



BINDER Scientific  
Product catalog



27.0°C

BINDER

# Material testing

## FP | M series

### Proven experts: BINDER Material test chambers

- ▶ Proven level of performance
  - ▶ Fan with increased airflow rate
  - ▶ Adjustable rapid air exchange rate
- ▶ Proven precision
  - ▶ High standard according to DIN 12880 (27-point measurement)
  - ▶ The specialists for demanding heating profiles
  - ▶ Uniform test conditions throughout the chamber interior
- ▶ Proven versatility
  - ▶ Communication interface
  - ▶ Digital multi-program controller
  - ▶ Adjustable ventilation, program-controlled (M series)

For demanding heating profiles, these chambers show what they're made of: Best APT.line™ preheating chamber for maximum precision, wide temperature range and comprehensive programming options, with which you can customize ramps, profiles and processes.



Tempering of seals



Drying of electronic components



Plastics testing

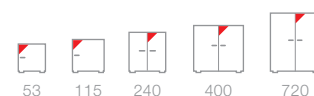
# Material test chambers with mechanical convection FP series



The FP series carries out the most demanding tests and scores particularly well with its comprehensive programming options. The mechanical (forced) convection provides reliably short drying and extremely fast heating times – even and especially for chambers under full loads.



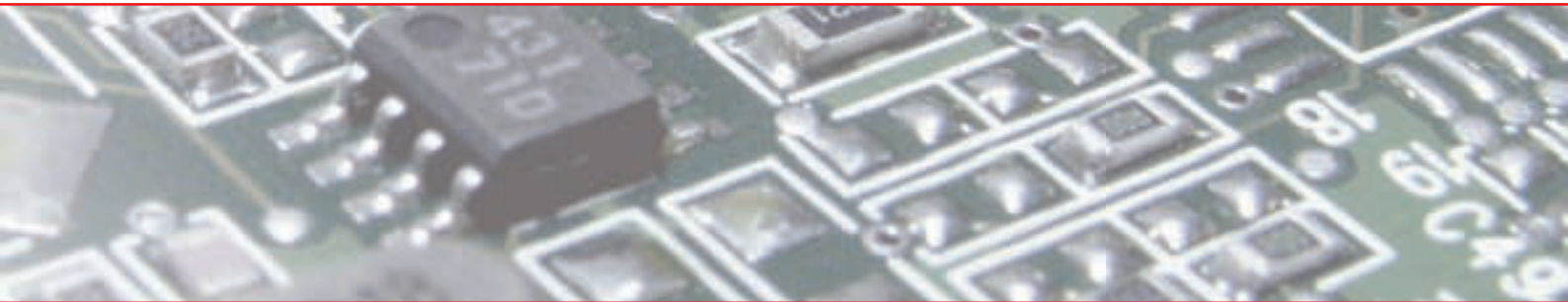
► FP 115 model



Available sizes (liters)

## ► EQUIPMENT

- Temperature range from 5 °C above ambient temperature to 300 °C
- MP controller with 2 programs with 10 sections each, alternatively switchable to program with 20 segments
- The time of an individual program step can be set to max. 999 hours and 59 minutes.
- Adjustable ramp function via program editor
- Integrated weekly program timer with real-time function
- Digital temperature setting accurate to tenths of a degree or to one degree
- Adjustable fan speed
- Adjustable ventilation by means of front ventilation flap slide and rear exhaust Ø 50 mm
- Elapsed time indicator
- Independent adjustable temperature safety device class 2 (DIN 12880), with visual temperature alarm
- RS 422 interface for APT-COM™ DataControlSystem communication software
- Units up to 115 liters are stackable
- Two chrome-plated racks included



## ► FP SERIES | BEST TEST RESULTS:



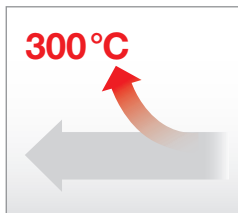
### Uniform test conditions

- APT.line™ preheating chamber
  - Homogeneous temperature distribution
  - Identical test conditions throughout the chamber interior independent of sample size and quantity



### Convenient work environment

- Hermetic door closure with 2-points door closure
- Low heat dissipation due to 60 mm insulation
- Rack with tilt protection for easy loading and unloading
- Complete stainless steel inner chamber
- No permanent fixtures



### Broad range of applications

- Rapid air exchange rate and large capacity reserves
- Adjustable fan speed
- Short heating up times



### Best quality and precision guaranteed

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

## ► OPTIONS

- Access ports with silicone plugs
- Racks, chrome-plated or stainless steel
- Perforated shelf, stainless steel
- Reinforced rack, stainless steel
- Reinforced inner chamber with 2 reinforced racks
- Independent temperature safety device class 3.1 according to DIN 12880
- Door with window and interior lighting
- Door lock
- Analog output for temperature 4 - 20 mA with 6-pin DIN socket including DIN connector
- Additional measuring channel for display of specimen temperature (PT 100 sensor)
- Temperature measurement according to DIN 12880
- HEPA fresh-air filter, class EU 14
- Increased air exchange rate through high-performance fan
- Measurement of air exchange rate according to ASTM D5374
- Isolated switching outputs (6-pin DIN socket)
- Calibration certificate
- Extension to calibration certificate
- Data Logger Kits and Logger software



Door with heated viewing window with interior lighting



Calibrations and validations



Access ports with silicone plugs



Test chamber with special racks and modified airflow

► **BINDER INDIVIDUAL**  
More information on page 133

# Technical data for your planning and installation

## FP series



	FP 53	FP 115	FP 240	FP 400	FP 720
<b>Exterior dimensions</b>					
Width (mm/inch)	635 / 25.0	835 / 32.87	1035 / 40.75	1235 / 48.62	1235 / 48.62
Height (including feet/castors) (mm/inch)	620 / 24.41	705 / 27.76	825 / 32.48	1025 / 40.35	1530 / 60.24
Depth (mm/inch)	575 / 22.64	645 / 25.39	745 / 29.33	765 / 30.12	865 / 34.06
plus door handle, I-panel and exhaust duct (mm/inch)	105 / 4.13	105 / 4.13	105 / 4.13	105 / 4.13	105 / 4.13
Number of doors	1	1	2	2	2
<b>Interior dimensions</b>					
Width (mm/inch)	400 / 15.75	600 / 23.62	800 / 31.50	1000 / 39.37	1000 / 39.37
Height (mm/inch)	400 / 15.75	480 / 18.90	600 / 23.62	800 / 31.50	1200 / 47.24
Depth (mm/inch)	340 / 13.39	410 / 16.14	510 / 20.08	510 / 20.08	610 / 24.02
Interior volume (l/cu.ft.)	53 / 1.9	115 / 4.1	240 / 8.6	400 / 14.3	720 / 25.7
Number of racks (standard/max.)	2 / 5	2 / 6	2 / 7	2 / 10	2 / 15
Load per rack (kg/lbs.)	15 / 33	20 / 44	30 / 66	35 / 77	45 / 99
Permitted total load (kg/lbs.)	40 / 88	50 / 110	70 / 155	90 / 199	120 / 265
Weight of the unit (empty) (kg/lbs.)	45 / 99	62 / 137	98 / 216	145 / 320	184 / 406
<b>Temperature data</b>					
Temperature range, 5 °C/9 °F above ambient up to °C/°F	300 / 572	300 / 572	300 / 572	300 / 572	300 / 572
Temperature uniformity <sup>1)</sup> at 150 °C/302 °F (±K)	2.0	1.8	2.0	2.5	2.0
Temperature fluctuation (±K)	0.3	0.3	0.3	0.3	0.3
Heating-up time <sup>2)</sup> to 150 °C/302 °F (min)	24	30	27	35	39
Recov. time after door was opened for 30 sec. <sup>2)</sup> at 150 °C/302 °F (min)	5	8	10	17	20
Air change at 150 °C/302 °F (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	5.0
Energy consumption at 150 °C/302 °F (Wh/h)	300	544	850	1200	1320
<b>Model no.</b>					
	9010-0153	9010-0255	9010-0263	9010-0265	9010-0267

