

# 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<br>(°C / °F)   | Airflow            | Volume<br>(L / cu ft)                                             | 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<br>/ -40 to 302 | Vertical airflow   | 25, 65, 100<br>/ 0.9, 2.3, 3.5                                    | TC3-KE | 304  |
|                        |                                                                                                                                                                                                       | -20 to 150<br>/ -4 to 302  | Vertical airflow   | 25, 65, 100<br>/ 0.9, 2.3, 3.5                                    | TC3-ME | 304  |
| Medium large size type | <b>Ultra low temp. type (-70°C)</b> <ul style="list-style-type: none"> <li>• Verification completed according to international standards</li> <li>• Convenient safety system configuration</li> </ul> | -70 to 180<br>/ -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 (-40°C)</b> <ul style="list-style-type: none"> <li>• 27 points temperature verification completed</li> <li>• High-load samples are available</li> </ul>              | -35 to 180<br>/ -31 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 (-40°C)</b> <ul style="list-style-type: none"> <li>• Vertical airflow model series</li> <li>• Provide good permeable shelves</li> </ul>                                | -35 to 180<br>/ -31 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 (-25°C)</b> <ul style="list-style-type: none"> <li>• Excellent durability and performance</li> <li>• Dual overheating temperature limiter</li> </ul>                                | -25 to 100<br>/ -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 custom options</li> </ul>                                        | -5 to 100<br>/ 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<br>/ -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<br>/ 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

### Powerful & Useful control Optimized precision control

› **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.

› **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.



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



Electronic over temperature protection system.



Controller for temperature. (TC3-model)



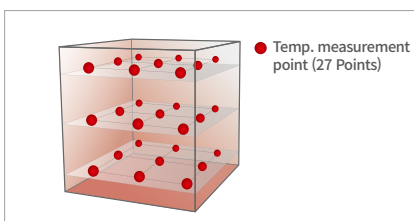
## Maximized usability with simple and useful functions

- > **Ease of check the test status**  
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 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.

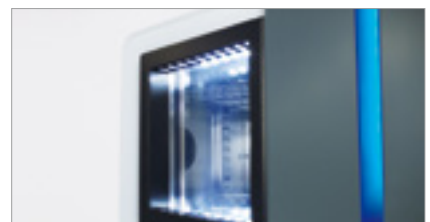
※ Some of the above contents are limited to specific models.



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)

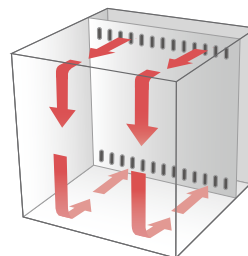


### TC3-KE

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



### TC3-ME

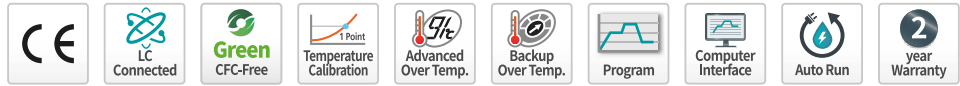


### Optimized Model Configuration

- 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 panel.
- 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 operation 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.
- Monitor and control via mobile app anytime, anywhere with LC Connected. (mobile monitoring system) (when purchased LC GreenBox)



Cable port



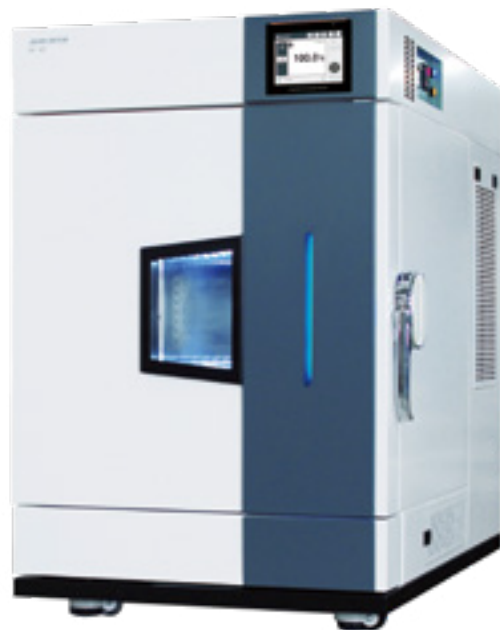
Door handles & Locking device

| Description                                | No.             |
|--------------------------------------------|-----------------|
| <b>Pattern</b>                             | 100             |
| <b>Repeat time</b>                         | 999             |
| <b>Part repeat time</b>                    | 255             |
| <b>Max. segments / pattern</b>             | 100             |
| <b>Available max. segments</b>             | 2000            |
| <b>Programmable process time / segment</b> | 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 data &amp; Ordering information</b> |                         |                         |                         |                        |                        |                        |
| Electrical requirements (230V, 1ph, 60Hz, A)      | 7.4                     | 8.8                     | 10.8                    | 5.3                    | 6.1                    | 6.8                    |
| <b>Cat. No.</b>                                   | <b>AAH861131K</b>       | <b>AAH861231K</b>       | <b>AAH861331K</b>       | <b>AAH860131K</b>      | <b>AAH860231K</b>      | <b>AAH860331K</b>      |
| Electrical requirements (230V, 1ph, 50Hz, A)      | 7.4                     | 8.8                     | 10.8                    | 5.3                    | 6.1                    | 6.8                    |
| <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.

