

## Climate chambers with illumination

The BINDER KBW series climate chamber with illumination achieves homogeneous light distribution and ensures consistent temperature conditions with its natural illumination.



### Advantages:

- Homogeneous light distribution
- Natural growth conditions
- Temperature, humidity & light in one unit

### Areas of application:



Cosmetics Industry



Plant / Insect Growth



Packaging Industry

Features	Customer benefits	Characteristics
APT.line™ climate technology	<ul style="list-style-type: none"> <li>• Same test conditions throughout the chamber interior</li> <li>• Independent of specimen size and quantity</li> <li>• No drying out of specimens</li> </ul>	<b>APT.line™</b> <ul style="list-style-type: none"> <li>• Constant and gentle circulation of air through large-surface side walls even under a full load</li> <li>• Homogeneous climate conditions throughout all specimens</li> </ul>
Light	<ul style="list-style-type: none"> <li>• Up to 20% greater usable space</li> <li>• Light sources adjustable to specimen sizes</li> <li>• Same irradiation results throughout the chamber interior</li> </ul>	<ul style="list-style-type: none"> <li>• Flexible positioning and fully removeable illumination cassettes</li> <li>• Excellent light uniformity for all specimens on the entire shelf</li> <li>• Different light spectra can be used</li> </ul>
Cooling system	<ul style="list-style-type: none"> <li>• Reliable testing independent of ambient conditions</li> </ul>	<ul style="list-style-type: none"> <li>• Powerful compressor cooling system with large power reserves for lighting applications</li> <li>• No freezing thanks to double evaporator plate</li> <li>• Carefully measured cooling</li> </ul>
Standard equipment	<ul style="list-style-type: none"> <li>• No extra costs</li> <li>• Chamber is easily moved on casters</li> </ul>	<b>Comprehensive standards</b> <ul style="list-style-type: none"> <li>• Communication interface</li> <li>• Access port diameter 30 mm (1.2 inch)</li> <li>• BINDER test certificate</li> <li>• Casters</li> <li>• Inner glass door and double outer door seal</li> <li>• Door heated against condensation</li> </ul>
Unit design	<ul style="list-style-type: none"> <li>• Minimum space requirements</li> <li>• Easy assembly</li> <li>• Large chamber interior volume</li> <li>• Easy cleaning</li> </ul>	<ul style="list-style-type: none"> <li>• Optimal ratio of usable space and footprint</li> <li>• Large access area thanks to wide design</li> <li>• Chamber interior made out of high-quality stainless steel</li> <li>• Closed illumination cassettes</li> <li>• No permanent fixtures</li> </ul>
Accessories and Services	<ul style="list-style-type: none"> <li>• Complete solution</li> <li>• Everything from one source</li> <li>• BINDER Service is always nearby</li> </ul>	<b>Comprehensive product portfolio</b> <ul style="list-style-type: none"> <li>• Various options: BINDER Data Logger Kits, access ports in various sizes and positions, control and documentation software APT-COM™</li> <li>• Years of proven and recognized validation and documentation materials</li> <li>• Worldwide service network</li> </ul>

- Electronically controlled APT.line™ preheating chamber assuring temperature accuracy and reproducible results
- Temperature range 0 °C to 70 °C (32 °F to 158 °F) (without illumination)
- Temperature range 5 °C to 60 °C (41 °F to 140 °F) (with illumination)
- 2 variable positioned illumination cassettes with 5 daylight illumination tubes, each, in steps switchable
- The patented illumination system assures an unique homogeneous light distribution
- MP controller with 2 programs with 10 sections each, alternatively switchable to 1 program with 20 sections
  - Integrated week program timer with real time function
  - Digital temperature setting with an accuracy of a tenth of a degree
  - Adjustable ramp functions via program editor
  - Adjustable fan speed
  - Elapsed time indicator
- Access port Ø 30 mm (1.18 inch), left side
- Inner glass door
- Independent adjustable temperature safety device class 3.1, providing full protection against chamber over-temperature, with visual and audible temperature alarm
- RS 422 interface for communication software APT-COM™ DataControlSystem
- Adjustable intervals for printer
- 2 stainless steel racks
- BINDER technical specification conformance certificate

## KBW 240 (E5.1)

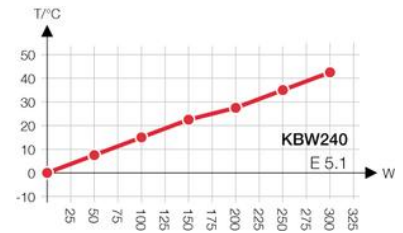
▶ Exterior dimensions	
Width (mm/inch)	930 / 36.6
Height (incl. casters) (mm/inch)	1460 / 57.5
Depth incl. door handle, I-triangle, connection 80 mm (3.15 inch) (mm/inch)	800 / 31.5
Wall clearance, rear (mm/inch)	100 / 3.9
Wall clearance, side (mm/inch)	100 / 3.9
Steam space volume (l/cu.ft.)	348 / 12.3
Number of doors (ea.)	1
Inner glass door(s) (ea.)	1

▶ Interior dimensions	
Width (mm/inch)	650 / 25.6
Height (mm/inch)	785 / 30.9
Depth (mm/inch)	485 / 19.1
Interior volume (l/cu.ft.)	247 / 8.7
Racks (number standard/max.)	2 / 9
Load per rack (kg/lbs.)	30 / 66
Permitted total load (kg/lbs.)	100 / 221
Weight (empty) (kg/lbs.)	202 / 446
Variable position illumination cassettes	2

