

## Environmental simulation chamber for complex alternating climate profiles A

BINDER MKF series chamber is ideally suited for all testing based on current temperature and climate testing methods according to DIN and IEC standards. Their ease of operation and comprehensive standard equipment ensures something special in use.



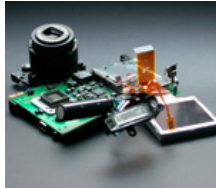
### Advantages:

- State-of-the-art reliability
- User-friendly chamber interior
- Comprehensive standard equipment

### Areas of application:



Automotive

Electronics /  
Semiconductor Industry

Plastics 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> </ul>	<b>APT.line™</b> <ul style="list-style-type: none"> <li>• Uniform circulation even under full load</li> <li>• Homogeneous climate conditions throughout test specimens</li> </ul>
Humidification system and water supply	<ul style="list-style-type: none"> <li>• Minimal maintenance requirements</li> <li>• Simple, clean handling</li> <li>• Independent of water quality</li> <li>• Fast response times</li> </ul>	<b>Vapor pressure humidification</b> <ul style="list-style-type: none"> <li>• Drift-free, capacitive humidity sensor for very accurately measured values</li> <li>• Suitable for any water quality (MKF)</li> <li>• Sewage pump for discharges up to 1 m in height</li> </ul>
Standard equipment	<ul style="list-style-type: none"> <li>• Very good price/performance ratio</li> </ul>	<b>Well equipped</b> <ul style="list-style-type: none"> <li>• Capacitive humidity sensor</li> <li>• Heated viewing window</li> <li>• LED illumination</li> <li>• Rugged chassis with rollers from 115 liters</li> <li>• Ethernet interface</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>	<b>Good use of space</b> <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>• Wide construction</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 system from one source</li> </ul>	<b>Comprehensive product portfolio</b> <ul style="list-style-type: none"> <li>• Additional production lines with drying and vacuum chambers</li> <li>• Control and documentation software APT-COM™</li> <li>• BINDER Data Logger Kits</li> <li>• Water treatment with BINDER PURE AQUA SERVICE</li> <li>• Years of proven and recognized validation and documentation materials</li> </ul>

- Electronically controlled APT.line™ preheating chamber assuring temperature accuracy and reproducible results
- Temperature range without humidity -40 °C to 180 °C, with humidity 10 °C to 95 °C
- Humidity range 10% to 98% RH
- MCS controller with 25 storable programs of 100 sections each for a maximum of 500 program segments
- User-friendly LCD screen
  - 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 and vapor pressure humidification
- Adjustable ramp function via program editor
- Integrated water storage tank
- Heated viewing window with interior lighting
- 230 V power socket on the right-side operating panel
- Independent adjustable temperature safety device Class 2 (DIN 12880)
- 4 potential-free relay outputs that can be activated via MCS controller
- Ethernet interface for communication software APT-COM™ DataControlSystem
- 2 access ports Ø 80 mm, right and left side
- 1 shelf, stainless steel
- 4 casters (2 with brakes)
- BINDER test certificate

## MKF 720 (E3.1)

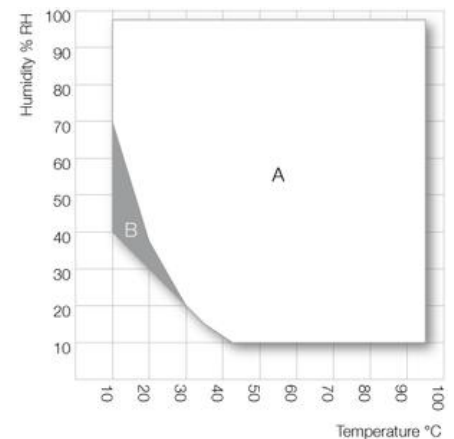
▶ Exterior dimensions	
Width (incl. 18 mm access port with plug) (mm)	1613
Height (incl. casters) (mm)	2005
Depth (plus 55 mm door handle) (mm)	1173
Wall clearance, rear (mm)	300
Wall clearance, side (mm)	200
Viewing window HxW (mm)	300 x 508
Number of doors (ea.)	1

▶ Interior dimensions	
Width (mm)	1200
Height (mm)	1020
Depth (mm)	600
Interior volume (l)	734
Shelves (number standard/max.)	1 / 11
Load per shelf (kg)	40
Permitted total load (kg)	160
Weight (empty) (kg)	590

