

# Heating & Cooling Chamber



Satisfaction with the requirements of European regulations and guidelines.



Real-time equipment monitoring and control system using mobile app.



Eco-friendly product that has passed environmental impact assessment tests.



More precise temperature control through temperature calibration.



Electronic over temperature protection system.



Conventional over temperature protection, a kind of backup device against electronic over temperature protection failure.



Over temperature protection function.



Control of temperature / humidity / RPM / time, etc. through dedicated program.



PC communication via RS-232 / RS-485 / USB port.



It memorizes the state of power failure and operates automatically when power is restored.



2 year warranty Free A/S.

## General Application

Reliability, Climate/freezing, Quality assurance, Thermal resistance testing.

- Electrical and electronic components, Sensor.
- The machinery / Military / Aircraft equipment.
- Construction materials / Plastics / Textile industries.
- Metal industries such as metallurgy.
- Semiconductor, PCB, LCD&LED.
- Chemical / Oil industry.
- Automotive industry.
- Pharmaceutical industry.

Description		Temp. Range (°C / °F)	Airflow	Volume (L)	Model	Page
Small type	<b>Tabletop type</b> <ul style="list-style-type: none"> <li>• Compact design</li> <li>• Excellent insulation and sealing structure</li> </ul>	-40 to 150 / -40 to 302	Vertical airflow	25, 65, 100 /0.9, 2.3, 3.5	TC3-KE	304
		-20 to 150 / -4 to 302	Vertical airflow	25, 65, 100 /0.9, 2.3, 3.5	TC3-ME	304
Medium large size type	<b>Ultra low temp. type</b> (-70°C) <ul style="list-style-type: none"> <li>• Verification completed according to foreign standards</li> <li>• Convenient safety system configuration</li> </ul>	-70 to 180 / -94 to 356	Horizontal airflow	125, 253, 420, 720, 1000 / 4.4, 8.9, 14.8, 25.4, 35.3	KB	308
	<b>Low temp. and horizontal type</b> (-40°C) <ul style="list-style-type: none"> <li>• 27 points temperature verification completed</li> <li>• High-load samples are available</li> </ul>	-40 to 180 / -40 to 356	Horizontal airflow	125, 253, 420, 720, 1000 / 4.4, 8.9, 14.8, 25.4, 35.3	KM	312
	<b>Low temp. and vertical type</b> (-40°C) <ul style="list-style-type: none"> <li>• Vertical airflow model series</li> <li>• Provide good permeable shelves</li> </ul>	-40 to 180 / -40 to 356	Vertical airflow	125, 253, 420, 720, 990 / 4.4, 8.9, 14.8, 25.4, 35.0	JM	316
	<b>Low temp. type</b> (-20°C) <ul style="list-style-type: none"> <li>• Excellent durability and performance</li> <li>• Dual overheating temperature limiter</li> </ul>	-25 to 100 / -13 to 212	Horizontal airflow	125, 250, 400, 700, 1000 / 4.4, 8.8, 14.1, 24.7, 35.3	PB	320
	<b>Ambient temperature type</b> <ul style="list-style-type: none"> <li>• Stable temperature control</li> <li>• Offering a variety of options</li> </ul>	-5 to 100 / 23 to 212	Horizontal airflow	125, 250, 400, 700, 1000 / 4.4, 8.8, 14.1, 24.7, 35.3	PM	324
General type	<b>Compact design</b> <ul style="list-style-type: none"> <li>• Space-saving vertical structure.</li> <li>• Includes Dual model. (2-in-1)</li> </ul>	-20 to 100 / -4 to 212	Horizontal airflow	150, 255, 485, 150 x 2 chamber / 5.3, 9.0, 17.1, 17.1 x 2 chamber	LCH	328
		0 to 100 / 32 to 212	Horizontal airflow	150, 255, 485, 150 x 2 chamber / 5.3, 9.0, 17.1, 17.1 x 2 chamber	LCH-G	328

※ The contents of the above and the contents of this catalog may differ depending on the specific model and conditions of use. For the information about the features and specifications that applying to each models, please check the information on the corresponding page of each models.

# Heating & Cooling Chamber



## Heating & Cooling Chamber

### Proven reliability and reproducibility Continuous innovative model

› **Completion of verification according to strict international standards**

Increase in reliability of accurate temperature implementation and test results (27 point measurement data) according to DIN 12880 and IEC 60068.

› **Complete chamber structure**

Includes double-packing door.  
Stable temperature control with excellent insulation and sealing.

› **Steady and uniform airflow formation**

Air flow optimized for uniform heat transfer ensures stable overall temperature distribution.

› **Height-adjustable and strong shelf**

Durable wire-shaped shelves provided as standard can be placed at different height.

### Powerful & Useful control Optimized precision control

› **Dedicated controller to operate temperature.**

Temperature Auto-tuning function.  
Highly-reliable control through calibration.

› **Powerful program operation**

Provides diverse program operation environment with a maximum of 100 patterns and 6000 segments.

› **Sophisticated custom control**

Auto-tuning by subdivided PID zone for more precise control stability.

› **Multi-functional dedicated software**

Up to 32 devices can be controlled at same time.  
Device operation and data processing function supported.



Normal Abnormal  
Easy to understand running status with LED display showing the operation condition.



Electronic over temperature protection system.



Controller for temperature. (TC3-model)



## Maximized usability with simple and useful functions

### > Easy test status checking

Convenient internal observation with LED lamp and looking glass window.  
Figures out the operation state through displaying LED even a long distance.

### > Door lock with key lock

Door structure having well-sealed.  
Included Key lock features as standard.

### > Cable port provided as standard

50 mm diameter cable port and silicone plug are provided as standard for convenient testing.

### > Convenient moving and installation

Easy to move and install with casters.

## More convenient and safe structure applied the top-grade grade safety system

### > Electronic over temperature shutdown system

Independent precision temperature sensor and controller.  
Provides more secure and reliable over temperature shutdown.

### > General-type over temperature shutdown system

Backup device for electronic system failure.  
Implementation of over-temperature shutdown even for electronic errors.

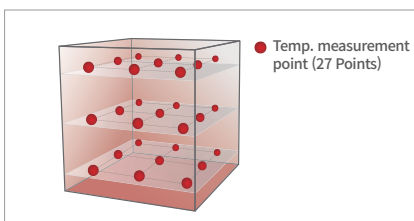
### > Self-protection system

Protection system as like water tank shortage, door open warning, etc.  
Over-current and short-circuit breaking device.

### > Protection features for refrigeration system

Protection system for overload and over temperature on refrigerator.  
Stops automatically in case refrigerant pressure (high/low pressure) is abnormal.

※ Some of the above contents are limited to specific models



● Temp. measurement point (27 Points)

27 Points temperature verification completed.



Dedicated stand with drawer and load space. (TC3-PE, KE)



Viewing Window as standard.

# Heating & Cooling Chamber

## Tabletop type

Compact temperature test chamber by continuing technological innovation

- TC3-KE (-40°C)
- TC3-ME (-20°C)

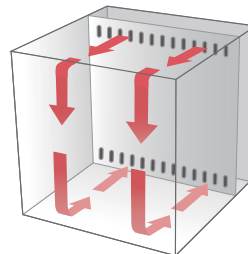


**TC3-KE**

with 2EA wire shelves (standard)  
Stand (option)



**TC3-ME**



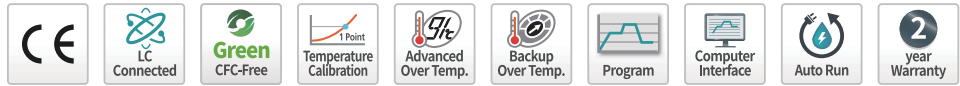
### Optimized Model Configuration

- 2 series (KE, ME) according to temperature control range.  
TC3-KE ; -40 ~ 150°C  
TC3-ME ; -20 ~ 150°C
- Standard type heating & cooling chamber for selecting the optimized model according to test conditions.
- Dedicated stand for convenient use and moving. (option)
- Recorder for maintaining test records. (option)

### Structural Functional Features

- Proven reproducibility and reliability with structural design optimized for miniaturization.
- Compact design for excellent space saving.
- Excellent thermal insulation and sealing to ensure stable temperature reproducibility even for repeated test use.
- The door part has a double sealing structure and excellent airtightness.





## Use Convenience Features

- Convenient operation with 5.6 inch color touch display controller.
- Easy observation of samples with tempered glass door with built in heating wire and LED lamp.
- By displaying the operation status of the device with LED colors, convenient to identify chambers status from a far.
- The cable port(ø 50 mm) included as standard make it convenient to connect external equipment.
- The door structure can be easily opened or closed.
- Door handle with built-in key lock.
- Identification of the control and operating conditions at the front of the product.
- Design by stainless steel internal chamber made of stainless steel provide clean maintenance and excellent corrosion resistance.
- Easy to clean as it is easy to remove refrigerator condenser grill, making it convenient to maintain efficiency of refrigeration.
- Equipped with easy-to-move/install caster.



Viewing window



Indicator LED of product condition.

## Multifunction Control System

- Highly-reliable control through calibration.
- Auto-tuning by subdivided PID zone for more precise control stability.
- RS-232 port (default) and RS-485 port (option) supported.
- Control and data processing by connecting up to 32 devices to PC at same time via RS-485 port.
- Convenient checking with useful graph display.



Cable port



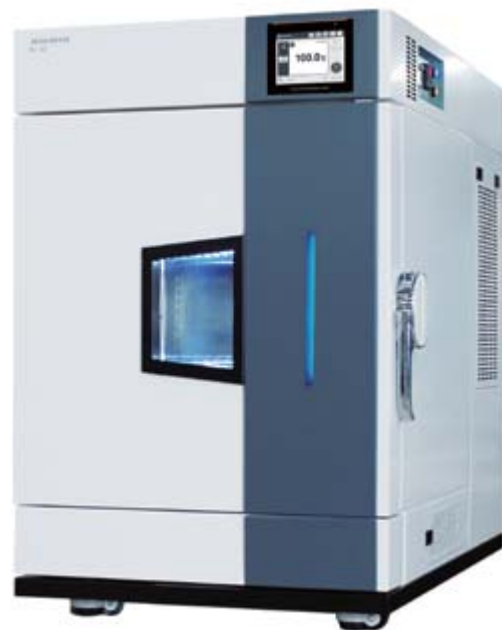
Door handles & Locking device

Description	No.
Pattern	100
Repeat time	999
Part repeat time	255
Max. segments / pattern	100
Available max. segments	2000
Programmable process time / segment	99 hour 59 min.

\* It is possible to set 100 segments per pattern, but the maximum number of segments is not 10,000 (100 pattern x 100 segment) but 2,000.

## **▮ Outstanding Safety**

- Electronic over temperature protection system.  
(A-OT, advanced over temperature limiter)  
Independent precision temperature sensor and controller for safer and more accurate over temperature shutdown.
- Conventional over-temperature protection.  
(B-OT, backup over temperature limiter)  
A backup device for electronic system failure, mechanically preventing over temperature even when it occurs electronic errors.
- Door open warning and automatic shut off.
- Over-current and short circuit protection of device.
- Each heater has fuse for more being safe use
- Automatic stop when operating current of refrigerator is overloaded.
- Automatic stop in case of over temperature of the compressor.
- Auto shut off in case refrigerant pressure (high/low pressure) is abnormal.



## Specification

Model		TC3-KE-025	TC3-KE-065	TC3-KE-100	TC3-ME-025	TC3-ME-065	TC3-ME-100
<b>Temperature data</b>							
Range (°C / °F)		-40 to 150 / -40 to 302	-40 to 150 / -40 to 302	-40 to 150 / -40 to 302	-20 to 150 / -4 to 302	-20 to 150 / -4 to 302	-20 to 150 / -4 to 302
Fluctuation (±°C / °F) <sup>1)</sup>		0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54
Variation (±°C / °F) <sup>2)</sup>		0.5 / 0.9	0.5 / 0.9	0.5 / 0.9	0.5 / 0.9	0.5 / 0.9	0.5 / 0.9
Heating time <sup>3)</sup>		60	60	60	50	50	50
Cooling time <sup>4)</sup>		70	70	70	55	55	55
<b>Interior dimensions</b>							
Chamber volume (L / cu ft)		25 / 0.88	65 / 2.3	100 / 3.53	25 / 0.88	65 / 2.3	100 / 3.53
Width (mm / inch)		350 / 13.8	400 / 15.7	500 / 19.7	350 / 13.8	400 / 15.7	500 / 19.7
Depth (mm / inch)		220 / 8.7	330 / 13	380 / 15	220 / 8.7	330 / 13	380 / 15
Height (mm / inch)		350 / 13.8	495 / 19.5	530 / 20.9	350 / 13.8	495 / 19.5	530 / 20.9
Quantity of shelves (standard/max.)		2/7	2/10	2/10	2/7	2/10	2/10
Distance of between shelves (mm / inch)		20 / 0.8	20 / 0.8	20 / 0.8	20 / 0.8	20 / 0.8	20 / 0.8
Max. load per shelf (kg / lbs)		25 / 55.1	25 / 55.1	25 / 55.1	25 / 55.1	25 / 55.1	25 / 55.1
Permitted total load (kg / lbs)		65 / 143.3	65 / 143.3	65 / 143.3	65 / 143.3	65 / 143.3	65 / 143.3
Cable port (∅, mm / inch)		50 / 2	50 / 2	50 / 2	50 / 2	50 / 2	50 / 2
Weight (kg / lbs)		110 / 242.5	140 / 308.6	150 / 330.7	80 / 176.4	110 / 242.5	130 / 286.6
<b>Electrical requirements</b>	AC230V, 1ph, 60Hz	7.4A	8.8A	10.8A	5.3A	6.1A	6.8A
	<b>Cat. No.</b>	<b>AAH861131K</b>	<b>AAH861231K</b>	<b>AAH861331K</b>	<b>AAH860131K</b>	<b>AAH860231K</b>	<b>AAH860331K</b>
	AC230V, 1ph, 50Hz	7.4A	8.8A	10.8A	5.3A	6.1A	6.8A
	<b>Cat. No.</b>	<b>AAH861132K</b>	<b>AAH861232K</b>	<b>AAH861332K</b>	<b>AAH860132K</b>	<b>AAH860232K</b>	<b>AAH860332K</b>

※ The above specifications are tested according to DIN 12880 and IEC 60068 standards.

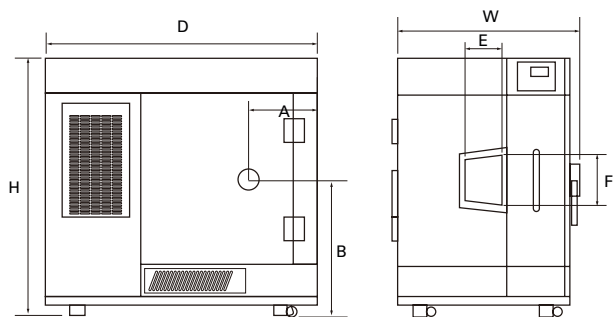
※ Permissible environmental conditions are 18 - 30°C (recommended 20°C), 85% RH or less, under 2000m above sea level.

1) The set value is set under the conditions of 100°C.

2) The set value is set under the conditions of 25°C.

