

# Model VD 23 | Vacuum drying chambers for non-flammable solvents

BINDER'S VD series vacuum drying chambers deliver impressive performance through their precise temperature control and gentle drying. The patented expansion rack technology from BINDER also optimizes heat transfer. The shelves can be repositioned for flexible placement and the interior of the chamber is easy to clean.

#### **BENEFITS**

- · Fast, gentle drying
- Optimum heat transfer through large thermal conducting plates
- · Safe work thanks to proven safety concept
- · Also option of modular complete system with vacuum pump and pump chamber



Model 23



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#### IMPORTANT FEATURES

- Temperature range: +9°C above ambient temperature to +220 °C
- Controller with digital display of pressure and temperature
- Program-controlled drying monitoring with automatic ventilation at end of process
- Internal data logger, measured values can be read out in open format via USB •
- 1 aluminum expansion rack, can be custom-positioned

- Inert gas connection
- Universal access port DN 16 for the introduction of external measuring devices
- Shatterproof, spring-mounted safety glass panel
- Large viewing window with option of interior lighting
- Computer interface: Ethernet

#### **OPTIONAL EQUIPMENT**

- Touchscreen Controller Graphical display of main process parameter
- Expansion racks Choice of aluminum or stainless steel racks depending on the application requirements
- Analogue output for temperature and pressure signals for external monitoring and evaluation of the process parameters, integration into inhouse systems is possible
- Universal ventilation Selection of different ventilation by air or inert gas
- Universal access port DN 40 for the introduction of external measuring devices
- Multi Management Software APT-COM Manage, record and document device parameters
- · Services extensive services ensure correct device function

## ORDERING INFORMATION

Interior volume [L]	Power supply - unit fuse	Plug*	Version	Model version	ArtNo.
Model VD 23					
24	200230 V 1~ 50/60 Hz -6,3 A	CEE 7/7	Standard	VD023-230V	9630-0001
	100120 V 1~ 50/60 Hz -10,0 A	NEMA 5-15	Standard	VD023UL-120V	9630-0005