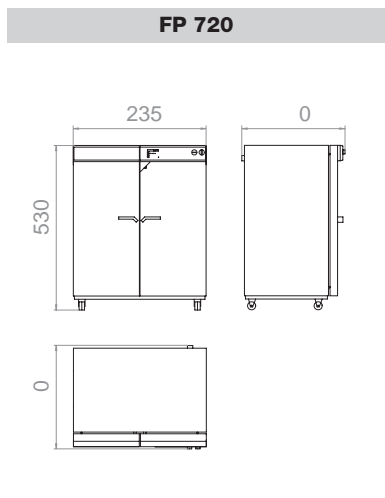
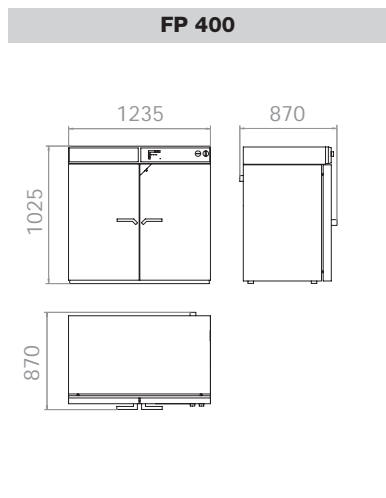
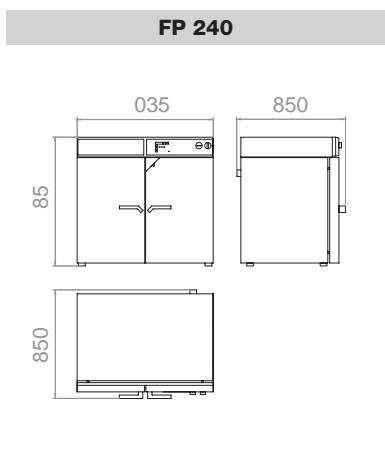
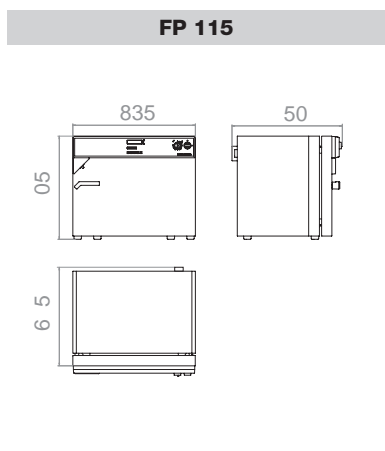
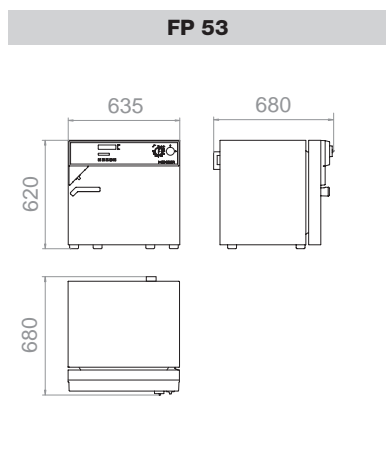
<sup>1)</sup> value without window // <sup>2)</sup> to 98 % of the set value /// All technical data are specified for units with standard equipment at an ambient temperature of 25 °C and a voltage fluctuation of ±10 %. The temperature data are determined in accordance with factory standard following DIN 12880 respecting the recommended wall clearances of 10 % of the height, width and depth of the inner chamber. All indications are average values, typical for units produced in series. We reserve the right to change technical specifications at any time.



Current information and values are available at:  
[www.binder-world.com](http://www.binder-world.com)



► DIMENSIONS



► INSTALLATION REQUIREMENTS

	FP 53	FP 115	FP 240	FP 400	FP 720
Nominal voltage ( $\pm 10\%$ ) 50/60 Hz (V)	230 1N~	230 1N~	230 1N~	400 3N~	400 3N~
Nominal power (kW)	1.2	1.6	2.7	3.4	5.0

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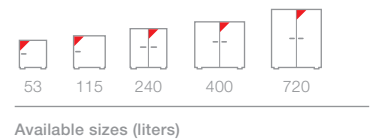
# Temperature test chambers with individual programming M series



With a maximum temperature of 300 °C and comprehensive programming options, the M series is ideally suited for material and accelerated aging testing. The particularly powerful airflow rate and programmable exhaust air valve ensure fast heating, and test temperatures are maintained at a level with minimal spatial fluctuations more accurately than ever before.



► M 720 model



## ► EQUIPMENT

- Temperature range from 5 °C above ambient temperature to 300 °C
- MCS screen controller which can store 25 programs of 100 sections each for a maximum of 500 program segments:
  - User-friendly LCD screen
  - Easy-to-read menu guidance
  - 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
- Exhaust duct Ø 50 mm
- Independent adjustable temperature safety device class 2 (DIN 12880), with visual temperature alarm
- RS 422 interface for APT-COM™ DataControlSystem communication software
- Units up to 115 liters are stackable
- Two chrome-plated racks included

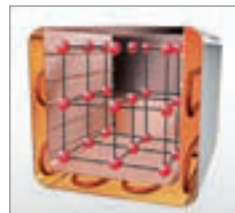


► M SERIES | BEST TEST RESULTS:



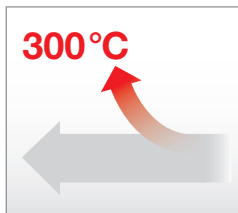
**Uniform test conditions**

- APT.line™ preheating chamber
  - Homogeneous temperature distribution
  - Same test conditions throughout the chamber interior independent of sample size and quantity



**Best quality and precision guaranteed**

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



**Broad range of applications**

- High air exchange rate and large power reserves
- Adjustable fan speed
- Short heating up times



**Convenient work environment**

- Hermetic door closure with 2-points door closure
- Low heat dissipation due to 60 mm insulation
- Rack with tilt protection for easy loading and unloading
- Complete stainless steel inner chamber
- No permanent fixtures



