

# Model MK 400 | 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 400



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## MAIN FEATURES

- Temperature range: -40 °C to +180 °C
- APT.line™ preheating chamber technology
- Intuitive touchscreen controller with time-segment and real-time programming
- Internal data logger, measured values can be read out in open format via USB
- Programmable condensation protection for samples
- Troubleshooting system with visual and acoustic alarms
- CFC-free refrigerant R-452A
- 1 stainless steel rack
- Access port with silicone plug, 50 mm, left
- Heated viewing window with LED interior lighting

## OPTIONAL EQUIPMENT

- APT-COM Multi Management Software – for managing, recording, and documenting unit parameters
- Racks – option of stainless steel racks, depending on test requirements
- Compressed air supply system
- Services – wide range of services to ensure that the unit functions correctly

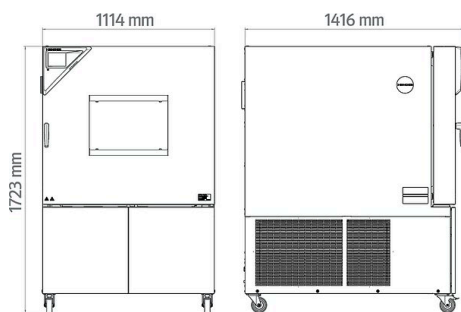
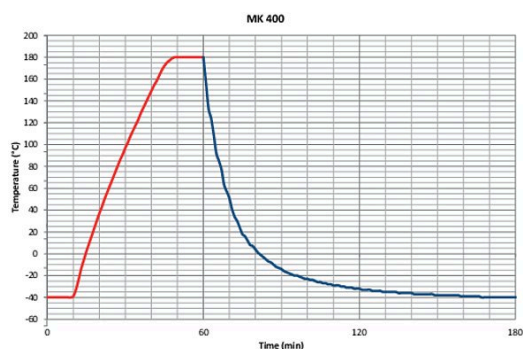
## ORDERING INFORMATION

Interior volume [L]	Voltage	Option model	Version	Art.-No.
417	400 V 3~ ph 50 Hz	Standard	MK400-400V	9020-0406
	480 V 3~ ph 60 Hz	with voltage and frequency converter	MK400-480V-C	9020-0445

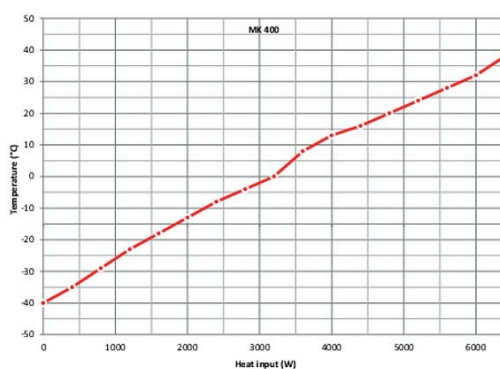
## TECHNICAL DATA

Description	MK400-400V <sup>1</sup>	MK400-480V-C <sup>1</sup>
Article Number	9020-0406	9020-0445
Performance Data Temperature		
Temperature range	-40...180	-40...180
Temperature variation [± K]	0.1...1.2	0.1...1.2
Temperature fluctuation [± K]	0.1...0.5	0.1...0.5
Heating-up time from -40 °C to 180 °C [min]	55	55
Average heating-up rate according to IEC 60068-3-5 [K/min]	5	5
Cooling down time from 180 °C to -40 °C [min]	115	115
Average cooling down time according to IEC 60068-3-5 [K/min]	5	5
Max. heat compensation at 20 °C [W]	4500	4500
Electrical data		
Rated Voltage [V]	400	480
Power frequency [Hz]	50	60
Nominal power [kW]	7	7
Unit fuse [A]	16	16
Phase (Nominal voltage)	3~	3~
Measures		
Interior volume [L]	417	417
Net weight of the unit (empty) [kg]	413	413
Permitted load [kg]	150	150
Load per rack [kg]	30	30
Viewing window width [mm]	508	508
Viewing window height [mm]	300	300
Wall clearance back [mm]	500	500
Wall clearance sidewise [mm]	300	300
Internal Dimensions		
Width [mm]	735	735
Height [mm]	700	700
Depth [mm]	810	810
Doors		
Unit doors	1	1
Housing dimensions not incl. fittings and connections		
Width net [mm]	1115	1115
Height net [mm]	1710	1710
Depth net [mm]	1400	1400
Environment-specific data		
Energy consumption at 20 °C	1400 Wh/h	1400 Wh/h
Sound-pressure level [dB(A)]	65	65
Fixtures		
Number of shelves (std./max.)	1/6	1/6

- 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**

Designation	Description	*	Art.-No.
Access port with silicone plug	left		
	30 mm	01	8012-1322
	50 mm	01	8012-1328
	80 mm	01	8012-1334
	100 mm	01	8012-1542
	125 mm	01	8012-1351
	right		
	30 mm	01	8012-1319
	50 mm	01	8012-1325
	80 mm	01	8012-1331
	100 mm	01	8012-1539
	125 mm	01	8012-1348
	top		
	80 mm	01	8012-1536
	100 mm	01	8012-1530
	125 mm	01	8012-1533
Analog output 4-20 mA	for temperature values (output not adjustable)	–	8012-1084
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

