Model MKF 400 CO_2 | Dynamic climate chambers for rapid temperature changes with humidity control

The dynamic climate chambers in the MKF CO_2 series are designed for combined temperature and humidity tests under dynamic conditions. High alternating speeds and precise humidity control support standard-compliant, reproducible test runs. A comprehensive list of standard features ensures incredible value for money.

The MKF CO_2 series uses natural CO_2 as a refrigerant and expands the portfolio with a solution designed for combined climate testing.

BENEFITS

- More performance for your budget and long-term investment security
- Easy to integrate, intuitive to use, and flexible to network
- Reliable protection for samples, data, and processes
- Reproducible results and long-term operational stability

Model 400

Model 400

IMPORTANT FEATURES

- Temperature range: -50°C to +180°C
- Humidity range: 10% to 98% RH
- Humidity regulation with capacitive humidity sensor and steam humidification
- APT.line™ preheating chamber technology
- Cooling with natural CO2 R744 refrigerant
- Intuitive touchscreen controller with time-segment and real-time programming
- Ergonomically adjustable operating terminal
- Signal triangle with light-up status display
- Internal data logger, measured values can be read out in open format via USB
- BINDER Multi Management Software APT-COM™ basic edition
- Programmable condensation protection for samples
- Troubleshooting system with visual and acoustic alarms
- Stainless-steel inner chamber
- 1 stainless steel rack
- 1 access port with silicone plug, 50 mm, left
- Heated viewing window with LED interior lighting
- Class 2 independent adjustable temperature safety device (DIN 12880) with visual alarm
- 4 sturdy twin casters with brakes at the front
- Data interfaces: Ethernet, USB
- Adjustable ramp function
- Integrated line recorder
- Real-time clock
- Door heating to prevent condensation
- Integrated water-storage tank, 20 L
- 4 zero-voltage relay contacts

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.
Model MKF 400 CO_2					
417	480 V 3~/N/PE 60 Hz -16,0 A	NEMA L22-20P	Standard	MKF400-480V	9020-0521
	400 V 3~/N/PE 50 Hz -16,0 A	CEE 16 / 6 H plug 5-pin	Standard	MKF400CO2-400V	9020-0519

TECHNICAL DATA

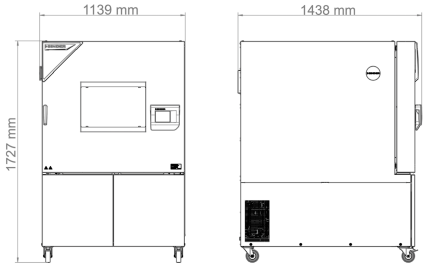
Data		
Article Number	9020-0519	9020-0521
Designation	MKF400CO2-400V	MKF400-480V
Option model	Standard	Standard
Performance Data Temperature		
Temperature range	-50...180 °C*	-50...180 °C*
Temperature uniformity dependent on set value	0.1...1.0 ± K	0.1...1.0 ± K
Temperature fluctuation dependent on set value	0.1...0.4 ± K	0.1...0.4 ± K
Average heating-up rate according to IEC 60068-3-5 between -40°C and 180°C	5.7 K/min	5.7 K/min
Average cooling down time according to IEC 60068-3-5 between 180°C and -40°C	5.0 K/min	5.0 K/min
Cooling down time from 180°C to -40°C	80 min	80 min
Performance Data Climate		
Temperature range with humidity	10...95 °C	10...95 °C
Humidity range	10...98 % RH	10...98 % RH
Temperature fluctuation with humidity dependent on set value	0.1...1 ± K	0.1...1 ± K
Humidity fluctuation with humidity dependent on set value	2 ± % r.F.	2 ± % r.F.
Max. heat compensation at 25°C and 90% RH	1,600 W	1,600 W
Electrical data		
Rated Voltage	400 V	480 V
Power frequency	50 Hz	60 Hz
Nominal power	7,9 kW	7,9 kW
Unit fuse	16,0 A	16,0 A
Phase (Nominal voltage)	3~/N/PE	3~/N/PE
Dimensions and weights		
Interior volume	417 L	417 L
Net weight of the unit (empty)	394 kg	404 kg
Load per rack	30 kg	30 kg
Permitted load	150 kg	150 kg

Wall clearance back	300 mm	300 mm
Wall clearance sidewise	200 mm	200 mm
Housing dimensions not incl. fittings and connections		
Width net	1,115 mm	1,115 mm
Height net	1,727 mm	1,727 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	62 dB(A)	62 dB(A)
Energy consumption at 25°C and 60% RH	1,550 Wh/h	1,550 Wh/h
Fixtures		
Number of shelves (std./max.)	1/6	1/6