**Custom programming**

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

► **OPTIONS**

- Access ports with silicone plugs
- Racks, chrome-plated or stainless steel
- Perforated shelf, stainless steel
- Reinforced rack, stainless steel
- Reinforced inner chamber with 2 reinforced racks
- Door with window and interior lighting
- Door lock
- Analog output for temperature 4 - 20 mA with 6-pin DIN socket
- Additional measuring channel for display of specimen temperature (PT 100 sensor)
- Inert gas connection (gas inlet and outlet)
- Temperature measurement according to DIN 12880
- HEPA fresh-air filter, class EU 14
- Ventilation measurement according to ASTM D5374 with definition and protocol
- Calibration certificate
- Extension to calibration certificate
- Data Logger Kits and Logger software



Reinforced shelves



Various access ports



Data Logger Kits



Test chamber with electrical door lock

► **BINDER  
INDIVIDUAL**  
More information  
on page 133

# Technical data for your planning and installation

## M series



	M 53	M 115	M 240	M 400	M 720
<b>Exterior dimensions</b>					
Width (mm/inch)	635 / 25.0	835 / 32.87	1035 / 40.75	1235 / 48.62	1235 / 48.62
Height (including feet/castors) (mm/inch)	780 / 30.71	865 / 34.06	985 / 38.78	1185 / 46.65	1695 / 66.73
Depth (mm/inch)	575 / 22.64	645 / 25.39	745 / 29.33	765 / 30.12	865 / 34.06
plus door handle, l-panel and exhaust duct (mm/inch)	105 / 4.13	105 / 4.13	105 / 4.13	105 / 4.13	105 / 4.13
Quantity of doors	1	1	2	2	2
<b>Interior dimensions</b>					
Width (mm/inch)	400 / 15.75	600 / 23.62	800 / 31.50	1000 / 39.37	1000 / 39.37
Height (mm/inch)	400 / 15.75	480 / 18.90	600 / 23.62	800 / 31.50	1200 / 47.24
Depth (mm/inch)	340 / 13.39	410 / 16.14	510 / 20.08	510 / 20.08	610 / 24.02
Interior volume (mm/inch)	53 / 1.9	115 / 4.1	240 / 8.6	400 / 14.3	720 / 25.7
Quantity of racks (standard/max.)	2 / 5	2 / 6	2 / 7	2 / 10	2 / 15
Load per rack (kg/lbs.)	15 / 33	20 / 44	30 / 66	35 / 77	45 / 99
Permitted total load (kg/lbs.)	40 / 88	50 / 110	70 / 155	90 / 199	120 / 265
Weight of the unit (empty) (kg/lbs.)	61 / 135	89 / 196	131 / 289	173 / 382	203 / 448
<b>Temperature data</b>					
Temperature range, 5 °C/9 °F above ambient up to °C/°F	300 / 572	300 / 572	300 / 572	300 / 572	300 / 572
Temperature uniformity <sup>1)</sup> at 150 °C/302 °F (±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 <sup>2)</sup> to 150 °C/302 °F (min)	15	16	19	18	21
Recov. time after door was opened for 30 sec. <sup>1)2)</sup> at 150 °C/302 °F (min)	3	3	3	3	3
Air change at 150 °C/302 °F (x/h)	192	96	60	54	36
<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	5.0
Energy consumption at 150 °C/302 °F (Wh/h)	300	544	850	1200	1320
<b>Model no.</b>					
	9010-0201	9010-0202	9010-0203	9010-0204	9010-0205

<sup>1)</sup> without glass door // <sup>2)</sup> to 98 % of the set value /// 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 with factory standard following DIN 12880 respecting the recommended wall clearances of 10 % of the height, width and depth of the inner chamber.

All indications are average values, typical for units produced in series. We reserve the right to change technical specifications at any time.

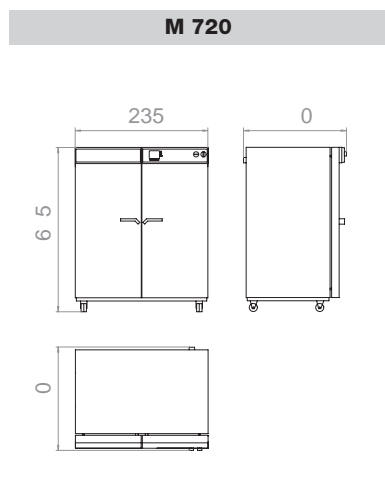
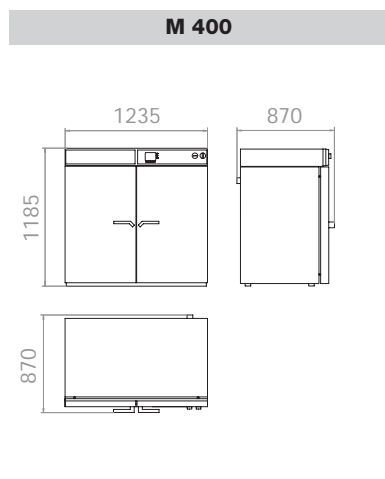
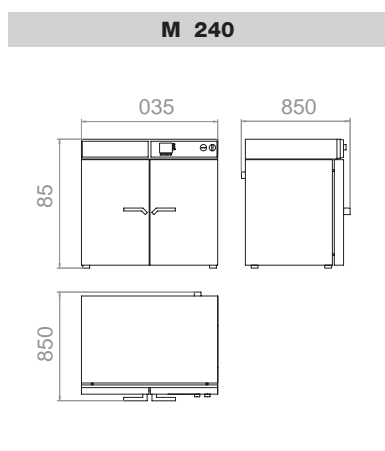
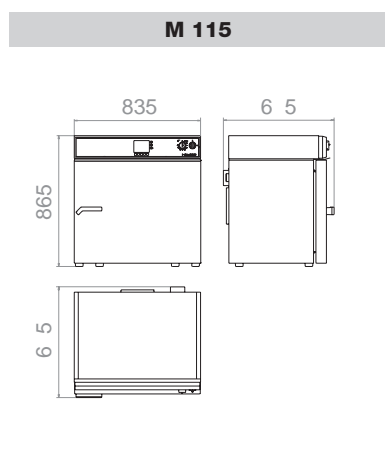
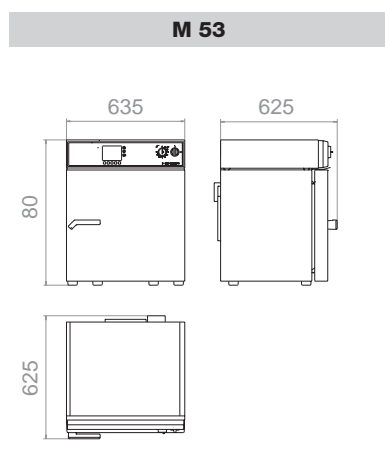


Current information and values are available at:

