Environmental simulation chambers
MK | MKF | MKT
Natural simulation at its best!

Expanding the scope of natural environmental simulation, the new generation of BINDER temperature and climatic test chambers set new standards in Research and Development, Quality Assurance and Materials Testing. They are designed for materials testing at temperatures between -70°C – 180°C [-94 °F to 356 °F] with many features included as standard equipment. Absolutely reliable technology of the highest caliber. In addition to their improved temperature dynamics of up to 5K/min. during heating and cooling, the main advantage of this redesigned series is a highly responsive humidification system, which can operate regardless of the available feed water quality. The pressurized steam is injected through a valve into the interior, where it rapidly distributes homogenously and in a superfine mist throughout the entire chamber. Fine-tuning the interaction between these various factors results in truly natural simulation of all conditions, a sound basis for absolutely reliable materials testing and – Best Conditions for your Success!

MK series – Environmental simulation chambers for classic temperature profiles
This series covers the classic temperature range between -40 °C (-40°F) and 180 °C (356°F) for heat and refrigeration tests.
Model size: 53, 115, 240, 720 liter

MKF series – Environmental simulation chambers for complex alternating climatic profiles
The MKF series is ideally suited for all tests in accordance with current temperature and climatic test standards based on DIN and IEC standards from -40 °C (-40°F) to 180 °C (356°F) and humidity range from 10% to 98 % RH.
Model size: 240 liter

MKT series – Environmental simulation chambers for complex temperature profiles in low temperature area
The MKT test chambers meet all requirements for testing under extreme temperature conditions between -70 °C (-94 °F) and 180 °C (356 °F).
Model size: 240 liter
MK | MKF | MKT series
Facts you should know:

► Absolute precision from -70 to +180 °C.
   Precision in temperature control that is available only from Binder and is standard in all of our units. The specially designed APT.line™ provides maximum airflow. The Horizontal Airflow Design ensures natural simulation through symmetrical airflow. Highly accurate temperature control up to maximum load conditions, including a programmable dew preventer for protecting your test specimens.

► Humidity a la carte: Electronically controlled from 10 to 98% RH.
   The electronically controlled humidification and dehumidification system ensures reliable and constant humidity levels, even with repeated batch changes. Precise control with a capacitive humidity sensor. Absolutely reliable: no maintenance, no drift, ensures uninterrupted testing.

► Outstanding price/performance ratio
   Standard equipment:
   - Heated viewing window with interior lighting
   - Capacitive humidity sensor
   - Pressurized steam humidification
   - Wheels
   - Ethernet interface
   - Access ports

► Details: Your key to perfection.
   When you rely on precision, speed, and consistency in temperature control, it's the little things that count; details give a product the final touch. At Binder, this includes the following features:

1. MCS Controller. Improved color display and easy programming of complex test profiles
2. Direct water connection. Automatic water replacement - an important requirement for trouble-free long-term studies.
3. The interior. Absolutely smooth surfaces made of high-quality stainless steel and rounded edges permit easy cleaning and perfect hygiene.
4. Optimization of usable space. Maximum utilization for all common test specimen sizes and convenient loading.
MK series
Environmental test chambers for complex temperature profiles

This series covers the classic temperature range between -40 °C (-40 °F) and 180 °C (356 °F) for heat and refrigeration tests – with the added benefit of natural simulation by means of preheating chamber technology and the Horizontal Air Flow Design. Unique technology, developed by BINDER. With these features, the MK series thus meets the highest precision and performance requirements for cyclic temperature tests and presents an intelligent alternative to expensive individual solutions.

Equipment:
- Electronically controlled APt.line™ preheating chamber technology
- MCS controller with 25 storable programs of 100 sections each for a maximum of 500 program segments
  - User friendly LCD screen
  - Easy-to-read menu guide
  - Integrated electronic chart recorder
  - Variety of options for the graphic display of process parameters
  - Real time
  - Programmable condensation protection for test material
  - 230 V power socket on the right-side operating panel (MK 240/720)
  - Adjustable ramp function via program editor
  - Access port Ø 80 mm (3.1 inch) top (MK 53), Ø 50 mm (2 inch) left side (MK 240),
    2 access ports Ø 80 mm (3.1 inch) right and left side (MK 720)
  - Temperature safety device class 2 (DIN 12880) with visual and acoustic temperature alarm
  - Heated viewing window with interior lighting
  - Environmental friendly refrigerant R 404a
  - Ethernet or RS 422 interface for GLP/GMP and FDA guideline 21 CFR Part 11 compliant APT-COM™
  - DataControlSystem software
  - 1 stainless steel shelf
  - BINDER test certificate
MKF series
Climatic test chambers for complex alternating climatic profiles

The MKF series is ideally suited for all tests in accordance with current temperature and climatic test standards based on DIN and IEC standards. The required temperature and humidity values can be attained rapidly and maintained accurately, even under extreme conditions. The unparalleled ease of operation as well as extensive standard features provide that "little extra" in handling.

