

## Model KBW 400 | Growth chambers with light

The BINDER climate chamber with illumination of the KBW series achieves homogeneous light distribution with its natural illumination. That allows this growth chamber to create constant lighting and temperature conditions.

### BENEFITS

- Patented lighting system ensures homogeneous light distribution
- Flexible positioning of illumination cassettes, three different light spectra, individually selectable
- Integrated weekly program in real-time



Model 400



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### IMPORTANT FEATURES

- Temperature range: 0 °C to +70 °C
- Temperature range with light: +5 °C to +60 °C
- 3 positionable illumination cassettes, each with 5 fluorescent tubes
- APT.line™ preheating chamber technology
- Adjustable fan speed
- Intuitive touchscreen controller with time-segment and real-time programming with internal data recording
- Tight-sealing inner door made of safety glass (ESG)
- Avoidance of glass corrosion by special TIMELESS coating
- 3 stainless steel racks
- Access port with silicone plug, 30 mm, left
- Class 3.1 independent temperature safety device (DIN 12880) with visual and audible temperature alarm
- Computer interface: Ethernet
- Door heating

### ORDERING INFORMATION

| Interior volume [L]  | Power supply - unit fuse        | Plug*   | Version  | Model version | Art.-No.  |
|----------------------|---------------------------------|---------|----------|---------------|-----------|
| <b>Model KBW 400</b> |                                 |         |          |               |           |
| 400                  | 200...240 V 1~ 50/60 Hz -16,0 A | CEE 7/7 | Standard | KBW400-230V   | 9020-0339 |

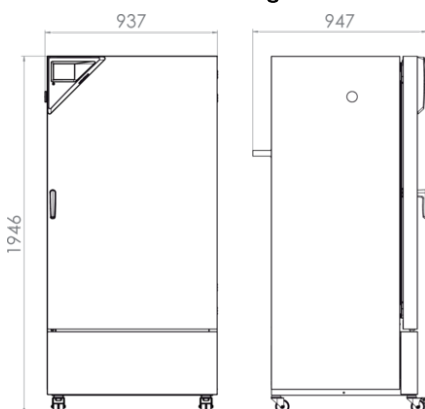
## TECHNICAL DATA

| Data   |                     |
|--|---------------------|
| Designation  | KBW400-230V         |
| Article Number   | 9020-0339           |
| Option model   | Standard            |
| Performance Data Temperature                           |                     |
| Temperature range without illumination cassettes       | 0...70 °C           |
| Temperature range with 100% illumination               | 5...60 °C           |
| Temperature uniformity with 100% illumination          | 1,5 ± K             |
| Temperature uniformity without illumination cassettes  | 0,5 ± K             |
| Temperature fluctuation with 100% illumination         | 0,2 ± K             |
| Temperature fluctuation without illumination cassettes | 0,1 ± K             |
| Max. heat compensation at 40°C                         | 600 W               |
| Max. heat compensation at 40°C with illumination       | 450 W               |
| Lightdata per Illumination Cassettes                   |                     |
| Daylight tubes   | 24 W/m <sup>2</sup> |
| Daylight tubes   | 9000 lx             |
| Fluora® growth lamps                                   | 7500 lx             |
| Arabidopsis lamps                                      | 11000 lx            |
| Electrical data  |                     |
| Rated Voltage  | 200...240 V         |
| Power frequency  | 50/60 Hz            |
| Nominal power  | 1,6 kW              |
| Unit fuse  | 16,0 A              |
| Phase (Nominal voltage)                                | 1~                  |
| Measures   |                     |
| Interior volume  | 400 L               |
| Net weight of the unit (empty)                         | 252 kg              |
| Load per rack  | 30 kg               |
| Permitted load   | 120 kg              |

|  |          |
|--|----------|
| Wall clearance back  | 100 mm   |
| Wall clearance sidewise                                      | 100 mm   |
| <b>Housing dimensions not incl. fittings and connections</b> |          |
| Width net  | 925 mm   |
| Height net   | 1,950 mm |
| Depth net  | 805 mm   |
| <b>Internal Dimensions</b>                                   |          |
| Interior width   | 650 mm   |
| Interior height  | 1,270 mm |
| Interior depth   | 485 mm   |
| Inner doors  | 1        |
| Unit doors   | 1        |
| <b>Environment-specific data</b>                             |          |
| Sound-pressure level   | 53 dB(A) |
| Energy consumption at 37°C and with illumination             | 620 Wh/h |
| <b>Fixtures</b>  |          |
| Number of shelves (std./max.)                                | 3/12     |
| Number of illumination cassettes (std./max.)                 | 3/3      |

