

# Model MKF 115 | 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 115



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## MAIN 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™ Basic Edition
- Troubleshooting system with visual and audible alarms
- Intuitive touchscreen controller with time-segment and real-time programming
- Interner Datenlogger, Messwerte im offenen Format über USB auslesbar
- 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
- 230 V power socket on the right-side control panel
- 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-404A
- Cooling with compressor cooling unit

## ORDERING INFORMATION

| Interior volume [L]  | Voltage           | Option model                         | Version       | Art.-No.  |
|----------------------|-------------------|--------------------------------------|---------------|-----------|
| <b>Model MKF 115</b> |                   |                                      |               |           |
| 115                  | 400 V 3~ ph 50 Hz | Standard                             | MKF115-400V   | 9020-0207 |
|                      | 480 V 3~ ph 60 Hz | with voltage and frequency converter | MKF115-480V-C | 9020-0357 |

## TECHNICAL DATA

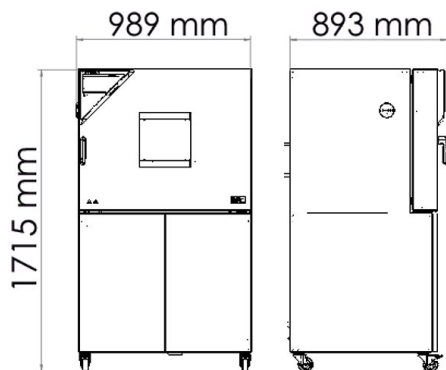
| Description  | MKF115-400V <sup>1</sup> | MKF115-480V-C <sup>1</sup> |
|--|--------------------------|----------------------------|
| Article Number   | 9020-0207                | 9020-0357                  |
| <b>Performance Data Temperature</b>                          |                          |                            |
| Temperature range [°C]                                       | -40...180                | -40...180                  |
| Temperature variation depending on setpoint [± K]            | 0.1...1.3                | 0.1...1.3                  |
| Temperature fluctuation depending on setpoint [± K]          | 0.1...0.6                | 0.1...0.6                  |
| Average heating-up rate according to IEC 60068-3-5 [K/min]   | 5.5                      | 5.5                        |
| Cooling down time from 180 °C to -40 °C [min]                | 95                       | 95                         |
| Average cooling down time according to IEC 60068-3-5 [K/min] | 4.5                      | 4.5                        |
| Max. heat compensation at 25 °C [W]                          | 2100                     | 2100                       |
| <b>Performance Data Climate</b>                              |                          |                            |
| Temperature range [°C]                                       | 10...95                  | 10...95                    |
| Temperature fluctuation depending on setpoint [± K]          | 0.1...1.3                | 0.1...1.3                  |
| Humidity range [% RH]  | 10...98                  | 10...98                    |
| Humidity fluctuation depending on setpoint                   | ≤2,5 ± % RH              | ≤2,5 ± % RH                |
| Dew point temperature range [°C]                             | 5...94                   | 5...94                     |
| <b>Electrical data</b>                                       |                          |                            |
| Rated Voltage [V]  | 400                      | 480                        |
| Power frequency [Hz]   | 50                       | 60                         |
| Nominal power [kW]   | 4.8                      | 4.8                        |
| Unit fuse [A]  | 16                       | 16                         |
| Phase (Nominal voltage)                                      | 3~                       | 3~                         |
| <b>Outer dimensions</b>                                      |                          |                            |
| Width net [mm]   | 980                      | 980                        |
| Height net [mm]  | 1725                     | 1725                       |
| Depth net [mm]   | 865                      | 865                        |
| Wall clearance back [mm]                                     | 300                      | 300                        |
| Wall clearance sidewise [mm]                                 | 200                      | 200                        |
| Viewing window width [mm]                                    | 288                      | 288                        |
| Viewing window height [mm]                                   | 222                      | 222                        |
| <b>Doors</b>   |                          |                            |
| Unit doors   | 1                        | 1                          |
| <b>Internal Dimensions</b>                                   |                          |                            |
| Width [mm]   | 600                      | 600                        |
| Height [mm]  | 480                      | 480                        |
| Depth [mm]   | 400                      | 400                        |
| <b>Measures</b>  |                          |                            |
| Interior volume [L]  | 115                      | 115                        |
| Net weight of the unit (empty) [kg]                          | 280                      | 280                        |
| permitted load [kg]  | 60                       | 60                         |
| Load per rack [kg]   | 30                       | 30                         |

<sup>1</sup> 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.

