9
Cable port		Basically one hole provided / ø50mm (2") - Optionally max. two holes available / ø 50 or 80mm (2 or 3.2")		
Interface port		Basically RS-232C [RS-485-optional]		
Electrical requirements (230V, 50Hz)		3ph / 17.2A	3ph / 17.3A	
Cat. No.		AAHC3012K	AAHC3112K	AAHC3212K
Electrical requirements (380V, 50Hz)		3ph / 10.1A	3ph / 10.2A	
Cat. No.		AAHC3014K	AAHC3114K	AAHC3214K

1) Technical data according to DIN 12880, IEC 60068.

※ Permissible environmental conditions: temperature (18 to 30°C) and relative humidity (up to 85%).

※ All specifications are under ambient temperature 20°C (68°F), No load.

※ FDA establishment registered company. FDA listed products.



Economy environmental test chamber.
Stability test in accordance with ICH guidelines Q1A (R2)



TH-TG with optional recorder

Standard accessories

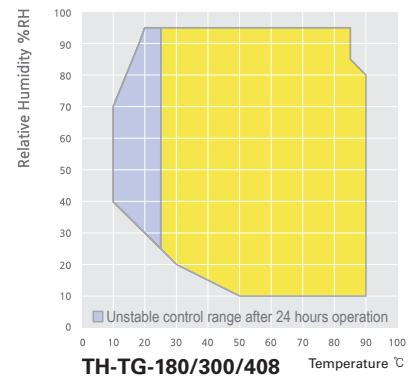
- Viewing window, Wire shelves, Cable port (Ø50mm)
- Water container, Door key

Optional accessories see page 238

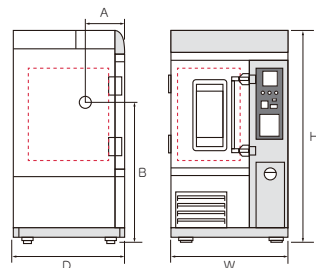
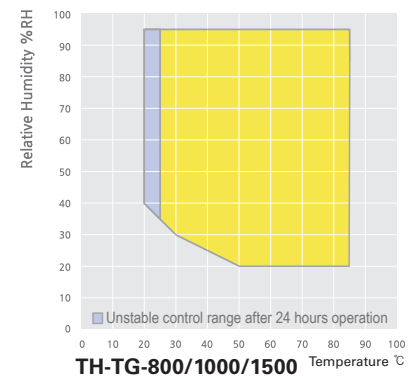
- Interface converter, Water purifiers, Direct water system

Control range

- Temperature range from -5 to 100 °C
- Humidity range from 10 to 95% RH

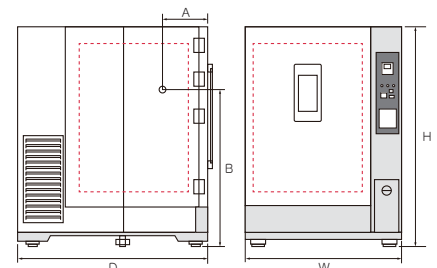


- Temperature range from -5 to 100 °C
- Humidity range from 20 to 95% RH



Dimension

Model	TH-TG-180	TH-TG-300	TH-TG-408
Capacity	180L (6.4 cu ft)	314L (11.1 cu ft)	419L (14.8 cu ft)
W	950mm (37.4")	1200mm (47.2")	1200mm (47.2")
D	907mm (35.7")	863mm (33.9")	1063mm (41.9")
H	1484mm (58.4")	1524mm (60.0")	1524mm (59.2")
A	321mm (12.6")	295mm (11.6")	421mm (16.6")
B	985mm (38.8")	1015mm (39.9")	995mm (39.2")



Dimension

Model	TH-TG-800	TH-TG-1000	TH-TG-1500
Capacity	770L (27.2 cu ft)	997L (35.2 cu ft)	1540L (54.4 cu ft)
W	1200mm (47.2")	1200mm (47.2")	1554mm (61.2")
D	1230mm (48.4")	1500mm (59.1")	1876mm (73.9")
H	1973mm (77.7")	1973mm (77.7")	1935mm (76.2")
A	385mm (15.2")	475mm (18.7")	478mm (18.8")
B	1315mm (51.8")	1315mm (51.8")	1354mm (53.3")

Temperature & Humidity Chambers (Floor Standing - TH-TG)

Performance

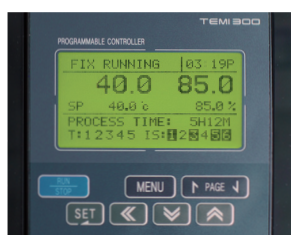
- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Advanced performance of low and high temperature and humidity control, achieved by adapting the humidification tank exterior to the chamber, added benefit for long term test.
- Water recycling and filtering system reduce water consumption for longer operation.
- Air-tight door closure with perfect sealed packing.
 - Heat-resistant silicone packing completely blocks high heat leakage from the inner chamber.
 - Two-point door latch also enhances tightness to door closure.
- Energy efficiency is achieved by optimization of the insulation system.
 - Even if the unit is operating at max. temperature, the surface of the unit doesn't allow high temperatures of over 60°C.

Safety

- Built in door lock with a key.
- Automatic shut off after overheat alarm.
- Low and empty water level alarm.
- Power supply leakage breaker.
- Over current protection.
- Open door alarm.

Convenience

- Spacious chamber volume with a maximum capacity of 1500L.
 - Various volume sizes, available to suit any users' need.
- Corrosion resistance stainless steel chamber and electric polished humidification tank.
- Maintenance of water supply are easily performed with a front water tank.
 - Portable water container makes supplying water convenient.
- Water supply during operation is also available for long term test purposes.
- Direct water system provides user great convenience when performing long-term tests. (optional)
- Clear observation of samples.
 - Tempered glass door with built in heating wire.
 - Energy efficient, long life span LED lighting.
 - Wider view, inner glass door is available for monitoring of samples. (optional)
- Cable port for introduction of external probes or wires.
 - 50mm diameter cable port comes standard on the left side of the unit.
 - Additional 50mm or 80mm diameter cable ports, custom ordered. (optional)
- Casters for easy mobility during installation or relocation.
- User friendly LCD controller.
 - Set value and present value are clearly visible together on display.
 - Operating progress visible in graph mode allow for direct data interpretation.
 - Temperature and other operating parameters recorded with use of selectable recorder. (optional)
- Sufficient programmable control support.



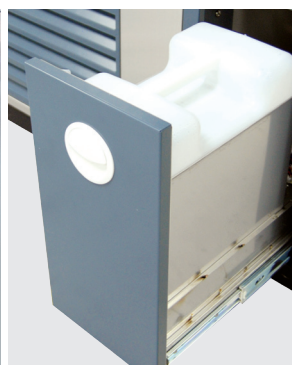
LCD controller



Computer panel



Viewing window



Portable water container

Description	No
Programmable pattern capacity	120
Pattern repeat time	999
Max. segments per a pattern	100
Available max. segments*	100
Programmable process time per a segment	0 to 99 hr 59 min

* Even though the max. segments per a pattern are 100, available total segments are up to 300 not 3000, so you need to arrange the number of segment and patterns properly.

- Computer interface.
 - RS-485 communication port enables connection of up to maximum 9 units. Simultaneous monitoring and operating of multiple units is an available feature. (optional)
 - Program patterns are simple to set with the use of our software.
 - Storage of program information, backup of value settings, recovery, temperature, humidity values.
 - RS-232 communication port comes standard.

Model			TH-TG-180	TH-TG-300	TH-TG-408	TH-TG-800	TH-TG-1000	TH-TG-1500
Chamber volume (L / cu ft)			180 / 6.4	314 / 11.1	419 / 14.8	770 / 27.2	997 / 35.2	1540 / 54.4
Controller			PID control (LCD Type)					
Temperature ¹⁾	Range	without humidity (℃ / °F)	-5 to 100 / 23 to 212					
		with humidity (℃ / °F)	10 to 90 / 50 to 194			20 to 90 / 68 to 194		
	Fluctuation ¹⁾ (±℃ / °F) at 40℃ / 60%RH		0.3 / 0.55					
	Variation ¹⁾ (±℃ / °F) at 40℃ / 60%RH		0.5 / 0.9					
Time	Heating		50min (5℃ → 100℃)			55min (5℃ → 100℃)		
	Cooling		120min (100℃ → 5℃)			145min (100℃ → 5℃)		
Humidity	Range (%RH)		10 to 95 ※ See page 219 for more detailed humidity range check.			20 to 95 ※ See page 219 for more detailed humidity range check.		
	Fluctuation ²⁾ (±%RH) at 60%RH / 40℃		2					
	Variation ²⁾ (±%RH) at 60%RH / 40℃		3					
Refrigeration	System		Air-cooled					
	Refrigerant		R-507A					
	Capacity (W)		250	375			750	
Water tank	Capacity (L / cu ft)		15 / 0.53					30 / 1.1
	Water quality		pH6.2 ~ 7.2, Electrical conductivity 20 ^{µS} / cm to below					
No. of wire shelves (standard / max.)			2 / 7	2 / 8	2 / 8	2 / 17	2 / 17	2 / 17
Distance of between shelves (mm / inch)			60 / 2.4	60 / 2.4	60 / 2.4	60 / 2.4	60 / 2.4	60 / 2.4
Max. load per shelf (kg / lbs)			20 / 44.1	25 / 55.1	25 / 55.1	40 / 88.2	40 / 88.2	40 / 88.2
Permitted total load (kg / lbs)			50 / 110.2	65 / 143.3	65 / 143.3	100 / 220.5	100 / 220.5	100 / 220.5
Dimension (W×D×H)	Viewing window (mm / inch)		200×330 / 7.9×13					
	Interior (mm / inch)		500×600×600 / 19.7×23.6×23.6	748×600×700 / 29.4×23.6×27.6	748×800×700 / 29.4×31.5×27.6	748×920×1120 / 29.4×36.2×44.1	748×1190×1120 / 29.4×46.9×44.1	1100×1000×1400 / 43.3×39.4×55.1
	Exterior (mm / inch)		950×907×1484 / 37.4×35.7×58.4	1200×863×1524 / 47.2×34×60	1200×1063×1524 / 47.2×41.9×60.0	1200×1230×1973 / 47.2×48.4×77.7	1200×1500×1973 / 47.2×59.1×77.7	1554×1876×1935 / 61.2×73.9×76.2
	Net weight (kg / lbs)		220±10 / 485±22	250±10 / 551±22	280±10 / 617±22	360±10 / 794±22	410±10 / 904±22	480±10 / 1058±22
Cable port			Basically one hole provided / ø 50mm (2"). Optionally max. two holes available / ø 50 or 80mm (2 or 3.2")					
Interface port			Basically RS-232C, (RS-485 : optional)					
Electrical requirements	AC230V, 1ph, 60Hz		12.3 A	14.5 A	14.5 A	15.4 A	15.4 A	25.0A
	Cat.No.		AAHC2001K	AAHC2011K	AAHC2021K	AAHC2031K	AAHC2041K	AAHC2051K
	AC230V, 1ph, 50Hz		14.8A	17.4A	17.4A	18.5A	18.5A	30.0A
	Cat.No.		AAHC2002K	AAHC2012K	AAHC2022K	AAHC2032K	AAHC2042K	AAHC2052K

1) All specifications are under ambient temperature 20°C (68°F), No load.

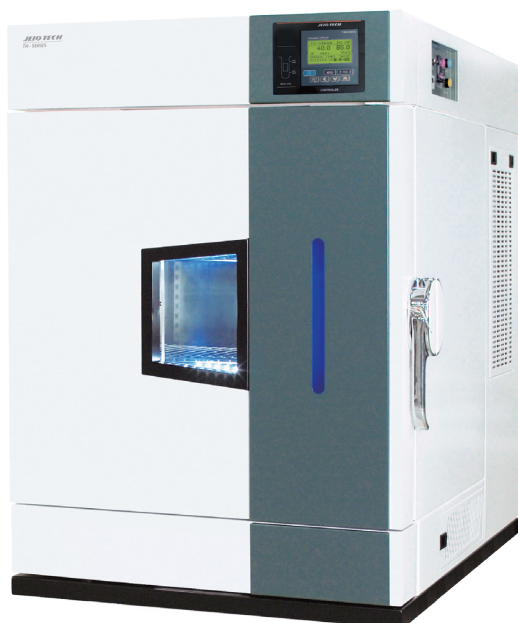
2) Technical data according to DIN 12880, IEC 60068.

※ FDA establishment registered company. FDA listed products.

Temperature & Humidity Chambers (Tabletop - TH-KE)

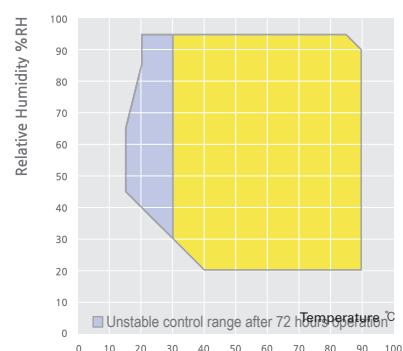


Various environmental tests can be performed due to wide temperature and humidity control range.