Equipment:
- Electronically controlled APT-line™ preheating chamber technology
- MCS controller with 25 storable programs of 100 sections each for a maximum of 500 program segments
  - User friendly LCD screen
  - Easy-to-read menu guide
  - Integrated electronic chart recorder
  - Variety of options for the graphic display of process parameters
  - Real time
- Electronically controlled humidification and dehumidification system with capacitive humidity sensor and pressurized steam
- Integrated water storage tank
- Heated viewing window with interior illumination
- Programmable condensation protection for test material
- Adjustable ramp functions via program editor
- Environmental friendly refrigerant R 404a
- 230 V power socket on the right-side operating panel
- Temperature safety device, Class 2 (DIN 12880) with visual and acoustic temperature alarm
- 4 potential-free relay outputs that can be activated via MCS controller
- Ethernet interface for use with optional GMP/GLP and FDA guideline 21 CFR Part 11 compliant APT-COM™
  DataControl System software
- 1 access port Ø 50 mm (2 inch), left side (MKF 240)
- 4 castors with 2 brakes
- 1 stainless steel rack included
Serie MKT
Low temperature test chambers for complex temperature profiles

The MKT test chambers meet all requirements for testing under extreme temperature conditions between -70 °C (-94 °F) and 180 °C (356 °F). The outstanding heating and cooling speeds permit even faster temperature changes and more complex test cycles to be performed.

- Cooling-down rate MKT
- Heating-up rate MKT

Equipment:
- Electronically controlled APT line™ preheating chamber technology
- MCS controller with 25 storable programs of 100 sections each for a maximum of 500 program segments
- Features:
  - User-friendly LCD display
  - Integrated electronic line recorder
  - Different diagram possibilities of process parameters
  - Real time clock
  - Heated viewing window with interior illumination
  - Programmable condensation protection for test material
  - Adjustable ramp functions via program editor
  - Environmental friendly refrigerants R 404a and R 23
  - Temperature safety device class 2 (DIN 12880) with visual and acoustic temperature alarm
  - 230 V power socket on the right-side operating panel
  - 4 potential-free relay outputs that can be activated via MCS controller
  - Ethernet interface for use with optional GMP/GLP and FDA guideline 21 CFR Part 11 compliant APT-COM™ DataControlSystem software
  - Access port, Ø 50 mm (2 inch), left side
  - 1 stainless steel shelf included
  - 4 castors (with 2 brakes)
  - BINDER test certificate
MK / MKF / MKT series
Options / accessories

- Notch-type access port in door
  Provide easy connection of cables to test specimens and facilitate loading and unloading of the chamber. Doors have access ports measuring 100 x 35 mm (4 x 1.4 inch), which can be sealed with the included silicon plugs.

- Reinforced shelf
  To ensure safe and stable storage of heavy test specimens.

- Specimen temperature measurement
  Additional flexible PT 100 temperature sensor for precise temperature measurement of the specimen with digital temperature display. Recording of measured data possible via Ethernet or RS 422 interface.

- BINDER Pure Aqua Service
  Our efficient, flexible water purification system delivers top water quality and extends the maintenance period. Special feature: Our system uses a disposable purification cartridge and also has a water quality indicator.

- APT-COM™ DataControlSystem
  Software for easy control, programming and documentation.
## Technical specifications

<table>
<thead>
<tr>
<th>Exterior dimensions</th>
<th>MK 55 (E 2.1)</th>
<th>MK 115 (E 3)</th>
<th>MK 240 (E 3)</th>
<th>MKF 240 (E 3)</th>
<th>MKT 240 (E 3)</th>
<th>MK 720 (E 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width (mm/inch)</td>
<td>740 / 29.1</td>
<td>995 / 39.2</td>
<td>1130 / 44.5</td>
<td>1130 / 44.5</td>
<td>1130 / 44.5</td>
<td>1613 / 63.5</td>
</tr>
<tr>
<td>Height (incl. Füße/Rollen) (mm/inch)</td>
<td>1242 / 48.9</td>
<td>1718 / 67.6</td>
<td>1713 / 67.4</td>
<td>1713 / 67.4</td>
<td>1938 / 76.3</td>
<td>2005 / 78.9</td>
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<tr>
<td>Depth excl. 50 mm (2.2 inch) for door handle (mm/inch)</td>
<td>744 / 29.3</td>
<td>855 / 33.7</td>
<td>946 / 37.2</td>
<td>946 / 37.2</td>
<td>946 / 37.2</td>
<td>1173 / 46.2</td>
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<tr>
<td>Wall clearance side rear (mm/inch)</td>
<td>160 / 6.3</td>
<td>160 / 6.3</td>
<td>160 / 6.3</td>
<td>160 / 6.3</td>
<td>160 / 6.3</td>
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<table>
<thead>
<tr>
<th>Interior dimensions</th>
<th>MK 55 (E 2.1)</th>
<th>MK 115 (E 3)</th>
<th>MK 240 (E 3)</th>
<th>MKF 240 (E 3)</th>
<th>MKT 240 (E 3)</th>
<th>MK 720 (E 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width (mm/inch)</td>
<td>402 / 15.8</td>
<td>600 / 23.6</td>
<td>735 / 28.9</td>
<td>735 / 28.9</td>
<td>735 / 28.9</td>
<td>1200 / 47.2</td>
</tr>
<tr>
<td>Height (mm/inch)</td>
<td>402 / 15.8</td>
<td>480 / 18.9</td>
<td>700 / 27.6</td>
<td>700 / 27.6</td>
<td>700 / 27.6</td>
<td>1020 / 40.2</td>
</tr>
<tr>
<td>Depth (mm/inch)</td>
<td>330 / 13.0</td>
<td>400 / 15.7</td>
<td>443 / 17.4</td>
<td>443 / 17.4</td>
<td>443 / 17.4</td>
<td>600 / 23.6</td>
</tr>
<tr>
<td>Interior volume (l/cu.ft.)</td>
<td>53 / 1.9</td>
<td>115 / 4.0</td>
<td>228 / 8.0</td>
<td>228 / 8.0</td>
<td>228 / 8.0</td>
<td>734 / 25.9</td>
</tr>
<tr>
<td>Weight (empty) (kg/lbs.)</td>
<td>150 / 331</td>
<td>260 / 573</td>
<td>340 / 794</td>
<td>380 / 794</td>
<td>380 / 83</td>
<td>570 / 1257</td>
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</table>

