

## Model KBF PRO 470 | Constant climate chambers with expanded temperature / humidity range

A powerful all-rounder among constant climate chambers: Equipped with all kinds of sophisticated technology, the KBF PRO takes any material test in its stride – whether it takes place at -20°C or under THB conditions at +85°C and 85% relative humidity. It offers flexible water supply options for all installation sites and consumes up to 40% less energy than its predecessor, the KMF model. Optional light modules are also available to turn the KBF PRO into a chamber for ICH photostability testing or plant growth.



Model 470



Model 470

### IMPORTANT FEATURES

- Temperature range: -20°C to +100°C
- Humidity range: 10% to 98% RH
- Proven APT.line™ preheating chamber technology
- Up to 40% lower energy consumption compared to the previous model
- Energy-efficient cooling with modern inverter cooling unit
- Cooling with climate-neutral R-290 refrigerant
- Door heating to prevent condensation
- Adjustable fan speed
- Humidity regulation with capacitive humidity sensor and responsive steam humidification
- Housing design with HIT technology
- Stainless-steel inner chamber
- Inner doors made of metal oxide-coated safety glass
- Two racks with stainless-steel telescopic rails
- Large access port with silicone plug
- Floor-standing units featuring robust twin casters with brakes at the front
- Stackable tabletop units with a volume of up to 130 liters
- Intuitive touchscreen controller with time-segment and real-time programming
- Ergonomically adjustable control terminal (for units with a volume of 470 liters and above)
- Signal triangle with light-up status display (for units with a volume of 470 liters and above)
- Internal data logger, measured values can be read out in open format via USB
- Class 3.3 independent temperature safety device (DIN 12880) with visual and acoustic alarms
- Unit self-test for comprehensive status analysis
- Data interfaces: Ethernet, USB
- BINDER Multi Management Software APT-COM™ basic edition
- Optional light modules for ICH photostability testing (for models 260, 470, 720)
- Optional LED light modules for plant growth (for models from 260)

### ORDERING INFORMATION

| Interior volume [L] | Power supply - unit fuse        | Plug*   | Version  | Model version  | Art.-No.  |
|---------------------|---------------------------------|---------|----------|----------------|-----------|
| Model KBF PRO 470   |                                 |         |          |                |           |
| 472                 | 208...240 V 1~ 50/60 Hz -16,0 A | CEE 7/7 | Standard | KBFPRO470-230V | 9020-0441 |

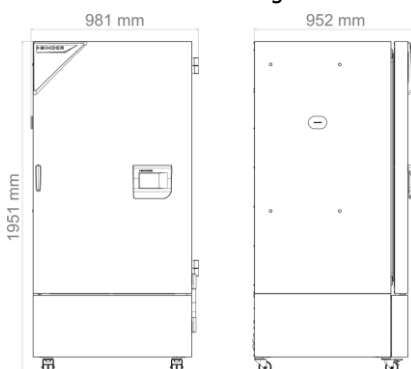
## TECHNICAL DATA

| Data  |                |
|---|----------------|
| Designation   | KBFPRO470-230V |
| Article Number  | 9020-0441      |
| Option model  | Standard       |
| Performance Data Temperature                                    |                |
| Temperature range   | -20...100 °C   |
| Max. heat compensation at 40°C                                  | 800 W          |
| Performance Data Climate  |                |
| Temperature range with humidity                                 | 10...90 °C     |
| Humidity range  | 10...98 % RH   |
| Temperature uniformity at 25°C and 60% RH                       | 0.3 ± K        |
| Temperature uniformity at 40°C and 75% RH                       | 0.3 ± K        |
| Temperature fluctuation at 25°C and 60% RH                      | 0.1 ± K        |
| Temperature fluctuation at 40°C and 75% RH                      | 0.1 ± K        |
| Recovery time after door was opened for 30 s at 25°C and 60% RH | 1 min          |
| Recovery time after door was opened for 30 s at 40°C and 75% RH | 4 min          |
| Electrical data   |                |
| Rated Voltage   | 208...240 V    |
| Power frequency   | 50/60 Hz       |
| Nominal power   | 1,6 kW         |
| Unit fuse   | 16,0 A         |
| Phase (Nominal voltage)   | 1~             |
| Dimensions and weights  |                |
| Interior volume   | 472 L          |
| Net weight of the unit (empty)                                  | 249 kg         |
| Load per rack   | 40 kg          |
| Permitted load  | 90 kg          |
| Wall clearance back   | 100 mm         |
| Wall clearance sidewise   | 180 mm         |
| Housing dimensions not incl. fittings and connections           |                |

