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 dying 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.

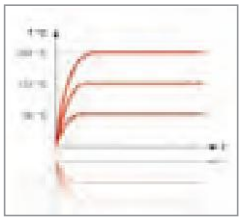
▶ VD 53 model

Available sizes (liters)

▶ **EQUIPMENT**

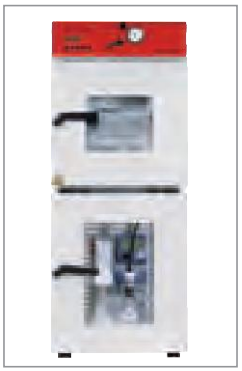
- Temperature range from 15 °C above ambient temperature to 200 °C
- MP controller with two programs with 10 sections each or switchable to one program with 20 sections
- Integrated weekly program timer with real-time function
- Digital temperature setting with an accuracy of one degree
- Precision-adjustable 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



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

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

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
- Vaccuum 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

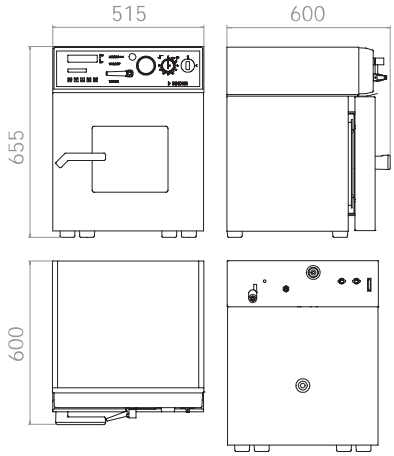
	VD 23	VD 53	VD 115
Exterior dimensions			
Width VD (mm/inch)	515 / 20.28	635 / 25.0	740 / 29.13
Height VD (including feet) (mm/inch)	655 / 25.79	775 / 30.51	900 / 35.43
Total height VD + option "vacuum module" (mm/inch)	1280 / 50.39	1400 / 55.12	1525 / 60.04
Depth incl. door handle, connection (mm/inch)	600 / 23.62	650 / 25.59	770 / 30.31
Interior dimensions			
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
Temperature data			
Temperature range, 15 °C/27 °F above ambient up to °C/°F	200 / 392	200 / 392	200 / 392
Temperature uniformity[1] at 100 °C/212 °F (±K)	1.5	2	3.5
Temperature fluctuation [1] (±K)	0.1	0.1	0.1
Heating up time [1] [2] 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
Electrical data VD			
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
Model no.	**9030-0029**	**9030-0030**	**9030-0031**
Electrical data VD-UL			
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
Model no. UL unit	**9030-0035**	**9030-0036**	**9030-0037**

[1] values measured with alumimum racks // [2] 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 determinated 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.

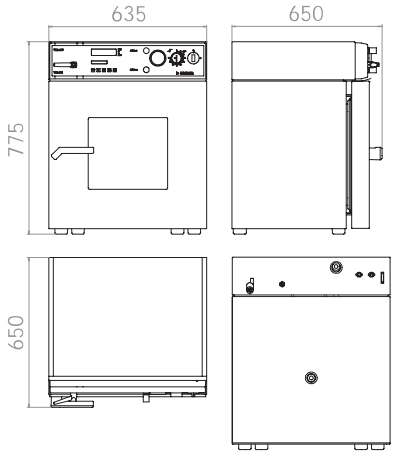
Current information and values are available at:
www.binder-world.com

DIMENSIONS

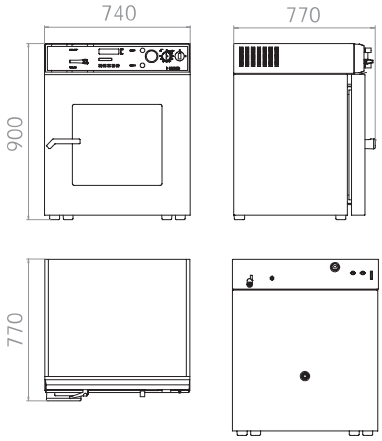
VD 23



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

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.

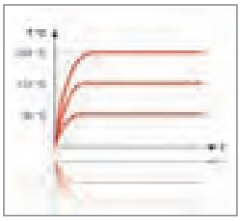
▶ VDL 53 model

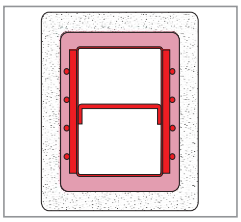
Available sizes (liters)

▶ **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 resistent 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

Technical data
for your planning and installation
VDL series



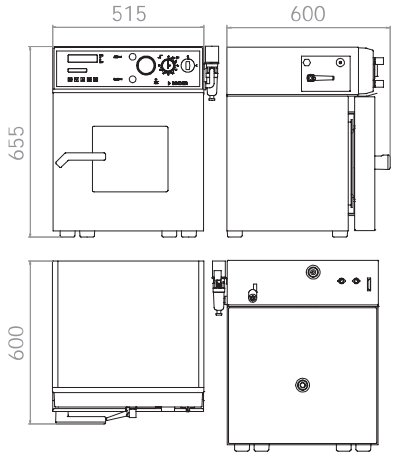
	VDL 23	VDL 53	VDL 115
Exterior dimensions			
Width VDL (mm/inch)	515 / 20.28	635 / 25.0	740 / 29.13
Height VDL (including feet) (mm/inch)	655 / 25.79	775 / 30.51	900 / 35.43
Total height VDL + option "vacuum module" (mm/inch)	1280 / 50.39	1400 / 55.12	1525 / 60.04
Depth incl. door handle, connection (mm/inch)	600 / 23.62	650 / 25.59	770 / 30.31
Interior dimensions			
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
Temperature data			
Temperature range, 15 °C/27 °F above ambient up to °C/°F	200 / 392	200 / 392	200 / 392
Temperature uniformity[1] at 100 °C/212 °F (±K)	1.5	2	3.5
Temperature fluctuation[1] (±K)	0.1	0.1	0.1
Heating up time [1] [2] 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
Electrical data			
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
Model no.	9030-0038	9030-0039	9030-0040

[1] values measured with alumimum racks // [2] 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 determinated 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.

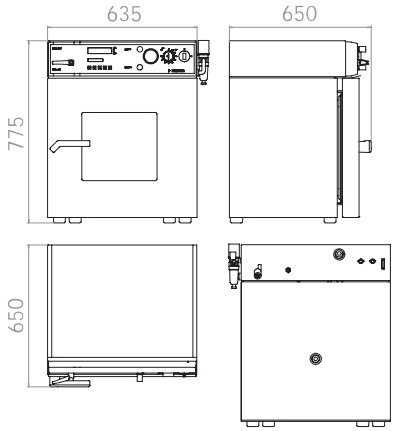
Current information and values are available at
www.binder-world.com

DIMENSIONS

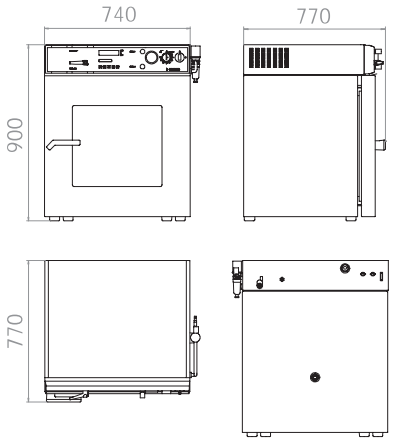
VDL 23



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

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.