Control range

- Temperature range from -40 to 150°C
- Humidity range from 20 to 95% RH



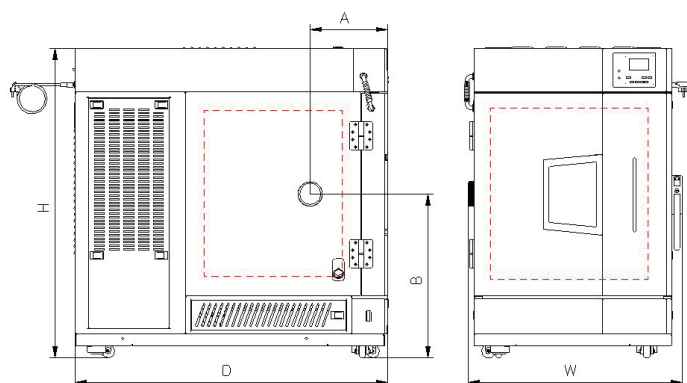
TH-KE-25/65/100

TH-KE

Standard accessories • Viewing window, Wire shelves, Cable port (Ø50mm), Door key

Optional accessories • Two step stands, Direct water system
see page 237

- ※ Above products design can be changed without prior notice.
- ※ Inner glass door is not equipped to the unit since 2013.



Dimension

Model	TH-KE-25	TH-KE-65	TH-KE-100
Capacity	25L (0.9 cu ft)	65L (2.3 cu ft)	100L (3.53 cu ft)
W	522mm (20.6")	602mm (23.7")	760mm (29.9")
D	878mm (34.6")	1048mm (41.3")	1108mm (43.6")
H	919mm (36.2")	1056mm (41.6")	1096mm (43.1")
A	211mm (8.3")	276mm (10.9")	276mm (10.9")
B	495mm (19.5")	580mm (22.8")	580mm (22.8")

Performance

- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Uniform temperature and humidity control guarantees reliable test result.
- Air-tight door closure with perfect sealed packing.
 - Heat-resistant silicone packing completely blocks high heat leakage from the inner chamber.
- Maintenance of water supply is easily performed.
 - Water level condition is easy to check by the water level indicator on the front control panel.
- Water supply during operation is also available for long term test purposes.
- Direct water system provides user great convenience when performing long-term tests. (optional)

Safety

- Built in door lock with a key.
- Automatic shut off after overheat alarm.
- Low and empty water level alarm.
- Power supply leakage breaker.
- Over current protection.
- Open door alarm.



LCD controller

Viewing window



Stand with caster (optional)

Convenience

- Compact design and quite operation.
- Three different size models are available to suit user's need.
- Corrosion resistance stainless steel chamber.
- Operating condition is clearly noticed by front LED indicator.
 - Three different colored lights show each status of running, stop, and power off condition.
- Clear observation of samples.
 - Tempered glass window with wire heater and lighting provides a clear view of samples in the chamber, beneficial for during testing.
- Cable port for introduction of external probes or wires.
 - 50mm diameter cable port comes standard on the left side of the unit.
 - Additional 50mm or 80mm diameter cable ports, custom ordered. (optional)
- Two type of stands for space-saving. (optional)
 - Single stand with a drawer provides enough storage space.
 - Two step stand accepts loading two units to save limited space.
- User friendly LCD controller.
 - Set value and present value are clearly visible together on display.
 - Operating progress visible in graph mode allow for direct data interpretation.
 - Temperature and other operating parameters recorded with use of selectable recorder. (optional)
- Sufficient programmable control support.

Description	No
Programmable pattern capacity	10
pattern repeat time	999
Max. Segments per a pattern	100
Available max. segments*	100
Programmable process time per a segment	0 to 99 hr. 59 min.

* Even though the max. segments per a pattern are 100, available total segments are up to 300 not 3000, so you need to arrange the number of segment and patterns properly

- Computer interface.
 - Computer interface.
 - RS-485 communication port enables connection of up to maximum 9 units. Simultaneous monitoring and operating of multiple units is an available feature. (optional)
 - Program patterns are simple to set with the use of our software.
 - Storage of program information, backup of value settings, recovery, temperature, humidity values.
 - RS-232 communication port comes standard.

Temperature & Humidity Chambers (Tabletop - TH-KE)

Model		TH-KE-025	TH-KE-065	TH-KE-100
Chamber volume (L / cu ft)		25 / 0.9	65 / 2.3	100 / 3.5
Controller		Program controller (LCD type)		
Temperature ¹⁾	Range (°C / °F)	-40 to 150 / -40 to 302 without humidity 15 to 90 / 59 to 194 with humidity		
	Fluctuation ²⁾ (±°C / °F) at 50°C / 60%RH	0.4 / 0.72	0.4 / 0.72	0.3 / 0.54
	Variation ²⁾ (±°C / °F) at 50°C / 60%RH	0.3 / 0.54	0.4 / 0.72	0.4 / 0.72
Time	Heating - without humidity (min.) from -40°C to 100°C	60		
	Cooling - without humidity (min.) from 20°C to -40°C	65	92	90
Humidity	Range (%RH)	20 to 95 ※ See page 222 for more detailed humidity range check.		
	Fluctuation ²⁾ (±%RH) at 60%RH / 50°C	4.1	2.8	1.8
	Variation ²⁾ (±%RH) at 60%RH / 50°C	0.9	1.0	1.2
Refrigeration	System	Mechanical single stage refrigerator system (air-cooled condenser)		
	Refrigerant	R-507A		
Water tank	Capacity (L / cu ft)	7.5 / 0.26	10 / 0.35	14.5 / 0.51
	Water quality	pH6.2 ~ 7.2, Electrical conductivity 20°C / cm to below		
No. of wire shelves (standard / max.)		2 / 7	2 / 10	2 / 10
Distance of between shelves (mm / inch)		20 / 1.6	20 / 1.6	20 / 1.6
Max. load per shelf (kg / lbs)		25 / 55.1	25 / 55.1	25 / 55.1
Permitted total load (kg / lbs)		65 / 143.3	65 / 143.3	65 / 143.3
Dimension (WxDxH)	Interior (mm / inch)	348×220×353 / 13.7×8.7×13.9	398×330×498 / 15.7×13×19.6	498×390×538 / 19.6×15.4×21.2
	External (mm / inch)	552×878×919 / 21.7×34.6×36.2	602×1048×1056 / 23.7×41.2×41.6	760×1108×1096 / 29.9×43.6×43.1
	Viewing window (mm / inch)	220×300 / 8.7×11.8		
	Net weight (kg / lbs)	110 ±10 / 242.5 ±22	140 ±10 / 308.6 ±22	150 ±10 / 330.7 ±22
Cable port		Basically one hole provided / ø 50mm (2") Optionally max. two holes available / ø 50 or 80mm (2 or 3.2")		
Interface port		Basically RS-232C, [RS-485: optional]		
Electrical requirements (AC230V, 1ph, 60Hz)		10.1A	12.4A	16A
Cat. No.		AAH82411K	AAH82421K	AAH82431K
Electrical requirements (AC230V, 1ph, 50Hz)		9.7A	11.8A	15.6A
Cat. No.		AAH82412K	AAH82422K	AAH82432K

1) All specifications are under ambient temperature 20°C (68°F), No load.

2) Technical data according to DIN 12880, IEC 60068.

※ Permissible environmental conditions: temperature (18 to 30°C) and relative humidity (up to 85%).

※ Recommended ambient temperature: +20°C (68°F).

※ FDA establishment registered company. FDA listed products.

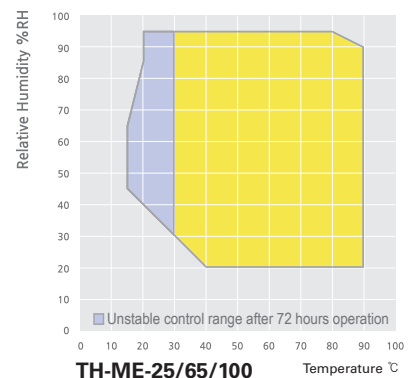


Light weight and compact design with high performance.



Control range

- Temperature range from -20 to 150 °C
- Humidity range from 20 to 95% RH

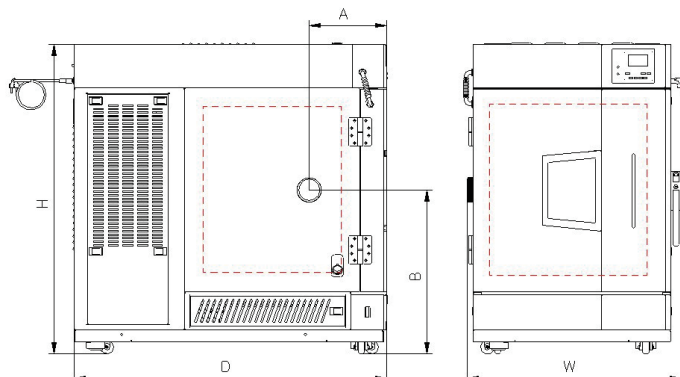


TH-ME

Standard accessories • Viewing window, Wire shelves, Cable port (Ø50mm), Door key

Optional accessories • Two step stands, Direct water system
see page 237

- ※ Above products design can be changed without prior notice.
- ※ Inner glass door is not equipped to the unit since 2013.



Dimension

Model	TH-ME-25	TH-ME-65	TH-ME-100
Capacity	25L (0.9 cu ft)	65L (2.3 cu ft)	100L (3.53 cu ft)
W	522mm (20.6")	602mm (23.7")	760mm (29.9")
D	878mm (34.6")	1048mm (41.3")	1108mm (43.6")
H	919mm (36.2")	1056mm (41.6")	1096mm (43.1")
A	211mm (8.3")	276mm (10.9")	276mm (10.9")
B	495mm (19.5")	580mm (22.8")	580mm (22.8")

Performance

- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Uniform temperature and humidity control guarantees reliable test result.
- Air-tight door closure with perfect sealed packing.
 - Heat-resistant silicone packing completely blocks high heat leakage from the inner chamber.
- Maintenance of water supply is easily performed.
 - Water level condition is easy to check by the water level indicator on the front control panel.
- Water supply during operation is also available for long term test purposes.
- Direct water system provides user great convenience when performing long-term tests. (optional)

Safety

- Built in door lock with a key.
- Automatic shut off after overheat alarm.
- Low and empty water level alarm.
- Power supply leakage breaker.
- Over current protection.
- Open door alarm.

Convenience

- Compact design and quite operation.
- Three different size models are available to suit user's need.
- Corrosion resistance stainless steel chamber.
- Operating condition is clearly noticed by front LED indicator.
 - Three different colored lights show each status of running, stop, and power off condition.
- Clear observation of samples.
 - Tempered glass window with wire heater and lighting provides a clear view of samples in the chamber, beneficial for during testing.
- Cable port for introduction of external probes or wires.
 - 50mm diameter cable port comes standard on the left side of the unit.
 - Additional 50mm or 80mm diameter cable ports, custom ordered. (optional)
- Two type of stands for space-saving. (optional)
 - Single stand with a drawer provides enough storage space.
 - Two step stand accepts loading two units to save limited space.
- User friendly LCD controller.
 - Set value and present value are clearly visible together on display.
 - Operating progress visible in graph mode allow for direct data interpretation.
 - Temperature and other operating parameters recorded with use of selectable recorder. (optional)
- Sufficient programmable control support.

Description	No
Programmable pattern capacity	10
pattern repeat time	999
Max. Segments per a pattern	100
Available max. segments*	100
Programmable process time per a segment	0 to 99 hr. 59 min.

* Even though the max. segments per a pattern are 100, available total segments are up to 300 not 3000, so you need to arrange the number of segment and patterns properly.



Controller



Viewing window with operating LED Indicator

- Computer interface.
 - Computer interface.
 - RS-485 communication port enables connection of up to maximum 9 units. Simultaneous monitoring and operating of multiple units is an available feature. (optional)
 - Program patterns are simple to set with the use of our software.
 - Storage of program information, backup of value settings, recovery, temperature, humidity values.
 - RS-232 communication port comes standard.

