

# Model FD 720 | Drying and heating chambers Avantgarde.Line with forced convection

A BINDER FD series Avantgarde. Line 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**

- · Best energy efficiency on the market
- · Excellent temporal and spatial temperature accuracy
- · USB connection for recording data
- Temperature range up to 300 °C



#### MAIN FEATURES

- Temperature range: ambient temperature plus 12  $^{\circ}\text{C}$  to 300  $^{\circ}\text{C}$
- Up to 30% lower energy consumption compared to conventional units on the market
- High temperature accuracy thanks to APT.line™ technology
- Forced convection
- Controller with LCD display
- Electromechanical control of the exhaust air flap

- · 2 chrome-plated racks
- Class 2 integrated independent adjustable temperature safety device (DIN 12880) with visual alarm
- · Ergonomic handle design
- · USB port for recording data

#### ORDERING INFORMATION

Interior volume [cu.ft.]	Voltage	Option model	Version	ArtNo.
Model FD 720				
26.2	400 V 3 ph 50/60 Hz	Standard	FD720-400V	9010-0311

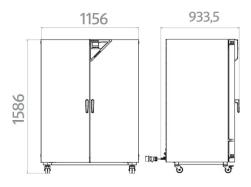


## **TECHNICAL DATA**

Article Number         9010-03311           Performance Data Temperature         Temperature variation at 150°C [x K]         300           Temperature variation at 150°C [x K]         2.5           Temperature fluctuation at 150°C [x K]         0.6           Heating-up time to 150°C [x K]         2.5           Recovery time after 30 seconds door open at 150°C [min]         6           Electrical data         ***           Power frequency [kz]         600           Nominal power [kW]         4.5           Unit fuse [A]         3 x 16           Phase (Nominal voltage) [ph]         3 x 16           Phase (Nominal voltage) [ph]         1590           Unit due [x]         1590           Phase (Nominal voltage) [ph]         169           Height net [mm]         169           Unit de prime (mm)         160           Wall clearance slowless [mm]         100           Wall clearance slowless [mm]         100           Unit doors         2           Unit doors         2           Unit doors         2           Unit doors         30           Unit doors         4           Unit doors         50           Unit doors         6	Description	FD720-400V <sup>1</sup>
Temperature range 12 °C above ambient temperature to (°C)         300           Temperature variation at 150 °C (£ K)         2.5           Temperature functation at 150 °C (£ K)         2.6           Heating-up time to 150 °C (min)         2.6           Recovery time after 30 seconds door open at 150 °C (min)         6.0           Electrical date	Article Number	9010-0311
Temperature variation at 150 °C [± K]         2.5           Temperature fluctuation at 150 °C [± K]         0.6           Heating-up time 150 °C [min]         25           Recovery time after 30 seconds door open at 150 °C [min]         6           Electrical data	Performance Data Temperature	
Temperature fluctuation at 150 °C [± K]         0.6           Heating-up time to 150 °C [min]         25           Recovery time after 30 seconds door open at 150 °C [min]         6           Electrical data         V           Rated Voltage [V]         400           Power frequency [Ftz]         50060           Nominal power [kW]         4.5           Unit tuse [A]         3 x 16           Phase (Nominal voltage) [ph]         3 x 16           Unit tuse [A]         165           Height net [mm]         150           Upper timensions         30           Wall clearance sack [mm]         600           Wall clearance sack [mm]         160           Unit doors         2           Unit doors         2           Unit doors         300           Pepting [mm]         160           Pepting [mm]         700 </td <td>Temperature range 12 °C above ambient temperature to [°C]</td> <td>300</td>	Temperature range 12 °C above ambient temperature to [°C]	300
Heating-up time to 150 °C (min)         5           Recovery time after 30 seconds door open at 150 °C (min)         6           Electrical data         Wood           Rated Voltage [V]         400           Power frequency [Hz]         5060           Nominal power [kW]         4.5           Unit fuse [A]         3 x 16           Phase (Nominal voltage) [ph]         30           Outer dimensions         ***           Width net [mm]         1165           Height net [mm]         870           Wall clearance back (mm]         800           Wall clearance sidewise [mm]         100           Vall clearance sidewise [mm]         100           Unit doors         2           Unit doors         2           Unit doors         100           Height [mm]         16           Heiver by (ight of the unit (empty) [kg]         16           Heiver by veight of the unit (empty) [kg]         166           Lever by	Temperature variation at 150 °C [± K]	2.5
