

## 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

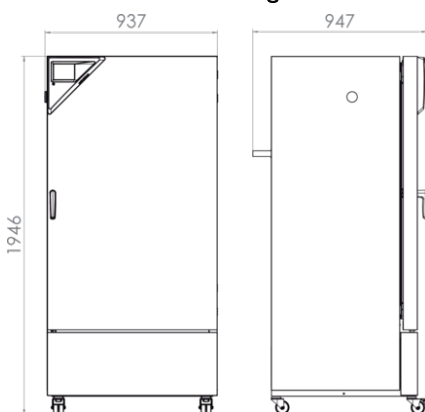
## TECHNICAL DATA

Data	
Designation	KBW400-230V
Article Number	9020-0339
Option model	Standard
Performance Data Temperature	
Temperature range	0...70 °C
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~
Dimensions and weights	
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  $+22\text{ °C} \pm 3\text{ °C}$  and a power supply voltage fluctuation of  $\pm 10\%$ . 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		
	30 mm	01	8012-1439
Access port with silicone plug	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		
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	–	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.

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