Model		TH-ME-025	TH-ME-065	TH-ME-100
Chamber volume (L / cu ft)		25 / 0.9	65 / 2.3	100 / 3.5
Controller		Program controller (LCD type)		
Temperature	Range (°C / °F)	-20 to 150 / -4 to 302 without humidity 15 to 90 / 59 to 194 with humidity		
	Fluctuation ¹⁾ (±°C / °F) at 25°C / 60%RH	0.3 / 0.54	0.2 / 0.36	0.2 / 0.36
	Variation ¹⁾ (±°C / °F) at 25°C / 60%RH	0.6 / 1.08	0.2 / 0.36	0.2 / 0.36
Time	Heating - without humidity (min.) from -20°C to 120°C	60	67	73
	Cooling - without humidity (min.) from 120°C to -20°C	174	144	153
Humidity	Range (%RH)	20 to 95 ※ See page 225 for more detailed humidity range check.		
	Fluctuation ¹⁾ (±%RH) at 60%RH / 55°C	2.0	2.7	2.7
	Variation ¹⁾ (±%RH) at 60%RH / 55°C	0.6	1.1	1.2
Refrigeration	System	Mechanical single stage refrigerator system (air-cooled condenser)		
	Refrigerant	R-507A		
Water tank	Capacity (L / cu ft)	7.5 / 0.26	10 / 0.35	14.5 / 0.51
	Water quality	pH6.2 to 7.2 / Electrical conductivity 20°C/cm to below		
No. of wire shelves (standard / max.)		2 / 7	2 / 10	2 / 10
Distance of between shelves (mm / inch)		20 / 1.6	20 / 1.6	20 / 1.6
Max. load per shelf (kg / lbs)		25 / 55.1	25 / 55.1	25 / 55.1
Permitted total load (kg / lbs)		65 / 143.3	65 / 143.3	65 / 143.3
Dimension (WxDxH)	Interior (mm / inch)	348×220×353 / 13.7×8.7×13.9	398×330×498 / 15.7×13×19.6	498×390×538 / 19.6×15.4×21.2
	External (mm / inch)	552×878×919 / 21.7×34.6×36.2	602×1048×1056 / 23.7×41.2×41.6	760×1108×1096 / 29.9×43.6×43.1
	Viewing window (mm / inch)	220×300 / 8.7×11.8		
	Net weight (kg / lbs)	80±5 / 176±11	110±5 / 242±11	130±5 / 286±11
Cable port		Basically one hole provided / ø 50mm (2") Optionally max. two holes available / ø 50 or 80mm (2 or 3.2")		
Interface port		Basically RS-232C [RS-485 optional]		
Electrical requirements (230V, 1ph, 60Hz)		9.6A	12A	15.5A
Cat. No.		AAH82111K	AAH82121K	AAH82131K
Electrical requirements (230V, 1ph, 50Hz)		9.2A	11.1A	13.8A
Cat. No.		AAH82112K	AAH82122K	AAH82132K

1) Technical data according to DIN 12880, IEC 60068.

* 80mm cable access hole is NOT available for 25L chamber. (TH-ME-025).

* Above the dimensions are NOT included size of attached accessories.

※ Permissible environmental conditions: temperature (18 to 30°C) and relative humidity (up to 85%).

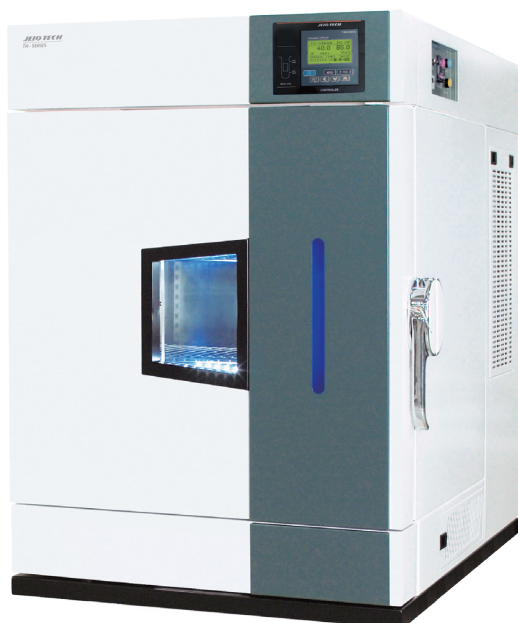
※ All specifications are under ambient temperature 20°C (68°F), No load.

※ FDA establishment registered company. FDA listed products.

Temperature & Humidity Chambers (Tabletop - TH-PE)

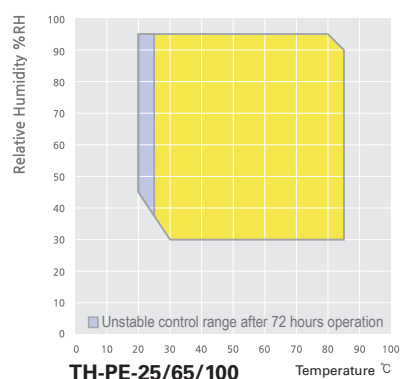


The best choice for the limited laboratory space!
Tabletop chamber is beneficial for space efficiency.



Control range

- Temperature range from 0 to 120 °C
- Humidity range from 30 to 95% RH



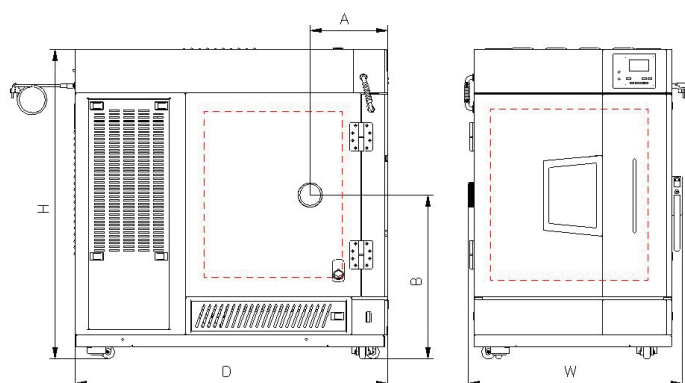
TH-PE

Standard accessories • Viewing window, Wire shelves, Cable port (Ø50mm), Door key

Optional accessories • Two step stands, Direct water system
see page 237

※ Above products design can be changed without prior notice.

※ Inner glass door is not equipped to the unit since 2013.



Dimension

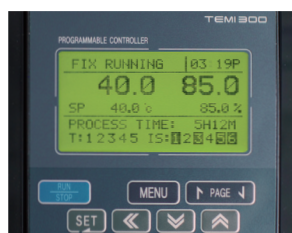
Model	TH-PE-25	TH-PE-65	TH-PE-100
Capacity	25L (0.9 cu ft)	65L (2.3 cu ft)	100L (3.53 cu ft)
W	522mm (20.6")	602mm (23.7")	760mm (29.9")
D	878mm (34.6")	1048mm (41.3")	1108mm (43.6")
H	919mm (36.2")	1056mm (41.6")	1096mm (43.1")
A	211mm (8.3")	276mm (10.9")	276mm (10.9")
B	495mm (19.5")	580mm (22.8")	580mm (22.8")

Performance

- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Uniform temperature and humidity control guarantees reliable test result.
- Air-tight door closure with perfect sealed packing.
 - Heat-resistant silicone packing completely blocks high heat leakage from the inner chamber.
- Maintenance of water supply is easily performed.
 - Water level condition is easy to check by the water level indicator on the front control panel.
- Water supply during operation is also available for long term test purposes.
- Direct water system provides user great convenience when performing long-term tests. (optional)

Safety

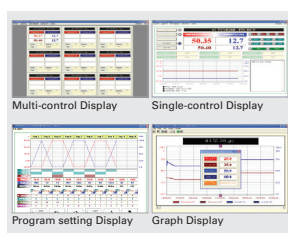
- Built in door lock with a key.
- Automatic shut off after overheat alarm.
- Low and empty water level alarm.
- Power supply leakage breaker.
- Over current protection.
- Open door alarm.



LCD controller



Door handle



Computer Interface



Viewing window

Convenience

- Compact design and quite operation.
- Three different size models are available to suit user's need.
- Corrosion resistance stainless steel chamber.
- Operating condition is clearly noticed by front LED indicator.
 - Three different colored lights show each status of running, stop, and power off condition.
- Clear observation of samples.
 - Tempered glass window with wire heater and lighting provides a clear view of samples in the chamber, beneficial for during testing.
- Cable port for introduction of external probes or wires.
 - 50mm diameter cable port comes standard on the left side of the unit.
 - Additional 50mm or 80mm diameter cable ports, custom ordered. (optional)
- Two type of stands for space-saving. (optional)
 - Single stand with a drawer provides enough storage space.
 - Two step stand accepts loading two units to save limited space.
- User friendly LCD controller.
 - Set value and present value are clearly visible together on display.
 - Operating progress visible in graph mode allow for direct data interpretation.
 - Temperature and other operating parameters recorded with use of selectable recorder. (optional)
- Sufficient programmable control support.

Description	No
Programmable pattern capacity	10
pattern repeat time	999
Max. Segments per a pattern	100
Available max. segments*	100
Programmable process time per a segment	0 to 99 hr. 59 min.

* Even though the max. segments per a pattern are 100, available total segments are up to 300 not 3000, so you need to arrange the number of segment and patterns properly.

- Computer interface.
 - Computer interface.
 - RS-485 communication port enables connection of up to maximum 9 units. Simultaneous monitoring and operating of multiple units is an available feature. (optional)
 - Program patterns are simple to set with the use of our software.
 - Storage of program information, backup of value settings, recovery, temperature, humidity values.
 - RS-232 communication port comes standard.

Temperature & Humidity Chambers (Tabletop - TH-PE)

Model		TH-PE-025	TH-PE-065	TH-PE-100
Chamber volume (L / cu ft)		25 / 0.9	65 / 2.3	100 / 3.5
Controller		Program controller (LCD type)		
Temperature	Range (°C / °F)	0 to 120 / 32 to 248 without humidity 15 to 90 / 59 to 194 with humidity		
	Fluctuation ¹⁾ (±°C / °F) at 25°C / 60%RH	0.2 / 0.36	0.3 / 0.54	0.2 / 0.36
	Variation ¹⁾ (±°C / °F) at 25°C / 60%RH	0.3 / 0.54		
Time	Heating - without humidity (min.) from 0°C to 120°C	40		
	Cooling - without humidity (min.) from 20°C to 0°C	30		
Humidity	Range (%RH)	30 to 95 ※ See page 228 for more detailed humidity range check.		
	Fluctuation ¹⁾ (±%RH) at 60%RH / 55°C	1.6	0.4	0.5
	Variation ¹⁾ (±%RH) at 60%RH / 55°C	3.0		
Refrigeration	System	Mechanical single stage refrigerator system (air-cooled condenser)		
	Refrigerant	R-404A		
Water tank	Capacity (L / cu ft)	7.5 / 0.26	10 / 0.35	14.5 / 0.51
	Water quality	pH6.2 ~ 7.2, Electrical conductivity 20°C / cm to below		
No. of wire shelves (standard / max.)		2 / 7	2 / 10	2 / 10
Distance of between shelves (mm / inch)		20 / 1.6	20 / 1.6	20 / 1.6
Max. load per shelf (kg / lbs)		25 / 55.1	25 / 55.1	25 / 55.1
Permitted total load (kg / lbs)		65 / 143.3	65 / 143.3	65 / 143.3
Dimension (WxDxH)	Interior (mm / inch)	348×220×353 / 13.7×8.7×13.9	398×330×498 / 15.7×13×19.6	498×390×538 / 19.6×15.4×21.2
	External (mm / inch)	552×878×919 / 21.7×34.6×36.2	602×1048×1056 / 23.7×41.2×41.6	760×1108×1096 / 29.9×43.6×43.1
	Viewing window (mm / inch)	220×300 / 8.7×11.8		
	Net weight (kg / lbs)	80±5 / 176±11	110±5 / 242±11	130±5 / 286±11
Cable port		Basically one hole provided / ø 50mm (2") Optionally max. two holes available / ø 50 or 80mm (2 or 3.2")		
Interface port		Basically RS-232C [RS-485 optional]		
Electrical requirements (230V, 1hp, 60Hz)		9.6A	12A	14.4A
Cat. No.		AAH82211K	AAH82221K	AAH82231K
Electrical requirements (230V, 1hp, 50Hz)		9.2A	11.1A	13.8A
Cat. No.		AAH82212K	AAH82222K	AAH82232K

1) Technical data according to DIN 12880, IEC 60068.

* 80mm cable access hole is NOT available for 25L chamber (TH-PE-025).

* Above the dimensions are NOT included size of attached accessories.

※ Permissible environmental conditions: temperature (18 to 30°C) and relative humidity (up to 85%).

※ All specifications are under ambient temperature 20°C (68°F), No load.

※ FDA establishment registered company. FDA listed products.



Pharmaceutical stability test chamber

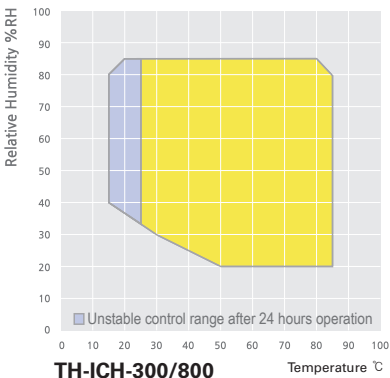
Manufactured in accordance with ICH Guidelines Q1A-Stability test (R2), Q1B-Photostability test (Option 2).

- ▶ Optimum temperature and humidity control system for long-term stability test.
- ▶ Independent luminescence control system for photostability test.



Control range

- Temperature range from -5 to 85 °C
- Humidity range from 20 to 85% RH



TH-ICH

with the optional recorder

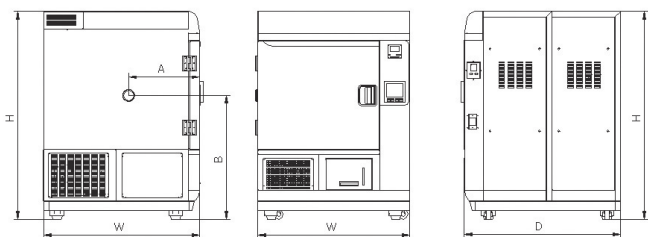
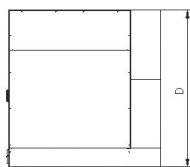
Standard accessories

- Wire shelves, Cable port (Ø50mm)
- Fluorescent lamp (cool white), UVA lamp, UV sensor, Illumination sensor, Door key

Optional accessories

see page 238

- Direct water system



Dimension

Model	TH-ICH-300	TH-ICH-800
Capacity	300L (10.6 cu ft)	760L (26.8 cu ft)
W	1130mm (44.5")	1220mm (48")
D	985mm (33.8")	1215mm (47.8")
H	1520mm (59.8")	1965mm (77.4")
A	460mm (18.1")	545mm (21.5")
B	905mm (35.6")	1185mm (46.7")

Performance

- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Rapid humidity control is achieved by adapting the humidification tank interior to the chamber.
- Air-tight door closure with perfect sealed packing.
 - Heat-resistant silicone packing completely blocks high heat leakage from the inner chamber.

