

## Environmental simulation chamber for cyclical temperature

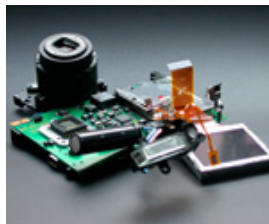
The BINDER environmental simulation chamber of the MK series is suitable for heat or cold testing between  $-40\text{ }^{\circ}\text{C}$  and  $180\text{ }^{\circ}\text{C}$ . The APT.line™ preheating chamber technology uniquely simulates a natural environment. For cyclical temperature testing, this environmental simulation chamber is a smart alternative to complex individual solutions.



### Advantages:

- State-of-the-art reliability
- User-friendly chamber interior
- Comprehensive standard equipment

### Areas of application:



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Features	Customer benefits	Characteristics
APT.line™ climate technology	<ul style="list-style-type: none"> <li>• Same test conditions throughout the chamber interior</li> <li>• Independent of specimen size and quantity</li> </ul>	<b>APT.line™</b> <ul style="list-style-type: none"> <li>• Uniform circulation even under full load</li> <li>• Homogeneous climate conditions throughout test specimens</li> </ul>
Standard equipment	<ul style="list-style-type: none"> <li>• Very good price/performance ratio</li> </ul>	<b>Well equipped</b> <ul style="list-style-type: none"> <li>• Heated viewing window</li> <li>• LED illumination</li> <li>• Rugged chassis with rollers from 115 liters</li> <li>• Ethernet interface</li> </ul>
Unit design	<ul style="list-style-type: none"> <li>• Minimum space requirements</li> <li>• Convenient, safe access</li> <li>• Easy assembly</li> </ul>	<b>Good use of space</b> <ul style="list-style-type: none"> <li>• Optimal ratio of usable space and footprint</li> <li>• All operator controls accessible from the front</li> <li>• Wide construction</li> </ul>
Production	<ul style="list-style-type: none"> <li>• Reliable devices with long service lives</li> <li>• Short delivery times</li> </ul>	<ul style="list-style-type: none"> <li>• Premium quality made in Germany</li> <li>• Highly automated series production (20,000 units per year)</li> <li>• High-quality materials, state-of-the-art production technology</li> </ul>
Accessories and Services	<ul style="list-style-type: none"> <li>• Complete system from one source</li> </ul>	<b>Comprehensive product portfolio</b> <ul style="list-style-type: none"> <li>• Additional production lines with drying and vacuum chambers</li> <li>• Control and documentation software APT-COM™</li> <li>• BINDER Data Logger Kits</li> <li>• Water treatment with BINDER PURE AQUA SERVICE</li> <li>• Years of proven and recognized validation and documentation materials</li> </ul>

## Performance characteristics

- Electronically controlled APT.line™ preheating chamber assuring temperature accuracy and reproducible results
- Temperature range of -40 °C to 180 °C
- 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 clock
- Adjustable ramp function via program editor
- Access port Ø 80 mm, top
- Heated viewing window with LED interior lighting
- Temperature safety device class 2 (DIN 12880) with visual and audible temperature alarm
- RS 422 interface for communication software APT-COM™ DataControlSystem
- 1 stainless steel rack
- BINDER test confirmation
- BINDER Communication software APT-COM™ 3 Basic Edition

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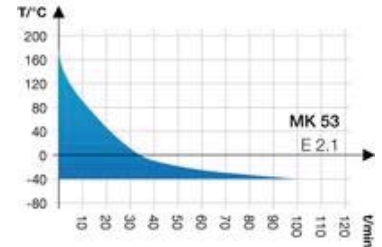
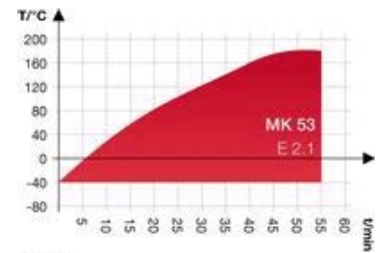
## MK 53 (E2.1)

Exterior dimensions	
Width (incl. 80 mm access port with plug) (mm)	745
Height (incl. feet) (mm)	1245
Depth (incl. door handle, I-triangle, connection 55 mm) (mm)	795
Wall clearance, side (mm)	160
Wall clearance, rear (mm)	100
Viewing window width (mm)	280
Viewing window height (mm)	280
Number of doors (ea.)	1

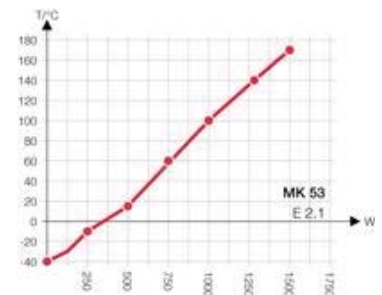
Interior dimensions	
Width (mm)	402
Height (mm)	402
Depth (mm)	330
Interior volume (l)	53
Shelves (number standard/max.)	1 / 5
Load per shelf (kg)	15
Permitted total load (kg)	40
Weight (empty) (kg)	150

Temperature data	
Temperature range (°C)	-40 - 180
Temperature variation (± K)	0,4 - 2,0
Temperature fluctuation (± K)	0,1 - 0,5
Recovery time after door was open for 30 sec.	
at -10 °C (min.)	5
at 70 °C (min.)	1
at 150 °C (min.)	5
Mean warm-up rate acc. to factory standard (°C/min.) -40 °C to 180 °C	4,6
Mean cooling rate acc. factory standard (°C/min.) 180 °C to -40 °C	4,1
Heat compensation, max. (W)	500

## Heating up and cooling down rate



## Heat compensation



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## MK 53 (E2.1)

▶ Electrical data	
IP protection class acc. to EN 50529	IP 20
Voltage ( $\pm 10\%$ ) 50 Hz (V)	230, 1 N ~
Nominal power (kW)	2,6
Energy consumption at 20 °C (kW) 1)	1,02
Noise level (approx. dB(A))	59

1) These values can be used for dimensioning air condition systems.

All technical data are specified for units with standard equipment at an ambient temperature of 25 °C and a line voltage fluctuation of  $\pm 10\%$ . The temperature data is 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 figures are typical average values for series devices. We reserve the right to alter technical specifications at any time.

## Options

### MK 53 (E2.1)

Access port with silicone plug 30, 50, 80 mm	<input type="radio"/>
Securing elements for additional fastening of racks (1 set of 4 pieces)	<input type="radio"/>
Keyboard lock	<input type="radio"/>
Analog temperature output, 4-20 mA, with 6-pin DIN socket (output not adjustable)	<input type="radio"/>
Factory calibration certificate. Measurement in center of chamber at 150 °C or at specified testing temperature	<input type="radio"/>
Extension to factory calibration certificate. Each additional measurement at an additional measuring point or temperature	<input type="radio"/>
Additional measuring channel for digital display of specimen temperature, with flexible PT 100 temperature sensor. Measuring data recorded through device interface	<input type="radio"/>
Data Logger Kit T 220: For the continuous temperature recording of -90 °C to 220 °C. Kit includes 1 data logger, PT 100 sensor with 2 m Teflon extension cable and 1 fixture for the connection at the BINDER unit	<input type="radio"/>
Data Logger converter cable RS 232 to USB 2.0	<input type="radio"/>
Data Logger Software: Configuration und evaluation software for all BINDER Data Logger Kits, incl. data cable (RS 232)	<input type="radio"/>
Rack, stainless steel	<input type="radio"/>
Shelf, perforated, stainless steel	<input type="radio"/>
Locking door handle with key	<input type="radio"/>

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