



BINDER Industrial  
Product Catalog

# Table of contents

	<b>BINDER GmbH</b>	<b>02 - 05</b>	
	<b>Environmental simulation chambers 06 - 23</b> Product information MK series ..... 8 Product information MKF series .....12 Product information MKT series .....18 Product information MKFT series .....20		<b>MK   MKF   MKT</b>
	<b>Constant climate chambers</b>	<b>24 - 29</b> Product information KMF series .....26	<b>KMF</b>
	<b>Vacuum drying ovens</b>	<b>30 - 41</b> Product information VD series ..... 32 Product information VDL series ..... 36	<b>VD   VDL</b>
	<b>Safety drying ovens</b>	<b>42 - 51</b> Product information FDL series ..... 44 Product information MDL series ..... 48	<b>FDL   MDL</b>
	<b>Material test chambers</b>	<b>52 - 61</b> Product information FP series ..... 54 Product information M series ..... 58	<b>FP   M</b>
	<b>Drying and Heating ovens</b>	<b>62 - 75</b> Product information ED series ..... 64 Product information FD series ..... 68 Product information FED series ..... 72	<b>ED   FD   FED</b>
	<b>APT-COM™ communication software</b>	<b>76 - 79</b>	
	<b>BINDER INDIVIDUAL</b>	<b>80 - 83</b>	
	<b>BINDER Service</b>	<b>84 - 87</b>	





## The company BINDER

### | Experience through research. Passion for Perfection.

BINDER is the world's largest specialist of simulation chambers for use in scientific and industrial laboratories. At our plant in Tuttlingen, Germany we produce more than 23.000 units per year.

Every BINDER chamber is a statement of our mission: to achieve perfection by continuously improving our product quality and product safety. We'll never depart from our resolve to build the best climate chambers in the world – and to be always that one step ahead of our competition. We don't merely follow quality standards, we surpass them. Passionate about our products and restless in our pursuit of excellence, we are continuously searching for new solutions and are always implementing the most cutting-edge technology in products.

In addition to our comprehensive product range, we also offer a variety of accessories and tailor-made solutions to meet your individual requirements. Wherever you operate and whatever solution you require, thanks to our worldwide Sales and Service network, we'll be everywhere you need us - directly at your location of operations.





# Environmental simulation chambers from BINDER

- | Perfectly matched to testing standards.  
Optimally designed for reliability.

We were the first to realize that climate chambers nowadays have to do so much more than just testing. They are part of a process in which absolute reliability is paramount. Climate chambers from BINDER for industrial use are perfectly matched to the standards or individual requirements of quality assurance and development.

BINDER climate chambers always provide accurate test results, because their construction is based on state-of-the-art technology. But that is only half the story. Our years of experience in equipping scientific laboratories enable us to determine precisely what you want. BINDER will always provide you with the best equipment for your application - by knowing your workplace, we turn our advantage into your benefit:

- ▶ Reliable test results thanks to highly precise temperature and humidification controls and unique APT.line™ preheating chamber technology
- ▶ Convenient work environment thanks to simple handling and operation
- ▶ Absolute control thanks to network-compatible APT-COM™ documentation system
- ▶ Excellent price/performance ratio thanks to comprehensive standard equipment

Climate chambers from BINDER will not only provide safety in your daily routine, but will also meet the highest requirements you may set for flexibility and reliability - and that anew with every application.





# MK | MKF | MKT | MKFT

## Environmental simulation chambers

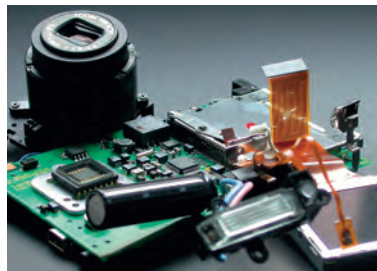
### The basis for reliable materials testing

Whether EN, IEC, MIL standards or an individual specification – with a BINDER environmental simulation chamber, you also have complex alternating climate profiles safely under control. The vapor pressure humidification system and our patented APT.line™ airflow design ensure perfect test conditions. This guarantees exact measurements over the entire temperature range of -70 °C und 180 °C at a temperature dynamic of 5K per minute. The ideal basis for reliable materials testing and the success of your work.

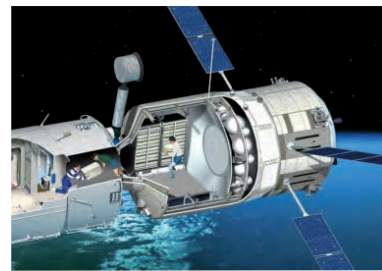
- ▶ State-of-the-art reliability
- ▶ User-friendly chamber interior
- ▶ Comprehensive standard equipment



Automotive industry



Electronics testing



Air and space travel



# MK series: Environmental simulation chambers for cyclic temperature testing

The smart alternative to expensive individual solutions for cyclic temperature testing: The MK series masters all heating and cooling testing between -40 °C and 180 °C. It distinguishes itself through precision and performance. The APT.line™ pre-heating chamber technology ensures natural simulation – and thus reliable test results.



#### ► AREAS OF APPLICATION

Automotive, Electronics/Semiconductor Industry, Plastics Industry, Aerospace/Defence Industry, Metal Industry/Engineering,

#### ► EQUIPMENT

- Temperature range of -40 °C to 180 °C
- 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
- Programmable condensation protection for test material
- 230 V power socket on the right-side operating panel (except MK 53)
- Adjustable ramp function via program editor
- Access port Ø 80 mm top (MK 53), Ø 50 mm, left side (MK 115, 240), 2 access ports Ø 80 mm right and left side (MK 720)
- Temperature safety device class 2 (DIN 12880) with visual and acoustic temperature alarm
- Heated viewing window with LED interior lighting
- Ethernet for GLP/GMP and FDA guideline 21 CFR Part 11 compliant APT-COM™ DataControlSystem software
- Stainless steel rack included
- 4 castors (2 with brakes)



► Performance features | MK series



- Homogeneous climate conditions**
- ▶ APT.line™ for uniform circulation even under full load
  - ▶ Same test conditions throughout the chamber interior
  - ▶ Independent of specimen size and quantity



- Comprehensive product portfolio**
- ▶ BINDER Data Logger Kits
  - ▶ Years of proven and recognized validation and documentation materials
  - ▶ Customized solutions



- Well equipped**
- ▶ Heated viewing window,
  - ▶ Rugged chassis with castors from 115 liters
  - ▶ Ethernet interface
  - ▶ Documentation Software APT-COM™



- Convenient assembly and operation**
- ▶ Large access area
  - ▶ Controls accessible from the front
  - ▶ Optimum use of space

► OPTIONS

- Notch-type access port in the door, 100 x 35 mm
- Data Logger Kits and software
- Shelf, stainless steel
- Perforated shelf, stainless steel
- Reinforced shelf, stainless steel
- Locking of controller keyboard
- Lockable door
- Safety device for over and under temperature (DIN 12880)
- Analog outputs 4 to 20 mA with DIN bushing 6 poles
- Additional measuring channel for specimen temperature display
- Qualification folder
- Calibration certificate
- Extension for calibration certificate



Notch-type access port in door



BINDER INDIVIDUAL MK with openings in the door for manual access, which is convenient when working with test specimens without disturbing the climatic conditions



Reinforced shelf

MK | MKF | MKT  
KMF  
VD | VDL  
FDL | MDL  
FP | FM  
ED | FD | FED



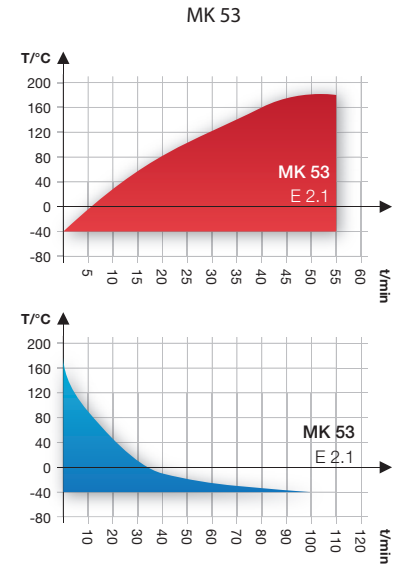
# MK series

## Technical data

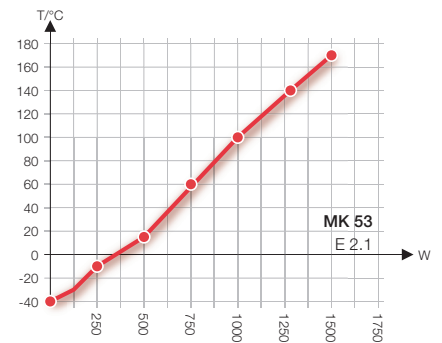


	MK 53	MK 115	MK 240	MK 720
<b>Exterior dimensions</b>				
Width (mm)	740	1000	1135	1615
Height (incl. feet/castors) (mm)	1240	1725	1715	2005
Depth, plus 55 mm for controller and door handle (mm)	795	860	945	1175
<b>Interior dimensions</b>				
Width (mm)	402	600	735	1200
Height (mm)	402	480	700	1020
Depth (mm)	330	400	443	600
Interior volume (l/cu.ft.)	53	115	228	734
Quantity of racks (standard/max.)	1/5	1/4	1/6	1/11
Load per rack (kg/lbs.)	15	30	30	40
Permitted total load (kg/lbs.)	40	60	70	160
Weight (empty) (kg/lbs.)	150	260	340	570
<b>Temperature data</b>				
Temperature range (°C/°F)	-40 - 180	-40 - 180	-40 - 180	-40 - 180
Temperature uniformity (± K)	0,4 - 2,0	0,1 - 2,0	0,1 - 1,2	0,3 - 2,0
Temperature fluctuation (± K)	0,1 - 0,5	0,1 - 0,5	0,1 - 0,5	0,1 - 0,5
Mean heating-up rate from -40°C to 180°C acc. to factory standard (K/min.)	4,6	5,5	5	4
Mean cooling rate from 180°C to -40°C acc. to factory standard (K/min.)	4,1	5,2	4,5	5
Max. heat compensation (kW)	0,5	2,0	2,0	6,5
<b>Electrical data</b>				
Housing protection acc. to EN 60529	IP 20	IP 20	IP 20	IP 20
Nominal voltage (± 10%) 50 Hz (V)	230 1N~	400 3N~	400 3N~	400 3N~
Nominal power (kW)	2,6	3	4,2	7,2
Energieverbrauch bei 20°C (kW)	1,02	0,6	1,3	1,9
Noise level (ca. dB(A))	59	62	62	65
Model no.	9020-0006	9020-0175	9020-0181	9020-0197

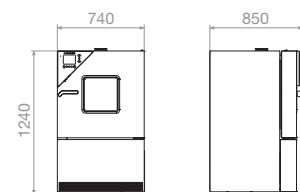
### ▶ HEATING UP AND COOLING DOWN RATE



### ▶ HEAT COMPENSATION



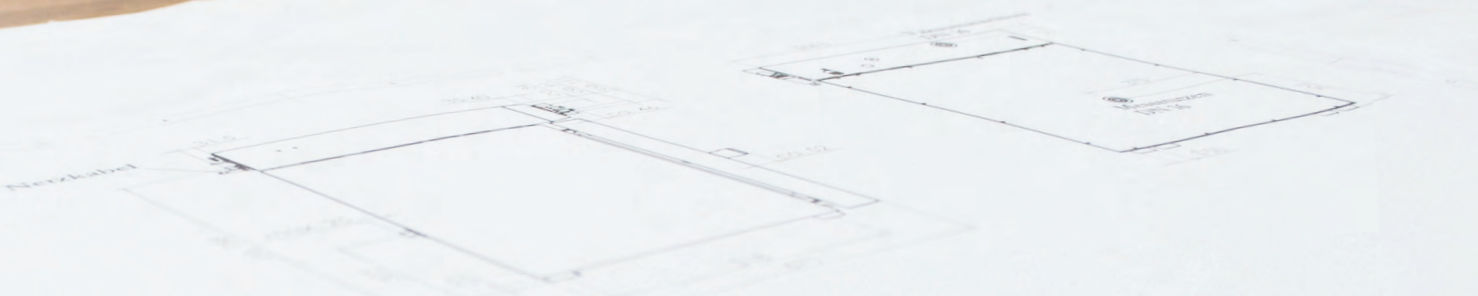
### ▶ DIMENSIONS



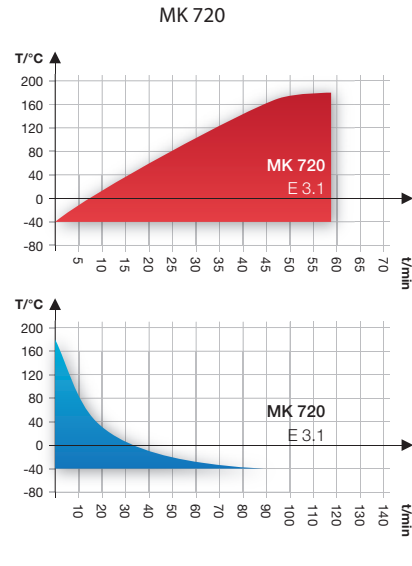
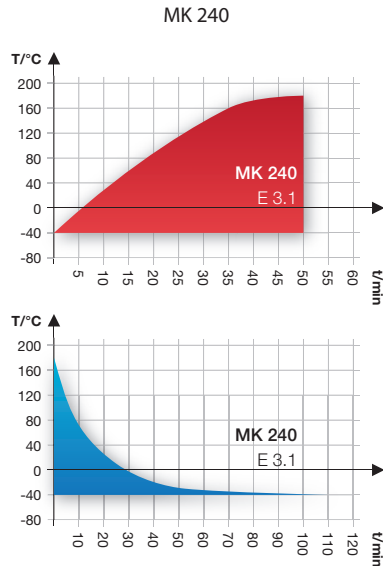
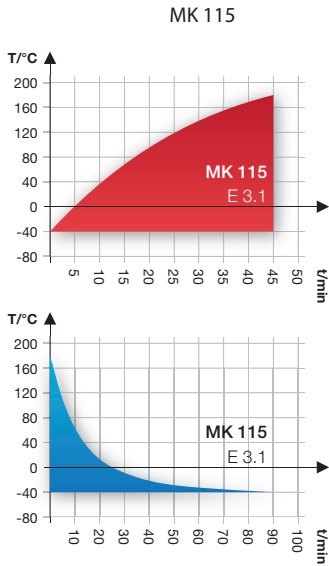
All technical specifications are specified for units with standard equipment at an ambient temperature of 25 °C and a voltage fluctuation of ±10 %. The temperature data are determined in accordance to factory standard following DIN 12880. All values have been specified at a fan speed of 100 %. All indications are average values, typical for units produced in series. We reserve the right to alter technical specifications at all times.

Latest Information and technical data at:

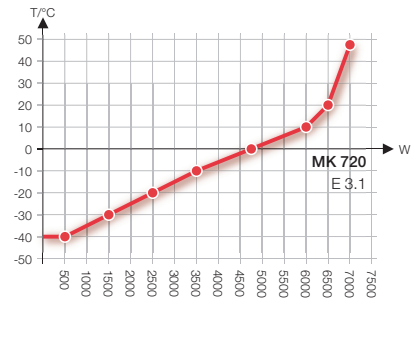
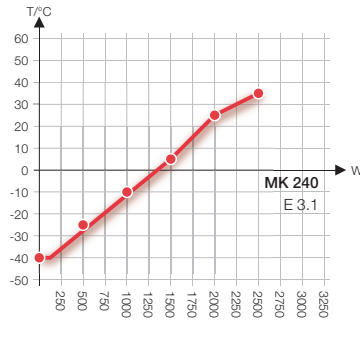
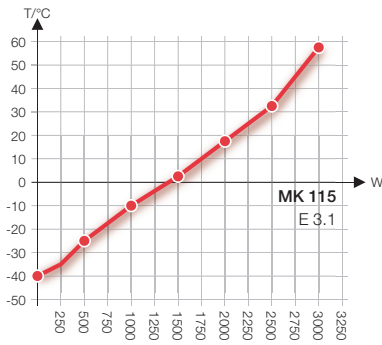
 [www.binder-world.com](http://www.binder-world.com)



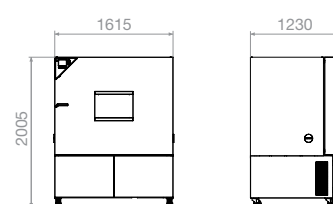
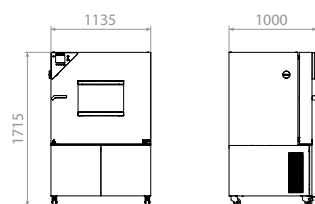
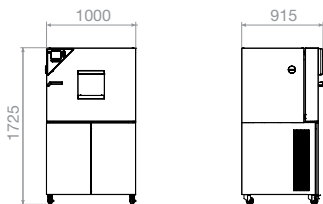
► HEATING UP RATE AND COOLING DOWN RATE



► HEAT COMPENSATION



► DIMENSIONS



MK | MKF | MKT

KMF

VD | VDL

FDL | MDL

FP | M

ED | FD | FED



# MKF series: Climate test chambers for complex alternating climate profiles

Ideally suited for all testing based on current temperature and climate testing standards: The MKF series meets the requirements based on EN, IEC, MIL standards and several tests derived from these standards. The required temperature and humidity values are quickly achieved and accurately maintained thanks to high dynamics. This guarantees exact measurement results at any time.

