Model MK 400 CO_2 | Dynamic climate chambers for rapid temperature changes

The environmental simulation chambers in the MK CO_2 series are designed for dynamic temperature tests and complex temperature profiles. High alternating speeds facilitate rapid temperature changes and ensure that tests are conducted in accordance with standards and are reproducible. A comprehensive list of standard features ensures incredible value for money.

The MK CO_2 series uses natural CO_2 as a refrigerant, offering an alternative for applications with specific refrigeration requirements.

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*
- APT.line™ preheating chamber technology
- Cooling with R744, a natural CO_2 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
- Access port with silicone plug, 80 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

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	Art.-No.
Model MK 400 CO_2					
417	400 V 3~/N/PE 50 Hz -16,0 A	CEE 16 / 6 H plug 5-pin	Standard	MK400CO2-400V	9020-0518

Interior volume [L]	Power supply - unit fuse	Plug*	Version	Model version	Art.-No.
	480 V 3~/N/PE 60 Hz -16,0 A	–	Standard	MK400CO2-480V	9020-0520

TECHNICAL DATA

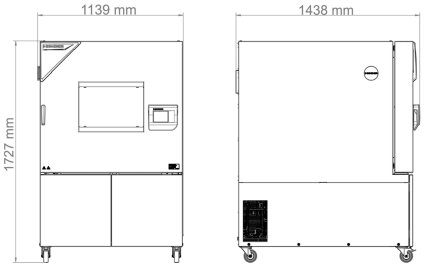
Data		
Article Number	9020-0518	9020-0520
Designation	MK400CO2-400V	MK400CO2-480V
Option model	Standard	Standard
Performance Data Temperature		
Temperature range	-50...180 °C*	-50...180 °C*
Temperature uniformity dependent on set value	0.1...1.0 ± K	0.1...1.0 ± K
Temperature fluctuation dependent on 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
Electrical data		
Rated Voltage	400 V	480 V
Power frequency	50 Hz	60 Hz
Nominal power	6,8 kW	6,8 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)	380 kg	380 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	1,710 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	62 dB(A)	62 dB(A)
Energy consumption at 25°C	1,200 Wh/h	1,200 Wh/h
Fixtures		
Number of shelves (std./max.)	1/6	1/6

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

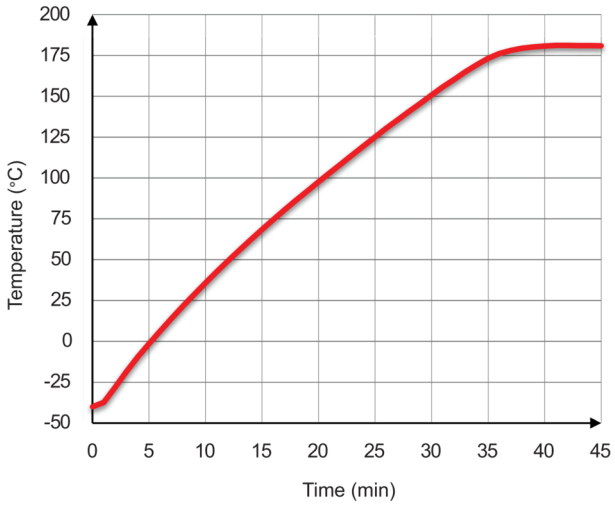
All technical data is specified exclusively for unloaded units with standard equipment at an ambient temperature of 22 ± 3°C and a line voltage fluctuation of ± 10%. The temperature data is determined in accordance with BINDER factory standard following DIN 12880:2007, respecting the recommended wall 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]