3) TC3-KE : -40°C to 100°C(-40°F to 212°F), TC3-ME : -20°C to 100°C(-4°F to 212°F)

4) TC3-KE : 20°C to -40°C(68°F to -40°F), TC3-ME : 20°C to -20°C(68°F to -4°F)



## Dimension

Model	TC3-KE-025	TC3-KE-065	TC3-KE-100	TC3-ME-025	TC3-ME-065	TC3-ME-100
<b>W (mm / inch)</b>	550 / 21.7	600 / 23.6	700 / 27.6	550 / 21.7	600 / 23.6	700 / 27.6
<b>D (mm / inch)</b>	680 / 26.8	1050 / 41.3	1110 / 43.7	680 / 26.8	1050 / 41.3	1110 / 43.7
<b>H (mm / inch)</b>	915 / 36	1060 / 41.7	1100 / 43.3	915 / 36	1060 / 41.7	1100 / 43.3
<b>A (mm / inch)</b>	211 / 8.3	276 / 10.9	276 / 10.9	211 / 8.3	276 / 10.9	276 / 10.9
<b>B (mm / inch)</b>	495 / 19.5	580 / 22.8	580 / 22.8	495 / 19.5	580 / 22.8	580 / 22.8
<b>E (mm / inch)</b>	170 / 6.7	170 / 6.7	170 / 6.7	170 / 6.7	170 / 6.7	170 / 6.7
<b>F (mm / inch)</b>	229 / 9	229 / 9	229 / 9	229 / 9	229 / 9	229 / 9

## Accessories Page 330

Cable Port, Shelves, Signal Lamp, Recorder, Stand



# Heating & Cooling Chamber

## Ultra low temperature type (-70°C), horizontal air flow

Wide range of temperature control from -70 to 180°C

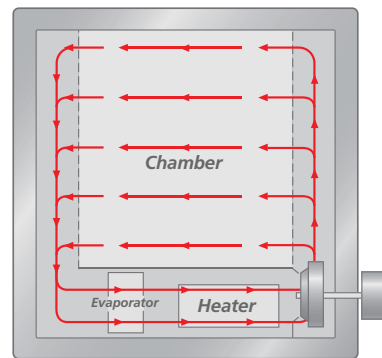


### KBD-040

with 2EA wire shelves (standard), Recorder, Signal Lamp (option)

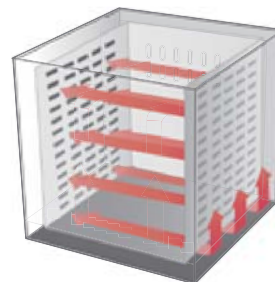
### Completion of Temperature Verification According to Strict International Standard

- Temperature verification in accordance with DIN 12880 and IEC 60068-3-5 provides excellent reliability and reproducibility.
- Provided specification the fluctuation and gradient in typical temperature point.
- Provided heating / cooling time data to help select the right model for testing purposes.
- Tested recovery time in accordance with specifications to provide data that is useful for real-use.



### Structural Functional Features

- Chamber structure with excellent sealing and insulation provides a stable long-term test and reduce costs by minimizing energy loss.
- According to international standards, even when operated at upper temperature, the surface temperature does not exceed 51°C. (EN 563 standard)
- Door consists of a double-sealed structure to satisfy DIN 58371. (door airtight guidance)
- Durability even after long-term repeated use has been verified by satisfying the door load test (SEFA standard).
- Door structure is a two-point hang structure, building more stable seal with less force.





## Optimized Dedicated Control System

- 5.7-inch color touch display controller.
- Intuitive screen configuration for easy and convenient control.
- Graph display makes it easier to check operation.
- PID zone subdivided into 4 zones for more precise control stability.
- RS-232 port (default) and RS-485 port (option) supported.
- Control and data processing by connecting up to 32 devices to PC at same time via RS-485 port.
- Includes software for PC control.
- Saving data, convenient for reporting.

## Use Convenience Features

- Convenient opening and closing door with either side latches.
- Door handle with built-in key lock.
- Identification of the control and operating conditions at the front of the product.
- Design by stainless steel internal chamber provide clean maintenance and excellent corrosion resistance.
- Easy to clean as it is easy to remove refrigerator condenser grill, making it convenient to maintain efficiency of refrigeration.
- Equipped with easy-to-move/install caster.
- Perforated shelf for heavy-load sample. (option)
- Convenient and various options such as signal lamps, cable port, air cycle rate, gas purge, etc.

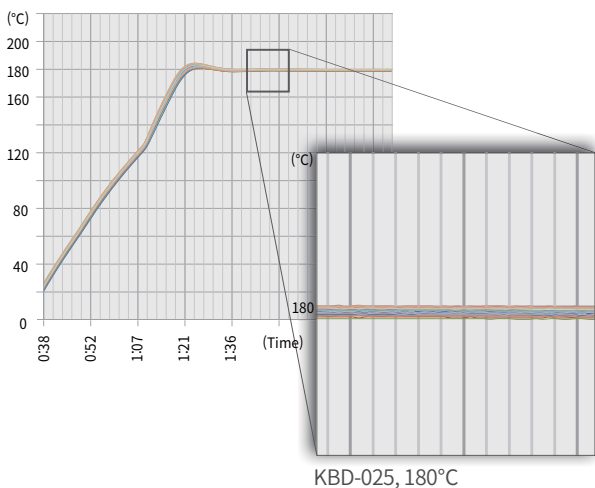
Description	No.
Pattern	100
Repeat time	999
Part repeat time	255
Max. segments / pattern	100
Available max. segments	6000
Programmable process time / segment	99 hr. 59 min.

\* It is possible to set 100 segments per pattern, but the maximum number of segments is not 10,000 (100 pattern x 100 segment) but 6,000.

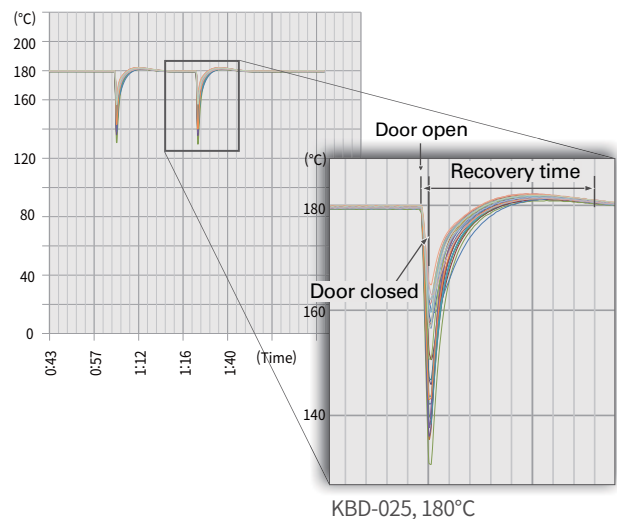
## Outstanding Safety

- Electronic over temperature protection system. (A-OT, advanced over temperature limiter)  
Independent precision temperature sensor and controller for safer and more accurate over temperature shutdown.
- Conventional over-temperature protection (B-OT, backup over temperature limiter)  
A backup device for electronic system failure, mechanically preventing over temperature even when it occurs electronic errors.
- Door open warning and automatic shut off.
- Emergency stop button on the front of the product.
- Over-current and short circuit protection of device.
- When main power connections, users can quickly respond by notifying of electric phase sequence errors.
- Electrical instrumentation access warning and system shutdown.
- Each heater by fuse for more safety using.
- Auto stop when operating current of refrigerator is overloaded.
- Automatic stop in case of over temperature of the compressor.
- Auto shut off in case refrigerant pressure (high/low pressure) is abnormal.

### Temperature Fluctuation



### Recovery Time After Door Opening



## Specification

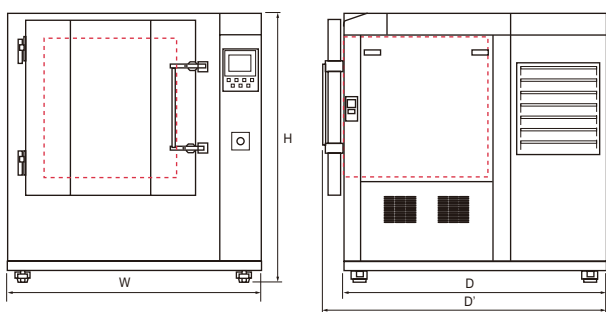
Model	KBD-012	KBD-025	KBD-040	KBD-070	KBD-100
<b>Temperature data</b>					
Range (°C / °F)	-70 to 180 / -94 to 356	-70 to 180 / -94 to 356	-70 to 180 / -94 to 356	-70 to 180 / -94 to 356	-70 to 180 / -94 to 356
<b>Fluctuation (±°C / °F)<sup>1), 2)</sup></b>					
at -70°C	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36
at -50°C	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36
at -25°C	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36
at -10°C	0.2 / 0.36	0.2 / 0.36	0.3 / 0.54	0.2 / 0.36	0.2 / 0.36
at 25°C	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36
at 70°C	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36
at 100°C	0.2 / 0.36	0.2 / 0.36	0.3 / 0.54	0.2 / 0.36	0.2 / 0.36
at 150°C	0.2 / 0.36	0.3 / 0.54	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36
at 180°C	0.3 / 0.54	0.3 / 0.54	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36
<b>Gradient (±°C / °F)<sup>1)</sup></b>					
at -70°C	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.2 / 0.36	0.2 / 0.36
at -50°C	0.4 / 0.72	0.5 / 0.9	0.4 / 0.72	0.3 / 0.54	0.3 / 0.54
at -25°C	0.4 / 0.72	0.4 / 0.72	0.4 / 0.72	0.3 / 0.54	0.3 / 0.54
at -10°C	0.5 / 0.9	0.4 / 0.72	0.5 / 0.9	0.4 / 0.72	0.4 / 0.72
at 25°C	0.5 / 0.9	0.4 / 0.72	0.4 / 0.72	0.4 / 0.72	0.4 / 0.72
at 70°C	0.6 / 1.08	0.7 / 1.26	0.6 / 1.08	0.7 / 1.26	0.7 / 1.26
at 100°C	1 / 1.8	1 / 1.8	1 / 1.8	0.9 / 1.62	0.9 / 1.62
at 150°C	1 / 1.8	1.1 / 1.98	1 / 1.8	0.8 / 1.44	0.8 / 1.44
at 180°C	1.2 / 2.16	1.2 / 2.16	1.1 / 1.98	1 / 1.8	1 / 1.8
<b>Heating time (min)<sup>2)</sup></b>					
from -70°C to 25°C	26	28	30	30	31
from -50°C to 25°C	23	23	24	25	27
from -25°C to 25°C	15	15	16	17	18
from -10°C to 25°C	11	10	11	13	13
from 25°C to 70°C	13	13	14	14	16
from 25°C to 100°C	26	25	25	26	27
from 25°C to 150°C	41	40	38	42	44
from 25°C to 180°C	54	53	55	56	58
from -50°C to 180°C	69	68	68	72	75
from -50°C to 120°C	55	56	56	61	62
from -25°C to 120°C	47	48	48	53	55
from -50°C to 5°C	18	17	18	21	21
from -70°C to 5°C	25	25	25	28	28
from 5°C to 125°C	43	42	45	47	48
from 125°C to 180°C	18	17	18	22	23
<b>Cooling time (min)<sup>2)</sup></b>					
from 25°C to -70°C	75	75	77	74	73
from 25°C to -40°C	33	33	32	30	32
from 25°C to -25°C	22	22	20	20	21
from 25°C to -10°C	17	17	14	13	15
from 70°C to 25°C	23	20	23	20	22
from 100°C to 25°C	34	35	35	32	31
from 120°C to -50°C	83	80	81	80	80
from 5°C to -40°C	23	23	23	23	23
from 5°C to -70°C	67	72	72	70	70
<b>Recovery time after door was opened for 30sec.(min.)<sup>2)</sup></b>					
at -70°C	12	12	13	9	10
at -50°C	8	8	8	6	6
at -25°C	6	6	6	5	5
at -10°C	5	5	6	5	5
at 70°C	6	6	6	6	6
at 100°C	5	5	5	6	6
at 150°C	7	7	10	10	10
at 180°C	7	8	10	10	10
<b>Ordering information</b>					
Electrical requirement (380V/50Hz/3P, A)	10A	12A	18A	29A	29A
<b>Cat. No.</b>	<b>AAHKC1114K</b>	<b>AAHKC2114K</b>	<b>AAHKC3114K</b>	<b>AAHKC4114K</b>	<b>AAHKC5114K</b>

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.



## Dimension

Model	KBD-012	KBD-025	KBD-040	KBD-070	KBD-100
<b>Interior dimensions</b>					
Chamber volume (L / cu ft)	125 / 4.41	253 / 8.93	420 / 14.83	720 / 25.43	1000 / 35.31
Width (mm / inch)	500 / 19.7	600 / 23.6	750 / 29.5	900 / 35.4	1000 / 39.4
Depth (mm / inch)	500 / 19.7	650 / 25.6	700 / 27.6	800 / 31.5	910 / 35.8
Height (mm / inch)	500 / 19.7	650 / 25.6	800 / 31.5	1000 / 39.4	1100 / 43.3
Quantity of shelves (standard/max.)	2 / 6	2 / 9	2 / 11	2 / 15	2 / 16
Distance of between shelves (mm / inch)	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2	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
<b>Exterior dimensions</b>					
Width (mm / inch), W	1114 / 43.9	1240 / 48.8	1424 / 56.1	1575 / 62	1675 / 65.9
Depth / with handle (mm - inch), D/D'	1327 / 1360 - 52.2 / 53.5	1492 / 1525 - 58.7 / 60	1567 / 1600 - 61.7 / 63	1777 / 1810 - 70 / 71.3	1887 / 1920 - 74.3 / 75.6
Height (mm / inch), H	1208 / 47.6	1308 / 51.5	1509 / 59.4	1819 / 71.6	1919 / 75.6
Weight (kg / lbs)	170 / 374.8	260 / 573.2	320 / 705.5	390 / 859.8	440 / 970

## Accessories Page 330

Cable Port, Shelves, Signal Lamp, Recorder, Gas Purge System

# Heating & Cooling Chamber

## Low temperature type (-40°C), horizontal air flow

### Horizontal airflow and -40 to 180°C temperature range

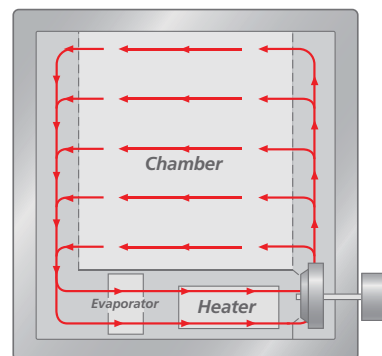


#### KMV-040

with 2EA wire shelves (standard), Recorder, Signal lamp (option)

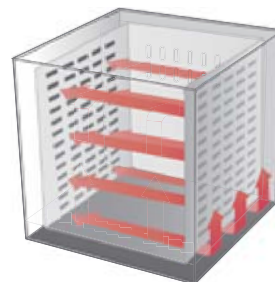
#### Completion of Temperature Verification According to Strict International Standard

- Temperature verification in accordance with DIN 12880 and IEC 60068-3-5 provides excellent reliability and reproducibility.
- Provided specification the fluctuation and gradient in typical temperature point.
- Provided heating / cooling time data to help select the right model for testing purposes.
- Tested recovery time in accordance with specifications to provide data that is useful for real-use.



#### Structural Functional Features

- Chamber structure with excellent sealing and insulation provides a stable long-term test and reduce costs by minimizing energy loss.
- According to international standards, even when operated at upper temperature, the surface temperature does not exceed 51°C. (EN 563 standard)
- Door consists of a double-sealed structure to satisfy DIN 58371. (door airtight guidance)
- Durability even after long-term repeated use has been verified by satisfying the door load test. (SEFA standard)
- Door structure is a two-point hang structure, building more stable seal with less force.