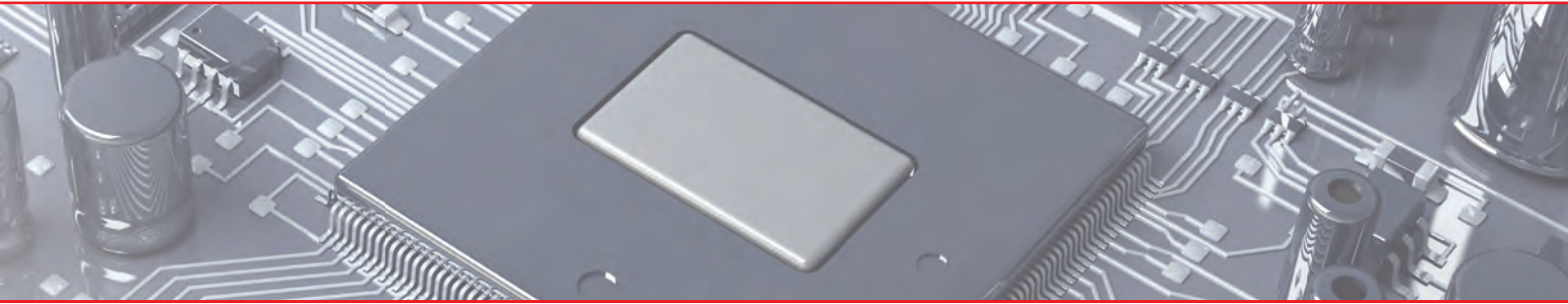


#### ► AREAS OF APPLICATION:

Automotive, Electronics/Semiconductor Industry, Plastics Industry, Aerospace/Defence Industry, Metal Industry/Engineering

#### ► EQUIPMENT

- Temperature range of -40 °C to 180 °C
- 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 and pressurized steam
- Integrated water storage tank
- Heated viewing window with interior illumination
- Programmable condensation protection for test material
- Adjustable ramp functions via program editor
- 230 V power socket on the right-side operating panel
- Temperature safety device, Class 2 (DIN 12880) with visual and acoustic temperature alarm
- 4 potential-free relay outputs that can be activated via MCS controller
- Ethernet interface for use with APT-COM™ DataControlSystem software
- 1 access port Ø 50 mm , left side
- Stainless steel rack include
- 4 castors (2 with brakes)



► Performance features | MKF series



**Homogeneous climate conditions**

- ▶ APT.line™ for uniform circulation even under full load
- ▶ Same test conditions throughout the chamber interior
- ▶ Independent of specimen size and quantity



**Convenient assembly and operation**

- ▶ Large access area
- ▶ Controls accessible from the front
- ▶ Optimum use of space



**Optimally humidification system**

- ▶ Fast response times thanks to Vapor pressure humidification
- ▶ Drift-free, capacitive humidity sensor for very accurately measured values
- ▶ Minimal maintenance requirements
- ▶ Independent of water quality
- ▶ Sewage pump for discharges up to 1 m in height



**Comprehensive product portfolio**

- ▶ BINDER Data Logger Kits
- ▶ Years of proven and recognized validation and documentation materials
- ▶ Customized solutions



**Well equipped**

- ▶ Heated viewing window,
- ▶ Rugged chassis with castors from 115 liters
- ▶ Ethernet interface
- ▶ Documentation Software APT-COM™

► **OPTIONS**

- Access port with silicone plug
- Notch-type access port in the door, 100 x 35 mm
- Data Logger Kits and software
- Shelf, stainless steel
- Perforated shelf, stainless steel
- Reinforced shelf, stainless steel
- Locking of controller keyboard
- Lockable door
- Safety device for over and under temperature (DIN 12880)
- Analog outputs 4 to 20 mA with DIN bushing 6 poles
- Additional measuring channel for specimen temperature display
- BINDER PURE AQUA SERVICE
- Disposable cartridge for BINDER PURE AQUA SERVICE
- Qualification folder
- Calibration certificate
- Extension for calibration certificate



Notch-type access port in door



BINDER PURE AQUA SERVICE



Reinforced shelf



BINDER INDIVIDUAL MKF with reinforced inner chamber and solidly mounted perforated shelves for very heavy test specimens

MK | MKF | MKT  
KMF  
VD | VDL  
FDL | MDL  
FP | FM  
ED | FD | FED

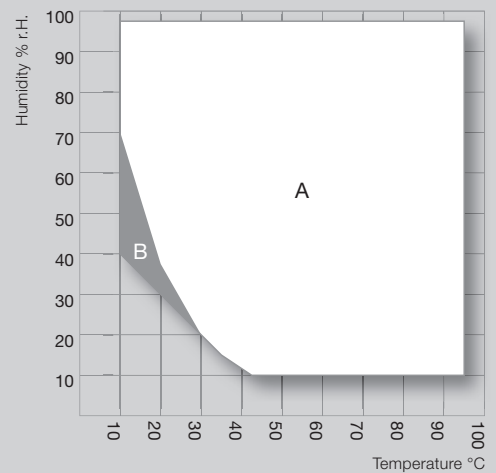
# MKF series

## Technical data



	MKF 115	MKF 240	MKF 720
<b>Exterior dimensions</b>			
Width (mm)	1000	1135	1615
Height (incl. castors) (mm)	1725	1715	2005
Depth plus 55 mm door handle (mm)	860	945	1175
<b>Interior dimensions</b>			
Width (mm)	600	735	1200
Height (mm)	480	700	1020
Depth (mm)	400	443	600
Interior volume (l)	115	228	734
Quantity of racks (standard/max.)	1/4	1/6	1/11
Load per rack (kg)	30	30	40
Permitted total load (kg)	60	70	160
Weight (empty) (kg)	280	360	590
<b>Temperature data</b>			
Temperature range (°C)	-40 - 180	-40 - 180	-40 - 180
Temperature fluctuation (± K)	0,1 - 0,6	0,1 - 0,5	0,1 - 0,5
Temperature uniformity (± K)	0,1 - 1,3	0,5 - 2,0	0,1 - 1,8
Average heating up time acc. to IEC 60068-3-5 1) (K/min.)	5,5	5	4,8
Average cooling down time acc. to IEC 60068-3-5 1) (K/min.)	4,5	5	4,8
Max. heat compensation (W)	2,5	2,8	6,5
<b>Climatic data</b>			
Temperature range (°C)	10 - 95	10 - 95	10 - 95
Humidity range (% r.H.)	10 - 98	10 - 98	10 - 98
Humidity fluctuation (± % r.H.)	≤ 2,5	0,5 - 3,0	≤ 2,5
Temperature fluctuation (± K)	0,1 - 1,3	0,5 - 3,0	0,2 - 1,5
Max. heat compensation (kW)	0,4	0,3	1
<b>Electrical data</b>			
Housing protection acc. to EN 60529	IP 20	IP 20	IP 20
Nominal voltage (±10%) 50 Hz (V)	400 3N~	400 3N~	400 3N~
Nominal power (kW)	4,5	5,1	11
<b>Model no.</b>	<b>9020-0107</b>	<b>9020-0132</b>	<b>9020-0198</b>

TEMPERATURE-HUMIDITY CHART



A: Standard Climate range /  
B: temporary usable space (up to 24 h)

All technical specifications are specified for units with standard equipment at an ambient temperature of 25 °C and a voltage fluctuation of ±10 %. The temperature data are determined in accordance to factory standard following DIN 12880. All values have been specified at a fan speed of 100 %. All indications are average values, typical for units produced in series. We reserve the right to alter technical specifications at all times.

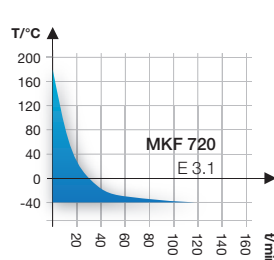
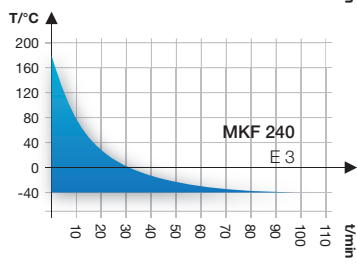
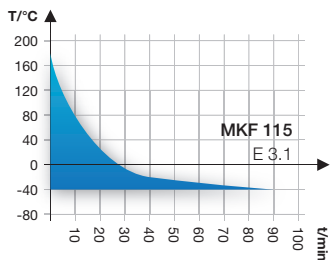
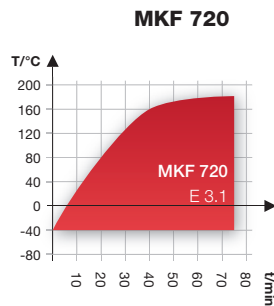
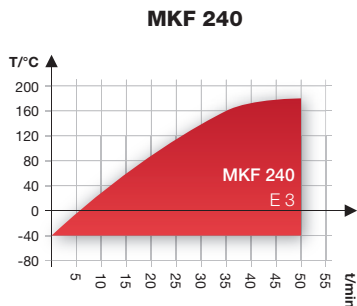
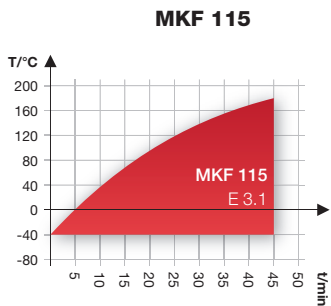


Latest Information and technical data at:  
[www.binder-world.com](http://www.binder-world.com)

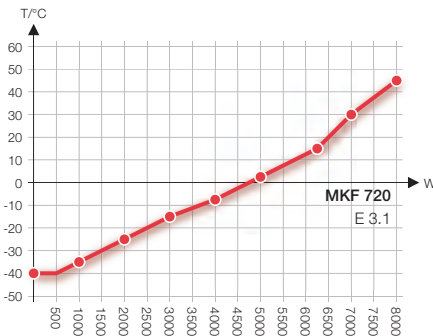
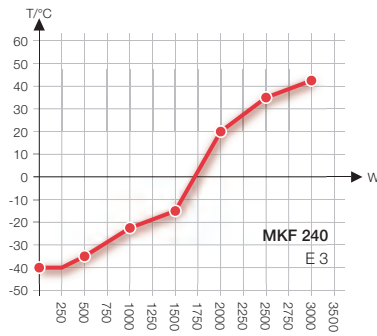
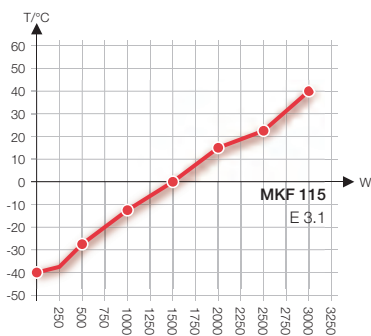




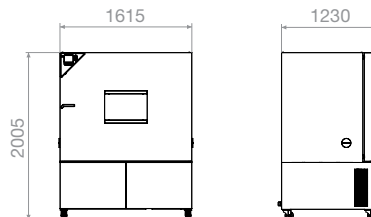
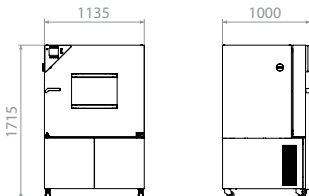
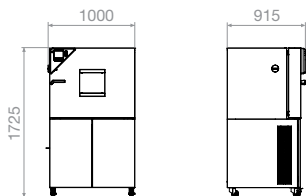
► HEATING UP RATE AND COOLING DOWN RATE



► HEAT COMPENSATION



► DIMENSIONS



MK | MKF | MKT  
 KMF  
 VD | VDL  
 FDL | MDL  
 EP | M  
 ED | FD | FEED

# MKT series: Low temperature testing chambers for complex temperature profiles

The specialists for extreme testing:

The MKT meets all requirements for complex test cycles between -70 °C and 180 °C. Their advantages include fast heating and cooling, as well as homogeneous airflow. The chamber interior offers perfect test conditions – even under a full load.



#### ► AREAS OF APPLICATION:

Automotive, Electronics/Semiconductor Industry, Plastics Industry, Aerospace/Defence Industry, Metal Industry/Engineering

#### ► EQUIPMENT

- Temperature range of -70 °C to 180 °C
- 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
- Programmable condensation protection for test material
- 230 V power socket on the right-side operating panel
- Adjustable ramp function via program editor
- Access port Ø 50 mm, left side
- Temperature safety device class 2 (DIN 12880) with visual and acoustic temperature alarm
- Heated viewing window with LED interior lighting
- Ethernet interface for GLP/GMP and FDA guideline 21 CFR Part 11 compliant APT-COM™ DataControlSystem software
- Stainless steel rack included
- 4 castors (2 with brakes)



▶ PERFORMANCE FEATURES | MKT SERIES



- Homogeneous climate conditions**
- ▶ APT.line™ for uniform circulation even under full load
  - ▶ Same test conditions throughout the chamber interior
  - ▶ Independent of specimen size and quantity



- Comprehensive product portfolio**
- ▶ BINDER Data Logger Kits
  - ▶ Years of proven and recognized validation and documentation materials
  - ▶ Customized solutions



- Well equipped**
- ▶ Heated viewing window,
  - ▶ Rugged chassis with castors from 115 liters
  - ▶ Ethernet interface
  - ▶ Documentation Software APT-COM™



- Convenient assembly and operation**
- ▶ Large access area
  - ▶ Controls accessible from the front
  - ▶ Optimum use of space

▶ OPTIONS

- Access port with silicone plug
- Notch-type access port in the door, 100 x 35 mm
- Data Logger Kits and software
- Shelf, stainless steel
- Perforated shelf, stainless steel
- Reinforced shelf, stainless steel
- Lockable door
- Safety device for over and under temperature (DIN 12880)
- Analog output 4 to 20 mA
- Additional measuring channel for specimen temperature display
- RS 422 interface
- Qualification folder
- Calibration certificate
- Extension for calibration certificate



Notch-type access port in door



BINDER INDIVIDUAL MKT with various access ports for multiple instrument connection leads



Reinforced shelf

MK | MKF | MKT  
KMF  
VD | VDL  
FDL | MDL  
FP | FM  
ED | FD | FED



# MKT series

## Technical data



	MKT 115	MKT 240	MKT 720
<b>Exterior dimensions</b>			
Width (mm)	1000	1135	1615
Height (incl. feet/castors) (mm)	1725	1940	2005
Depth, plus 55 mm for controller and door handle (mm)	860	945	1175
<b>Interior dimensions</b>			
Width (mm)	600	735	1200
Height (mm)	480	700	1020
Depth (mm)	400	443	600
Interior volume (l)	115	228	734
Quantity of racks (standard/max.)	1/4	1/6	1/11
Load per rack (kg)	30	30	40
Permitted total load (kg)	60	70	160
Weight (empty) (kg)	300	380	610
<b>Temperature data</b>			
Temperature range (°C/°F)	-70 - 180	-70 - 180	-70 - 180
Temperature uniformity (± K)	0,1 - 2,0	0,1 - 1,0	0,3 - 2,0
Temperature fluctuation (± K)	0,1 - 0,7	0,1 - 0,4	0,1 - 0,5
Mean heating-up rate from -40°C to 180°C acc. to factory standard (K/min.)	5,0	5,0	4,5
Mean cooling rate from 180°C to -40°C acc. to factory standard (K/min.)	4,2	4,2	4,2
Max. heat compensation (kW)	2,0	3	6,0
<b>Electrical data</b>			
Housing protection acc. to EN 60529	IP 20	IP 20	IP 20
Nominal voltage (± 10%) 50 Hz (V)	400 3N~	400 3N~	400 3N~
Nominal power (kW)	5,5	6,5	7,2
Energy consumption at 20 °C (kW)	1,0	1,4	1,9
Noise level (ca. dB(A))	64	64	65
Model no.	9020-0151	9020-0196	9020-0082

All technical specifications are specified for units with standard equipment at an ambient temperature of 25 °C and a voltage fluctuation of ±10 %. The temperature data are determined in accordance to factory standard following DIN 12880. All values have been specified at a fan speed of 100 %. All indications are average values, typical for units produced in series. We reserve the right to alter technical specifications at all times.

