

# Model FD 23 | Drying and heating chambers with forced convection

A BINDER FD series heating oven is always used when fast drying and sterilization is required. Thanks to its fully homogeneous temperature distribution, quick dynamics and powerful fan, this heating oven saves valuable time.

## BENEFITS

- Uniform drying conditions thanks to APT.line™ technology
- Identical test conditions throughout the chamber interior independent of sample size and quantity
- Outstanding thermal insulation saves operation costs



Model 23



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## MAIN FEATURES

- Temperature range: room temperature plus 5 °C to 300 °C
- APT.line™ preheating chamber technology
- Forced convection
- Adjustable exhaust air flap
- Controller with timer functions
- 2 chrome-plated racks
- Class 2 independent adjustable temperature safety device (DIN 12880) with visual alarm

## ORDERING INFORMATION

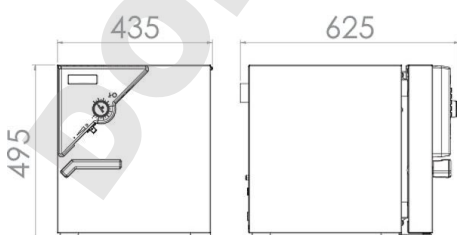
Interior volume [L]	Voltage	Option model	Version	Art.-No.
Model FD 23				
20	230 V 1~ ph 50/60 Hz	Standard	FD023-230V	9010-0194
	120 V 1~ ph 60 Hz	Standard	FD023UL-120V	9010-0196

## TECHNICAL DATA

Description	FD023-230V <sup>1</sup>	FD023UL-120V <sup>1</sup>
Article Number	9010-0194	9010-0196
<b>Performance Data Temperature</b>		
Temperature range 5 °C above ambient temperature to [°C]	300	300
Temperature variation at 150 °C [± K]	2.5	2.5
Temperature fluctuation at 150 °C [± K]	0.3	0.3
Heating-up time to 150 °C [min]	25	25
Recovery time after 30 seconds door open at 150 °C [min]	6	6
<b>Air change data</b>		
Air change (approx.) at 150 °C [x/h]	64	64
<b>Electrical data</b>		
Rated Voltage [V]	230	120
Power frequency [Hz]	50/60	60
Nominal power [kW]	0.8	0.8
Unit fuse [A]	10	12.5
Phase (Nominal voltage)	1~	1~
<b>Outer dimensions</b>		
Width net [mm]	435	435
Height net [mm]	495	495
Depth net [mm]	520	520
<b>Internal Dimensions</b>		
Depth [mm]	300	300
Height [mm]	330	330
Width [mm]	222	222
<b>Measures</b>		
Wall clearance back [mm]	160	160
Wall clearance sidewise [mm]	100	100
Interior volume [L]	20	20
Net weight of the unit (empty) [kg]	27	27
permitted load [kg]	25	25
Load per rack [kg]	12	12
<b>Doors</b>		
Unit doors	1	1
<b>Environment-specific data</b>		
Energy consumption at 150 °C [Wh/h]	300	300
<b>Fixtures</b>		
Number of shelves (std./max.)	2/4	2/4

<sup>1</sup> 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. Technical data refers to 100 % fan speed. 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 AND ACCESSORIES

Designation	Description	*	Art.-No.
	back		
	10 mm	01	8012-1283
	30 mm	01	8012-1368
	50 mm	01	8012-1384
	left		
	10 mm	01	8012-1276
	30 mm	01	8012-1359
Access port with silicone plug	50 mm	01	8012-1376
	right		
	10 mm	01	8012-1269
	30 mm	01	8012-1354
	50 mm	01	8012-1372
	top		
	10 mm	01	8012-1263
	30 mm	01	8012-1364
	50 mm	01	8012-1380
Alarm function for overheating	Switchable acoustic alarm, with adjustable limit value on the independent temperature safety device		
	120 V, 208 V option model	-	8012-1304
	230 V, 400 V option model	-	8012-1300
Analog output 4-20 mA	for temperature values (output not adjustable)	02	8012-0431
Calibration certificate, expanded	for temperature; for extending the measurement in center of chamber to include another test temperature	-	8012-1116
	for temperature, measurement in center of chamber at specified temperature	-	8012-1135
Calibration certificate, temperature	temperature measurement incl. certificate and 27 measuring points at specified temperature	-	8012-1594
	temperature measurement incl. certificate, 15- 18 measuring points at specified temperature	-	8012-1573
	temperature measurement incl. certificate, 9 measuring points at specified temperature	-	8012-1552
Class 3.1 independent temperature safety device	with visual alarm (DIN 12880)	04, 12	8012-1147
Data Logger Kit	T 350: For continuous temperature logging from 0 °C to 350 °C; kit includes 1 data logger, Pt 100 sensor with 2 m extension cable and 1 magnetic fixture for mounting to the BINDER unit	19	8012-0714
Data Logger Software	LOG ANALYZE software kit, configuration and evaluation software for all BINDER Data Logger Kits (incl. USB data cable)	19	8012-0821
Door gasket	made of FKM, silicone-free	03	8012-1306
Door lock	lockable door handle	-	8012-1247
	with lid made from 18/8 stainless steel, stackable, dimensions: 230 x 133 x 45 mm	-	4022-0123
Instrument tray	with lid made from 18/8 stainless steel, stackable, dimensions: 315 x 215 x 60 mm	-	4022-0124
Measurement of air exchange rate	in accordance with ASTM D5374, definition and protocol according to ambient temperature	-	8012-1195
pH-neutral detergent	concentrated, for gentle remove of residual contaminants; 1 kg	-	1002-0016
Pt 100 temperature sensor	additional flexible Pt 100, interior, with external connection incl. LEMO connector (3-pin)	-	8012-1174
	chrome plated	-	6004-0050
Rack	stainless steel	-	6004-0051
Rack accessories	fasteners (1 set of 4) for additional security of racks	-	8012-0531
Shelf, perforated	Stainless steel	-	6004-0052
	viewing window in door, 180 x 180 mm, and 15 W interior lighting		
Viewing window and interior lighting	120 V option model	-	8012-1260
	230 V option model	-	8012-1259