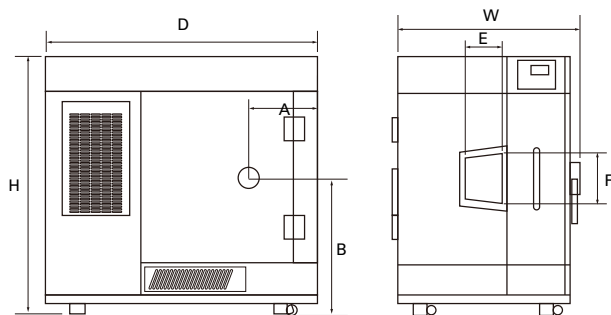
※ Permissible environmental conditions are 18 - 30°C (recommended 20°C), 85% RH or less, under 2000m above sea level.

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> | 880 / 34.6 | 1050 / 41.3 | 1110 / 43.7 | 880 / 34.6 | 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, LC Green Box



# Heating & Cooling Chamber

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

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

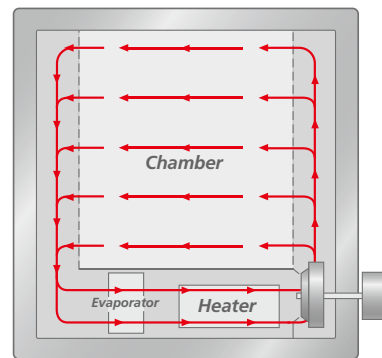


### KBD-040

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

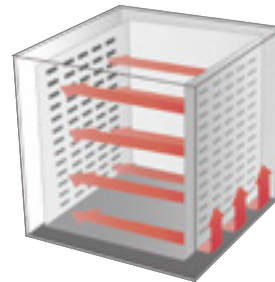
### Completion of Temperature Verification According to Strict International Standard

- 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

- 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 panel.
- 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.

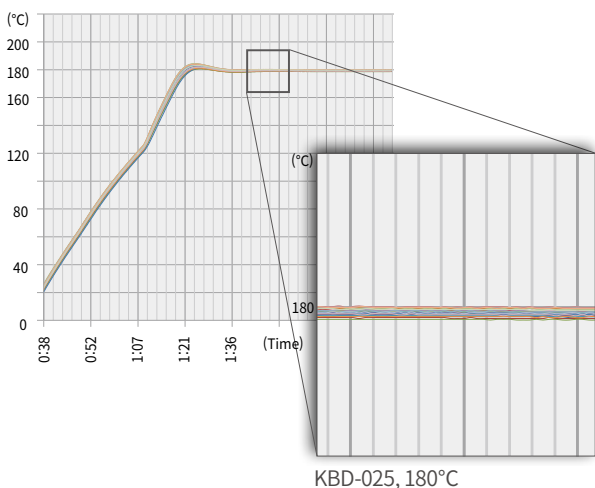
| Description                         | No.            |
|-------------------------------------|----------------|
| Pattern                             | 100            |
| Repeat time                         | 999            |
| Part repeat time                    | 255            |
| Max. segments / 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.