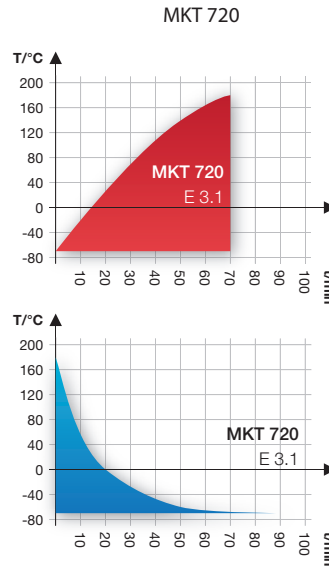
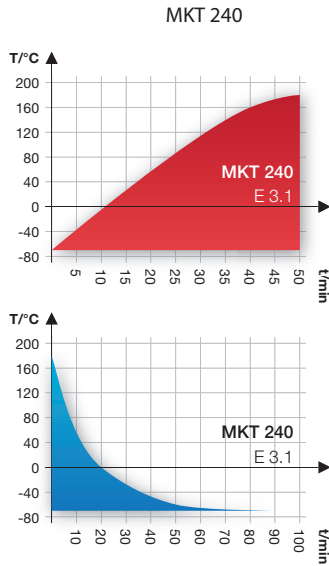
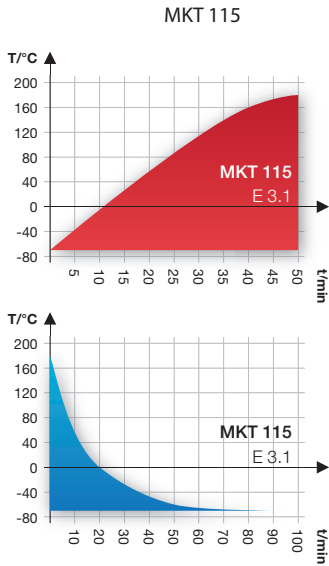


Latest information and technical data at:

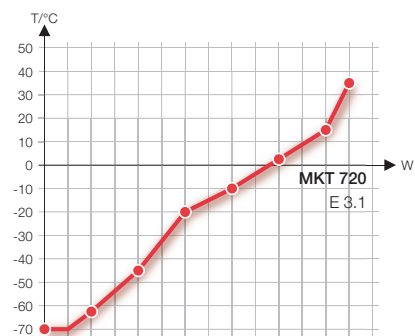
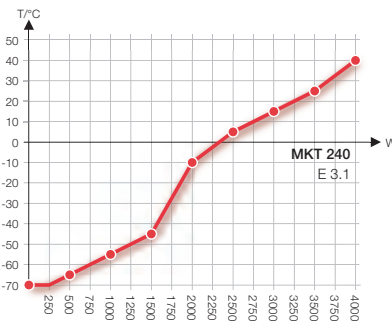
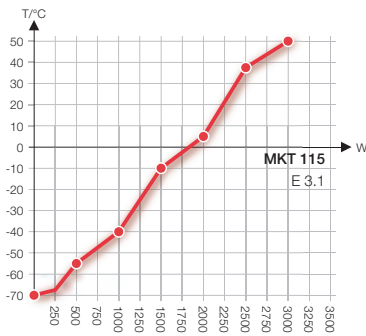
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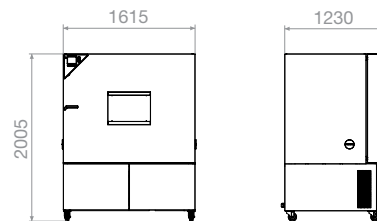
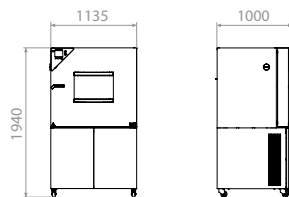
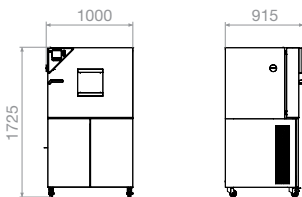
► HEATING UP RATE AND COOLING DOWN RATE



► HEAT COMPENSATION



► DIMENSIONS



MK | MKF | MKT

KMF

VD | VDL

FDL | MDL

FP | M

ED | FD | FED

# NEW: Serie MKFT: Environmental simulation chambers for low-temperature alternating climate profiles

The new MKFT series completes the product portfolio of BINDER environmental simulation chambers. Dynamic alternating climate change between  $-70\text{ }^{\circ}\text{C}$  and  $180\text{ }^{\circ}\text{C}$ , large performance reserves and in particular, rapid cooling at constant speeds ( $5\text{ K/min}$ ) make the MKFT the high-end product for complex standards-based climate tests such as PV 1200.



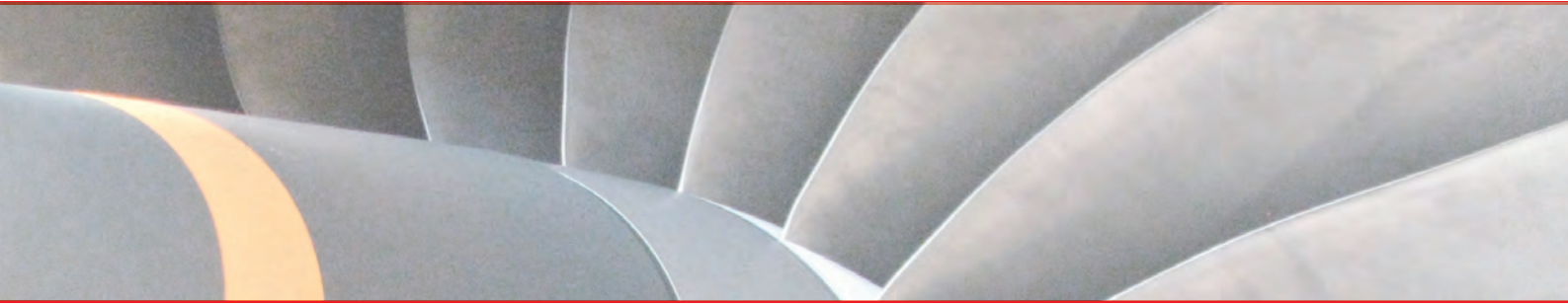
#### ► AREAS OF APPLICATION:

Automotive, Aerospace/Defence Industry,  
Electronics/Semiconductor Industry, Plastics  
Industry, Metal Industry/Engineering

#### ► EQUIPMENT

- Temperature range of  $-70\text{ }^{\circ}\text{C}$  to  $180\text{ }^{\circ}\text{C}$
- 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 and pressurized steam
- Integrated water storage tank
- Heated viewing window with interior illumination
- Programmable condensation protection for test material
- Adjustable ramp functions via program editor
- 230 V power socket on the right-side operating panel
- Temperature safety device, Class 2 (DIN 12880) with visual and acoustic temperature alarm
- 4 potential-free relay outputs that can be activated via MCS controller
- Ethernet interface for use with APT-COM™ DataControlSystem software
- 1 access port  $\varnothing 50\text{ mm}$ , left side
- Stainless steel rack include
- 4 castors (2 with brakes)





► PERFORMANCE FEATURES | MKFT SERIES



**Homogeneous climate conditions**

- ▶ APT.line™ for uniform circulation even under full load
- ▶ Same test conditions throughout the chamber interior
- ▶ Independent of specimen size and quantity



**Convenient assembly and operation**

- ▶ Large access area
- ▶ Controls accessible from the front
- ▶ Optimum use of space



**Optimally humidification system**

- ▶ Fast response times thanks to Vapor pressure humidification
- ▶ Drift-free, capacitive humidity sensor for very accurately measured values
- ▶ Minimal maintenance requirements
- ▶ Independent of water quality
- ▶ Sewage pump for discharges up to 1 m in height



**Comprehensive product portfolio**

- ▶ BINDER Data Logger Kits
- ▶ Years of proven and recognized validation and documentation materials
- ▶ Customized solutions



**Well equipped**

- ▶ Heated viewing window
- ▶ Rugged chassis with castors
- ▶ Ethernet interface
- ▶ Documentation Software APT-COM™

► OPTIONS

- Access port with silicone plug
- Notch-type access port in the door, 100 x 35 mm
- Data Logger Kits and software
- Shelf, stainless steel
- Perforated shelf, stainless steel
- Reinforced shelf, stainless steel
- Interface RS 422
- Lockable door
- Safety device for over and under temperature, class 2
- Analog outputs 4 to 20 mA with DIN bushing 6 poles
- Additional measuring channel for specimen temperature display
- BINDER PURE AQUA SERVICE
- Disposable cartridge for BINDER PURE AQUA SERVICE
- Qualification folder
- Calibration certificate and extension for calibration certificate



Notch-type access port in door



BINDER PURE AQUA SERVICE



Reinforced shelf



BINDER INDIVIDUAL MKFT with reinforced inner chamber and solidly mounted perforated shelves for very heavy test specimens

MK | MKF | MKT  
 KMF  
 VD | VDL  
 FDL | MDL  
 FP | FM  
 ED | FD | FED

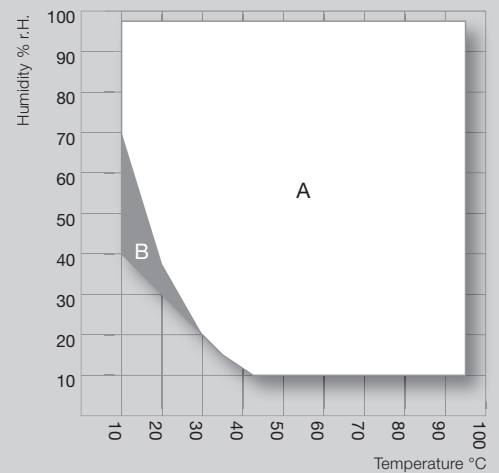
# Serie MKFT

## Technical data



	MKFT 240
<b>Exterior dimensions</b>	
Width (mm)	1135
Height (incl. castors) (mm)	1940
Depth plus 55 mm door handle (mm)	945
<b>Interior dimensions</b>	
Width (mm)	735
Height (mm)	700
Depth (mm)	443
Interior volume (l)	228
Quantity of racks (standard/max.)	1/6
Load per rack (kg)	30
Permitted total load (kg)	70
Weight (empty) (kg)	400
<b>Temperature data</b>	
Temperature range (°C)	-70 - 180
Temperature fluctuation (± K)	0,1 - 0,5
Temperature uniformity (± K)	0,5 - 2,0
Average heating up time acc. to IEC 60068-3-5 1) (K/min.)	5
Average cooling down time acc. to IEC 60068-3-5 1) (K/min.)	4,2
Max. heat compensation (kW)	2,8
<b>Climatic data</b>	
Temperature range (°C)	10 - 95
Humidity range (% r.H.)	10 - 98
Humidity fluctuation (± % r.H.)	≤ 2,5
Temperature fluctuation (± K)	0,2 - 1,7
Max. heat compensation (kW)	0,3
<b>Electrical data</b>	
Housing protection acc. to EN 60529	IP 20
Nominal voltage (±10%) 50 Hz (V)	400 3N~
Nominal power (kW)	7,5
<b>Model no.</b>	<b>9020-0080</b>

TEMPERATURE-HUMIDITY CHART

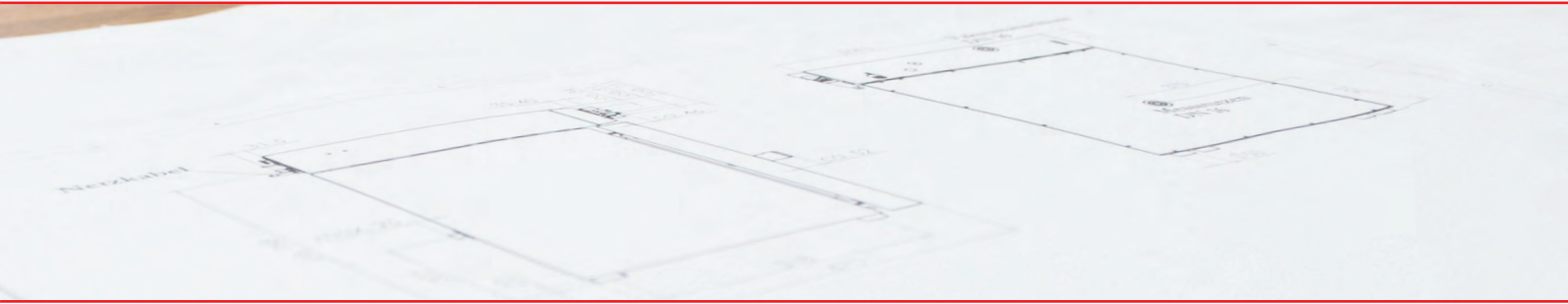


A: Standard Climate range /  
 B: temporary usable space (up to 24 h)

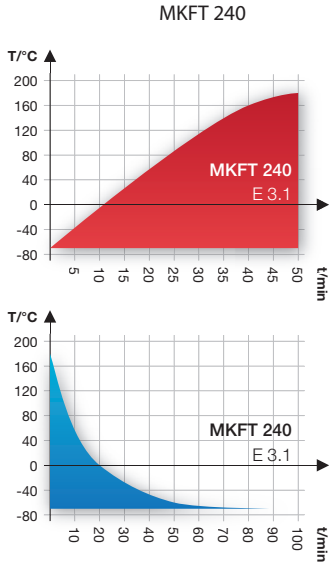
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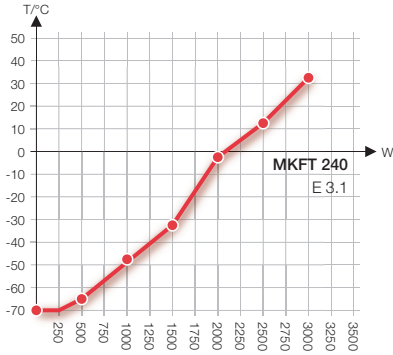
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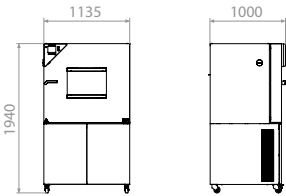
► HEATING UP RATE AND COOLING DOWN RATE



► HEAT COMPENSATION



► DIMENSIONS







# KMF series

## Constant climate chambers

### | A single-source solution for stress testing

Our KMF series test chambers for constant climatic conditions will provide consistently constant temperature and humidity values for long-term testing. This is certainly no easy goal, particularly in the wide climatic range of 85 °C and 85% relative humidity. This series thus offers the perfect solution for an extremely large range of applications, including tests in the solar and electronics industries, as well as shelf-life testing.

This makes them unique in their class.

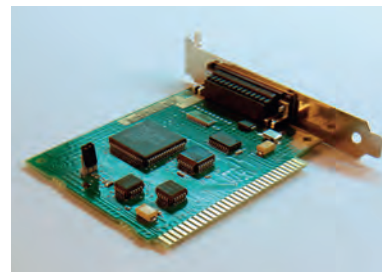
- ▶ The only one in its class
- ▶ Stable test conditions up to 85 °C / 85% RH
- ▶ Optimal ratio of usable space and footprint



Solar panel tests



Testing synthetic materials



Electronic stress testing

# KMF series: Constant climate chambers for stress testing

The constant climate chamber KMF is designed for absolutely reliable stress tests and precise maintenance of constant climatic conditions. Its advanced reserve capacity and extremely broad climatic range: from -10 up to 100 °C and condensation free up to 90 % RH. These features makes this series absolutely unique in its class..



#### ► AREAS OF APPLICATION:

Automotive, Plastics Industry, Packaging Industry, Buildings Materials Industry, Electronics/Semiconductor Industry, Surface Technology

#### ► EQUIPMENT

- Temperature range from -10 °C to 100 °C
- 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
- Heated door
- Inner glass door with sealing
- Independent adjustable temperature safety device class 3.1, with visual and audible temperature alarm
- Access port with silicone plug Ø 30 mm left side
- Complete safety connection kit for water supply (up to 1 m height)
- Ethernet interface for communication software APT-COM™ DataControlSystem
- 1 stainless steel rack
- 4 castors (2 with brakes) from 115L





► PERFORMANCE FEATURES | KMF



**BINDER APT.line™**

- Constant and gentle circulation of air through large-surface side walls even under a full load
- Homogeneous climate conditions throughout test specimens



**Optimally humidification system**

- Fast response times thanks to Vapor pressure humidification
- Drift-free, capacitive humidity sensor for very accurately measured values
- Minimal maintenance requirements



**Convenient assembly and operation**

- Large access area
- Controls accessible from the front
- Optimum use of space



**Flexible water management**

- Independent of water quality
- Sewage pump for discharges up to 1 m in height



**Comprehensive product portfolio**

- BINDER Data Logger Kits
- Years of proven and recognized validation and documentation materials
- Customized solutions

► OPTIONS

- Access ports with silicone plug
- Rack, stainless steel
- Perforated shelf, stainless steel
- Reinforced rack, stainless steel, max. load 70 kg
- Lockable controller keyboard
- Interior lighting
- Additional PT 100 temperature sensor
- RS 422 interface
- External water supply set
- BINDER PURE AQUA SERVICE
- Calibration certificate
- Temperature precision measurement according to DIN 12880
- Data Logger Kits and Software
- Independent temperature safety device class 3.3 (DIN 12880)
- 4-20 mA analog outputs for temperature and humidity measurements
- Door lock



**BINDER PURE AQUA SERVICE**



**BINDER Data Logger Kits**



**Various access ports**



**BINDER INDIVIDUAL KMF with additional windows, doors and access ports to accommodate the various instrument connection leads**