## Optimized Dedicated Control System

- 3.7-inch color touch display controller.
- Intuitive screen configuration for easy and convenient control.
- Graph display makes it easier to check operation.
- PID zone subdivided into 4 zones for more precise control stability.
- RS-232 port (default) and RS-485 port (option) supported.
- Control and data processing by connecting up to 32 devices to PC at same time via RS-485 port.
- Includes software for PC control.
- Saving data, convenient for reporting.

## Use Convenience Features

- Convenient opening and closing door with either side latches.
- Door handle with built-in key lock.
- Identification of the control and operating conditions at the front of the product.
- Design by stainless steel internal chamber provide clean maintenance and excellent corrosion resistance.
- Easy to clean as it is easy to remove refrigerator condenser grill, making it convenient to maintain efficiency of refrigeration.
- Equipped with easy-to-move/install caster.
- Perforated shelf for heavy-load sample. (option)
- Convenient and various options such as signal lamps, cable port, air cycle rate, gas purge, etc.

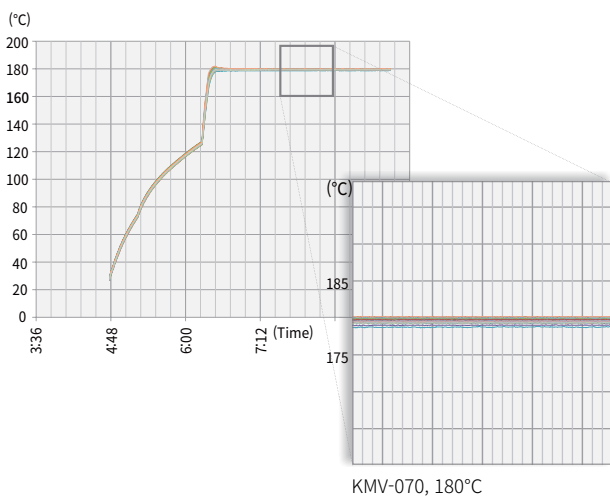
Description	No.
Pattern	100
Repeat time	999
Part repeat time	255
Max. segments / pattern	100
Available max. segments	2000
Programmable process time / segment	99 hr. 59 min.

\* It is possible to set 100 segments per pattern, but the maximum number of segments is not 10,000 (100 pattern x 100 segment) but 2,000.

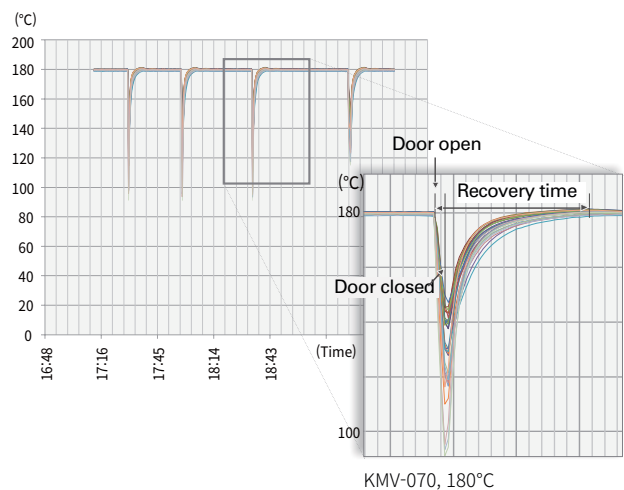
## Outstanding Safety

- Electronic over temperature protection system. (A-OT, advanced over temperature limiter)  
Independent precision temperature sensor and controller for safer and more accurate over temperature shutdown.
- Conventional over-temperature protection (B-OT, backup over temperature limiter)  
A backup device for electronic system failure, mechanically preventing over temperature even when it occurs electronic errors.
- Door open warning and automatic shut off.
- Emergency stop button on the front of the product.
- Over-current and short circuit protection of device.
- When main power connections, users can quickly respond by notifying of electric phase sequence errors.
- Electrical instrumentation access warning and system shutdown.
- Each heater by fuse for more safety using.
- Auto stop when operating current of refrigerator is overloaded.
- Automatic stop in case of over temperature of the compressor
- Auto shut off in case refrigerant pressure (high/low pressure) is abnormal.

### Temperature Variation



### Recovery Time After Door Opening



## Specification

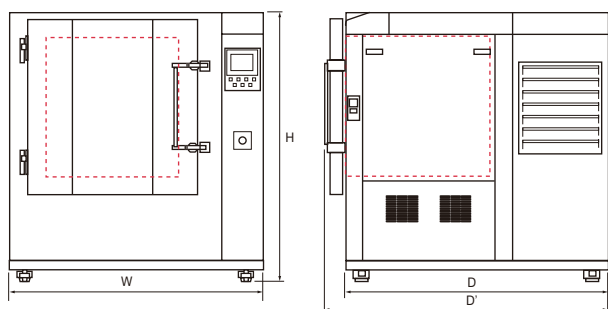
Model	KMV-012	KMV-025	KMV-040	KMV-070	KMV-100
<b>Temperature data</b>					
Range (°C / °F)	-40 to 180 / -40 to 356	-40 to 180 / -40 to 356	-40 to 180 / -40 to 356	-40 to 180 / -40 to 356	-40 to 180 / -40 to 356
<b>Fluctuation (±°C / °F) <sup>1), 2)</sup></b>					
at -40°C	0.5 / 0.9	0.5 / 0.9	0.3 / 0.54	0.2 / 0.36	0.3 / 0.54
at -25°C	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.2 / 0.36	0.2 / 0.36
at -10°C	0.3 / 0.54	0.3 / 0.54	0.2 / 0.36	0.3 / 0.54	0.3 / 0.54
at 25°C	0.2 / 0.36	0.2 / 0.36	0.5 / 0.9	0.4 / 0.72	0.2 / 0.36
at 70°C	0.3 / 0.54	0.3 / 0.54	0.4 / 0.72	0.3 / 0.54	0.2 / 0.36
at 100°C	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54
at 150°C	0.2 / 0.36	0.2 / 0.36	0.3 / 0.54	0.2 / 0.36	0.2 / 0.36
at 180°C	0.4 / 0.72	0.4 / 0.72	0.3 / 0.54	0.3 / 0.54	0.2 / 0.36
<b>Gradient (±°C / °F) <sup>1)</sup></b>					
at -40°C	0.5 / 0.9	0.5 / 0.9	1.2 / 2.16	0.6 / 1.08	0.3 / 0.54
at -25°C	0.6 / 1.08	0.6 / 1.08	1.2 / 2.16	0.7 / 1.26	0.4 / 0.72
at -10°C	0.7 / 1.26	0.7 / 1.26	1.2 / 2.16	0.8 / 1.44	0.4 / 0.72
at 25°C	0.7 / 1.26	0.7 / 1.26	1.1 / 1.98	0.8 / 1.44	0.5 / 0.9
at 70°C	0.8 / 1.44	0.8 / 1.44	1.7 / 3.06	0.9 / 1.62	0.7 / 1.26
at 100°C	1 / 1.8	1 / 1.8	1.9 / 3.42	1.1 / 1.98	0.8 / 1.44
at 150°C	1 / 1.8	1 / 1.8	2.3 / 4.14	0.5 / 0.9	0.7 / 1.26
at 180°C	1.4 / 2.52	1.4 / 2.52	2.3 / 4.14	0.8 / 1.44	0.8 / 1.44
<b>Heating time (min) <sup>2)</sup></b>					
from -40°C to 25°C	23	23	23	20	23
from -25°C to 25°C	20	20	19	20	18
from -10°C to 25°C	14	14	17	15	14
from 25°C to 70°C	17	17	21	19	21
from 25°C to 100°C	31	31	29	44	44
from 25°C to 150°C	61	61	48	82	90
from 25°C to 180°C	65	65	55	100	76
from -40°C to 180°C	92	92	79	102	203
from -25°C to 120°C	68	68	66	67	99
from -40°C to 5°C	15	15	13	10	19
from 5°C to 125°C	53	53	54	80	171
from 125°C to 180°C	24	24	12	12	13
<b>Cooling time (min) <sup>2)</sup></b>					
from 25°C to -40°C	41	41	37	38	44
from 25°C to -25°C	20	20	20	17	20
from 25°C to -10°C	13	13	15	10	15
from 70°C to 25°C	16	16	16	13	15
from 100°C to 25°C	25	25	25	18	27
from 150°C to 25°C	81	81	110	103	290
from 180°C to 25°C	152	152	173	177	310
from 180°C to -40°C	180	180	221	212	361
from 120°C to -25°C	43	43	46	48	48
from 180°C to 125°C	113	113	150	153	292
from 125°C to 5°C	33	33	36	27	31
from 5°C to -40°C	34	34	35	32	38
<b>Recovery time after door was opened for 30sec (min.) <sup>2)</sup></b>					
at -40°C	8	8	6.5	7	6
at -25°C	3.5	3.5	7.5	6	7
at -10°C	2.5	2.5	6.5	6.5	6.5
at 25°C	4	4	5.5	4.5	5
at 70°C	4	4	5.5	5	8
at 100°C	4	4	6.5	6	6
at 150°C	4	4	4.5	4.3	3.5
at 180°C	11.5	11.5	6	5	4
<b>Ordering information</b>					
Electrical requirement (230V/60Hz/1P)	19.2A	26A			
<b>Cat. No.</b>	<b>AAHK9011K</b>	<b>AAHK9021K</b>	-	-	-
Electrical requirement (230V/50Hz/1P)	19.2A	26A			
<b>Cat. No.</b>	<b>AAHK9012K</b>	<b>AAHK9022K</b>	-	-	-
Electrical requirement (380V/50Hz/3P)			12.5A	18A	19.4A
<b>Cat. No.</b>	-	-	<b>AAHK9038K</b>	<b>AAHK9048K</b>	<b>AAHK9058K</b>

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.



## Dimension

Model	KMV-012	KMV-025	KMV-040	KMV-070	KMV-100
<b>Interior dimensions</b>					
Chamber volume (L / cu ft)	125 / 4.41	253 / 8.93	420 / 14.83	720 / 25.43	1000 / 35.31
Width (mm / inch)	500 / 19.7	600 / 23.6	750 / 29.5	900 / 35.4	1000 / 39.4
Depth (mm / inch)	500 / 19.7	650 / 25.6	700 / 27.6	800 / 31.5	910 / 35.8
Height (mm / inch)	500 / 19.7	650 / 25.6	800 / 31.5	1000 / 39.4	1100 / 43.3
Quantity of shelves (standard/max.)	2 / 6	2 / 9	2 / 11	2 / 15	2 / 16
Distance of between shelves (mm / inch)	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2	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
<b>Exterior dimensions</b>					
Width (mm / inch), W	1070 / 42.1	1170 / 46.1	1370 / 53.9	1495 / 58.9	1595 / 62.8
Depth / with handle (mm - inch), D/D'	740 / 775 - 29.1 / 30.5	890 / 925 - 35 / 36.4	940 / 975 - 37 / 38.4	1595 / 1625 - 62.8 / 64	1695 / 1725 - 66.7 / 67.9
Height (mm / inch), H	1385 / 54.5	1585 / 62.4	1780 / 70.1	1650 / 65	1800 / 70.9
Weight (kg / lbs)	170 / 374.8	260 / 573.2	320 / 705.5	390 / 859.8	440 / 970

## Accessories Page 330

Cable Port, Shelves, Viewing Window, Signal Lamp, Recorder, Fan Speed Adjuster, Gas Purge System, Hour Meter

# Heating & Cooling Chamber

## Low temperature type (-40°C), vertical air flow

### Vertical airflow and -40 to 180°C temperature range



**JMV-070**

with 2EA wire shelves (standard), Recorder, Signal Lamp (option)

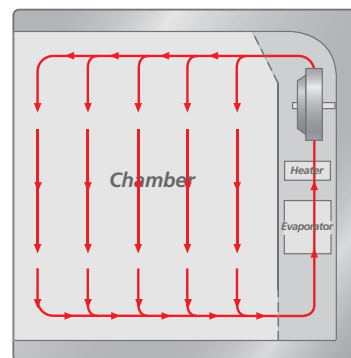


### Completion of Temperature Verification According to Strict International Standard

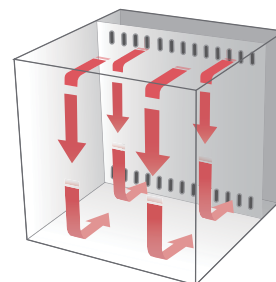
- Temperature verification in accordance with DIN 12880 and IEC 60068-3-5 provides excellent reliability and reproducibility.
- Provided specification the Fluctuation and Gradient in typical temperature point.
- Provided heating / cooling time data to help select the right model for testing purposes.
- Tested recovery time in accordance with specifications to provide data that is useful for real-use.

### Structural Functional Features

- Chamber structure with excellent sealing and insulation provides a stable long-term test and reduce costs by minimizing energy loss.
- According to international standards, even when operated at upper temperature, the surface temperature does not exceed 51°C. (EN 563 standard)
- Door consists of a double-sealed structure to satisfy DIN 58371. (door airtight guidance)
- Durability even after long-term repeated use has been verified by satisfying the door load test. (SEFA standard)
- Door structure is a two-point hang structure, building more stable seal with less force.



Side View





## Optimized Dedicated Control System

- 3.7-inch color touch display controller.
- Intuitive screen configuration for easy and convenient control.
- Graph display makes it easier to check operation.
- PID zone subdivided into 4 zones for more precise control stability.
- RS-232 port (default) and RS-485 port (option) supported.
- Control and data processing by connecting up to 32 devices to PC at same time via RS-485 port.
- Includes software for PC control.
- Saving data, convenient for reporting.

## Use Convenience Features

- Convenient opening and closing door with either side latches.
- Door handle with built-in key lock.
- Identification of the control and operating conditions at the front of the product.
- Design by stainless steel internal chamber provide clean maintenance and excellent corrosion resistance.
- Easy to clean as it is easy to remove refrigerator condenser grill, making it convenient to maintain efficiency of refrigeration.
- Equipped with easy-to-move/install caster.
- Perforated shelf for heavy-load sample. (option)
- Convenient and various options such as signal lamps, cable port, air cycle rate, gas purge, etc.

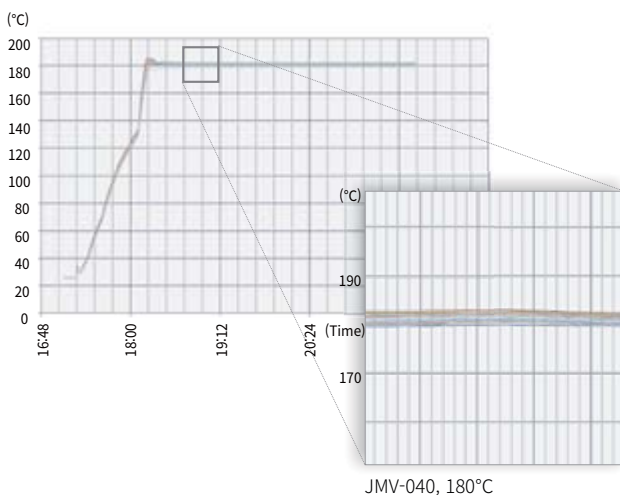
Description	No.
Pattern	100
Repeat time	999
Part repeat time	255
Max. segments / pattern	100
Available max. segments	2000
Programmable process time / segment	99 hr. 59 min.

\* It is possible to set 100 segments per pattern, but the maximum number of segments is not 10,000 (100 pattern x 100 segment) but 2,000.