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



► DIMENSIONS



► INSTALLATION REQUIREMENTS

	FP 53	FP 115	FP 240	FP 400	FP 720
Nominal voltage ( $\pm 10\%$ ) 50/60 Hz (V)	230 1N~	230 1N~	230 1N~	400 3N~	400 3N~
Nominal power (kW)	1.2	1.6	2.7	3.4	5.0





# Safety drying

## FDL | MDL series

### Unconditionally good: BINDER Safety drying ovens

- ▶ Unconditionally accurate
  - ▶ Fast, uniform drying
  - ▶ Wide temperature range up to 350 °C
  - ▶ Low heat dissipation due to 60 mm insulation
  - ▶ Specimen temperature display with temperature sensor
- ▶ Unconditionally safe
  - ▶ Meets EN 1539: Fresh air monitoring with automatic switchoff
  - ▶ Safety class IP 33
  - ▶ Hermetic door with 2-points door closure
- ▶ Unconditionally versatile
  - ▶ Extension for coil coating test available for MDL series
  - ▶ Digital multi-program controller
  - ▶ Communication interface

For the perfect finish to your solvent-based paints and coating materials, we offer you two series. Absolute temperature accuracy with a high air exchange rate and thus the basis for the best results qualitatively and reproducible tests. You can work safely at all times thanks to replaceable fresh air cartridges and electronic monitoring.



Surface technology / Coating materials



Drying adhesives

# Safety drying ovens

## FDL series

This series provides the perfect environment for all specimens containing solvents: the high efficiency filter cartridge and symmetric airflow provide a silicone free and dust-free inner chamber. The FDL meets all EN 1539 requirements and also ensures maximum work safety with the intelligent fresh air monitoring program.



► FDL 115 model



115

Available size (liters)

### ► EQUIPMENT

- All safety features compliant with EN 1539
- Temperature range from 5 °C above ambient temperature to 300 °C
- MP controller with 2 programs with 10 sections each, or alternatively one program with 20 sections
- The time of an individual program step can be set to max. 999 hours and 59 minutes
- Integrated weekly program timer with real-time function
- Digital temperature setting with an accuracy of one or a tenth of a degree
- Elapsed time indicator
- Door gasket made of FKM (up to max. 200 °C)
- 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 audible and visual alarm
- Fresh-air monitoring with audible and visual alarm and automatic deactivation of heating
- Rear exhaust connector Ø 100 mm
- RS 422 interface for APT-COM™ DataControlSystem communication software
- Two chrome-plated racks included

► FDL SERIES | BEST TEST RESULTS:



**Uniform test conditions**

- APT.line™ preheating chamber
  - Homogeneous temperature distribution
  - Identical test conditions throughout the chamber interior independent of sample size and quantity



**Convenient work environment**

- Hermetic door closure with 2-points door closure
- Low heat dissipation due to 60 mm insulation
- Rack with tilt protection
- Complete stainless steel inner chamber
- No permanent fixtures
- Silicone free



**Maximum work safety**

- Defined solvent quantity meets drying safety standards
- EN 1539 compliant: Fresh air monitoring with automatic switchoff
- Safety class IP 33
- Easy to replace fresh air filter

► **OPTIONS**

- Access ports, Ø 10 mm, Ø 30 mm, right, left
- Racks, chrome-plated or stainless steel
- Perforated shelf, stainless steel
- Specimen temperature display with temperature sensor and analog output 4 – 20 mA
- Replacement air filter (class F6/EU6 for particle sizes between 1 µm and 10 µm)
- Door lock
- Door gasket made of silicone for applications > 200 °C
- Calibration certificate, measurement in center
- Extension to factory calibration certificate (additional measuring point)
- Temperature measurement according to DIN 12880



Temperature measurement of the specimen



Calibrations and validations



Various access ports



Safety drying oven with UV lamp for testing UV resistance

► **BINDER  
INDIVIDUAL**  
More information  
on page 133

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# Technical data for your planning and installation

## FDL series



	FDL 115
<b>Exterior dimensions</b>	
Width (mm/inch)	835 / 32.87
Height (including feet) (mm/inch)	800 / 31.50
Depth (mm/inch)	685 / 26.97
plus door handle (mm/inch)	50 / 1.97
<b>Interior dimensions</b>	
Width (mm/inch)	600 / 23.62
Height (mm/inch)	435 / 17.13
Depth (mm/inch)	435 / 17.13
Interior volume (l/cu.ft.)	115 / 4.1
Quantity of racks (standard/max.)	2 / 5
Load per rack (kg/lbs.)	20 / 44
Permitted total load (kg/lbs.)	50 / 110
Weight of the unit (empty) (kg/lbs.)	90 / 199
<b>Temperature data</b>	
Temperature range, 5 °C/9 °F above ambient up to °C/°F	300 / 572
Temperature uniformity at 150 °C/302 °F (±K)	2.5
Temperature fluctuation (±K)	0.3
Heating-up time <sup>2)</sup> at 150 °C/302 °F (min.)	17
Recov. time after door was opened for 30 sec. <sup>2)</sup> at 150 °C/302 °F (min.)	3
Air change (approx. x/min.)	3
Air circulation (approx. x/min.)	40
Exhaust air volume flow (approx. L/Min. m <sup>3</sup> /h)	400 (24.0)
Air flow velocity (m/sec)	0.8 – 1.2
Highest permitted solvent quantity (g) (at T-180 °C, M-100 g/mol, U-40 g/m <sup>3</sup> , 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/302 °F (Wh/h)	1098
<b>Model no.</b>	<b>9010-0269</b>

<sup>1)</sup> value without window // <sup>2)</sup> to 98 % of the set-point value /// 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 with factory standard following DIN 12880 respecting the recommended wall clearances of 10 % of the height, width and depth of the inner chamber. All indications are average values, typical for units produced in series. We reserve the right to change technical specifications at any time.



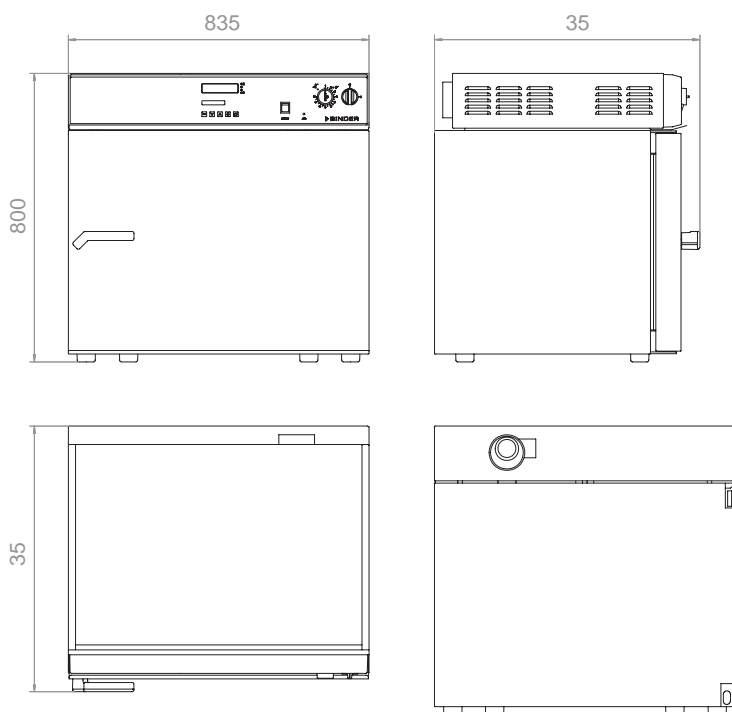
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► DIMENSIONS

