Model KBF PRO 1600 | Humidity test chambers with expanded temperature / humidity range

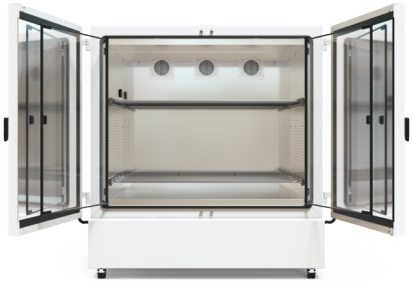
A powerful all-rounder among constant climate chambers: Equipped with all kinds of sophisticated technology, the KBF PRO takes any material test in its stride – whether it takes place at -20°C or under THB conditions at +85°C and 85% relative humidity. It offers flexible water supply options for all installation sites and consumes up to 40% less energy than its predecessor, the KMF model. With optional light modules, the KBF PRO can be converted into a plant growth chamber.

BENEFITS

- Reliable and powerful thanks to innovative temperature control technology
- Reliable: long-term operation based on proven compressor technology and inner chamber made of stainless steel
- Smart: signal triangle with light-up status display, ergonomic control terminal with touchscreen program controller, rack with telescopic rails
- Efficient: low energy consumption thanks to modern inverter cooling technology



Model 1600



Model 1600

IMPORTANT FEATURES

- Temperature range: -20 °C to +100 °C
- Humidity range: 10% to 98% RH
- Proven APT.line™ preheating chamber technology
- Energy-efficient cooling with modern inverter cooling unit
- Cooling with climate-neutral R-290 refrigerant
- Door heating to prevent condensation
- Adjustable fan speed
- Humidity regulation with capacitive humidity sensor and responsive steam humidification
- Housing design with HIT technology
- Stainless-steel inner chamber
- Inner doors made of metal oxide-coated safety glass
- Two racks made of stainless steel with telescopic rails
- 80 mm x 45 mm access port with silicone plug
- Floor-standing units featuring sturdy twin casters with brakes at the front
- Intuitive touchscreen controller with time-segment and real-time programming
- Ergonomically adjustable operating terminal
- Signal triangle with light-up status display
- Internal data logger, measured values can be read out in open format via USB
- Class 3.3 independent temperature safety device (DIN 12880) with visual and acoustic alarms
- Unit self-test for comprehensive status analysis
- Data interfaces: Ethernet, USB
- BINDER Multi Management Software APT-COM™ basic edition
- Optional LED light modules for plant growth

ORDERING INFORMATION

Interior volume		Power supply - unit fuse	Plug*	Version	Model version	Art.-No.
[cu.ft.]	[L]					
Model KBF PRO 1600						
57	1,610	208...240 V 1~ 50/60 Hz -16,0 A	CEE 7/7	Standard	KBFPRO1600-230V	9020-0444

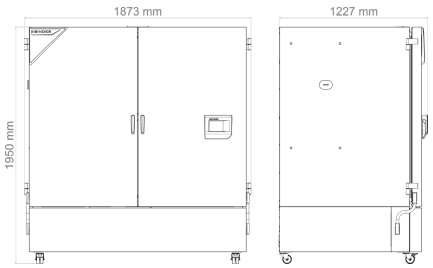
TECHNICAL DATA

Data	
Article Number	9020-0444
Designation	KBFPRO1600-230V
Option model	Standard
Performance Data Temperature	
Temperature range	-20...100 °C
Max. heat compensation at 40°C	1,000 W
Performance Data Climate	
Temperature range with humidity	10...90 °C
Humidity range	10...98 % r.F.
Temperature uniformity at 25°C and 60% RH	0.3 ± K
Temperature uniformity at 40°C and 75% RH	0.3 ± K
Temperature fluctuation at 25°C and 60% RH	0.1 ± K
Temperature fluctuation at 40°C and 75% RH	0.1 ± K
Humidity fluctuation at 25°C and 60% RH	1 ± % r.F.
Humidity fluctuation at 40°C and 75% RH	1 ± % r.F.
Recovery time after door was opened for 30 s at 25°C and 60% RH	3 min
Recovery time after door was opened for 30 s at 40°C and 75% RH	7 min
Electrical data	
Rated Voltage	208...240 V
Power frequency	50/60 Hz
Nominal power	1,9 kW
Unit fuse	16,0 A
Phase (Nominal voltage)	1~
Dimensions and weights	
Interior volume	57 cu.ft.
Net weight of the unit (empty)	992 lbs
Load per rack	88 lbs
Permitted load	441 lbs
Wall clearance back	7,09 in