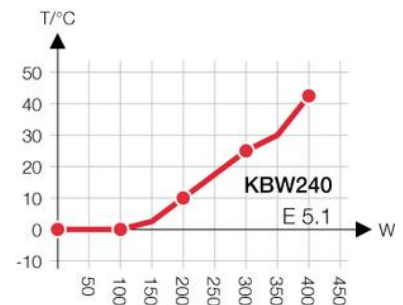
▶ Temperature data (without illumination)	
Temperature range (°C/°F)	0 - 70 / 32 - 158
Temperature variation (± K)	0.5
Temperature fluctuation (± K)	0.1
Max. heat compensation up to 40 °C (104 °F) (W)	350

▶ Temperature data (with 100 % illumination)	
Temperature range (°C/°F)	5 - 60 / 41 - 140
Temperature variation (± K)	0.5
Temperature fluctuation (± K)	0.1
Max. heat compensation up to 40 °C (104 °F)(W)	250
Illumination data (per illumination cassette)	
Daylight tubes (Lux) / (W/m <sup>2</sup> )	10.000 / 36
Fluora® growth lamps (Lux) / (W/m <sup>2</sup> )	6.500 / 34
Arabidopsis tubes (Lux) / (W/m <sup>2</sup> )	10.000 / 40

### Heat compensation with illumination



### Heat compensation without illumination



## KBW 240 (E5.1)

▶ Electrical data	
IP protection class acc. to EN 60529	IP 20
Voltage ( $\pm 10\%$ ) 50 / 60 Hz (V)	200 - 240, 1 N ~
Nominal power (kW)	1.4
Energy consumption 1)	
without illumination at 0 °C (32 °F) (W)	360
with illumination at 4 °C (39.2 °F) (W)	520
with illumination at 25 °C (77 °F) (W)	495
with illumination at 37 °C (98.6 °F) (W)	525
Noise level (dB (A))	52

1) These values can be used for dimensioning air condition systems.

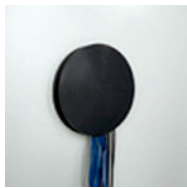
All technical data are specified for units with standard equipment at an ambient temperature of 25 °C (77 °F) and a line voltage fluctuation of  $\pm 10\%$ . The temperature data is determined in accordance to factory standard following DIN 12880, respecting the recommended wall clearances of 10 % of the height, width and depth of the inner chamber. All figures are typical average values for series devices. We reserve the right to alter technical specifications at any time.

**Variable illumination**

The illumination selection is based on the application, light spectrum and intensity. For example: FLUORA® growth fluorescent tubes may be exchanged for daylight fluorescent tubes

**BINDER Data Logger Kits**

The new BINDER Data Logger Kits – Makes independent recording of temperature and humidity data in the BINDER device possible. The tailored product solution contains helpful accessories: from mounting the logger to the BINDER device to cable access assistance to the sensor mount

**Access port**

With silicone plugs for introducing external measuring instruments into the chamber, access ports with 30, 50 or 100 mm (1.18, 1.97, 3.94 inch) diameters

**Analog output**

Analog output for temperature 4 - 20 mA with 6-pin DIN socket (output not adjustable)

**Calibration certificate & validation**

BINDER can significantly reduce the workload in qualifying and validating devices. Nobody knows our devices as well and has as much experience in certifications as we do

**KBW 240 (E5.1)**

Access ports with silicone plug 30, 50, 100 mm (1.18, 1.97, 3.94 inch)	O
Securing elements for additional fastening of racks (1 set of 4 pieces)	O
Additional PT 100 temperature sensor, flexibly installed, with external connection, including DIN connector (6-pin)	O
Ethernet interface for communication software APTCOM™ DataControlSystem	O
Factory calibration certificate. Measurement in center of chamber at 37 °C (98.6 °F) or at specified testing temperature	O
Extension to factory calibration certificate. Each additional measurement at an additional measuring point or temperature	O
Temperature measurement acc. to DIN 12880 (27 measuring points) at 37 °C (98.6 °F) or at specified temperature with measuring protocol and certificate	O
Data Logger Kit T 220: For the continuous temperature recording of -90 °C (-130 °F) to 220 °C (428 °F). Kit includes 1 data logger, PT 100 sensor with 2 m Teflon extension cable and 1 fixture for the connection at the BINDER unit	O
Data Logger converter cable RS 232 to USB 2.0	O
Data Logger Software: Configuration und evaluation software for all BINDER Data Logger Kits, incl. data cable (RS 232)	O
Rack, stainless steel	O
Shelf, perforated, stainless steel	O
Reinforced rack, stainless steel, with 1 set of securing elements (1 set of 4 pieces), max. load 70 kg (154 lbs.)	O
Vibration compatible shelf / platform (positioned at bottom level) to be mounted inside the chamber for shaker / spinner / roller operation. Other positions available on request	O
Temperature safety device, class 3.3 (DIN 12880) with optical alarm	O
Analog temperature output, 4-20 mA, with 6-pin DIN socket (output not adjustable)	O
Zero-voltage relay outputs accessible via 6-pin DIN socket. Additional module for controlling 2 relay outputs via 2 of the programmable controller's controller contacts. Outputs can be switched on and off either automatically, or also manually	O
Waterproof interior socket 230 V AC (max. 200 W), IP65 protected, with corresponding plug (IP66 protected) Max. allowed operating temperature 50 °C (122 °F)	O
FLUORA® growth lamps set as replacement for the standard tubes for 230 V	O
Arabidopsis fluorescent tubes set as replacement for the standard tubes for 230 V	O
Replacement set of standard daylight illumination tubes for one illumination cassette	O
Replacement set of FLUORA® illumination tubes for one illumination cassette	O
Replacement set of Arabidopsis illumination tubes for one illumination cassette	O
Locking door handle with key	O