Model MK 56 | Dynamic climate chambers for rapid temperature changes

The BINDER MK series chamber is suitable for all heat and cold tests between -40 °C and 180 °C. The MK is a clever alternative to complex individual solutions for cyclical temperature tests.

**BENEFITS**

- Homogeneous climate conditions thanks to APT.line™ technology
- Comprehensive programming and data acquisition
- Large heated viewing window

**MAIN FEATURES**

- Temperature range: -40 °C to 180 °C
- APT.line™ preheating chamber technology
- Programmable condensation protection for test material
- Heated viewing window with LED interior lighting
- BINDER APT-COM™ 3 Basic Edition communication software
- Troubleshooting system with visual and audible alarms
- Intuitive touchscreen controller with time-segment and real-time programming
- Internal data logger, measured values can be read out in open format via USB
- Unit self-test for comprehensive status analysis
- Access port with silicone plug, 50 mm, left
- Class 2 independent adjustable temperature safety device (DIN 12880) with visual alarm
- 4 castors, two with brakes
- Computer interface: Ethernet
- Adjustable ramp function
- Integrated chart recorder
- Real-time clock
- 1 stainless steel rack
- Inner chamber made of stainless steel
- CFC-free refrigerant R-452A
- Cooling with compressor cooling unit

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Model MK 56</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>230 V 1~ ph 50 Hz</td>
<td>Standard</td>
<td>MK056-230V</td>
<td>9020-0374</td>
</tr>
<tr>
<td></td>
<td>240 V 1~ ph 60 Hz</td>
<td>Standard</td>
<td>MK056-230V</td>
<td>9020-0388</td>
</tr>
</tbody>
</table>

Technical specifications are subject to change.
## TECHNICAL DATA

<table>
<thead>
<tr>
<th>Description</th>
<th>MK056-230V(^1)</th>
<th>MK056-230V(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article Number</td>
<td>9020-0374</td>
<td>9020-0388</td>
</tr>
<tr>
<td><strong>Performance Data Temperature</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature range [°C]</td>
<td>-40...180</td>
<td>-40...180</td>
</tr>
<tr>
<td>Temperature variation depending on setpoint [± K]</td>
<td>0.5...1.5</td>
<td>0.5...1.5</td>
</tr>
<tr>
<td>Temperature fluctuation depending on setpoint [± K]</td>
<td>0.1...0.5</td>
<td>0.1...0.5</td>
</tr>
<tr>
<td>Average heating-up rate according to IEC 60068-3-5 [K/min]</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Cooling down time from 180 °C to -40 °C [min]</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td>Average cooling down time according to IEC 60068-3-5 [K/min]</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Max. heat compensation at 25 °C [W]</td>
<td>800</td>
<td>800</td>
</tr>
<tr>
<td><strong>Electrical data</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated Voltage [V]</td>
<td>230</td>
<td>240</td>
</tr>
<tr>
<td>Power frequency [Hz]</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>Nominal power [kW]</td>
<td>2.8</td>
<td>2.8</td>
</tr>
<tr>
<td>Unit fuse [A]</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Phase (Nominal voltage)</td>
<td>1~</td>
<td>1~</td>
</tr>
<tr>
<td><strong>Outer dimensions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width net [mm]</td>
<td>720</td>
<td>720</td>
</tr>
<tr>
<td>Height net [mm]</td>
<td>1445</td>
<td>1445</td>
</tr>
<tr>
<td>Depth net [mm]</td>
<td>778</td>
<td>778</td>
</tr>
<tr>
<td>Wall clearance back [mm]</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Wall clearance sidewise [mm]</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Viewing window width [mm]</td>
<td>288</td>
<td>288</td>
</tr>
<tr>
<td>Viewing window height [mm]</td>
<td>255</td>
<td>255</td>
</tr>
<tr>
<td><strong>Doors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit doors</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Internal Dimensions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width [mm]</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>Height [mm]</td>
<td>420</td>
<td>420</td>
</tr>
<tr>
<td>Depth [mm]</td>
<td>350</td>
<td>350</td>
</tr>
<tr>
<td><strong>Measures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interior volume [L]</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Net weight of the unit (empty) [kg]</td>
<td>168</td>
<td>168</td>
</tr>
<tr>
<td>permitted load [kg]</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Load per rack [kg]</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td><strong>Environment-specific data</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sound-pressure level [dB(A)]</td>
<td>59</td>
<td>59</td>
</tr>
<tr>
<td><strong>Fixtures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of shelves (std./max.)</td>
<td>1/4</td>
<td>1/4</td>
</tr>
</tbody>
</table>