**FDL 115**



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► INSTALLATION REQUIREMENTS

	FDL 115
Nominal voltage (+10 %) 50/60 Hz (V)	230
Nominal power (kW)	2.9

# Safety drying ovens with expanded temperature range

## MDL series

The MDL series works at temperatures up to 350 °C and at an extremely high airflow rate. It is perfectly suited for high-temperature testing such as in the coil coating testing sector. The preheating chamber technology with special airflow design allows evenly distributed burn-in over a very short period – and all that with maximum work safety due to electronic fresh air monitoring. The customized programming also gives you all the freedom you need for your work.



► MDL 115 model



115

Available size (liters)

### ► EQUIPMENT

- Compliant with all EN 1539 safety requirements
- Temperature range from 5 °C above ambient temperature to 350 °C
- MCS controller which can store 25 programs of 100 sections each for a maximum of 500 program segments
  - User-friendly LCD screen
  - Easy-to-read menu guidance
  - Integrated electronic chart recorder
  - Variety of options for the graphic display of process parameters
  - Real-time clock
- Heating output 9.0 kW
- Door gasket made of high temperature resistant silicone
- Rear exhaust connector 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 audible and visual alarm
- Fresh-air monitoring with audible and visual alarm and automatic heating feature deactivation
- RS 422 interface for APT-COM™ DataControlSystem communication software
- Two chrome-plated racks included

► MDL SERIES | BEST TEST RESULTS:



**Uniform test conditions**

- APT.line™ preheating chamber
  - Homogeneous temperature distribution
  - Identical test conditions throughout the chamber interior independent of sample size and quantity



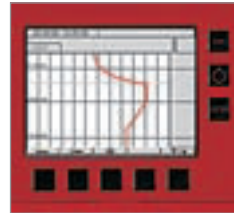
**Convenient work environment**

- Hermetic door closure with 2-points door closure
- Low heat dissipation due to 60 mm insulation
- Rack with tilt protection
- Complete stainless steel inner chamber
- No permanent fixtures



**Maximum work safety**

- Defined solvent quantity meets drying safety standards
- EN 1539 compliant: Fresh air monitoring with automatic switchoff
- Safety class IP 33
- Easy to replace fresh air filter



**Custom programming**

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

► **OPTIONS**

- Racks, chrome-plated or stainless steel
- Perforated shelf, stainless steel
- Extension in the door for coil coating tests
- Replacement air filter (class F6/EU6 for particle sizes between 1 µm and 10 µm)
- Additional measuring channel for digital display of specimen temperature with clip temperature sensor
- Door lock
- Lockable controller keyboard
- Calibration certificate, measurement in center
- Extension to factory calibration certificate (additional measuring point)
- Temperature measurement according to DIN 12880



Temperature measurement of the specimen



Extension for coil coating applications



Calibrations and validations



Safety drying oven with HEPA fresh-air filter EU 14

► **BINDER INDIVIDUAL**  
More information on page 133

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# Technical data for your planning and installation

## MDL series



	MDL 115
<b>Exterior dimensions</b>	
Width (mm/inch)	835 / 32.87
Height (including feet) (mm/inch)	800 / 31.50
Depth (mm/inch)	685 / 26.97
plus door handle (mm/inch)	50 / 1.97
<b>Interior dimensions</b>	
Width (mm/inch)	600 / 23.62
Height (mm/inch)	435 / 17.13
Depth (mm/inch)	435 / 17.13
Interior volume (l/cu.ft.)	115 / 4.1
Quantity of racks (standard/max.)	2 / 5
Load per rack (kg/lbs.)	20 / 44
Permitted total load (kg/lbs.)	50 / 110
Weight of the unit (empty) (kg/lbs.)	90 / 199
<b>Temperature data</b>	
Temperature range, 5 °C/9 °F above ambient up to °C/°F	350 / 662
Temperature uniformity at 150 °C/302 °F (±K)	3.4
Temperature uniformity with door flap at 150 °C/302 °F (±K)	3
Temperature fluctuation (±K)	0.5
Heating-up time <sup>2)</sup> at 150 °C/302 °F (minutes)	6
Recov. time after door was opened for 30 sec. <sup>2)</sup> at 150 °C/302 °F (minutes)	2
Recov. time after door was opened for 30 sec <sup>2)</sup> with door flap, at 150 °C/302 °F (minutes)	1
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-100 g/mol, U-40 g/m <sup>3</sup> , 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/302 °F (Wh/h)	1130
Model no.	9010-0200

<sup>1)</sup> value without window // <sup>2)</sup> to 98 % of the set-point value /// 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 with factory standard following DIN 12880 respecting the recommended wall clearances of 10 % of the height, width and depth of the inner chamber. All indications are average values, typical for units produced in series. We reserve the right to change technical specifications at any time.

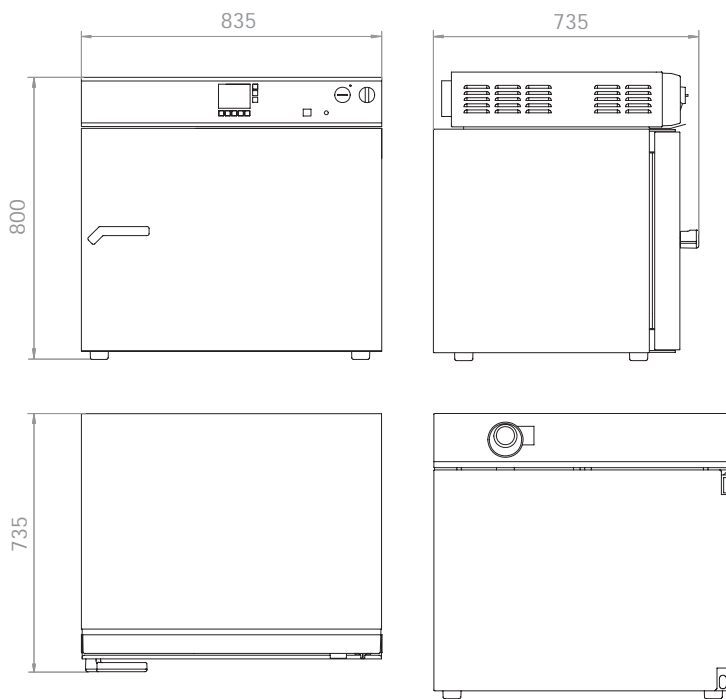


Current information and values are available at:  
[www.binder-world.com](http://www.binder-world.com)



