

KBWF series

Plant growth chambers with optimal climatic conditions

The closest thing to natural conditions. Making use of the multifaceted programming options, we achieve perfect interaction between heat or cold, humidity and light. This wide climatic range can simulate any climatic condition precisely and constant over extended periods of time, including natural lighting conditions and day-night simulation.



Leistungsmerkmale/Ausstattung:

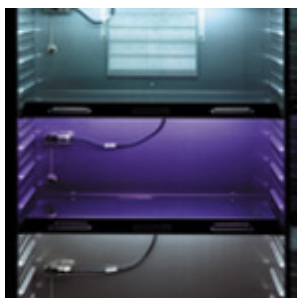
- Electronically controlled APT.line™ preheating chamber technology
- Temperature range: -5 °C to 100 °C (23 °F to 212 °F) without humidity and illumination
- Temperature range: 20 °C to 90 °C (68 °F to 194 °F) with humidity respective illumination
- Humidity range 10 % - 90 % RH
- MCS controller for temperature, humidity, and illumination with 25 storable programs of 100 sections each for a maximum of 500 program segments, for programming day/night cycles
 - Integrated electronic chart recorder
 - Variety of options for the graphic display of process parameters
 - Real-time clock
- Illumination system with daylight fluorescent tubes in the doors, thermally isolated from the inner chamber and ventilated (optimized illumination)
 - KBWF 240 - 10 count × 18 W
 - KBWF 720 - 10 count × 36 W
- Electronically controlled humidification and dehumidification system for use with tap water
- Capacitive humidity sensor with SPH technology
- Automatic defrosting device
- Independent adjustable temperature safety device, Class 3.1 (DIN 12880) with visual and acoustic temperature alarm
- 2 access ports, Ø 30 mm (1.2 inch) right side, top and bottom
- Environmentally friendly refrigerant R 134a
- Inner glass door
- Collecting pan for condensate on the door
- Complete safety connection kit for water supply incl. water hose as well as for water drain (total length 6 m / 19.7 ft.)
- RS 422 interface for communication software APT-COM™ DataControlSystem
- 2 stainless steel shelves
- BINDER test certificate

	KBWF 240	KBWF 720
Exterior dimensions		
Width (mm/inch)	905 / 35.6	1234 / 48.6
Height (inclusive feet/castors) (mm/inch)	1458 / 57.4	1816 / 71.5
Depth (mm/inch)	765 / 30.1	867 / 34.1
Plus door handle, I-panel, connection (mm/inch)	100 / 3.9	100 / 3.9
Wall clearance (mm/inch)	100 / 3.9	100 / 3.9
Wall clearance with open door(s) (mm/inch)	160 / 6.3	160 / 6.3
Steam space volume (l/cu.ft.)	338 / 11.9	855 / 30.2
Height of water connections (± 3 mm / ± 0.12 inch) in mm/inch	84 / 3.3	190 / 7.5
Number of doors	1	2
Number of inner glass doors	1	2
Interior dimensions		
Width (mm/inch)	650 / 25.6	1000 / 39.4
Height (mm/inch)	785 / 30.1	1168 / 46.0
Depth (mm/inch)	470 / 18.5	600 / 23.6
Interior volume (l/cu.ft.)	240 / 8.5	700 / 25.1
Shelves (number standard/max.)	2/7	2/14
Load per rack (kg/lbs.)	30 / 66	45 / 99
Permitted total load (kg/lbs.)	100 / 221	120 / 265
Weight (empty) (kg/lbs.)	213 / 470	345 / 762
Temperature data		
Temperature range		
without humidity / without illumination ($^{\circ}\text{C}/^{\circ}\text{F}$)	-5-100/23-212	-5-100/23-212
with humidity / with illumination ($^{\circ}\text{C}/^{\circ}\text{F}$)	5-100 /41-212	5-100 /41-212
with humidity / without illumination ($^{\circ}\text{C}/^{\circ}\text{F}$)	20-90/68-194	20-90/68-194
with humidity / with illumination (illumination in the door) ($^{\circ}\text{C}/^{\circ}\text{F}$)	20-90/68-194	20-90/68-194
Temperature variation without humidity		
at 10 $^{\circ}\text{C}$ (50 $^{\circ}\text{F}$) (\pm $^{\circ}\text{C}$)	0,4	0,4
at 37 $^{\circ}\text{C}$ (98.6 $^{\circ}\text{F}$) (\pm $^{\circ}\text{C}$)	0,4	0,4
Temperature variation with humidity (\pm $^{\circ}\text{C}$)	1,0	1,0
Temperature fluctuation during heating operation (\pm $^{\circ}\text{C}$)	0,1	0,1
Temperature fluctuation during cooling operation (\pm $^{\circ}\text{C}$)	0,5	0,5
Heating up time 1), 2) to 37 $^{\circ}\text{C}$ (98.6 $^{\circ}\text{F}$) (Min.)	30	28
Cooling down time from room temperature 1), 2) to 10 $^{\circ}\text{C}$ (50 $^{\circ}\text{F}$) (Min.)	35	35
Recovery time after door was open for 30 sec 1), 2)		
at 37 $^{\circ}\text{C}$ (98.6 $^{\circ}\text{F}$) (Min.)	5	5
at 50 $^{\circ}\text{C}$ (122 $^{\circ}\text{F}$) (Min.)	4	4
Humidity fluctuation 1), 2), 3) (\pm % r.H.)	1.5	1.5
Max. illumination / growth lamps		
(Lux) / $\mu\text{E}/(\text{s} \times \text{m}^2)^*$	7500 / 164	7500 / 164
Max. illumination/daylight lamps		
(Lux) / $\mu\text{E}/(\text{s} \times \text{m}^2)^*$	16600 / 250	16600 / 250
Max. illum daylight. with option high intensity illum. under the chamber ceiling (Lux)	19000	19000
Programming of light intensity 20 % / 40 % / at 60 % / at 100 %	X	X
Electrical data		
Housing protection acc. to EN 60529	IP 20	IP 20
Nominal voltage (± 10 %) 50/60 Hz (V)	230 / 115	230 / 115
Nominal power (W)	3000	2950