# TECHNICAL DATA

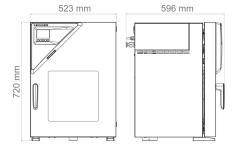
Action Humbher         \$690 com         \$690 com           Option model         Sandard         Sandard           Performance Duta Temperature         1970 Above arbient temperature to 220°C         1970 Above arbient temperature to 220°C           Temperature uniformity on ton'C         50.4 K         50.4 K           Herefore path fluctuation at 100°C         60.7 M         60.7 M           Herefore path fluctuation at 100°C         60.7 M         60.7 M           Herefore path fluctuation at 100°C         60.7 M         60.7 M           Vaccurs Data         70.00 M         60.7 M           Reservation fluctuation at 100°C         60.7 M         60.7 M           Reservation fluctuation         200.00 M         60.7 M           Reservation fluctuation         50.60 M         70.00 M           Reservation fluctuation         60.8 M         60.00 M           Nomed fluctuation with small flurge         60.00 M         60.00 M           Compessed at connection with small flurge         60.00 M         60.00 M           Compessed at connection for pressure excassistion         5.00 M         60.00 M           Diversions and weight         60.00 M         60.00 M           Exception for the unit for epitols         60.00 M         60.00 M           Diversions	TECHNICAL DATA				
Antice Number	Data				
Description model         Scandad         Scandad           Performance Data Temperature           Temperature anage         49 °C above ambient temperature to 220 °C           Temperature anage         40 °C above ambient temperature to 220 °C           Temperature anage         40 °C above ambient temperature to 220 °C           Temperature anage         40 °C above ambient temperature to 220 °C           Temperature anage         40 °C above ambient temperature to 220 °C           Temperature anage         40 °C above ambient temperature to 220 °C           Temperature anage         80 min         80 min           Vacuum Data         80 min         80 min           Vacuum Data         70 min         90 min           Beatrical data         200 230 °V         100 230 °V           Beatrical data         200 230 °V         100 230 °V           Brown Required         6,3 °A         90 °AV           Brown Required         6,3 °A         90 °AV           Brown Required         100 °M min         100 °M min           Brown Required (Some Some Reconstitution)         100 °M min         100 °M min           Brown Required (Some Some Reconstitution)         100 °M min         100 °M min           Brown Required (Some Some Reconstitution)         100 °M min<	Designation	VD023-230V	VD023UL-120V		
Professionane Distribution         10 C Alone antibuti Imperature (220°C)         10 C Alone antibut	Article Number	9630-0001	9630-0005		
Temperature onege         1-9 °C above ambient temperature to 220 °C         1-9 °C above ambient temperature to 220 °C           Temperature uniformity at 200°C         0.4 K         1.0 4 K           Temperature fluctuation at 100°C         0.1 1 K         0.1 1 K           Heating up time to 200°C         20 n bar/h         20 n bar/h           Vocum Obsta	Option model	Standard	Standard		
Temperature uniformity at 100°C         10 ± K         10 ± K           Itemperature functivation at 100°C         30 ± K         0.1 ± K           Heading up time to 100°C         80 min         80 min           Vectors between the time to 100°C         20 ± bar/h         0.01 bar/h           Description of time to 100°C         20 ± bar/h         0.01 bar/h           Description of time to 100°C         20 ± bar/h         0.01 bar/h           Description of time to 100°C         20 ± bar/h         0.01 bar/h           Description of the 100°C         20 ± bar/h         0.01 bar/h           Description of the 100°C         20 ± bar/h         0.01 bar/h           Description of the 100°C         20 ± bar/h         0.00 ± bar/h           Description of time 100°C         20 ± bar/h         0.00 ± bar/h           Description of time 100°C         20 ± bar/h         0.00 ± bar/h           Description of time 100°C         20 ± bar/h         0.00 ± bar/h           Description of time 100°C         20 ± bar/h         0.00 ± bar/h           Description of the 100°C         20 ± bar/h         0.00 ± bar/h           Description of the 100°C         20 ± bar/h         0.00 ± bar/	Performance Data Temperature				