<table>
<thead>
<tr>
<th>Temperature data</th>
<th>MK 55 (E 2.1)</th>
<th>MK 115 (E 3)</th>
<th>MK 240 (E 3)</th>
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<th>MKT 240 (E 3)</th>
<th>MK 720 (E 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature uniformity (± K)</td>
<td>0.4 - 2.0</td>
<td>0.1 - 2.0</td>
<td>0.5 - 2.0</td>
<td>0.5 - 2.0</td>
<td>0.1 - 1.0</td>
<td>0.3 - 2.0</td>
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<tr>
<td>Temperature fluctuation (± K)</td>
<td>0.1 - 0.5</td>
<td>0.1 - 0.5</td>
<td>0.1 - 0.6</td>
<td>0.1 - 0.6</td>
<td>0.1 - 0.4</td>
<td>0.1 - 0.5</td>
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<tr>
<td>Average heating rate from -40°C up to 180°C (Min.)</td>
<td>4.6</td>
<td>5.5</td>
<td>5</td>
<td>5</td>
<td>5.4</td>
<td>4.5</td>
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<tr>
<td>Heating down time from 180°C to -40°C (Min.)</td>
<td>4.1</td>
<td>5.2</td>
<td>5</td>
<td>5</td>
<td>4.2</td>
<td>5</td>
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<tr>
<td>Heat Compensation, max. (W)</td>
<td>500</td>
<td>2000</td>
<td>2800</td>
<td>2800</td>
<td>2500</td>
<td>6500</td>
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<table>
<thead>
<tr>
<th>Climatical data</th>
<th>MK 55 (E 2.1)</th>
<th>MK 115 (E 3)</th>
<th>MK 240 (E 3)</th>
<th>MKF 240 (E 3)</th>
<th>MKT 240 (E 3)</th>
<th>MK 720 (E 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature range (°C)</td>
<td>-10 - 95</td>
<td>-10 - 95</td>
<td>-10 - 95</td>
<td>-10 - 95</td>
<td>-10 - 95</td>
<td>-10 - 95</td>
</tr>
<tr>
<td>Humidity area (% RH)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Heat Compensation, max. (W)</td>
<td>500</td>
<td>-</td>
<td>-</td>
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</table>

<table>
<thead>
<tr>
<th>Electrical Data</th>
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<th>MK 240 (E 3)</th>
<th>MKF 240 (E 3)</th>
<th>MKT 240 (E 3)</th>
<th>MK 720 (E 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage (±10 %) 50 / 60Hz (V)</td>
<td>220 - 1N--</td>
<td>400 3N--</td>
<td>400 3N--</td>
<td>400 3N--</td>
<td>400 3N--</td>
<td>400 3N--</td>
</tr>
<tr>
<td>Nominal power (kW)</td>
<td>2,6</td>
<td>3,0</td>
<td>4,2</td>
<td>5,4</td>
<td>6,5</td>
<td>7,2</td>
</tr>
<tr>
<td>Noise Level (ca. dB(A))</td>
<td>59</td>
<td>62</td>
<td>62</td>
<td>62</td>
<td>64</td>
<td>64</td>
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</tbody>
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| Order number | 9020-0006 | 9020-0146 | 9020-0148 | 9020-0132 | 9020-0110 | 9020-0156 |

All technical data are specified for units with standard equipment at an ambient temperature of 25 °C (77 °F) and a voltage fluctuation of ± 10 %. The temperature data are determined in accordance to factory standard following DIN 12880, respecting the recommended wall clearances of 10 % of the height, width and depth of the inner chamber. All indications are average values, typical for units produced in series. We reserve the right to alter technical specifications at all times.