\* Notes › See last page

## SERVICES

Designation	Description	*	Art.-No.
<b>Installation services</b>			
Installation	and set up of unit at operating location, connect to existing connections	13, 18	DL10-0100
Instruction	unit function instructions for operation and programming of the controller	18	DL10-0500
<b>Preventive maintenance</b>			
Preventive maintenance	Executive of equipment inspection according to maintenance plan	14, 18	DL20-0200
<b>Calibration services</b>			
Calibration temperature incl. certificate	including certificate, one measuring point in center of chamber at specified temperature	14, 16, 17, 18	DL30-0101
Measurement of air exchange rate	including certificate (in accordance with ASTM D5374)	14, 16, 17, 18	DL33-0000
Temperature measurement 18 measuring points	including certificate, 18 measuring points at specified temperature	14, 16, 17, 18	DL30-0118
Temperature measurement 27 measuring points	including certificate, 27 measuring points at specified temperature	14, 16, 17, 18	DL30-0127
Temperature measurement 9 measuring points	including certificate, 9 measuring points at specified temperature	14, 16, 17, 18	DL30-0109
<b>Validation services</b>			
Execution of IQ/OQ	in accordance with qualification folder	15, 18, 20	DL40-0100
Execution of IQ/OQ/PQ	in accordance with customer's requirement, price: on request	15, 18	DL44-0500
Qualification folder IQ/OQ	supporting documents for validation performed by customer, consisting of: IQ/OQ checklists, unit schematics, QM certificate in accordance with ISO 9001	15, 18, 20	8012-0792
Qualification folder IQ/OQ/PQ	supporting documents for validation performed by customer, in accordance with customer's requirement, extension of Qualification folder IQ/OQ by chapter PQ	15, 18	8012-0943
<b>Warranty service</b>			
Extension of the warranty from 2 to 3 years	beginning with the date of delivery, wearing parts are not included	-	DL00-3041
Extension of the warranty from 2 to 5 years	beginning with the date of delivery, wearing parts are not included	-	DL00-3042

\* Notes › See last page

## NOTES

- 01 Condensation may occur in the area around the access port. Access ports may be placed in custom locations for an additional charge.  
02 UL mark is not granted when this option is used.  
03 Heat resistant only to max. 200 °C.  
04 Only available on units rated for 230 V.  
06 Heating-up time may increase as a result of the lower heat conductivity.  
07 The additional heat input may affect the temperature behavior.  
09 Not in conjunction with the optional access port, door with window and interior lighting.  
10 Not available on 23-liter units.  
11 Not available on 23- or 53-liter units.  
12 Only available on units rated for 230 V or 400 V.  
13 Installation and connections take place at unit location; transport within the company only upon consultation.  
14 We recommend a BINDER service contract to cover unit inspections, calibrations and validations.  
15 OQ according to Yellow Paper = completed factory validation documentation of all OQ checklists.  
16 Sensor calibration is performed in an accredited calibration laboratory.  
17 Calibration is performed according to the BINDER factory standard.  
18 Quoted prices do not include travel costs. Please refer to the chapter on BINDER Service for travel costs for your region. Quoted prices for services performed in Switzerland do not include a country-specific added fee (available on request).  
19 For additional accessories, refer to the Process documentation chapter.  
20 When ordering IQ/OQ qualification folders and associated IQ/OQ execution on one order, we offer a 15 % discount for the item of the IQ/OQ folder.  
When ordering IQ/OQ/PQ qualification folders and associated IQ/OQ/PQ execution on one order, we offer a 15 % discount for the item of the IQ/OQ/PQ folder.

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