► DIMENSIONS

**MDL 115**



► INSTALLATION REQUIREMENTS

	MDL 115
Nominal voltage ( $\pm 10\%$ ) 50/60 Hz (V)	400 V / 3N~
Nominal power (kW)	9

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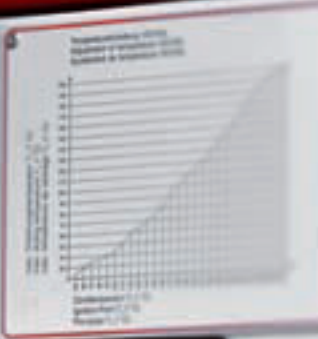
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BINDER



# Vacuum drying

## VD | VDL series

### Extremely superior: BINDER Vacuum drying ovens

- ▶ Extremely fast
  - ▶ Direct heat transfer to the sample material through thermal conducting plates
  - ▶ Fast, condensation-free drying processes
  - ▶ Homogeneous sample drying
- ▶ Extremely safe
  - ▶ VDL series with explosion-proof inner chamber (ATEX compliant)
  - ▶ Maximum specimen protection with adjusted overshooting
  - ▶ Ensures optimal work safety through its one-of-a-kind safety concept
- ▶ Extremely durable
  - ▶ Inner chamber made of highly corrosion resistant stainless steel V4A (1.4571)
  - ▶ Coordinated, modular system
  - ▶ Application-specific Vacuum chemical membrane pumps

Both VD and VDL ovens can dry samples completely without residues, scaling or oxidation, and this is achieved in overdrive. Depending on your individual safety requirements, our unique safety concept sets a new standard and is combined with a first-rate performance and quality.



Semiconductors / Electronics



Chemistry / Plastic



Precision engineering

# Vacuum drying ovens for non-flammable solvents VD series

The VD series makes a strong impression with its drying abilities which provide a homogeneous temperature distribution ensured by its electronically controlled APT.line™ preheating chamber. The patented shelf expansion technology guarantees optimal heat transfer. The shelves are easy to clean and provide a flexible positioning.



► VD 53 model



23 53 115

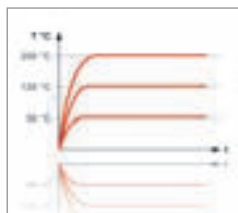
Available sizes (liters)

## ► EQUIPMENT

- Temperature range from 15 °C above ambient temperature to 200 °C
- MP controller with two programs with 10 sections each or switchable to one program with 20 sections
- Integrated weekly program timer with real-time function
- Digital temperature setting with an accuracy of one degree
- Precision-adjustable ventilation valve (for VD 23, the inert gas connection is also used as the ventilation valve)
- Precision-adjustable inert gas valve with Cross-Flow Technology
- All electrical components are decoupled from the inner chamber
- Spring-mounted safety glass panel with shatter protection
- Independent adjustable temperature safety device class 2 (DIN 12880), with visual temperature alarm
- Analog pressure gauge (displays pressure difference between the inner chamber and ambient pressure)
- Electro polished inner chamber, suction and ventilation tubes, pressure container, expansion racks and ball valve are made of highly corrosion resistant stainless steel V4A (1.4571)
- Door gasket made of tempered silicone
- Two x 24 V DC (max 0.4 A) switching outputs, switched via two control contacts in the program editor
- RS 422 interface for APT-COM™ DataControlSystem communication software
- Two patented, flexible aluminum expansion racks
- Also available as complete system with module and vacuum pump

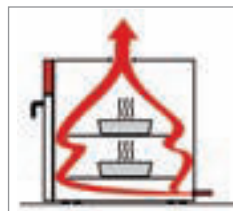


► **VD SERIES | FAST AND CONDENSATION-FREE DRYING PROCESS:**



**Process stability for perfect results**

- Innovative control concept for regulation of the entire temperature range without overshooting
  - Short heating up times
  - Easy operation
- APT.line™ preheating chamber
  - Gentle drying throughout the chamber interior
  - Direct heat transfer through large thermal conducting plates
  - Patented, flexible positioning of the expansion racks



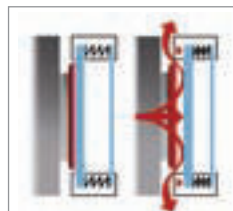
**Accelerated drying process**

- BINDER Cross-Flow Principle
- Even flow throughout the inner chamber from bottom to top
- Finely adjustable inert gas valve without turbulence for lighter samples
- Individually controlled



**Convenient, safe work environment**

- BINDER Complete system
- Coordinated, modular system consisting of vacuum drying oven, application-specific vacuum pumps and vacuum module.
  - Connection kit for easy assembly
  - Optimal working height
  - Low noise
  - Pressure and temperature profiles are depicted simultaneously



**Tested security**

- BINDER safety concept
- Spring-mounted safety glass panel with shatter protection
- 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
- Inner chamber and all connections made of highly corrosion resistant stainless steel V4A (1.4571)
  - Fixtures are fully removable

► **OPTIONS**

- Expansion racks, stainless steel
- Connection kit with various small-flange components
- Measuring port for vacuum-tight access port of measuring lines into the device (9-pin)
- Temperature measurement of the specimen with flexible PT 100 sensor and digital specimen temperature display
- Digital pressure display, measuring range from 1 mbar to atm. pressure, display accuracy 1 mbar
- Calibration certificates
- Extension to calibration certificate (additional measuring points)
- 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 for installation of vacuum pumps
- Measuring port
- Specimen temperature display with PT 100 sensor
- Validations and calibrations
- Vacuum drying oven with special racks for large numbers of particularly flat samples



Measuring port



Specimen temperature display with PT 100 sensor



Validations and calibrations



Vacuum drying oven with special racks for large numbers of particularly flat samples

