

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
- 3 positionable illumination cassettes, each with 5 fluorescent tubes
- APT.line™ preheating chamber technology
- Adjustable fan speed
- Controller with time-segment and real-time programming
- 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: RS 422
- Door heating
- Elapsed time indicator
- Inner doors made of tempered safety glass

ORDERING INFORMATION

Interior volume [cu.ft.]	Voltage	Option model	Version	Art.-No.
Model KBW 400				
14.1	200...240 V 1 ph 50/60 Hz	Standard	KBW400-230V	9020-0180

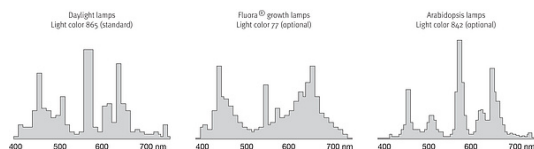
TECHNICAL DATA

Description	KBW400-230V ¹
Article Number	9020-0180
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]	0.1
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) [ph]	1
Measures - Outer dimensions	
Width net [mm]	925
Height net [mm]	1950
Depth net [mm]	805
Wall clearance back [mm]	100
Wall clearance sidewise [mm]	100
Measures - Doors	
Inner doors	1
Unit doors	1
Measures - Internal Dimensions	
Width [mm]	650
Height [mm]	1270
Depth [mm]	485
Measures	
Interior volume [L]	400
Net weight of the unit (empty) [kg]	267
permitted load [kg]	120
Load per rack [kg]	30
Environment-specific data	
Energy consumption at 37 °C and with illumination	705 Wh/h
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.

CHARTS



Light Spectra

OPTIONS AND ACCESSORIES

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
Analog output, 4 – 20 mA	for temperature values (output not adjustable)	02	8012-1425
Arabidopsis illumination cassette, accessories	replacement fluorescent tubes for one illumination cassette (set of 5)	–	8500-0023
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) 230 V option model	–	8012-1415
Door lock	lockable door handle	–	8012-1403
Ethernet interface	in place of RS 422, for communication software	–	8012-1417
FLUORA® illumination	Illumination cassettes equipped with FLUORA® fluorescent tubes instead of daylight fluorescent tubes	–	8012-0790
FLUORA® illumination cassette, accessories	replacement fluorescent tubes for one illumination cassette (set of 5)	–	8500-0022
Interface converter	RS 422 cable set and RS 232 / RS 422 interface converter for connection to 10-way plug distributor or for connection to a unit 230 V, 50/60 Hz option model	–	8012-0556
Interface converter, USB / RS422	RS 422 cable set and RS 422 / USB interface converter for connection to 10-way plug distributor or for connection to a unit (USB-powered converter)	–	8012-0665
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
pH-neutral detergent	concentrated, for gentle remove of residual contaminants; 1 kg	–	1002-0016
Rack	stainless steel	–	6004-0101
Rack accessories	Rack accessories – fasteners (1 set of 4) for additional security of racks	–	8012-0620
Rack, reinforced	stainless steel, with 1 set of 4 fasteners, max. load 70 kg	–	8012-0638
RS 422 interface	modular plug distributor for 10 RS 422 interfaces	–	8012-0295
RS 422 interface, cable (15 m)	RS 422 connection cable (15 m) between plug distributor and RS 422 interface	–	5023-0036
RS 422 interface, cable (50 m)	RS 422 extension cable (50 m) between interface converter and unit or RS 232 / RS 422 plug distributor	–	5023-0117
Shelf, perforated	stainless steel	–	6004-0040

* Notes › See last page

Designation	Description	*	Art.-No.
Shelf, reinforced	positioned at bottom level, max. load 67 kg, with additional attachment for operation of shaking device, stirring device or roller bottle system	-	8012-1429
Software	APT-COM™ communications software		
	version 2 to 3, GLP edition	19	9053-0016
	version 3, BASIC edition	19	9053-0014
	version 3, GLP edition	19	9053-0015
	version 3, STANDARD edition	19	9053-0013
	APT-COM™ communications software, price: for free		
	version 3, GLP DEMO Edition	19	9053-0008
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

SERVICES

Designation	Description	*	Art.-No.
Installation services			
Data Logger Kit installation service	and set up of unit at operating location, connect to existing connections	13, 18	DL100200
	unit function instructions for operation and programming of the controller	18	DL100600
Preventive maintenance			
Preventive maintenance	Executive of equipment inspection according to maintenance plan	14, 18	DL200300
Calibration services			
Data Logger Kit calibration service	including certificate, one measuring point in center of chamber at specified temperature	14, 16, 17, 18	DL300101
Light photometry	including certificate, radiometric measurement in the visible spectrum with determination and documentation of intensity distribution from an illumination cassette on 3 measurement levels	14, 16, 17, 18	DL310000
Temperature measurement 18 measuring points	including certificate, 18 measuring points at specified temperature	14, 16, 17, 18	DL300118
Temperature measurement 27 measuring points	including certificate, 27 measuring points at specified temperature	14, 16, 17, 18	DL300127
Temperature measurement 9 measuring points	including certificate, 9 measuring points at specified temperature	14, 16, 17, 18	DL300109
Validation services			
Execution of IQ/OQ, incl. light measurement	including light measurement, in accordance with qualification folder	15, 18, 20	DL430400
Execution of IQ/OQ/PQ	in accordance with customer's requirement, price: on request	15, 18	DL440500
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	8012-0877
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	8012-0964
Warranty service			
Extension of the warranty from 2 to 3 years	beginning with the date of delivery, wearing parts are not included	-	DL022041
Extension of the warranty from 2 to 5 years	beginning with the date of delivery, wearing parts are not included	-	DL022042

* 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.
- 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 (see the chapter on BINDER Service) 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 both items.
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.