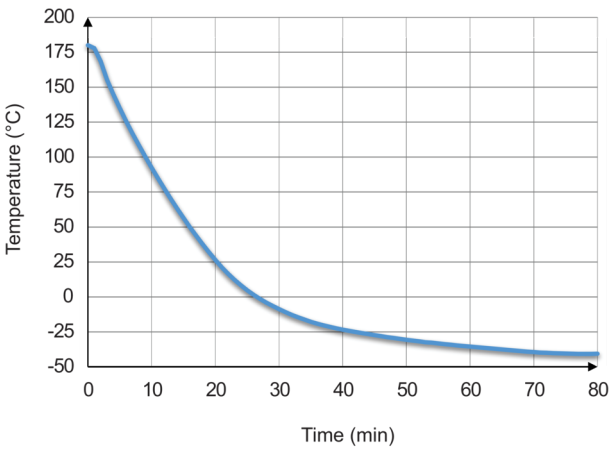
DIAGRAMS

Heating curve: MK 400 CO_2



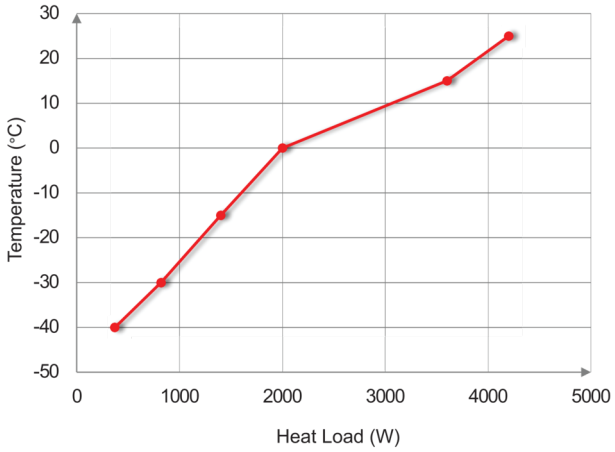
Heating up rate

Cooling curve: MK 400 CO_2



Cooling down rate

Heat compensation: MK 400 CO_2



Heat compensation chart

OPTIONS

Designation	Description	MK CO_2 400	*	Art.-No.
Access port with silicone plug	left			
	30 mm	•	01	8012-2649
	50 mm	•	01	8012-2651
	80 mm	•	01	8012-2653
	left			
	100 mm	•	01	8012-2643
	left			
	125 mm	•	01	8012-2646

Designation	Description	MK CO_2 400	*	Art.-No.
	right			
	30 mm	•	01	8012-2650
	50 mm	•	01	8012-2652
	80 mm	•	01	8012-2655
	100 mm	•	01	8012-2645
	125 mm	•	01	8012-2648
	top			
	80 mm	•	01	8012-2654
100 mm	•	01	8012-2644	
125 mm	•	01	8012-2647	
Analog output 4-20 mA	for temperature values (output not adjustable)	•	-	8012-2634
Calibration certificate, expanded	for temperature; for extending the measurement in center of chamber to include another test temperature	•	-	8012-2660
Calibration certificate, temperature	for temperature, measurement in center of chamber at specified temperature	•	-	8012-2656
	temperature measurement incl. certificate, 9 measuring points at specified temperature	•	-	8012-2659
	temperature measurement incl. certificate, 15- 18 measuring points at specified temperature	•	-	8012-2657
	temperature measurement incl. certificate and 27 measuring points at specified temperature	•	-	8012-2658
Door lock	lockable door handle	•	-	8012-2669
Pt 100 temperature sensor	additional flexible Pt 100, interior, for displaying the temperature on the unit display	•	-	8012-2667
RS 485 interface, 2-wire	Additional serial interface can be used parallel to Ethernet, for Multi Management Software APT-COM™	•	-	8012-2665
Zero voltage relay contacts	for controlling 3 relay contacts via program regulators, accessible via 6-pin DIN socket (max. 24 V - 2.5 A)	•	-	8012-2664

ACCESSORIES

Designation	Description	MK 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
APT-COM™ 4 PROFESSIONAL-Edition	convenient unit and user management built on the BASIC edition. Suitable for networking up to 100 units.			

Designation	Description	MK CO_2 400	*	Art.-No.
	version 4, PROFESSIONAL edition	•	-	9053-0040
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, CO_2, O_2 – or pressure, depending on unit			
	Digital in PDF format	•	-	7057-0005
	Hard copy inside folder	•	-	7007-0005
	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
Rack	stainless steel	•	-	8012-2123
Rack, reinforced	stainless steel	•	-	8012-2104
Rack accessories	fasteners (1 set of 4) for additional security of racks	•	-	8012-2280
Shelf, perforated	Stainless steel	•	-	8012-2260

SERVICES

Designation	Description	*	Art.-No.
Calibration services			
Calibration certificate, temperature	Calibration of one (1) test temperature specified by the user in center of chamber, including certificate	05	DL30-0130
	Extension of calibration of one (1) additional test temperature specified by the user in the center of the usable space, including certificate	05	DL30-0102
Temperature measurement, 9 measuring points	Temperature measurement with 9 measuring points with a set value specified by the user, including certificate	05	DL30-0109
Temperature measurement, 18 measuring points	Temperature measurement with 18 measuring points with a set value specified by the user, including certificate	05	DL30-0118
Temperature measurement, 27 measuring points	Temperature measurement with 27 measuring points with a set value specified by the user, including certificate	05	DL30-0127
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	DL10-0170
Unit instructions	Instruction regarding operating principle and basic functions of the unit, operation of the control electronics including programming	05	DL10-0560
Maintenance contracts			

Designation	Description	*	Art.-No.
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/pressure value, including certificate	05	DL20-0930
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
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	DL20-0607
Validation services			
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
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).

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