

# Model KBWF 240 | Growth chambers with light and humidity

The BINDER climate chamber with illumination of the KBW series achieves homogeneous light distribution with its natural illumination. That allows this climate 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
- Pressure humidification with fast response times



Model 240



Model 240

## MAIN FEATURES

- Temperature range: 0 °C to 70 °C
- Temperature range with light: 10 °C to 60 °C
- Humidity range: 10 % to 80 % RH
- 2 positionable illumination cassettes, each with 5 fluorescent tubes
- APT.line™ preheating chamber technology
- Adjustable fan speed
- Humidity regulation with capacitive humidity sensor and vapor humidification
- Controller with time-segment programming
- Tight-sealing inner door made of safety glass (ESG)
- Avoidance of glass corrosion by special TIMELESS coating
- Display via color LCD monitor
- 2 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.
Model KBWF 240				
8.7	200...240 V 1 ph 50 Hz	Standard	KBWF240-230V	9020-0336

## TECHNICAL DATA

Description	KBWF240-230V <sup>1</sup>
Article Number	9020-0336
Performance Data Temperature	
Temperature range with 100% illumination [°C]	10...60
Temperature range without illumination cassettes [°C]	0...70

<sup>1</sup> 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.

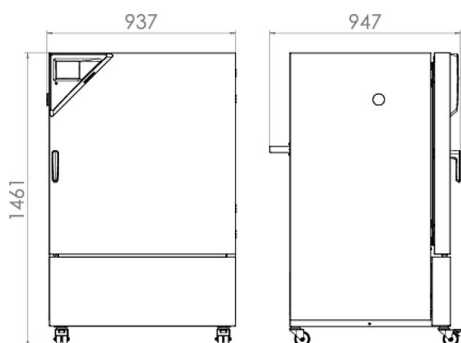
<sup>2</sup> Average value, measured at 25 °C with a spherical sensor (±10 %) by 12 cm below the light cassette. The values given in W/m<sup>2</sup> refer to global radiation.

Description	KBWF240-230V <sup>1</sup>
Article Number	9020-0336
<b>Performance Data Climate</b>	
Temperature range with 100% illumination [°C]	10...60
Temperature range without illumination cassettes [°C]	10...70
Humidity range with illumination cassettes, with illumination [% RH]	10...75
Humidity range without illumination [% RH]	10...80
<b>Lightdata per Illumination Cassettes</b>	
Daylight tubes [W/m <sup>2</sup> ] <sup>*2</sup>	24
Daylight tubes [lx] <sup>*2</sup>	9000
Fluora® growth lamps [W/m <sup>2</sup> ] <sup>*2</sup>	23
Fluora® growth lamps [lx] <sup>*2</sup>	7500
Arabidopsis lamps [W/m <sup>2</sup> ] <sup>*2</sup>	32
Arabidopsis lamps [lx] <sup>*2</sup>	11000
<b>Electrical data</b>	
Rated Voltage [V]	200...240
Power frequency [Hz]	50
Nominal power [kW]	2.4
Unit fuse [A]	16
Phase (Nominal voltage) [ph]	1
<b>Outer dimensions</b>	
Width net [mm]	925
Height net [mm]	1465
Depth net [mm]	800
Wall clearance back [mm]	100
Wall clearance sidewise [mm]	100
<b>Doors</b>	
Inner doors	1
Unit doors	1
<b>Internal Dimensions</b>	
Width [mm]	650
Height [mm]	785
Depth [mm]	485
<b>Measures</b>	
Interior volume [L]	247
Net weight of the unit (empty) [kg]	214
permitted load [kg]	100
Load per rack [kg]	30
<b>Environment-specific data</b>	
Energy consumption at 37 °C and 75 % RH [Wh/h]	760
Sound-pressure level [dB(A)]	53
<b>Fixtures</b>	
Number of shelves (std./max.)	2/7
Number of illumination cassettes (std./max.)	2/2

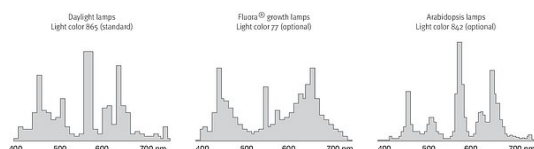
1 All technical data is specified for unloaded units with standard equipment at an ambient temperature of +22 °C ±3 °C and a power supply voltage fluctuation of ±10 %. The temperature data is determined in accordance to BINDER factory standard following DIN 12880, observing the recommended wall clearances 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/m<sup>2</sup> refer to global radiation.

## DIMENSIONS incl. fittings and connections [mm]



## CHARTS



## Light Spectra

## OPTIONS AND ACCESSORIES

Designation	Description	*	Art.-No.
	left		
	30 mm	01	8012-1447
	50 mm	01	8012-1477
	right		
Access port with silicone plug	30 mm	01	8012-1441
	50 mm	01	8012-1471
	top		
	30 mm	01	8012-1453
	50 mm	01	8012-1459
	100 mm	01	8012-1465
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	-	8012-1760
Analog output 4-20 mA	for temperature and humidity values (output not adjustable)	-	8012-1736
Arabidopsis illumination cassette	fluorescent tube set for replacement of daylight fluorescent tubes 17 W option model	-	8012-1479
BINDER PURE AQUA SERVICE	System for preparation or complete desalination of tap water, complete set containing PURE AQUA 300 single-use cartridge, measuring device, and all necessary connecting parts	-	8012-1809
BINDER PURE AQUA SERVICE, accessories	PURE AQUA 300 single-use replaceable cartridge for the BINDER PURE AQUA SYSTEM, filter capacity approx. 700 liters (for a conductivity of 200 $\mu\text{S}/\text{cm} = 6.6$ °dH)	-	6011-0179
	PURE AQUA 600 single-use replaceable cartridge for the BINDER PURE AQUA SYSTEM, filter capacity approx. 1,400 liters (for a conductivity of 200 $\mu\text{S}/\text{cm} = 6.6$ °dH)	-	6011-0180
Calibration certificate, expanded	for temperature and humidity; for extending the measurement in center of chamber to include another test value	-	8012-1192
Calibration certificate, temperature	temperature measurement incl. certificate and 27 measuring points at specified temperature	-	8012-1607
	temperature measurement incl. certificate, 15- 18 measuring points at specified temperature	-	8012-1587
	temperature measurement incl. certificate, 9 measuring points at specified temperature	-	8012-1566
Calibration certificate, temperature and humidity	Measurement in center of chamber at 25 °C / 60% RH or at specified test values	-	8012-1186
	temperature (according to DIN12880) and humidity measurement incl. certificate, 27 temperature measuring points and 1 humidity measuring point, at 25 °C / 60 % RH or at specified values	-	8012-1613

