

# 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



Model 56



Model 56

## 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 Multi Management Software APT-COM™ Basic Edition
- 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

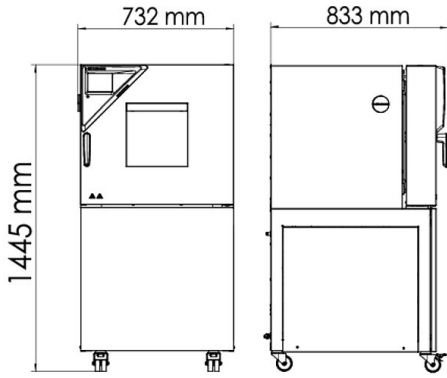
Interior volume [L]	Voltage	Option model	Version	Art.-No.
Model MK 56				
60	230 V 1~ ph 50 Hz	Standard	MK056-230V	9020-0374
	240 V 1~ ph 60 Hz	Standard	MK056-240V	9020-0388

## TECHNICAL DATA

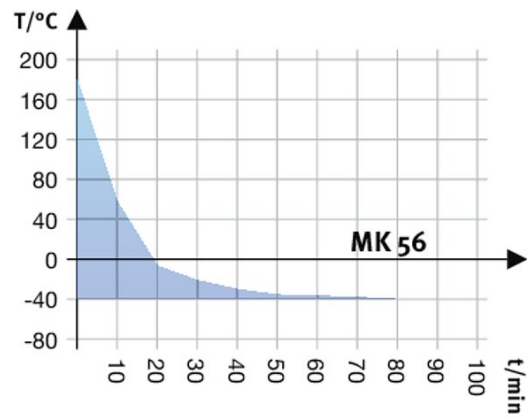
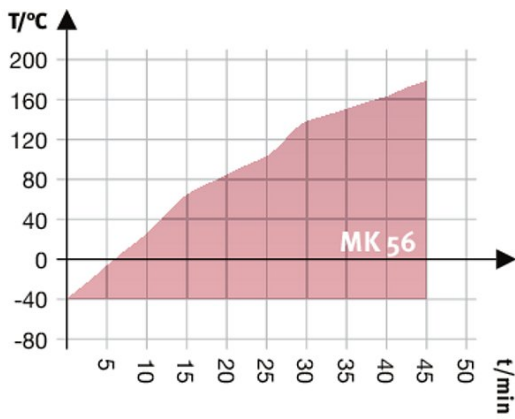
Description	MK056-230V <sup>1</sup>	MK056-240V <sup>1</sup>
Article Number	9020-0374	9020-0388
<b>Performance Data Temperature</b>		
Temperature range [°C]	-40...180	-40...180
Temperature variation depending on setpoint [± K]	0.5...1.5	0.5...1.5
Temperature fluctuation depending on setpoint [± K]	0.1...0.5	0.1...0.5
Average heating-up rate according to IEC 60068-3-5 [K/min]	5	5
Cooling down time from 180 °C to -40 °C [min]	90	90
Average cooling down time according to IEC 60068-3-5 [K/min]	5	5
Max. heat compensation at 25 °C [W]	800	800
<b>Electrical data</b>		
Rated Voltage [V]	230	240
Power frequency [Hz]	50	60
Nominal power [kW]	2.8	2.8
Unit fuse [A]	16	16
Phase (Nominal voltage)	1~	1~
<b>Internal Dimensions</b>		
Depth [mm]	350	350
Height [mm]	420	420
Width [mm]	400	400
<b>Housing dimensions not incl. fittings and connections</b>		
Width net [mm]	720	720
Height net [mm]	1445	1445
Depth net [mm]	778	778
<b>Measures</b>		
Viewing window width [mm]	288	288
Viewing window height [mm]	255	255
Wall clearance back [mm]	300	300
Wall clearance sidewise [mm]	200	200
Interior volume [L]	60	60
Net weight of the unit (empty) [kg]	168	168
permitted load [kg]	60	60
Load per rack [kg]	15	15
<b>Doors</b>		
Unit doors	1	1
<b>Environment-specific data</b>		
Sound-pressure level [dB(A)]	59	59
<b>Fixtures</b>		
Number of shelves (std./max.)	1/4	1/4