Temperature fluctuation at 100°C	Temperature range	+9 °C above ambient temperature to 220 °C	+9 °C above ambient temperature to 220 °C		
Interting up thire to 100°C.         So min         So min           Vacuum Data         Use Carde         Oct Data/h         Oct Data/h           Electrical data         Use Carde         Use Carde           Power frequency         So / Oct 12           Power frequency         Oct 200 / W.           Nominal power         Oct 200 / W.           Phase (Nominal vortage)	Temperature uniformity at 100°C	1.0 ± K	1.0 ± K		
Vacuum Data           Electrical Gates         0,01 bat/fh         0,01 bat/fh           Electrical Gates         200—230 V         100—120 V           Power frequency         50/60 Hz         100—120 V           Power frequency         6,9 kW         n.9 kW           Unit fuse         6,3 A         10.0 A           Phase (Normal Voltage)         1 - 2         1—           Connections           Weassuring access port with small flange         16 DN mm         16 DN mm           Meassuring access port with small flange         16 DN mm         16 DN mm           Compressed air connection for pressure-encapsulation         5 NW         5 NW           Dimensions and weights         24 L         24 L           New weight of the unit (empty)         64 kg         24 kg           Volud Jearnace back         100 mm         100 mm           Wall clearance back         100 mm         100 mm           Wall clearance back         100 mm         100 mm	Temperature fluctuation at 100°C	0.1 ± K	0.1 ± K		
Leckrate         o.ox bar/h         co.ox bar/h           Electrical data         Concept frequency         200_230 V         100_120 V           Power frequency         50/60 Hz         50/60 Hz         50/60 Hz           Nominal power         0.9 kW         0.9 kW         10,0 A           Phase (Naminal voltage)         1-2         1-2           Connections           Vacuum connection with small flange         16 DN mm         16 DN mm           Measuring access port with small flange         16 DN mm         16 DN mm           Compressed air connection for pressure-encapsulation         3 NW         5 NW           Dimensions and weights           Interior volume         24 L         24 L           Net weight of the unit tempty)         64 kg         64 kg           Load per tack         20 kg         20 kg           Wall clearance back         300 mm         100 mm           Wall clearance back         20 mm         70 mm           Would clearance sidewise	Heating up time to 100°C	8o min	8o min		
Electrical data           Rated Voltage         200.–230 V         100.120 V           Power frequency         50/60 Hz         50/60 Hz           Nominal power         0.9 kW         0.9 kW           Unit fuse         6.3 A         10.0 A           Phase (Nominal voltage)         1-         -           Connections           Vacuum connection with small flange         16 DN mm         16 DN mm           Measuring access port with small flange         16 DN mm         16 DN mm           Compressed air connection for pressure-encapsulation         5 NW         5 NW           Dimensions and weights           Uniterior volume         24 L         24 L           Net weight of the unit (empty)         64 kg         64 kg           Vestignt of the unit (empty)         50 kg         50 kg           Vall clearance back         100 mm         100 mm           Wall clearance back         100 mm         100 mm           Wall clearance sidewise         70 mm         70 mm	Vacuum Data				
Rated Voltage         200230 V         100120 V           Power frequency         50/60 Hz         50/60 Hz           Nominal power         0.9 kW         0.9 kW           Unit fuse         6.3 A         10.0 A           Phase (Nominal voltage)         1-         1-           Connections           Vacuum connection with small flange         16 DN mm         16 DN mm           Measuring access port with small flange         16 DN mm         16 DN mm           Compressed air connection for pressure-encapsulation         5 NW         5 NW           Dimensions and weights         24 L         24 L           Net weight of the unit (empty)         64 kg         64 kg         64 kg           Load per rack         20 kg         20 kg           Permitted load         50 kg         50 kg           Wall clearance back         100 mm         100 mm           Wall clearance sidewise         70 mm         70 mm	Leckrate	0,01 bar/h	0,01 bar/h		