Convenience

- Two different sized models available to suit any users' needs.
- Corrosion resistant stainless steel chamber.
- Cable port for introduction of external probes or wires.
 - 50mm diameter cable port comes standard on the left side of the unit.
 - Additional 50mm or 80mm diameter cable ports, custom ordered. (optional)
- Inner glass door with entry ports for handling samples without affecting inner chamber temperature and humidity. (optional)
- Casters for easy mobility during installation or relocation.
- User friendly LCD controller.
 - Set value and present value are clearly visible together on display.
 - Operating progress visible in graph mode allow for direct data interpretation.
 - Temperature and other operating parameters recorded with use of selectable recorder. (optional)
- Sufficient programmable control support.

Description	TH-ICH
Programmable pattern capacity	10
pattern repeat time	999
Max. Segments per a pattern	100
Available max. segments*	100
Programmable process time per a segment	0 to 99 hr. 59 min.

* Even though the max. segments per a pattern are 100, available total segments are up to 300 not 3000, so you need to arrange the number of segment and patterns properly.

- Computer interface.
 - RS-485 communication port enables connection of up to maximum 9 units. Simultaneous monitoring and operating of multiple units is an available feature. (optional)
 - Program patterns are simple to set with the use of our software.
 - Storage of program information, backup of value settings, recovery, temperature, humidity values.
 - RS-232 communication port comes standard.

Stability test ICH guideline Q1A (R2)

- Operating progress visible through graph mode for better data analyzation.
- Cyclic defrost system, designed to work excellently for the long period stability test operation.
 - (※ Temperature and humidity changes may occur during automatic defrost.)
- Maintenance of water supply are easily performed with a front water tank.
 - Water level check indicated by water level bar in the tank.
- Water supply during operation is also available for long term test purposes.
- Direct water system provides user great convenience when performing long-term test. (optional)

Photostability test ICH guideline Q1B (Option 2)

- Built in UV and fluorescent lamps for uniformed luminescence.
- Equipped with movable UV and VIS sensors .
- Independent lamp controller
 - An indicator for Total usage time of UV and fluorescent lamps.
- Convenient set function of cumulative dosage and lamp Off.

Safety

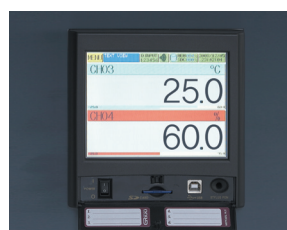
- Built in door lock with a key.
- Automatic shut off after overheat alarm.
- Low and empty water level alarm.
- Power supply leakage breaker.
- Over current protection.
- Open door alarm.



Lamp controller



LCD controller



Digital recorder (optional)



Water level indicator

Model		TH-ICH-300	TH-ICH-800
Chamber volume (L / cu ft)		300 / 10.6	760 / 26.8
Controller		PID control (LCD Type)	
Temperature ¹⁾	Range	without humidity (°C / °F)	-5 to 85 / 23 to 185 without Light 0 to 85 / 32 to 185 with Light
		with humidity (°C / °F)	+15 to 85 / 59 to 185 with Light
	Fluctuation ¹⁾ (±°C / °F) at 40°C / 60%RH		0.3 / 0.55
	Variation ¹⁾ (±°C / °F) at 40°C / 60%RH		0.7 / 1.3
Time	Heating		25min (20°C → 85°C)
	Cooling		35min (20°C → 5°C)
Humidity	Range (%RH)		20 to 85 ※ See page 231 for more detailed humidity range check.
	Fluctuation ²⁾ (±%RH) at 60%RH / 40°C		3
	Variation ²⁾ (±%RH) at 60%RH / 40°C		5
Light source (ICH Q1B option 2)	Cool white ³⁾		6,000 lux
	Ultraviolet-A ³⁾		5 W/m ²
	Light uniformity		VIS. : ±10% UVA : ±15%
Typical time required to reach ICH Recommendation of 1.2 million lux-hr		≈ 200Hr	≈ 184Hr
Typical time required to reach ICH recommendation of 200 W-hr/m ²		≈ 50Hr	≈ 40Hr
Refrigeration	System		Air-cooled
	Refrigerant		R-404A
Water tank	Capacity (L / cu ft)		15 / 0.53
	Water quality		pH6.2 ~ 7.2, Electrical conductivity 20 ^{μS} / cm to below
No. of wire shelves (standard / max.)		2 / 8	2 / 17
Distance of between shelves (mm / inch)		60 / 2.4	60 / 2.4
Max. load per shelf (kg / lbs)		25 / 55.1	40 / 88.2
Permitted total load (kg / lbs)		75 / 165.3	100 / 220.5
Dimension (W×D×H)	Interior (mm / inch)		750×650×650 / 29.5×25.6×25.6
	Exterior (mm / inch)		1130×985×1520 / 44.5×38.8×59.8
	Net weight (kg / lbs)		280±10 / 617±22
Cable port		Basically one hole provided / ø 50mm (2"), Optionally max. two holes available / ø 50 or 80mm (2 or 3.2")	
Interface port		Basically RS-232C, [RS-485 : optional]	
Electrical requirements	AC230V, 1ph, 60Hz		24.5 A
	Cat.No.		AAHC1001K
	AC230V, 1ph, 50Hz		23.5 A
	Cat.No.		AAHC1002K

1) All specifications are under ambient temperature 20°C (68°F), No load.

2) Technical data according to DIN 12880, IEC 60068.

3) The value is measured on the center of chamber at the point of vertical direction.

※ FDA establishment registered company. FDA listed products.

Specific Purpose Chambers (TH-CR)



Clean environmental test chamber.

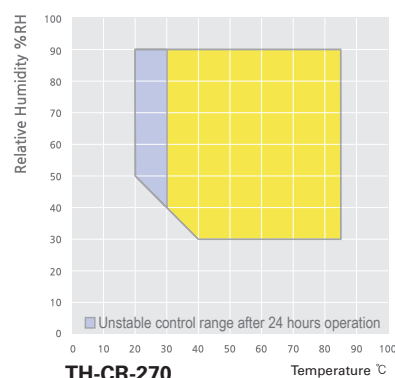
Specially designed for processes requiring clean and controlled environmental test conditions.
(ISO class 5 air cleanliness as per ISO 14644-1)

- ▶ Heat-resisting HEPA filter provides clean environment.
 - 0.3 μm and larger particulates are removed with 99.99% efficiency
- ▶ ULPA filter provides for better air cleanliness of the chamber. (optional)
 - 0.1 μm and larger particulates are removed with 99.999% efficiency
- ▶ No external exhaust system required.



Control range

- Temperature range from -35 to 100 $^{\circ}\text{C}$
- Humidity range from 30 to 90% RH

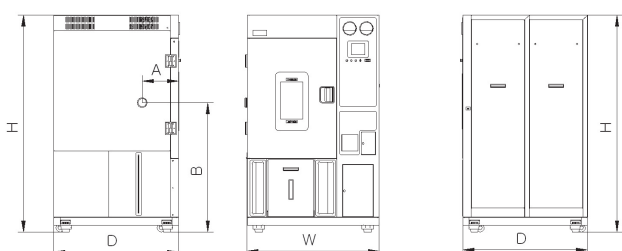
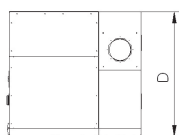


TH-CR

with optional recorder

Standard accessories • Viewing window, Wire shelves, Cable port ($\varnothing 50\text{mm}$), HEPA filter, Water container

Optional accessories • ULPA filter, Water purifier, Direct water system
see page 238



Dimension

Model	TH-CR-270
Capacity	270L (9.5 cu ft)
W	1180mm (46.5")
D	1120mm (44.1")
H	1935mm (76.1")
A	325mm (12.8")
B	1155mm (45.5")

Performance

- Microprocessor PID control / Temperature calibration / Automatic tuning.
- Exhaust duct is located at the upper right side of the unit to avoid influence other devices.
- Built-in differential pressure gauge for easy observation of HEPA filter condition.

Convenience

- Silicone-free construction for clean environment.
- Corrosion resistance stainless steel chamber.
- Maintenance of water supply are easily performed with a front water tank.
 - Water level check indicated by water level bar in the tank.
- Water supply during operation is also available for long term test purposes.
- Direct water system provides user great convenience when performing long-term tests. (optional)
- Clear observation of samples.
 - Tempered glass window with wire heater and lighting provides a clear view of samples in the chamber, beneficial for during testing.
 - Inner glass door with entry ports for handling samples without affecting inner chamber temperature and humidity. (optional)
- Cable port for introduction of external probes or wires.
 - 50mm diameter cable port comes standard on the left side of the unit.
 - Additional 50mm or 80mm diameter cable ports, custom ordered. (optional)
- Casters for easy mobility during installation or relocation.
- User friendly LCD controller.
 - 5.7 inch colorful interactive touch type LCD controller.
 - Set value and present value are clearly visible together on display.
 - Operating progress visible in graph mode allow for direct data interpretation.
 - Temperature and other operating parameters recorded with use of selectable recorder. (optional)
 - Sufficient programmable control support.
 - Programming operation.

Description	TH-ICH
Programmable pattern capacity	120
pattern repeat time	999
Max. Segments per a pattern	100
Available max. segments*	1200
Programmable process time per a segment	0 to 99 hr. 59 min.

* Even though the max. segments per a pattern are 100, available total segments are up to 1200 not 12000, so you need to arrange the number of segment and patterns properly.

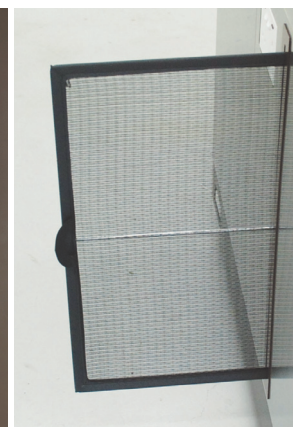
- Computer interface.
- RS-485 communication port enables connection of up to maximum 9 units. Simultaneous monitoring and operating of multiple units is an available feature. (optional)
- Program patterns are simple to set with the use of our software.
- Storage of program information, backup of value settings, recovery, temperature, humidity values.
- RS-232 communication port comes standard.

Safety Features

- Automatic shut off after overheat alarm.
- Low and empty water level alarm.
- Power supply leakage breaker.
- Over current protection.
- Open door alarm.



Control panel



Air-filter



Viewing window



Water level indicator

Specific Purpose Chambers (TH-CR)

Model		TH-CR-270	
Chamber volume (L / cu ft)		270 / 9.5	
Controller		Programmable, Touch screen type controller (5.7" color monitor) Local controller (fixed - command control)	
Temperature	Range (°C / °F)	-35 to 100 / -31 to 212 without humidity 20 to 85 / 104 to 185 with humidity	
	Fluctuation ¹⁾ (±°C / °F) at 40°C / 60%RH	0.5 / 0.9	
	Variation ¹⁾ (±°C / °F) at 40°C / 60%RH	0.5 / 0.9	
Time	Heating - without humidity (min.)	60 from -35°C to 120°C (31°F to 248°F)	
	Cooling - without humidity (min.)	65 from 20°C to -35°C (68°F to -31°F)	
Humidity	Range (%RH)	30 to 90 ※ See page 234 for more detailed humidity range check.	
	Fluctuation ¹⁾ (±%RH) at 60%RH / 40°C	3	
	Variation ¹⁾ (±%RH) at 60%RH / 40°C	3	
Cleanliness		Class 100 (ISO 14644-1)	
Refrigeration	System	Mechanical single stage refrigerator system (air-cooled condenser)	
	Refrigerant	R-404A	
Water supply	Capacity	15L (0.53cu ft) - Cartridge type	
	Water quality	pH6.2 to 7.2 / Electrical conductivity 20 ^{µS} /cm to below	
No. of wire shelves (standard / max.)		2 / 10	
Distance of between shelves (mm / inch)		40 / 1.6	
Max. load per shelf (kg / lbs)		25 / 55.1	
Permitted total load (kg / lbs)		65 / 143.3	
Dimension (WxDxH)	Interior (mm / inch)	600×700×648 / 23.6×27.6×25.4	
	Exterior (mm / inch)	1180×1120×1935 / 46.5×44.1×76.2	
	Viewing windows (mm / inch)	200×330 / 7.9×13	
	Net weight (kg / lbs)	400±10 / 881.8±22	
Cable port		Basically one hole provided / ø 50mm (2") Optionally max. two holes available / ø 50 or 80mm (2 or 3.2")	
Interface port		Basically RS-232C [RS-485-optional]	
Electrical requirements (230V, 1ph)		60Hz / 29A	50Hz / 29A
Cat. No.		AAH83011K	AAH83012K
Electrical requirements (380V, 3ph)		50Hz / 9.6A	
Cat. No.		AAH83018K	

1) Technical data according to DIN 12880, IEC 60068.