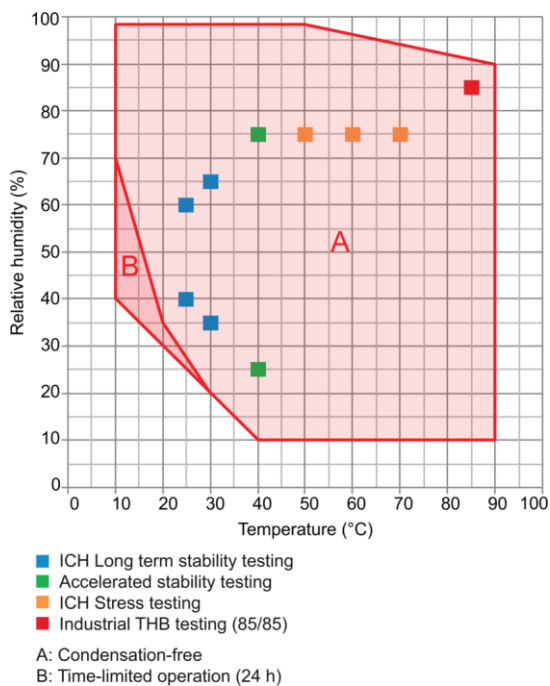
|                                       |          |
|---------------------------------------|----------|
| Width net                             | 930 mm   |
| Height net                            | 1,951 mm |
| Depth net                             | 900 mm   |
| <b>Internal Dimensions</b>            |          |
| Interior width                        | 656 mm   |
| Interior height                       | 1,250 mm |
| Interior depth                        | 575 mm   |
| Inner doors                           | 1        |
| Unit doors                            | 1        |
| <b>Environment-specific data</b>      |          |
| Energy consumption at 25°C and 60% RH | 245 Wh/h |
| Energy consumption at 40°C and 75% RH | 295 Wh/h |
| Energy consumption at 85°C and 85% RH | 455 Wh/h |
| <b>Fixtures</b>                       |          |
| Number of shelves (std./max.)         | 2/16     |

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



Climate chart

OPTIONS

| Designation                    | Description   | *  | Art.-No.  |
|--------------------------------|---|----|-----------|
|                                | left  |    |           |
|                                | 30 mm   | 01 | 8012-2489 |
|                                | 50 mm   | 01 | 8012-2490 |
|                                | 100 mm  | 01 | 8012-2491 |
|                                | right   |    |           |
|                                | 30 mm   | 01 | 8012-2492 |
| Access port with silicone plug | 50 mm   | 01 | 8012-2493 |
|                                | 100 mm  | 01 | 8012-2494 |
|                                | top   |    |           |
|                                | 30 mm   | 01 | 8012-2500 |
|                                | 50 mm   | 01 | 8012-2495 |
|                                | 100 mm  | 01 | 8012-2496 |
| Alarm output, zero-voltage     | Accessible via 3-pin clamping sleeve (max. 24 V - 2.5 A), with acoustic signal that can be switched off | -  | 8012-2504 |
| Analog output 4-20 mA          | for temperature and humidity values (output not adjustable)   | -  | 8012-2375 |

| Designation                                       | Description   | * | Art.-No.  |
|---|---|---|-----------|
| Calibration certificate, expanded                 | for temperature and humidity; for extending the measurement in center of chamber to include another test value  | - | 8012-2576 |
| Calibration certificate, temperature              | temperature measurement incl. certificate, 9 measuring points at specified temperature  | - | 8012-2379 |
|   | temperature measurement incl. certificate, 15- 18 measuring points at specified temperature   | - | 8012-2383 |
|   | temperature measurement incl. certificate and 27 measuring points at specified temperature  | - | 8012-2427 |
| Calibration certificate, temperature and humidity | Measurement in center of chamber at 25°C / 60% RH or at specified test values   | - | 8012-2438 |
|   | 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 | - | 8012-2578 |
| Coated heat exchanger                             | For preventing damage to the aluminum heat exchanger caused by corrosive sample material  | - | 8012-2584 |
| Door lock   | lockable door handle  | - | 8012-2538 |
| Door lock, electromechanical                      | can be opened with PIN code via controller  | - | 8012-2540 |
| Inner chamber, reinforced                         | max. total load 180 kg  | - | 8012-2526 |
| Interior lighting                                 | With climate-resistant LEDs, switches when the unit door is opened  | - | 8012-2562 |
| Shipping pallet                                   | with unloading ramp for installing unit without forklift  | - | 8012-2548 |
| Specimen temperature display                      | Flexible Pt 100 indoor temperature sensor, for object temperature display or control  | - | 8012-2554 |
| Swivel casters, height-adjustable                 | For horizontal alignment of the unit on uneven floors   | - | 8012-2544 |