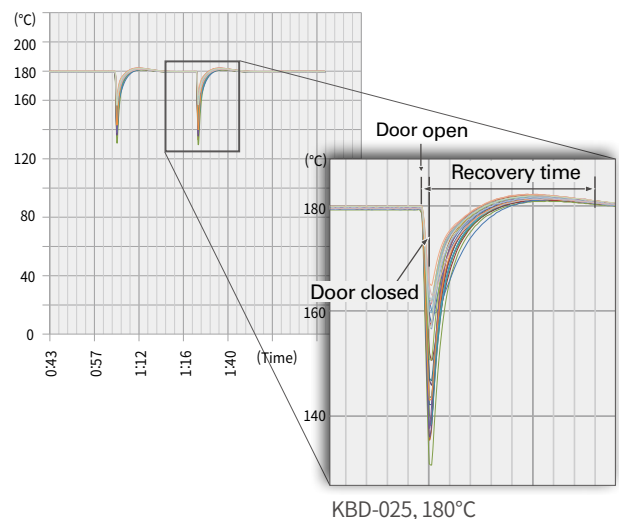
## Outstanding Safety

- 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

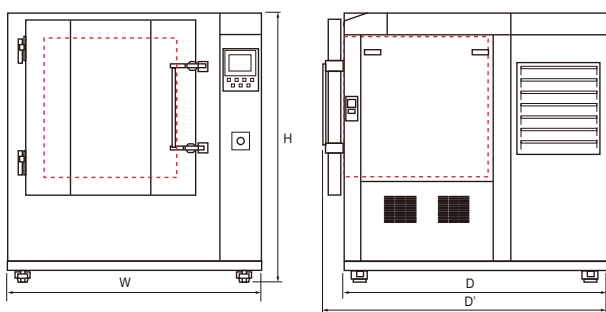
| Model                                                                    | KBD-012                    | KBD-025                    | KBD-040                    | KBD-070                    | KBD-100                    |
|--------------------------------------------------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| <b>Temperature data</b>                                                  |                            |                            |                            |                            |                            |
| Range (°C / °F)                                                          | -70 to 180<br>/ -94 to 356 | -70 to 180<br>/ -94 to 356 | -70 to 180<br>/ -94 to 356 | -70 to 180<br>/ -94 to 356 | -70 to 180<br>/ -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>Electrical data &amp; Ordering information</b>                        |                            |                            |                            |                            |                            |
| Electrical requirement (380V, 50Hz, 3P, A)                               | 10                         | 12                         | 18                         | 29                         | 29                         |
| <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<br>52.2 / 53.5 | 1492 / 1525<br>58.7 / 60 | 1567 / 1600<br>61.7 / 63 | 1777 / 1810<br>70 / 71.3 | 1887 / 1920<br>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 (-35°C), horizontal airflow

### Horizontal airflow and -35 to 180°C temperature range

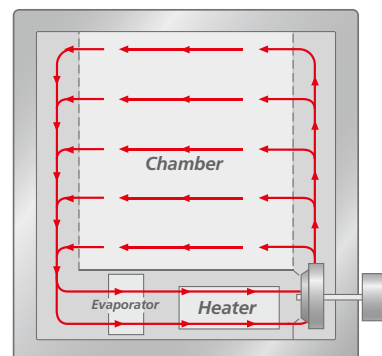


#### KMV-040

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

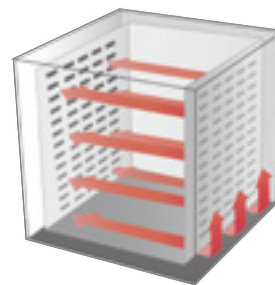
#### Completion of Temperature Verification According to Strict International Standard

- 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 panel.
- 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.

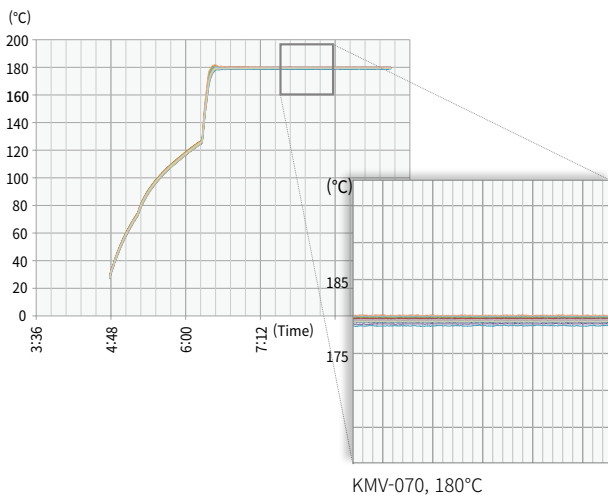
| Description                         | No.            |
|-------------------------------------|----------------|
| Pattern                             | 100            |
| Repeat time                         | 999            |
| Part repeat time                    | 255            |
| Max. segments / 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.

