# Model MKF 1020 $CO_2$ | 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 1020

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## IMPORTANT FEATURES

- Temperature range: -48°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 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
- 2 access ports with silicone plugs, 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
- 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 1020 $CO_2$** | | | | | |
| 991 | 480 V 3~/N/PE 60 Hz -32,0 A | NEMA L22-30P | Standard | MKF1020-480V | 9020-0530 |
| | 400 V 3~/N/PE 50 Hz -32,0 A | CEE 32 / 6 H plug 5-pin | Standard | MKF1020O2-400V | 9020-0528 |

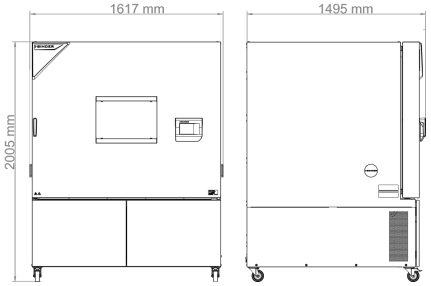
## TECHNICAL DATA

| Data | | |
|---|---|---|
| Article Number | 9020-0528 | 9020-0530 |
| Designation | MKF1020O2-400V | MKF1020-480V |
| Option model | Standard | Standard |
| **Performance Data Temperature** | | |
| Temperature range | -48...180 °C | -48...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...0.2 ± K | 0.1...0.2 ± K |
| Average heating-up rate according to IEC 60068-3-5 between -40°C and 180°C | 6.2 K/min | 6.2 K/min |
| Average cooling down time according to IEC 60068-3-5 between 180°C and -40°C | 4.8 K/min | 4.8 K/min |
| Cooling down time from 180°C to -40°C | 70 min | 70 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 | 1,400 W | 1,400 W |
| **Electrical data** | | |
| Rated Voltage | 400 V | 480 V |
| Power frequency | 50 Hz | 60 Hz |
| Nominal power | 11,5 kW | 11,5 kW |
| Unit fuse | 32,0 A | 32,0 A |
| Phase (Nominal voltage) | 3~/N/PE | 3~/N/PE |
| **Dimensions and weights** | | |
| Interior volume | 991 L | 991 L |
| Net weight of the unit (empty) | 570 kg | 580 kg |
| Load per rack | 40 kg | 40 kg |
| Permitted load | 200 kg | 200 kg |

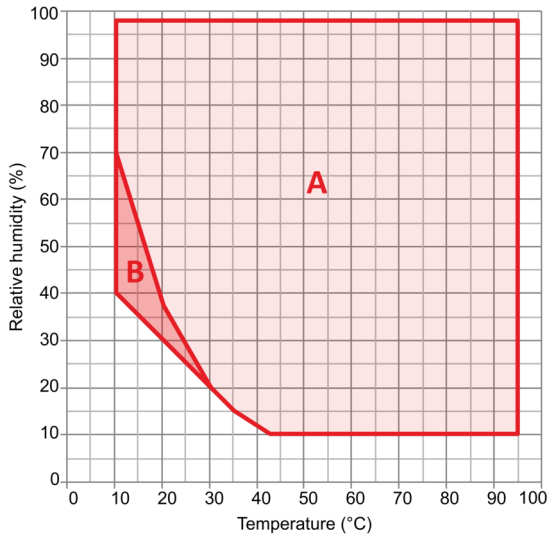
| | | |
|---|---|---|
| Wall clearance back | 300 mm | 300 mm |
| Wall clearance sidewise | 200 mm | 200 mm |
| **Housing dimensions not incl. fittings and connections** | | |
| Width net | 1,580 mm | 1,580 mm |
| Height net | 2,005 mm | 2,005 mm |
| Depth net | 1,480 mm | 1,480 mm |
| **Internal Dimensions** | | |
| Interior width | 1,200 mm | 1,200 mm |
| Interior height | 1,020 mm | 1,020 mm |
| Interior depth | 810 mm | 810 mm |
| Unit doors | 1 | 1 |
| **Environment-specific data** | | |
| Sound-pressure level | 60 dB(A) | 60 dB(A) |
| Energy consumption at 25°C and 60% RH | 3,000 Wh/h | 3,000 Wh/h |
| **Fixtures** | | |
| Number of shelves (std./max.) | 1/11 | 1/11 |