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 | 8012-1445 |
|   | 50 mm   | 01 | 8012-1475 |
|   | right   |    |           |
| Access port with silicone plug                  | 30 mm   | 01 | 8012-1439 |
|   | 50 mm   | 01 | 8012-1469 |
|   | top   |    |           |
|   | 30 mm   | 01 | 8012-1451 |
|   | 50 mm   | 01 | 8012-1457 |
|   | 100 mm  | 01 | 8012-1463 |
| Alarm output, zero-voltage                      | for temperature ( $\pm 2$ °C) and humidity ( $\pm 5$ % RH), accessible via 6-pin DIN socket (max. 24 V - 2.5 A), with audible signal that can be switched off               | -  | 8012-1757 |
| Analog output 4-20 mA                           | for temperature and humidity values (output not adjustable)   | -  | 8012-1721 |
| Arabidopsis illumination                        | Illumination cassettes equipped with Arabidopsis fluorescent tubes instead of daylight fluorescent tubes  | -  | 8012-0791 |
| Calibration certificate, expanded               | for temperature; for extending the measurement in center of chamber to include another test temperature   | -  | 8012-1121 |
|   | for temperature, measurement in center of chamber at specified temperature  | -  | 8012-1140 |
| Calibration certificate, temperature            | temperature measurement incl. certificate, 9 measuring points at specified temperature  | -  | 8012-1557 |
|   | temperature measurement incl. certificate, 15- 18 measuring points at specified temperature   | -  | 8012-1578 |
|   | temperature measurement incl. certificate and 27 measuring points at specified temperature  | -  | 8012-1599 |
| Class 3.3 independent temperature safety device | with visual alarm (DIN 12880)   | -  | 8012-1750 |
| Door lock                                       | lockable door handle  | -  | 8012-1775 |
| FLUORA® illumination                            | Illumination cassettes equipped with FLUORA® fluorescent tubes instead of daylight fluorescent tubes  | -  | 8012-0790 |
| Light photometry                                | including certificate, illumination and irradiance for visible light and UV-A, 25 measuring points on 3 measurement levels, as well as spectral distribution (250 – 785 nm) | -  | 8012-0910 |
| Pt 100 temperature sensor                       | additional flexible Pt 100, interior, for displaying the temperature on the unit display  | -  | 8012-1746 |
| RS 485 interface, 2-wire                        | Additional serial interface can be used parallel to Ethernet, for Multi Management Software APT-COM™  | -  | 8012-1742 |
| Shelf, reinforced                               | positioned at bottom level, max. load 45 kg, with additional attachment for operation of shaking device, stirring device or roller bottle system                            | -  | 8012-1429 |

| Designation                 | Description  | * | Art-No.   |
|-----------------------------|--|---|-----------|
| Zero voltage relay contacts | for controlling 3 relay contacts via program regulators, accessible via 6-pin DIN socket (max. 24 V - 2.5 A) | - | 8012-0679 |

## ACCESSORIES

| Designation                         | Description   | * | Art-No.   |
|-------------------------------------|---|---|-----------|
| APT-COM™ 4 BASIC-Edition            | for simple logging and documentation requirements with up to 5 networked units.   |   |           |
|                                     | version 4, BASIC edition  | - | 9053-0039 |
| 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 |
| 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, humidity, and light values        |   |           |
|                                     | Digital in PDF format   | - | 7057-0007 |
|                                     | Hard copy inside folder   | - | 7007-0007 |
|                                     | IQ/OQ documents – supporting documents for validation performed by customers, consisting of: IQ/OQ checklists incl. calibration guide and comprehensive unit documentation; parameters: temperature, humidity, and light values |   |           |
|                                     | Digital in PDF format   | - | 7057-0003 |
|                                     | Hard copy inside folder   | - | 7007-0003 |
| 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 |
| Rack                                | stainless steel   | - | 8012-2050 |
| Rack, reinforced                    | stainless steel, with fasteners (1 set of 4)  | - | 8012-0638 |
| Rack accessories                    | fasteners (1 set of 4) for additional security of racks   | - | 8012-2280 |
| pH-neutral detergent                | concentrated, for gentle remove of residual contaminants; 1 kg  | - | 8012-2250 |

## SERVICES

| Designation                 | Description | * | Art-No. |
|-----------------------------|-------------|---|---------|
| <b>Calibration services</b> |             |   |         |

| Designation                                  | Description  | *  | Art-No.   |
|--|--|----|-----------|
| Calibration certificate, temperature         | Calibration of one (1) test temperature specified by the user in center of chamber, including certificate  | -  | DL30-0101 |
|  | Extension of calibration of one (1) additional test temperature specified by the user in the center of the usable space, including certificate   | -  | DL30-0102 |
| Radiometric light photometry                 | Radiometric measurement in the visible spectrum with determination and documentation of intensity distribution from an illumination cassette on 3 measurement levels, including certificate  | -  | DL31-0000 |
| Temperature measurement, 9 measuring points  | Temperature measurement with 9 measuring points with a set value specified by the user, including certificate  | -  | DL30-0109 |
| Temperature measurement, 18 measuring points | Temperature measurement with 18 measuring points with a set value specified by the user, including certificate   | -  | DL30-0118 |
| Temperature measurement, 27 measuring points | Temperature measurement with 27 measuring points with a set value specified by the user, including certificate   | -  | 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)   | -  | 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   | -  | 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         | -  | 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 | -  | 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  | -  | DL20-0400 |
| <b>Validation services</b>                   |  |    |           |
| Execution of IQ/OQ/PQ                        | Execution of IQ/OQ/PQ in accordance with qualification folder  | -  | DL44-0500 |
| Execution of IQ/OQ incl. light photometry    | Execution of IQ/OQ including light photometry in accordance with qualification folder  | -  | DL43-0400 |
| <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.
- 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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