\* Notes › See last page

Designation	Description	*	Art.-No.
<b>Compressed air connection</b>	for the connection to an existing pressurized air network	–	8012-1089
<b>Converter, voltage and frequency</b>	to operate the device at a nominal voltage of 480 V 3 ph 60 Hz, 32 A	–	8009-0807
<b>Door lock</b>	lockable door handle	–	8012-1861
<b>Notch-type access port</b>	notch-type access port in door, 100 x 35 mm	–	8012-1850
<b>Pt 100 temperature sensor</b>	additional flexible Pt 100, interior, for displaying the temperature on the unit display	–	8012-1093
<b>RS 485 interface, 2-wire</b>	Additional serial interface can be used parallel to Ethernet, for Multi Management Software APT-COM™	–	8012-1768
<b>Temperature safety device class 2</b>	with visual alarm (DIN 12880)	–	8012-1792
<b>Zero voltage relay contacts</b>	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

## ACCESSORIES

Designation	Description	*	Art.-No.
<b>APT-COM™ 4 GLP-Edition</b>	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	–	9053-0042
<b>APT-COM™ 4 PROFESSIONAL-Edition</b>	convenient unit and user management built on the BASIC edition. Suitable for networking up to 100 units. version 4, PROFESSIONAL edition	–	9053-0040
<b>Converter, voltage and frequency</b>	to operate the device at a nominal voltage of 480 V 3 ph 60 Hz, 16 A	–	8009-0806
<b>pH-neutral detergent</b>	concentrated, for gentle remove of residual contaminants; 1 kg	–	1002-0016
<b>Qualification documents</b>	IQ/OQ documents – supporting documents for validation performed by customers, consisting of: IQ/OQ checklists incl. calibration guide and comprehensive unit documentation; parameters: temperature, CO <sub>2</sub> , O <sub>2</sub> , pressure, depending on unit		
	Digital in PDF format	–	7057-0001
	Hard copy inside folder	–	7007-0001
	IQ/OQ/PQ documents – supporting documents for validation performed by customers, according to customer requirements, PQ section added to qualification folder IQ/OQ; parameters: temperature, CO <sub>2</sub> , O <sub>2</sub> – or pressure, depending on unit		
	Digital in PDF format	–	7057-0005
	Hard copy inside folder	–	7007-0005
<b>Rack</b>	stainless steel	–	8012-2123
<b>Rack accessories</b>	fasteners (1 set of 4) for additional security of racks	–	8012-0620
<b>Rack, reinforced</b>	stainless steel, with fasteners (1 set of 4)	–	8012-2104
<b>RS 485 / RS 422 interface converter</b>	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
<b>Shelf, perforated</b>	Stainless steel	–	8009-1182
<b>WLAN kit</b>	The kit contains a client bridge that establishes a wireless connection between BINDER units and APT-COM4, LIMS, or customer-specific software via an Ethernet interface. It provides an alternative solution in situations where units need to be positioned in locations without an on-site Ethernet connection. In secured networks, installation and configuration must be performed by the customer's IT service.	–	8500-0164

\* Notes › See last page

**SERVICES**

Designation	Description	*	Art.-No.
<b>Installation services</b>			
Unit commissioning	Connect the unit to the customer-side connections (electricity, water, wastewater, gas), basic functions check, brief operating instructions. (excl.: unpacking, setup, controller instructions, programming, installation work)	05	DL10-0300
Unit instructions	Instruction regarding operating principle and basic functions of the unit, operation of the control electronics including programming	05	DL10-0700
<b>Maintenance contracts</b>			
<b>Maintenance services</b>			
BRONZE 3-year maintenance contract	Maintenance service as contractually agreed, visual inspection of mechanical and electrical components, check of control response, 20% discount on spare parts	05	DL20-0710
GOLD 3-year maintenance contract	Maintenance service as contractually agreed, visual inspection of mechanical and electrical components, check of control response, 20% discount on spare parts, testing of all key functions, replacement of wear parts, calibration of one temperature/humidity value, including certificate	05	DL20-0920
Leakage test	Testing and logging of the leak-tightness of systems containing hydrofluorocarbons in accordance with Regulation EC842/2006, incl. test book	05	DL00-0034
Maintenance	One-off maintenance service in accordance with maintenance schedule. Visual inspection of mechanical and electrical components, testing of all key functions. Calibration of a test temperature specified by the user in center of usable space without certificate	05	DL20-0500
SILVER 3-year maintenance contract	Maintenance service as contractually agreed, visual inspection of mechanical and electrical components, check of control response, 20% discount on spare parts, testing of all key functions, calibration of one test temperature specified by the user in the center of the usable space, without certificate	05	DL20-0830
<b>Calibration services</b>			
Calibration certificate, temperature	Calibration of one (1) test temperature specified by the user in center of chamber, including certificate	03, 04, 05	DL30-0101
	Extension of calibration of one (1) additional test temperature specified by the user in the center of the usable space, including certificate	03, 04, 05	DL30-0102
Temperature measurement, 18 measuring points	Temperature measurement with 18 measuring points with a set value specified by the user, including certificate	03, 04, 05	DL30-0118
Temperature measurement, 27 measuring points	Temperature measurement with 27 measuring points with a set value specified by the user, including certificate	03, 04, 05	DL30-0127
Temperature measurement, 9 measuring points	Temperature measurement with 9 measuring points with a set value specified by the user, including certificate	03, 04, 05	DL30-0109
<b>Validation services</b>			
Execution of IQ/OQ	Execution of IQ/OQ in accordance with qualification folder	05	DL41-0200
Execution of IQ/OQ/PQ	Execution of IQ/OQ/PQ in accordance with qualification folder	05	DL44-0500
<b>Warranty service</b>			
1-year warranty extension	The warranty is extended by 1 year from the delivery date, wear parts are excluded	–	DL50-0040

\* 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 Sensor calibration is performed in an accredited calibration laboratory.
- 04 Calibration is performed according to the BINDER factory standard.
- 05 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).

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