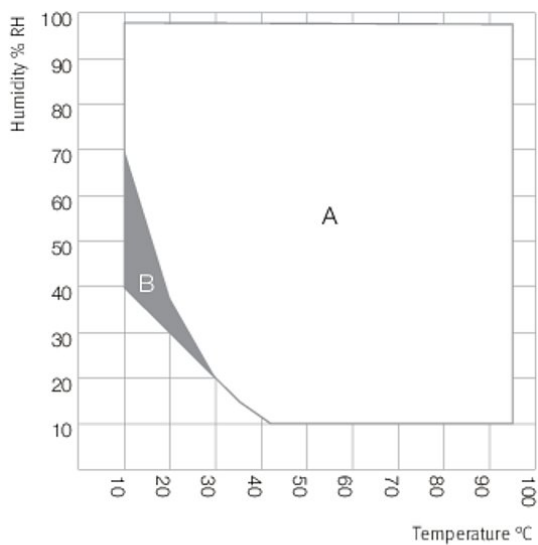
|                               |                          |                            |
|-------------------------------|--------------------------|----------------------------|
| Description                   | MKF115-400V <sup>1</sup> | MKF115-480V-C <sup>1</sup> |
| Article Number                | 9020-0207                | 9020-0357                  |
| Environment-specific data     |                          |                            |
| Sound-pressure level [dB(A)]  | 62                       | 67                         |
| Fixtures                      |                          |                            |
| Number of shelves (std./max.) | 1/4                      | 1/4                        |

1 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]**

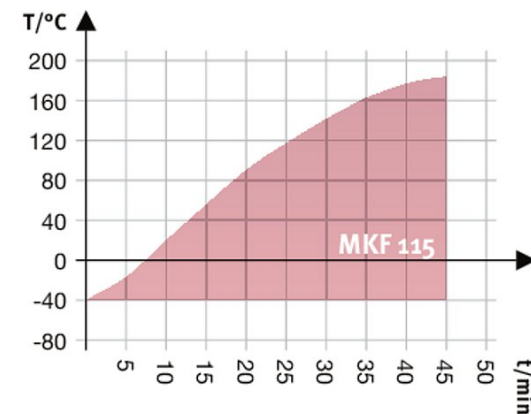


**CHARTS**

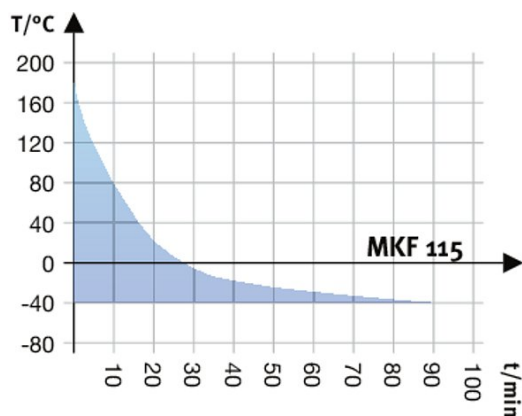


A: Standard Climate range  
 B: Time-limited operation (max. 24 hours)