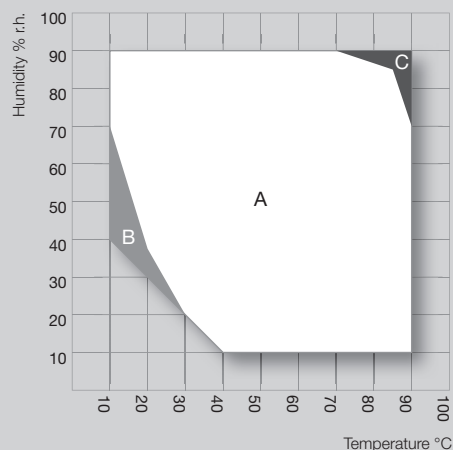
# KMF series

## Technical data



	KMF 115	KMF 240	KMF 720
<b>Exterior dimensions</b>			
Width (mm)	885	930	1255
Höhe (inkl. FüÙe/Rollen) (mm)	1050	1460	1925
Depth (mm)	650	800	890
including door handle, l-triangle, connection (mm)	730	880	970
<b>Interior dimensions</b>			
Width (mm)	600	650	973
Height (mm)	483	785	1250
Depth (mm)	351	485	576
Interior volume (l)	102	247	700
Quantity of racks (standard/max.)	1/5	1/9	1/15
Load per rack (kg)	30	30	45
Permitted total load (kg)	100	100	150
Weight (empty) (kg)	127	185	309
<b>Temperature data (without humidity)</b>			
Temperature range (°C)	10 - 100	10 - 100	10 - 100
Average heating up time acc. to IEC 60068-3-5 (K/min.)	1,3	1,1	1,0
Average cooling down time acc. to IEC 60068-3-5 (K/min.)	0,5	0,6	0,4
Max. heat compensation up to 25°C (W)	150	350	400
<b>Climatic data</b>			
Temperature range (°C)	+10 - +90	+10 - +90	+10 - +90
Temperature uniformity (± K)	0,3 - 1,0	0,3 - 1,5	0,2 - 1,0
Temperature fluctuation (± K)	0,1 - 0,2	0,1 - 0,5	0,1 - 0,5
Humidity range (% r.H.)	10 - 90	10 - 90	10 - 90
Humidity fluctuation (± % r.H. )	≤ 2,5	≤ 2	≤ 2
<b>Electrical data</b>			
Housing protection acc. to EN 60529	IP 20	IP 20	IP 20
Nominal voltage (±10%) 50/60 Hz (V)	200-240 1N~	200-240 1N~	200-240 1N~
Nominal power (kW)	2,0	2,1	3,1
Energy consumption at 85°C / 85 % r.h. (W)	570	500	1050
Noise level approx. (dB (A))	52	52	53
Model no.	9020-0187	9020-0145	9020-0185

TEMPERATURE-HUMIDITY CHART



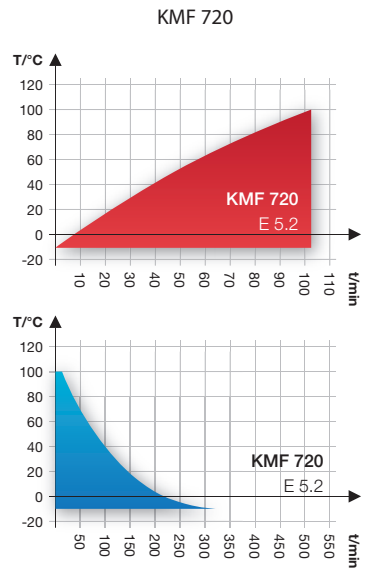
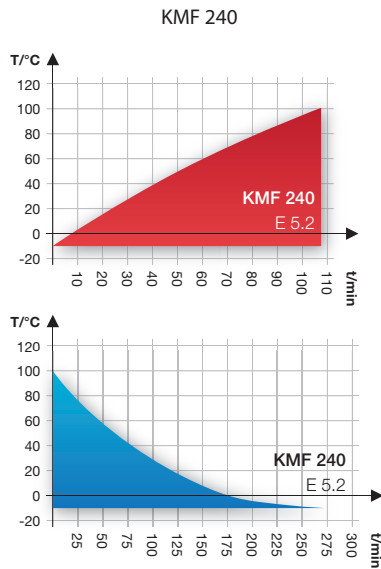
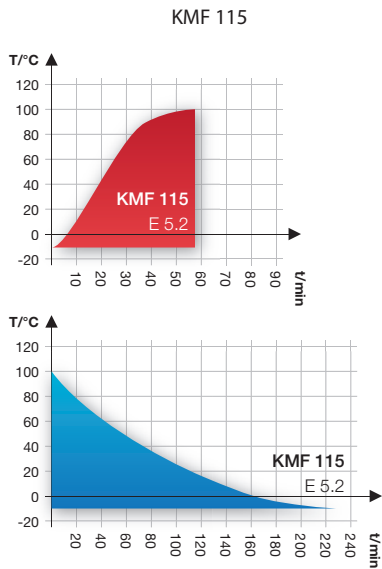
- A: guaranteed condensation free range
- B: temporary usable range (up to 24 h)
- C: In this range, condensation in the inner chamber is possible

SALL technical specification are specified for units with standard equipment at an ambient temperature of 25 °C and a voltage fluctuation of ±10 %. The temperature data are determined in accordance to factory standard following DIN 12880. All values have been specified at a fan speed of 100 %. All indications are average values, typical for units produced in series. We reserve the right to alter technical specifications at all times.

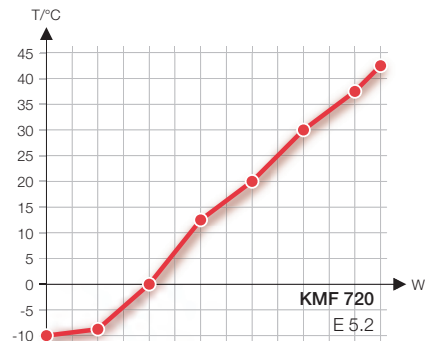
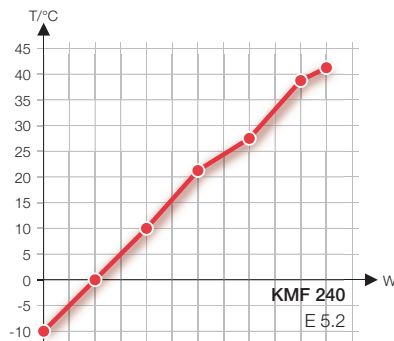
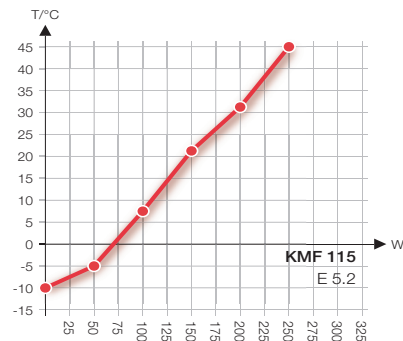
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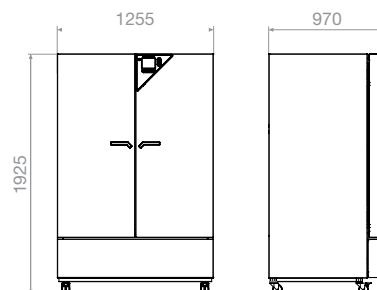
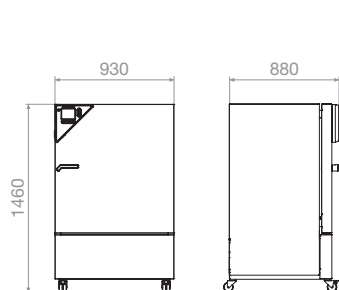
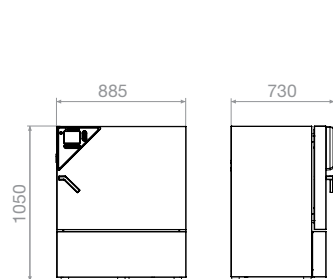
► HEATING UP RATE AND COOLING DOWN RATE



► HEAT COMPENSATION



► DIMENSIONS



MK | MKF | MKT  
KMF  
VD | VDL  
FDL | MDL  
FP | M  
ED | FD | FED





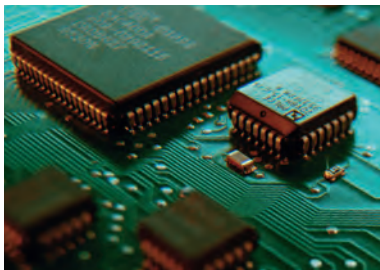
# VD | VDL

## Vacuum drying ovens

### | Absolute reliable drying

Drying with no residues, no danger of incrustation, no oxidation – all under gentle cycle conditions. We have also developed a special customized safety concept for your individual requirements that sets new standards in safety, all while maintaining our usual perfect performance and quality.

- ▶ Safe work with one-of-a-kind safety concept
- ▶ Fast, condensation-free drying processes
- ▶ Homogeneous sample drying in a vacuum



Semiconductors/Electronics



Precision engineering



Chemical industry/Plastics

## VD series: Vacuum drying ovens for non-flammable solvents

The VD series offers safe drying with homogenous temperature distribution, thanks to its electronically controlled APT.line™ preheating technology. Optimum heat transfer through patented expansion rack technology; the racks can be positioned as needed and are easy to clean.



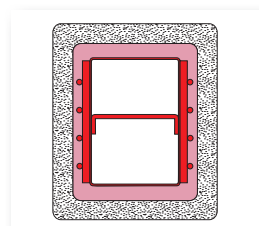
### ► AREA OF APPLICATIONS:

Electronics / Semiconductor Industry, Plastics Industry, Automotive, Aerospace/Defence Industry, Surface Technology

### ► EQUIPMENT

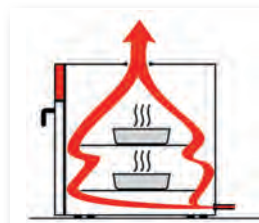
- Temperature range: 15°C above ambient temperature up to 200°C
- MP controller with 2 programs with 10 sections each, or alternatively one program with 20 sections
- Integrated week program timer with real time function
- Digital temperature setting with an accuracy of one degree
- Elapsed time indicator
- Fine dosing ventilation valve (at VD 23 the standard inert gas connection is also used as ventilation valve)
- Fine dosing inert gas valve with cross-flow technology
- All electrical components are decoupled from the interior chamber
- Spring-mounted shatter proof safety glass panel
- Independent adjustable temperature safety device, Class 2 (DIN 12880), with visual alarm
- DN 16 measuring port in rear wall
- Analog pressure gauge (display pressure difference between the inner chamber and the ambient pressure)
- Electro polished inner chamber, suction and ventilation tubes, pressure container, and ball valve are made of highly corrosion resistant stainless steel V4A (1.4571)
- Door gasket made of tempered silicone
- 2 x 24 V DC (max. 0.4 A) switching outputs, switched via 2 control contact of the program editor
- RS 422 interface for communication software APT-COM™ DataControlSystem
- 2 patented, flexible aluminum expansion racks
- Available also as complete system, with vacuum module and vacuum pump

► PERFORMANCE FEATURES | VD SERIES



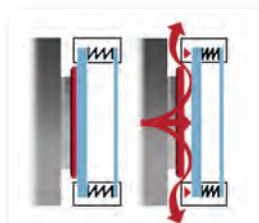
**BINDER APT.line™**

- Gentle drying throughout the chamber interior
- Absolute temperature uniformity
- Direct transfer of heat to the specimens due to thermal conducting plates with large contact surfaces
- Patented, flexible positioning of the expansion racks



**BINDER Cross-Flow Principle**

- Fast drying thanks to accelerated drying process
- Even flow throughout the inner chamber from bottom to top
- Finely adjustable valve without turbulence, individually controlled



**BINDER Safety Concept**

- Safety working conditions:
- Spring-mounted safety glass panel with shatter protection (FDA tested)
- Standard inert gas connection for interior flushing
- Electronic components are decoupled from the inner chamber



**Simple, time-saving cleaning**

- Smooth inner chamber with rounded corners
- Fixtures are fully removable
- Inner chamber made of highly corrosion resistant stainless steel V4A (1.4571)



**BINDER Complete system**

- Coordinated, modular system contains vacuum drying chamber, vacuum pumps and module
- Connection kit for easy installation
- Optimal working height
- 50% less noise
- Pressure and temperature profiles are depicted simultaneously

► OPTIONS

- Expansion racks, aluminum or stainless steel
- Connection kit with different small flanges
- Measurement port for air-tight lead-through of measurement lines into the unit (9-pin)
- Specimen temperature measurement via flexible PT100 sensor
- Digital pressure display
- Factory calibration certificate
- Extention to factory calibration certificate door gasket, FKM (viton)
- Vacuum module with chemical membrane pump VP 1.1
- Vacuum module with chemical membrane pump VP 2.1
- Vacuum module with speed controlled chemical membrane pump VP 3.1
- Vacuum module



Measuring port



Specimen temperature display



Calibration and Validation



**BINDER INDIVIDUAL VD** with special shelves for the placement of large numbers of very flat specimens


# VD Series

## Technical data



	VD 23	VD 53	VD 115
<b>Exterior dimensions</b>			
Width (mm)	515	635	740
Height (inclusive feet) (mm)	655	775	900
Height VD option "vacuum module" (mm)	1280	1400	1525
Depth (mm)	500	550	670
plus door handle, connection (mm)	100	100	100
<b>Interior dimensions</b>			
Width (mm)	285	400	506
Height (mm)	285	400	506
Depth (mm)	285	330	450
Interior volume (l/cu.ft.)	23	53	115
Quantity of expansion racks (aluminum) (standard/max.)	2/4	2/5	2/6
Load per rack (kg/lbs.)	20	20	20
Permitted total load (kg/lbs.)	35	45	65
Weight of the unit (empty) (kg/lbs.)	63	95	153
<b>Temperature data</b>			
Temperature range, 15°C above ambient up to °C/°F	200	200	200
Temperature uniformity at 100°C (± K)	1,5	2	3,5
Temperature fluctuation (± K)	0,1	0,1	0,1
Heating up time Position II to 100°C (min.)	50	80	90
Permitted end vacuum (mbar)	0,01	0,01	0,01
Leak rate max. (bar/h)	0,01	0,01	0,01
<b>Electrical data</b>			
Housing protection acc. to EN 60529	IP 20	IP 20	P 20
Nominal voltage (±10 %) 50/60 Hz (V)	230	230	230
Nominal power (kW)	0,8	1,2	1,7
Energy consumption at 100°C (W)	105	150	250
Model no.	9030-0029	9030-0030	9030-0031

All technical specifications are specified for units with standard equipment at an ambient temperature of 25 °C (77 °F) 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 values have been specified at a fan speed of 100 %. All indications are average values, typical for units produced in series. We reserve the right to alter technical specifications at all times.

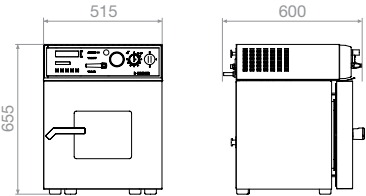
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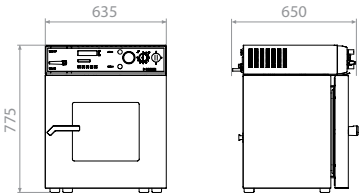


► DIMENSIONS

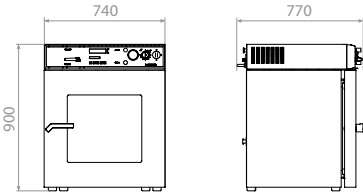
VD 23



VD 53



VD 115



# VDL series: Safety vacuum drying ovens for flammable solvents

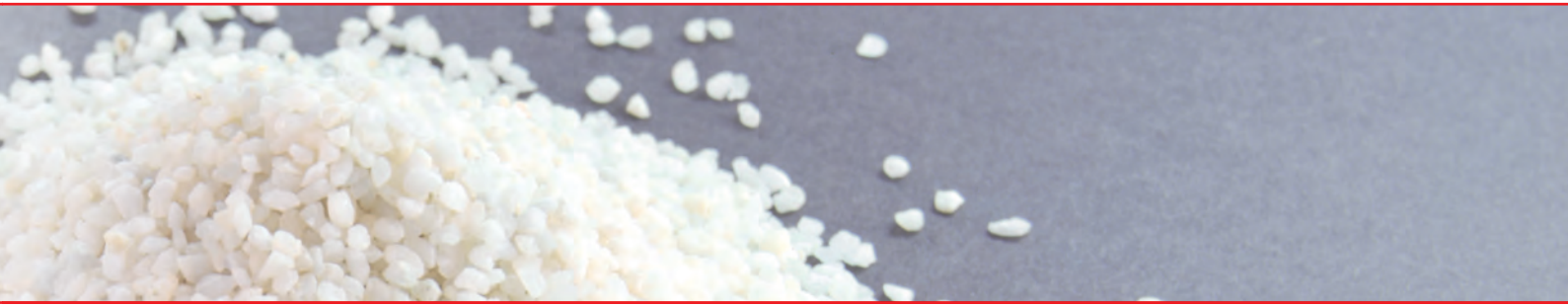
The VDL series comes with a standard safety package that guarantees maximum safety for drying samples that contain organic solvents, complete with a TÜV/GS safety certificate. The interior chamber is designed in accordance with the ATEX Directive for Zone 2 operation.



