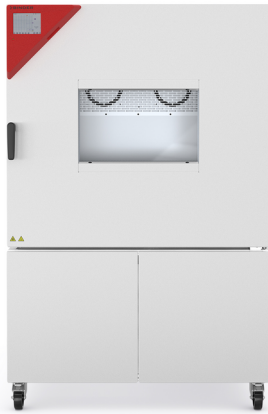


## Model MKF 400 | Dynamic climate chambers for rapid temperature changes with humidity control

A BINDER MKF series environmental simulation chamber is ideally suited for any cold and heat testing based on current temperature and climate testing methods according to DIN and IEC standards. The comprehensive standard equipment for this environmental simulation chamber ensures ease of operation.

### BENEFITS

- Homogeneous climate conditions thanks to APT.line™ technology
- Automatic water and wastewater management
- Pressure humidification with fast response times
- Comprehensive programming and data acquisition
- Large heated viewing window



Model 400



Model 400

### IMPORTANT FEATURES

- Temperature range: -40 °C to +180 °C
- Humidity range: 10 % to 98 % RH
- Integrated water-storage tank, 20 liters
- 4 zero-voltage relay contacts
- APT.line™ preheating chamber technology
- Programmable condensation protection for test material
- Heated viewing window with LED interior lighting
- Humidity regulation with capacitive humidity sensor and vapor humidification
- BINDER Multi Management Software APT-COM™ 4 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
- 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
- Door heating
- Alarm notification in the event of insufficient water in fresh water tank
- 1 stainless steel rack
- Complete safety connection kit for water supply and drainage, up to 1 m height
- 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
- Systems for water treatment and compressed air supply
- 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	Art.-No.
<b>Model MKF 400</b>					
417	400 V 3~ 50 Hz -16,0 A	CEE 16 / 6 H plug 5-pin	Standard	MKF400-400V	9020-0408
	480 V 3~ 60 Hz -16,0 A	CEE 16 / 6 H plug 5-pin	with voltage and frequency converter	MKF400-480V-C	9020-0446

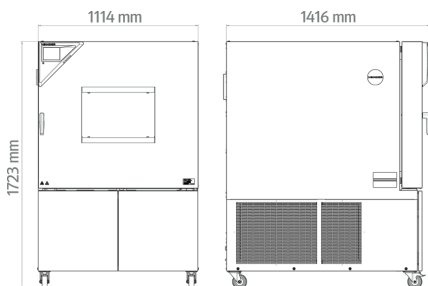
## TECHNICAL DATA

Data		
Designation	MKF400-400V	MKF400-480V-C
Article Number	9020-0408	9020-0446
Option model	Standard	with voltage and frequency converter
Performance Data Temperature		
Temperature range	-40...180 °C	-40...180 °C
Temperature uniformity dependent on set value	0.1...1.2 ± K	0.1...1.2 ± K
Temperature fluctuation dependent on set value	0.1...0.5 ± K	0.1...0.5 ± K
Average heating-up rate according to IEC 60068-3-5	5.0 K/min	5.0 K/min
Cooling down time from 180°C to -40°C	115 min	115 min
Average cooling down time according to IEC 60068-3-5	5.0 K/min	5.0 K/min
Performance Data Climate		
Temperature range with humidity	10...95 °C	10...95 °C
Temperature fluctuation with humidity dependent on set value	0.1...1.3 ± K	0.1...1.3 ± K
Humidity fluctuation with humidity dependent on set value	2,5 ± % r.F.	2,5 ± % r.F.
Max. heat compensation at 25°C and 90% RH	800 W	800 W
Electrical data		
Rated Voltage	400 V	480 V
Power frequency	50 Hz	60 Hz
Nominal power	8 kW	8 kW
Unit fuse	16,0 A	16,0 A
Phase (Nominal voltage)	3~	3~
Measures		
Interior volume	417 L	417 L
Net weight of the unit (empty)	432 kg	432 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

