

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 ٠



Model 400



Model 400

- **IMPORTANT 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 ٠
- Internal data logger, measured values can be read out in open format via USB 1 stainless steel rack •
- 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
- ٠ Computer interface: Ethernet
- ٠ Adjustable ramp function
- Integrated chart recorder
- Real-time clock
- Inner chamber made of stainless steel
- CFC-free refrigerant R-452A
- Cooling with compressor cooling unit

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]	Power supply - unit fuse	Plug*	Version	Model version	ArtNo.
Model MK 400					
	400 V 3~ 50 Hz -16,0 A	CEE 16 / 6 H plug 5- pin	Standard	MK400-400V	9020-0406
417	480 V 3~ 60 Hz -16,0 A	CEE 16 / 6 H plug 5- pin	with voltage and frequency converter	МК400-480V-С	9020-0445

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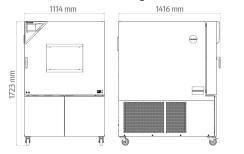
TECHNICAL DATA

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ControlSanadiJoint MathemaPotomodelSanadiJoint MathemaPerformance least TemperatureJoint MathemaJoint MathemaTemperature cargieJoint MathemaJoint MathemaTemperature cargieJoint MathemaJoint MathemaTemperature cargieJoint MathemaJoint MathemaTemperature cargieJoint MathemaJoint MathemaTemperature cargie carding to RE Goode 5So KirkinSo KirkinAreage nearing for MathemaJoint MathemaJoint MathemaCooling door time from sRovE to JoyneSo KirkinSo KirkinCooling door time from sRovE to JoyneSo KirkinSo KirkinCooling door time from sRovE to JoyneSo KirkinSo KirkinCooling door time from sRovE to JoyneSo KirkinSo KirkinAreage nearing for ME Goode 5So KirkinSo KirkinAreage nearing for ME Goode 5So KirkinSo KirkinAreage nearing for ME Goode 5So KirkinJoint MathemaAreage nearing for ME Goode 5Joint MathemaJoint Mathema	Designation	MK400-400V	МК400-480V-С
Advances Advances Imparature range 4.080 °C 4.080 °C Imparature range 0.112 °K 0.112 °K Temparature function decendent on set value 0.1.0.5 °K 0.1.0.5 °K Ansage beating up rate according to EC 60063-55 5.0 Kmin 5.0 Kmin Colling seen fine from 160° CTo 4.0°C 15.0 fm 5.0 Kmin Average cooling decording to EC 60063-55 5.0 Kmin 5.0 Kmin Average cooling decording to EC 60063-55 5.0 Kmin 5.0 Kmin Average cooling decording to EC 60063-55 5.0 Kmin 5.0 Kmin Average cooling decording to EC 60063-55 5.0 Kmin 5.0 Kmin Average cooling decording to EC 60063-55 5.0 Kmin 5.0 Kmin Average cooling decording to EC 60063-55 5.0 Kmin 5.0 Kmin Average cooling decording to EC 60063-55 5.0 Kmin 5.0 Kmin Average cooling decording to EC 60063-55 5.0 Kmin 5.0 Kmin Average cooling decording to EC 60063-55 5.0 Kmin 5.0 Kmin Average cooling decording to EC 60063-55 5.0 Kmin 5.0 Kmin Name Er Eventer evectoring to EC 60063-55 </td <td>Article Number</td> <td>9020-0406</td> <td>9020-0445</td>	Article Number	9020-0406	9020-0445