\(^1\) All technical data is specified for unloaded units with standard equipment at an ambient temperature of +22 °C ±3 °C and a power supply voltage fluctuation of ±10 %. The temperature data is determined in accordance to BINDER factory standard following DIN 12880, observing the recommended wall clearances of 10 % of the height, width, and depth of the inner chamber. Technical data refers to 100 % fan speed. All indications are average values, typical for units produced in series. We reserve the right to change technical specifications at any time.
DIMENSIONS incl. fittings and connections [mm]

CHARTS

Heating up rate

Cooling down rate

Heat compensation chart
## OPTIONS AND ACCESSORIES

<table>
<thead>
<tr>
<th>Designation</th>
<th>Description</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>access port with silicone plug</td>
<td></td>
<td></td>
</tr>
<tr>
<td>left</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 mm</td>
<td></td>
<td>01 8012-1322</td>
</tr>
<tr>
<td>50 mm</td>
<td></td>
<td>01 8012-1328</td>
</tr>
<tr>
<td>80 mm</td>
<td></td>
<td>01 8012-1334</td>
</tr>
<tr>
<td>right</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 mm</td>
<td></td>
<td>01 8012-1319</td>
</tr>
<tr>
<td>50 mm</td>
<td></td>
<td>01 8012-1325</td>
</tr>
<tr>
<td>80 mm</td>
<td></td>
<td>01 8012-1331</td>
</tr>
<tr>
<td>top</td>
<td></td>
<td></td>
</tr>
<tr>
<td>80 mm</td>
<td></td>
<td>01 8012-1536</td>
</tr>
</tbody>
</table>

**Analog output 4-20 mA**

for temperature values (output not adjustable)

- Art.-No. 8012-1084

**Calibration certificate, expanded**

for temperature; for extending the measurement in center of chamber to include another test temperature

- Art.-No. 8012-1124

for temperature, measurement in center of chamber at specified temperature

- Art.-No. 8012-1143

temperature measurement incl. certificate and 27 measuring points at specified temperature

- Art.-No. 8012-1602

temperature measurement incl. certificate, 15-18 measuring points at specified temperature

- Art.-No. 8012-1581

temperature measurement incl. certificate, 9 measuring points at specified temperature

- Art.-No. 8012-1560

**Data Logger Kit**

T 220: For continuous temperature logging from -90 °C to 220 °C. The kit includes 1 data logger, Pt 100 sensor with 2 m extension cable and 1 magnetic fixture for mounting to the BINDER unit

- Art.-No. 8012-0715

**Data Logger Software**

LOG ANALYZE software kit, configuration and evaluation software for all BINDER Data Logger Kits (incl. USB data cable)

- Art.-No. 8012-0821

**Door lock**

lockable door handle

- Art.-No. 8012-1782

**Dry-air purge**

uncontrolled, incl. connection; for preventing condensation

- Art.-No. 8012-1806

**Dry-air purge, connection**

for the connection to an existing pressurized air network

- Art.-No. 8012-1795

**Interface converter**

RS 422 cable set and RS 232 / RS 422 interface converter for connection to 10-way plug distributor or for connection to a unit

- Art.-No. 8012-0557

120 V, 60 Hz option model

- Art.-No. 8012-0556

230 V, 50/60 Hz option model

- Art.-No. 8012-0405

RS 422 interface cable and RS 422 / Ethernet interface converter for connection to 10-way plug distributor or for connection to a unit

- Art.-No. 8012-0380

120 V, 60 Hz option model

- Art.-No. 8012-0361

230 V, 50/60 Hz option model

- Art.-No. 8012-0665

**Interface converter, USB / RS422**

RS 422 cable set and RS 422 / USB interface converter for connection to 10-way plug distributor or for connection to a unit (USB-powered converter)

- Art.-No. 8012-0665

**interface converter, RS422**

RS 422 interface, cable (15 m)

- Art.-No. 5023-0036

RS 422 extension cable (50 m)

- Art.-No. 5023-0117

**pH-neutral detergent**

concentrated, for gentle remove of residual contaminants; 1 kg

- Art.-No. 1002-0016

**Pt 100 temperature sensor**

additional flexible Pt 100, interior, for displaying the temperature on the unit display

- Art.-No. 8012-1093

**Rack**

stainless steel

- Art.-No. 6004-0150

**Rack accessories**

Rack accessories – fasteners (1 set of 4) for additional security of racks

- Art.-No. 8012-1092

**Rack, reinforced**

stainless steel, with fasteners (1 set of 4), max. load 70 kg

- Art.-No. 8012-1091

**RS 422 interface**

modular plug distributor for 10 RS 422 interfaces

- Art.-No. 8012-0295

**RS 422 interface, cable (15 m)**

RS 422 connection cable (15 m) between plug distributor and RS 422 interface

- Art.-No. 5023-0036

**RS 422 interface, cable (50 m)**

RS 422 extension cable (50 m) between interface converter and unit or RS 232 / RS 422 plug distributor

