

## KBW 400 (E3.1) - Plant growth chamber with optimal lighting conditions

Precision combined with maximum dynamics. KBW exceeds any requirements with respect to optimal lighting and temperature conditions for exactly defined culture processes. Extremely short reaction times keep all growth parameters in equilibrium - natural simulation as never before. Handling is truly enhanced by the integrated week program timer function in the controller.



### ► Performance features and equipment:

- Electronically controlled APT.line™ preheating chamber assuring temperature accuracy and reproducible results
- Temperature range:
  - without illumination -10 °C to 60 °C (14 °F to 140 °F)
  - with illumination 14 °C to 60 °C (57.2 °F to 140 °F)
- MP controller with 2 programs with 10 sections each, alternatively switchable to 1 program with 20 sections
  - Digital temperature setting with an accuracy of a tenth of a degree
  - Integrated week program timer with real time function for programming day/night cycles
  - Adjustable ramp functions via program editor
- Digital temperature setting with an accuracy of a tenth of a degree
- Adjustable fan speed
- Elapsed time indicator
- Illumination: flexible illumination cassettes with 4 daylight fluorescent tubes each, switchable (OFF – 50 % – 100 %)
- Access port, Ø 30 mm (1.2 inch) , right side, top and bottom
- Inner glass door
- Independent adjustable temperature safety device class 3.1, providing full protection against chamber over-temperature, with visual and audible temperature alarm
- Environmentally friendly refrigerant R 134a
- RS 422 interface for communication software APT-COM™ DataControlSystem, or switch over to printer output with RS 232 / RS 422 interface converter
- Adjustable intervals for printer
- Stainless steel rack included
- BINDER test certificate



**KBW 400 (E3.1)**

<b>Exterior dimensions</b>	
Width (mm/inch)	884 / 34.8
Height (inclusive feet) (mm/inch)	1850 / 72.8
Depth (mm/inch)	716 / 28.2
Plus door handle, I-panel, connection (mm/inch)	100 / 3.9
Wall clearance (mm/inch)	100 / 3.9
Wall clearance with open door(s) (mm/inch)	160 / 6.3
Steam space volume (l/cu.ft.)	515 / 18.2
Number of door(s) / inner glass door(s)	1 / 1
<b>Interior dimensions</b>	
Width (mm/inch)	650 / 25.6
Height (mm/inch)	1308 / 51.5
Depth (mm/inch)	470 / 18.5
Interior volume (l/cu.ft.)	400 / 14.2
Load per rack (kg/lbs.)	20 / 44
Permitted total load (kg/lbs.)	100 / 221
Weight of the unit (empty) (kg/lbs.)	236 / 521
Number of light cassettes	3
<b>Temperature data</b>	
Temperature range 1)	
0 % light intensity °C/°F	-10 - 60 / 14 - 140
100 % light intensity °C/°F	14 - 60 / 57.2 - 140
0 % light intensity with option enhanced refrigeration (°C/°F)	-10 - 60 / 14 - 140
100 % light intensity with option enhanced refriger. (°C/°F)	0 - 60 / 32 - 140
Temperature variation	
at 0 °C (32 °F), 0 % / 100 % illumination and enhanced refrigeration (± °C)	0.7 / 2.9
at 25 °C (77 °F), 0 % / 100 % illumination (± °C)	0.5 / 4
at 25 °C (77 °F) / 100 % light intensity / enhanced refrigeration (± °C)	2.8
Temperature fluctuation	
during heating operation (± °C)	0.1
during cooling operation (± °C)	0.3
Heating up time at 37 °C (98.6 °F), 0 % / 100 % illumination 2) (Min.)	26 / 22
Cooling down time room temperature 2)	
up to 4 °C (39.2 °F) / 0 % light intensity (minutes)	120
up to 4 °C (39.2 °F) / 0 % light intensity / enhanced refrigeration (minutes)	39
up to 4 °C (39.2 °F) / 100 % light intensity / enhanced refrigeration (minutes)	84
Recovery time after door was opened for 30 sec.	
at 4 °C (39.2 °F), 0 % illumination 1)(Min.)	8
at 4 °C (39.2 °F), 0 % / 100 % illumination / enhanced refrigeration (Min.)	3 / 5
at 37 °C (98.6 °F), 0 % / 100 % illumination (Min.)	2 / 3
Illumination data 3)	
Daylight fluorescent tubes, light color 865 (LUX)	12.300
Daylight fluorescent tubes, light color 865 (µE/S x m²)	180
OPTION Fluora® growth lamps, light color 77 (LUX)	6.900
OPTION Fluora® growth lamps, light color 77 (µE/S x m²)	150
<b>Electrical data</b>	
Housing protection acc. to EN 60529	IP 20
Nominal voltage (±10 %) 50 / 60 Hz (V)	230
Nominal power (kW)	1.35
Energy consumption 4) at 37 °C (98.6 °F) (W)	90

