

## Constant climate chambers for stress testing from -10 °C to 100 °C

The BINDER KMF ensures absolutely constant test conditions throughout the testing area. Its advantage is the low space requirement and flexibility in terms of water supply. The wide temperature and humidity range make it ideally suited for stress testing series.



### Advantages:

- The only one in its class
- Stable test conditions up to 85 °C / 85% RH
- Optimal ratio of usable space and footprint

### Areas of application:



Automotive



Plastics Industry



Packaging Industry

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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 test specimens</li> </ul>
Water supply	<ul style="list-style-type: none"> <li>• Flexible solution independent of water supply and installation site</li> <li>• Easy plug-and-play handling</li> </ul>	<b>Suitable for any water quality</b> <ul style="list-style-type: none"> <li>• Direct connection to the domestic water system</li> <li>• Convenient water treatment with BINDER PURE AQUA SERVICE</li> <li>• Sewage pump for discharges up to 1 m in height</li> </ul>
Humidification system	<ul style="list-style-type: none"> <li>• Minimal maintenance requirements</li> <li>• Simple, clean handling</li> </ul>	<ul style="list-style-type: none"> <li>• Vapor pressure humidification for fast response times</li> <li>• Drift-free, capacitive humidity sensor</li> <li>• Short recovery time after door opening</li> </ul>
Cooling system	<ul style="list-style-type: none"> <li>• Reliable test results even under extreme climate and site conditions</li> <li>• Stable, long-term tests according to GLP/GMP</li> </ul>	<ul style="list-style-type: none"> <li>• Powerful compressor cooling system for ambient temperatures up to 32 °C</li> <li>• No freezing thanks to double evaporator plate</li> </ul>
Standard equipment	<ul style="list-style-type: none"> <li>• Optimal price/performance ratio</li> </ul>	<b>Comprehensive standards</b> <ul style="list-style-type: none"> <li>• Ethernet interface</li> <li>• Access port diameter 30 mm</li> <li>• Casters from 240 l volume</li> <li>• Inner glass door with seal 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>• Convenient, safe access</li> <li>• Easy assembly</li> </ul>	<ul style="list-style-type: none"> <li>• Optimal ratio of usable space and footprint</li> <li>• All operator controls accessible from the front</li> <li>• Large access area thanks to wide design</li> </ul>
Production	<ul style="list-style-type: none"> <li>• Reliable devices with long service lives</li> <li>• Short delivery times</li> </ul>	<ul style="list-style-type: none"> <li>• Premium quality made in Germany</li> <li>• Highly automated series production (20,000 units per year)</li> <li>• High-quality materials, state-of-the-art production technology</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>• Additional product lines: Drying chambers, vacuum drying chambers, environmental simulation chambers</li> <li>• Various options: BINDER Data Logger Kits, GLP compliance, access ports in various sizes and positions, object temperature measurement</li> <li>• Years of proven and recognized validation and documentation materials</li> <li>• Worldwide service network</li> </ul>

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- Electronically controlled APT.line™ preheating chamber with cooling system assuring temperature accuracy and reproducible results
- Temperature range -10 °C to 100 °C (without humidity)
- Temperature range 10 °C to 90 °C (with humidity)
- Humidity range 10% to 90% RH
- MCS controller with 25 storable programs of 100 sections each for a maximum of 500 program segments
- User-friendly LCD screen
  - Easy-to-read menu guide
  - Integrated electronic chart recorder
  - Variety of options for the graphic display of process parameters
  - Real-time clock
- Electronically controlled humidification and dehumidification system with capacitive humidity sensor
- Inner glass door
- Independent temperature safety device class 3.1 (DIN 12880) with optical and audible temperature alarm
- Access port with silicone plug Ø 30 mm, left side
- Complete safety connection kit for water supply and drainage, including water hose, (total length 6 m)
- Ethernet interface for communication software APT-COM™ DataControlSystem
- 1 shelf, stainless steel
- BINDER test certificate

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**KMF 115 (E5.2)**

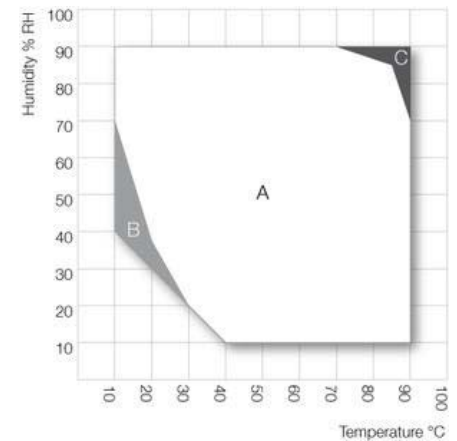
▶ Exterior dimensions	
Width (mm)	880
Height (incl. feet) (mm)	1048
Depth (plus door handle, l-panel, connection 52 mm) (mm)	647
Wall clearance, rear (mm)	100
Wall clearance, side (mm)	100
Number of doors (ea.)	1
Inner glass door(s) (ea.)	1

▶ Interior dimensions	
Width (mm)	600
Height (mm)	483
Depth (mm)	351
Interior volume (l)	102
Racks (number standard/max.)	1 / 5
Load per rack (kg)	30
Permitted total load (kg)	100
Weight (empty) (kg)	127