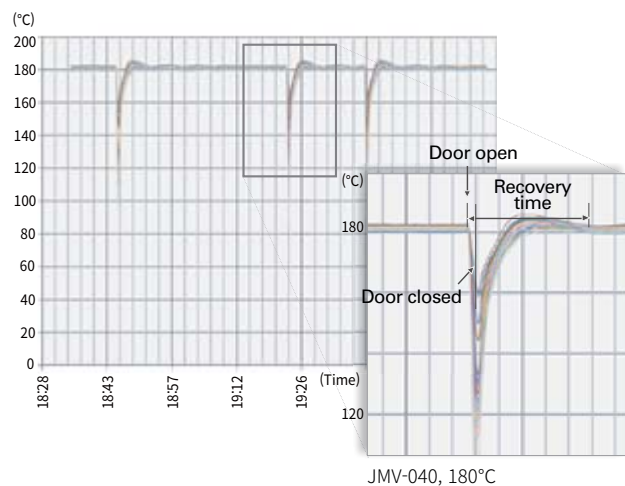
## Outstanding Safety

- Electronic over temperature protection system. (A-OT, advanced over temperature limiter)  
Independent precision temperature sensor and controller for safer and more accurate over temperature shutdown.
- Conventional over-temperature protection. (B-OT, backup over temperature limiter)  
A backup device for electronic system failure, mechanically preventing over temperature even when it occurs electronic errors.
- Door open warning and automatic shut off.
- Emergency stop button on the front of the product.
- Over-current and short circuit protection of device.
- When main power connections, users can quickly respond by notifying of electric phase sequence errors.
- Electrical instrumentation access warning and system shutdown.
- Each heater by fuse for more safety using.
- Auto stop when operating current of refrigerator is overloaded.
- Automatic stop in case of over temperature of the compressor.
- Auto shut off in case refrigerant pressure (high/low pressure) is abnormal.

### Temperature Fluctuation



### Recovery Time After Door Opening





## Specification

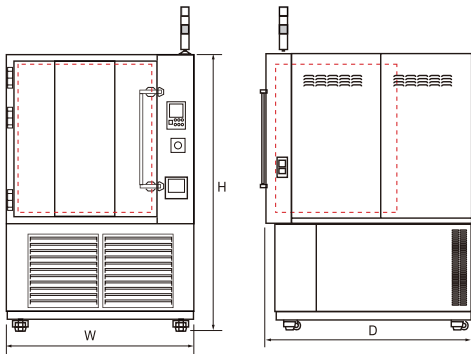
Model	JMV-012	JMV-025	JMV-040	JMV-070	JMV-100
<b>Temperature data</b>					
Range (°C / °F)	-40 to 180 / -40 to 356	-40 to 180 / -40 to 356	-40 to 180 / -40 to 356	-40 to 180 / -40 to 356	-40 to 180 / -40 to 356
<b>Fluctuation (±°C / °F)<sup>1), 2)</sup></b>					
at -40°C	0.4 / 0.72	0.4 / 0.72	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36
at -25°C	0.4 / 0.72	0.4 / 0.72	0.3 / 0.54	0.2 / 0.36	0.3 / 0.54
at -10°C	0.5 / 0.9	0.5 / 0.9	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36
at 25°C	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.2 / 0.36	0.2 / 0.36
at 70°C	0.6 / 1.08	0.6 / 1.08	0.3 / 0.54	0.2 / 0.36	0.2 / 0.36
at 100°C	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.2 / 0.36
at 150°C	0.4 / 0.72	0.4 / 0.72	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54
at 180°C	0.3 / 0.54	0.3 / 0.54	0.4 / 0.72	0.4 / 0.72	0.5 / 0.9
<b>Gradient (±°C / °F)<sup>1)</sup></b>					
at -40°C	0.7 / 1.26	0.7 / 1.26	0.3 / 0.54	0.9 / 1.62	0.7 / 1.26
at -25°C	0.6 / 1.08	0.6 / 1.08	0.3 / 0.54	0.9 / 1.62	0.7 / 1.26
at -10°C	0.6 / 1.08	0.6 / 1.08	0.3 / 0.54	1.1 / 1.98	0.8 / 1.44
at 25°C	0.8 / 1.44	0.8 / 1.44	0.4 / 0.72	0.7 / 1.26	0.6 / 1.08
at 70°C	0.8 / 1.44	0.8 / 1.44	0.6 / 1.08	1.1 / 1.98	0.9 / 1.62
at 100°C	0.9 / 1.62	0.9 / 1.62	0.7 / 1.26	1 / 1.8	0.8 / 1.44
at 150°C	1.1 / 1.98	1.1 / 1.98	1.2 / 2.16	0.8 / 1.44	0.9 / 1.62
at 180°C	1.4 / 2.52	1.4 / 2.52	1.5 / 34.7	1 / 1.8	1.3 / 34.3
<b>Heating time (min)<sup>2)</sup></b>					
from -40°C to 25°C	30	30	31	20	21
from -25°C to 25°C	20	20	17	18	16
from -10°C to 25°C	17	17	13	13	15
from 25°C to 70°C	26	26	18	25	20
from 25°C to 100°C	28	28	21	26	25
from 25°C to 150°C	50	50	39	39	51
from 25°C to 180°C	56	56	63	46	56
from -40°C to 180°C	61	61	81	62	73
from -25°C to 120°C	52	52	39	47	47
from -40°C to 5°C	7	7	8	6	7
from 5°C to 125°C	44	44	59	40	49
from 125°C to 180°C	10	10	14	16	17
<b>Cooling time (min)<sup>2)</sup></b>					
from 25°C to -40°C	37	37	29	28	46
from 25°C to -25°C	22	22	20	22	24
from 25°C to -10°C	18	18	17	19	17
from 70°C to 25°C	20	20	22	23	23
from 100°C to 25°C	30	30	26	34	31
from 150°C to 25°C	95	95	92	110	160
from 180°C to 25°C	144	144	158	186	289
from 180°C to -40°C	172	172	198	192	297
from 120°C to -25°C	56	56	57	54	46
from 180°C to 125°C	110	110	133	144	228
from 125°C to 5°C	37	37	43	30	35
from 5°C to -40°C	25	25	22	18	34
<b>Recov. time after door was opened for 30sec.(min.)<sup>2)</sup></b>					
at -40°C	6	6	6	6.5	9
at -25°C	5	5	6.5	7	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	7
at 70°C	8.5	8.5	8	9.5	7.5
at 100°C	5.5	5.5	4.5	6	5.5
at 150°C	6.5	6.5	7	9	3.5
at 180°C	6.5	6.5	6.5	8	4
<b>Ordering information</b>					
Electrical requirement (230V/60Hz/1P)	19.2A	26A	-	-	-
<b>Cat. No.</b>	<b>AAHKB011K</b>	<b>AAHKB021K</b>	-	-	-
Electrical requirement (230V/50Hz/1P)	19.2A	26A			
<b>Cat. No.</b>	<b>AAHKB012K</b>	<b>AAHKB022K</b>			
Electrical requirement (380V/50Hz/3P)			12.5A	18A	19.4A
<b>Cat. No.</b>	-	-	<b>AAHKB038K</b>	<b>AAHKB048K</b>	<b>AAHKB058K</b>

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.



## Dimension

Model	JMV-012	JMV-025	JMV-040	JMV-070	JMV-100
<b>Interior dimensions</b>					
Chamber volume (L / cu ft)	125 / 4.41	253 / 8.93	420 / 14.83	720 / 25.43	990 / 34.96
Width (mm / inch)	500 / 19.7	600 / 23.6	750 / 29.5	900 / 35.4	1000 / 39.4
Depth (mm / inch)	500 / 19.7	650 / 25.6	700 / 27.6	800 / 31.5	900 / 35.4
Height (mm / inch)	500 / 19.7	650 / 25.6	800 / 31.5	1000 / 39.4	1100 / 43.3
Quantity of shelves (standard/max.)	2 / 6	2 / 9	2 / 11	2 / 15	2 / 16
Distance of between shelves (mm / inch)	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2
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
<b>Exterior dimensions</b>					
Width (mm / inch), W	890 / 35	990 / 39	1140 / 44.9	1290 / 50.8	1390 / 54.7
Depth (mm / inch), D	950 / 37.4	1180 / 46.5	1330 / 52.4	1430 / 56.3	1530 / 60.2
Height (mm / inch), H	1200 / 47.2	1350 / 53.1	1590 / 62.6	1940 / 76.4	2040 / 80.3
Weight (kg / lbs)	170 / 374.8	260 / 573.2	320 / 705.5	390 / 859.8	440 / 970

## Accessories Page 330

Cable Port, Shelves, Viewing Window, Signal Lamp, Recorder, Fan Speed Adjuster, Gas Purge System, Hour Meter

# Heating & Cooling Chamber

## Low temperature type (-25°C), horizontal air flow

-25 to 100°C temperature range to meet basic test requirements



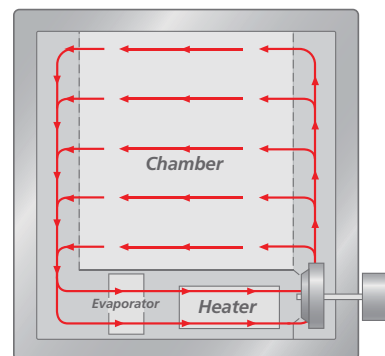
### PBV-040

with 2EA wire shelves (standard), Recorder, Signal lamp (option)



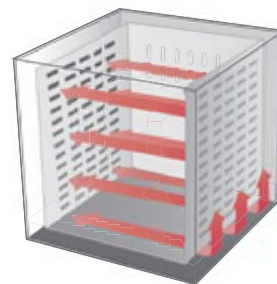
### Completion of Temperature Verification According to Strict International Standard

- Temperature verification in accordance with DIN 12880 and IEC 60068-3-5 provides excellent reliability and reproducibility.
- Provided specification the fluctuation and gradient in typical temperature point.
- Provided heating / cooling time data to help select the right model for testing purposes.
- Tested recovery time in accordance with specifications to provide data that is useful for real-use.



### Structural functional features

- Chamber structure with excellent sealing and insulation provides a stable long-term test and reduce costs by minimizing energy loss.
- According to international standards, even when operated at upper temperature, the surface temperature does not exceed 51°C. (EN 563 standard)
- Door consists of a double-sealed structure to satisfy DIN 58371. (door airtight guidance)
- Durability even after long-term repeated use has been verified by satisfying the door load test. (SEFA standard)
- Door structure is a two-point hang structure, building more stable seal with less force.





## Optimized Dedicated Control System

- 3.7-inch color touch display controller.
- Intuitive screen configuration for easy and convenient control.
- Graph display makes it easier to check operation.
- PID zone subdivided into 4 zones for more precise control stability.
- RS-232 port (default) and RS-485 port (option) supported.
- Control and data processing by connecting up to 32 devices to PC at same time via RS-485 port.
- Includes software for PC control.
- Saving data, convenient for reporting.

## Use Convenience Features

- Convenient opening and closing door with either side latches.
- Door handle with built-in key lock.
- Identification of the control and operating conditions at the front of the product.
- Design by stainless steel internal chamber provide clean maintenance and excellent corrosion resistance.
- Easy to clean as it is easy to remove refrigerator condenser grill, making it convenient to maintain efficiency of refrigeration.
- Equipped with easy-to-move/install caster.
- Perforated shelf for heavy-load sample. (option)
- Convenient and various options such as signal lamps, cable port, air cycle rate, gas purge, etc.

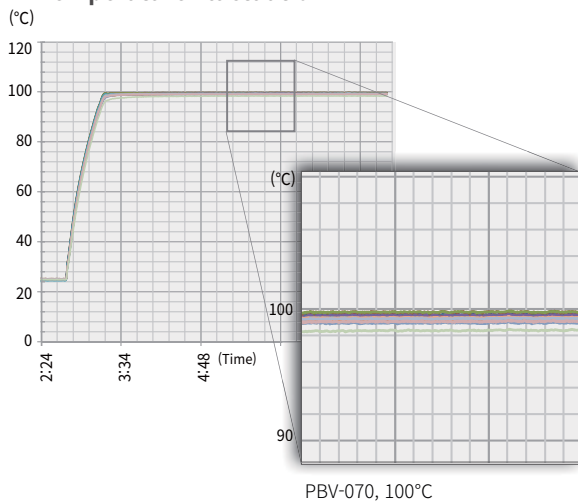
Description	No.
Pattern	100
Repeat time	999
Part repeat time	255
Max. segments / pattern	100
Available max. segments	2000
Programmable process time / segment	99 hr. 59 min.

\* It is possible to set 100 segments per pattern, but the maximum number of segments is not 10,000 (100 pattern x 100 segment) but 2,000.

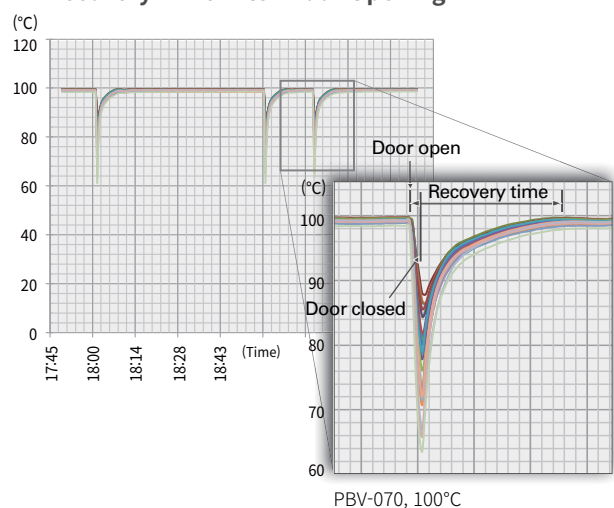
## Outstanding Safety

- Conventional over-temperature protection. (over temperature limiter)
- Door open warning and automatic shut off.
- Emergency stop button on the front of the product.
- Over-current and short circuit protection of device.
- When main power connections, users can quickly respond by notifying of electric phase sequence errors.
- Electrical instrumentation access warning and system shutdown.
- Each heater by fuse for more safety using.
- Auto stop when operating current of refrigerator is overloaded.
- Automatic stop in case of over temperature of the compressor.
- Auto shut off in case refrigerant pressure (high/low pressure) is abnormal.