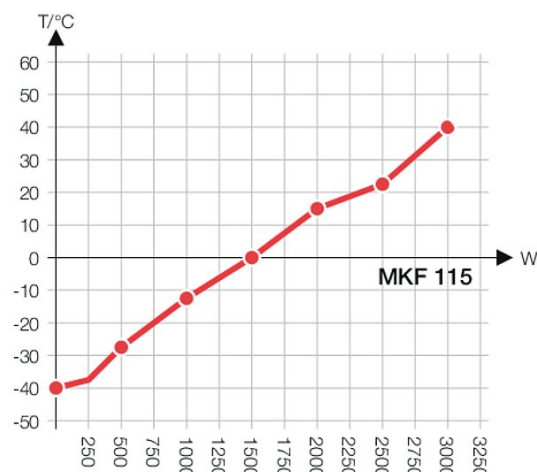
Climate chart



Heating up rate



Cooling down rate



Heat compensation chart

## OPTIONS AND ACCESSORIES

| Designation                                       | Description   | *      | Art.-No.  |
|---|---|--------|-----------|
| Access port                                       | notch-type access port in door, 100 x 35 mm   | -      | 8012-1853 |
|   | left  |        |           |
|   | 30 mm   | 01     | 8012-1323 |
|   | 50 mm   | 01     | 8012-1329 |
|   | 80 mm   | 01     | 8012-1335 |
|   | 100 mm  | 01, 11 | 8012-1543 |
|   | 125 mm  | 01, 11 | 8012-1352 |
|   | right   |        |           |
| Access port with silicone plug                    | 30 mm   | 01     | 8012-1320 |
|   | 50 mm   | 01     | 8012-1326 |
|   | 80 mm   | 01     | 8012-1332 |
|   | 100 mm  | 01, 11 | 8012-1540 |
|   | 125 mm  | 01, 11 | 8012-1349 |
|   | top   |        |           |
|   | 80 mm   | 01     | 8012-1537 |
|   | 100 mm  | 01, 11 | 8012-1531 |
|   | 125 mm  | 01, 11 | 8012-1534 |
| Analog output 4-20 mA                             | for temperature and humidity values (output not adjustable)   | -      | 8012-1085 |
| BINDER PURE AQUA SERVICE                          | system for preparation or complete desalination of tap water, containing single-use cartridge, hoses and measuring device   | -      | 8012-0759 |
| BINDER PURE AQUA SERVICE, accessories             | Single-use, replacement cartridge for BINDER PURE AQUA System   | -      | 6011-0165 |
| 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 and 27 measuring points at specified temperature  | -      | 8012-1609 |
| Calibration certificate, temperature              | temperature measurement incl. certificate, 15- 18 measuring points at specified temperature   | -      | 8012-1589 |
|   | temperature measurement incl. certificate, 9 measuring points at specified temperature  | -      | 8012-1568 |
| Calibration certificate, temperature and humidity | Measurement in center of chamber at 25 °C / 60% RH or at specified test values  | -      | 8012-1188 |
|   | 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 |

\* Notes › See last page

| Designation                         | Description  | *  | Art.-No.  |
|-------------------------------------|--|----|-----------|
| Data Logger Kit                     | T 220: For continuous temperature logging from -90 °C to 220 °C. The kit includes 1 data logger, Pt 100 sensor with 2 m extension cable and 1 magnetic fixture for mounting to the BINDER unit   | 19 | 8012-0715 |
|                                     | TH 100/70: For continuous temperature and humidity logging from -40 °C to 100 °C / 0% to 100% RH and additional logging of ambient conditions. Kit includes 1 data logger, 2 attachable combined humidity/temperature sensors, 2 m extension cable and 1 fixture for mounting to the BINDER unit | 19 | 8012-1838 |
|                                     | TH 100: For continuous temperature and humidity logging from -50 °C to 100 °C; 0% to 100% RH. Kit includes 1 data logger, Pt 100 sensor with 2 m extension cable, and 1 magnetic fixture for mounting to the BINDER unit   | 19 | 8012-1837 |
| Door lock                           | lockable door handle   | -  | 8012-1862 |
| Dry-air purge                       | controlled, incl. connection; suitable for the simulation of current automobile industry standards   | -  | 8012-1863 |
| Dry-air purge, connection           | for the connection to an existing pressurized air network  | -  | 8012-1802 |
| pH-neutral detergent                | concentrated, for gentle remove of residual contaminants; 1 kg   | -  | 1002-0016 |
| Pt 100 temperature sensor           | additional flexible Pt 100, interior, for displaying the temperature on the unit display   | -  | 8012-1094 |
| Rack                                | stainless steel  | -  | 6004-0008 |
| Rack accessories                    | fasteners (1 set of 4) for additional security of racks  | -  | 8012-0620 |
| Rack, reinforced                    | stainless steel, with fasteners (1 set of 4)   | -  | 8012-0709 |
| 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 |
| RS 485 interface, 2-wire            | Additional serial interface can be used parallel to Ethernet, for Multi Management Software APT-COM™   | -  | 8012-1769 |
| Shelf, perforated                   | Stainless steel  | -  | 6004-0030 |
| Temperature safety device class 2   | with visual alarm (DIN 12880)  | -  | 8012-1864 |
| Water circuit                       | allows condensed water to be reused  | -  | 8012-1512 |
| Water cooling                       | for reduced heat loss to ambient air   | -  | 8012-0843 |