※ Permissible environmental conditions: temperature (18 to 30°C) and relative humidity (up to 85%).

※ All specifications are under ambient temperature 20°C (68°F), No load.

※ Upon request, other sizes of chambers are available. Please contact with us.

※ FDA establishment registered company. FDA listed products.

for Tabletop Chambers

Accessory check list

□ Standard ○ Optional

Description	Models		
	TH-KE	TH-ME	TH-PE
Portable recorder (6 points)	○	○	○
Portable recorder (digital, 6 channels)	○	○	○
interface converter RS-485C → 232C included a cable (5m / 16.4ft)	○	○	○
Interface cable (5m / 16.4ft)	○	○	○
Warning signal lamp	○	○	○
Viewing window	□	□	□
Wire shelf	□	□	□
Perforated shelf	○	○	○
Cable port (Ø 50mm / 2.0")	□	□	□
Cable port (Ø 80mm / 3.2") ¹⁾	○	○	○
Stand	○	○	○
Two step stand	○	○	○
Temperature sensor (RTD type)	□	□	□
Humidity sensor	□	□	□
Water purifier	○	○	○
Direct water system	○	○	○

1) 80mm cable access hole is NOT available for 25L chamber.

Ordering information

Cat. No.	Description	Suitable for
AAA8T504	Portable recorder (6 points)	All models
AAA8T506	Portable recorder (digital, 6 channels)	All models
AAA8T540	Interface converter RS-485C → 232C Included a cable (5m / 16.4ft)	All models
AAA8T542	Interface cable (5m / 16.4ft)	All models
AAA80550	Warning signal lamp	All models
RTD679	Wire shelf	TH-KE/ME/PE-025
RTD680		TH-KE/ME/PE-065
RTD681		TH-KE/ME/PE-100, TH-PF-100
AAA80602-6	Perforated shelf	TH-KE/ME/PE-025
AAA80602-7		TH-KE/ME/PE-065
AAA80602-8		TH-KE/ME/PE-100, TH-PF-100
AAA8T610	Cable port (Ø 50mm / 2.0")	TH-KE/ME/PE/PF Models
AAA8T611	Cable port (Ø 80mm / 3.2")	TH-KE/ME/PE/PF Models ¹⁾
AAA80631	Stand	TH-KE/ME/PE-025
AAA80632		TH-KE/ME/PE-065
AAA80633		TH-KE/ME/PE-100, TH-PF-100
AAA80634	Two step stand	TH-KE/ME/PE-025
AAA80635		TH-KE/ME/PE-065
CFA1923	Temperature sensor (RTD type)	All models
CFA7113	Humidity sensor	All models
AAA8T621	Water purifier	All models
AAA80620	Direct water system	All models

1) 80mm cable access hole is NOT available for 25L chamber.

Accessories & Options

for Floor Standing Chambers

Accessory check list

□ Standard ○ Optional

Description	Models					
	TH-G	TH-I	TH-KH	TH-TG	TH-ICH	TH-CR
Recorder (6 points)	○	○	○	○	○	○
Recorder (digital, 6 channels)	○	○	○	○	○	○
interface converter RS-485C → 232C included a cable (5m / 16.4ft)	○	○	○	○	○	○
Interface cable (5m / 16.4ft)	○	○	○	○	○	○
Warning signal lamp	○	○	○	○	○	○
Inner glass door	○	○	○	○	○	-
Viewing window	□	□	□	□	-	□
Wire shelf	□	□	□	□	□	□
Perforated shelf	○	○	○	○	○	○
Cable port (Ø 50mm / 2")	□	□	□	□	□	□
Cable port (Ø 80mm / 3.2")	○	○	○	○	○	○
Temperature sensor (RTD type)	□	□	□	□	□	□
Humidity sensor	□	□	□	□	□	□
Fluorescent lamp (Cool White)	-	-	-	-	□	-
UVA lamp	-	-	-	-	□	-
UV sensor	-	-	-	-	□	-
Illumination Sensor	-	-	-	-	□	-
HEPA filter	-	-	-	-	-	□
ULPA filter	-	-	-	-	-	○
Water cartridge tank (Water Container)	□	□	□	□	-	□
Water purifier	○	○	○	○	○	○
Direct water system	○	○	○	○	○	○

Ordering information

Cat. No.	Description	Suitable for
AAA8T500	Recorder (6 points)	All models
AAA8T505	Recorder (digital, 6 channels)	All models
AAA8T540	interface converter RS-485C → 232C included a cable (5m / 16.4ft)	All models
AAA8T542	Interface cable (5m / 16.4ft)	All models
AAA80550	Warning signal lamp	All models
AAA81552	Inner glass door	TH-G//KH-180
AAA81551		TH-G//KH-300, 408, CR-270
AAA81550		TH-G-800, 1000
AAAC2501		TH-TG-180
AAAC2502		TH-TG-300, 408
AAAC2503		TH-TG-800, 1000
AAA81554		TH-ICH-300
AAA81555		TH-ICH-800
AAA8T610	Cable port (Ø 50mm / 2")	All models
AAA8T611	Cable port (Ø 80mm / 3.2")	All models
CFA1185	Temperature sensor (RTD type)	TH-G//GU models
CFA1923		TH-TG/ICH/CR models
CFA7113	Humidity sensor	All models
RTD1190	Fluorescent lamp (cool white)	TH-ICH-300
RTD1191		TH-ICH-800
RTD1188	UVA lamp	TH-ICH-300
RTD1189		TH-ICH-800
AAA80680	THE-680 UV sensor	TH-ICH-300/800
AAA80681	THE-681 Illumination sensor	TH-ICH-300/800
AAA80661	Door lock device	TH-ICH-300/800
EDA9184	HEPA filter	TH-CR-270
EDA9175	ULPA filter	TH-CR-270
AAA80622	Water cartridge tank	All models

Cat. No.	Description	Suitable for
AAA8T621	Water purifier	All models
AAA80620	Direct water system	All models
EDA8212	Wire shelf	TH-G//KH-180
EDA8213		TH-G//KH-300
EDA8214		TH-G//KH-408
EDA8215		TH-G-800
EDA8216		TH-G-1000
RTD1302		TH-TG-180
RTD1303		TH-TG-300
RTD1300		TH-TG-408
RTD1304		TH-TG-800
RTD1301		TH-TG-1000
RTD1305		TH-G/TG-1500
RTD1196		TH-ICH-300
RTD1198		TH-ICH-800
STT1040		TH-CR-270
AAA80602-1	Perforated shelf	TH-G//KH-180
AAA80602-2		TH-G//KH-300
AAA80602-3		TH-G//KH-408
AAA80602-4		TH-G-800
AAA80602-5		TH-G-1000
AAA80604-11		TH-TG-180
AAA80604-12		TH-TG-300
AAA80604-13		TH-TG-408
AAA80604-14		TH-TG-800
AAA80604-15		TH-TG-1000
AAA80604-16		TH-G/TG-1500
AAA80604-2		TH-ICH-300
AAA80604-4		TH-ICH-800
AAA80603-1		TH-CR-270



Optimal photosynthesis condition guaranteed when using our plant growth chamber.

Ample capacity, maximum capacity of 1000L to satisfy user's plant growth needs



GC-1000TLH / GC-300TLH

with optional recorder

Standard accessories • Inner glass door, Wire shelves

Optional accessories • Perforated shelves, CO₂ sensors
see page 241

Optimal photosynthesis condition for plant growth.

- ▶ Uniform temperature and humidity. (TLH models)
- ▶ Reinforced Blue and Red spectrums lighting system for plant photosynthesis.
- ▶ Optional CO₂ sensor (optional)
- ▶ Programmable temperature, humidity, and lighting.
- ▶ Progressive temperature, humidity, illumination program control for optimization of plant growth environment for night and day.

Performance

General control system

- 5 °C to 50 °C (lamp off) / 10 °C to 50 °C. (lamp on)
- Max. to 35,000Lux for GC-1000.
Max. to 20,000Lux for GC-300 Models.
- 40 to 80% RH for GC-300TLH. (at 20 to 35 °C)
50 to 90% RH for GC-1000TLH. (at 20 to 35 °C)
- Max. 5,000ppm CO₂ on/off system. (optional)
- Microprocessor PID control / Temperature calibration / Automatic tuning.
- 10 step programmable temperature, humidity, and illumination profiles and repeatable steps of up to 999 cycles.

Illuminance control system

- Uniformed luminescence distribution.
- Broad distribution of side lamps for hastening the growth of plants.
- High intensity illumination of upper lamp for light efficient and low thermal load. (for GC-1000TLH/1000TL)
- Unique construction for minimization of heat increase from surrounding lamps.
 - Tempered glass door blocks heated air from lamps.
 - Designed to exhaust heated air through upper vent holes. (for GC-1000TLH)
- Stable and long lasting lighting through introduction of high frequency electronic ballast lamps.

Convenience

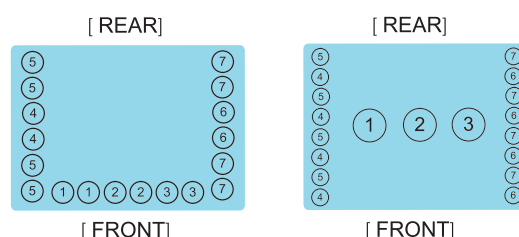
- Ergonomically designed door construction.
 - Inner glass door with silicone and external door with magnetic sealing for dual airtight packing.
 - Well designed providing a smooth open for minimization of damage to plants.
- Wide inner tempered glass door for clear observation of plant growth without affecting inner chamber's environment.
- Tall plants can be grown inside of the chamber with adjustment of shelf level.
- Maintenance of water supply are easily performed with a front water tank. (GC-1000TLH)
 - Water level check indicated by water level bar in the tank.
- Water supply during operation is also available for long term test purposes.
- Adjustable water tank position. (for GC-300TLH)
- Detachable condenser air-filter for easy maintenance of refrigerating efficiency.
 - Maintenance of air filter no longer cumbersome with our detachable condenser air filter.
- Casters for easy mobility during installation or relocation.
- Eco-friendly CFC-free refrigerant use.

Safety

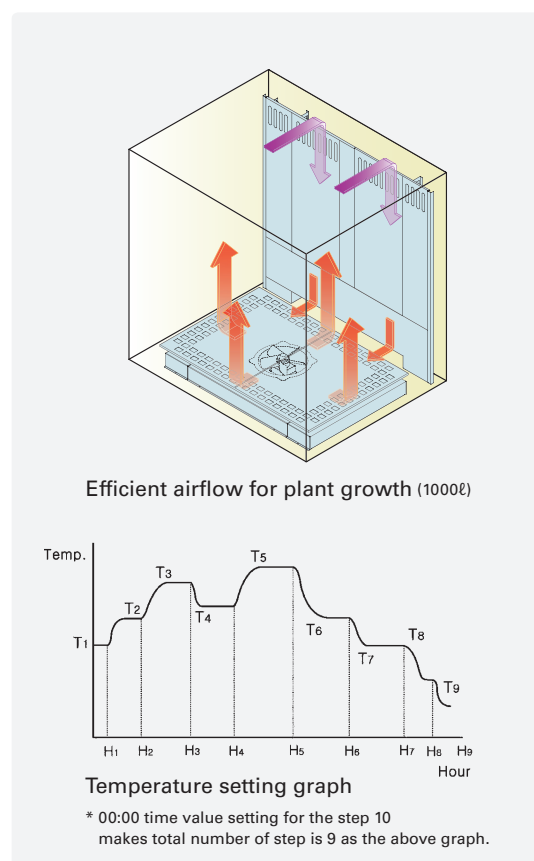
- Automatic shut off after overheat alarm.
- Low and empty water level alarm.
- Power supply leakage breaker.
- Over current protection,
- Open door alarm.

Lamps setting

- Control illumination values with the below lamp setting arrangements.