► **AREA OF APPLICATIONS:**  
Surface Technology, Chemicals

► **EQUIPMENT**

- Equipment interior is designed in accordance with the ATEX Directive for Zone II 3G
- Temperature range of 15°C above ambient temperature up to 200°C
- MP controller with two programs with 10 sections each, or alternatively one program with 20 sections
- Digital temperature setting with an accuracy of one degree
- Elapsed time indicator
- Spring-mounted safety glass pane with splinter protection
- Pressure monitor for controlled heating release at < 125 mbar (94 torr)
- Over pressure capsulated instrument panel with compressed air connection and maintenance unit
- Flame protection gasket
- Fine dosing inert gas valve with cross-flow technology
- Analog pressure gauge (display pressure difference between the inner chamber and the ambient pressure)
- Electro polished inner chamber, suction and ventilation tubes, pressure container, and ball valve are made of highly corrosion resistant stainless steel V4A (1.4571)
- Door gasket made of tempered silicone
- Independent adjustable temperature safety device, Class 2 (DIN 12880), with visual alarm
- DN 16 measuring port in rear wall
- RS 422 interface for communication software APT-COM™ DataControlSystem
- 2 patented, flexible aluminum expansion racks
- Available also as complete system, with module and vacuum pump

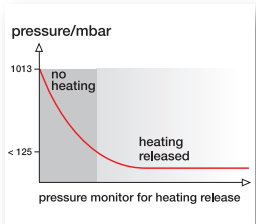


► PERFORMANCE FEATURES | VDL SERIES



**BINDER Safety Concept**

- ▶ Spring-mounted safety glass panel with shatter protection (FDA tested)
- ▶ Standard inert gas connection for interior flushing
- ▶ Electronic components are decoupled from the inner chamber
- ▶ Flame protection gasket
- ▶ Automatic heating activated < 125 mbar
- ▶ Over pressure capsuled instrument prevents gas penetration
- ▶ ATEX-tested inner chamber



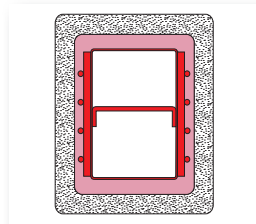
**BINDER Cross-Flow Principle**

- ▶ Fast drying thanks to accelerated drying process
- ▶ Even flow throughout the inner chamber from bottom to top
- ▶ Finely adjustable valve without turbulence, individually controlled



**Simple, time-saving cleaning**

- ▶ Smooth inner chamber with rounded corners
- ▶ Fixtures are fully removable
- ▶ Inner chamber made of highly corrosion resistant stainless steel V4A (1.4571)



**BINDER APT.line™**

- ▶ Gentle drying throughout the chamber interior
- ▶ Absolute temperature uniformity
- ▶ Direct transfer of heat to the specimens due to thermal conducting plates with large contact surfaces
- ▶ Patented, flexible positioning of the expansion racks

► **OPTIONS:**

- Expansion racks, aluminum or stainless steel
- Connection kit with different small flanges
- Measurement port for air-tight lead-through of measurement lines into the unit (9-pin)
- Specimen temperature measurement via flexible PT100 sensor
- Factory calibration certificate
- Extention to factory calibration certificate
- Door gasket, FKM (viton)
- Vacuum module with membrane pump VP 4
- Vacuum module with membrane pump VP 5
- Vacuum module



Measuring port



Vacuum module



Specimen temperature display



**BINDER INDIVIDUAL VDL** with a custom-made front panel that provides extra protection to prevent gas leakage

# VDL Series

## Technical data



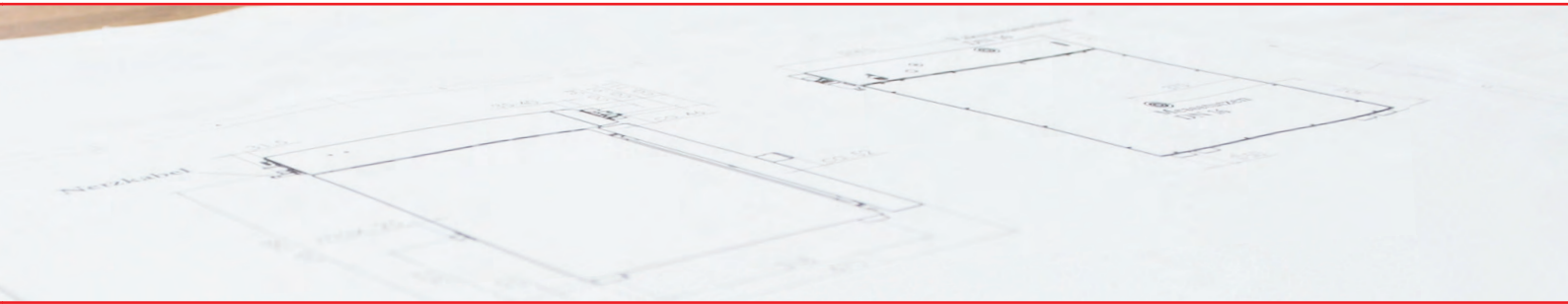
	VDL 23	VDL 53	VDL 115
<b>Exterior dimensions</b>			
Width (mm)	515	635	740
Height (inclusive feet) (mm)	655	775	900
Height VDL with option "vacuum module" (mm)	1280	1400	1525
Depth (mm)	500	550	670
plus door handle, connection (mm)	100	100	100
<b>Interior dimensions</b>			
Width (mm)	285	400	506
Height (mm)	285	400	506
Depth (mm)	285	330	450
Interior volume (l/cu.ft.)	23	53	115
Quantity of expansion racks (aluminum) (standard/max.)	2/4	2/5	2/6
Load per rack (kg/lbs.)	20	20	20
Permitted total load (kg/lbs.)	35	45	65
Weight of the unit (empty) (kg/lbs.)	63	95	153
<b>Temperature data</b>			
temperature range, 15°C above ambient up to °C	200	200	200
Temperature uniformity at 100°C (± K)	1,5	2	3,5
Temperature fluctuation (± K)	0,1	0,1	0,1
Heating up time Position II to 100°C (min.)	50	80	155
Permitted end vacuum (mbar)	0,01	0,01	0,01
Leak rate (max.mbar/h)	0,01	0,01	0,01
Compressed air connection for pressure-encapsulation (Ø mm)	8	8	8
<b>Electrical data</b>			
Housing protection acc. to EN 60529	IP 54	IP 54	IP 54
Nominal voltage (±10 %) 50/60 Hz (V)	230	230	230
Nominal power (kW)	0,8	1,2	1,9
Energy consumption at 100°C (W)	105	150	250
<b>Model no.</b>	<b>9030-0038</b>	<b>9030-0039</b>	<b>9030-0040</b>

All technical specifications are specified for units with standard equipment at an ambient temperature of 25 °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 values have been specified at a fan speed of 100 %. All indications are average values, typical for units produced in series. We reserve the right to alter technical specifications at all times.



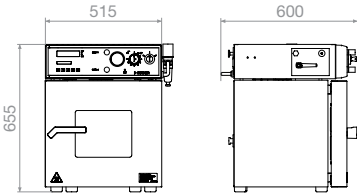
Latest Information and technical data at:  
[www.binder-world.com](http://www.binder-world.com)



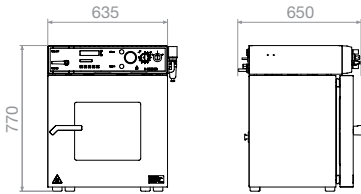


► DIMENSIONS

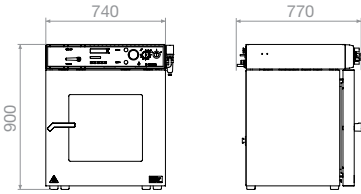
VDL 23



VDL 53



VDL 115



MK | MKF | MKT

KMF

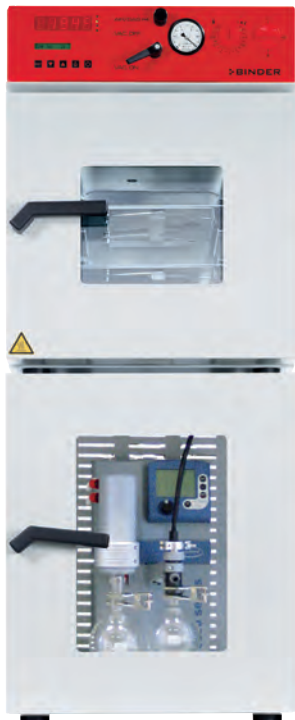
VD | VDL

FDL | MDL

FP | M

ED | FD | FED

# VD series: Vacuum module with pump



Series VD equipment can be supplied with an optional separate vacuum module that achieves up to 50% noise reduction.

The chemical membrane pump for the vacuum module is available in three different versions, depending upon individual requirements. The speed-controlled vacuum pump VP 3.1 or example, automatically adjusts to the various process conditions, which saves up to 30% time.

Additional benefits:

- excellent suction capacity even at low pressure
- long service life because of oil-free operation
- good chemical resistance, thanks to the extensive use of fluoroplastics



Vacuum module with integrated chemical membrane pump	Vacuum module with chemical membrane pump	Vacuum module with chemical membrane pump	Vacuum module with speed controlled chemical membrane pump
Type	VP 1.1	VP 2.1	VP 3.1
Nominal airflow	2 m <sup>3</sup> /h	3,4 m <sup>3</sup> /h	4,6 m <sup>3</sup> /h
Final pressure	7 mbar	1,5 mbar	1,5 mbar
Electrical connection (50–60 Hz)	230 V / 115 V	230 V / 115 V	230 V / 115 V
VD 23 series	•	•	•
VD 53 series	•	•	•
VD 115 series	•	•	•

# VDL series: Vacuum module with pump



The vacuum module in the VDL series can be supplied with two different types of chemical membrane pumps, each of which have different intake and delivery capacities. Both models are ATEX compliant and have explosion-proof motors with integrated latching overload and thermal protection switches

As of July 1, 2003, only ATEX-compliant equipment may be used in explosion hazard areas. All BINDER VDL series vacuum pumps are ATEX certified.



Vacuum module with integrated chemical membrane pump	Vacuum module with chemical membrane pump Ex-proof	Vacuum module with chemical membrane pump Ex-proof
Type	VP 4	VP 5
ATEX approved according to ATEX Directive 94/9/EG	yes	yes
Nominal airflow	1,9 m³/h	3,7 m³/h
Final pressure	12 mbar	3 mbar
Electrical supply (50 Hz)	230 V	230 V
VDL 23 series	•	-
VDL 53 series	•	-
VDL 115 series	•	•
Application details	Approved ATEX-compliant membrane pump for VDL 23 and VDL 115 series	Approved ATEX-compliant membrane pump with a reduced final vacuum for the VDL 115 series

• option

- not available

MK | MKF | MKT  
 KMF  
 VDL | VDL  
 FDL | MDL  
 FPL | M





# FDL | MDL

## Safety drying ovens

### First-class equipment for first-class results.

A job isn't well done when it's finished – it's finished only when it's well done! Keeping this in mind, we developed two series to provide the perfect finish to your solvent-based paints and coating materials. Absolutely precise temperature control, even with high rates of air change, creates the basis for the highest quality of results and reproducible tests. Electronically controlled monitoring and replaceable fresh-air filter cartridges ensure safe operation at all times.

- ▶ Fast and uniform drying
- ▶ Defined solvent quantity according to EN 1539
- ▶ Wide temperature range up to 350 °C



Drying of varnish



Drying of adhesive compounds

## FDL series: Safety drying ovens

This series presents the perfect environment for solvent-based samples. The interior chamber has a symmetrical airflow with defined flow velocities, free of silicone and dust, safeguarded by a high-efficiency filter cartridge. FDL thus complies with all EN 1539 requirements and its program with the intelligent fresh air monitoring feature offers maximum occupational safety.



► **AREAS OF APPLICATION:**  
Chemicals, Surface Technology

► **EQUIPMENT**

- In compliance with all safety requirements according to the standards EN 1539
- Temperature range of 5 °C above ambient temperature up to 300 °C
- MP controller with 2 programs with 10 sections each or alternatively switch over to one program with 20 sections
- The time interval of single program sections can be adjusted up to a maximum of 999h and 59min.
- Integrated week program timer with real time function
- Digital temperature setting with an accuracy of one a degree
- Elapsed time indicator
- Independent adjustable temperature safety device, Class 2 (DIN 12880) with optical and acoustic alarm
- RS 422 interface for communication software to APT-COM™ DataControlSystem
- 2 chrome-plated shelves

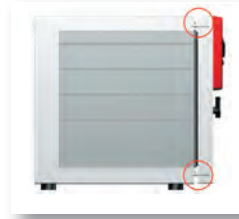


► Performance features | FDL SERIES



**BINDER APT.line™**

- Same test conditions throughout the chamber interior, Independent of specimen size and quantity
- Homogeneous temperature conditions throughout test specimens



**Modest operating costs**

- Very tight door closure with 2-point door latch
- Low heat dissipation due to 60 mm insulation
- Rack with tilt protection
- Complete inner chamber made of stainless steel
- No permanent fixtures
- Silicone free



**Maximum industrial safety**

- Safe standard-compliant drying by defined solvent quantity
- Complies with EN 1539: Fresh air monitoring with automatic switchoff
- Safety class IP 33
- Easy to replace fresh air filter

► **OPTIONS:**

- Access port with 10, 30 mm (0.4; 1.2 inch) diameter, right or left side
- Rack, chrome-plated or stainless steel
- Shelf, perforated, stainless steel
- Specimen temperature display with clip sensor and 4-20 m analog output
- Replacement airfilter (class F 6/EU 6 – for particle sizes between 1µm and 10µm)
- Door lock
- Door gasket, silicone, resistant to high operating temperatures > 200°C
- Factory calibration certificate
- Extension to factory calibration certificate
- Temperature measurement acc. to DIN 12880



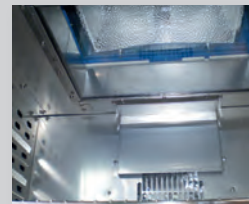
Specimen temperature measurement



Calibration and validation



Various access ports



BINDER INDIVIDUAL FDL with an ultraviolet lamp for testing UV resistance

# FDL series

## Technical Data



	FDL 115
<b>Exterior dimensions</b>	
Width (mm)	835
Height (inclusive feet) (mm)	800
Depth (mm)	685
plus door handle (mm)	50
<b>Interior dimensions</b>	
Width (mm)	600
Height (mm)	435
Depth (mm)	435
Interior volume (l)	115
Quantity of racks (standard/max.)	2/5
Load per rack (kg)	20
Permitted total load (kg)	50
Weight of the unit (empty) (kg)	90
<b>Temperature data</b>	
Temperature range, 5°C above ambient up to °C	300
Temperature uniformity at 150°C (± K)	2,5
Temperature fluctuation (± K)	0,3
Heating-up time at 150°C (Min.)	17
Recov. time after door was opened for 30 sec. at 150°C (minutes)	3
Air change (approx. x/min.)	3
Air circulation (approx. x/min.)	40
Exhaust air volume flow (approx. l/Min. m³/h)	400 (24,0)
Air flow velocity (m/sec)	0,8-1,2
Highest permitted solvent quantity (g) (at T=180°C, M=100g/mol, U=40g/m³, K=0,5)	6,65
<b>Electrical data</b>	
Housing protection acc. to EN 60529	IP 33
Nominal voltage (±10 %) 50/60 Hz (V)	230
Nominal power (kW)	2,9
Energy consumption at 150°C (W)	1098
<b>Model no.</b>	<b>9010-0269</b>

All technical specifications are specified for units with standard equipment at an ambient temperature of 25 °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 values have been specified at a fan speed of 100 %. All indications are average values, typical for units produced in series. We reserve the right to alter technical specifications at all times.



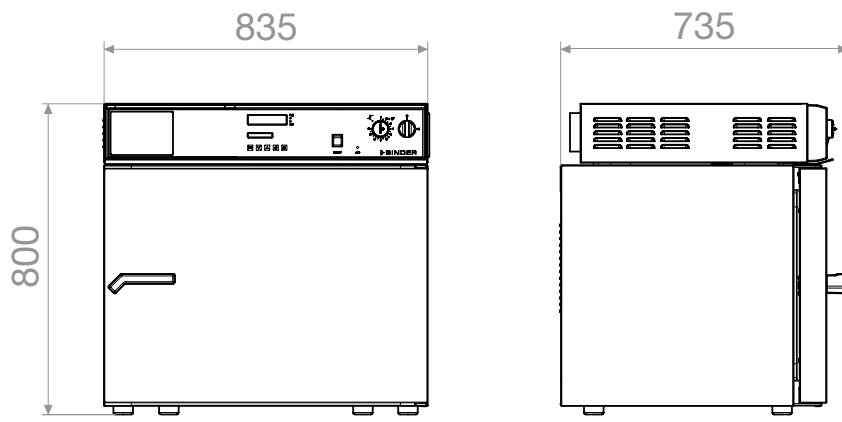
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[www.binder-world.com](http://www.binder-world.com)





► DIMENSIONS

FDL 115



MK | MKF | MKT

KMF

VD | VDL

FDL | MDL

FP | M

ED | FD | FED

# MDL Series: Safety drying ovens with expanded temperature range

The MDL series operates at temperatures up to 350 °C (662 °F) at an extremely high airflow, ideal conditions for high temperature testing, e.g. in coil coating applications. The preheating chamber with its special Airflow Design permits homogenous baking processes to be performed with maximum occupational safety in extremely short time, safeguarded by electronic monitoring of fresh air. Individual programming options provide maximum flexibility for completing your jobs.