► **BINDER INDIVIDUAL**  
More information on page 133

# Technical data for your planning and installation

## VD series



	VD 23	VD 53	VD 115
<b>Exterior dimensions</b>			
Width VD (mm/inch)	515 / 20.28	635 / 25.0	740 / 29.13
Height VD (including feet) (mm/inch)	655 / 25.79	775 / 30.51	900 / 35.43
Total height VD + option "vacuum module" (mm/inch)	1280 / 50.39	1400 / 55.12	1525 / 60.04
Depth incl. door handle, connection (mm/inch)	600 / 23.62	650 / 25.59	770 / 30.31
<b>Interior dimensions</b>			
Width (mm/inch)	285 / 11.22	400 / 15.75	506 / 19.92
Height (mm/inch)	285 / 11.22	400 / 15.75	506 / 19.92
Depth (mm/inch)	295 / 11.61	340 / 13.39	460 / 18.11
Interior volume (l/cu.ft.)	23 / 0.81	53 / 1.87	115 / 4.06
Quantity of expansion racks (aluminum) (standard/max.)	2 / 4	2 / 5	2 / 6
Load per rack (kg/lbs.)	20 / 44	20 / 44	20 / 44
Permitted total load (kg/lbs.)	35 / 77	45 / 99	65 / 143
Weight of the unit (empty) (kg/lbs.)	63 / 139	95 / 210	153 / 338
<b>Temperature data</b>			
Temperature range, 15 °C/27 °F above ambient up to °C/°F	200 / 392	200 / 392	200 / 392
Temperature uniformity <sup>1)</sup> at 100 °C/212 °F (±K)	1.5	2	3.5
Temperature fluctuation <sup>1)</sup> (±K)	0.1	0.1	0.1
Heating up time <sup>1) 2)</sup> to 100 °C (min.) Position POWER	65	80	95
Permitted end vacuum (mbar / inchHg)	0,01 / 0.000295	0,01 / 0.000295	0,01 / 0.000295
Leak rate max. (bar/h / inHg/h)	0,01 / 2.95	0,01 / 2.95	0,01 / 2.95
<b>Electrical data VD</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	1.9
Energy consumption at 100 °C (Wh/h)	105	150	250
<b>Model no.</b>	<b>9030-0029</b>	<b>9030-0030</b>	<b>9030-0031</b>
<b>Electrical data VD-UL</b>			
Nominal voltage (±10 %) 60 Hz (V)	115	115	115
Nominal current (A)	10.5	14.8	7.0
Nominal power (kW)	1.2	1.7	0.8
<b>Model no. UL unit</b>	<b>9030-0035</b>	<b>9030-0036</b>	<b>9030-0037</b>

<sup>1)</sup> values measured with aluminum racks // <sup>2)</sup> to 98 % of the set-point value /// 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 with factory standard following DIN 12880 respecting the recommended wall clearances of 10 % of the height, width and depth of the inner chamber. All indications are average values, typical for units produced in series. We reserve the right to change technical specifications at any time.

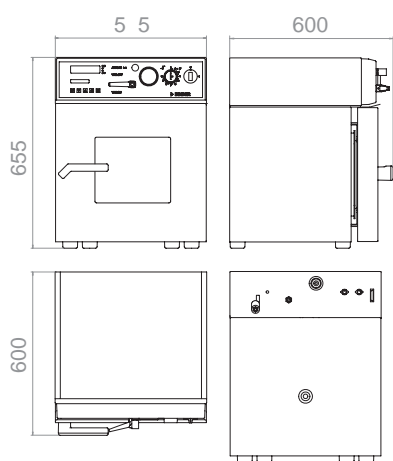


Current information and values are available at:  
[www.binder-world.com](http://www.binder-world.com)

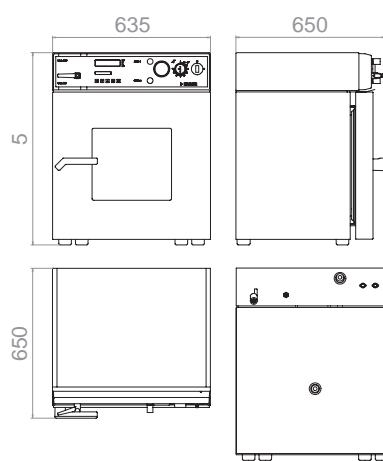


► DIMENSIONS

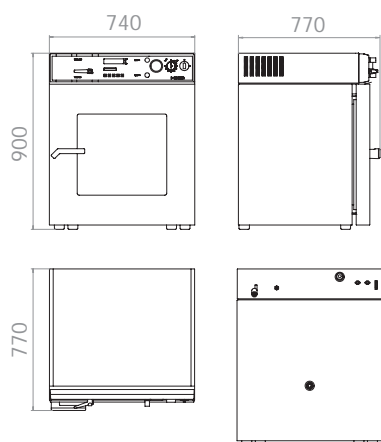
**VD 23**



**VD 53**



**VD 115**



► INSTALLATION REQUIREMENTS

	VD 23	VD 53	VD 115
Vacuum connection with small flange (DN mm/inch)	16 / 0.63	16 / 0.63	16 / 0.63
Measuring access port with small flange (DN mm/inch)	16 / 0.63	16 / 0.63	16 / 0.63
Inert gas connection with flow limiter (RP")	3 / 8	3 / 8	3 / 8

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# Safety vacuum drying ovens for flammable solvents

## VDL series

The safety package of the VDL series ensures maximum safety when drying organic solvents standard with TÜV/GS. The inner chamber is designed according to ATEX directive 94/9/EC for Zone EX II 3G.



► VDL 53 model



23 53 115

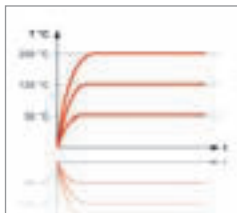
Available sizes (liters)

### ► EQUIPMENT

- Temperature range from 15 °C above ambient temperature to 200 °C
- MP controller with 2 programs with 10 sections each or switchable to one program with 20 segments
- Digital temperature setting with an accuracy of one degree
- Spring-mounted safety glass panel with shatter protection
- Pressure control device for heating activated < 125 mbar
- Over pressure capsuled instrument panel with compressed air connection and maintenance unit
- Flame protection gasket
- Precision-adjustable ventilation valve
- Precision-adjustable inert gas valve with Cross-Flow Technology
- Analog pressure gauge (displays pressure difference between the inner chamber and ambient pressure)
- Electro polished inner chamber, suction and ventilation tubes, pressure container, expansion racks 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 temperature alarm
- RS 422 interface for APT-COM™ DataControlSystem communication software
- Two patented, flexible aluminum expansion racks
- Also available as complete system with module and vacuum pump

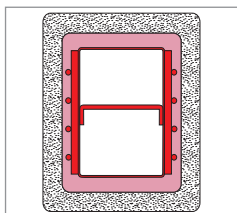


► VDL SERIES | FAST AND CONDENSATION-FREE DRYING PROCESS:



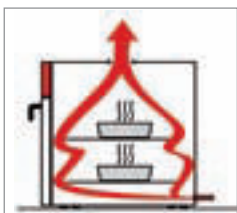
**Process stability for perfect results**

- Innovative control concept for regulation of the entire temperature range without overshooting
  - Short heating up times
  - Easy operation
- APT.line™ preheating chamber
  - Gentle drying throughout the chamber interior
  - Direct heat transfer through large thermal conducting plates
  - Patented, flexible positioning of the expansion racks



**Standards compliant according to ATEX II 3G**

- BINDER safety concept
- Explosion-protected inner chamber in accordance with EX II 3G
- Spring-mounted safety glass panel with shatter protection
- Standard inert glass connection for interior flushing
- Electronic components decoupled from the inner chamber
- Overpressure encapsulated instrument field
- Automatic heating activated < 125 mbar
- Patented flame protection gasket



**Accelerated drying process**

- BINDER Cross-Flow Principle
- Even flow throughout the inner chamber from bottom to top
- Finely adjustable inert gas valve without turbulence for lighter samples
- Individually controlled