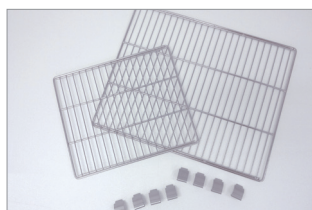
GC-300 lamp arrangement GC-1000 lamp arrangement



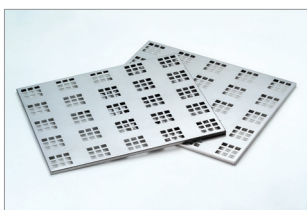
Model		GC-300TL		GC-300TLH		GC-1000TLH	
Chamber volume (L / cu ft)		300 / 10.6				1000 / 35.3	
Control system		Microprocessor PID controller					
Temperature	Range (°C / °F)	5 to 50 / 41 to 122 - Lamp off					
		10 to 50 / 50 to 122 - Lamp on					
		20 to 50 / 68 to 122 - with humidity					
	Fluctuation (±°C / °F) at 25°C	0.1 / 0.18 - without humidity					
	Variation (±°C / °F) at 25°C	0.8 / 1.43 - without humidity					
Illumination	Range (Lux)	0 to 20,000				0 to 35,000	
	Control (steps)	10				11	
	Lamp	FI lamp (32W×18ea)				FL lamp (32W×16ea) Metal lamp (400W×3ea)	
Humidity	Range (% RH)	-	40 to 80 at 20 to 35°C		50 to 90 at 20 to 35°C		
			70 to 90 at 36 to 50°C		60 to 90 at 36 to 50°C		
	Fluctuation (±RH) at 60% RH	-	3				
CO ₂ (optional)	Range (ppm)	Max. 5,000					
	Sensor	NDIR CO ₂ sensor					
Refrigerant (HP)		1/2				3/4	
Temp. heater power (W)		750×2ea				1,500×2ea	
Humid. heater power (W)		-		1300		1500	
Dimension (W×D×H)	Interior (mm / inch)	510×540×1100 / 20×21.3×43.3				1200×800×1080 / 47.2×31.5×42.5	
	Exterior (mm / inch)	700×805×1900 / 27.6×30.1×74.8				1410×1070×2150 / 55.5×42.1×84.7	
	Net weight (kg / lbs)	250 / 551.2				550 / 1212.5	
Electrical requirements (230V)		60Hz / 12.5A	50Hz / 12.5A	60Hz / 16A	50Hz / 16A	60Hz / 30A	50Hz / 30A
Cat. No.		AAHA1011K	AAHA1012K	AAHA1021K	AAHA1022K	AAHA1031K	AAHA1032K

※ FDA establishment registered company. FDA listed products.

Accessories & Options



Wire shelves



Perforated shelves



Recorder (dot type)



CO₂ sensor

Model	Wire shelves			Perforated shelves			Recorder	CO ₂ sensor
	Cat. No.	Dimension (W×L, mm / inch)	No. of shelves (standard/max.)	Cat. No.	Dimension (W×L, mm / inch)	No. of shelves (max.)	Cat. No.	Cat. No.
GC-300TL	EDA8220	466×490 / 18.3×19.3	3 / 14	AAA22522	466×490 / 18.3×19.3	14	AAAA1501	AAAA1521
GC-300TLH	EDA8220		3 / 14	AAA22522		14	AAAA1501	AAAA1521
GC-1000TLH	EDA8222	580×770 / 2.8×30.3	6 / 29	AAAA1512	580×770 / 22.8×30.3	29	AAAA1502	AAAA1521

Electrophoresis Systems

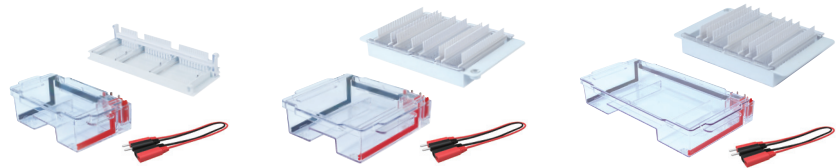
Three systems for different sized gels, satisfying your need for a more detailed DNA/RNA analysis.



EP-10 with power supply

Feature

- The electrophoresis system is a molded transparent polycarbonate product with superior shock-resistance, transparent, and durability to acrylic adhesives.
- Detachable electrode assembly allows for easy cleaning and maintenance.
- Each unit comes with one banana cable. Black & red cables are coupled together and can be inserted or extracted at the same time.
- UV-transparent gel trays allow for viewing bands on the UV-transilluminator without removing gel tray.
- Diverse-sized molded gel trays and casters for leak-free casting
 - EP-5 : 82x81mm (1ea) and 82x58mm (2ea) gel trays with one comb position.
 - EP-10 : 181x103mm (2ea) gel trays with max. four comb positions.
 - EP-18 : 181x206mm (1ea) gel tray with max. six comb positions.
- Double-sided combs are provided depending on each model.
 - EP-5 : 1mm thick 27-and 40-well comb (1ea)
 - EP-10, 18 : 1.5mm thick 20-and 31-well comb (2ea), 1mm thick 20-and 31-well comb (2ea), 1.5mm thick 16-and 20-well comb (2ea), 1mm thick 16-and 20-well comb (2ea), 1.5mm thick 25-and 34-well comb (2ea), 1mm thick 25-and 34-well comb (2ea)
- 31-well comb and 16-well comb for matching multichannel pipettes. Suitable for large amounts of sample screening- up to 186 samples at once using 6 combs in EP-18 gel tray.
- Comb-setting grooves in gel trays or caster prevents sliding of combs.
- Adjustable gel length.
- Flat, uniformly thick gels are formed by built in level maker on the gel tray and level bubble on the gel caster.



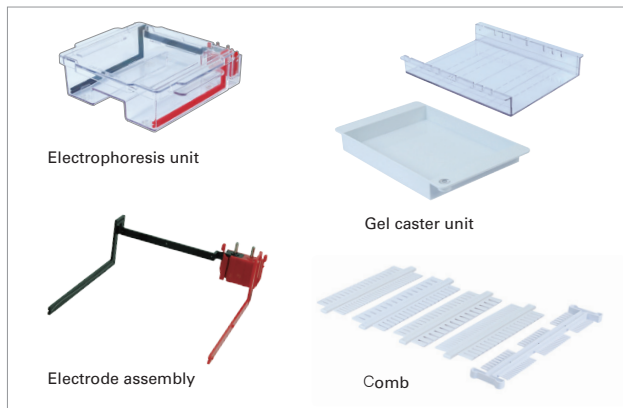
Model		EP-05	EP-10	EP-18
Buffer capacity (L / cu ft)		0.5 / 0.02	1.0 / 0.04	1.8 / 0.07
Material	Tank, Lid, Gel tray, Gel caster	PC (polycarbonate)		
	Comb	ABS (acrylonitrile-butadienestyrene)		
	Electrode	Platinum wire		
Dimension	Electrophoresis tank (mm / inch)	219x134x70 / 8.6x5.3x2.8	219x214x70 / 8.6x8.4x2.8	387x214x70 / 15.2x8.4x2.8
	Gel caster (WxDxH) (mm / inch)	254x87x17 / 10x3.4x0.7	167x264x30 / 6.6x10.4x1.2	167x264x30 / 6.6x10.4x1.2
	Gel tray (WxDxH) (mm / inch)	82x81x17 / 3.2x3.2x0.7	180x102x29 / 7.1x4.0x1.1	180x205x29 / 7.1x8.1x1.1
	Comb (WxD) (mm / inch)	225x45 / 8.9x1.8	158x46 / 6.2x1.8	158x46 / 6.2x1.8
	Net weight (Kg / lbs) ¹⁾	0.39 / 0.86	0.60 / 1.32	0.93 / 2.05
Cat. No.		AAAJ6011	AAAJ6021	AAAJ6031

1) Electrophoresis unit's weight

* Included Electrophoresis unit, Gel caster unit, Comb in one system. (power supply is not included)

* FDA establishment registered company. FDA listed products.

Accessories & Options



Power supply

- Four pairs of outlet terminals enable running 4 cells simultaneously.
- Folding front legs obtain wider viewing angle.
- Compact and stackable design.
- EPS-300 comes with one banana cable together.

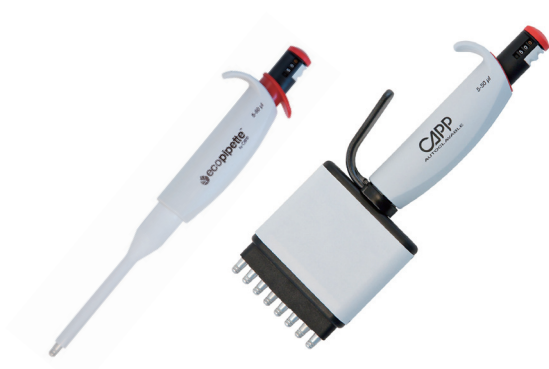


Cat. No.	Description	Suitable for
AAAJ6501	Electrophoresis unit (tank, lid, electrode assembly)	EP-05
AAAJ6502	Electrophoresis unit (tank, lid, electrode assembly)	EP-10
AAAJ6503	Electrophoresis unit (tank, lid, electrode assembly)	EP-18
AAAJ6511	Gel caster unit (gel caster/tray)	EP-05
AAAJ6512	Gel caster unit (gel caster/tray)	EP-10
AAAJ6513	Gel caster unit (gel caster/tray)	EP-18
AAAJ6521	Electrode assembly	EP-05
AAAJ6522	Electrode assembly	EP-10
AAAJ6523	Electrode assembly	EP-18
AAAJ6531	Comb 27/40 well, thickness 1.0mm (5ea)	EP-05
AAAJ6536	Comb 25/34 well, thickness 1.0mm (5ea)	EP-10/18
AAAJ6537	Comb 25/34 well, thickness 1.5mm (5ea)	
AAAJ6532	Comb 20/31 well, thickness 1.0mm (5ea)	
AAAJ6533	Comb 20/31 well, thickness 1.5mm (5ea)	
AAAJ6534	Comb 16/20 well, thickness 1.0mm (5ea)	
AAAJ6535	Comb 16/20 well, thickness 1.5mm (5ea)	

Model	EPS-300
Output range	5–250 V, fully adjustable in 1 V steps 20mA–3000mA, fully adjustable in 10mA steps Max. 300 W
Type of output	Constant voltage, Constant current
Output terminals	4pair recessed banana jack in parallel
Timer	1min to 99hr 59min, Continuous (elapsed time display)
Pause/Resume function	Yes
Display	7-segment 4 digit LED, 2 line
Safety features	No-load detection, Rapid resistance change detection, Ground leak detection, Over current protection, Overvoltage protection, Overpower protection, Over temperature protection
Dimensions (WxDxH) (mm / inch)	230x307x92 / 9.1x12.1x3.6
Material	ABS
Net weight (Kg / lbs)	2.5 / 5.5
Electrical requirements	AC 100 to 240V, 50/60Hz
Power consumption	4.0A at 100V, 1.7A at 240V (max voltage & max power)
Cat. No.	AAAJ6541

Pipettes

Comprehensive selection of quality pipettes designed to fit your needs. They are uniquely designed and made of high quality material to ensure their longevity.



Mechanical Pipettes



Electronic Pipettes



Pipette Controller/Aid

Mechanical Pipettes

- Volume locking device.
- Volume on the knob is fully visible during both left and right handed operation.
- The only pipette with fixed and variable exchangeable counter mechanism.
- Single-channel models:
Lightweight handle for ease of tip ejection with finger rest.
- Multi-channel models:
Large handle for comfortable grip and soft-touch tip ejection.
- Entire pipette can be steam autoclaved. (no disassemble required)
- Double O-ring for optimal tip seal.

Electronic Pipettes

- Easy electronic setting and pipetting without hand fatigue.
- Automatic calibration.
- Large easy-to-read display.
- Aspirating and dispensing speed : 5 steps.
- Pipetting mode :
 - Auto : automatic pipetting.
 - MD : multi dispensing with reverse pipetting.
 - Mix : mixing
 - SE : sequential aspirating and dispensing.
- Acoustic signals, tip ejection alarm, Blow-out function.
- Program recall : maximum 9 protocols can be stored.
- Lower half of the pipette is autoclavable.
- Double O-ring for optimal tip seal.
- Left and right handed operation available for multi-channel models.

Pipette Controller/Aid

- Light and fatigue free: weights only 167g, including the battery.
- Powerful : 50ml pipette is filled in less than 10 seconds.
- Gravity delivery, blow-out dispensing and fully adjustable speed-setting.
- Exchangeable 0.2 μm PTFE disc filter acts as effective shut-down system if overfill occurs.
- Vapour outlet for venting out corrosive liquids or fumes.
- Autoclavable : nose cone, pipette holder and filter.

Cat No.	Description	Inaccuracy %	Imprecision %	Color Code
Single, Variable vol.				
BCPC021S	0.2-2 μl	12 / 2	6 / 1	Violet
BCPC101	0.5-10 μl	2.5 / 1	1.8 / 0.5	White
BCPC201	2-20 μl	5 / 1	1.5 / 0.3	Gray
BCPC501	5-50 μl	2 / 1	1.2 / 0.3	Red
BCPC1001	10-100 μl	2 / 0.7	0.8 / 0.2	Orange
BCPC2001	20-200 μl	1.5 / 0.6	0.5 / 0.15	Yellow
BCPC10001	100-1000 μl	1.5 / 0.8	0.4 / 0.15	Blue
BCPC50001	1000-5000 μl	1.2 / 0.6	0.3 / 0.15	Green
Multi, 8-channel				
BCPC108	0.5-10 μl	5 / 2	3.6 / 1	White
BCPC208	2-20 μl	5 / 2	3.6 / 1	Gray
BCPC508	5-50 μl	3.2 / 1.4	1.6 / 0.6	Red
BCPC1008	10-100 μl	2.5 / 1.3	1.2 / 0.5	Orange
BCPC2008	20-200 μl	1.8 / 1.2	0.8 / 0.4	Yellow
BCPC3008	30-300 μl	1.66 / 1.4	0.6 / 0.3	Black

* FDA establishment registered company. FDA listed products.

Cat No.	Description	Inaccuracy %	Imprecision %	Color Code
Single, 1-channel				
BCPE201BA	2-20 μl	1	0.3	Red
BCPE2001BA	10-200 μl	0.6	0.15	Yellow
BCPE10001BA	100-1000 μl	0.5	0.15	Blue
Multi, 8-channel				
BCPE208BA	2-20 μl	1	0.3	Red
BCPE2008BA	10-200 μl	0.6	0.15	Yellow
BCPE12008BA	100-1200 μl	0.5	0.15	Blue

* FDA establishment registered company. FDA listed products.