Temperature range -4080 °C 4040 °C Temperature uniformity dependent on set value 0.11 × K 0.11 × K Temperature fluctuation dependent on set value 0.10 × K 0.10 × K Average heating-op rate according to EEC 60068.35 50 Vmin 50 Vmin Cooling-door time for also *C to -qo*C 155 min 50 Vmin Average cooling door time for also *C to -qo*C 155 min 50 Vmin Average cooling door time for also *C to -qo*C 155 min 50 Vmin Average cooling door time for also *C to -qo*C 155 min 50 Vmin Average cooling door time for also *C to -qo*C 150 Vmin 50 Vmin Average cooling door time for also *C to -qo*C 150 Vmin 50 Vmin Average cooling door time for also *C to -qo*C 150 Vmin 50 Vmin Average cooling door time for also *C to -qo*C 150 Vmin 50 Vmin Average cooling door time for also *C to -qo*C 150 Vmin 150 Vmin Rever fragearcy 50 Hz 60 Hz 150 Vmin Rever fragearcy 50 Pmin 150 Vmin 150 Vmin Rever fragearcy 30 kg	Option model	Standard	with voltage and frequency converter
Imperatue uniformity dependent on set value 0.1.1.2 4 K 0.1.1.5 4 K Temperatue fluctuation dependent on set value 0.1.0 5 4 K 0.1.0 5 4 K Arenge heating up note according to EC 60088-55 50 K/min 50 K/min Cooling down time from s80*C to 40*C 155 min 50 K/min Arenge nooling down time according to EC 60088-55 50 K/min 50 K/min Arenge cooling down time according to EC 60088-56 50 K/min 50 K/min Arenge cooling down time according to EC 60088-56 50 K/min 50 K/min Arenge cooling down time according to EC 60088-56 50 K/min 50 K/min Arenge cooling down time according to EC 60088-56 50 K/min 50 K/min Arenge cooling down time according to EC 60088-56 50 K/min 50 K/min Power frequency 50 K 60 K 50 K Reinfal gooer 74N 50 K 60 K Power frequency 60 K 60 K 60 K Reinfal gooer 91 K 60 K 60 K Reinfal gooer 60 K 60 K 60 K Reinfal gooer 60 K 60 K <td< td=""><td>Performance Data Temperature</td><td></td><td></td></td<>	Performance Data Temperature		
Imperature fluctuation dependent on set Value 0::::::::::::::::::::::::::::::::::::	Temperature range	-40180 °C	-40180 °C
Arenage heating up rate according to EC 60068-35 5.0 K/min 5.0 K/min Cooling down time foron 8.0°C to 4.0°C 15 min 5.0 K/min Arecage cooling down time according to EC 60068-35 5.0 K/min 5.0 K/min Enercial data 5.0 K/min 5.0 K/min Enercial data 4.00 V 5.0 K/min 5.0 K/min Power frequency 5.0 K/min 6.0 K2 5.0 K/min Noninal power 5.0 K/min 6.0 K2 5.0 K/min Base Nominal voltage 5.0 K/min 5.0 K/min 5.0 K/min Diver frequency 5.0 K 5.0 K/min 5.0 K/min Diver frequency 5.0 K 5.0 K 5.0 K Diver freque	Temperature uniformity dependent on set value	0.11.2 ± K	0.11.2 ± K