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]

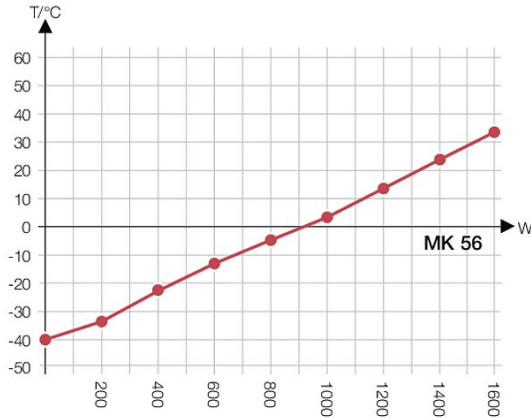


CHARTS



Heating up rate

Cooling down rate



Heat compensation chart

## OPTIONS AND ACCESSORIES

Designation	Description	*	Art.-No.
	left		
	30 mm	01	8012-1322
	50 mm	01	8012-1328
	80 mm	01	8012-1334
	right		
Access port with silicone plug	30 mm	01	8012-1319
	50 mm	01	8012-1325
	80 mm	01	8012-1331
	top		
	80 mm	01	8012-1536
Analog output 4-20 mA	for temperature values (output not adjustable)	-	8012-1084
APT-COM™ 4 GLP-Edition	for working under GLP-compliant conditions. Measured values are documented in a tamper-proof way in line with the requirements of FDA Regulation 21 CFR 11. version 4, GLP edition	19	9053-0042
APT-COM™ 4 PROFESSIONAL-Edition	convenient unit and user management built on the BASIC edition. Suitable for networking up to 100 units. version 4, PROFESSIONAL edition	19	9053-0040
Calibration certificate, expanded	for temperature; for extending the measurement in center of chamber to include another test temperature	-	8012-1124
	for temperature, measurement in center of chamber at specified temperature	-	8012-1143
Calibration certificate, temperature	temperature measurement incl. certificate and 27 measuring points at specified temperature	-	8012-1602
	temperature measurement incl. certificate, 15- 18 measuring points at specified temperature	-	8012-1581
	temperature measurement incl. certificate, 9 measuring points at specified temperature	-	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	19	8012-0715
Data Logger Software	LOG ANALYZE software kit, configuration and evaluation software for all BINDER Data Logger Kits (incl. USB data cable)	19	8012-0821
Door lock	lockable door handle	-	8012-1782
Dry-air purge	uncontrolled, incl. connection; for preventing condensation	-	8012-1806
Dry-air purge, connection	for the connection to an existing pressurized air network	-	8012-1795
pH-neutral detergent	concentrated, for gentle remove of residual contaminants; 1 kg	-	1002-0016
Pt 100 temperature sensor	additional flexible Pt 100, interior, for displaying the temperature on the unit display	-	8012-1093
Rack	stainless steel	-	6004-0150
Rack accessories	fasteners (1 set of 4) for additional security of racks	-	8012-0620
Rack, reinforced	stainless steel, with fasteners (1 set of 4)	-	8012-1091
RS 485 / RS 422 interface converter	RS 422 cable set and RS 485 / RS 422 interface converter for connection to 10-way plug distributor 115 V option model	-	8012-0599
	230 V option model	-	8012-0589
RS 485 interface, 2-wire	Additional serial interface can be used parallel to Ethernet, for Multi Management Software APT-COM™	-	8012-1768
Shelf, perforated	Stainless steel	-	6004-0182
Temperature safety device class 2	with visual alarm (DIN 12880)	-	8012-1792
Water cooling	for reduced heat loss to ambient air	-	8012-1815
Zero voltage relay contacts	for controlling 3 relay contacts via program regulators, accessible via 6-pin DIN socket (max. 24 V - 2.5 A)	-	8012-1095