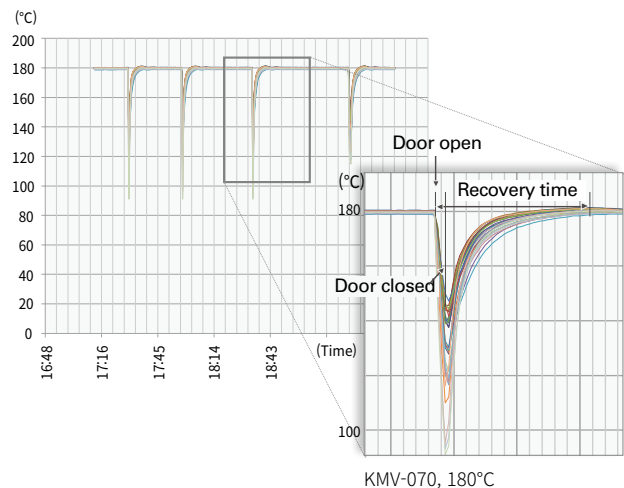
## Outstanding Safety

- 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

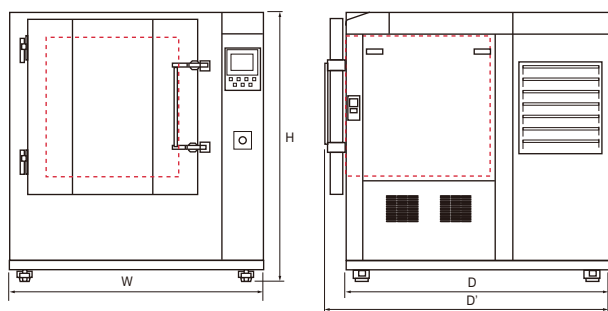
| Model                                                                     | KMV-012                   | KMV-025                   | KMV-040                   | KMV-070                   | KMV-100                   |
|---------------------------------------------------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| <b>Temperature data</b>                                                   |                           |                           |                           |                           |                           |
| Range (°C / °F)                                                           | -35 to 180<br>/-31 to 356 | -35 to 180<br>/-31 to 356 | -35 to 180<br>/-31 to 356 | -35 to 180<br>/-31 to 356 | -35 to 180<br>/-31 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>Electrical data &amp; Ordering information</b>                         |                           |                           |                           |                           |                           |
| Electrical requirement (230V, 60Hz, 1P, A)                                | 19.2                      | 26                        |                           |                           |                           |
| <b>Cat. No.</b>                                                           | <b>AAHK9011K</b>          | <b>AAHK9021K</b>          | -                         | -                         | -                         |
| Electrical requirement (230V, 50Hz, 1P, A)                                | 19.2                      | 26                        |                           |                           |                           |
| <b>Cat. No.</b>                                                           | <b>AAHK9012K</b>          | <b>AAHK9022K</b>          | -                         | -                         | -                         |
| Electrical requirement (380V, 50Hz, 3P, A)                                |                           |                           | 12.5                      | 18                        | 19.4                      |
| <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<br>29.1 / 30.5 | 890 / 925<br>35 / 36.4 | 940 / 975<br>37 / 38.4 | 1595 / 1625<br>62.8 / 64 | 1695 / 1725<br>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 (-35°C), vertical airflow

### Vertical airflow and -35 to 180°C temperature range



**JMV-070**

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

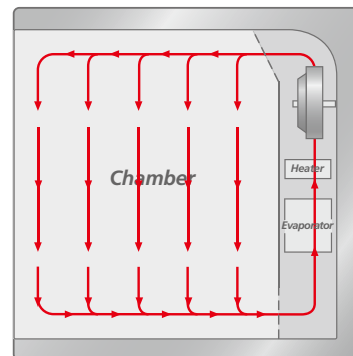


#### Completion of Temperature Verification According to Strict International Standard

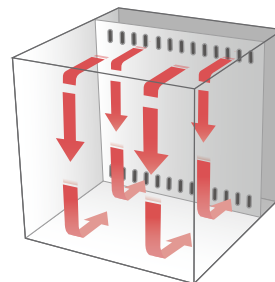
- Temperature verification in accordance with DIN 12880 and IEC 60068-3-5 provides excellent reliability and reproducibility.
- Provided specification the fluctuation and gradient in typical temperature point.
- Provided heating / cooling time data to help select the right model for testing purposes.
- 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 panel.
- 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.

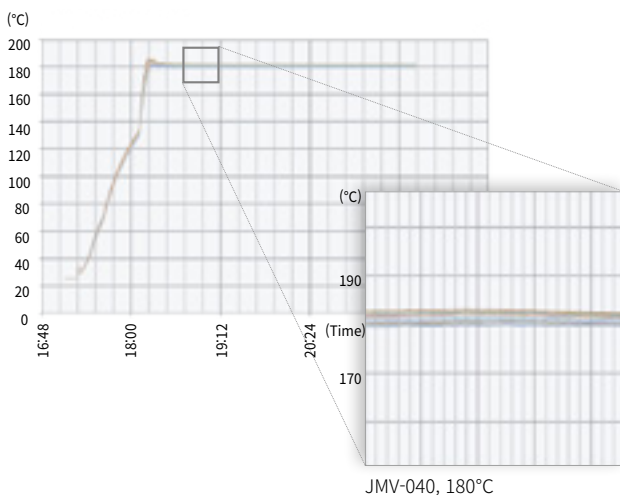
| Description                         | No.            |
|-------------------------------------|----------------|
| Pattern                             | 100            |
| Repeat time                         | 999            |
| Part repeat time                    | 255            |
| Max. segments / 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.