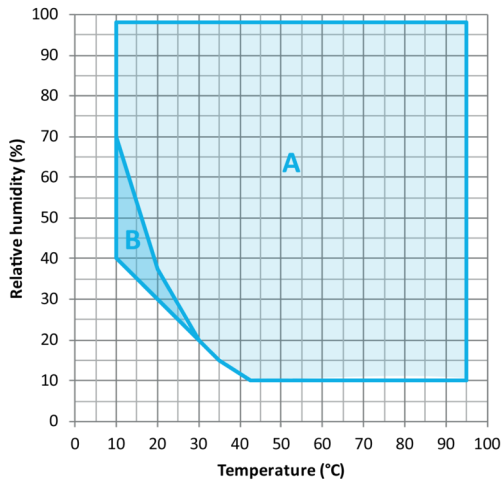
Housing dimensions not incl. fittings and connections		
Width net	1,115 mm	1,115 mm
Height net	1,710 mm	1,710 mm
Depth net	1,400 mm	1,400 mm
Internal Dimensions		
Interior width	735 mm	735 mm
Interior height	700 mm	700 mm
Interior depth	810 mm	810 mm
Unit doors	1	1
Environment-specific data		
Sound-pressure level	65 dB(A)	65 dB(A)
Energy consumption at 25°C and 60% RH	1,900 Wh/h	1,900 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  $+22\text{ °C} \pm 3\text{ °C}$  and a power supply voltage fluctuation of  $\pm 10\%$ . 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.

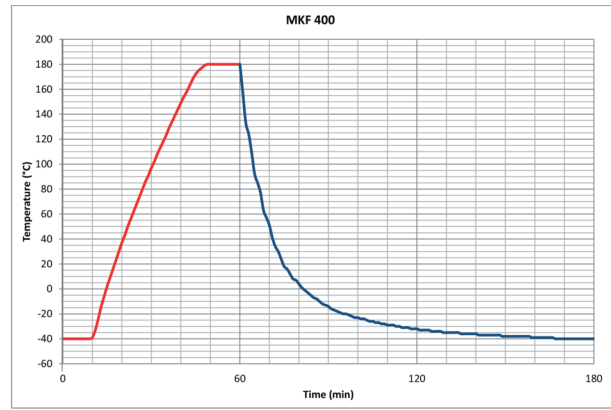
### DIMENSIONS Incl. fittings and connections [mm]



**DIAGRAMS**

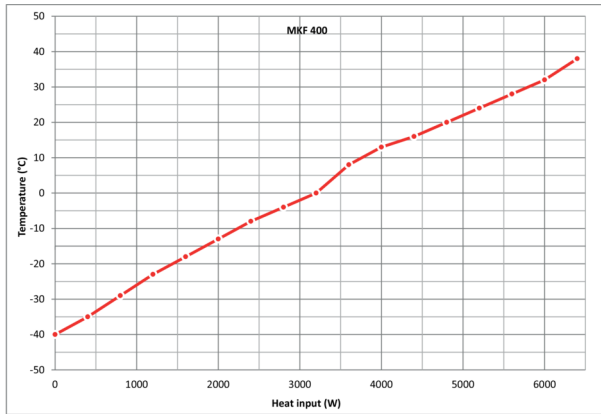


A: Standard Climate range  
B: Time-limited operation (max. 24 hours)



Heating up rate / Cooling down rate

Climate chart



Heat compensation chart

**OPTIONS**

Designation	Description	MKF 400	*	Art.-No.
	left			
	30 mm	•	01	8012-1323
	50 mm	•	01	8012-1329
Access port with silicone plug	80 mm	•	01	8012-1335
	100 mm	•	01	8012-1543
	125 mm	•	01	8012-1352
	right			