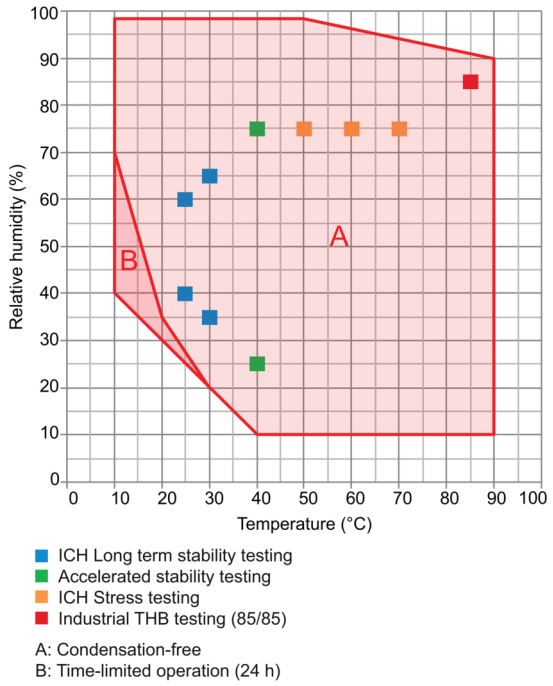
Wall clearance sidewise	7,09 in
Housing dimensions not incl. fittings and connections	
Width net	70.67 in
Height net	76.81 in
Depth net	46.26 in
Internal Dimensions	
Interior width	59.88 in
Interior height	49.21 in
Interior depth	33.35 in
Inner doors	2
Unit doors	2
Environment-specific data	
Sound-pressure level at 25°C and 60% RH	52 dB(A)
Energy consumption at 25°C and 60% RH	490 Wh/h
Energy consumption at 40°C and 75% RH	555 Wh/h
Energy consumption at 85°C and 85% RH	825 Wh/h
Fixtures	
Number of shelves (std./max.)	2/16

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.

DIMENSIONS Incl. fittings and connections [mm]



DIAGRAMS



Climate chart

OPTIONS

Designation	Description	*	Art.-No.
Access port with silicone plug	left		
	30 mm	01	8012-2489
	50 mm	01	8012-2490
	100 mm	01	8012-2491
	right		
	30 mm	01	8012-2492
	50 mm	01	8012-2493
	100 mm	01	8012-2494
	top		
	30 mm	01	8012-2500
	50 mm	01	8012-2495
	100 mm	01	8012-2496
Alarm	accessible via 3-pin clamping sleeve (max. 24 V - 2.5 A)	-	8012-2504
Analog output 4-20 mA	for temperature and humidity values (output not adjustable)	-	8012-2375