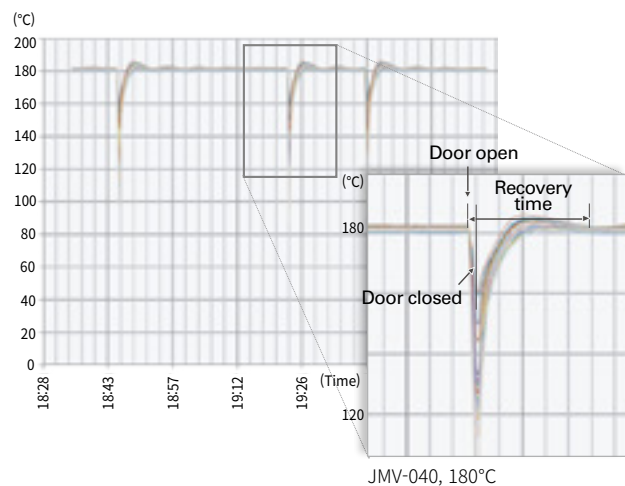
## Outstanding Safety

- 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

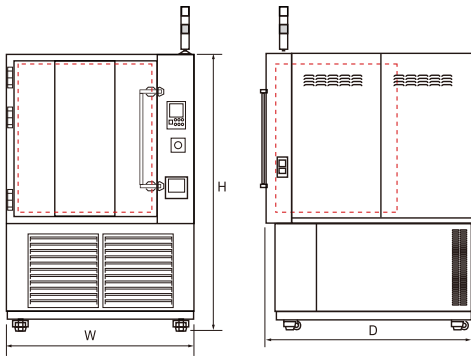
| Model                                                                    | JMV-012                    | JMV-025                    | JMV-040                    | JMV-070                    | JMV-100                    |
|--------------------------------------------------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| <b>Temperature data</b>                                                  |                            |                            |                            |                            |                            |
| Range (°C / °F)                                                          | -35 to 180<br>/ -31 to 356 | -35 to 180<br>/ -31 to 356 | -35 to 180<br>/ -31 to 356 | -35 to 180<br>/ -31 to 356 | -35 to 180<br>/ -31 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>Recovery 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>Electrical data &amp; Ordering information</b>                        |                            |                            |                            |                            |                            |
| Electrical requirement (230V, 60Hz, 1P, A)                               | 19.2                       | 26                         | -                          | -                          | -                          |
| <b>Cat. No.</b>                                                          | <b>AAHKB011K</b>           | <b>AAHKB021K</b>           | -                          | -                          | -                          |
| Electrical requirement (230V, 50Hz, 1P, A)                               | 19.2                       | 26                         | -                          | -                          | -                          |
| <b>Cat. No.</b>                                                          | <b>AAHKB012K</b>           | <b>AAHKB022K</b>           | -                          | -                          | -                          |
| Electrical requirement (380V, 50Hz, 3P, A)                               | -                          | -                          | 12.5                       | 18                         | 19.4                       |
| <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 airflow

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



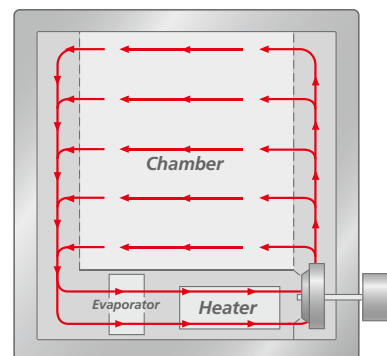
### PBV-040

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



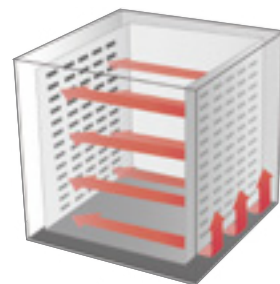
### Completion of Temperature Verification According to Strict International Standard

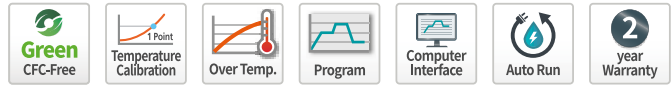
- Temperature verification in accordance with DIN 12880 and IEC 60068-3-5 provides excellent reliability and reproducibility.
- Provided specification the fluctuation and gradient in typical temperature point.
- Provided heating / cooling time data to help select the right model for testing purposes.
- 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 panel.
- 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.