Power frequency 50/60 Hz  Nominal power  Out fluse  Out	Electrical data				
Nominal power 0,9 kW 0,9 kW 10,0 A 10	Rated Voltage	200230 V	100120 V		
Unit fuse 6,3 A 10,0 A 1-1 Phase (Nominal voltage) 1-1 Vacuum connections  Vacuum connection with small flange 16 DN mm 16 DN mm  Aleasuring access port with small flange 16 DN mm 16 DN mm  Compressed air connection for pressure-encapsulation 5 NW 5 NW  Dimensions and weights  Interior volume 24 L 24 L  Net weight of the unit (empty) 64 kg 64 kg  Load per rack 20 kg  Wall clearance back 100 mm  Wall clearance back 100 mm  Wall clearance sidewise 70 mm  To mm  Housing dimensions not incl. fittings and connections	Power frequency	50/60 Hz	50/60 Hz		
Phase (Nominal voltage)  1- 1- 1- 1- 1- 1- 1- 1- 1- 1- 1- 1- 1- 1	Nominal power	0,9 kW	0,9 kW		
Connections  Vacuum connection with small flange 16 DN mm 16 DN mm  Measuring access port with small flange 16 DN mm 16 DN mm  Compressed air connection for pressure-encapsulation 5 NW 5 NW  Dimensions and weights  Interior volume 24 L  Net weight of the unit (empty) 64 kg 64 kg  Permitted load 50 kg  Wall clearance back 100 mm 100 mm  Wall clearance sidewise 70 mm  To mm  Housing dimensions not incl. fittings and connections	Unit fuse	6,3 A	10,0 A		
Vacuum connection with small flange     16 DN mm     16 DN mm       Measuring access port with small flange     16 DN mm     16 DN mm       Compressed air connection for pressure-encapsulation     5 MW     5 MW       Dimensions and weights       Interior volume     24 L     24 L       Net weight of the unit (empty)     64 kg     64 kg       Load per rack     20 kg     20 kg       Permitted load     50 kg     50 kg       Wall clearance back     100 mm     100 mm       Wall clearance sidewise     70 mm     70 mm       Housing dimensions not incl. fittings and connections	Phase (Nominal voltage)	1~	1~		
Measuring access port with small flange 16 DN mm 16 DN mm 5 NW	Connections				
Compressed air connection for pressure-encapsulation 5 NW 5 NW  Dimensions and weights  Interior volume 24 L  Net weight of the unit (empty) 64 kg 64 kg  Load per rack 20 kg 20 kg  Permitted load 50 kg 50 kg  Wall clearance back 100 mm 100 mm  Wall clearance sidewise 70 mm 70 mm  Housing dimensions not incl. fittings and connections	Vacuum connection with small flange	16 DN mm	16 DN mm		
Dimensions and weights  Interior volume  24 L  Act 24 L  Act 364 kg  64 kg  Load per rack  20 kg  20 kg  Permitted load  50 kg  Wall clearance back  100 mm  70 mm  Housing dimensions not incl. fittings and connections	Measuring access port with small flange	16 DN mm	16 DN mm		
Interior volume 24 L  Net weight of the unit (empty) 64 kg 64 kg  Load per rack 20 kg  Permitted load 50 kg  Wall clearance back 100 mm  Wall clearance sidewise 70 mm  To mm  To mm  Housing dimensions not incl. fittings and connections	Compressed air connection for pressure-encapsulation	5 NW	5 NW		
Net weight of the unit (empty) 64 kg 64 kg  Load per rack 20 kg  Permitted load 50 kg  Wall clearance back 100 mm 70 mm  Housing dimensions not incl. fittings and connections	Dimensions and weights				
Load per rack  Permitted load  So kg  Wall clearance back  Wall clearance sidewise  70 mm  Too mm  Too mm  Too mm  Too mm	Interior volume	24 L	24 L		
Permitted load 50 kg 50 kg  Wall clearance back 100 mm 100 mm  Wall clearance sidewise 70 mm 70 mm  Housing dimensions not incl. fittings and connections	Net weight of the unit (empty)	64 kg	64 kg		
Wall clearance back 100 mm 100 mm 70 mm  Wall clearance sidewise 70 mm 70 mm  Housing dimensions not incl. fittings and connections	Load per rack	20 kg	20 kg		
Wall clearance sidewise 70 mm 70 mm  Housing dimensions not incl. fittings and connections	Permitted load	50 kg	50 kg		
Housing dimensions not incl. fittings and connections	Wall clearance back	100 mm	100 mm		
	Wall clearance sidewise	70 mm	70 mm		
Width net 523 mm 523 mm	Housing dimensions not incl. fittings and connections				
	Width net	523 mm	523 mm		



