

Model KBW 400 | Growth chambers with light

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



Model 400

MAIN FEATURES

- Temperature range: 0 °C to 70 °C
- Temperature range with light: 10 °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

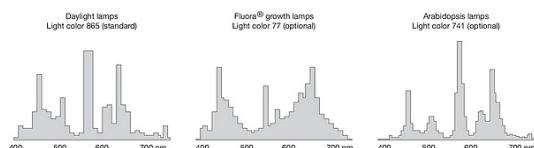
Interior volume [L]	Voltage	Option model	Version	Art.-No.
Model KBW 400				
400	200...240 V 1~ 50/60 Hz	Standard	KBW400-230V	9020-0180

TECHNICAL DATA

Description	KBW400-230V
Article Number	9020-0180
Performance Data Temperature	
Temperature range without illumination [°C]	0...70
Temperature range with 100% illumination [°C]	5...60
Temperature uniformity without illumination [± K]	0.5
Temperature uniformity with 100% illumination [± K]	1.5
Temperature fluctuation without illumination [± K]	0.1
Temperature fluctuation with 100% illumination [± K]	0.1
Max. heat compensation at 40 °C [W]	600
Max. heat compensation at 40 °C with illumination [W]	450

Description	KBW400-230V
Article Number	9020-0180
Lightdata per Illumination Cassettes	
Daylight tubes [W/m²]	24
Daylight tubes [lx]	9000
Fluora® growth lamps [W/m²]	23
Fluora® growth lamps [lx]	7500
Arabidopsis lamps [W/m²]	32
Arabidopsis lamps [lx]	11000
Electrical data	
Rated Voltage [V]	200...240
Power frequency [Hz]	50/60
Nominal power [kW]	1.6
Nominal current [A]	6.7
Unit fuse [A]	16
Phase (Nominal voltage)	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
Steam space volume [L]	564
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
Load per rack [kg]	30
Environment-specific data	
Energy consumption at 0 °C	405 Wh/h
Energy consumption at 4 °C and with illumination	675 Wh/h
Energy consumption at 25 °C and with illumination	660 Wh/h
Energy consumption at 37 °C and with illumination	705 Wh/h
Sound-pressure level [dB(A)]	53

CHARTS



Light Spectra

OPTIONS AND ACCESSORIES

Designation	Description	*	Art.-No.
Access port with silicone plug	30 mm, left	01	8012-0648
	30 mm, right	01	8012-0647
	30 mm, top	01	8012-0649
	50 mm, left	01	8012-0653
	50 mm, right	01	8012-0652
	50 mm, top	01	8012-0650
	100 mm, top	01	8012-0651
Analog output, 4 – 20 mA	for temperature values (output not adjustable)	02	8012-0626
Arabidopsis illumination cassette	fluorescent tube set for replacement of daylight fluorescent tubes 17 W option model	–	8012-0791
Arabidopsis illumination cassette, accessories	replacement fluorescent tubes for one illumination cassette (set of 5)	–	8500-0023
Calibration certificate, expanded	each measurement at additional measuring point or testing temperature	–	8012-0022
Calibration certificate, temperature	for temperature, measurement in center of chamber at specified temperature	–	8012-0030
	temperature measurement incl. Certificate and 27 measuring points at specified temperature	–	8012-0921
	temperature measurement incl. certificate, 15- 18 measuring points at specified temperature	–	8012-0918
	temperature measurement incl. certificate, 9 measuring points at specified temperature	–	8012-0915
Class 3.3 independent temperature safety device	with visual alarm (DIN 12880)	–	8012-0610
Data Logger Kit	T 220: temperature logging from -90 °C to 220 °C	19	8012-0715
Data Logger Kit, software	LOG ANALYZE software kit, configuration and evaluation software for all BINDER Data Logger Kits (incl. USB data cable)	19	8012-0821
Daylight illumination cassette, accessories	replacement fluorescent tubes for one illumination cassette (set of 5)	–	8500-0024
Door lock	lockable door handle	–	8012-0584
Ethernet interface	in place of RS 422, for communication software	–	8012-0613
FLUORA® illumination cassette, accessories	replacement fluorescent tubes for one illumination cassette (set of 5)	–	8500-0022 8012-0790
Interface converter, RS232/RS422 - 230V	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
Interior socket	coverable, with associated LEMO connector (nominal voltage, max. 500 W, max. 90 °C, protection class IP67)	07	8012-0640
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
Magnetic Pouch (A4)	insert pouch with magnetic strip	–	1007-0065
pH-neutral detergent	concentrated, for gentle remove of residual contaminants; 1 kg	–	1002-0016
Pt 100 temperature sensor	additional Pt 100, with flexible cable installed with external connection, incl. 6-pin DIN socket	–	8012-0637

* Notes › See last page

Designation	Description	*	Art.-No.
Rack	stainless steel	–	6004-0101
Rack, accessories	set of 4 fasteners for additional security	–	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
Shelf, reinforced	positioned at bottom level, max. load 67 kg, with additional attachment for operation of shaking device, stirring device or roller bottle system	–	8012-0639
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 outputs	for controlling 3 relay outputs via program-pin DIN socket (max. 24 V regulators, accessible via 6 - 2.5 A)	–	8012-0679

* Notes › See last page

SERVICES

Designation	Description	*	Art.-No.
Installation services			
Installation	and set up of unit at operating location, connect to existing connections	13, 18	DL100200
Instruction	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			
Calibration temperature	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

* 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.
- 05 Attention: The pump is delivered separately. The electric connection for the pump (230 V/1~/50 Hz) must be carried out by an authorized electrician.
- 06 Heating-up time may increase as a result of the lower heat conductivity.
- 07 The additional heat input may affect the temperature behavior.
- 08 The pump (packaged separately) is ready for connection.
- 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.
- 21 ATEX conformity:
Pumping chamber (pumped gases): II 2G IIC T3 X
Environment with inert purge gas: II 2G IIB T4 X
Environment without inert purge gas: II 3G IIB T4 X
Motor: II 2G Ex d IIB T4 Gb

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.ru

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