\* Notes › See last page

## SERVICES

Designation	Description	*	Art.-No.
<b>Installation services</b>			
Installation	and set up of unit at operating location, connect to existing connections	13, 18	DL10-0300
Instruction	unit function instructions for operation and programming of the controller	18	DL10-0700
<b>Preventive maintenance</b>			
Preventive maintenance	Executive of equipment inspection according to maintenance plan	14, 18	DL20-0500
<b>Calibration services</b>			
Calibration temperature incl. certificate	including certificate, one measuring point in center of chamber at specified temperature	14, 16, 17, 18	DL30-0101
Temperature measurement 18 measuring points	including certificate, 18 measuring points at specified temperature	14, 16, 17, 18	DL30-0118
Temperature measurement 27 measuring points	including certificate, 27 measuring points at specified temperature	14, 16, 17, 18	DL30-0127
Temperature measurement 9 measuring points	including certificate, 9 measuring points at specified temperature	14, 16, 17, 18	DL30-0109
<b>Validation services</b>			
Execution of IQ/OQ	in accordance with qualification folder	15, 18, 20	DL41-0200
Execution of IQ/OQ/PQ	in accordance with customer's requirement, price: on request	15, 18	DL44-0500
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	15, 18, 20	8012-0863
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	15, 18	8012-0951
<b>Warranty service</b>			
Extension of the warranty from 2 to 3 years	beginning with the date of delivery, wearing parts are not included	-	DL01-1041
Extension of the warranty from 2 to 5 years	beginning with the date of delivery, wearing parts are not included	-	DL01-1042

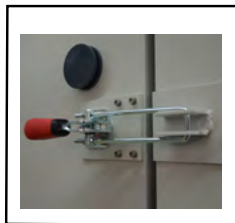
\* Notes › See last page

# Lithium ion battery cell testing chambers

The BINDER test chambers for aging and performance of lithium-ion energy storage devices offer maximum application convenience and meet Eucar/Hazard level 4\*. BINDER supplies test chambers with a standard package for aging tests, as well as a more extensive package for carrying out performance and aging tests.



Pressure relief flap with an additional relieving spring as a safety measure in the event of faults



Door-locking mechanism with strong closing brackets on the side

Access port for introducing external measuring instruments

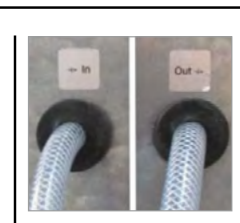


**Eucar/  
Hazard  
Level 4\***

Additional safety measures on the MK 240 dynamic climate chamber



Temperature range limited to 120 °C on the controller



Inert gas connections for rinsing (e.g., for nitrogen)

## PACKAGE P – FOR PERFORMANCE AND AGING TESTS

### Application:

Cells and modules are tested at different temperatures **with and without a current supply** to measure performance.

### Solution:

- Class 2 independent temperature safety device when temperature is set to 120 °C
- Temperature range limited to 120 °C on the controller
- Stainless steel pressure relief flap installed in the middle of the top of the unit
- Enhanced door lock mechanism with reinforced brackets
- Inert gas connections



## PACKAGE A – FOR AGING TESTS

### Application:

Cells and modules are tested at different temperatures always **without a current supply** in order to assess aging during storage.

### Solution:

- Class 2 independent temperature safety device when temperature is set to 120 °C.
- Temperature range limited to 120 °C on the controller

## FURTHER ADJUSTMENTS AVAILABLE ON REQUEST:

BINDER series units are converted by our BINDER INDIVIDUAL department according to special customer requirements, and equipped with additional functions.



Program sequence display using indicator lamps



Electromechanical door lock mechanism controlled in a program and/or manually



Additional access ports available in almost all sizes and locations

## TIPS AND TRICKS



Learn more in our user report:

TÜV SÜD Battery Testing GmbH -  
Energy storage device in hardness test

› [go2binder.com/en-TUEV-SUED-Battery-Testing](https://go2binder.com/en-TUEV-SUED-Battery-Testing)

Find out more ›



# WolfLabs

**Pricing on any accessories shown can be found by keying the part number into the search box on our website.**

The specifications listed in this brochure are subject to change by the manufacturer and therefore cannot be guaranteed to be correct. If there are aspects of the specification that must be guaranteed, please provide these to our sales team so that details can be confirmed.

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Please contact us if this literature doesn't answer all your questions.