### Temperature Fluctuation



### Recovery Time After Door Opening



## Specification

Model	PBV-012	PBV-025	PBV-040	PBV-070	PBV-100
<b>Temperature data</b>					
Range (°C / °F)	-25 to 100 / -13 to 212	-25 to 100 / -13 to 212	-25 to 100 / -13 to 212	-25 to 100 / -13 to 212	-25 to 100 / -13 to 212
<b>Fluctuation (±°C / °F)<sup>1), 2)</sup></b>					
at -25°C	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36
at -15°C	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36
at -10°C	0.3 / 0.54	0.3 / 0.54	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36
at 25°C	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.4 / 0.72	0.2 / 0.36
at 70°C	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36	0.3 / 0.54	0.2 / 0.36
at 100°C	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36	0.3 / 0.54	0.2 / 0.36
<b>Gradient (±°C / °F)<sup>1)</sup></b>					
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
<b>Heating time (min)<sup>2)</sup></b>					
from -25°C to 25°C	19	19	29	22	24
from -15°C to 25°C	17	17	22	20	22
from -10°C to 25°C	15	15	21	18	20
from 25°C to 70°C	20	20	33	22	27
from 25°C to 100°C	34	34	52	35	38
from -25°C to 100°C	47	47	76	46	61
<b>Cooling time (min)<sup>2)</sup></b>					
from 25°C to -25°C	36	36	26	25	34
from 25°C to -15°C	21	21	21	20	24
from 25°C to -10°C	17	17	19	18	21
from 70°C to 25°C	17	17	20	20	25
from 100°C to 25°C	28	28	30	29	35
from 100°C to -25°C	65	65	50	53	56
<b>Recovery time after door was opened for 30sec.(min.)<sup>2)</sup></b>					
at -25°C	5	5	5	4	7
at -15°C	4.5	4.5	3.5	5.5	5
at -10°C	6	6	4.5	4	5
at 25°C	5	5	4	5.5	3.5
at 70°C	5	5	9.5	5	7.5
at 100°C	5.5	5.5	9	6	7
<b>Ordering information</b>					
Electrical requirement (230V/60Hz/1P)	16.3A	22.8A			
<b>Cat. No.</b>	<b>AAHK5011K</b>	<b>AAHK5021K</b>	-	-	-
Electrical requirement (230V/50Hz/1P)	16.3A	22.8A			
<b>Cat. No.</b>	<b>AAHK5012K</b>	<b>AAHK5022K</b>	-	-	-
Electrical requirement (380V/50Hz/3P)			7.3A	9.1A	10.9A
<b>Cat. No.</b>	-	-	<b>AAHK5038K</b>	<b>AAHK5048K</b>	<b>AAHK5058K</b>

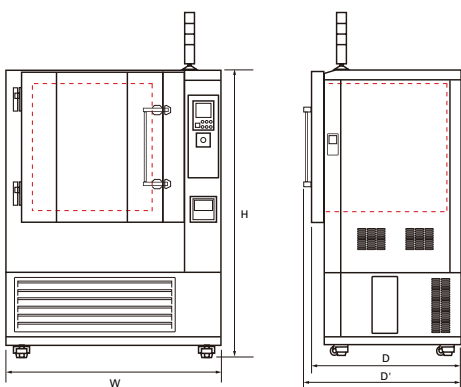
1) According to IEC 60068-3-5

2) According to DIN 12880

※ Above specification value is recorded by 230V/60Hz, 380V/50Hz.

※ Above specifications can be changed without prior notice.





## Dimension

Model	PBV-012	PBV-025	PBV-040	PBV-070	PBV-100
<b>Interior dimensions</b>					
Chamber volume (L / cu ft)	125 / 4.41	250 / 8.83	400 / 14.13	700 / 24.72	1000 / 35.31
Width (mm / inch)	500 / 19.7	600 / 23.6	750 / 29.5	900 / 35.4	1000 / 39.4
Depth (mm / inch)	500 / 19.7	650 / 25.6	700 / 27.6	800 / 31.5	910 / 35.8
Height (mm / inch)	500 / 19.7	650 / 25.6	800 / 31.5	1000 / 39.4	1100 / 43.3
Quantity of shelves (standard/max.)	2 / 6	2 / 9	2 / 11	2 / 15	2 / 16
Distance of between shelves (mm / inch)	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2
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
<b>Exterior dimensions</b>					
Width (mm / inch), W	1060 / 41.7	1154 / 45.4	1304 / 51.3	1454 / 57.2	1720 / 67.7
Depth / with handle (mm - inch), D/D'	672 / 702 - 26.5 / 27.6	822 / 852 - 32.4 / 33.5	872 / 902 - 34.3 / 35.5	1510 / 1540 - 59.4 / 60.6	1620 / 1650 - 63.8 / 65
Height (mm / inch), H	1340 / 52.8	1540 / 60.6	1724 / 67.9	1628 / 64.1	1534 / 60.4
Weight (kg / lbs)	360 / 793.7	420 / 925.9	520 / 1146.4	640 / 1411	700 / 1543.2

## Accessories Page 330

Cable Port, Shelves, Viewing Window, Signal Lamp, Recorder, Fan Speed Adjuster, Gas Purge System, Hour Meter

# Heating & Cooling Chamber

## Ambient temperature type (-5°C), horizontal air flow

-5 to 100°C temperature range to meet basic test requirements



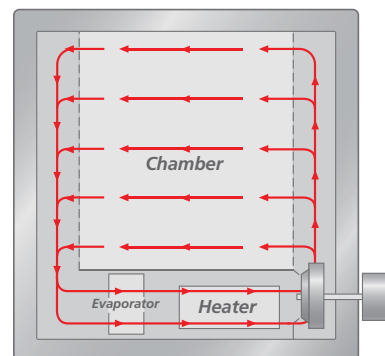
### PMV-040

with 2EA wire shelves (standard), Recorder, Signal lamp (option)



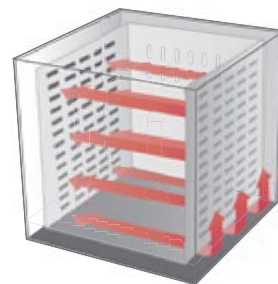
### Completion of Temperature Verification According to Strict International Standard

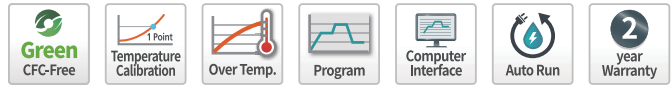
- Temperature verification in accordance with DIN 12880 and IEC 60068-3-5 provides excellent reliability and reproducibility.
- Provided specification the fluctuation and gradient in typical temperature point.
- Provided heating / cooling time data to help select the right model for testing purposes.
- Tested recovery time in accordance with specifications to provide data that is useful for real-use.



### Structural Functional Features

- Chamber structure with excellent sealing and insulation provides a stable long-term test and reduce costs by minimizing energy loss.
- According to international standards, even when operated at upper temperature, the surface temperature does not exceed 51°C. (EN 563 standard)
- Door consists of a double-sealed structure to satisfy DIN 58371. (door airtight guidance)
- Durability even after long-term repeated use has been verified by satisfying the door load test. (SEFA standard)
- Door structure is a two-point hang structure, building more stable seal with less force.





## Optimized Dedicated Control System

- 3.7-inch color touch display controller.
- Intuitive screen configuration for easy and convenient control.
- Graph display makes it easier to check operation.
- PID zone subdivided into 4 zones for more precise control stability.
- RS-232 port (default) and RS-485 port (option) supported.
- Control and data processing by connecting up to 32 devices to PC at same time via RS-485 port.
- Includes software for PC control.
- Saving data, convenient for reporting.

## Use Convenience Features

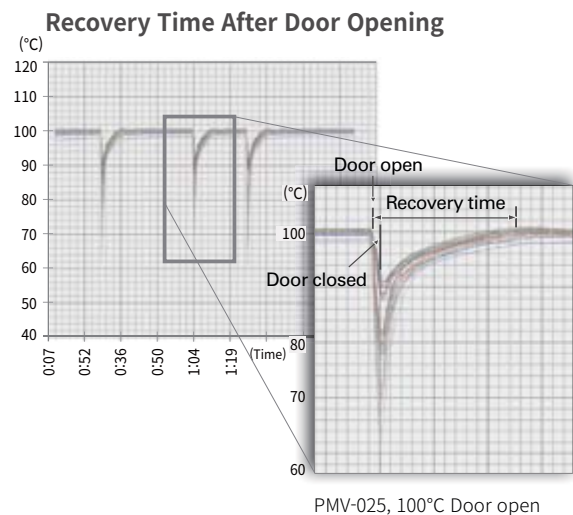
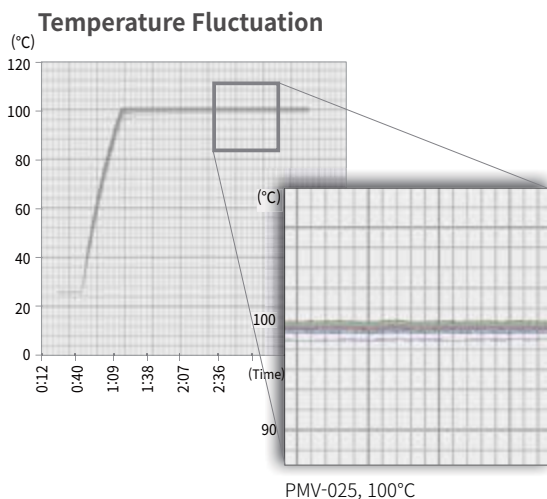
- Convenient opening and closing door with either side latches.
- Door handle with built-in key lock.
- Identification of the control and operating conditions at the front of the product.
- Design by stainless steel internal chamber provide clean maintenance and excellent corrosion resistance.
- Easy to clean as it is easy to remove refrigerator condenser grill, making it convenient to maintain efficiency of refrigeration.
- Equipped with easy-to-move/install caster.
- Perforated shelf for heavy-load sample. (option)
- Convenient and various options such as signal lamps, cable port, air cycle rate, gas purge, etc.

Description	No.
Pattern	100
Repeat time	999
Part repeat time	255
Max. segments / pattern	100
Available max. segments	2000
Programmable process time / segment	99 hr. 59 min.

\* It is possible to set 100 segments per pattern, but the maximum number of segments is not 10,000 (100 pattern x 100 segment) but 2,000.

## Outstanding Safety

- Conventional over-temperature protection. (over temperature limiter)
- Door open warning and automatic shut off.
- Emergency stop button on the front of the product.
- Over-current and short circuit protection of device.
- When main power connections, users can quickly respond by notifying of electric phase sequence errors.
- Electrical instrumentation access warning and system shutdown.
- Each heater by fuse for more safety using.
- Auto stop when operating current of refrigerator is overloaded.
- Automatic stop in case of over temperature of the compressor.
- Auto shut off in case refrigerant pressure (high/low pressure) is abnormal.



## Specification

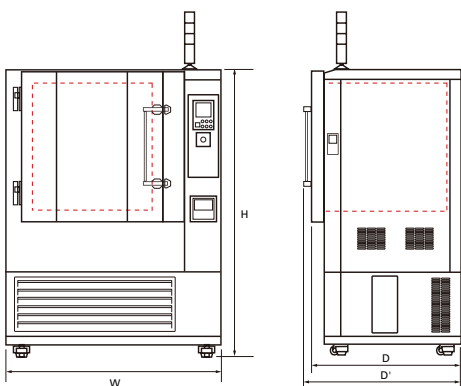
Model	PMV-012	PMV-025	PMV-040	PMV-070	PMV-100
<b>Temperature data</b>					
Range (°C / °F)	-5 to 100 / 23 to 212	-5 to 100 / 23 to 212	-5 to 100 / 23 to 212	-5 to 100 / 23 to 212	-5 to 100 / 23 to 212
<b>Fluctuation (±°C / °F)<sup>1), 2)</sup></b>					
at -5°C	0.3 / 0.54	0.3 / 0.54	0.2 / 0.36	0.2 / 0.36	0.3 / 0.54
at 0°C	0.3 / 0.54	0.3 / 0.54	0.2 / 0.36	0.2 / 0.36	0.3 / 0.54
at 25°C	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54
at 40°C	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54
at 60°C	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.4 / 0.72	0.3 / 0.54
at 80°C	0.3 / 0.54	0.3 / 0.54	0.2 / 0.36	0.2 / 0.36	0.3 / 0.54
at 100°C	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.4 / 0.72	0.3 / 0.54
<b>Gradient (±°C / °F)<sup>1)</sup></b>					
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 / 0.9	0.5 / 0.9	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 / 0.9	0.5 / 0.9
at 100°C	1 / 1.8	1 / 1.8	0.8 / 1.44	0.7 / 1.26	0.7 / 1.26
<b>Heating time (min)<sup>2)</sup></b>					
from -5°C to 25°C	24	24	21	17	19
from 0°C to 25°C	20	20	17	15	16
from 25°C to 40°C	16	16	15	11	11
from 25°C to 60°C	30	30	26	23	25
from 25°C to 80°C	32	32	33	34	38
from 25°C to 100°C	45	45	48	52	56
from -5°C to 100°C	60	60	62	64	75
<b>Cooling time (min)<sup>2)</sup></b>					
from 25°C to -5°C	36	36	35	31	31
from 25°C to 0°C	30	30	27	25	25
from 40°C to 25°C	17	17	16	14	16
from 60°C to 25°C	37	37	35	31	31
from 80°C to 25°C	52	37	48	43	45
from 100°C to 25°C	65	65	62	59	57
from 100°C to -5°C	97	97	92	87	91
<b>Recovery time after door was opened for 30sec.(min.)<sup>2)</sup></b>					
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
<b>Ordering information</b>					
Electrical requirement (230V/60Hz/1P)	9.7A	13.2A	15.5A	21.7A	
<b>Cat. No.</b>	<b>AAHK4011K</b>	<b>AAHK4021K</b>	<b>AAHK4031K</b>	<b>AAHK4041K</b>	-
Electrical requirement (230V/50Hz/1P)	9.7A	13.2A	15.5A	21.7A	
<b>Cat. No.</b>	<b>AAHK4012K</b>	<b>AAHK4022K</b>	<b>AAHK4032K</b>	<b>AAHK4042K</b>	-
Electrical requirement (380V/50Hz/3P)					6A
<b>Cat. No.</b>	-	-	-	-	<b>AAHK4058K</b>

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.



## Dimension

Model	PMV-012	PMV-025	PMV-040	PMV-070	PMV-100
<b>Interior dimensions</b>					
Chamber volume (L / cu ft)	125 / 4.41	250 / 8.83	400 / 14.13	700 / 24.72	1000 / 35.31
Width (mm / inch)	500 / 19.7	600 / 23.6	750 / 29.5	900 / 35.4	1000 / 39.4
Depth (mm / inch)	500 / 19.7	650 / 25.6	700 / 27.6	800 / 31.5	910 / 35.8
Height (mm / inch)	500 / 19.7	650 / 25.6	800 / 31.5	1000 / 39.4	1100 / 43.3
Quantity of shelves (standard/max.)	2 / 6	2 / 9	2 / 11	2 / 15	2 / 16
Distance of between shelves (mm / inch)	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2
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
<b>Exterior dimensions</b>					
Width (mm / inch), W	1060 / 41.7	1154 / 45.4	1304 / 51.3	1454 / 57.2	1720 / 67.7
Depth / with handle (mm - inch), D/D'	672 / 702 - 26.5 / 27.6	822 / 852 - 32.4 / 33.5	872 / 902 - 34.3 / 35.5	1510 / 1540 - 59.4 / 60.6	1620 / 1650 - 63.8 / 65
Height (mm / inch), H	1340 / 52.8	1540 / 60.6	1724 / 67.9	1628 / 64.1	1534 / 60.4
Weight (kg / lbs)	360 / 793.7	420 / 925.9	520 / 1146.4	640 / 1411	700 / 1543.2

## Accessories Page 330

Cable Port, Shelves, Viewing Window, Signal Lamp, Recorder, Fan Speed Adjuster, Gas Purge System, Hour Meter

# Heating & Cooling Chamber

## General type

### Includes space-saving vertical structure and dual chamber model

#### Optimized Model Configuration

- Two series ((LCH, LCH-G) according to temperature control range.  
LCH : -20 ~ 100°C  
LCH-G : 0 ~ 100°C
- Space-saving vertical structural design.
- Independent control of the temperature with dual chambers divided into upper and lower.
- Standard temperature test chamber to select optimized model according to test conditions.

#### Structural Functional Features

- Chamber structure with excellent sealing and insulation provides a stable long-term test and reduce costs by minimizing energy loss.
- Ensures that the surface temperature is kept below 60°C.
- Cable port (Ø80 mm) is included as standard, making it convenient to connect external equipment.
- Easy to clean as it is easy to remove refrigerator condenser grill, making it convenient to maintain efficiency of refrigeration.
- Airflow optimized for uniform heat transfer.

#### Use Convenience Features

- Microprocessor PID method for precise temperature control.
- Optimized temperature control with temperature auto-tuning.
- Calibration function minimizes temperature difference.
- 9 Steps Program Control. (200 times repeat function)
- Wait On/Off timer. (up to 99 hours 59 minutes)
- Save and use 3 frequently used temperatures.
- Identification of the control and operating conditions at the front of the product.
- Internal chamber made of stainless steel provide clean maintenance and excellent corrosion resistance.
- Equipped with easy-to-move/install caster.