Cooling down time from 2e ^{nc} to 4q ^{nC} 13 min 13 min Aretage cooling down time according to EC 60069-35 50 K/min 50 K/min Electrical data 400 V 460 V Reted Voltage 400 V 60 Hz Rover frequency 50 Hz 60 Hz Normal power 70 W 70 W Unit tase 16 A 16 A Pase (Normial voltage) 3-2 3-2 Messares 192 V 3-2 Interior voltame 492 L 492 L New regist of the unit (empty) 432 kg 432 kg I ad per rack 30 run 30 run Valid clearance back 500 run 500 run Valid clearance back 500 run 500 run Valid clearance back 500 run 500 run Netting dimensions not ind. fiftings and connections 145 run 145 run Height ref 1,15 run 1,15 run 1,15 run Height ref 1,20 run 1,20 run 1,20 run	Temperature fluctuation dependent on set value	0.10.5 ± K	0.10.5 ± K
Average cooling down time according to EC 60068-35 \$o K/min Federical data Exterted Voltage 400 V Rated Voltage 400 V Power frequency 5o Hz Nominal power 7 kW Disc (hominal voltage) 7 kW Place (hominal voltage) 3-7 Place (hominal voltage) 3-7 Place (hominal voltage) 3-7 Interfuse 47/L Ressures 417 L Premetted load 30 kg Interfuse (hominal voltage) 3-8 kg Interfuse (hominal voltage) 3-9 Ressures 417 L Retweight of the unit (emphy) 43 kg Interfuse (hominal voltage) 30 kg Permitted load 500 mm Vall clearance sidewise 500 mm Vall clearance sidewise 500 mm Vall clearance sidewise 1200 mm Permitted load 1210 mm Proved 1210 mm Vall clearance sidewise 1210 mm Poph ref. 1200 mm Permitted loat 1210 mm	Average heating-up rate according to IEC 60068-3-5	5.0 K/min	5.0 K/min
Electrical deta Rated Voltage 4x0 V 4x80 V Power frequency 5x0 Iz 6x0 A Nominal power 5x0 Iz 7xW Unit fuse 6x0 A 6x0 A Phase (Nominal voltage) 3x0 3x0 Phase (Nominal voltage) 3x0 3x0 Phase (Nominal voltage) 3x0 3x0 Phase (Nominal voltage) 3x1 3x1 Phase (Nominal voltage) 3x0 3x1 Phase (Nominal voltage) 3x0 3x1	Cooling down time from 180°C to -40°C	115 min	115 min
Rated Voltage 400 V 480 V Power frequency 50 Hz 60 Hz Nominal power 7 kW 7 kW Unit fuse 6.0 A 16.0 A Pose (Nominal voltage) 3~ 3- Measures 470 L 470 L Interfor volume 473 kg 471 L Net weight of the unit (empty) 438 kg 433 kg Posit doet annee beack 30 kg 30 kg Patil clearance back 500 mm 500 mm Valid clearance back 500 mm 500 mm Height net 1.15 mm 1.15 mm Height net 1.270 mm 1.270 mm Lead Domensions 1.400 mm 1.400 mm	Average cooling down time according to IEC 60068-3-5	5.0 K/min	5.0 K/min
Power frequency50 Hz60 HzPower frequency7kW7kWNaminal power7kW16.0 AUnit fuse16.0 A16.0 APhase (Nominal voltage)3-33-3Messere471 A471 ANet weight of the unit (empth)432 Ng433 NgNet weight of the unit (empth)19.0 Ng30.0 NgPermitted load10.0 Ng10.0 NgPermitted load10.0 Ng10.0 NgVal clearance back500 nm500 nmWidt hert1.01 S nm1.01 S nmHeight net1.01 S nm1.01 S nmHeight net1.02 nm1.02 nmDepth net1.02 nm1.02 nmHenatomesions1.02 nm1.02 nm	Electrical data		
Nominal power7 kWNominal power7 kWUnit fuse16.0 APhase (Nominal voltage)3-Assexes	Rated Voltage	400 V	480 V
Unit fuse 16,0 A Phase (Nominal voltage) 3-0 Phase (Nominal voltage) 3-0 Measures 1000000000000000000000000000000000000	Power frequency	50 Hz	60 Hz