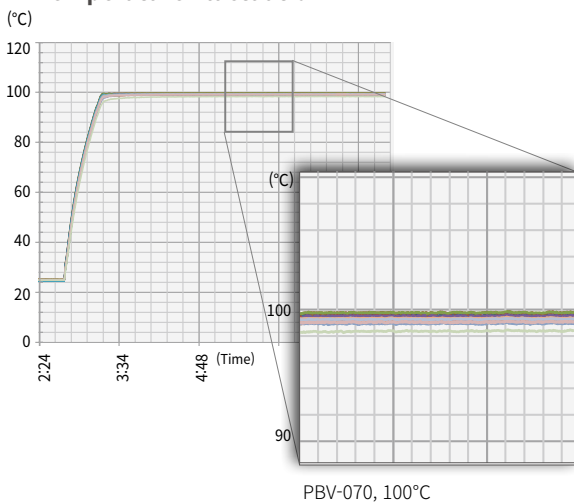
| Description                                | No.            |
|--------------------------------------------|----------------|
| <b>Pattern</b>                             | 100            |
| <b>Repeat time</b>                         | 999            |
| <b>Part repeat time</b>                    | 255            |
| <b>Max. segments / pattern</b>             | 100            |
| <b>Available max. segments</b>             | 2000           |
| <b>Programmable process time / segment</b> | 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.

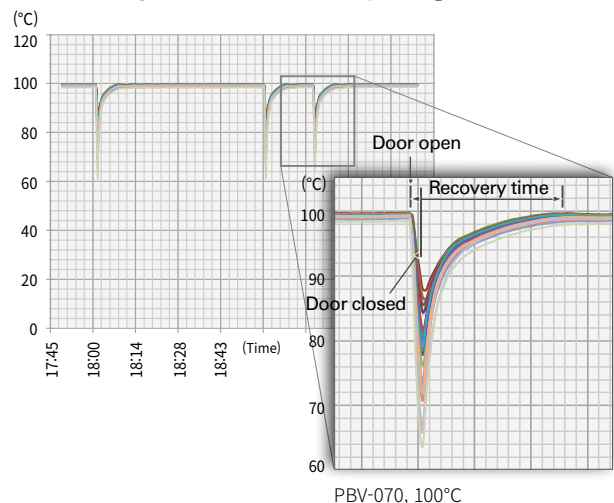
## Outstanding Safety

- 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

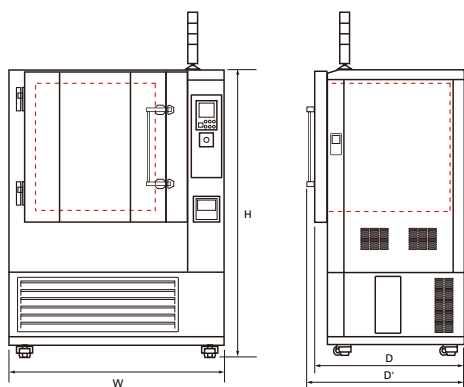
| Model                                                                    | PBV-012                    | PBV-025                    | PBV-040                    | PBV-070                    | PBV-100                    |
|--------------------------------------------------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| <b>Temperature data</b>                                                  |                            |                            |                            |                            |                            |
| Range (°C / °F)                                                          | -25 to 100<br>/ -13 to 212 | -25 to 100<br>/ -13 to 212 | -25 to 100<br>/ -13 to 212 | -25 to 100<br>/ -13 to 212 | -25 to 100<br>/ -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>Electrical data &amp; Ordering information</b>                        |                            |                            |                            |                            |                            |
| Electrical requirement (230V, 60Hz, 1P, A)                               | 16.3                       | 22.8                       |                            |                            |                            |
| <b>Cat. No.</b>                                                          | <b>AAHK5011K</b>           | <b>AAHK5021K</b>           | -                          | -                          | -                          |
| Electrical requirement (230V, 50Hz, 1P, A)                               | 16.3                       | 22.8                       |                            |                            |                            |
| <b>Cat. No.</b>                                                          | <b>AAHK5012K</b>           | <b>AAHK5022K</b>           | -                          | -                          | -                          |
| Electrical requirement (380V, 50Hz, 3P, A)                               |                            |                            | 7.3                        | 9.1                        | 10.9                       |
| <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<br>26.5 / 27.6 | 822 / 852<br>32.4 / 33.5 | 872 / 902<br>34.3 / 35.5 | 1510 / 1540<br>59.4 / 60.6 | 1620 / 1650<br>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 airflow

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



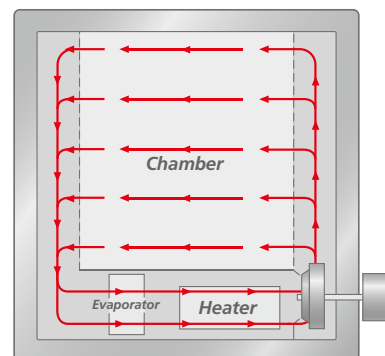
**PMV-040**

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



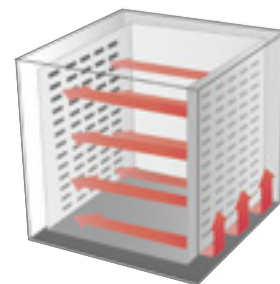
### Completion of Temperature Verification According to Strict International Standard