#### Outstanding Safety

- Over temperature limit function. (over temperature limiter)
- Malfunction prevented by controller lock function.
- Over-current and short circuit protection of device.
- Door open warning function.

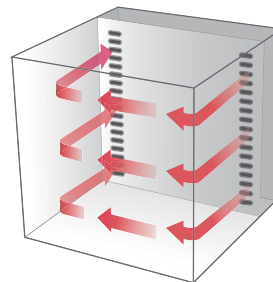


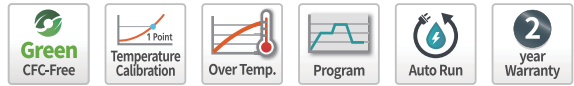
**LCH-21**

with 2EA wire shelves(standard)  
Recorder (option)

**LCH-11G-2C**

with 2EA wire shelves (standard)  
per chamber

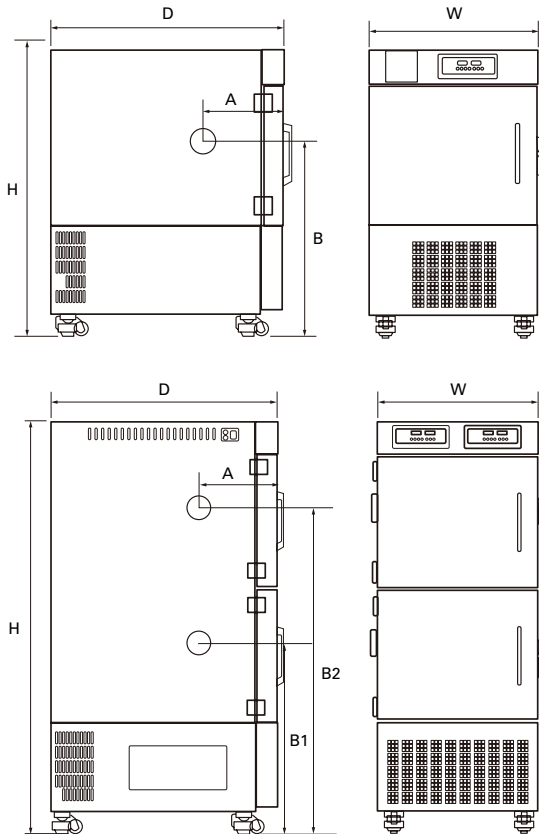




## Specification

Model	LCH-11	LCH-21	LCH-31	LCH-11-2C	LCH-11G	LCH-21G	LCH-31G	LCH-11G-2C
<b>Temperature data</b>								
Range (°C / °F)	-20 to 100 / -4 to 212	-20 to 100 / -4 to 212	-20 to 100 / -4 to 212	-20 to 100 / -4 to 212	0 to 100 / 32 to 212	0 to 100 / 32 to 212	0 to 100 / 32 to 212	0 to 100 / 32 to 212
Fluctuation (±°C / °F) <sup>1)</sup>	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54
Variation at 80°C (±°C / °F) <sup>1)</sup>	0.8 / 1.44	0.8 / 1.44	0.8 / 1.44	0.8 / 1.44	0.8 / 1.44	0.8 / 1.44	0.8 / 1.44	0.8 / 1.44
Heating time (20°C to 100°C, min)	80	80	80	80	80	80	80	80
Cooling time (100°C to 40°C, min)	60	60	60	60	60	60	60	60
<b>Interior dimensions</b>								
Chamber volume (L / cu ft)	150 / 5.3	255 / 9	485 / 17.1	150x2/53x2	150 / 5.3	255 / 9	485 / 17.1	150x2/53x2
Width (mm / inch)	600 / 23.6	600 / 23.6	700 / 27.6	600 / 23.6 <sup>2)</sup>	600 / 23.6	600 / 23.6	700 / 27.6	600 / 23.6 <sup>2)</sup>
Depth (mm / inch)	500 / 19.7	500 / 19.7	680 / 26.8	500 / 19.7 <sup>2)</sup>	500 / 19.7	500 / 19.7	680 / 26.8	500 / 19.7 <sup>2)</sup>
Height (mm / inch)	500 / 19.7	850 / 33.5	1020 / 40.2	500 / 19.7 <sup>2)</sup>	500 / 19.7	850 / 33.5	1020 / 40.2	500 / 19.7 <sup>2)</sup>
Quantity of shelves (standard/max.)	2 / 6	2 / 12	2 / 14	2 <sup>2)</sup> / 6 <sup>2)</sup>	2 / 6	2 / 12	2 / 14	2 <sup>2)</sup> / 6 <sup>2)</sup>
Distance of between shelves (mm / inch)	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2
Max. load per shelf (kg / lbs)	15 / 33.1	20 / 44.1	20 / 44.1	15 / 33.1	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 <sup>2)</sup>	50 / 110.2	70 / 154.3	70 / 154.3	50 / 110.2 <sup>2)</sup>
Cable port (∅, mm / inch)	80 / 3.1	80 / 3.1	80 / 3.1	80 / 3.1 <sup>2)</sup>	80 / 3.1	80 / 3.1	80 / 3.1	80 / 3.1 <sup>2)</sup>
Weight (kg / lbs)	125 / 275.6	185 / 407.9	225 / 496	195 / 429.9	120 / 264.6	180 / 396.8	220 / 485	190 / 418.9
<b>Electrical data &amp; Ordering information</b>								
Electrical requirement (230V/60Hz)	6.3A	9.2A	11.1A	12.6A	7.1A	10.6A	13.8A	14.2A
<b>Cat. No.</b>	<b>AAHK6111K</b>	<b>AAHK6211K</b>	<b>AAHK6311K</b>	<b>AAHK6411K</b>	<b>AAHK6121K</b>	<b>AAHK6221K</b>	<b>AAHK6321K</b>	<b>AAHK6421K</b>
Electrical requirement (230V/50Hz)	6.3A	9.2A	11.1A	12.6A	7.1A	10.6A	13.8A	14.2A
<b>Cat. No.</b>	<b>AAHK6112K</b>	<b>AAHK6212K</b>	<b>AAHK6312K</b>	<b>AAHK6412K</b>	<b>AAHK6122K</b>	<b>AAHK6222K</b>	<b>AAHK6322K</b>	<b>AAHK6422K</b>
Electrical requirement (380V/50Hz)	11.6A	-	-	23.2A	13A	-	-	26A
<b>Cat. No.</b>	<b>AAHK6113U</b>	-	-	<b>AAHK6413U</b>	<b>AAHK6123U</b>	-	-	<b>AAHK6423U</b>

- 1) According to IEC 60068-3-5  
2) Based on inner chamber 1ea.



## Dimension

Model	LCH-11G LCH-11	LCH-21G LCH-21	LCH-31G LCH-31
<b>W (mm / inch)</b>	740 / 29.1	740 / 29.1	840 / 33.1
<b>D (mm / inch)</b>	1032 / 40.6	1032 / 40.6	1212 / 47.7
<b>H (mm / inch)</b>	1280 / 50.4	1630 / 64.2	1800 / 70.9
<b>A (mm / inch)</b>	355 / 14	355 / 14	445 / 17.5
<b>B (mm / inch)</b>	845 / 33.3	1050 / 41.3	1155 / 45.5

## Dimension

Model	LCH-11G-2C
	LCH-11-2C
<b>W (mm / inch)</b>	740 / 29.1
<b>D (mm / inch)</b>	1032 / 40.6
<b>H (mm / inch)</b>	1900 / 74.8
<b>A (mm / inch)</b>	355 / 14
<b>B1 (mm / inch)</b>	875 / 34.4
<b>B2 (mm / inch)</b>	1495 / 58.9

## Accessories Page 330

Cable Port, Shelves, Recorder

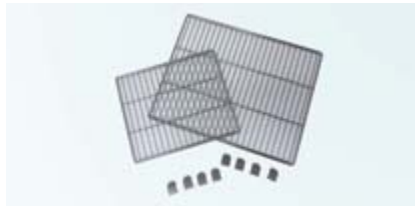


# Accessories



## Cable Port

- Both cap and silicone plug are included as standard in Ø50 mm cable port.
- It is available to add Ø50 mm, Ø80 mm.



## Wire Shelf

- Excellent ventilation structure.
- Stainless steel.
- Includes 2ea as standard.



## Perforated Shelf

- Suitable for high-load samples.
- Excellent maintenance as made of stainless steel.



## Viewing Window

- Constantly observing the samples under test in anytime.
- Tempered glass window with wire heater and LED lamp.



## Signal Lamp

- Figuring out equipment status remotely.
- Run/Stand-by/Error displayed by color.

Model	Standard	Cable Port ø50	Cable Port ø80	Wire Shelf	Perforated Shelf	Viewing Window	Signal Lamp
TC3-KE-025	ø50 Cable Port	AAA8T610	N/A	00RTD0000679	AAA80602-6	N/A	AAA80550
TC3-KE-065	ø50 Cable Port	AAA8T610	AAA8T611	00RTD0000680	AAA80602-7	N/A	AAA80550
TC3-KE-100	ø50 Cable Port	AAA8T610	AAA8T611	00RTD0000681	AAA80602-8	N/A	AAA80550
TC3-ME-025	ø50 Cable Port	AAA8T612	N/A	00RTD0000679	AAA80602-6	N/A	AAA80550
TC3-ME-065	ø50 Cable Port	AAA8T612	AAA8T611	00RTD0000680	AAA80602-7	N/A	AAA80550
TC3-ME-100	ø50 Cable Port	AAA8T612	AAA8T611	00RTD0000681	AAA80602-8	N/A	AAA80550
KBD-012	ø50 Cable Port	AAAK8511	AAAK8512	00LTV0000070	AAAK1501	N/A	AAA80550
KBD-025	ø50 Cable Port	AAAK8511	AAAK8512	00LTV0000053	AAAK1502	N/A	AAA80550
KBD-040	ø80 Cable Port	AAAK8511	AAAK8512	00LTV0000029	AAAK1503	N/A	AAA80550
KBD-070	ø80 Cable Port	AAAK8511	AAAK8512	00LTV0000030	AAAK1504	N/A	AAA80550
KBD-100	ø80 Cable Port	AAAK8511	AAAK8512	00LTV0000057	AAAK1505	N/A	AAA80550
KMV-012	ø50 Cable Port	AAAK8511	AAAK8512	00LTV0000070	AAAK1501	AAAK8501	AAA80550
KMV-025	ø50 Cable Port	AAAK8511	AAAK8512	00LTV0000053	AAAK1502	AAAK8501	AAA80550
KMV-040	ø80 Cable Port	AAAK8511	AAAK8512	00LTV0000029	AAAK1503	AAAK8501	AAA80550
KMV-070	ø80 Cable Port	AAAK8511	AAAK8512	00LTV0000030	AAAK1504	AAA80673	AAA80550
KMV-100	ø80 Cable Port	AAAK8511	AAAK8512	00LTV0000057	AAAK1505	AAA80673	AAA80550
JMV-012	ø50 Cable Port	AAAK8511	AAAK8512	00LTV0000070	AAAK1501	AAAK8501	AAA80550
JMV-025	ø50 Cable Port	AAAK8511	AAAK8512	00LTV0000053	AAAK1502	AAAK8501	AAA80550
JMV-040	ø80 Cable Port	AAAK8511	AAAK8512	00LTV0000029	AAAK1503	AAAK8501	AAA80550
JMV-070	ø80 Cable Port	AAAK8511	AAAK8512	00LTV0000030	AAAK1504	AAA80673	AAA80550
JMV-100	ø80 Cable Port	AAAK8511	AAAK8512	00LTV0000057	AAAK1505	AAA80673	AAA80550
PBV-012	ø50 Cable Port	AAAK8511	AAAK8512	00LTV0000070	AAAK1501	AAAK8501	AAA80550
PBV-025	ø50 Cable Port	AAAK8511	AAAK8512	00LTV0000053	AAAK1502	AAAK8501	AAA80550
PBV-040	ø80 Cable Port	AAAK8511	AAAK8512	00LTV0000029	AAAK1503	AAAK8501	AAA80550
PBV-070	ø80 Cable Port	AAAK8511	AAAK8512	00LTV0000030	AAAK1504	AAA80673	AAA80550
PBV-100	ø80 Cable Port	AAAK8511	AAAK8512	00LTV0000057	AAAK1505	AAA80673	AAA80550
PMV-012	ø50 Cable Port	AAAK8511	AAAK8512	00LTV0000070	AAAK1501	AAAK8501	AAA80550
PMV-025	ø50 Cable Port	AAAK8511	AAAK8512	00LTV0000053	AAAK1502	AAAK8501	AAA80550
PMV-040	ø80 Cable Port	AAAK8511	AAAK8512	00LTV0000029	AAAK1503	AAAK8501	AAA80550
PMV-070	ø80 Cable Port	AAAK8511	AAAK8512	00LTV0000030	AAAK1504	AAA80673	AAA80550
PMV-100	ø80 Cable Port	AAAK8511	AAAK8512	00LTV0000057	AAAK1505	AAA80673	AAA80550
LCH-11	ø80 Cable Port	AAA8T610	AAA8T611	00EDA0008219	AAA22521	N/A	N/A
LCH-21	ø80 Cable Port	AAA8T610	AAA8T611	00EDA0008219	AAA22521	N/A	N/A
LCH-31	ø80 Cable Port	AAA8T610	AAA8T611	00EDA0008219	AAA22521	N/A	N/A
LCH-11-2C	ø80 Cable Port	AAA8T610	AAA8T611	00EDA0008219	AAA22521	N/A	N/A
LCH-11G	ø80 Cable Port	AAA8T610	AAA8T611	00EDA0008219	AAA22521	N/A	N/A
LCH-21G	ø80 Cable Port	AAA8T610	AAA8T611	00EDA0008219	AAA22521	N/A	N/A
LCH-31G	ø80 Cable Port	AAA8T610	AAA8T611	00EDA0008219	AAA22521	N/A	N/A
LCH-11G-2C	ø80 Cable Port	AAA8T610	AAA8T611	00EDA0008219	AAA22521	N/A	N/A



#### Recorder (Paper)

- Up to 6 channels supported.
- Set recording range and speed.
- Paper width: 100mm.



#### Recorder (Digital)

- Paperless. (5.7" LCD Display)
- Up to 6 channels supported.
- Data stored in internal/external memory.



#### Gas Purge System

- Gas system that can replace and purge the inside of chamber with nitrogen and CO<sub>2</sub> gas.



#### Hour Meter

- Cumulative usage time management. (No reset function)
- Minimum units of measurement: 0.1 hours. (6 minutes)
- Maximum display 99999.9 hours.



#### Stand (1 Stage)

- Dedicated stand for small appliances.
- Provides Lower drawer and loading space.
- Casters provided as standard for moving/fixing.

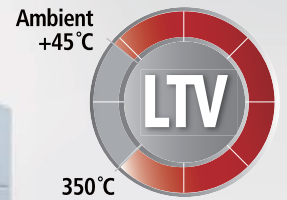
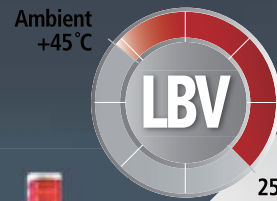


#### Stand (2 Stage)

- Placing of two compact devices vertically.
- Minimized installation space for different temperature and tests.