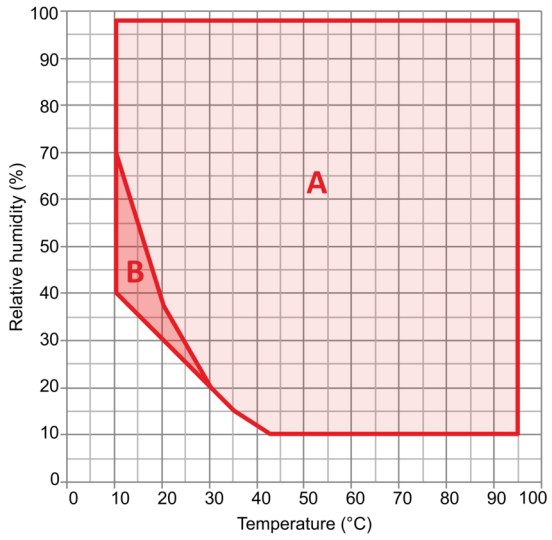
*Temperature reduction to -50°C adjustable for up to 8 hours.

All technical data is specified exclusively for unloaded units with standard equipment at an ambient temperature of 22 ± 3°C and a line voltage fluctuation of ± 10%. The temperature data is determined in accordance with BINDER factory standard following DIN 12880:2007, respecting the recommended wall clearances of 10% of the height, width, and depth of the interior chamber. All figures are typical average values for series units. Technical data refers to 100% fan speed. We reserve the right to alter technical specifications at any time.

DIMENSIONS Incl. fittings and connections [mm]

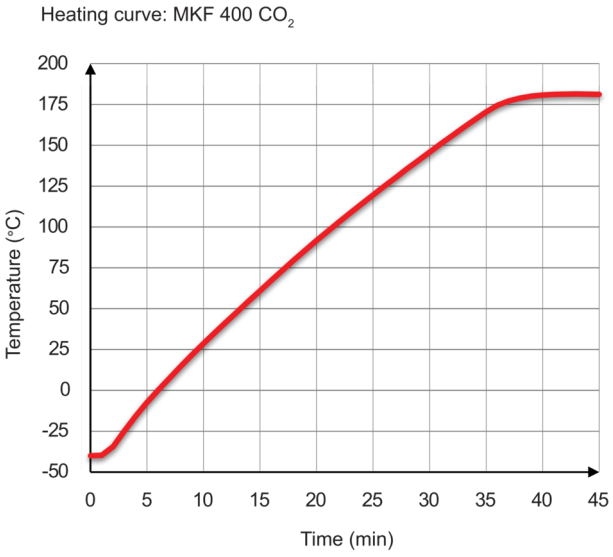


DIAGRAMS

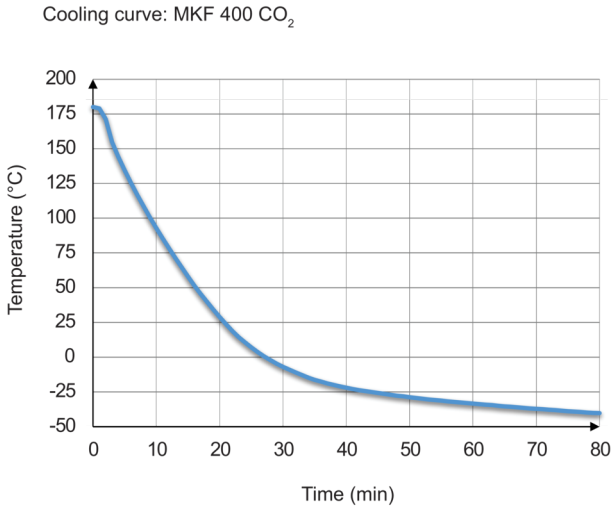


A: Standard Climate range
B: Time-limited operation (max. 24 hours)