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]

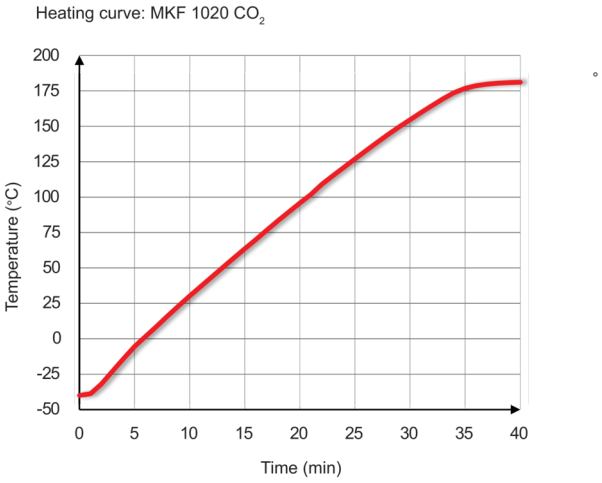


## DIAGRAMS

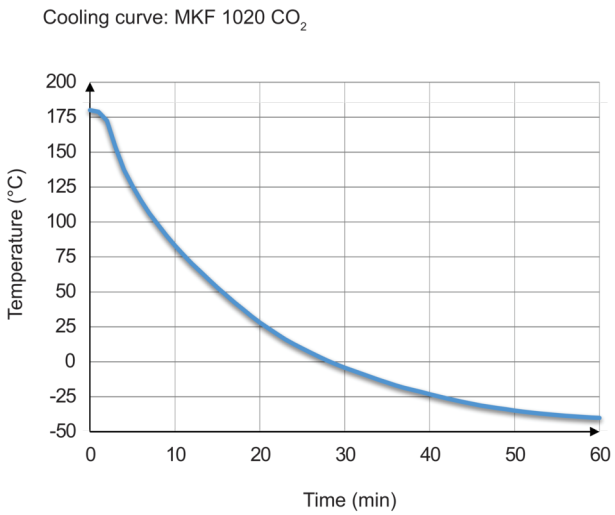



A: Standard Climate range
B: Time-limited operation (max. 24 hours)

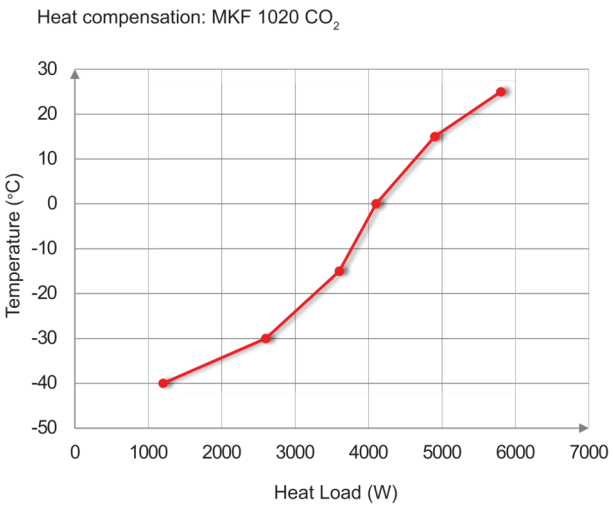
Climate chart




Heating up rate




Cooling down rate




Heat compensation chart

## OPTIONS

| Designation | Description | MKF $CO_2$ 1020 | * | Art.-No. |
|---|---|---|---|---|
| | left | | | |
| | 30 mm | • | 01 | 8012-2683 |
| Access port with silicone plug | 50 mm | • | 01 | 8012-2685 |
| | 80 mm | • | 01 | 8012-2687 |
| | 100 mm | • | 01 | 8012-2690 |

| Designation | Description | MKF $CO_2$ 1020 | * | Art.-No. |
|---|---|---|---|---|
| | 125 mm | • | 01 | 8012-2693 |
| | 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 $CO_2$ 1020 | * | 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 |
| 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 | • | - | 8012-2124 |
| Rack, reinforced | stainless steel | • | - | 8012-2105 |
| 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 | • | - | 8012-2261 |

## 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 |

| Designation | Description | * | Art.-No. |
|---|---|---|---|
| | 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 |
| 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).

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