**Simple, time-saving cleaning**

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

► OPTIONS

- Expansion racks, stainless steel
- Connection kit with various small-flange components
- Measuring port for vacuum-tight access port of measuring lines into the device (9-pin)
- Temperature measurement of the specimen with flexible PT 100 sensor and digital specimen temperature display
- Calibration certificates
- Extension to calibration certificate (additional measuring points)
- Door gasket, FKM (Viton)
- Vacuum module with ATEX chemical membrane pump VP 4
- Vacuum module with ATEX chemical membrane pump VP 5
- Vacuum module for installation of vacuum pumps



BINDER one-stop solution vacuum module with pump



ATEX chemical membrane pump VP 4



Vacuum drying oven with custom-made front panel for additional protection against gas leakage

► BINDER  
INDIVIDUAL  
More information  
on page 133

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# Technical data for your planning and installation

## VDL series



	VDL 23	VDL 53	VDL 115
<b>Exterior dimensions</b>			
Width VDL (mm/inch)	515 / 20.28	635 / 25.0	740 / 29.13
Height VDL (including feet) (mm/inch)	655 / 25.79	775 / 30.51	900 / 35.43
Total height VDL + option "vacuum module" (mm/inch)	1280 / 50.39	1400 / 55.12	1525 / 60.04
Depth incl. door handle, connection (mm/inch)	600 / 23.62	650 / 25.59	770 / 30.31
<b>Interior dimensions</b>			
Width (mm/inch)	285 / 11.22	400 / 15.75	506 / 19.92
Height (mm/inch)	285 / 11.22	400 / 15.75	506 / 19.92
Depth (mm/inch)	295 / 11.61	340 / 13.39	460 / 18.11
Interior volume (l/cu.ft.)	23 / 0.81	53 / 1.87	115 / 4.06
Quantity of expansion racks (aluminum) (standard/max.)	2 / 4	2 / 5	2 / 6
Load per rack (kg/lbs.)	20 / 44	20 / 44	20 / 44
Permitted total load (kg/lbs.)	35 / 77	45 / 99	65 / 143
Weight of the unit (empty) (kg/lbs.)	63 / 139	95 / 210	153 / 338
<b>Temperature data</b>			
Temperature range, 15 °C/27 °F above ambient up to °C/°F	200 / 392	200 / 392	200 / 392
Temperature uniformity <sup>1)</sup> at 100 °C/212 °F (±K)	1.5	2	3.5
Temperature fluctuation <sup>1)</sup> (±K)	0.1	0.1	0.1
Heating up time <sup>1)2)</sup> to 100 °C (min.) Position POWER	65	80	95
Permitted end vacuum (mbar/inchHg)	0.01 / 0.000295	0.01 / 0.000295	0.01 / 0.000295
Leak rate (mbar/h / inchHg/h)	10 / 0.295	10 / 0.295	10 / 0.295
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 (Wh/h)	105	150	250
<b>Model no.</b>			
	9030-0038	9030-0039	9030-0040

<sup>1)</sup> values measured with aluminum racks // <sup>2)</sup> up to 98 % of the set-point value /// 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 indications are average values, typical for units produced in series. We reserve the right to change technical specifications at any time.

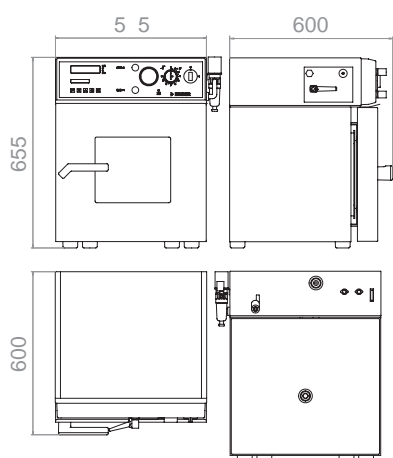


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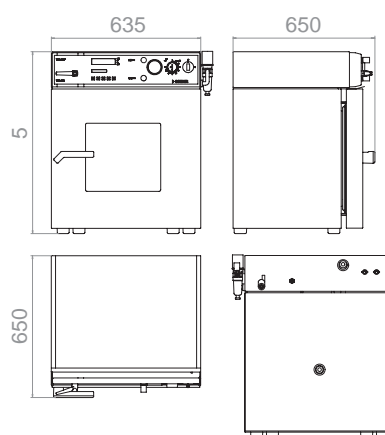


► DIMENSIONS

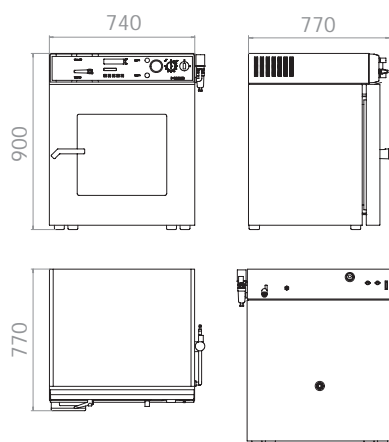
**VDL 23**



**VDL 53**



**VDL 115**



► INSTALLATION REQUIREMENTS

	VDL 23	VDL 53	VDL 115
Vacuum connection with small flange (DN mm/inch)	16 / 0.63	16 / 0.63	16 / 0.63
Measuring access port with small flange (DN mm/inch)	16 / 0.63	16 / 0.63	16 / 0.63
Inert gas connection with flow limiter (RP")	3 / 8	3 / 8	3 / 8

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# Vacuum module with pump

## VD series



For the VD series, you get an optional separate vacuum module for an ergonomic working height and to reduce noise.

The associated chemical membrane pump is available in three different designs - depending on individual needs. The speed-controlled vacuum pump VP 3.1, for example, adapts to the relevant process cycle and offers up to 30 % time savings.

Additional benefits:

- ▶ Excellent pumping speed even at low pressure
- ▶ Long lifespan due to its oil-free operation
- ▶ Special fluoroplastics provide high chemical resistance



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	2.0 m³/h	3.4 m³/h	4.6 m³/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	•	•	•



# Vacuum module with pump

## VDL series



In the vacuum module of the VDL series, there are two different chemical membrane pumps to choose from with different suction capacity and final pressure. Both models are ATEX approved and distinguish themselves by the pressure-capsulated motor with integrated, self-locking overload and overheating protection.

In potentially explosive areas, only ATEX-compliant operating materials may be used since July 1, 2003. All BINDER vacuum pumps for the VDL series are ATEX-compliant.



Vacuum module with integrated chemical membrane pump	Vacuum module with chemical membrane pump, explosion protected	Vacuum module with chemical membrane pump, explosion protected
Typ	VP 4	VP 5
ATEX approval according to ATEX 94/9/EC	yes	yes
Nominal airflow	1.9 m³/h	3.7 m³/h
Final pressure	12 mbar	3 mbar
Electrical connection (50 Hz)	230 V	230 V
VDL 23 series	•	–
VDL 53 series	•	–
VDL 115 series	•	•
Application profile	Approved ATEX-compliant Membrane pump for VDL 23 VDL 53 series	Approved ATEX-compliant Membrane pump with low final vacuum for VDL 115 series

- Option
- not available

We reserve the right to alter technical specifications at any time.

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