

## Model MK 400 CO<sub>2</sub> | 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

- Safe: Reliable protection for samples, data and processes
- Reliable: Long-lasting components, standard-compliant technical data and lasting functional stability
- Smart: Intuitive operation, digital networking and sophisticated equipment
- Economical & ecological: Best price/performance ratio, energy-efficient CO<sub>2</sub> technology and future-proof equipment



Model 400



Model 400

### IMPORTANT FEATURES

- Temperature range: -40 °C to +180 °C
- APT.line™ preheating chamber technology
- Cooling with climate-neutral R-744 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 (models 56, 115, 240, 400), 50 mm, left
- 2 access ports with silicone plugs (models 720, 1020), 80 mm, left and right
- 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
- Temperature reduction to -50 °C adjustable for up to 8 hours

### 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.
<b>Model MK 400 CO<sub>2</sub></b>					
417	400 V 3~/N/PE 50 Hz -16,0 A	CEE 16 / 6 H plug 5-pin	Standard	MK400CO <sub>2</sub> -400V	9020-0518

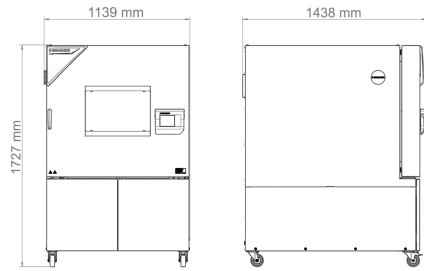
## TECHNICAL DATA

Data	
Designation	MK400CO2-400V
Article Number	9020-0518
Option model	Standard
Performance Data Temperature	
Temperature range	-40...180 °C
Temperature uniformity dependent on set value	0.1...1.2 ± K
Temperature fluctuation dependent on set value	0.1...0.5 ± K
Average heating-up rate according to IEC 60068-3-5	5.0 K/min
Cooling down time from 180°C to -40°C	115 min
Average cooling down time according to IEC 60068-3-5	4.0 K/min
Electrical data	
Rated Voltage	400 V
Power frequency	50 Hz
Nominal power	7 kW
Unit fuse	16,0 A
Phase (Nominal voltage)	3~/N/PE
Dimensions and weights	
Interior volume	417 L
Net weight of the unit (empty)	371 kg
Load per rack	30 kg
Permitted load	150 kg
Unit doors	1
Environment-specific data	
Sound-pressure level	65 dB(A)
Energy consumption at 20°C	1,400 Wh/h
Fixtures	
Number of shelves (std./max.)	1/6

The technical specifications provided are accurate at the time of creation and are subject to change without prior notice as product development continues. They do not constitute guaranteed characteristics. Technical modifications are reserved. The technical data provided corresponds to the status at the time this data sheet was created and is therefore only **preliminary technical data**. It may still change during further product validation or with the start of series production. The technical data provided cannot be guaranteed at this time.

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]



## OPTIONS

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

Designation	Description	*	Art.-No.
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	*	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
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 <sub>2</sub> , O <sub>2</sub> – 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 <sub>2</sub> , O <sub>2</sub> , 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.
<b>Calibration services</b>			
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
<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>			
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
<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	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	DL20-0607
<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	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

**BINDER Asia Pacific (Hong Kong) Ltd.**

Kowloon, Hong Kong, P.R. China  
TEL +852 39070500  
asia@binder-world.com  
www.binder-world.com