Model		Pipette Controller
Pipette range		0.1~100ml
Aspirating and dispensing speed		6ml/sec
Material	Body	UV-resistant ABS housing
	Filter	25 mm diameter, PTFE(external), Hydrophobic(internal), 0.2 μm ,
	Nose cone	Polypropylene
	Pipette holder	Silicon
Electrical requirement	Battery	600mAh / 3.6V (up to 12 hours of continuous use of Lithium battery)
	Power adapter	AC 100~240V, AC-DC 3.6V
Cat. No.	BCPPA100	

* FDA establishment registered company. FDA listed products.

Accessories & Options



Pipette tips



Volume controller knobs



Combi stands

Pipette Tips

- Variety of pipette tips
 - Standard tips, Low retention tips and Low retention filter tips.
- Filter tips eliminate opportunities for cross contamination.
 - No detectable nucleic acid contamination, no detectable PCR inhibitors, no detectable endonucleases, no detectable endotoxin, sterile.
- Superiority of low retention tips.
 - Low retention tips deliver volumes within 0.1 % of the set volume, versus 0.5-0.7% for standard tips.
- Cost saving reload system.
 - Unique reload system makes re-filling the racks easier than ever, and is designed to cut down on both cost and waste.

Cat. No.	Type	Size(μl)	Sterile	Packaging	Qty/Unit	Description
BCP5130010C	Standard tips	10	-	Bag	1000 Tips × 20	Clear
BCP5130070C		200	-	Bag	1000 Tips × 10	Clear
BCP5130100C		300	-	Bag	1000 Tips × 10	Clear
BCP5130130C		1000	-	Bag	1000 Tips × 5	Clear
BCP5130160C		5000	-	Bag	250 Tips × 10	Clear
BCP5130105C		300	-	Hinged racks	10x96 Tips × 5	-
BCP5130135C		1000	-	Hinged racks	16x60 Tips	-
BCP5130165C		5000	-	Racks	10x50 Tips	-
BCP5130110C		300	Pre-sterile	Hinged racks	10x96 Tips × 5	-
BCP5130140C		1000	Pre-sterile	Hinged racks	16x60 Tips	-
BCP5030010C	Low retention tips (without filter)	10	-	Bag	1000 Tips × 20	Clear
BCP5030070C		200	-	Bag	1000 Tips × 10	Clear
BCP5030015C		10	-	Hinged racks	10x96 Tips × 5	-
BCP5030075C		200	-	Hinged racks	10x96 Tips × 5	-
BCP5030020C		10	Pre-sterile	Hinged racks	10x96 Tips × 5	-
BCP5030080C		200	Pre-sterile	Hinged racks	10x96 Tips × 5	-
BCP5030035C		10	Pre-sterile	-	20x96 Tips × 4	Reload
BCP5030095C		200	Pre-sterile	-	10x96 Tips × 10	Reload
BCP5131030C	Low retention tips (with filter)	10	Pre-sterile	Bag	1000 Tips × 20	-
BCP5131062C		20	Pre-sterile	Bag	1000 Tips × 10	-
BCP5131066C		100	Pre-sterile	Bag	1000 Tips × 10	-
BCP5131090C		200	Pre-sterile	Bag	1000 Tips × 10	-
BCP5131150C		1000	Pre-sterile	Bag	1000 Tips × 10	-
BCP5030030C		10	Pre-sterile	Hinged racks	10x96 Tips × 5	-
BCP5030062C		20	Pre-sterile	Hinged racks	10x96 Tips × 5	-
BCP5030066C		100	Pre-sterile	Hinged racks	10x96 Tips × 5	-
BCP5030090C		200	Pre-sterile	Hinged racks	10x96 Tips	-
BCP5130150C		1000	Pre-sterile	Hinged racks	8x60 Tips × 10	-
BCP5130155C		1000	Pre-sterile	-	10x96 Tips × 5	Reload



Carousel stands



Wall holders



Stand for electronic pipettes

for Mechanical Pipettes

Cat. No.	Description	Models	
		Single	Multi
BCP2VZ	Variable volume controller knob for 0.2-2 μl pipettes	•	-
BCP10VZ	Variable volume controller knob for 0.5-10 μl pipettes	•	•
BCP20VZ	Variable volume controller knob for 2-20 μl pipettes	•	•
BCP50VZ	Variable volume controller knob for 5-50 μl pipettes	•	•
BCP100VZ	Variable volume controller knob for 10-100 μl pipettes	•	•
BCP200VZ	Variable volume controller knob for 20-200 μl pipettes	•	•
BCP1000VZ	Variable volume controller knob for 100-1000 μl pipettes	•	-
BCP5000VZ	Variable volume controller knob for 1000-5000 μl pipettes	•	-
BCP300VZ1	Variable volume controller knob, 30-200 μl , for 30-300 μl pipettes	-	•
BCP300VZ	Variable volume controller knob, 125-300 μl , for 30-300 μl pipettes	-	•
BCP02FE1	1 μl fixed volume controller knob for 0.2-2 μl pipettes	•	-
BCP02FE2	2 μl fixed volume controller knob for 0.2-2 μl pipettes	•	-
BCP10FE5	5 μl fixed volume controller knob for 0.5-10 μl pipettes	•	-
BCP10FE10	10 μl fixed volume controller knob for 0.5-10 μl pipettes	•	-
BCP20FE10	20 μl fixed volume controller knob for 2-20 μl pipettes	•	-
BCP20FE20	20 μl fixed volume controller knob for 2-20 μl pipettes	•	-
BCP50FE20	20 μl fixed volume controller knob for 5-50 μl pipettes	•	-
BCP50FE25	25 μl fixed volume controller knob for 5-50 μl pipettes	•	-
BCP50FE50	50 μl fixed volume controller knob for 5-50 μl pipettes	•	-
BCP100FE30	30 μl fixed volume controller knob for 10-100 μl pipettes	•	-
BCP100FE50	50 μl fixed volume controller knob for 10-100 μl pipettes	•	-
BCP100FE100	100 μl fixed volume controller knob for 10-100 μl pipettes	•	-
BCP200FE100	100 μl fixed volume controller knob for 20-200 μl pipettes	•	-
BCP200FE200	200 μl fixed volume controller knob for 20-200 μl pipettes	•	-
BCP1000FE500	500 μl fixed volume controller knob for 100-1000 μl pipettes	•	-
BCP1000FE1000	1000 μl fixed volume controller knob for 100-1000 μl pipettes	•	-
BCPC10001FT	Disposable filter for use with 100-1000 μl pipettes, bag w/ 50 pcs	•	-
BCPC50001FT	Disposable filter for use with Capp 1000-5000 μl pipettes, bag w/ 25 pcs	•	-
BCP003921	Block for 4 volume controllers	•	•
BCPC01	Combi stand (2 modules) for up to 3 mechanical pipettes	•	•
BCPS06	Carousel stand for up to 6 mechanical pipettes	•	•
BCPW1M	Wall holder for mechanical pipettes	•	•
BCP001691	Bench top stand for multichannel pipettes	-	•

for Electronic Pipettes

Cat. No.	Description	Models	
		Single	Multi
BCPESTAND	Stand for 3 units of electronic pipettes	•	•

Ultrasonic Cleaners

Aggressive cleaning ability in a variety of output modes!

Industrial B.L.T type ultrasonic transducer (Bolt Clamped Langevin Type Transducer) generates high-frequency sound waves that provide maximum cleaning power.



UCP-10

Standard accessories • Cover, Basket, Drain valve
(except for UCP-02)



UCS-20

Standard accessories • Cover, Basket, Drain valve

UCP models (ABS, Membrane key pad, and SUS tank)

- Durable / flame resistance ABS material used and cover with 304 stainless steel tanks.
- Over-temperature protection with alarm. (except for UCP-02)
- Digital LED display using splash-proof keypads: timer (1 to 99 min, Max 4 hour operating), temperature monitor. (except for UCP-02)
- High-frequency 40 kHz sound waves provide greater cleaning power and increased reliability.
- Multiple output mode (Normal/Pulse/Sweep) with power selection (Low/Middle/ High). (except for UCP-02)
- Before cleaning, dissolved gas removed by degas function. (except for UCP-02)
- Drain valve, basket, cover as standard offer. (except for UCP-02)



Model		UCP - 02	UCP - 10	UCP - 20
Bath volume (L / cu ft)		2 / 0.07	10 / 0.35	20 / 0.70
Temperature range (°C / °F)		-	Amb. to 70 / Amb. to 158	
Ultrasonic power (W)		100	300	500
Dimension	Bath interior (WxL, D) (mm / inch)	142×132, 104 / 5.6×5.2, 4.1	295×240, 160 / 11.6×9.4, 6.3	500×290, 160 / 19.7×11.4, 6.3
	Exterior (WxLxH) (mm / inch)	290×210×200 / 11.4×8.4×7.9	490×368×297 / 19.3×14.5×11.7	721×451×297 / 28.4×17.8×11.7
	Net weight (kg / lbs)	2 / 4.4	11 / 24.3	17 / 37.5
Electrical requirements (230V, 50 / 60Hz)		0.6A	1.3A	2.2A
Cat. No.		BDH532011K	BDH532012K	BDH532013K
Electrical requirements (120V, 60Hz)		1A	1.7A	4.2A
Cat. No.		BDH532011U	BDH532012U	BDH532013U

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UCS models (SUS external and tank)

- External and tank parts are made of durable 304 stainless steel.
- Over-temperature protection with alarm.
- Digital LED display using splash-proof keypads: timer (1 to 99 min, Max 4 hour operating), temperature monitor.
- High-frequency 40 kHz sound waves provide greater cleaning power and increased reliability.
- Multiple output mode(Normal/Pulse/Sweep) with power selection (Low/Middle/ High).
- Drain valve, basket, cover as standard offer.



Model		UCS-05	UCS-10	UCS-20
Bath volume (L / cu ft)		5.7 / 0.20	10 / 0.35	20 / 0.70
Temperature range (°C / °F)		Amb. to 70 / Amb. to 158		
Ultrasonic power (W)		200	300	500
Dimension	Bath interior (WxL, D) (mm / inch)	295×160, 160 / 11.6×6.3, 6.3	295×240, 160 / 11.6×9.4, 6.3	500×290, 160 / 19.7×11.4, 6.3
	Exterior (WxLxH) (mm / inch)	325×230×320 / 12.8×9.1×12.6	325×330×320 / 12.8×12.9×12.6	530×330×297 / 20.9×12.9×11.7
	Net weight (kg / lbs)	8 / 17.6	11 / 24.3	15 / 33.1
Electrical requirements (230V, 50 / 60Hz)		0.9A	1.3A	2.2A
Cat. No.		BDH532031K	BDH532032K	BDH532033K
Electrical requirements (120V, 50 / 60Hz)		1.7A	2.5A	4.2A
Cat. No.		BDH532031U	BDH532032U	BDH532033U

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Beakers

Disposable Beakers



- Disposable or autoclaved for reuse.
- Unbreakable with normal use.
- Molded with three special lips.
 - Dripless pouring high viscosity media.
 - Easily stacking and unstacking.
- Transparent polypropylene material for excellent clarity and high chemical resistance.
- Graduated with easy to read markings.
- Flat bottom for use with magnetic stirrer.

Model		Disposable Beakers			
Capacity (ml)		50	100	250	500
Graduation (ml)		5	5	10	20
Dimension (øxH, mm / inch)		45x55 / 1.8x2.2	56x69 / 2.2x2.7	77x92 / 3.0x3.6	96x116 / 3.8x4.6
Autoclavable		O (121 °C)			
Cat. No.	PP (polypropylene)	AAAM1001	AAAM1011	AAAM1021	AAAM1031

Plastic Beakers



PP Beakers

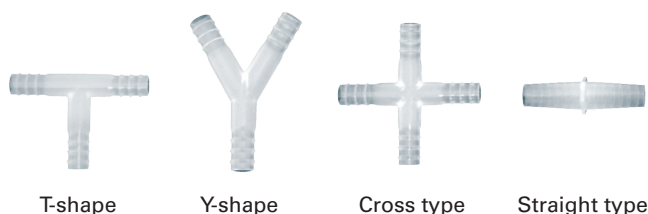


PMP Beakers

- Material selection between polypropylene and polymethylpentene.
- Autoclaved for reuse.
- Unbreakable with normal use. (ISO 7056)
- Easy stacking and unstacking.
- Excellent clarity and high chemical resistance.
- Graduated with easy to read markings.
- Flat bottom for use with magnetic stirrer.

