

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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MAIN FEATURES

- Temperature range: 0 °C to +70 °C
- Temperature range with light: +5 °C to +60 °C
- 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
- Internal data logger, measured values can be read out in open format via USB
- Unit self-test for comprehensive status analysis
- Tight-sealing inner door made of safety glass (ESG)
- Avoidance of glass corrosion by special TIMELESS coating
- 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

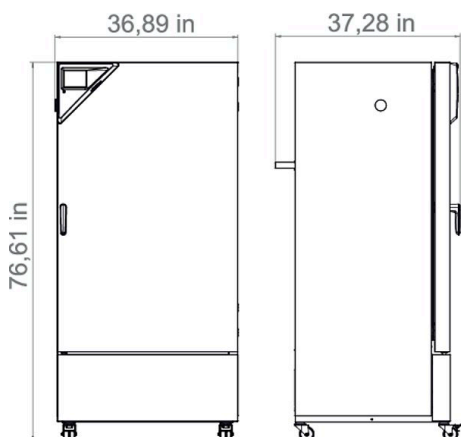
ORDERING INFORMATION

| Interior volume [cu.ft.] | Voltage | Option model | Version | Art.-No. |
|--------------------------|-------------------------|--------------|-------------|-----------|
| 14.1 | 200...240 V 1~ 50/60 Hz | Standard | KBW400-230V | 9020-0339 |

TECHNICAL DATA

| Description | KBW400-230V ¹ |
|--|--------------------------|
| Article Number | 9020-0339 |
| Performance Data Temperature | |
| Temperature range with 100% illumination [°C] | 5...60 |
| Temperature range without illumination cassettes [°C] | 0...70 |
| Temperature variation with 100% illumination [± K] | 1.5 |
| Temperature variation without illumination cassettes [± K] | 0.5 |
| Temperature fluctuation with 100% illumination [± K] | 0.2 |
| Temperature fluctuation without illumination cassettes [± K] | 0.1 |
| Lightdata per Illumination Cassettes | |
| Daylight tubes [W/m ²]* ² | 24 |
| Daylight tubes [lx]* ² | 9000 |
| Fluora® growth lamps [W/m ²]* ² | 23 |
| Fluora® growth lamps [lx]* ² | 7500 |
| Arabidopsis lamps [W/m ²]* ² | 32 |
| Arabidopsis lamps [lx]* ² | 11000 |
| Electrical data | |
| Rated Voltage [V] | 200...240 |
| Power frequency [Hz] | 50/60 |
| Nominal power [kW] | 1.6 |
| Unit fuse [A] | 16 |
| Phase (Nominal voltage) | 1~ |
| Measures | |
| Interior volume [cu.ft.] | 14.1 |
| Net weight of the unit (empty) [lbs] | 589 |
| Permitted load [lbs] | 265 |
| Load per rack [lbs] | 66 |
| Wall clearance back [in] | 3.94 |
| Wall clearance sidewise [in] | 3.94 |
| Internal Dimensions | |
| Width [in] | 25.61 |
| Height [in] | 50 |
| Depth [in] | 19.11 |
| Doors | |
| Inner doors | 1 |
| Unit doors | 1 |
| Housing dimensions not incl. fittings and connections | |
| Width net [in] | 36.45 |
| Height net [in] | 76.8 |
| Depth net [in] | 31.72 |
| Environment-specific data | |
| Energy consumption at 37 °C and with illumination [Wh/h] | 620 |
| Sound-pressure level [dB(A)] | 53 |
| Fixtures | |
| Number of shelves (std./max.) | 3/12 |
| Number of illumination cassettes (std./max.) | 3/3 |

- 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.
- 2 Average value, measured at 25 °C with a spherical sensor (±10 %) by 12 cm below the light cassette. The values given in W/m² refer to global radiation.