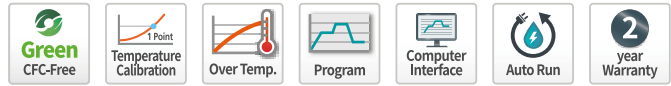
- Temperature verification in accordance with DIN 12880 and IEC 60068-3-5 provides excellent reliability and reproducibility.
- Provided specification the fluctuation and gradient in typical temperature point.
- Provided heating / cooling time data to help select the right model for testing purposes.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

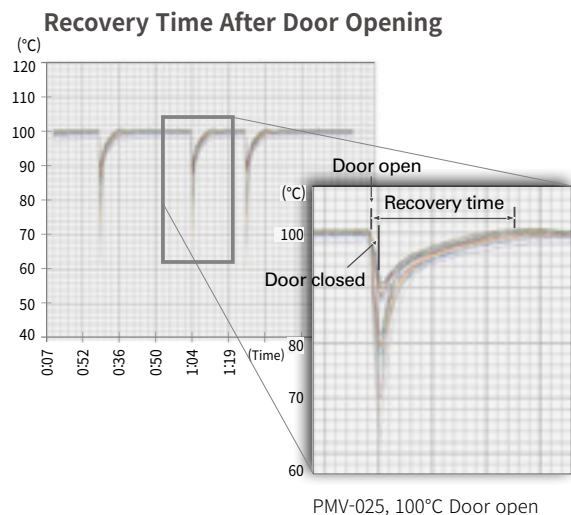
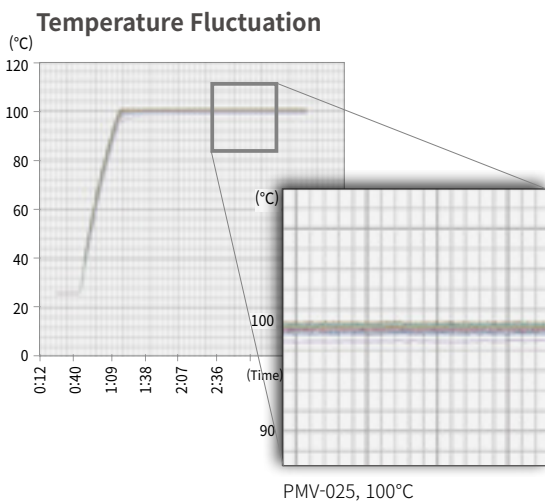
- Convenient opening and closing door with either side latches.
- Door handle with built-in key lock.
- Identification of the control and operating conditions at the front panel.
- Design by stainless steel internal chamber provide clean maintenance and excellent corrosion resistance.
- Easy to clean 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.            |
|--------------------------------------------|----------------|
| <b>Pattern</b>                             | 100            |
| <b>Repeat time</b>                         | 999            |
| <b>Part repeat time</b>                    | 255            |
| <b>Max. segments / pattern</b>             | 100            |
| <b>Available max. segments</b>             | 2000           |
| <b>Programmable process time / segment</b> | 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

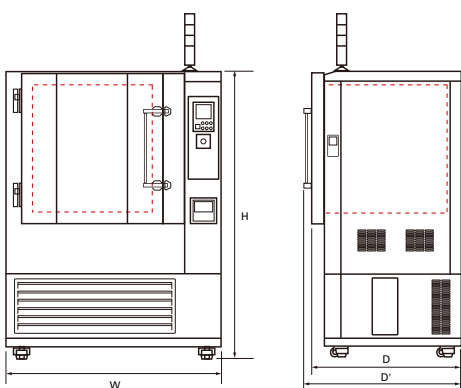
| Model                                                                    | PMV-012                  | PMV-025                  | PMV-040                  | PMV-070                  | PMV-100                  |
|--------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>Temperature data</b>                                                  |                          |                          |                          |                          |                          |
| Range (°C / °F)                                                          | -5 to 100<br>/ 23 to 212 | -5 to 100<br>/ 23 to 212 | -5 to 100<br>/ 23 to 212 | -5 to 100<br>/ 23 to 212 | -5 to 100<br>/ 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>Electrical data &amp; Ordering information</b>                        |                          |                          |                          |                          |                          |
| Electrical requirement (230V, 60Hz, 1P, A)                               | 9.7                      | 13.2                     | 15.5                     | 21.7                     |                          |
| <b>Cat. No.</b>                                                          | <b>AAHK4011K</b>         | <b>AAHK4021K</b>         | <b>AAHK4031K</b>         | <b>AAHK4041K</b>         | -                        |
| Electrical requirement (230V, 50Hz, 1P, A)                               | 9.7                      | 13.2                     | 15.5                     | 21.7                     |                          |
| <b>Cat. No.</b>                                                          | <b>AAHK4012K</b>         | <b>AAHK4022K</b>         | <b>AAHK4032K</b>         | <b>AAHK4042K</b>         | -                        |
| Electrical requirement (380V, 50Hz, 3P, A)                               |                          |                          |                          |                          | 6                        |
| <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<br>26.5 / 27.6 | 822 / 852<br>32.4 / 33.5 | 872 / 902<br>34.3 / 35.5 | 1510 / 1540<br>59.4 / 60.6 | 1620 / 1650<br>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 (-20°C, 0), horizontal airflow

### 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 panel.
- 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.