Designation	Description	*	Art.-No.
Calibration certificate, expanded	for temperature and humidity; for extending the measurement in center of chamber to include another test value	-	8012-2576
Calibration certificate, temperature	temperature measurement incl. certificate, 9 measuring points at specified temperature	-	8012-2379
	temperature measurement incl. certificate, 15- 18 measuring points at specified temperature	-	8012-2383
	temperature measurement incl. certificate and 27 measuring points at specified temperature	-	8012-2427
Calibration certificate, temperature and humidity	Measurement in center of chamber at 25°C / 60% RH or at specified test values	-	8012-2438
	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	-	8012-2578
Coated heat exchanger	For preventing damage to the aluminum heat exchanger caused by corrosive sample material	-	8012-2586
Door lock	lockable door handle	-	8012-2539
Door lock, electromechanical	can be opened with PIN code via controller	-	8012-2590
Inner chamber, reinforced	permitted load with U rails 300 kg	-	8012-2733
Interior lighting	With climate-resistant LEDs, switches when the unit door is opened	-	8012-2570
Shipping pallet	with unloading ramp for installing unit without forklift	-	8012-2548
Specimen temperature display	Flexible Pt 100 indoor temperature sensor, for object temperature display or control	-	8012-2554
Swivel casters, height-adjustable	For horizontal alignment of the unit on uneven floors	-	8012-2544

ACCESSORIES

Designation	Description	*	Art.-No.
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
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	-	8012-0759
BINDER PURE AQUA SERVICE, accessories	Single-use, replacement cartridge for BINDER PURE AQUA System	-	6011-0165
CO_2 gassing module	BINDER CO_2 gassing module 0-1%, with NDIR CO_2 sensor and analog output 4-20 mA	-	8012-2140
	BINDER CO_2 gassing module 0-20%, with NDIR CO_2 sensor and analog output 4-20 mA	-	8012-2138
LED light bars	Basic set consisting of 2 pieces, attachment material, control unit for max. 4 light strips, 100-240 V, 50/60 Hz		

Designation	Description	*	Art.-No.
	Basic set 500, length 50 cm	-	8012-1108
	Basic set 900, length 90 cm	-	8012-1109
	Expansion set consisting of 2 pieces, attachment material: clips. For expanding the basic set of light bars		
	Expansion set 500, length 50 cm	-	8012-1717
	Expansion set 900, length 90 cm	-	8012-1718
Light module for plants	BINDER LED plant light module consisting of 16 LED strip lights, 3-channel controller and fresh air pump as well as independent power supply	-	8012-2439
pH-neutral detergent	concentrated, for gentle remove of residual contaminants; 1 kg	-	8012-2250
Qualification documents IQ/OQ	IQ/OQ documents digital in PDF format – supporting documents for validation consisting of: IQ/OQ checklists, comprehensive unit documentation covering:		
	temperature. humidity, and light values. Excluded: Document execution is separate.	-	7057-0012
	temperature and humidity. Excluded: Document execution is separate.	-	7057-0011
Qualification documents IQ/OQ/PQ	IQ/OQ/PQ documents digital in PDF format – supporting documents for validation customizied to customer requirements, PQ section added to the qualification folder IQ/OQ; supporting documents for validation consisting of: IQ/OQ checklists, comprehensive unit documentation covering:		
	temperature and humidity values. Excluded: Document execution is separate.	-	7057-0017
	temperature, humidity, CO_2 and O_2 values. Excluded: Document execution is separate.	-	7057-0027
	temperature, humidity and CO_2 values. Excluded: Document execution is separate.	-	7057-0026
	temperature, humidity values and light values. Excluded: Document execution is separate.	-	7057-0018
	temperature and light values. Excluded: Document execution is separate.	-	7057-0025
Shelf rack, perforated	Shelf rack in set with pair of retaining rails (U rails), made entirely of stainless steel		
	Load-bearing capacity 40 kg	-	8012-2410
Standard rack	Shelf rack in set with pair of retaining rails (ball bearing mounted telescopic rails), made entirely of stainless steel		
	Load-bearing capacity 40 kg	-	8012-2387
	Shelf rack in set with pair of retaining rails (U rails), made entirely of stainless steel		
	Load-bearing capacity 40 kg	-	8012-2393
Water supply	External, free-standing, set consisting of 20-liter fresh water canister with pump and level sensor and 20-liter waste water canister	-	8012-2592