\* Notes › See last page

## SERVICES

| Designation  | Description   | *              | Art.-No.  |
|--|---|----------------|-----------|
| <b>Installation services</b>   |   |                |           |
| Installation   | and set up of unit at operating location, connect to existing connections   | 13, 18         | DL10-0300 |
| Instruction  | unit function instructions for operation and programming of the controller  | 18             | DL10-0700 |
| <b>Preventive maintenance</b>  |   |                |           |
| Preventive maintenance   | Executive of equipment inspection according to maintenance plan   | 14, 18         | DL20-0500 |
| <b>Calibration services</b>  |   |                |           |
| Calibration temperature and humidity   | including certificate, one measuring point in center of chamber at 25 °C / 60 % RH or at specified values   | 14, 16, 17, 18 | DL30-0301 |
| Temperature and humidity measurement according to DIN12880                             | including certificate (27 temperature measuring points and one humidity measuring point, at 25 °C / 60 % RH or at specified values)                     | 14, 16, 17, 18 | DL30-0427 |
| Temperature measurement 18 temperature measuring points and 1 humidity measuring point | including certificate, 18 temperature measuring points and 1 humidity measuring point in center of chamber, at 25 °C / 60 % RH or at specified values   | 14, 16, 17, 18 | DL30-0318 |
| Temperature measurement 27 temperature measuring points and 1 humidity measuring point | including certificate, 27 temperature measuring points and 1 humidity measuring point in center of chamber, at 25 °C / 60 % RH or at specified values   | 14, 16, 17, 18 | DL30-0327 |
| <b>Validation services</b>   |   |                |           |
| Execution of IQ/OQ   | in accordance with qualification folder   | 15, 18, 20     | DL42-0300 |
| Execution of IQ/OQ/PQ  | in accordance with customer's requirement, price: on request  | 15, 18         | DL44-0500 |
| Qualification folder IQ/OQ   | supporting documents for validation performed by customer, consisting of: IQ/OQ checklists, unit schematics, QM certificate in accordance with ISO 9001 | 15, 18, 20     | 8012-0865 |

\* Notes › See last page

| Designation                                 | Description   | *      | Art.-No.  |
|---|---|--------|-----------|
| Qualification folder IQ/OQ/PQ               | supporting documents for validation performed by customer, in accordance with customer's requirement, extension of Qualification folder IQ/OQ by chapter PQ | 15, 18 | 8012-0953 |
| <b>Warranty service</b>                     |   |        |           |
| Extension of the warranty from 2 to 3 years | beginning with the date of delivery, wearing parts are not included   | -      | DL01-3041 |
| Extension of the warranty from 2 to 5 years | beginning with the date of delivery, wearing parts are not included   | -      | DL01-3042 |

\* Notes › See last page

## NOTES

- 01 Condensation may occur in the area around the access port. Access ports may be placed in custom locations for an additional charge.
- 02 UL mark is not granted when this option is used.
- 03 Heat resistant only to max. 200 °C.
- 04 Only available on units rated for 230 V.
- 06 Heating-up time may increase as a result of the lower heat conductivity.
- 07 The additional heat input may affect the temperature behavior.
- 09 Not in conjunction with the optional access port, door with window and interior lighting.
- 10 Not available on 23-liter units.
- 11 Not available on 23- or 53-liter units.
- 12 Only available on units rated for 230 V or 400 V.
- 13 Installation and connections take place at unit location; transport within the company only upon consultation.
- 14 We recommend a BINDER service contract to cover unit inspections, calibrations and validations.
- 15 OQ according to Yellow Paper = completed factory validation documentation of all OQ checklists.
- 16 Sensor calibration is performed in an accredited calibration laboratory.
- 17 Calibration is performed according to the BINDER factory standard.
- 18 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).
- 19 For additional accessories, refer to the Process documentation chapter.
- 20 When ordering IQ/OQ qualification folders and associated IQ/OQ execution on one order, we offer a 15 % discount for the item of the IQ/OQ folder.  
When ordering IQ/OQ/PQ qualification folders and associated IQ/OQ/PQ execution on one order, we offer a 15 % discount for the item of the IQ/OQ/PQ folder.