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 (± 2 °C) and humidity (± 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 and 27 measuring points at specified temperature | - | 8012-1599 |
| | temperature measurement incl. certificate, 15- 18 measuring points at specified temperature | - | 8012-1578 |
| | temperature measurement incl. certificate, 9 measuring points at specified temperature | - | 8012-1557 |
| 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 |
| Interior socket | Waterproof, switched flush-mounting box (CA3GD) for nominal voltage in unit interior, with cover and corresponding plug (nominal voltage; max. 500 W; max. 90 °C; protection class IP67) | - | 8012-1741 |
| 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, perforated | Stainless steel | - | 6004-0040 |
| 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 |
| 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 |

* Notes › See last page

ACCESSORIES

| 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 | - | 8012-0715 |
| Data Logger Software | LOG ANALYZE software kit, configuration and evaluation software for all BINDER Data Logger Kits (incl. USB data cable) | - | 8012-0821 |
| Multi Management Software | Multi Management Software APT-COM™ | | |
| | version 4, BASIC edition | - | 9053-0039 |
| | version 4, GLP edition | - | 9053-0042 |
| | version 4, PROFESSIONAL edition | - | 9053-0040 |
| pH-neutral detergent | concentrated, for gentle remove of residual contaminants; 1 kg | - | 1002-0016 |
| Qualification documents | 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 |
| | 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 |
| Rack | stainless steel | - | 6004-0101 |
| Rack accessories | fasteners (1 set of 4) for additional security of racks | - | 8012-0620 |
| Rack, reinforced | stainless steel, with fasteners (1 set of 4) | - | 8012-0638 |
| 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 | - | 6004-0040 |

* Notes › See last page

SERVICES

| Designation | Description | * | Art.-No. |
|--|--|------------|-----------|
| Installation services | | | |
| Unit installation | 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 |
| Maintenance services | | | |
| Maintenance | 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 chamber without certificate | 05 | DL20-0400 |
| Calibration services | | | |
| 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 | 03, 04, 05 | DL31-0000 |
| Temperature calibration | Calibration of one (1) test temperature specified by the user in center of chamber including certificate | 03, 04, 05 | DL30-0101 |
| | Extension of calibration of one (1) additional test temperature specified by the user in the center of the usable space, including certificate | 03, 04, 05 | DL30-0102 |
| Temperature measurement, 18 measuring points | Temperature measurement with 18 measuring points with a set value specified by the user, including certificate | 03, 04, 05 | DL30-0118 |
| Temperature measurement, 27 measuring points | Temperature measurement with 27 measuring points with a set value specified by the user, including certificate | 03, 04, 05 | DL30-0127 |
| Temperature measurement, 9 measuring points | Temperature measurement with 9 measuring points with a set value specified by the user, including certificate | 03, 04, 05 | DL30-0109 |
| Validation services | | | |
| Execution of IQ/OQ incl. light photometry | Execution of IQ/OQ including light photometry in accordance with qualification folder | 05 | DL43-0400 |

* Notes › See last page

| Designation | Description | * | Art.-No. |
|--------------------------------------|--|----------|-----------------|
| Execution of IQ/OQ/PQ | Execution of IQ/OQ/PQ in accordance with qualification folder | 05 | DL44-0500 |
| Warranty service | | | |
| Warranty extension from 2 to 3 years | The warranty is extended from 2 to 3 years from the delivery date, wear parts are excluded | - | DL02-2041 |
| Warranty extension from 2 to 5 years | The warranty is extended from 2 to 5 years from the delivery date, wear parts are excluded | - | DL02-2042 |

* 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 Sensor calibration is performed in an accredited calibration laboratory.
- 04 Calibration is performed according to the BINDER factory standard.
- 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
FAX +49 7462 2005 100
info@binder-world.com
www.binder-world.com

BINDER Asia Pacific (Hong Kong) Ltd.

Kowloon, Hong Kong, P.R. China
TEL +852 39070500
FAX +852 39070507
asia@binder-world.com
www.binder-world.com

Representative Office for CIS

Moscow, Russia
TEL +7 495 988 15 16
FAX +7 495 988 15 17
russia@binder-world.com
www.binder-world.com

BINDER Environmental Testing Equipment (Shanghai) Co., Ltd.

Shanghai, P.R. China
TEL +86 21 685 808 25
FAX +86 21 685 808 29
china@binder-world.com
www.binder-world.com

BINDER Inc.

Bohemia, NY, USA
TEL +1 631 224 4340
FAX +1 631 224 4354
usa@binder-world.com
www.binder-world.us