Height net	698 mm	698 mm
Depth net	413 mm	413 mm
Internal Dimensions		
Interior width	285 mm	285 mm
Interior height	285 mm	285 mm
Interior depth	295 mm	295 mm
Unit doors	1	1
Environment-specific data		
Sound-pressure level	40 dB(A)	40 dB(A)
Energy consumption at 100°C	140 Wh/h	140 Wh/h
Fixtures		
Number of shelves (std./max.)	1/4	1/4

All technical data is specified for unloaded units with standard equipment at an ambient temperature of +22 °C ±3 °C and a power supply voltage fluctuation of ±10%. The temperature data is determined in accordance to BINDER factory standard following DIN 12880, observing 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.

## DIMENSIONS Incl. fittings and connections [mm]



### **OPTIONS**

Designation	Description	VD 23	*	ArtNo.
Additional universal ventilation	Additional universal connection for ventilation with ambient air or inert gas. Flow limiter thread (RP"), and connection with 3/8" male thread.	•	-	8612-0001
Analog output 4-20 mA	for temperature and pressure values (output not adjustable)	•	-	8612-0004
Calibration certificate, expanded	for temperature; for extending the measurement in center of chamber to include another test temperature	•	-	8012-1127
Calibration certificate, pressure	Calibration of the pressure display to a specified value, including certificate	•	-	8012-2021
	Extension of the calibration of the pressure display by another pressure value, including certificate	•	-	8012-2022
Calibration certificate, temperature	for temperature, measurement in center of chamber at specified temperature	•	-	8012-1145
	temperature measurement incl. certificate, 9 measuring points at specified temperature	•	-	8012-0916



Designation	Description	VD 23	*	ArtNo.
	temperature measurement incl. certificate, 15- 18 measuring points at specified temperature	•	-	8012-0919
Door gasket	made of FKM, silicone-free	•	-	8612-0007
Door lock	lockable door handle	•	-	8612-0002
Expansion racks	stainless steel expansion rack instead of standard aluminum expansion rack, incl. calibration	•	-	8612-0011
Interior lighting	LED light strips on the left and right in the door	•	-	8612-0005
Temperature measurement of the specimen	with flexible Pt 100 sensor and digital specimen temperature display	•	-	8612-0006
Touchscreen controller	Large display panel with intuitive operation, actual and set values of main process parameters are shown simultaneously on the display. In addition, the graphic chronological evaluation of process parameters is displayed.	•	-	8612-0015
Universal access port	Additional DN 40 small flange universal access port with blind flange, for positioning sensors or supply lines in the chamber.	•	-	8612-0003

# ACCESSORIES

Designation	Description	VD 23	*	ArtNo.
	for simple logging and documentation requirements with up to 5 networked units.			
APT-COM™ 4 BASIC-Edition	version 4, BASIC edition	•	-	9053-0039
APT-COM™ 4 GLP-Edition	for working under GLP-compliant conditions. Measured values are documented in a tamper- proof way in line with the requirements of FDA Regulation 21 CFR 11.			
	version 4, GLP edition	•	-	9053-0042
APT-COM™ 4 PROFESSIONAL-	convenient unit and user management built on the BASIC edition. Suitable for networking up to 100 units.			
Edition	version 4, PROFESSIONAL edition	•	-	9053-0040
Emeration made	aluminum	•	-	8012-2055
Expansion racks	stainless steel	•	-	8012-2259
pH-neutral detergent	concentrated, for gentle remove of residual contaminants; 1 kg	•	-	8012-2250
	Pump chamber for vacuum pumps, with switchable power socket. Chemical membrane pump with a nominal air flow of 2.0 m³/hour, final pressure 7 mbar			
Pump chamber with VAP 1 vacuum pump	120 V / 50-60 Hz option model	•	-	8012-1961
	230 V / 50-60 Hz option model	•	-	8012-1958
Pump chamber with VAP 2.1 vacuum pump	Pump chamber for vacuum pumps, with switchable power socket. Chemical membrane pump with a nominal air flow of 4.0 m³/hour, final pressure 2,0 mbar			
	120 V / 50–60 Hz option model	•	-	8012-1967



Designation	Description	VD 23	*	ArtNo.
	230 V / 50-60 Hz option model	•	-	8012-1964
	IQ/OQ/PQ documents – supporting documents for validation performed by customers, according to customer requirements, PQ section added to qualification folder IQ/OQ; parameters: temperature, $\mathrm{CO_2}$ , $\mathrm{O_2}$ – or pressure, depending on unit			
	Digital in PDF format	•	-	7057-0005
Qualification documents	Hard copy inside folder	•	-	7007-0005
Qualification documents	IQ/OQ documents – supporting documents for validation performed by customers, consisting of: IQ/OQ checklists incl. calibration guide and comprehensive unit documentation; parameters: temperature, ${\rm CO_2}$ , ${\rm O_2}$ , pressure, depending on unit			
	Digital in PDF format	•	-	7057-0001
	Hard copy inside folder	•	-	7007-0001
Vacuum pump connection kit	for vacuum pump VAP1 and VAP2; consisting of aluminum clamping ring, universal centering ring, small flange with hose nozzle, (2.5 m) rubber hose and 2 hose clamps	•	-	8012-1995
	Chemical membrane pump with a nominal air flow of 2.0 m³/hour, final pressure 7 mbar			
Vacuum pump VAP 1	120 V / 50-60 Hz option model	•	-	5013-0223
	230 V / 50-60 Hz option model	•	-	5013-0217
Vacuum pump VAP 2	Chemical membrane pump with a nominal air flow of 4.0 m³/hour, final pressure 1,8 mbar			
vacualii pullip vAF 2	120 V / 50-60 Hz option model	•	-	5013-0219
Vacuum pump VAP 2.1	Chemical membrane pump with a nominal air flow of 4.0 m³/hour, final pressure < 2 mbar			
	230 V / 50-60 Hz option model	•	-	5013-0249