Phase (Nominal voltage) 3- Resures 417 L Interior volume 417 L Net weight of the unit (empty) 413 kg Jaad per rack 30 kg Permitted load 300 kg Wall clearance back 500 mm Vall clearance sidewise 300 mm Height net 1.115 mm Height net 1.200 mm Permited load 1.115 mm	Nominal power	7 kW	7 kW
MeasuresInterior volume417 L417 LNet weight of the unit (empty)413 kg413 kgLoad per rack30 kg30 kgPermitted load150 kg30 kgVall clearance back500 mm500 mmWall clearance sidewise300 mm300 mmHousing dimensions not Incl. fittings and connections1,115 mmHeight net1,210 mm1,210 mmHeight net1,400 mm1,400 mm	Unit fuse	16,0 A	16,0 A
Interior volume417 L417 LNet weight of the unit (empty)413 kg413 kgLoad per rack30 kg30 kgPermitted load150 kg150 kgWall clearance back500 mm500 mmWall clearance sidewise300 mm300 mmHousing dimensions not incl. fittings and connections1.115 mmWidth net1.210 mm1.210 mmHeight net1.400 mm1.400 mmIternal Dimensions1.400 mm	Phase (Nominal voltage)	3~	3~
Net weight of the unit (empty) 413 kg 413 kg Load per rack 30 kg 30 kg Permitted load 150 kg 150 kg Wall clearance back 500 mm 500 mm Wall clearance sidewise 300 mm 300 mm Housing dimensions not incl. fittings and connections 300 mm 1115 mm Width net 1,115 mm 1,115 mm 1,115 mm Leight net 1,200 mm 1,200 mm 1,400 mm	Measures		
Load per rack 30 kg 30 kg Permitted load 150 kg 150 kg Wall clearance back 500 mm 500 mm Wall clearance sidewise 300 mm 300 mm Housing dimensions not incl. fittings and connections 300 mm 1,115 mm Width net 1,115 mm 1,115 mm 1,115 mm Height net 1,710 mm 1,710 mm 1,710 mm Depth net 1,400 mm 1,400 mm 1,400 mm	Interior volume	417 L	417 L
Permitted load 150 kg 150 kg Wall clearance back 500 mm 500 mm Wall clearance sidewise 300 mm 300 mm Housing dimensions not incl. fittings and connections 300 mm 1,115 mm Width net 1,115 mm 1,115 mm 1,210 mm Depth net 1,400 mm 1,400 mm 1,400 mm	Net weight of the unit (empty)	413 kg	413 kg
Wall clearance back500 mm500 mmWall clearance sidewise300 mm300 mmHousing dimensions not incl. fittings and connections1,115 mmWidth net1,115 mm1,115 mmHeight net1,710 mm1,710 mmDepth net1,400 mm1,400 mm	Load per rack	30 kg	30 kg
Wall clearance sidewise300 mmHousing dimensions not incl. fittings and connections300 mmWidth net1,115 mm1,115 mmHeight net1,710 mm1,710 mmDepth net1,400 mm1,400 mm	Permitted load	150 kg	150 kg
Housing dimensions not incl. fittings and connections Width net 1,115 mm Height net 1,710 mm Depth net 1,400 mm Internal Dimensions 1,400 mm	Wall clearance back	500 mm	500 mm
Width net 1,115 mm 1,115 mm Height net 1,710 mm 1,710 mm Depth net 1,400 mm 1,400 mm	Wall clearance sidewise	300 mm	300 mm
Height net 1,710 mm 1,710 mm Depth net 1,400 mm 1,400 mm	Housing dimensions not incl. fittings and connections		
Depth net 1,400 mm Internal Dimensions	Width net	1,115 mm	1,115 mm
Internal Dimensions	Height net	1,710 mm	1,710 mm
	Depth net	1,400 mm	1,400 mm
Interior width 735 mm 735 mm	Internal Dimensions		
	Interior width	735 mm	735 mm