Model		Plastic Beakers				
Capacity (ml)		100	250	500	1000	2000
Graduation (ml)		5	10	20	50	100
Dimension (øxH, mm / inch)		61x72 / 2.4x2.8	81x95 / 3.2x3.7	101x119 / 3.9x4.7	125x148 / 4.9x5.8	157x186 / 6.2x7.3
Autoclavable		O (121 °C for PP, 135 °C for PMP)				
Cat. No.	PP (polypropylene)	AAAM2011	AAAM2021	AAAM2031	AAAM2041	AAAM2051
	PMP (polymethylpentene)	AAAM3011	AAAM3021	AAAM3031	AAAM3041	AAAM3051

Tubing Connectors



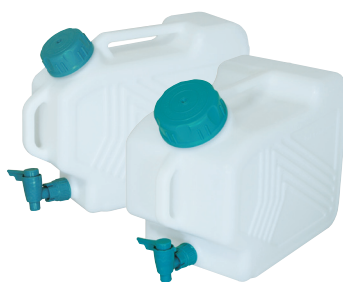
- Chemical resistant polypropylene.
- Autoclavable (121 °C)
- Barbed fitting on each side secures attachment of tubing.
- Four different types tubing connectors.
 - T-shape, Y-shape, Cross type, Straight type.
- Various sizes from 3.2mm to 12.7mm.

O.D. (mm)	O.D. (inch)	T-shape	Y-shape	Cross type	Straight type
3.2	1/8	AAAM5001	AAAM5071	AAAM5141	AAAM5211
4	5/32	AAAM5011	AAAM5081	AAAM5151	N/A
4.7	3/16	AAAM5021	AAAM5091	AAAM5161	AAAM5221
6	1/4	AAAM5031	AAAM5101	AAAM5171	AAAM5231
8	5/16	AAAM5041	AAAM5111	AAAM5181	N/A
9.5	3/8	AAAM5051	AAAM5121	AAAM5191	AAAM5241
12.7	1/2	AAAM5061	AAAM5131	AAAM5201	AAAM5251

Carboys



Round type (DBR-10 / DBR-20)



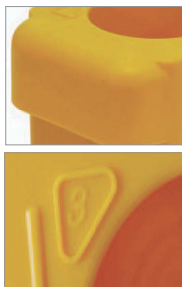
Rectangular type (DBC-05 / DBC-10)

- Great for storing and dispensing solutions.
- Sturdy carboys have a spigot which is molded in to the body for convenience and strength.
- Space-saving design for storing liquid solvent.
- HDPE container features durable and excellent chemical resistance.
- Spigot provides easy dispensing and leak resistance.
- The amount of liquid solvent is easily adjustable by spigot tap's angle.
- Molded in shoulder handles provide great convenience and strength.
- Gradations for easy checking.
 - DBR models : gradations on the side and front of the body are great for checking the volume of media at any side of view.
 - DBC models : gradations on the front and bottom for convenience of storing media even when you stand the carboy up.

Model	DBR-10	DBR-20	DBC-05	DBC-10
Description	Round type		Rectangular type	
Material (body / cap / spigot)	HDPE (High-density polyethylene)			
Volume (L / gal)	10 / 2.64	20 / 5.28	5 / 1.32	10 / 2.64
Tubing inner dia. (mm / inch)	15.9 / 5/8 (when used with provided spigot adapter : 6.35 to 7.94 / 1/4to 5/16)			
Filling inlet inner dia. (mm / inch)	73 / 2.9	74 / 2.9	49 / 1.9	ø 72 / 2.8
Dimension (WXDXH, mm / inch)	225 x 277 x 399 / 8.9 x 10.9 x 15.7	260 x 317 x 539 / 10.2 x 12.5 x 21.2	114 x 387 x 305 / 4.5 x 15.2 x 12	204 x 387 x 317 / 8 x 15.2 x 12.5
Net weight (kg / lbs)	1.5 / 3.3	2.1 / 4.6	1.4 / 3.1	1.8 / 4
Cat. No.	AAAJ3021	AAAJ3031	AAAJ3111	AAAJ3121

Flask Supports / Ice Pan / On-Ice Rack

Flask Supports



- It's concave recessed, secure, and safe multi-volume flask holder.
- Polypropylene body is chemically resistant to various organic solvents.
- Convenient grip for easy carrying
- Noticeable name tag for classification
- Able to hold ice Multi-purpose holder
- Heat Resistance: -30 °C to 121 °C

Model	FT 010 13	FT 010 34	FT 025 12	FT 025 23	FT 050 12	FT 100 12	FT 200 12
Capacity (ml)	100	100	250	250	500	1000	2000
Row x Column	1 x 3	3 x 4	1 x 2	2 x 3	1 x 2	1 x 2	1 x 2
Hole (Dia.xH) (mm / inch)	70x91 / 2.76x3.58	70x91 / 2.76x3.58	98x122 / 3.86x4.8	98x122 / 3.86x4.8	121x128 / 4.76x5.04	148x156 / 5.83x6.14	183x188 / 7.2x7.4
Dimension (WxDxH)(mm / inch)	310x100x100 / 12.2x3.94x3.94	384x265x98 / 15.12x10.43x3.86	280x125x130 / 11.02x4.92x5.12	389x239x130 / 15.31x9.41x5.12	360x146x135 / 14.17x5.75x5.31	415x192x165 / 16.34x7.56x6.5	503x223x199 / 19.8x8.78x7.83
Cat. No.	AAA23706	AAA23701	AAA23707	AAA23702	AAA23706	AAA23701	AAA23707

Ice Pan / On-Ice Rack



- Ice pan keeps bottles, test tubes, and temperature-sensitive samples cool for hours.
- Rigid one molded urethane foam construction provides high durability and excellent insulating properties.
- Water proof, leak proof, unbreakable with normal use.
- Rim enables safe handling and transport.
- Ice pan can be used with on-ice racks (optional) for higher heat transfer. Scratch-proof and high heat transfer aluminum rack with easy tube identification. (numbers carved into the rack)
- Heat resistance: -196 °C to 80 °C

Ice Pan

Model	IBS-310
Material	Urethane foam
Volume (L / cu ft)	4 / 0.14
Dimension (WxDxH) (mm / inch)	347x257x132 / 13.7x10.1x5.2
Net weight (kg / lbs)	1.4 / 3.1
Cat. No.	AAAJ2801

Optional Accessory - On-Ice Rack

Model	JCB-150
Material	Aluminum
Dimension (WxDxH, mm)	157.5 x 151.5 x 21.1
Max. mountable tube	1.5ml micro tube x 50ea 0.2ml micro tube x 64ea
Cat. No.	AAAJ2011



Conical Tube Racks



- Chemical resistance ABS racks and PC rack are available.
- Use each rack itself alone and also it is suitable for use with Microplate Shakers. (for ABS racks)
- Autoclavable (for PC rack)

Model	15ml Conical Tube Rack	50ml Conical Tube Rack	
Material	ABS (acrylonitrile-butadienestyrene)	ABS (acrylonitrile - butadienestyrene)	PC (polycarbonate)
Capacity (ml)	15	50	
Dimension (WxDxH) (mm / inch)	269x85x72 / 10.6x3.3x2.8	269x85x72 / 10.6x3.3x2.8	263x55x55 / 10.4x2.2x2.2
Max. mountable tube	30 (3 x 10)	12 (2 x 6)	6 (1 x 6)
Autoclavable	-	-	O
Cat. No.	CPS0011	CPS0012	AAAJ2211

Centrifuge Tube Rack



- Autoclavable and chemical resistance PC rack.
- Hold six 30 ml centrifuge tubes.

Model	30 ml Centrifuge Tube Rack
Material	PC (polycarbonate)
Capacity (ml)	30
Dimension (WxDxH) (mm / inch)	263x55x55, ø 25.7 / 10.4x2.2x2.2, ø 1.0
Max. mountable tube	6 (1 x 6)
Autoclavable	O
Cat. No.	AAAJ2111

Micro Tube Rack



- Autoclavable and chemical resistance PC rack.
- Included transparent cap has a recessed area allowing stacking.
- Use each rack itself alone and also it is suitable for use with Microplate Shakers.
- Hold eighty 1.5/2.0 ml micro tubes on one side or eighty 1.2/0.5 ml micro tubes on the other.

Model	Micro Tube Rack with Cap
Material	PC (polycarbonate)
Capacity (ml)	1.5/2.0, 0.5/1.2 on each side
Dimension (WxDxH) (mm / inch)	269x90x50 (cap included) / 10.6x3.5x2.0
Max. mountable tube	80 (5x16), each side
Autoclavable	O
Cat. No.	AAAJ2311

Cryo Boxes / Storage Boxes

Cryo Boxes



- Designed for ultra-low temperature storage of biological materials.
- Ideal for use in mechanical freezers and liquid nitrogen tanks.
- Autoclavable and polycarbonate chemical resistance materials.
- Rack can be disassembled from the tray for easy maintenance. (for CRB-81S/T)
- Storage inside of the liquid nitrogen tank is available.
- Transparent lid with alphanumeric inscription is beneficial for clear sample's monitoring and easy sample arrangement.
- Heat Resistance : -196 °C to 121 °C

Model	CRB-25	CRB-81S	CRB-81T
Material	PC (polycarbonate)		
Tube size (ml)	1.2 to 2.0	1.2 to 2.0	5
Max. mountable tube	25 (5×5)	81 (9×9)	81 (9×9)
Dimension (W×D×H) (mm / inch)	77×77×53 / 3.0×3.0×2.1	132×132×54 / 5.2×5.2×2.1	132×132×96 / 5.2×5.2×3.8
Cat. No.	AAAJ7001	AAAJ7002	AAAJ7003

※ 5ea for 1 set.

Storage Boxes



- Suitable for storage of samples in general conditions.
- Autoclavable and polypropylene chemical resistance materials.
- Transparent lid with locking clasp keeps samples secure while offering a clear view of samples.
- Each groove on the bottom assists settling each tube stable and tight inside of the body.
- Alphanumeric grid on the lid for easy handling and identifying samples.
- Heat Resistance: -20 °C to 121 °C

Model	SRB-100
Material	PP (Polypropylene)
Tube size (ml)	1.2 to 2.0
Max. mountable tube	100 (10×10)
Dimension (W×D×H) (mm / inch)	140×140×53 / 5.5×5.5×2.1
Cat. No.	AAAJ7011

※ 5ea for 1 set.

Clamp Holders



C-20



C-10



C-7



C-5

- Clamp holders are ideal for use with overhead stirrers and hotplate stirrers.
- Adjustable to fit support rods up to 5/8" in. diameter.
- Lightweight, also selectable aluminum or polypropylene clamp holders.
- One-molded knob with fixing screw for strong support
- Nonskid contact surface tightens stand rod stably.
- C-20, C-10 for overhead stirrers and C-10, C-7, C-5 for hotplate stirrers.

Model	C-20	C-10	C-7	C-5
Max. dia. (Ø, mm)	27	17	12	12
Opening dia. (Ø, mm)	20	15	-	-
Material (body / knob / bolt)	Aluminum / Polypropylene / Stainless steel			Polypropylene
Cat. No.	AAA37511	AAA37512	AAA37513	AAA37514

Magnetic Drives



- Magnetic drives are designed for agitating a fully vacuumed flask. Multi-functional easy to replace impeller.
- Use of rare-earth elements which is Neodymium (Nd), Samarium (Sm-Co) magnet.
- High-speed rpm, vibration free.
- Specifically designed with permanent magnets which has a dynamic torque rating.
- Small size and powerful rotating magnetic drive is useful both for laboratory and manufacturing applications.

Application of magnetic drive

Model		MD-T6-24	MD-T6-29	MD-T6-34
Ground joint		24 / 40	29 / 42	34 / 45
Material	Body / Housing	SUS316L / CR-PLATE		
	Bushing / Seal	PTFE / Viton		
Driving	Vacuum	Max. 1×10-4 mmHg		
	Pressure	Max. 5kg / cm2		
	Temp	Max. 70℃ (without cooling), Max. 300℃ (with cooling)		
Shaft dia. (Ø, mm / inch)		8 / 5/16		
Cooling in/out dia. (Ø, mm / inch)		3.2 / 1/8		
Dimension (Ø×L, mm / inch)		50×200 / 2×7.9		
Net weight (kg / lbs)		1.02 / 2.25	1.04 / 2.29	1.08 / 2.38
Cat. No.		BEA511001	BEA511002	BEA511003

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· **Lab Companion U.S.A**

19 Alexander Road, Unit #7. Billerica, MA 01821-5094, U.S.A.
Tel +1 781 376 0700 Fax +1 781 376 0704 e-mail info@jeiotech.com

· **Lab Companion CHINA**

B-705, Jingting Bldg. No.1000 Hongquan Rd, Minhang district, Shanghai, P.R.
201103 China
Tel +86 21 5108 9161 Fax +86 21 5168 5414 e-mail jack@jeiotech.com

· **Lab Companion Korea - International head office**

#1005, 219 (Byucksan Digital Valley 6-cha) Gasan digital 1-ro, Geumcheon-Gu,
Seoul 153-704, Korea
Tel +82 2 2627 3816 Fax +82 2 3143 1824 e-mail overseas@jeiotech.com

· **Lab Companion SEA - South East Asia**

No.57-59, Jalan Adenium 2G/6, Pusat Perniagaan Adenium, 48300 Bandar Bukit Beruntung,
Selangor Darul Ehsan, Malaysia
Tel +603 6021 6880 Fax +603 6021 7880 e-mail labcompsea@gmail.com

· **Lab Companion EUROPE**

Unit 3, Tower Business Park, Warpsgrove Lane, Chalgrove, Oxfordshire, OX44 7XZ,
United Kingdom
Tel +44 1865 400321 Fax +44 1865 400736 e-mail labcompanion@medlinescientific.com