Designation	Description	MKF 400	*	Art.-No.
	30 mm	•	01	8012-1320
	50 mm	•	01	8012-1326
	80 mm	•	01	8012-1332
	100 mm	•	01	8012-1540
	125 mm	•	01	8012-1349
	top			
	80 mm	•	01	8012-1537
	100 mm	•	01	8012-1531
	125 mm	•	01	8012-1534
Analog output 4-20 mA	for temperature and humidity values (output not adjustable)	•	-	8012-1085
Calibration certificate, expanded	for temperature and humidity; for extending the measurement in center of chamber to include another test value	•	-	8012-1194
	temperature measurement incl. certificate, 9 measuring points at specified temperature	•	-	8012-1568
Calibration certificate, temperature	temperature measurement incl. certificate, 15- 18 measuring points at specified temperature	•	-	8012-1589
	temperature measurement incl. certificate and 27 measuring points at specified temperature	•	-	8012-1609
	Measurement in center of chamber at 25°C / 60% RH or at specified test values	•	-	8012-1188
Calibration certificate, temperature and humidity	temperature (according to DIN12880) and humidity measurement incl. certificate, 27 temperature measuring points and 1 humidity measuring point, at 25 °C / 60 % RH or at specified values	•	-	8012-1615
Compressed air connection	for the connection to an existing pressurized air network	•	-	8012-1787
Door lock	lockable door handle	•	-	8012-1862
Notch-type access port	notch-type access port in door, 100 x 35 mm	•	-	8012-1856
Pt 100 temperature sensor	additional flexible Pt 100, interior, for displaying the temperature on the unit display	•	-	8012-1094
RS 485 interface, 2-wire	Additional serial interface can be used parallel to Ethernet, for Multi Management Software APT-COM™	•	-	8012-1769
Temperature safety device class 2	with visual alarm (DIN 12880)	•	-	8012-1864
Water circuit	allows condensed water to be reused	•	-	8012-1512

## ACCESSORIES

Designation	Description	MKF 400	*	Art.-No.
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
BINDER PURE AQUA SERVICE	System for preparation or complete desalination of tap water, complete set containing PURE AQUA 300 single-use cartridge, measuring device, and all necessary connecting parts	•	-	8012-0759
BINDER PURE AQUA SERVICE, accessories	Single-use, replacement cartridge for BINDER PURE AQUA System	•	-	6011-0165
Qualification documents	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 and humidity values			
	Digital in PDF format	•	-	7057-0006
	Hard copy inside folder	•	-	7007-0006
	IQ/OQ documents – supporting documents for validation performed by customers, consisting of: IQ/OQ checklists incl. calibration guide and comprehensive unit documentation; parameters: temperature and humidity values			
	Digital in PDF format	•	-	7057-0002
	Hard copy inside folder	•	-	7007-0002
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
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
WLAN kit	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.	•	-	8012-2262
pH-neutral detergent	concentrated, for gentle remove of residual contaminants; 1 kg	•	-	8012-2250

## SERVICES

Designation	Description	*	Art.-No.
<b>Calibration services</b>			
Temperature and humidity calibration	Expansion –Temperature and humidity calibration with 1 measuring point in center of chamber with 1 specified pair of values, including certificate	–	DL30-0302
	Temperature and humidity calibration with 1 measuring point in center of chamber with 1 specified pair of values, including certificate	–	DL30-0301
Temperature and humidity measurement, 9-1 measuring points	Temperature measurement with 9 temperature measuring points and 1 humidity measuring point in center of chamber with a pair of values specified by the user, including certificate	–	DL30-0309
Temperature and humidity measurement, 18-1 measuring points	Temperature measurement with 18 temperature measuring points and 1 humidity measuring point in center of chamber with a pair of values specified by the user, including certificate	–	DL30-0318
Temperature and humidity measurement, 27-1 measuring points	Temperature measurement with 27 temperature measuring points and 1 humidity measuring point in center of chamber with a pair of values specified by the user, including certificate	–	DL30-0327
Temperature and humidity measurement according to DIN12880	Temperature measurement in accordance with DIN 12880 with 27 temperature measuring points and 1 humidity measuring point in center of chamber with a pair of values specified by the user, including certificate	–	DL30-0427
<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)	–	DL10-0300
Unit instructions	Instruction regarding operating principle and basic functions of the unit, operation of the control electronics including programming	–	DL10-0700
<b>Maintenance contracts</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	–	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 <sub>2</sub> 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
<b>Maintenance services</b>			
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
<b>Validation services</b>			
Execution of IQ/OQ	Execution of IQ/OQ in accordance with qualification folder	–	DL42-0300
Execution of IQ/OQ/PQ	Execution of IQ/OQ/PQ in accordance with qualification folder	–	DL44-0500
<b>Warranty service</b>			



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Designation	Description	*	Art.-No.
1-year warranty extension	The warranty is extended by 1 year from the delivery date, wear parts are excluded	–	DL50-0040

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## 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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