▶ Temperature data	
Temperature range (°C) 1)	-40 - 180
Temperature fluctuation (± K)	0,1 - 0,5
Temperature variation (± K)	0,1 - 1,8
Mean warm-up rate acc. to IEC 60068-3-5 (°C/min.)	4,8
Mean cooling rate acc. to IEC 60068-3-5 (°C/min.)	4,8
Warm-up time from -40 °C to 180 °C (min.)	74
Cooling down time from 180 °C to -40 °C (min.)	118
Heat compensation, max. (W)	6500

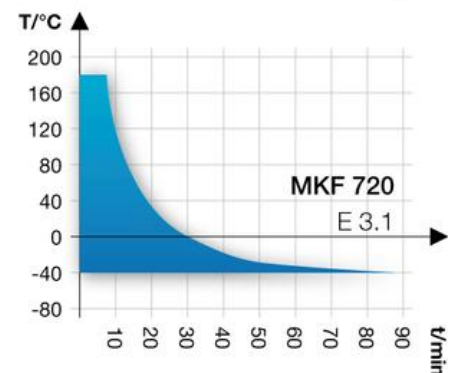
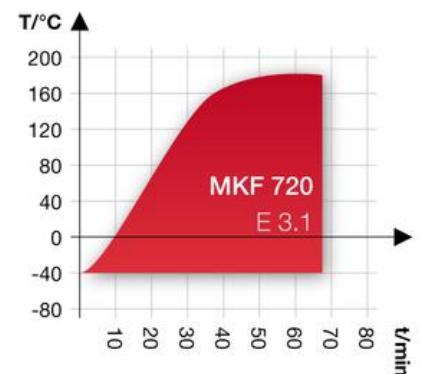
▶ Climate data	
Temperature range (°C)	10 - 95
Humidity range (% RH)	10 - 98
Humidity fluctuation (± RH %)	≤ 2,5
Dew point temperature range (°C)	5 - 94
Heat compensation, max. (W)	1000

## Temperature-humidity chart



A: Standard Climate range / B: Discontinuous range

## Heating up and cooling down rate



## Heat Compensation



**MKF 720 (E3.1)**

▶ Electrical data	
IP protection class acc. to EN 60529	IP 20
Voltage ( $\pm 10\%$ ) 50 / 60 Hz (V)	400 3N~
Nominal power (kW)	11,0
Noise level (approx. dB(A))	65

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. All figures are typical average values for series devices. We reserve the right to alter technical specifications at any time.



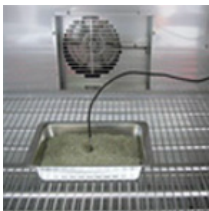
### Notch-type access port in door

Provides easy connection of cables to test specimens and facilitates loading and unloading of the chamber. Doors have access ports measuring 100 x 35 mm, which can be sealed with the included silicone plugs.



### Reinforced rack

To ensure safe and stable storage of heavy test specimens.



### 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.



### 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.

**MKF 720 (E3.1)**

Access ports with silicone plug, 30, 50, 80, 100, 125 mm	<input type="radio"/>
Analog output for temperature 4 - 20 mA with 6-pin DIN socket (output not adjustable)	<input type="radio"/>
Fasteners for additional security for racks (1 set of 4)	<input type="radio"/>
Door lock	<input type="radio"/>
Additional measuring channel for digital display of specimen temperature with flexible PT 100 temperature sensor, measured data recorded via unit interface	<input type="radio"/>
Temperature safety device for over and under temperature, Class 2	<input type="radio"/>
RS 422 interface	<input type="radio"/>
Temperature measurement acc. to DIN 12880-2 and 9-point humidity measurement/factory standard with protocol and certificate at 25 °C / 60% RH or at specified values	<input type="radio"/>
Calibration certificate for temperature and humidity. Measurement in center of chamber at 25 °C / 60% RH or at specified values	<input type="radio"/>
Extension to calibration certificate for temperature and humidity. Each additional measurement at an additional measuring point or set of values	<input type="radio"/>
BINDER PURE AQUA SERVICE containing single-use cartridge, cabling, and pump	<input type="radio"/>
Data Logger Kit TH 100/70: With two attachable combined sensors for temperature and humidity recording	<input type="radio"/>
Data Logger Kit TH 100: With one attachable combined sensor for temperature and humidity recording	<input type="radio"/>
Data Logger Kit TH 220: With PT 100 sensor for temperature recording	<input type="radio"/>
Data Logger Software	<input type="radio"/>
Rack, stainless steel	<input type="radio"/>
Reinforced rack, stainless steel, with 1 set of fasteners (4 pieces), max. load 70 kg	<input type="radio"/>
Perforated shelf, stainless steel	<input type="radio"/>
Notch-type access port in door, 100 x 35 mm	<input type="radio"/>