- Art.-No. 5023-0117

**RS 485 interface, 2-wire**

Additional serial interface can be used parallel to Ethernet, for communication software

- Art.-No. 8012-1768

**Shelf, perforated**

Stainless steel

- Art.-No. 6004-0182

* Notes › See last page
## Designation

<table>
<thead>
<tr>
<th>Description</th>
<th>*</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>APT-COM™ communications software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>version 2 to 3, GLP edition</td>
<td>19</td>
<td>9053-0016</td>
</tr>
<tr>
<td>version 3, BASIC edition</td>
<td>19</td>
<td>9053-0014</td>
</tr>
<tr>
<td>version 3, GLP edition</td>
<td>19</td>
<td>9053-0015</td>
</tr>
<tr>
<td>version 3, STANDARD edition</td>
<td>19</td>
<td>9053-0013</td>
</tr>
<tr>
<td>APT-COM™ communications software, price: for free</td>
<td></td>
<td></td>
</tr>
<tr>
<td>version 3, GLP DEMO Edition</td>
<td>19</td>
<td>9053-0008</td>
</tr>
</tbody>
</table>

### Software

- **Temperature safety device class 2**
  - with visual alarm (DIN 12880)

- **Water cooling**
  - for reduced heat loss to ambient air

- **Zero voltage relay contacts**
  - for controlling 3 relay contacts via program regulators, accessible via 6-pin DIN socket (max. 24 V - 2.5 A)

### SERVICES

#### Designation

<table>
<thead>
<tr>
<th>Description</th>
<th>*</th>
<th>Art.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Installation and set up of unit at operating location, connect to existing connections</td>
<td>13, 18</td>
<td>DL10-0300</td>
</tr>
<tr>
<td>DL10-0600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction</td>
<td>18</td>
<td>DL10-0700</td>
</tr>
<tr>
<td>unit function instructions for operation and programming of the controller</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Preventive maintenance

- **Preventive maintenance**
  - Executive of equipment inspection according to maintenance plan

- **Calibration services**
  - Calibration temperature incl. certificate
    - including certificate, one measuring point in center of chamber at specified temperature
  - Temperature measurement 18 measuring points
    - including certificate, 18 measuring points at specified temperature
  - Temperature measurement 27 measuring points
    - including certificate, 27 measuring points at specified temperature
  - Temperature measurement 9 measuring points
    - including certificate, 9 measuring points at specified temperature

- **Validation services**
  - Execution of IQ/OQ
    - in accordance with qualification folder
  - Execution of IQ/OQ/PQ
    - in accordance with customer's requirement, price: on request
  - Qualification folder IQ/OQ
    - supporting documents for validation performed by customer, consisting of: IQ/OQ checklists, unit schematics, QM certificate in accordance with ISO 9001
  - Qualification folder IQ/OQ/PQ
    - supporting documents for validation performed by customer, in accordance with customer's requirement, extension of Qualification folder IQ/OQ by chapter PQ

- **Warranty service**
  - Extension of the warranty from 2 to 3 years
    - beginning with the date of delivery, wearing parts are not included
  - Extension of the warranty from 2 to 5 years
    - beginning with the date of delivery, wearing parts are not included

* Notes › See last page
NOTES

01 Condensation may occur in the area around the access port. Access ports may be placed in custom locations for an additional charge.
02 UL mark is not granted when this option is used.
03 Heat resistant only to max. 200 °C.
04 Only available on units rated for 230 V.
06 Heating-up time may increase as a result of the lower heat conductivity.
07 The additional heat input may affect the temperature behavior.
09 Not in conjunction with the optional access port, door with window and interior lighting.
10 Not available on 23-liter units.
11 Not available on 23- or 53-liter units.
12 Only available on units rated for 230 V or 400 V.
13 Installation and connections take place at unit location; transport within the company only upon consultation.
14 We recommend a BINDER service contract to cover unit inspections, calibrations and validations.
15 OQ according to Yellow Paper = completed factory validation documentation of all OQ checklists.
16 Sensor calibration is performed in an accredited calibration laboratory.
17 Calibration is performed according to the BINDER factory standard.
18 Quoted prices do not include travel costs. Please refer to the chapter on BINDER Service for travel costs for your region. Quoted prices for services performed in Switzerland do not include a country-specific added fee (available on request).
19 For additional accessories, refer to the Process documentation chapter.
20 When ordering IQ/OQ qualification folders and associated IQ/OQ execution on one order, we offer a 15 % discount for the item of the IQ/OQ folder.
   When ordering IQ/OQ/PQ qualification folders and associated IQ/OQ/PQ execution on one order, we offer a 15 % discount for the item of the IQ/OQ/PQ folder.