Energy consumption 4) at 37 °C (98.6 °F) (W)	594	970

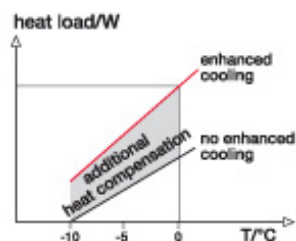
- 1) up to 98 % of the set value
 - 2) value without illumination
 - 3) upon door opening or water exchange in humidity cylinder: $> \pm 1.5$ % r.H., recovery time approx. 20 min.
 - 4) these energy consumption values can be used upon calculation of air conditioning systems
 - 5) max. value, distance 120mm/4.7 in. from the glass door
- * Light measurement using Quantum sensors with cosinus correction positioned vertically upside.

All technical specification are specified for units with standard equipment at an ambient temperature of + 20 °C (68 °F) and a voltage fluctuation of ± 10 %. The temperature data are determinated in accordance to factory standard following DIN 12880, part 2 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. Day light lamps / growth lamps / Arabidopsis lamps.



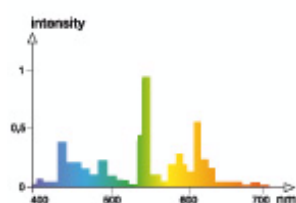
Reinforced refrigerating

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.



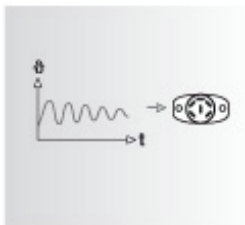
Classification of illumination conditions

Radiometric measurements of the visible spectral range, with definition and documentation of intensity distribution from a light module on three measurement levels.



Zero-voltage relay alarm outputs

Monitoring function for temperature and humidity monitoring, forwarding of alarm signals (e.g. computer, cell phone).



Analog outputs

For temperature 4 - 20 mA with 6-pin DIN socket (non-adjustable output).

High intensity illumination

High intensity illumination under the chamber ceiling with additional daylight fluorescent tubes. Thermal isolation and ventilation to simulate natural lighting. Restricted humidity range < 30 % r.H. at 20 °C (68 °F).

	KBWF 240	KBWF 720
Access port with silicone plug	O	O
Shelf, stainless steel	O	O
Shelf, perforated, stainless steel	O	O
Reinforced shelf, stainless steel, with 1 set of securing elements (max. 70 kg / 154 lbs.)	-	-
Securing elements for additional fastening of racks (1 set of 4)	O	O
Lockable door	O	O
Locking of controller keyboard	O	O
Independent adjustable temperature safety device, Class 3.3 (DIN 12880)	O	O
Safety kit for water connection. Pre-mounted assembly of reflux prevention device and hose burst protection device	O	O
High-intensity illumination under ceiling of chamber with additional daylight fluorescent tubes (KBWF 240: 6 x 18 W, KBWF 720: 8 x 18 W)	O	O
Potential-free alarm outputs for temperature and humidity, accessible via 6-pin DIN socket with acoustic signal that can be switched off. (max. power 24 V AC/DC, 2.5 A)	O	O
Analog output, 4–20 mA for temperature and humidity measurements, with 6-pin DIN socket (Outputs are adjusted automatically as the controller is adjusted)	O	O
Reinforced refrigeration system	-	-
High-intensity illumination with reinforced refrigeration system (Only available in combination with KBW equipped with dimmable illumination. Only for 230 V units!)	O	O
FLUORA growth lamps	O	O
Arabidopsis lamps	O	O
Serial printer with interface coverter for printing temperature logs. Connects to RS 232 printer interface. Inclusive connection cables for RS 422 interface and RS 232/RS 422 interface converter, 230 V	-	-
Dimmable illumination	-	-
Certificate illumination measurement for KBW. Radiometric measurements in the visible spectral range with definition and documentation of intensity allocation from the illumination cassette to 3 measurement levels.	-	-
Waterproof interior socket 230 V (maximum 500 W)	O	O
Temperature measurement according to DIN 12880-2 at 25 °C (77 °F) or at specified temperature measurement log and certificate	O	O
Calibration certificate for temperature and humidity	O	O
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Fanfold chart paper	O	O
1 set fibre pens	O	O

O Option - not available

Technical specifications subject to change

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