\* Notes › See last page

Designation	Description	*	Art.-No.
Class 3.3 independent temperature safety device	with visual alarm (DIN 12880) 230 V option model	–	8012-1753
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	19	8012-0715
	TH 70/70: For continuous temperature and humidity logging from -40 °C to 70 °C / 0% to 100% RH and additional logging of ambient conditions. Kit includes 1 data logger, 2 attachable combined humidity/temperature sensors, 2 m extension cable and 1 fixture for mounting to the BINDER unit	19	8012-0717
	TH 70: For continuous temperature and humidity logging from -40 °C to 70 °C; 0% to 100% RH. Kit includes 1 data logger, Pt 100 sensor with 2 m extension cable, and 1 magnetic fixture for mounting to the BINDER unit	19	8012-0716
Data Logger Software	LOG ANALYZE software kit, configuration and evaluation software for all BINDER Data Logger Kits (incl. USB data cable)	19	8012-0821
Door lock	lockable door handle	–	8012-1776
FLUORA® illumination	Illumination cassettes equipped with FLUORA® fluorescent tubes instead of daylight fluorescent tubes	–	8012-1478
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	–	8012-0556
	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)	–	8012-1547
pH-neutral detergent	concentrated, for gentle remove of residual contaminants; 1 kg	–	1002-0016
Pt 100 temperature sensor	additional flexible Pt 100, interior, for displaying the temperature on the unit display	–	8012-1749
Rack accessories	Rack accessories – fasteners (1 set of 4) for additional security of racks	–	8012-0620
Rack, reinforced	stainless steel, with fasteners (1 set of 4), max. load 70 kg	–	8012-0638
Racks	stainless steel	–	6004-0101
RS 422 interface	in place of Ethernet, for communication software	–	8012-1435
	modular plug distributor for 10 RS 422 interfaces	–	8012-0295
RS 422 interface, accessories	RS 422 connection cable (15 m) between plug distributor and RS 422 interface	–	5023-0036
	RS 422 extension cable (50 m) between interface converter and unit or RS 232 / RS 422 plug distributor	–	5023-0117
RS 485, 2-wire	Additional serial interface can be used parallel to Ethernet, for communication software	–	8012-1745
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	–	8012-1430
	APT-COM™ communications software		
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	
Water supply set	external, consisting of fresh- and waste-water containers (20 liters each), cabling and pump	–	8012-0643

\* Notes › See last page

## SERVICES

Designation	Description	*	Art.-No.
<b>Installation services</b>			
Installation	and set up of unit at operating location, connect to existing connections	13, 18	DL10-0300
Instruction	unit function instructions for operation and programming of the controller	18	DL10-0700
<b>Preventive maintenance</b>			
Preventive maintenance	Executive of equipment inspection according to maintenance plan	14, 18	DL20-0400

\* Notes › See last page

Designation	Description	*	Art.-No.
<b>Calibration services</b>			
Calibration temperature and humidity	including certificate, one measuring point in center of chamber at 25 °C / 60 % RH or at specified values	14, 16, 17, 18	DL30-0301
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	DL31-0000
Temperature and humidity measurement according to DIN12880	including certificate (27 temperature measuring points and one humidity measuring point, at 25 °C / 60 % RH or at specified values)	14, 16, 17, 18	DL30-0427
Temperature measurement 18 temperature measuring points and 1 humidity measuring point	including certificate, 18 temperature measuring points and 1 humidity measuring point in center of chamber, at 25 °C / 60 % RH or at specified values	14, 16, 17, 18	DL30-0318
Temperature measurement 27 temperature measuring points and 1 humidity measuring point	including certificate, 27 temperature measuring points and 1 humidity measuring point in center of chamber, at 25 °C / 60 % RH or at specified values	14, 16, 17, 18	DL30-0327
Temperature measurement 9 temperature measuring points and 1 humidity measuring point	including certificate, 9 temperature measuring points and 1 humidity measuring point in center of chamber, at 25 °C / 60 % RH or at specified values	14, 16, 17, 18	DL30-0309
<b>Validation services</b>			
Execution of IQ/OQ incl. light measurement	including light measurement, in accordance with qualification folder	15, 18, 20	DL43-0400
Execution of IQ/OQ/PQ	in accordance with customer's requirement, price: on request	15, 18	DL44-0500
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	8012-0878
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	8012-0965
<b>Warranty service</b>			
Extension of the warranty from 2 to 3 years	beginning with the date of delivery, wearing parts are not included	–	DL02-3041
Extension of the warranty from 2 to 5 years	beginning with the date of delivery, wearing parts are not included	–	DL02-3042

\* 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.
- 07 The additional heat input may affect the temperature behavior.
- 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 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 the item of the IQ/OQ folder.  
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.