▶ Technical data in temperature mode (without humidity)	
Temperature range (°C)	-10 - 100
Mean warm-up rate acc. to IEC 60068-3-5 (°C/min.)	1,3
Mean cooling rate acc. to IEC 60068-3-5 (°C/min.)	0,5
Warm-up time 2) from -10 °C to 100 °C (min.)	85
Cooling down time 2) from 100 °C to -10 °C (min.)	240
Max. heat compensation up to 25 °C (W)	150

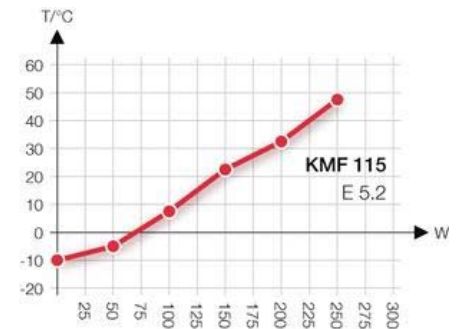
▶ Technical data in climate mode (with humidity)	
Temperature range (°C)	10 - 90
Temperature variation (± C)	0,3 - 1,0
Temperature fluctuation (±K)	0,1 - 0,2
Humidity range (% RH)	10 - 90
Humidity fluctuation (± RH %)	≤ 2,5
Dew point temperature range (°C)	5 - 80
Max. heat compensation at 25 °C / 90% RH (W)	30

**Temperature-humidity chart**



A: Standard Climate range / B: Discontinuous range / C: In this range, condensation in the inner chamber is possible

**Heat compensation**



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▶ Electrical data	
IP protection class acc. to EN 60529	IP 20
Voltage ( $\pm 10\%$ ) 50 / 60 Hz (V)	200-240 1N~
Nominal power (kW)	2,0
Energy consumption at 85 °C / 85 % RH (kW) 1)	0,57
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 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. Technical data refers to 100% fan speed. All figures are typical average values for series devices. We reserve the right to alter technical specifications at any time.

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### **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.



### **BINDER Pure Aqua Service**

This convenient and flexible water treatment system extends maintenance intervals and is easily implemented independent of water quality.  
The specific advantage: Point-of-use system with water quality display and replaceable filter cartridge.



### **External water supply set**

External water supply set from fresh and waste water container, wiring and pump



### **Temperature measurement of the specimen**

Additional PT 100 temperature sensor for accurate temperature measurement of the specimen and digital display of measured values. Recording of measured data via Ethernet or RS 422 interface optional.



### **Numerous access ports**

With silicone plugs for introducing external measuring instruments into the chamber, access ports with 30, 50 or 100 mm diameters.

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Access ports with silicone plug, 30, 50, 100 mm	<input type="checkbox"/>
Fasteners for additional security for racks (1 set of 4)	<input type="checkbox"/>
Additional PT 100 temperature sensor, flexibly installed with external connection, includes LEMO connector (3-pin)	<input type="checkbox"/>
RS 422 interface	<input type="checkbox"/>
External water supply set including fresh and waste water containers, cabling, and pump	<input type="checkbox"/>
BINDER PURE AQUA SERVICE containing single-use cartridge, cabling and measuring device	<input type="checkbox"/>
Single-use cartridge for BINDER PURE AQUA SERVICE	<input type="checkbox"/>
Lockable controller keyboard	<input type="checkbox"/>
Temperature precision measurement according to DIN 12880 and 9-point humidity measurement / factory standard with measurement log and certificate, measured at 25 °C / 60% RH or at specified values	<input type="checkbox"/>
Calibration certificate for temperature and humidity. Measurement in center of chamber at 25 °C / 60% RH or at specified values	<input type="checkbox"/>
Extension to calibration certificate for temperature and humidity. Each additional measurement at an additional measuring point or set of values	<input type="checkbox"/>
Data Logger Kit TH 100/70: With two attachable combined sensors. One for the continuous temperature and humidity recording of -40 °C to 100 °C / 0% to 100 % RH. Second one at the data logger for recording the environmental conditions of 0% to 100 % RH. Kit includes 1 data logger, 2 attachable combined humidity/temperature sensors, 2 m extension cable and 1 fixture for mounting to the BINDER unit	<input type="checkbox"/>
Data Logger Kit TH 100: For the continuous temperature and humidity recording of -40 °C to 100 °C / 0% to 100% RH. Kit includes 1 data logger, 1 attachable combined humidity/temperature sensor, 2 m extension cable and 1 fixture for mounting to the BINDER unit	<input type="checkbox"/>
Data Logger Kit T 220: For continuous temperature recording of -90 °C to 220 °C. Kit includes 1 data logger, PT 100 sensor with 2 m Teflon extension cable and 1 fixture for mounting to the BINDER unit	<input type="checkbox"/>
Data Logger Software: Configuration and evaluation software for all BINDER Data Logger Kits, incl. data cable	<input type="checkbox"/>
Rack, stainless steel	<input type="checkbox"/>
Reinforced rack, stainless steel, with 1 set of securings (4 pieces), max. load 70 kg	<input type="checkbox"/>
Perforated shelf, stainless steel	<input type="checkbox"/>
Interior lighting (15 W)	<input type="checkbox"/>
Door lock	<input type="checkbox"/>
Independent temperature safety device class 3.3 (DIN 12880) with optical alarm	<input type="checkbox"/>
4 - 20 mA analog outputs for temperature and humidity measurements (e.g. chart recorder connection) with 6-pin DIN socket. Outputs are adjusted automatically when adjusting the controller.	<input type="checkbox"/>

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