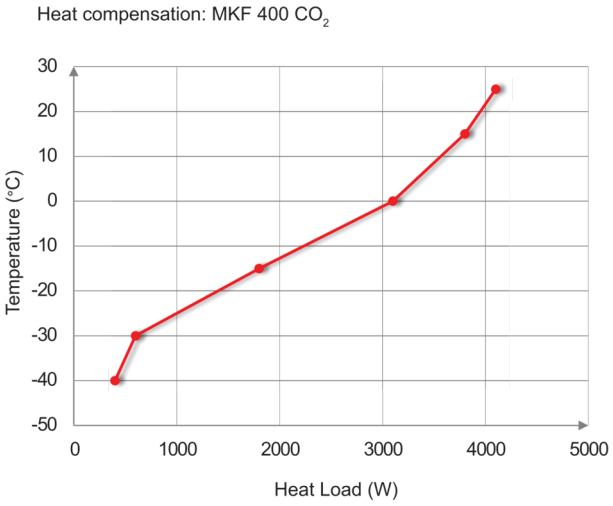
Climate chart



Heating up rate



Cooling down rate



Heat compensation chart

OPTIONS

Designation	Description	MKF CO_2 400	*	Art.-No.
Access port with silicone plug	left			
	30 mm	•	01	8012-2683
	50 mm	•	01	8012-2685
	80 mm	•	01	8012-2687
	100 mm	•	01	8012-2690
	125 mm	•	01	8012-2693

Designation	Description	MKF CO_2 400	*	Art.-No.
	right			
	30 mm	•	01	8012-2684
	50 mm	•	01	8012-2686
	80 mm	•	01	8012-2689
	100 mm	•	01	8012-2692
	125 mm	•	01	8012-2695
	top			
	80 mm	•	01	8012-2688
	100 mm	•	01	8012-2691
	125 mm	•	01	8012-2694
Analog output 4-20 mA	for temperature and humidity values (output not adjustable)	•	-	8012-2674
Calibration certificate, expanded	for temperature and humidity; for extending the measurement in center of chamber to include another test value	•	-	8012-2701
Calibration certificate, temperature	temperature measurement incl. certificate, 9 measuring points at specified temperature	•	-	8012-2698
	temperature measurement incl. certificate, 15- 18 measuring points at specified temperature	•	-	8012-2699
	temperature measurement incl. certificate and 27 measuring points at specified temperature	•	-	8012-2697
Calibration certificate, temperature and humidity	Measurement in center of chamber at 25°C / 60% RH or at specified test values	•	-	8012-2700
	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	•	-	8012-2696
Door lock	lockable door handle	•	-	8012-2673
Pt 100 temperature sensor	additional flexible Pt 100, interior, for displaying the temperature on the unit display	•	-	8012-2705
RS 485 interface, 2-wire	Additional serial interface can be used parallel to Ethernet, for Multi Management Software APT-COM™	•	-	8012-2706
Water circuit	allows condensed water to be reused	•	-	8012-2709

ACCESSORIES

Designation	Description	MKF CO_2 400	*	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

Designation	Description	MKF CO_2 400	*	Art.-No.
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
pH-neutral detergent	concentrated, for gentle remove of residual contaminants; 1 kg	•	-	8012-2250
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
Rack	stainless steel	•	-	8012-2123
Rack, reinforced	stainless steel	•	-	8012-2104
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
Shelf, perforated	Stainless steel	•	-	8012-2260

SERVICES

Designation	Description	*	Art.-No.
Calibration services			
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	05	DL30-0302
	Temperature and humidity calibration with 1 measuring point in center of chamber with 1 specified pair of values, including certificate	05	DL30-0330
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	05	DL30-0309

Designation	Description	*	Art.-No.
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	05	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	05	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	05	DL30-0427
Installation 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)	05	DL10-0180
Unit instructions	Instruction regarding operating principle and basic functions of the unit, operation of the control electronics including programming	05	DL10-0560
Maintenance contracts			
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 test temperature specified by the user in the center of the usable space, including certificate	05	DL20-0935
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	DL20-0835
Maintenance services			
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	DL20-0610
Validation services			
Execution of IQ/OQ	Execution of IQ/OQ in accordance with qualification folder	05	DL42-0300
Execution of IQ/OQ/PQ	Execution of IQ/OQ/PQ in accordance with qualification folder	05	DL44-0500
Warranty service			
1-year warranty extension	The warranty is extended by 1 year from the delivery date, wear parts are excluded	05	DL50-0040

NOTES

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

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).

BINDER GmbH
Tuttlingen, Germany
TEL +49 7462 2005 0
info@binder-world.com
www.binder-world.com

BINDER Inc.
Bohemia, NY, USA
TEL +1 631 224 4340
usa@binder-world.com
www.binder-world.us

BINDER Environmental Testing Equipment (Shanghai) Co., Ltd.
Shanghai, P.R. China
TEL +86 21 685 808 25
china@binder-world.com
www.binder-world.com