## 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 |
| 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 |
| CO <sub>2</sub> gassing module        | BINDER CO <sub>2</sub> gassing module 0-1%, with NDIR CO <sub>2</sub> sensor and analog output 4-20 mA   | - | 8012-2140 |
|                                       | BINDER CO <sub>2</sub> gassing module 0-20%, with NDIR CO <sub>2</sub> sensor and analog output 4-20 mA  | - | 8012-2138 |
| ICH light module                      | BINDER ICH-Q1B light module consisting of a VIS cassette and a UVA cassette as well as an independent power supply   | - | 8012-2441 |

| Designation               | Description   | * | Art.-No.  |
|---------------------------|---|---|-----------|
| ICH light module with LQC | BINDER ICH-Q1B light module with light-dose control consisting of a VIS cassette, a UVA cassette, a spherical VIA sensor, a spherical UVA sensor as well as an independent power supply                                 | - | 8012-2443 |
| LED light bars            | Basic set consisting of 2 pieces, attachment material, control unit for max. 4 light strips, 100-240 V, 50/60 Hz  |   |           |
|                           | Basic set 300, length 30 cm   | - | 8012-1107 |
|                           | Basic set 500, length 50 cm   | - | 8012-1108 |
|                           | Expansion set consisting of 2 pieces, attachment material: clips. For expanding the basic set of light bars   |   |           |
|                           | Expansion set 300, length 30 cm   | - | 8012-1716 |
|                           | Expansion set 500, length 50 cm   | - | 8012-1717 |
| Light module for plants   | BINDER LED plant light module consisting of 16 LED strip lights, 3-channel controller and fresh air pump as well as independent power supply  | - | 8012-2439 |
| 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 |
| Reinforced rack           | Shelf rack in set with pair of retaining rails (U rails), made entirely of stainless steel  |   |           |
|                           | Load-bearing capacity 80 kg   | - | 8012-2413 |
| Shelf rack, perforated    | Shelf rack in set with pair of retaining rails (U rails), made entirely of stainless steel  |   |           |
|                           | Load-bearing capacity 40 kg   | - | 8012-2407 |
| Standard rack             | Shelf rack in set with pair of retaining rails (ball bearing mounted telescopic rails), made entirely of stainless steel  |   |           |
|                           | Load-bearing capacity 40 kg   | - | 8012-2384 |
|                           | Shelf rack in set with pair of retaining rails (U rails), made entirely of stainless steel  |   |           |
|                           | Load-bearing capacity 40 kg   | - | 8012-2390 |
| Water supply              | External, free-standing, set consisting of 20-liter fresh water canister with pump and level sensor and 20-liter waste water canister   | - | 8012-2592 |

## SERVICES

| Designation   | Description  | * | Art.-No.  |
|---|--|---|-----------|
| <b>Calibration services</b>                                 |  |   |           |
| 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   | – | DL30-0302 |
|   | Temperature and humidity calibration with 1 measuring point in center of chamber with 1 specified pair of values, including certificate  | – | DL30-0340 |
| 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   | – | 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  | – | 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  | – | 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   | – | DL30-0427 |
| <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)   | – | DL10-0300 |
| Unit instructions   | Instruction regarding operating principle and basic functions of the unit, operation of the control electronics including programming  | – | 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   | – | 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 value, including certificate                  | – | DL20-0920 |
| 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 | – | DL20-0820 |
| <b>Maintenance services</b>                                 |  |   |           |
| 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  | – | DL20-0613 |
| <b>Validation services</b>                                  |  |   |           |
| Execution of IQ/OQ  | Execution of IQ/OQ in accordance with qualification folder   | – | DL42-0300 |
| Execution of IQ/OQ/PQ                                       | Execution of IQ/OQ/PQ in accordance with qualification folder  | – | 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   | – | DL50-0030 |

## NOTES

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

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