1) at an ambient temperature < 20 °C

2) up to 98 % of the set value

3) Distance between measurement level and light cassette: 12 cm (7.4 inch)

4) these energy consumption values can be used upon calculation of air conditioning systems

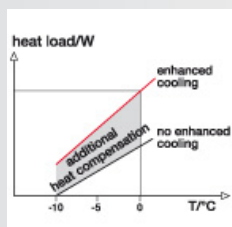
All technical data are specified for units with standard equipment at an ambient temperature of 20 °C and a voltage fluctuation of ±10 %. The temperature data are determined in accordance to factory standard following DIN 12880 respecting the recommended wall clearances of 10 % of the height, width and depth of the inner chamber. All indications are average values, typical for units produced in series. We reserve the right to alter technical specifications at all times.





► Different illumination

Lighting can be selected based upon application and light intensity. For example: FLUORA® growth lamps set as replacement for the standard tubes.



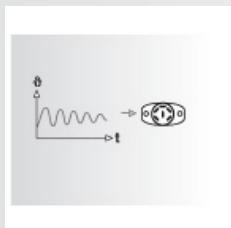
► Reinforced refrigerating

To compensate for heat from the lamps.



► Waterproof interior power socket in the inner chamber

Maximum 500 W, switched via the main switch, with associated plug (protection type IP 65), 230 V 1N ~50/60 Hz.



► Analog outputs

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

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Access port with silicone plugs, 10 mm (0.39 inch), 30 mm (1.18 inch), 50 mm (1.97 inch), 100 mm (3.94 inch)	<input type="radio"/>
Securing elements for additional fastening of racks (1 set of 4)	<input type="radio"/>
Switchable waterproof interior socket 230 V AC (max. 500 W), IP 65 protected, with corresponding plug (IP 66 protected)	<input type="radio"/>
Certificate light measurement for KBW lighting. Radiometric measurements in the visible spectral range with definition and documentation of intensity allocation from one light cartridge to 3 measurement levels	<input type="radio"/>
Temperature measurement acc. to DIN 12880 (27 measuring points) at 25 °C (77 °F) or at specified temperature with measuring protocol and certificate	<input type="radio"/>
Factory calibration certificate. Measurement in center of chamber at 25 °C (77 °F) or at specified testing temperature	<input type="radio"/>
Extension to factory calibration certificate. Each additional measurement at an additional measuring point or temperature	<input type="radio"/>
Rack, stainless steel	<input type="radio"/>
Shelf, perforated, stainless steel	<input type="radio"/>
Lockable door	<input type="radio"/>
Reinforced refrigeration system	<input type="radio"/>
Temperature safety device, Class 3.3 (DIN 12880) with optical alarm	<input type="radio"/>
Analog temperature output, 4 - 20 mA, with 6 - pin DIN socket (output not adjustable)	<input type="radio"/>
FLUORA® growth lamps set as replacement for the standard tubes	<input type="radio"/>
Arabidopsis fluorescent tubes set as replacement for the standard tubes	<input type="radio"/>