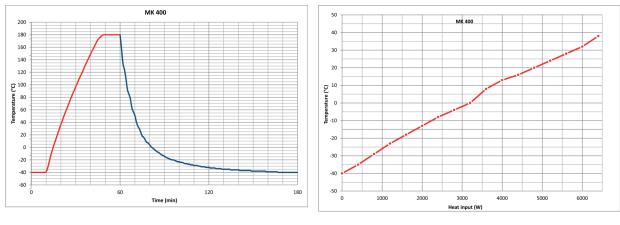
Interior height	700 mm	700 mm			
Interior depth	810 mm	810 mm			
Unit doors	1	1			
Environment-specific data	invironment-specific data				
Sound-pressure level	65 dB(A)	65 dB(A)			
Energy consumption at 20°C	1,400 Wh/h	1,400 Wh/h			
Fixtures					
Number of shelves (std./max.)	1/6	1/6			

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]

DIAGRAMS



Heating up rate / Cooling down rate

Heat compensation chart

OPTIONS

Designation	Description	MK 400	*	ArtNo.
Access port with silicone plug	left			

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Designation	Description	MK 400	*	ArtNo.
	30 mm	•	01	8012-1322
	50 mm	•	01	8012-1328
	80 mm 		01	8012-1334
			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 measurement incl. certificate, 9 measuring points at specified temperature	•	-	8012-1560
temperature	temperature measurement incl. certificate, 15- 18 measuring points at specified temperature	•	-	8012-1581
	temperature measurement incl. certificate and 27 measuring points at specified temperature	•	-	8012-1602
Compressed air connection	for the connection to an existing pressurized air network	•	-	8012-1089
Door lock	lockable door handle	•	-	8012-1861
Notch-type access port	notch-type access port in door, 100 x 35 mm	•	-	8012-1850
Pt 100 temperature sensor	additional flexible Pt 100, interior, for displaying the temperature on the unit display	•	-	8012-1093
RS 485 interface, 2-wire	Additional serial interface can be used parallel to Ethernet, for Multi Management Software APT-COM™	•		8012-1768
Temperature safety device class 2	with visual alarm (DIN 12880)	•	-	8012-1792

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Designation	Description	MK 400	*	ArtNo.
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

ACCESSORIES

Designation	Description	MK 400	*	ArtNo.
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	•	-	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	•	-	9053-0040
	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_2 , O_2 – or pressure, depending on unit			
	Digital in PDF format	•	-	7057-0005
	- Hard copy inside folder	•	-	7007-0005
Qualification documents	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_2 , O_2 , pressure, depending on unit			
	- Digital in PDF format	•	-	7057-0001
	- Hard copy inside folder	•	-	7007-0001
	RS 422 cable set and RS 485 / RS 422 interface converter for connection to 10-way plug distributor			
RS 485 / RS 422 interface converter	115 V option model	•	-	8012-0599
	230 V option model	•	-	8012-0589
Rack	stainless steel	•	-	8012-2123
Rack, reinforced	stainless steel, with fasteners (1 set of 4)	•	-	8012-2104
Rack accessories	fasteners (1 set of 4) for additional security of racks		-	8012-2280
Shelf, perforated	Stainless steel	•	-	8012-2260
oH-neutral detergent	concentrated, for gentle remove of residual contaminants; 1 kg	•	-	8012-2250

SERVICES

Designation	Description	*	ArtNo.
Calibration services			

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Designation	Description	*	ArtNo.
Calibration contificate town orature	Calibration of one (1) test temperature specified by the user in center of chamber, including certificate	_	DL30-0101
Calibration certificate, temperature	Extension of calibration of one (1) additional test temperature specified by the user in the center of the usable space, including certificate	_	DL30-0102
Temperature measurement, 9 measuring points	Temperature measurement with 9 measuring points with a set value specified by the user, including certificate	_	DL30-0109
Temperature measurement, 18 measuring points	Temperature measurement with 18 measuring points with a set value specified by the user, including certificate	-	DL30-0118
Temperature measurement, 27 measuring points	Temperature measurement with 27 measuring points with a set value specified by the user, including certificate	_	DL30-0127
nstallation services			
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)	-	DL10-0300
Unit instructions	Instruction regarding operating principle and basic functions of the unit, operation of the control electronics including programming	_	DL10-0700
Maintenance contracts			
3RONZE 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	-	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 and CO_2 value, including certificate	_	DL20-0940
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	_	DL20-0830
Maintenance services			
Leakage test	Testing and logging of the leak-tightness of systems containing hydrofluorocarbons in accordance with Regulation EC842/2006, incl. test book	_	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	_	DL20-0500
Validation services			
Execution of IQ/OQ	Execution of IQ/OQ in accordance with qualification folder	_	DL41-0200
	Execution of IQ/OQ/PQ in accordance with qualification folder	_	DL44-0500
Execution of IQ/OQ/PQ			
-xecution of IQ/OQ/PQ Warranty service			

NOTES

01 Condensation may occur in the area around the access port. Access ports may be placed in custom locations for an additional charge.

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