► **AREAS OF APPLICATION:**  
Chemicals, Surface Technology

► **EQUIPMENT**

- In compliance with all safety requirements according to the standards EN 1539
- Temperature range of 5 °C above ambient temperature up to 350 °C
- 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
- Heat output: 9.0 kW
- Silicone door gasket, resistant to high operating temperatures
- Rear exhaust duct Ø 100 mm
- Replaceable fresh-air filter cartridge, Class F6 (EU6 fine-particle filter for particle sizes between 1 µm and 10 µm)
- Independent adjustable temperature safety device, Class 2 (DIN 12880) with optical and acoustic alarm
- Fresh-air monitoring with acoustic alarm and automatic shut-off of heating
- RS 422 interface for communication software APT-COM™ DataControlSystem
- 2 chrome-plated shelves

► PERFORMANCE FEATURES | MDL SERIES



**BINDER APT.line™**

- Same test conditions throughout the chamber interior, Independent of specimen size and quantity
- Homogeneous temperature conditions throughout test specimens



**Modest operating costs**

- Very tight door closure with 2-point door latch
- Low heat dissipation due to 60 mm insulation
- Rack with tilt protection
- Complete inner chamber made of stainless steel
- No permanent fixtures



**Maximum industrial safety**

- Safe standard-compliant drying by defined solvent quantity
- Complies with EN 1539: Fresh air monitoring with automatic switchoff
- Safety class IP 33
- Easy to replace fresh air filter



**Individual programming**

- Convenient documentation
- All measured values read at a glance
- Controller with color display and 25 storable programs
- Integrated digital continuous-line recorder for monitoring limits and alarm function

► **OPTIONS:**

- Rack, chrome-plated or stainless steel
- Shelf, perforated, stainless steel
- Door flap for coil-coating tests
- Replacement airfilter (class F 6/EU 6 – for particle sizes between 1µm and 10µm)
- Additional measuring channel for digital display of specimen temperature via RS 422 interface
- Door lock
- Keyboard lock
- Factory calibration certificate
- Extension to factory calibration certificate
- Temperature measurement acc. to DIN 12880



Specimen temperature measurement



Drawer for coil coating applications



Calibration and validation



BINDER INDIVIDUAL MDL with a HEPA EU 14 inlet air filter

# MDL Series

## Technical Data



	MDL 115
<b>Exterior dimensions</b>	
Width (mm)	835
Height (inclusive feet) (mm)	800
Depth (mm)	685
plus door handle (mm)	50
<b>Interior dimensions</b>	
Width (mm)	600
Height (mm)	435
Depth (mm)	435
Interior volume (l)	115
Quantity of racks (standard/max.)	2/5
Load per rack (kg)	20
Permitted total load (kg)	50
Weight of the unit (empty) (kg)	90
<b>Temperature data</b>	
Temperature range, 5°C above ambient up to °C	350
Temperature uniformity at 150°C (± K)	3,4
Temperature fluctuation (± K)	0,5
Heating-up time 2) at 150°C (Min.)	6
Recov. time after door was opened for 30 sec. at 150°C (minutes)	2
Air change (approx. x/min.)	3
Air circulation (approx. x/min.)	40
Exhaust air volume flow (approx. l/Min. m³/h)	400 (24,0)
Air flow velocity (m/sec)	0,8-1,2
Highest permitted solvent quantity (g) (at T=180°C, M=100g/mol, U=40g/m³, K=0,5)	6,65
<b>Electrical data</b>	
Housing protection acc. to EN 60529	IP 33
Nominal voltage (±10 %) 50/60 Hz (V)	400 V / 3N~
Nominal power (kW)	9
Energy consumption at 150°C (W)	1130
<b>Model no.</b>	<b>9010-0200</b>

All technical specifications are specified for units with standard equipment at an ambient temperature of 25 °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 values have been specified at a fan speed of 100 %. All indications are average values, typical for units produced in series. We reserve the right to alter technical specifications at all times.

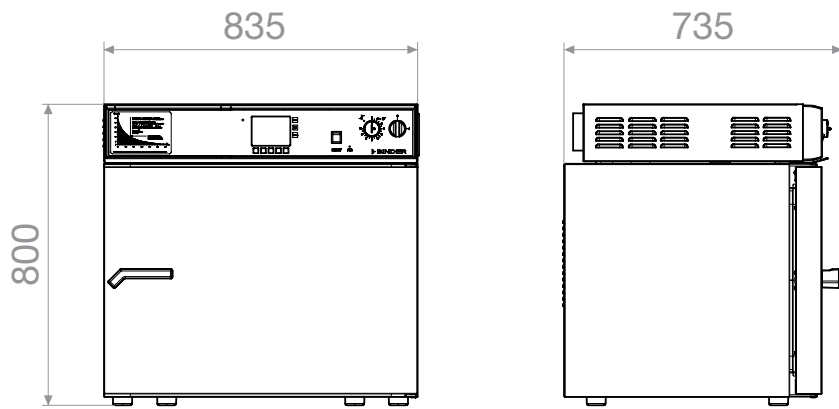
 Latest Information and technical data at:  
[www.binder-world.com](http://www.binder-world.com)





► DIMENSIONS

MDL 115



MK | MKF | MKT

KMF

VD | VDL

FDL | MDL

FP | M

ED | FD | FED



FP | M

## Material test chambers

### | Complex applications are our favorites!

These test chambers prove themselves best in complex applications, using advanced APT.line™ technology. Preheating chamber technology for maximum precision over a broad temperature range, plus comprehensive programming options for selecting any desired combinations of ramps, profiles, and test sequences.

- ▶ The specialist for demanding heating profiles
- ▶ Adjustable high air exchange rate



Tempering of industrial rubber seals



Drying of electronic components



Testing of plastic and synthetic materials

## FP series: Material test chambers with forced convection

FP series chambers are designed for the most demanding test applications and are particularly effective, thanks to their extensive programming abilities. The (mechanical) forced convection reliably facilitates quick drying times as well as extra rapid heating-up, even with fully loaded chambers.



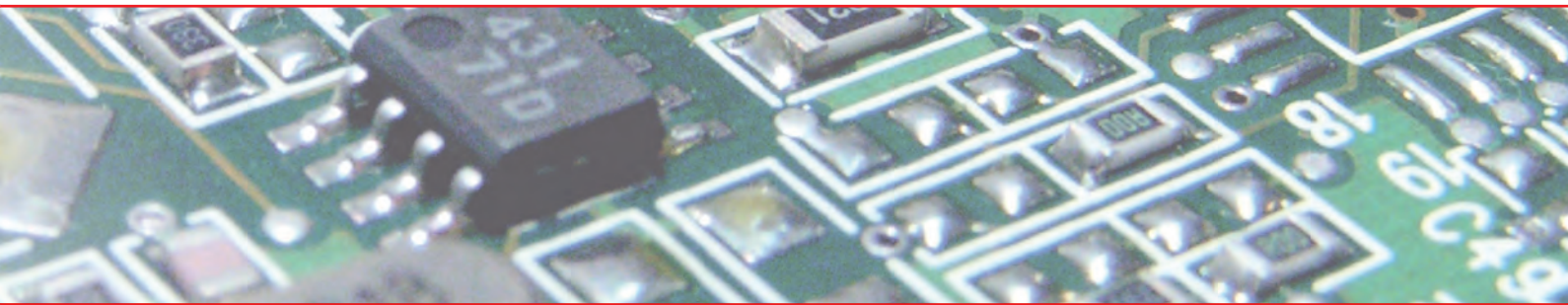
► **AREAS OF APPLICATION:**

Electronics / Semiconductor Industry, Plastics Industry, Metal Industry / Engineering, Surface Technology

► **EQUIPMENT**

- Temperature range of 5 °C above ambient temperature up to 300 °C
- MP controller with 2 programs with 10 sections each, alternatively one program with 20 sections
- The time interval of single program sections can be adjusted up to a maximum of 999h and 59min.
- Integrated week program timer with real time function
- Digital temperature setting with an accuracy of one of a degree
- Adjustable ramp function via program editor
- Adjustable fan speed
- Elapsed time indicator
- Independent adjustable temperature safety device, class 2 (DIN 12880), with visual alarm
- Adjustable front ventilation flap side by side and rear exhaust duct Ø 50 mm
- RS 422 interface for communication software APT-COM™ DataControlSystem
- Units up to 115 (4.1 cu.ft.) liters are stackable
- 2 chrome-plated racks





## ► PERFORMANCE FEATURES | FP SERIES



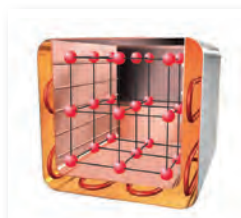
### BINDER APT.line™

- Same test conditions throughout the chamber interior, Independent of specimen size and quantity
- Homogeneous temperature conditions throughout test specimens



### Broad range of applications

- High air exchange rate and large power reserve
- Adjustable fan speed
- Short warm up times



### Guarantee for top quality and precision

- High standard according to DIN 12880 (27-point measurement)
- Short delivery times
- Minimal maintenance and operating costs



### Convenient work environment

- Very tight door closure with 2-point door latch
- Low heat dissipation due to 60 mm insulation
- Rack with tilt protection for easy loading and unloading
- Complete inner chamber made of stainless steel
- No permanent fixtures

## ► OPTIONS:

- Access port with silicone plugs
- Rack, chrome-plated or stainless steel
- Perforated shelf, stainless steel
- Reinforced rack, stainless steel
- Reinforced inner chamber, including 2 reinforced racks
- Independent adjustable temperature safety device, class 3.1 (DIN 12880)
- Door with window and interior lighting
- Door lock
- Analog temperature output, 4-20 mA, with 6-pin DIN socket
- Additional measuring channel for digital display of specimen temperature (with PT100 sensor)
- Temperature measurement acc. to DIN 12880
- HEPA fresh-air filter, Class EU14
- Increased air change rate through high performance fan
- Measurement of air change rate according to ASTM D5374
- Zero-voltage relay outputs accessible via 6-pin DIN socket
- Factory calibration certificate
- Extension to factory calibration certificate
- Data Logger Kits and software



Door with window and interior lighting



Calibration certificate and validation



Numerous access ports



BINDER INDIVIDUAL FP with specific shelves for special test specimens


# FP series

## Technical data



	FP 53	FP 115	FP 240	FP 400	FP 720
<b>Exterior dimensions</b>					
Width (mm)	635	835	1035	1235	1235
Height (inclusive feet/castors) (mm)	620	705	825	1025	1528
Depth (mm)	575	645	745	765	865
plus door handle, I-panel and exhaust duct (mm)	105	105	105	105	105
Quantity of doors	1	1	2	2	2
<b>Interior dimensions</b>					
Width (mm)	400	600	800	1000	1000
Height (mm)	400	480	600	800	1200
Depth (mm)	330	400	500	500	600
Interior volume (l)	53	115	240	400	720
Quantity of racks (standard/max.)	2/5	2/6	2/7	2/10	2/15
Load per rack (kg)	15	20	30	35	45
Permitted total load (kg)	40	50	70	90	120
Weight of the unit (empty) (kg)	45	62	98	145	184
<b>Temperature data</b>					
Temperature range, 5°C above ambient up to °C)	300	300	300	300	300
Temperature uniformity at 150°C (± K)	2	1,8	2	2,5	2
Temperature fluctuation (± K)	0,3	0,3	0,3	0,3	0,3
Heating-up time to 150°C (minutes)	24	30	27	35	39
Recov. time after door was opened for 30 sec. at 150°C (minutes)	5	8	10	17	20
Air change at 300°C (x/h)	64	32	20	18	12
<b>Electrical data</b>					
Housing protection acc. to EN 60529	IP 20	IP 20	IP 20	IP 20	IP 20
Nominal voltage (± 10%) 50/60 Hz (V)	230 1 N ~	230 1 N ~	230 1 N ~	400 3 N ~	400 3 N ~
Nominal power (kW)	1,2	1,6	2,7	3,4	5
Energy consumption at 150°C (W)	300	544	850	1200	1320
<b>Model no.</b>	<b>9010-0153</b>	<b>9010-0255</b>	<b>9010-0263</b>	<b>9010-0265</b>	<b>9010-0267</b>

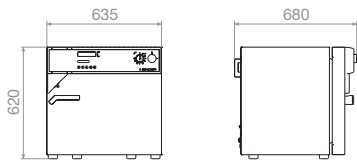
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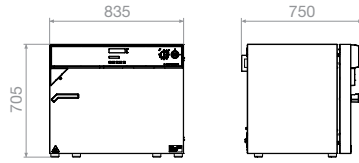


► DIMENSIONS

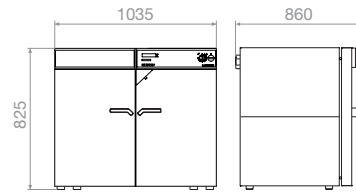
FP 53



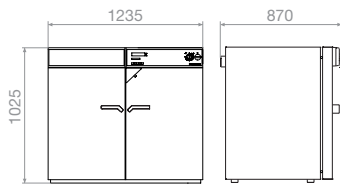
FP 115



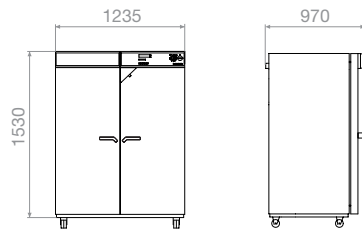
FP 240



FP 400



FP 720



MK | MKF | MKT

KMF

VD | VDL

FDL | MDL

FP | M

ED | FD | FED

# M series: Material test chambers with extensive programming

Because of its individual programming options and ability to operate at maximum temperatures up to 300 °C the M series is ideally suited for materials testing and aging tests. The heavy-duty air turbine and a programmable exhaust ventilation flap provide rapid heating-up and ensure that the test temperature is maintained absolutely precise at all levels, with minimal spatial fluctuations; performance as never before.



► **AREAS OF APPLICATION:**  
Buildings Materials Industry, Metal Industry /  
Engineering, Surface Technology, Electronics /  
Semiconductor Industry, Plastics Industry

► **EQUIPMENT**

- Temperature range of 5 °C above ambient temperature up to 300 °C
- 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
- Adjustable ramp function via program editor
- Program-controlled ventilation flap
- High air-exchange rate through high-performance fan
- Adjustable fan speed
- Rear exhaust duct Ø 50 mm
- Independent adjustable temperature safety device, class 2 (DIN 12880), with optical temperature alarm
- RS 422 interface for communication software APT-COM™ DataControlSystem
- Units up to 115 liters are stackable
- 2 chrome-plated shelves



► PERFORMANCE FEATURES | M SERIES



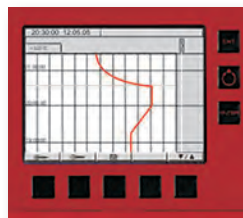
**BINDER APT.line™**

- Same test conditions throughout the chamber interior, Independent of specimen size and quantity
- Homogeneous temperature conditions throughout test specimens



**Broad range of applications**

- High air exchange rate and large power reserve
- Adjustable fan speed
- Programmable ventilator flap
- Short warm up times



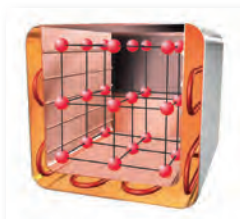
**Extensive programming**

- Convenient documentation
- All measured values read at a glance
- Controller with color display and 25 storable programs
- Integrated digital continuous-line recorder for monitoring limits and alarm function



**Convenient work environment**

- Very tight door closure with 2-point door latch
- Low heat dissipation due to 60 mm insulation
- Rack with tilt protection for easy loading and unloading
- Complete inner chamber made of stainless steel
- No permanent fixtures



**Guarantee for top quality and precision**

- High standard according to DIN 12880 (27-point measurement)
- Short delivery times
- Minimal maintenance and operating costs

► **OPTIONS:**

- Access port with silicone plugs
- Rack, chrome-plated or stainless steel
- Perforated shelf, stainless steel
- Reinforced rack, stainless steel
- Reinforced inner chamber, including 2 reinforced racks
- Door with window and interior lighting
- Door lock
- Analog temperature output, 4-20 mA, with 6-pin DIN socket
- Additional measuring channel for digital display of specimen temperature (with PT100 sensor)
- Temperature measurement acc. to DIN 12880
- HEPA fresh-air filter, Class EU14
- Increased air change rate through high performance fan
- Measurement of air change rate according to ASTM D5374
- Zero-voltage relay outputs accessible via 6-pin DIN socket
- Factory calibration certificate
- Extension to factory calibration certificate
- Data Logger Kits and software



reinforced rack



Various access ports



BINDER Data Logger Kits



BINDER INDIVIDUAL M with electrical door lock



# M series

## Technical data



	M 53	M 115	M 240	M 400	M 720
<b>Exterior dimensions</b>					
Width (mm)	635	835	1035	1235	1235
Height (inclusive feet/castors) (mm)	780	865	985	1185	1695
Depth (mm)	575	645	745	765	865
plus door handle, I-panel and exhaust duct (mm)	105	105	105	105	105
Quantity of doors	1	1	2	2	2
<b>Interior dimensions</b>					
Width (mm)	400	600	800	1000	1000
Height (mm)	400	480	600	800	1200
Depth (mm)	330	400	500	500	600
Interior volume (l)	53	115	240	400	720
Quantity of racks (standard/max.)	2/5	2/6	2/7	2/10	2/15
Load per rack (kg)	15	20	30	35	45
Permitted total load (kg)	40	50	70	90	120
Weight of the unit (empty) (kg)	61	89	131	173	203
<b>Temperature data</b>					
Temperature range, 5°C above ambient up to °C	300	300	300	300	300
Temperature uniformity at 150°C (± K)	1,3	1,5	1,5	1,5	1,9
Temperature fluctuation (± K)	0,3	0,3	0,3	0,3	0,3
Heating-up time to 150°C (minutes)	15	16	19	18	21
Recov. time after door was opened for 30 sec. at 150°C (minutes)	3	3	3	3	3
<b>Electrical data</b>					
Housing protection acc. to EN 60529	IP 20	IP 20	IP 20	IP 20	IP 20
Nominal voltage (± 10%) 50/60 Hz (V)	230 1 N ~	230 1 N ~	230 1 N ~	400 3 N ~	400 3 N ~
Nominal power (kW)	1,2	1,6	2,7	3,4	5
Energy consumption at 150°C (W)	300	544	850	1200	1320
<b>Model no.</b>	<b>9010-0201</b>	<b>9010-0202</b>	<b>9010-0203</b>	<b>9010-0204</b>	<b>9010-0205</b>

All technical data are specified for units with standard equipment at an ambient temperature of 25°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 values have been specified at a fan speed of 100 %. All indications are average values, typical for units produced in series. We reserve the right to alter technical specifications at all times.