SERVICES

Designation	Description	*	Art.-No.
Calibration services			

Designation	Description	*	Art.-No.
Calibration services	Calibration of CO_2 concentration at 0,5 % by vol. with analyzed test gas, including certificate	05	DL30-0404
	Calibration of CO_2 concentration at 5,0 % by vol. with analyzed test gas, including certificate	05	DL30-0405
Temperature and humidity calibration	Expansion –Additional Temperature and humidity calibration with 1 measuring point in center of chamber with 1 specified pair of values, including certificate. Travel to be quoted separate.	05	DL30-0302
	Temperature and humidity calibration with 1 measuring point in center of chamber with 1 specified pair of values, including certificate. Travel to be quoted separate.	05	DL30-0340
Temperature measurement, 9 temperature measuring points and 1 humidity measuring point	Temperature measurement with 9 temperature measuring points and 1 humidity measuring point in center of chamber with a pair of values specified by the user, including certificate. Travel to be quoted separate. A total of 3 shelves are required.	05	DL30-0309
Temperature measurement, 18 temperature measuring points and 1 humidity measuring point	Temperature measurement with 18 temperature measuring points and 1 humidity measuring point in center of chamber with a pair of values specified by the user, including certificate. Travel to be quoted separate. A total of 2 shelves are required.	05	DL30-0318
Temperature measurement, 27 temperature measuring points and 1 humidity measuring point	Temperature measurement with 27 temperature measuring points and 1 humidity measuring point in center of chamber with a pair of values specified by the user, including certificate. Travel to be quoted separate. A total of 3 shelves are required.	05	DL30-0327
Installation services			
Installation services	Installation of BINDER CO_2 gassing module (0-1% or 0-20%), assembly of supply box, insertion of CO_2 sensor and gas hose in interior, sealing of access port, connection of box to an existing CO_2 gas supply, update of controller data set, function check	05	DL10-0130
	Installation of BINDER LED plant light module, assembly of supply box, assembly of LED strip lights as specified, laying of cables and fresh air hose, sealing of access port, function check	05	DL10-0150
Unit installation	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) Travel to be quoted as separate.	05	DL10-0170
Unit instructions	Instruction regarding operating principle and basic functions of the unit, operation of the control electronics including programming. Travel to be quoted as separate Limited to 3 hours.	05	DL10-0550
Maintenance services			
BRONZE 3-year maintenance contract	Annual Device Inspection Includes Preventive Maintenance with Calibration Certificate. 10% Discount on Spare Parts and Labor for any additional Services needed Wear + tear parts to be purchased or billed to customer. Travel to be quoted as separate.	05	DL20-0710
GOLD 3-year maintenance contract	Annual Device Inspection Includes Preventive Maintenance with Calibration Certificate of both Temperature and Humidity. 25% Discount on Spare Parts and Labor for any additional Services needed. One additional courtesy visit per year can be used for service visit or operator. Wear + tear parts to be purchased or billed to customer. Travel to be quoted separate.	05	DL20-0920
Preventive maintenance	One-off maintenance service in accordance with maintenance schedule. Visual inspection of mechanical and electrical components, testing of all key functions. Checking a test temperature specified by the user in center of usable space without certificate. Wear + tear parts need to be purchased or billed to customer. Travel to be quoted as separate.	05	DL20-0613

Designation	Description	*	Art.-No.
SILVER 3-year maintenance contract	Annual Device Inspection Includes Preventive Maintenance with Calibration Certificate 15% Discount on Spare Parts and Labor for any additional Services needed One additional courtesy visit per year can be used for service visit or operator training. Wear + tear parts to be purchased or billed to customer. Travel to be quoted separate.	05	DL20-0820
Validation services			
Execution of IQ/OQ	Execution of IQ/OQ in accordance with qualification folder. Travel to be quoted separate.	05	DL42-0300
Execution of IQ/OQ/PQ	Execution of IQ/OQ/PQ in accordance with qualification folder. Travel to be quoted separate.	05	DL44-0500
Warranty service			
1-year warranty extension	The warranty is extended by 1 year from the delivery date, wear parts are excluded	05	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.

05 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).

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