Model	Recorder (Paper)	Recorder (Digital)	Fan Speed Adjuster	Gas Purge System	Hour Meter	Stand (1 stage)	Stand (2 stage)
TC3-KE-025	AAA8T504	AAA8T506	N/A	N/A	N/A	AAA80631	AAA80634
TC3-KE-065	AAA8T504	AAA8T506	N/A	N/A	N/A	AAA80632	AAA80635
TC3-KE-100	AAA8T504	AAA8T506	N/A	N/A	N/A	AAA80633	N/A
TC3-ME-025	AAA8T504	AAA8T506	N/A	N/A	N/A	AAA80631	AAA80634
TC3-ME-065	AAA8T504	AAA8T506	N/A	N/A	N/A	AAA80632	AAA80635
TC3-ME-100	AAA8T504	AAA8T506	N/A	N/A	N/A	AAA80633	N/A
KBD-012	AAA8T500	AAA8T505	N/A	AAA80691	N/A	N/A	N/A
KBD-025	AAA8T500	AAA8T505	N/A	AAA80691	N/A	N/A	N/A
KBD-040	AAA8T500	AAA8T505	N/A	AAA80691	N/A	N/A	N/A
KBD-070	AAA8T500	AAA8T505	N/A	AAA80691	N/A	N/A	N/A
KBD-100	AAA8T500	AAA8T505	N/A	AAA80691	N/A	N/A	N/A
KMV-012	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
KMV-025	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
KMV-040	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
KMV-070	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
KMV-100	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
JMV-012	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
JMV-025	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
JMV-040	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
JMV-070	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
JMV-100	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
PBV-012	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
PBV-025	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
PBV-040	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
PBV-070	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
PBV-100	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
PMV-012	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
PMV-025	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
PMV-040	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
PMV-070	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
PMV-100	AAA8T500	AAA8T505	AAAK1531	AAA80691	AAAK1532	N/A	N/A
LCH-11	AAA8T500	AAA8T505	N/A	N/A	N/A	N/A	N/A
LCH-21	AAA8T500	AAA8T505	N/A	N/A	N/A	N/A	N/A
LCH-31	AAA8T500	AAA8T505	N/A	N/A	N/A	N/A	N/A
LCH-11-2C	AAA8T500	AAA8T505	N/A	N/A	N/A	N/A	N/A
LCH-11G	AAA8T500	AAA8T505	N/A	N/A	N/A	N/A	N/A
LCH-21G	AAA8T500	AAA8T505	N/A	N/A	N/A	N/A	N/A
LCH-31G	AAA8T500	AAA8T505	N/A	N/A	N/A	N/A	N/A
LCH-11G-2C	AAA8T500	AAA8T505	N/A	N/A	N/A	N/A	N/A

# Heating Chamber



Real-time equipment monitoring and control system using mobile app.



Registered safety patent based on JEIO TECH's proprietary technology.



Recognized as an excellent design product by the Ministry of Commerce, Industry, and Energy.



More precise temperature control through 3-point temperature calibration.



More precise temperature control through temperature calibration.



Electronic over temperature protection system.



Conventional over temperature protection, a kind of backup device against electronic over temperature protection failure.



Warning alarm in case of deviation of temperature control.



Purifies and discharges harmful gas through internal filter.



Intuitive operation with Color Touch display.



Control of temperature / time, etc. through dedicated program.



Possible to set end time or start time of device operation.



PC communication via RS-232 / RS-485 / USB port.



It memorizes the state of power failure and operates automatically when power is restored.



2 year warranty Free A/S.

## General Application

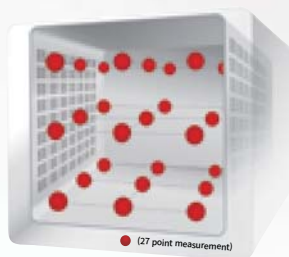
Industrial oven: Heat up to 350°C depending on the industrial site, and size is selectable from 125L to 1000L.

Clean oven: High temperature testing under clean conditions.

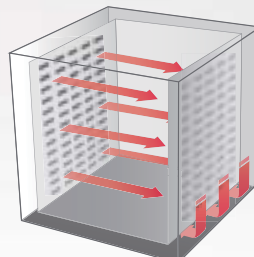
## Designed and tested based on 27 temperature measurement points in accordance with international standards

Horizontal airflow type with intake/damper included as standard.

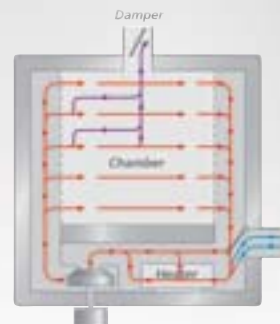
- › **Completion of verification according to strict international standards**  
High reliability by completing temperature verification at 27 points according to DIN 12880 standard.
- › **Steady and uniform horizontal airflow**  
Horizontal air flow optimized for uniform heat transfer ensures stable overall temperature distribution.
- › **Maintain precise temperature distribution**  
Air into Intake maintains precise control while supplying circulatory fresh air throughout the heater.
- › **Includes air intake/damper as standard**  
Adjustable air intake and damper are included as standard, making it easy to use.
- › **Excellent chamber structure with sealing and insulation**  
Excellent insulation and sealing to minimize energy loss and reduce test costs.
- › **Rapid air exchange capacity**  
Air intake and damper controls as standard for quick air exchange and various tests.
- › **Model provided based on temperature range and capacity**  
10 standard models up to 350°C and 1000L. Customized model can be provided according to user requirements.
- › **Enhanced safety thanks to over temperature double cut-off**  
Independent precision-type electronic over temperature protection device. Improved safety through double installation of mechanical devices.



Tested based on 27 temperature measurement points in accordance with DIN 12880



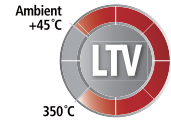
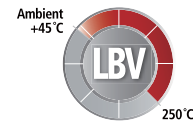
Uniform horizontal airflow



Structure allows for fresh air outside to be circulated through the heater

# Heating Chamber

Suitable for test of temperature feature such as heat treatment and drying.



## Completion of Temperature Verification According to Strict International Standard

- Temperature verification in accordance with DIN 12880 and IEC 60068-3-5 provides excellent reliability and reproducibility.
- Provided specification with the fluctuation and gradient in typical temperature point.
- Provided heating / cooling time data to help select the right model for testing purposes.
- Tested recovery time in accordance with specifications to provide data that is useful for real-use.

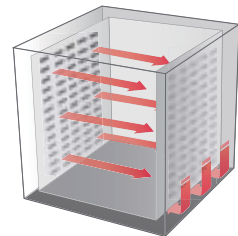
## Structural Functional Features

- Built-in air intake and damper that can be easily adjusted.
- There is a separate guard around the damper to protect the user from burns due to high temperature.
- Chamber structure with excellent sealing and insulation provides a stable long-term test and reduce costs by minimizing energy loss.
- According to international standards, even when operated at upper temperature, the surface temperature does not exceed 51°C. (EN-563 standard)
- Door consists of a double-sealed structure to satisfy DIN 58371. (door airtight guidance)
- Durability even after long-term repeated use has been verified by satisfying the door load test. (SEFA standard)
- Door locking device as standard offer.
- Equipped with easy-to-move/install caster.



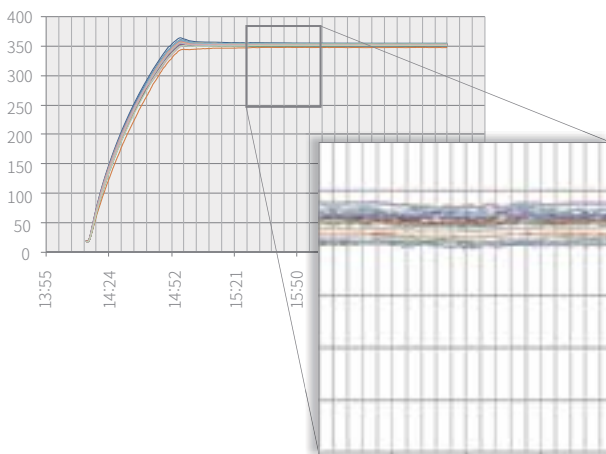
### LTV-012

with Wire Shelves 2ea (standard)  
Recorder (option)



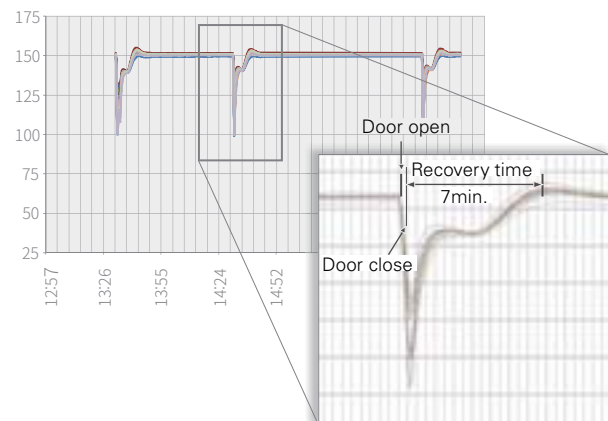
Uniform horizontal air flow

### Temperature Variation



LTV 070, 350°C

### Recovery Time After Door Opening



LTV 070, 150°C





## Optimized Dedicated Control System

- 3.5-inch color touch display controller applied.
- Intuitive screen configuration for easy and convenient control.
- Graph display makes it easier to check operation.
- PID zone subdivided into 4 zones for more precise control stability.
- RS-232 port (default) and RS-485 port (option) supported.
- Control and data processing by connecting up to 32 devices to PC at same time via RS-485 port.
- Includes software for PC control.
- Saving data, convenient for reporting.

Description	No.
Pattern	100
Repeat time	999
Part repeat time	255
Max. segments / pattern	100
Available max. segments	2000
Programmable process time / segment	99 hour 59 min.

\* It is possible to set 100 segments per pattern, but the maximum number of segments is not 10,000 (100 pattern x 100 segment) but 2,000.



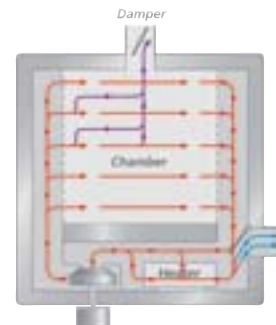
## Use Convenience Features

- Convenient opening and closing door with either side latches.
- Door handle with built-in key lock.
- Identify all operations and operating conditions from the front panel.
- Design by stainless steel internal chamber provide clean maintenance and excellent corrosion resistance.
- Perforated shelf for heavy-load sample. (option)
- Convenient and various options such as signal lamps, cable port, air cycle rate, gas purge, etc.



## Outstanding Safety

- Electronic over temperature protection system. (A-OT, advanced over temperature limiter)  
Independent precision temperature sensor and controller for safer and more accurate over temperature shutdown.
- Conventional over-temperature protection. (B-OT, backup over temperature limiter)  
A backup device for electronic system failure, mechanically preventing over temperature even when it occurs electronic errors.
- Door open warning and automatic shut off.
- Emergency stop button on the front of the product.
- Over-current and short circuit protection of device.
- When main power connections, users can quickly respond by notifying of electric phase sequence errors.
- Electrical instrumentation access warning and system shutdown.
- Each heater by fuse for more safety using.



Structure allows for fresh air outside to be circulated through the heater.

## Specification

Model	Max. 250°C					Max. 350°C				
	LBV-012	LBV-025	LBV-040	LBV-070	LBV-100	LTV-012	LTV-025	LTV-040	LTV-070	LTV-100
<b>Temperature data</b>										
<b>Range (intake/damper 100% close, °C / °F)</b>	Amb.+45 ~ 250 / Amb.+81 ~ 482					Amb.+45 ~ 350 / Amb.+81 ~ 662				
<b>Range (intake/damper 100% open, °C / °F)</b>	Max. 80 / 176	Max. 80 / 176	Max. 120 / 248	Max. 80 / 176	Max. 140 / 284	Max. 115 / 239	Max. 115 / 239	Max. 180 / 356	Max. 150 / 302	Max. 210 / 410
<b>Fluctuation (±°C / °F) <sup>1),2)</sup></b>										
at 100°C / 212°F	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.3 / 0.54	0.4 / 0.72	0.4 / 0.72	0.3 / 0.54	0.5 / 0.9	0.4 / 0.72
at 150°C / 302°F	0.3 / 0.54	0.3 / 0.54	0.4 / 0.72	0.4 / 0.72	0.4 / 0.72	0.4 / 0.72	0.4 / 0.72	0.3 / 0.54	0.4 / 0.72	0.6 / 1.08
at 200°C / 392°F	0.4 / 0.72	0.4 / 0.72	0.4 / 0.72	0.3 / 0.54	0.3 / 0.54	0.5 / 0.9	0.5 / 0.9	0.5 / 0.9	0.4 / 0.72	0.3 / 0.54
at 250°C / 482°F	0.5 / 0.9	0.5 / 0.9	0.5 / 0.9	0.6 / 1.08	0.4 / 0.72	0.6 / 1.08	0.6 / 1.08	0.6 / 1.08	0.4 / 0.72	0.4 / 0.72
at 300°C / 572°F	-	-	-	-	-	0.5 / 0.9	0.5 / 0.9	0.7 / 1.26	0.6 / 1.08	0.5 / 0.9
at 350°C / 662°F	-	-	-	-	-	0.7 / 1.26	0.7 / 1.26	0.6 / 1.08	0.6 / 1.08	0.8 / 1.44
<b>Gradient (±°C / °F) <sup>1)</sup></b>										
at 100°C / 212°F	0.4 / 0.72	0.4 / 0.72	0.5 / 0.9	0.5 / 0.9	0.5 / 0.9	0.5 / 0.9	0.5 / 0.9	0.6 / 1.08	0.7 / 1.26	0.4 / 0.72
at 150°C / 302°F	0.7 / 1.26	0.7 / 1.26	1 / 1.8	0.7 / 1.26	0.8 / 1.44	0.7 / 1.26	0.7 / 1.26	1 / 1.8	1.1 / 1.98	0.6 / 1.08
at 200°C / 392°F	1.1 / 1.98	1.1 / 1.98	1.7 / 3.06	1.1 / 1.98	1.2 / 2.16	1.1 / 1.98	1.1 / 1.98	1.7 / 3.06	1.9 / 3.42	1.1 / 1.98
at 250°C / 482°F	1.7 / 3.06	1.7 / 3.06	2.6 / 4.68	1.5 / 34.7	1.7 / 3.06	1.6 / 2.88	1.6 / 2.88	2.5 / 4.5	2.7 / 4.86	1.6 / 2.88
at 300°C / 572°F	-	-	-	-	-	2.4 / 4.32	2.4 / 4.32	3.4 / 6.12	3.4 / 6.12	2.4 / 4.32
at 350°C / 662°F	-	-	-	-	-	3.4 / 6.12	3.4 / 6.12	3.4 / 6.12	4.1 / 7.38	3.2 / 5.76
<b>Heating time (min, intake/damper 100% close) <sup>2)</sup></b>										
from Amb. to 100°C / 212°F	34	34	26	19	29	18	18	14	13	20
from Amb. to 150°C / 302°F	35	35	32	30	35	22	22	19	17	23
from Amb. to 200°C / 392°F	36	36	36	40	44	24	24	22	24	25
from Amb. to 250°C / 482°F	51	51	51	55	60	27	27	29	25	32
from Amb. to 300°C / 572°F	-	-	-	-	-	38	38	36	37	38
from Amb. to 350°C / 662°F	-	-	-	-	-	41	41	43	40	45
<b>Cooling time (min, intake/damper 100% open) <sup>2)</sup></b>										
from 150°C / 302°F to 100°C / 212°F	31 / 87.8 <sup>3)</sup>	31 / 87.8 <sup>3)</sup>	21 / 69.8	18 / 64.4 <sup>3)</sup>	31 / 87.8	19 / 66.2	19 / 66.2	9 / 48.2	11 / 51.8	15 / 59
from 200°C / 392°F to 100°C / 212°F	45 / 113 <sup>3)</sup>	45 / 113 <sup>3)</sup>	32 / 89.6	22 / 71.6 <sup>3)</sup>	48 / 118.4	28 / 82.4	28 / 82.4	15 / 59	15 / 59	54 / 129.2
from 250°C / 482°F to 100°C / 212°F	54 / 129.2 <sup>3)</sup>	54 / 129.2 <sup>3)</sup>	34 / 93.2	34 / 93.2 <sup>3)</sup>	62 / 143.6	41 / 105.8	41 / 105.8	21 / 69.8	16 / 60.8	59 / 138.2
from 300°C / 572°F to 100°C / 212°F	-	-	-	-	-	33 / 91.4	33 / 91.4	26 / 78.8	22 / 71.6	62 / 143.6
from 350°C / 662°F to 100°C / 212°F	-	-	-	-	-	43 / 109.4	43 / 109.4	30 / 86	27 / 80.6	62 / 143.6
<b>Recovery time after door was opened (min.) <sup>2)</sup></b>										
at 100°C / 212°F	10.5	10.5	8	6.5	8	8.5	8.5	6	6	7.5
at 150°C / 302°F	8	8	9	8	9.5	8.5	8.5	9	7.5	9.5
at 200°C / 392°F	4.5	4.5	8.5	7	8.5	3.5	3.5	8.5	8.5	8.5
at 250°C / 482°F	5	5	9.5	5.5	9.5	5	5	11.5	8.5	9.5
at 300°C / 572°F	-	-	-	-	-	7.5	7.5	12.5	8.5	9
at 350°C / 662°F	-	-	-	-	-	8.5	8.5	12.5	10	10
<b>Air circulation data</b>										
<b>Air change rate (approx, x/h)</b>	213	266	173	233	193	213	266	173	233	193
<b>Air circulation (approx, x/h)</b>	374	590	294	348	220	374	590	294	348	220
<b>Exhaust air volume flow (approx, L/min)</b>	380	1240	1400	1910	1560	380	1240	1400	1910	1560
<b>Air flow velocity (m/s)</b>	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	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
<b>Electrical requirement (230V/60Hz)</b>	1ph / 14A	1ph / 21.3A				1ph / 27.6A				
<b>Cat. No.</b>	AAHK1011K	AAHK1021K	-	-	-	AAHK2011K	-	-	-	-
<b>Electrical requirement (230V/50Hz)</b>	1ph / 14A	1ph / 21.3A				1ph / 27.6A				
<b>Cat. No.</b>	AAHK1012K	AAHK1022K	-	-	-	AAHK2012K	-	-	-	-
<b>Electrical requirement (380V/50Hz)</b>			3ph / 9.4A	3ph / 12A	3ph / 14.2A		3ph / 13.9A	3ph / 18.5A	3ph / 23.4A	3ph / 27.9A
<b>Cat. No.</b>	-	-	AAHK1038K	AAHK1048K	AAHK1058K	-	AAHK2028K	AAHK2039K	AAHK2048K	AAHK2058K