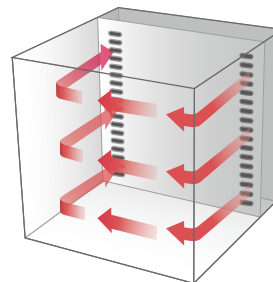


**LCH-21**

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

**LCH-11G-2C**

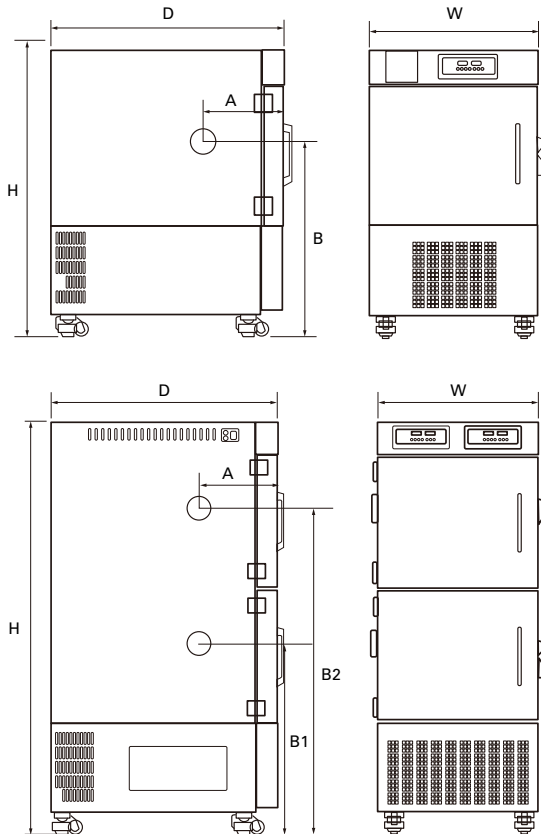
with 2EA wire shelves (standard)  
per chamber



## 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 / 6                    | 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, 1P, A)        | 6.3                    | 9.2                    | 11.1                   | 12.6                     | 7.1                  | 10.6                 | 13.8                 | 14.2                              |
| <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, 1P, A)        | 6.3                    | 9.2                    | 11.1                   | 12.6                     | 7.1                  | 10.6                 | 13.8                 | 14.2                              |
| <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, 3P, A)        | 11.6                   | -                      | -                      | 23.2                     | 13                   | -                    | -                    | 26                                |
| <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<br>LCH-11 | LCH-21G<br>LCH-21 | LCH-31G<br>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

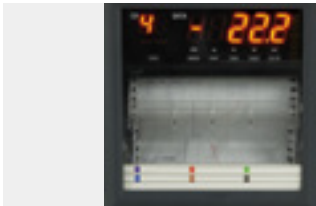
- Figuring out equipment status remotely.
- Run/Stand-by/Error displayed by color.



## LC GreenBox

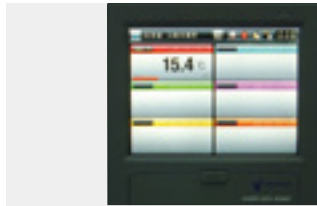
- Monitor and control the operation status of the device in real time via mobile app with simple internet connection.
- One LC GreenBox can connect up to 4 devices. (only TC3 model (Cat. No.: AAAQ1011))

| Model      | Standard       | Cable Port ø50 | Cable Port ø80 | Wire Shelf   | Perforated Shelf | Viewing Window | Signal Lamp |
|------------|----------------|----------------|----------------|--------------|------------------|----------------|-------------|
| TC3-KE-025 | ø50 Cable Port | AAA8T612       | N/A            | 00RTD0000679 | AAA80602-6       | N/A            | AAA80550    |
| TC3-KE-065 | ø50 Cable Port | AAA8T612       | AAA8T611       | 00RTD0000680 | AAA80602-7       | N/A            | AAA80550    |
| TC3-KE-100 | ø50 Cable Port | AAA8T612       | 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       | 00EDA0008220 | AAA22522         | N/A            | N/A         |
| LCH-31     | ø80 Cable Port | AAA8T610       | AAA8T611       | AAAK6531     | AAAK6532         | 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       | 00EDA0008220 | AAA22522         | N/A            | N/A         |
| LCH-31G    | ø80 Cable Port | AAA8T610       | AAA8T611       | AAAK6531     | AAAK6532         | 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             |