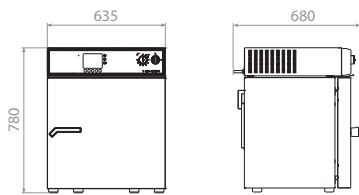


Aktuelle Informationen und Werte erhalten Sie unter:  
[www.binder-world.com](http://www.binder-world.com)

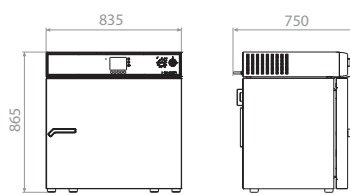


► DIMENSIONS

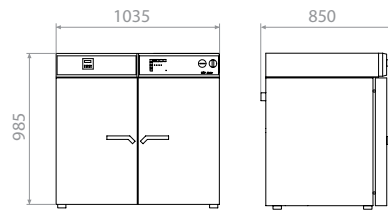
M 53



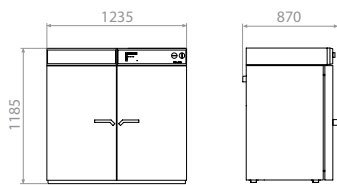
M 115



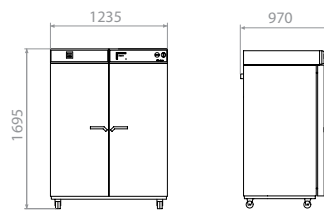
M 240



M 400



M 720





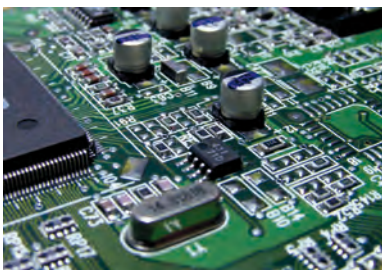
ED | FD | FED

## Drying / Heating ovens

## | A hot tip for thermal applications.

Efficient drying, long-term storage at elevated temperatures, and sterilization applications with homogenous temperature distribution are among the many tasks consistently and reliably performed by BINDER drying ovens and heating chambers. The wide temperature range 5 °C above ambient temperature up to 300 °C ensures rapid heating-up times and a large reserve capacity. Outstanding thermal insulation also lowers operating costs. We offer a wide selection of models, with an interior volume ranging from 23 to 720 l; these are available in several versions, all of which have our standard features. These chambers are available with either natural or forced convection and meet the high quality standards and process safety that are trademarks of BINDER chambers.

- ▶ Fast, even tempering
- ▶ Wide temperature range
- ▶ Quality „Made in Germany“



Drying of electronic components



Precision Engineering



Drying of plastics

## ED series: Drying ovens with natural convection

Routine drying and sterilization applications up to 300 °C and storage at precisely controlled elevated temperatures are the strengths of ED drying ovens. Because of the natural convection with a high rate of air exchange, thermal processes run with significantly increased efficiency.



► **AREAS OF APPLICATION:**

Electronics/Semiconductor Industry, Metal Industry/  
Engineering, Plastics Industry, Automotive,  
Aerospace/Defence Industry, Surface Technology

► **EQUIPMENT**

- Temperature range of 5 °C above ambient temperature up to 300 °C
- DS controller with integrated timer 0 to 99 hours
- Digital temperature setting with an accuracy of one degree
- Independent adjustable temperature safety device, Class 2 (DIN 12880), with visual temperature alarm
- Adjustable ventilation by means of rear exhaust duct Ø 50 mm with ventilation flap and front ventilation slide
- Optional RS 422 interface for communication software APT-COM™ DataControlSystem
- Units up to 115 liters are stackable
- 2 chrome-plated racks

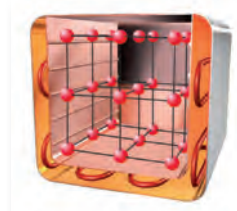


## ► PERFORMANCE FEATURES | ED SERIES



### BINDER APT.line™

- Homogeneous drying with natural convection
- Same test conditions throughout the chamber interior
- Independent of specimen size and quantity



### Guarantee for top quality and precision

- High standard according to DIN 12880 (27-point measurement)
- Short delivery times
- Minimal maintenance and operating costs



### Broad range of applications

- Standard Temperature range up to 300 °C
- Large power reserve
- Short warm up times

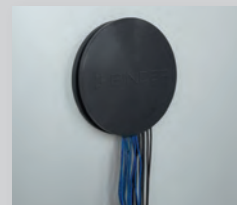


### Convenient work environment

- Very tight door closure with 2-point door latch
- Low heat dissipation due to 60 mm insulation
- Rack with tilt protection for easy loading and unloading
- Complete inner chamber made of stainless steel
- No permanent fixtures

## ► OPTIONS

- Access ports with various diameters, with silicone plug
- Rack, chrome-plated or stainless steel
- Perforated rack stainless steel
- Temperature safety device class 3.1 acc. to DIN 12880
- Door with window and interior lightning
- Lockable door
- Door gasket, FKM (Viton)
- Analog output 4-20 mA for temperature with 6 pole DIN socket, DIN plug included
- Temperature measurement acc. to DIN 12880
- Calibration certificate
- Extension for calibration certificate (additional values)
- Data Logger Kits and Logger software



Numerous access ports



Calibration certificate and validation




Door with window and interior lighting



BINDER INDIVIDUAL ED with subdivided interior and hangers

# ED series

## Technical data



	ED 23	ED 53	ED 115	ED 240	ED 400	ED 720
<b>Exterior dimensions</b>						
Width (mm)	435	635	835	1035	1235	1235
Height (inclusive feet/castors) (mm)	495	620	705	825	1025	1530
Depth (mm)	520	575	645	745	765	865
plus door handle, I-panel and exhaust duct (mm)	105	105	105	105	105	105
Quantity of doors	1	1	1	2	2	2
<b>Interior dimensions</b>						
Width (mm)	225	400	600	800	1000	1000
Height (mm)	330	400	480	600	800	1200
Depth (mm)	280	330	400	500	500	600
Interior volume (l)	20	53	115	240	400	720
Quantity of racks (standard/max.)	2/3	2/5	2/6	2/7	2/10	2/15
Load per rack (kg)	12	15	20	30	35	45
Permitted total load (kg)	25	40	50	70	90	120
Weight of the unit (empty) (kg)	22	42	57	86	125	174
<b>Temperature data</b>						
Temperature range, by 5°C above ambient up to °C	300	300	300	300	300	300
Temperature uniformity at 150°C (± K)	2,5	3,2	2,5	2,5	3	2,8
Temperature fluctuation	0,3	0,3	0,3	0,3	0,3	0,3
Heating-up time to 150°C (min)	24	27	29	48	62	69
Recov. time after door was opened for 30 sec. at 150°C (min)	5	6	9	13	20	14
<b>Electrical data</b>						
Housing protection acc. to EN 60529	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Nominal voltage (±10 %) 50/60 Hz (V)	230 1 N ~	230 1 N ~	230 1 N ~	230 1 N ~	400 3 N ~	400 3 N ~
Nominal power (kW)	0,8	1,2	1,6	2,7	3,4	5
Energy consumption at 150°C (W)	148	210	300	447	672	750
Model no.	9010-0191	9010-0079	9010-0097	9010-0101	9010-0075	9010-0076

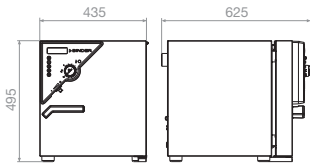
All technical specification are specified for units with standard equipment at an ambient temperature of 25 °C and a voltage fluctuation of ±10 %. The temperature data are determined in accordance to factory standard following DIN 12880, respecting the recommended wall clearances of 10 % of the height, width and depth of the inner chamber. All values have been specified at a fan speed of 100 %. All indications are average values, typical for units produced in series. We reserve the right to alter technical specifications at all times.

 Latest Information and technical data at:  
[www.binder-world.com](http://www.binder-world.com)

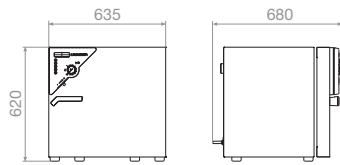


► DIMENSIONS

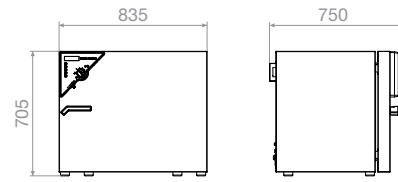
ED 23



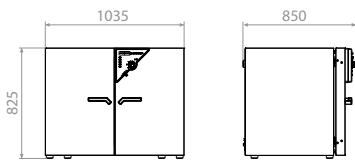
ED 53



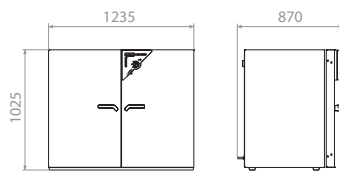
ED 115



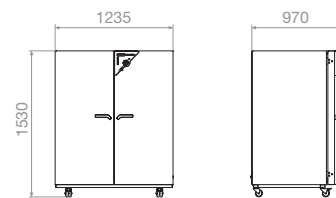
ED 240



ED 400



ED 720



MK | MKF | MKT

KMF

VD | VDL

FDL | MDL

FP | M

ED | FD | FED

## FD series: Drying ovens with forced convection

FD series units are primarily used in applications needing rapid drying and sterilization. Totally homogenous temperature distribution, rapid dynamic response, and a special air turbine which was developed by us and has 20% higher output, have made the FD series a genuine time-saving device.



► **AREAS OF APPLICATION:**

Electronics/Semiconductor Industry, Plastics Industry, Metal Industry/Engineering, Buildings Materials Industry, Automotive, Aerospace/Defence Industry, Surface Technology

► **EQUIPMENT**

- Temperature range of 5 °C above ambient temperature up to 300 °C
- DS controller with integrated timer 0 to 99 hours
- Digital temperature setting with an accuracy of one degree
- Independent adjustable temperature safety device, Class 2 (DIN 12880), with visual temperature alarm
- Adjustable ventilation by means of rear exhaust duct Ø 50 mm with ventilation flap and front ventilation slide
- Units up to 115 liters are stackable
- 2 chrome-plated racks

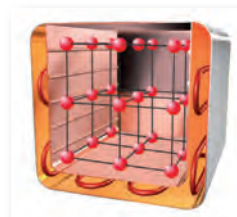


► PERFORMANCE FEATURES | FD SERIES



**BINDER APT.line™**

- Quick drying with forced convection
- Same test conditions throughout the chamber interior
- Independent of specimen size and quantity



**Guarantee for top quality and precision**

- High standard according to DIN 12880 (27-point measurement)
- Short delivery times
- Minimal maintenance and operating costs



**Broad range of applications**

- Standard Temperature range up to 300 °C
- Large power reserve
- Short warm up times



**Convenient work environment**

- User friendly microprocessor control
- Very tight door closure with 2-point door latch
- Low heat dissipation due to 60 mm insulation
- Rack with tilt protection for easy loading and unloading
- Complete inner chamber made of stainless steel
- No permanent fixtures
- Easy cleaning

► OPTIONS

- Access ports with various diameters, with silicone plug
- Rack, chrome-plated or stainless steel
- Perforated rack stainless steel
- Temperature safety device class 3.1 acc. to DIN 12880
- Door with window and interior lightning
- Lockable door
- Door gasket, FKM (Viton)
- Analog output 4-20 mA for temperature with 6 pole DIN socket, DIN plug included
- Temperature measurement acc. to DIN 12880
- Calibration certificate
- Extension for calibration certificate (additional values)
- Data Logger Kits and Logger software



Numerous access ports



Reinforced racks



Door with window and interior lighting



**BINDER INDIVIDUAL**  
FD with a special access port in the door so that specimens can even be loaded by conveyor into the chamber

MK | MKF | MKT  
KMF  
VD | VDL  
FDL | MDL  
FP | FM  
ED | FD | FED



# FD series

## Technical data



	FD 23	FD 53	FD 115	FD 240
<b>Exterior dimensions</b>				
Width (mm)	435	635	835	1035
Height (inclusive feet) (mm)	500	620	705	825
Depth (mm)	520	575	645	745
plus door handle, I-panel and exhaust duct (mm)	85	105	105	105
Quantity of doors	1	1	1	2
<b>Interior dimensions</b>				
Width (mm)	225	400	600	800
Height (mm)	330	400	480	600
Depth (mm)	277	330	400	500
Interior volume (l)	20	53	115	240
Quantity of racks (standard/max.)	2/3	2/5	2/6	2/7
Load per rack (kg)	12	15	20	30
Permitted total load (kg)	25	40	50	70
Weight of the unit (empty) (kg)	33	44	62	96
<b>Temperature data</b>				
Temperature range, 5°C above ambient up to °C	300	300	300	300
Temperature uniformity at 150°C (± K)	2,2	2	1,8	2
Temperature fluctuation (± K)	0,3	0,3	0,3	0,3
Heating-up time to 150°C (Min.)	22	22	28	24
Recov. time after door was opened for 30 sec. at 150°C (minutes)	4	4	5	6
<b>Electrical data</b>				
Housing protection acc. to EN 60529	IP 20	IP 20	IP 20	IP 20
Nominal voltage (±10 %) 50/60 Hz (V)	230 1 N ~	230 1 N ~	230 1 N ~	230 1 N ~
Nominal power (kW)	0,8	1,2	1,6	2,7
Energy consumption at 150°C (W)	300	429	544	850
Model no.	9010-0194	9010-0082	9010-0102	9010-0104

All technical specification are specified for units with standard equipment at an ambient temperature of 25 °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 values have been specified at a fan speed of 100 %. All indications are average values, typical for units produced in series. We reserve the right to alter technical specifications at all times.

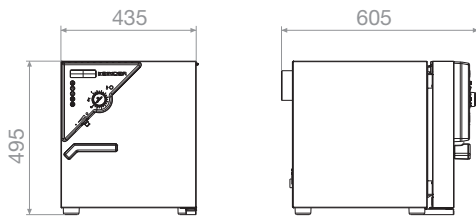


Latest Information and technical data at:  
[www.binder-world.com](http://www.binder-world.com)

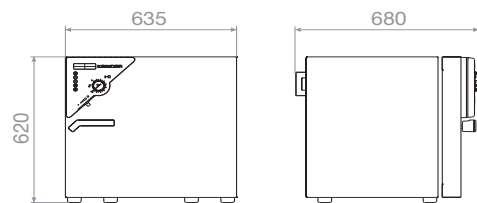


► DIMENSIONS

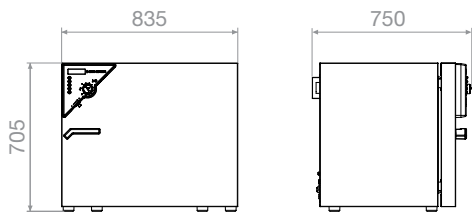
FD 23



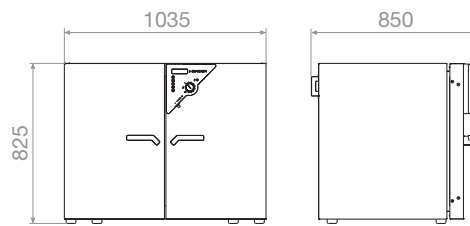
FD 53



FD 115



FD 240



MK | MKF | MKT

KMF

VD | VDL

FDL | MDL

FP | M

ED | FD | FED

## FED series: Heating chambers with forced convection

The FED series is a true all-rounder. It has a virtually unlimited capacity and is at the same time particularly adaptable to the specific requirements of a large variety of testing applications. The enhanced time functions and the digitally controlled air turbine can be used to adjust ideal temperature parameters and



### ► AREAS OF APPLICATION:

Electronics/Semiconductor Industry, Plastics Industry, Metal Industry/Engineering, Buildings Materials Industry, Automotive, Aerospace/ Defence Industry, Surface Technology

### ► EQUIPMENT

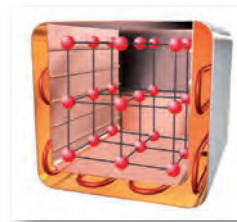
- Temperature range of 5 °C above ambient temperature up to 300 °C
- MS Controller with several timer functions
- Controller timer functions: delayed ON, delayed OFF, temperature dependent delayed OFF
- Digital temperature setting with an accuracy of one degree
- Adjustable fan speed
- Adjustable ventilation by means of rear exhaust duct Ø 50 mm with ventilation flap and front ventilation slide
- Independent adjustable temperature safety device, Class 2 (DIN 12880), with visual temperature alarm
- RS 422 interface for communication software APT-COM™ DataControlSystem
- Units up to 115 liters are stackable
- 2 chrome-plated racks

► PERFORMANCE FEATURES | FED SERIES



**BINDER APT.line™**

- Homogeneous drying with natural convection
- Same test conditions throughout the chamber interior
- Independent of specimen size and quantity



**Guarantee for top quality and precision**

- High standard according to DIN 12880 (27-point measurement)
- Short delivery times
- Minimal maintenance and operating costs



**Broad range of applications**

- Standard Temperature range up to 300 °C
- Large power reserve
- Short warm up times



**Convenient work environment**

- User friendly microprocessor control with expanded time functions
- Very tight door closure with 2-point door latch
- Low heat dissipation due to 60 mm insulation
- Rack with tilt protection for easy loading and unloading
- Complete inner chamber made of stainless steel
- No permanent fixtures
- Easy cleaning

► OPTIONS:

- Access ports with various diameters, with silicone plug
- Rack, chrome-plated or stainless steel
- Perforated rack stainless steel
- Temperature safety device class 3.1 acc. to DIN 12880
- Door with window and interior lightning
- Lockable door
- Door gasket, FKM (Viton)
- Analog output 4-20 mA for temperature with 6 pole DIN socket, DIN plug included
- Temperature measurement acc. to DIN 12880
- Calibration certificate
- Extension for calibration certificate (additional values)
- Data Logger Kit and Logger software



BINDER Data Logger



Reinforced racks



Numerous access ports



**BINDER INDIVIDUAL FED** with a special tray to enable the loading of specimens without having to open the door

# FED series

## Technical data



	FED 53	FED 115	FED 240	FED 400	FED 720
<b>Exterior dimensions</b>					
Width (mm)	635	835	1035	1235	1235
Height (inclusive feet/castors) (mm)	620	705	825	1025	1530
Depth (mm)	575	645	745	765	865
plus door handle, l-panel and exhaust duct (mm)	105	105	105	105	105
Quantity of doors	1	1	2	2	2
<b>Interior dimensions</b>					
Width (mm)	400	600	800	1000	1000
Height (mm)	400	480	600	800	1200
Depth (mm)	330	400	500	500	600
Interior volume (l)	53	115	240	400	720
Quantity of racks (standard/max.)	2/5	2/6	2/7	2/10	2/15
Load per rack (kg)	15	20	30	35	45
Permitted total load (kg)	40	50	70	90	120
Weight of the unit (empty) (kg)	44	62	96	145	195
<b>Temperature data</b>					
Temperature range, 5°C above ambient up to °C)	300	300	300	300	300
Temperature uniformity at 150°C (± K)	2	1,8	2	2,5	2
Temperature fluctuation at 70°C (± K)	0,3	0,3	0,3	0,3	0,3
Heating-up time to 150°C (minutes)	24	30	27	35	39
Recov. time after door was opened for 30 sec. at 150°C (minutes)	5	8	10	17	20
<b>Electrical data</b>					
Housing protection acc. to EN 60529	IP 20	IP 20	IP 20	IP 20	IP 20
Nominal voltage (± 10%) 50/60 Hz (V)	230 1 N ~	230 1 N ~	230 1 N ~	400 3 N ~	400 3 N ~
Nominal power (kW)	1,2	1,6	2,7	3,4	5
Energy consumption at 150°C (W)	397	544	850	1200	1320
Model no.	9010-0210	9010-0212	9010-0214	9010-0216	9010-0218

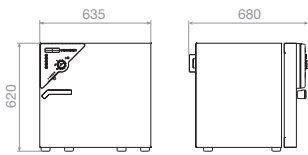
All technical specification are specified for units with standard equipment at an ambient temperature of 25 °C and a voltage fluctuation of ±10 %. The temperature data are determined in accordance to factory standard following DIN 12880, respecting the recommended wall clearances of 10 % of the height, width and depth of the inner chamber. All values have been specified at a fan speed of 100 %. All indications are average values, typical for units produced in series. We reserve the right to alter technical specifications at all times.

 Latest Information and technical data at:  
[www.binder-world.com](http://www.binder-world.com)

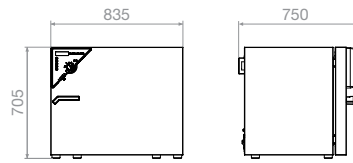


► DIMENSIONS

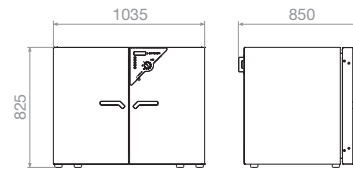
FED 53



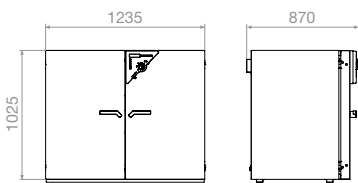
FED 115



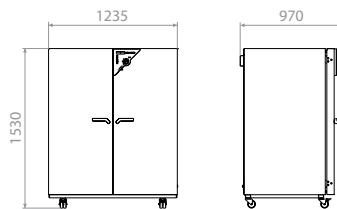
FED 240



FED 400



FED 720





# APT-COM™

## | APT-COM™ DataControlSystem

Working in compliance with standards always requires excellent documentation. APT-COM™ resulted in standard software with a uniquely universal capability: Users can easily achieve process safety and data security, as well as validation of the entire system using standard features. Easy. Cutting edge.

The system, which consists of software in three different editions and the connected equipment, offers features that are needed for tasks ranging from the simplest measurements to guideline-compliant work: Seamless monitoring of processes and documentation of process data. Documentation is automatically generated in electronic format and as hard copy. This produces guideline-compliant documentation without extra effort, just like having a tailor-made suit for every PC user. Easy to use for a broad range of applications.

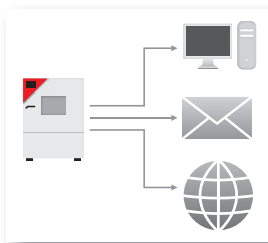
# APT-COM™ DataControlSystem

► **BINDER control and documentation system**

► **Performance potential in 3 classes**

The motto here is not “as much as possible”, but rather “as much as necessary”. This has less to do with the ever-present pressure to reduce costs, and much more to do with the fact that processes today have to be as efficient as possible to achieve the best results. This includes a software system that can meet the individual requirements of a multitude of different tests and users, all while maintaining optimal adaptability. This is the reason why we developed three different comprehensive versions of the APT-COM™ software:

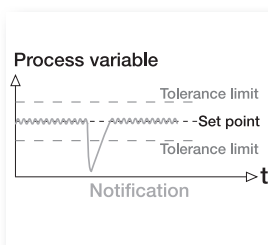
<p><b>BASIC</b></p> <p>permits remote adjustment of test parameters for the connected equipment, graphic interface programming, and manual documentation of your data.</p>	<p><b>STANDARD</b></p> <p>links up several units within a network and provides automatic documentation if required.</p>	<p><b>GLP-Edition</b></p> <p>For the highest demands we provide maximum functionality. Most regulatory requirements are met in this area in no time at all. Another strength of this version is remote alerts for limit violations or communication problems by means of independent monitoring and alert functions.</p>
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► **Clear presentation of process data**

**Always up-to-date:** Process data can be constantly accessed everywhere, either locally, by e-mail, or through the Internet.

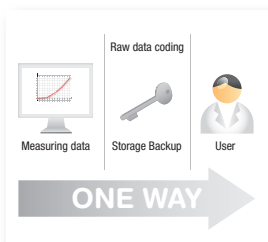
**Important information always available at a glance:** Making a decision on whether or not a process is running well is easy, thanks to the control console function.



► **Unsurpassed process safety and security**

**Tolerance limits for each monitored parameter:** No parameter can exceed the specified tolerance limits without setting off an automatic alert. The alert is sent via an intranet, the Internet, as e-mail, or as a phone call to the person responsible.

**Access restriction:** User IDs and passwords control access to sensitive processes. Different levels of authorization for system changes ensure proper system administration.



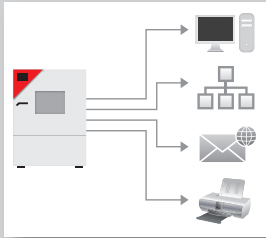
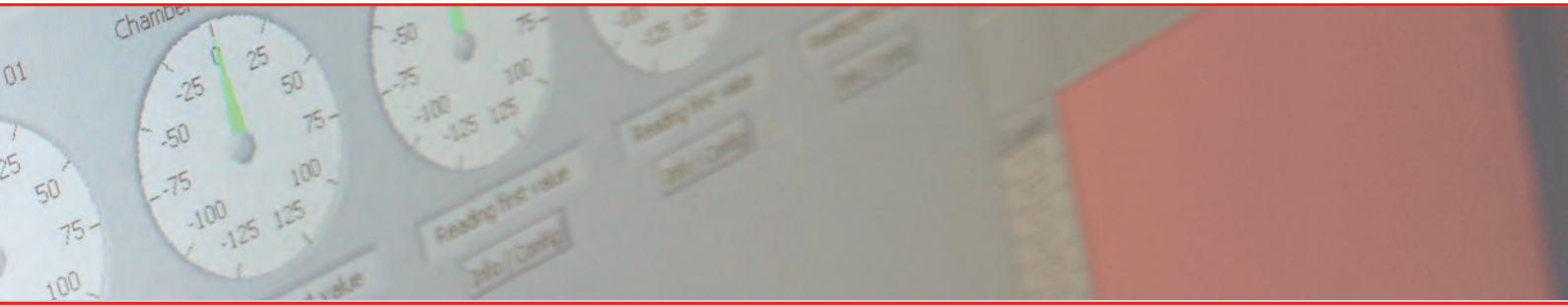
► **Guideline-compliant data security**

**Storage of measured data:** Protected against manipulation by an encrypted format, access restricted to the author or the administrator.

**Backup of measured data:** Automatic backup at user-defined time intervals for storage on all available storage media. Backed up information is easy to find thanks to automatic naming of the backup with a timestamp.

**Documentation of operator interventions:** Complete documentation of any operator interventions, with user ID, timestamp, archived protected against manipulation, and automatic backup of measured data.





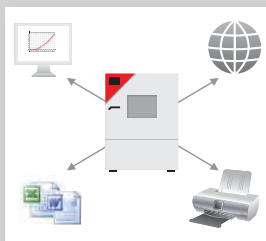
► **Time-saving documentation and presentation of results**

**Generation of measured data on the monitor:** Measured data is constantly regenerated from protected raw data and protected against manipulation.

**Display of measured data on the internet:** Users can access the process sequence with a standard browser on any PC connected to an intranet or the Internet, even without the APT-COM™ software.

**Coordinated file archiving:** Enables quick and easy display and printing of any past test runs.

**Clear printouts:** The measured data can be printed out automatically, at adjustable time intervals. Form fields for comments with respect to the measurements and for authentication ensures correct data assignment and coordination. Signature fields and page numbering provide an easy way to meet documentation requirements with minimum effort.



► **Control and programming**

**Remote monitoring of setpoints over great distances:** Equipment isn't always within close proximity of the workstation. This is why we have provided the option of transmitting process variables to the equipment via PC and reviewing equipment settings.

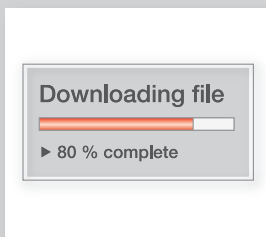
**Graphic program editor:** Facilitates the easy generation of extensive programs, which can be reviewed and transferred to different units. This saves time and increases transparency.



► **System qualification**

**Qualification folders with records for IQ and OQ:** Customized for the actual equipment and software configuration. Facilitates system validation, enjoys an excellent reputation among auditors, and saves time when implementing systems. Together with equipment qualification, a complete solution that takes full advantage of our experience.

**System qualification:** Our highly experienced BINDER service technicians supervise the proper commissioning and functionality of the system on site, and document these inspections in IQ/OQ protocols. The documentation of these important qualification steps is a comprehensive, time-saving service to ensure successful qualification.



► **Always state-of-the-art with updates**

**Software updates without added costs:** It goes without saying that our software is constantly being improved and updated. In addition to adding new equipment models, we also incorporate new guidelines and customer suggestions for improvements. Updates are available for free download from the BINDER website. Qualification documents are available for every version of the software.





# BINDER INDIVIDUAL

## | Providing the customized solutions you need.

Special applications sometimes require a special solution. Stainless steel housing and individual access ports are just the tip of the iceberg. In many cases, special projects require more technical know-how. For example, some customers have particularly heavy specimens that can't be stored in a conventional chamber, while others need a low-particle design. But no matter what the need, BINDER provides a solution. In countless projects over the years we have found successful solutions for the most diverse applications.

### CONTACT

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# BINDER INDIVIDUAL

## ► Know-how

BINDER Individual is a new name for a proven service. As a manufacturer present in many markets, sectors and applications, BINDER offers you a broad knowledge base gained through years of experience. Some examples:

- Customized optimization of heat, refrigeration, humidity, light, air, CO<sub>2</sub>, or O<sub>2</sub> supply
- Customized measurement, management, control, switching
- Customized connections, outlets, access ports
- Customized design of parameters (interior chamber)
- Customized integration of accessories (e.g. rollers)

## ► Reasons

Some of the reasons to discuss a customized solution with BINDER:

- To take advantage of know-how transfer through BINDER's extensive experience in a wide range of markets
- To create innovative solutions through individual technical consultation
- To implement simple and cost-effective customized solutions
- To optimize company-specific functionality
- To increase ease-of-use through customized designs
- Because an integrated solution is better than an in-house solution produced after the fact

## ► Service

Our technical support team is made up of application specialists, technical consultants, and engineers. This has the distinct advantage of being able to provide comprehensive services:

- including customized solutions
- professional planning
- full application support
- certified calibration and validation (factory calibration certificate)
- state-of-the-art production

## ► Our Guarantee

All of our components complement each other since they come from a single source. All work meets the requirements of ISO 9001 standards. We also guarantee our customized solutions, and provide an operating manual that covers the additional modifications.

We also guarantee a supply of spare parts for 10 years; all drawings and components for customized solutions have individual identification codes which are archived, in order to ensure that any spare parts for your customized application are provided correctly and promptly.



► Special solutions



Drying oven with subdivided interior and hangers in guide rails for tubing



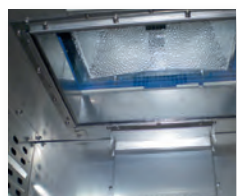
Integrated drying oven in a conveyor operation



Vacuum drying oven glove box



Safety drying oven with drawer for coil coating applications



Safety drying oven with an ultraviolet lamp for testing UV resistance



Climatic simulation chamber with additional windows, doors and access ports to accommodate the various instrument connection leads



Climatic simulation chamber with various access ports for multiple instrument connection leads



Vacuum drying oven with specific shelves for the placement of large numbers of very flat specimens



Climatic simulation chamber with full-view glass door and manual access openings



Environmental simulation chamber with reinforced inner chamber and solidly mounted perforated shelves for very heavy test specimens





# BINDER Service

## | Best Service for your success

A BINDER simulation chamber will provide you with the „best conditions for your success“ even after years of operation, because it is supported by the „best service for your success“. The BINDER Service provides expert advice and offers comprehensive solutions. A complete market service that distinguishes BINDER from its competitors and guarantees added value to the customer.

## Added value with BINDER



► **Validation service**

Reduce your expenditure in respect of equipment qualification and validation with a BINDER validation package when making your purchase. If you want to play it safe, then use our professional validation service.



► **Calibration service**

By allowing BINDER, as the manufacturer, to calibrate your equipment, you can be sure that all requirements are fulfilled for maximum process safety.

Your BINDER Support: fast, reliable performance on site, qualified calibration certificate, manufacturer's test plaque on equipment, maintenance recommendation.



► **Spare part service**

Only by using original spare parts from BINDER is the efficiency of your equipment guaranteed and an unrestricted manufacturer's warranty provided. We offer a standard 24 hour delivery service. You can be sure that we will always seek the best solution for you and your equipment.



► **Repair & Maintenance service**

You can rely on the BINDER manufacturer's service for repair work or maintenance too. We know the technology, minor modifications and updates best of all and heavily invest in training, diagnostic software and documentation.

► **Service contracts – Prevention is better than cure.**

BINDER offers a first class service with service contracts which are tailor-made to meet your requirements. Inclusive full range of consultancy, updates and exclusive internet service with the benefit of an extended warranty, including, best of all, the option of lifetime cover as part of an manufacturer's service.

- Optimum function by preventive maintenance
- Security of constant results through calibration, certificates, etc.
- Discount on spare parts
- Software updates (APT-COM™)
- Response times in accordance with your requirements
- Intensive service support
- Pool contracts
- Extended warranty period

► **BINDER®** Best conditions for your success  
is a registered trademark.

7002-0144; issue 10/2010 | The illustrations,  
information and technical specification contained  
in this catalog are all subject to change.

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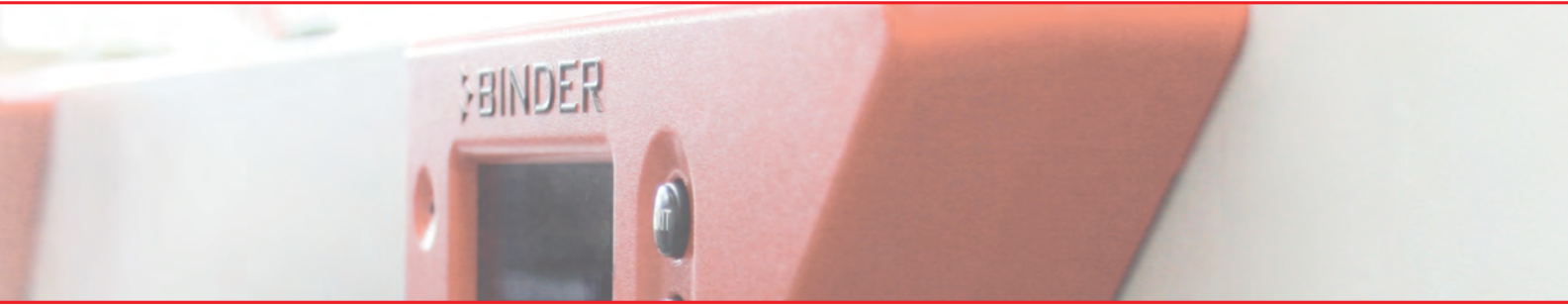
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