1) According to IEC 60068-3-5

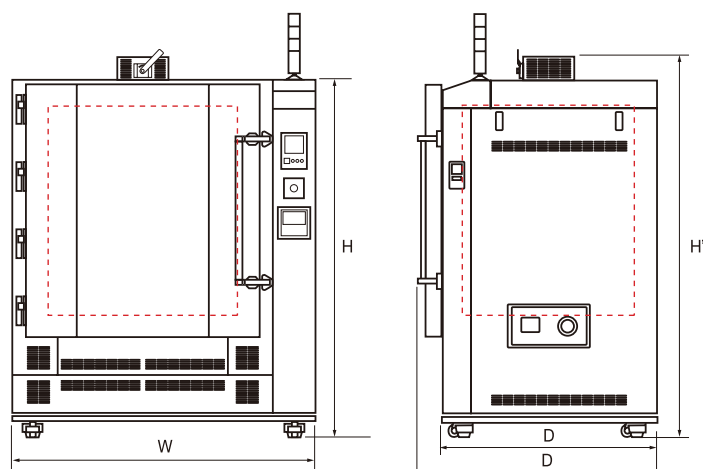
2) According to DIN 12880

3) Cooling time (min, Intake 50% close, Damper 100% open, According to DIN 12880)

※ Above specification value is recorded by 230V/60Hz, 380V/50Hz.

※ Above specifications can be changed without prior notice.





## Dimension

Model	Max. 250°C					Max. 350°C				
	LBV-012	LBV-025	LBV-040	LBV-070	LBV-100	LTV-012	LTV-025	LTV-040	LTV-070	LTV-100
<b>Interior dimension</b>										
Chamber volume (L / cu ft)	125 / 4.4	253 / 8.9	420 / 14.8	720 / 25.4	1000 / 35.3	125	253 / 8.9	420 / 14.8	720 / 25.4	1000 / 35.3
Width (mm / inch)	500 / 19.7	600 / 23.6	750 / 29.5	900 / 35.4	1000 / 39.4	500 / 19.7	600 / 23.6	750 / 29.5	900 / 35.4	1000 / 39.4
Depth (mm / inch)	500 / 19.7	650 / 25.6	700 / 27.6	800 / 31.5	910 / 35.8	500 / 19.7	650 / 25.6	700 / 27.6	800 / 31.5	910 / 35.8
Height (mm / inch)	500 / 19.7	650 / 25.6	800 / 31.5	1000 / 39.4	1100 / 43.3	500 / 19.7	650 / 25.6	800 / 31.5	1000 / 39.4	1100 / 43.3
Quantity of shelves (standard/max.)	2 / 6	2 / 8	2 / 11	2 / 14	2 / 16	2 / 6	2 / 8	2 / 11	2 / 14	2 / 16
Distance of between shelves (mm / inch)	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2	30 / 1.2
Max. load per shelf (kg / lbs)	15 / 33.1	20 / 44.1	30 / 66.1	40 / 88.2	45 / 99.2	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	50 / 110.2	70 / 154.3	90 / 198.4	120 / 264.6	150 / 330.7
Damper (Ø, mm / inch)	96.4 / 3.8	146.4 / 5.8	146.4 / 5.8	146.4 / 5.8	146.4 / 5.8	96.4 / 3.8	146.4 / 5.8	146.4 / 5.8	146.4 / 5.8	146.4 / 5.8
Air Intake (Ø, mm / inch)	42.8 / 1.7	73.3 / 2.9	73.3 / 2.9	73.3 / 2.9	73.3 / 2.9	42.8 / 1.7	73.3 / 2.9	73.3 / 2.9	73.3 / 2.9	73.3 / 2.9
<b>Exterior dimension</b>										
Width (mm / inch), W	1100 / 43.3	1200 / 47.2	1350 / 53.1	1500 / 59.1	1600 / 63	1100 / 43.3	1200 / 47.2	1350 / 53.1	1500 / 59.1	1600 / 63
Depth / with handle (mm-inch), D/D'	714 / 745 - 28.1 / 29.3	965 / 995 - 38 / 39.2	1014 / 1045 - 39.9 / 41.1	1114 / 1145 - 43.9 / 45.1	1224 / 1255 - 48.2 / 49.4	714 / 745 - 28.1 / 29.3	965 / 995 - 38 / 39.2	1014 / 1045 - 39.9 / 41.1	1114 / 1145 - 43.9 / 45.1	1224 / 1255 - 48.2 / 49.4
Height / with damper (mm-inch), H/H'	1240 / 1362 - 48.8 / 53.6	1435 / 1559 - 56.5 / 61.4	1590 / 1712 - 62.6 / 67.4	1790 / 1912 - 70.5 / 75.3	1890 / 2012 - 74.4 / 79.2	1240 / 1362 - 48.8 / 53.6	1435 / 1559 - 56.5 / 61.4	1590 / 1712 - 62.6 / 67.4	1790 / 1912 - 70.5 / 75.3	1890 / 2012 - 74.4 / 79.2
Weight (kg / lbs)	170 / 374.8	260 / 573.2	320 / 705.5	390 / 859.8	440 / 970	170 / 374.8	260 / 573.2	320 / 705.5	390 / 859.8	440 / 970

## Accessories

Model	LBV-012	LBV-025	LBV-040	LBV-070	LBV-100
	LTV-012	LTV-025	LTV-040	LTV-070	LTV-100
Wire shelf	00LTV0000070	00LTV0000053	00LTV0000029	00LTV0000030	00LTV0000054
Perforated shelf (Heavy load shelf)	AAAK1501	AAAK1502	AAAK1503	AAAK1504	AAAK1505
Viewing window (LBV Only)	AAAK1511		AAAK1512	AAAK1513	
Cable port (Φ80)	AAAK1521				
Cable port (Φ50)	AAAK1522				
Warning signal lamp	AAA80550				
Digital recorder (6 Channel)	AAA8T505				
Fan speed adjuster	AAAK1531				
Gas purge system	AAA80691				
Hour meter	AAAK1532				



### Gas Purge System

Gas system that can replace and purge the inside of chamber with nitrogen and CO<sub>2</sub> gas.

# Clean Oven

## Clean Oven - Class 100

### High temperature testing under clean conditions



**OFC-40HP**  
with Optional Accessory

**OFC-20**

#### **▮ Structural Functional Features**

- Optimized model provision and selection based on temperature range, capacity, controller, etc.
- Air flow optimized for uniform heat transfer ensures stable overall temperature distribution.
- Superior insulation and enclosed design minimize energy loss and reduce operating costs.
- Includes vent hole base with cover for gas exhaust, cable connection, etc. on the side.
- The door structure can be easily opened or closed, User can use both hands freely even if user hold the sample.
- Stainless steel interior and shelves are excellent in terms of corrosion resistance and clean maintenance.
- Includes castors, making it easy to move and install.
- Triple-toughened viewing window for safe and convenient observation even at high temperatures. (option)

#### **▮ Use Convenience Features**

- 3-point temperature calibration, high temperature accuracy over a wide temperature range.
- Optimized control with temperature auto-tuning.
- Save and use 3 frequently used temperatures.
- Wait On/Off timer.  
(OFC:Max. 999hour 59min., OFC-P:Max. 99hour 59min.)
- Microprocessor PID method for precise temperature control.
- USB/RS-232 connection and software provide convenient computer operation and data managing.
- Automatic restart of operation when power is restored after sudden power failure.

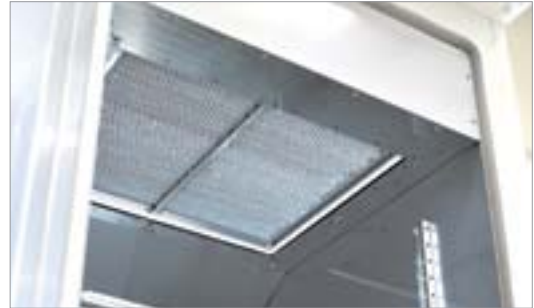
#### **▮ Outstanding Safety**

- Top-rated overheating protection system.  
(registration 10-0397583)
- Safe surface temperature even when operating at higher temperatures.
- Over temperature limit function. (over temperature limiter)
- Notifies when deviation from control temperature upper limit and lower limit occurs.
- Safe structure in which the heater, sensor, and pump inside the bath are separated by covering plates.
- Malfunction prevented by controller lock function.
- Provides notification/alarms when the door is open for an extended period of time.



### **▣ Built-in Class 100 HEPA Filter**

- The inside of the dryer is equipped with a heat-resistant HEPA filter to provide a clean environment inside the chamber.
- Class 100 cleanliness provided by HEPA Filter enabling 99.97% filtering of 0.3µm particles.
- Determines when to replace the filter with the built-in differential pressure gauge.
- Real time monitoring of HEPA filter status with digital differential pressure sensor and automatic replacement notification. (option)



### **▣ Smart Program Controller (OFC-P model)**

- Convenient operation with color LCD touch screen.
- 10-step programs can be set, so it is convenient for complex testing.
- Set time up to 99 hours and 59 minutes per step.
- Program repetition possible up to 99 times.



## **Specification**

		Max. 200°C		Max. 300°C	
Model	Basic Controller	OFC-20	OFC-40	OFC-20H	OFC-40H
	Program Controller	OFC-20P	OFC-40P	OFC-20HP	OFC-40HP
<b>Chamber volume (L / cu ft)</b>		200 / 7.1	400 / 14.1	200 / 7.1	400 / 14.1
<b>Temperature</b>	Range (°C / °F)	Amb.+15 ~ 200 / Amb.+27 ~ 392	Amb.+15 ~ 200 / Amb.+27 ~ 392	Amb.+15 ~ 300 / Amb.+27 ~ 572	Amb.+15 ~ 300 / Amb.+27 ~ 572
	Fluctuation at 100°C / 212°F (±°C / °F)	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36	0.2 / 0.36
	Variation at 100°C / 212°F (±°C / °F)	2 / 3.6	2.2 / 3.96	2 / 3.6	2.2 / 3.96
	Heating time to 100°C / 212°F (min.)	20	25	15	20
	Recovery time at 100°C / 212°F (min.)	7	7	7	7
<b>Dimensions</b>	Interior (W x D x H, mm / inch)	645 x 750 x 412 / 25.4 x 29.5 x 16.2	645 x 750 x 866 / 25.4 x 29.5 x 34.1	645 x 750 x 866 / 25.4 x 29.5 x 16.2	645 x 750 x 866 / 25.4 x 29.5 x 34.1
	Exterior (W x D x H, mm / inch)	850 x 1025 x 1240 / 33.5 x 40.4 x 48.8	850 x 1025 x 1692 / 33.5 x 40.4 x 66.6	850 x 1025 x 1240 / 33.5 x 40.4 x 48.8	850 x 1025 x 1692 / 33.5 x 40.4 x 66.6
	Net Weight (kg / lbs)	190 / 418.9	250 / 551.2	190 / 418.9	250 / 551.2
<b>Electrical requirements (230V, 50/60Hz, A)</b>		12.0 (1Phase)	-	-	-
<b>Cat No.</b>	<b>Basic Controller</b>	<b>Solid door</b>	AAH171115K	-	-
		<b>Window door</b>	AAH171125K	-	-
	<b>Program Controller</b>	<b>Solid door</b>	AAH173115K	-	-
		<b>Window door</b>	AAH173125K	-	-
<b>Electrical requirements (380V/50Hz)</b>		-	6.7A (3Phase)	6.2A (3Phase)	9.0A (3Phase)
<b>Cat No.</b>	<b>Basic Controller</b>	<b>Solid door</b>	-	AAH171214K	AAH172114K
		<b>Window door</b>	N/A	AAH171224K	AAH172124K
	<b>Program Controller</b>	<b>Solid door</b>	-	AAH173214K	AAH174114K
		<b>Window door</b>	-	AAH173224K	AAH174124K

## **Accessories**

Model	OFC-20	OFC-40	OFC-20H	OFC-40H
	OFC-20P	OFC-40P	OFC-20HP	OFC-40HP
<b>Viewing window</b>	AAA17505	AAA17509	AAA17505	AAA17509
<b>Perforated shelf</b>	00RTD0001196			
<b>Dot recorder</b>	AAA8T500			
<b>Thermal line recorder</b>	AAAE1503			
<b>Digital recorder</b>	AAA8T505			
<b>Digital differential pressure gauge</b>	AAAB1571(Analog, OFC) 00STT0002793(Digital, OFC-P)			
<b>HEPA filter</b>	00STT0002792			