# **SERVICES**

Designation	Description	*	ArtNo.
Calibration services			
Calibration cartificate temporature	Calibration of one (1) test temperature specified by the user in center of chamber, including certificate	-	DL30-0160
Calibration certificate, temperature	Extension of calibration of one (1) additional test temperature specified by the user in the center of the usable space, including certificate	-	DL30-0102
Pressure calibration	Digital pressure display calibration at a specified test pressure of 20–900 mbar, including certificate	-	DL30-0410
Plessure calibration	Expansion – Digital pressure display calibration at a specified test pressure of 20–900 mbar, including certificate	-	DL30-0411
Temperature measurement, 9 measuring points	Temperature measurement with 9 measuring points with a set value specified by the user, including certificate	_	DL30-0109
Temperature measurement, 15 measuring points	Temperature measurement with 15 measuring points with a set value specified by the user, including certificate	_	DL30-0218



Designation	Description	*	ArtNo.
Installation services			
Unit commissioning	Connect the unit to the customer-side connections (electricity, water, wastewater, gas), basic functions check, brief operating instructions. (excl.: unpacking, setup, controller instructions, programming, installation work)	-	DL10-0120
Unit instructions	Instruction regarding operating principle and basic functions of the unit, operation of the control electronics including programming	-	DL10-0510
Maintenance contracts			
BRONZE 3-year maintenance contract	Maintenance service as contractually agreed, visual inspection of mechanical and electrical components, check of control response, 20% discount on spare parts	-	DL20-0710
GOLD 3-year maintenance contract	Maintenance service as contractually agreed, visual inspection of mechanical and electrical components, check of control response, 20% discount on spare parts, testing of all key functions, replacement of wear parts, calibration of one test temperature specified by the user in the center of the usable space, including certificate	-	DL20-0980
SILVER 3-year maintenance contract	Maintenance service as contractually agreed, visual inspection of mechanical and electrical components, check of control response, 20% discount on spare parts, testing of all key functions, calibration of one test temperature specified by the user in the center of the usable space, without certificate	-	DL20-0880
Maintenance services			
Maintenance	One-off maintenance service in accordance with maintenance schedule. Visual inspection of mechanical and electrical components, testing of all key functions. Calibration of a test temperature specified by the user in center of usable space without certificate	-	DL20-0615
VAP 1 vacuum pump maintenance	Maintenance service of the VAP 1 vacuum pump according to the maintenance schedule, visual inspection, replacement of the diaphragms, O-rings and seals, (Service Kit 8500-0158 included in the scope of services) as well as final functional test.	-	DL20-0410
VAP 2 vacuum pump maintenance	Maintenance service of the VAP 2 vacuum pump according to the maintenance schedule, visual inspection, replacement of the diaphragms, O-rings and seals, (Service Kit 8500-0159 included in the scope of services) as well as final functional test.	-	DL20-0420
Validation services			
Execution of IQ/OQ	Execution of IQ/OQ in accordance with qualification folder	-	DL42-0310
Execution of IQ/OQ/PQ	Execution of IQ/OQ/PQ in accordance with qualification folder	-	DL44-0500
Warranty service			
1-year warranty extension	The warranty is extended by 1 year from the delivery date, wear parts are excluded	-	DL50-0020



# **BINDER GmbH**

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