Recovery time after 30 seconds door open at 150 °C [min]         6           Electrical data         40           Power fequency [Hz]         5060           Nominal power [kW]         4.5           Unit fuse [A]         3 x 16           Phase (Nominal voltage) [ph]         3 2           User dimensions         **** Width net [mm]         1165           Height net [mm]         590           Depth net [mm]         60           Wall clearance back [mm]         100           Wall clearance sidewise [mm]         100           Unit doos         2           Internal Dimensions         ***           Width [mm]         100           Height [mm]         100           Height [mm]         100           Hessures         ***           Interior volume [L]         74           New weight of the unit (empty) [kg]         166           Permitted load [kg]         156           Load per rack [kg]         45           Energy consumption at 150 °C [Whh]         80           Sound-pressure level [dB(A)]         43	Temperature fluctuation at 150 °C [± K]	0.6
Electrical data           Rated Voltage [V]         400           Power frequency [Hz]         5060           Nominal power [kW]         4.5           Unit fuse [A]         3 x 16           Phase (Nominal voltage) [ph]         3           Outer dimensions	Heating-up time to 150 °C [min]	25
Rated Voltage [V]         400           Power frequency [Hz]         5060           Nominal power [kW]         4.5           Unit fuse [A]         3 x 16           Phase (Nominal voltage) [ph]         3 3           Outer dimensions         ************************************	Recovery time after 30 seconds door open at 150 °C [min]	6
Power frequency [Hz]         50/80           Nominal power [kW]         4.5           Unit fuse [A]         3 x 16           Phase (Nominal voltage) [ph]         3 c           User dimensions         ************************************	Electrical data	
Nominal power [kW]         4.5           Unit fuse [A]         3 x 16           Phase (Nominal voltage) [ph]         3           Outer dimensions	Rated Voltage [V]	400
Unit fuse [A]         3 x 16           Phase (Nominal voltage) [ph]         3           Outer dimensions         ************************************	Power frequency [Hz]	50/60
Phase (Nominal voltage) [ph]         3           Outer dimensions         1165           Width net [mm]         1590           Depth net [mm]         870           Wall clearance back [mm]         160           Wall clearance sidewise [mm]         100           Doors         2           Internal Dimensions         2           Width [mm]         1000           Height [mm]         500           Depth [mm]         570           Measures         741           Net weight of the unit (empty) [kg]         166           Net weight of the unit (empty) [kg]         315           Load per rack [kg]         35           Load per rack [kg]         45           Energy consumption at 150 °C (Wh/h]         800           Sound-pressure level [dB(A)]         43	Nominal power [kW]	4.5
Outer dimensions           Width net [mm]         1165           Height net [mm]         1590           Depth net [mm]         870           Wall clearance back [mm]         160           Wall clearance sidewise [mm]         100           Doors         1           Unit doors         2           Internal Dimensions         1000           Height [mm]         1000           Depth [mm]         50           Measures         1           Interior volume [L]         741           Net weight of the unit (empty) [kg]         166           permitted load [kg]         315           Load per rack [kg]         45           Environment-specific data         800           Sound-pressure level [dB(A)]         43           Fixtures	Unit fuse [A]	3 x 16
Width net [mm]         1590           Depth net [mm]         870           Wall clearance back [mm]         160           Wall clearance sidewise [mm]         100           Doors         Trestance Sidewise [mm]           Unit doors         2           Internal Dimensions         1000           Height [mm]         1000           Depth [mm]         500           Depth [mm]         500           Measures         150           Interior volume [L]         741           Net weight of the unit (empty) [kg]         166           permitted load [kg]         315           Load per rack [kg]         45           Environment-specific data         800           Sound-pressure level [dB(A)]         43	Phase (Nominal voltage) [ph]	3
Height net [mm]         1590           Depth net [mm]         870           Wall clearance back [mm]         160           Wall clearance sidewise [mm]         100           Doors         2           Unit doors         2           Height [mm]         1000           Height [mm]         1300           Depth [mm]         570           Measures         166           Interior volume [L]         741           Net weight of the unit (empty) [kg]         166           permitted load [kg]         315           Load per rack [kg]         45           Environment-specific data         500           Energy consumption at 150 °C [Wh/h]         800           Sound-pressure level [dB(A)]         43           Fixtures         43	Outer dimensions	
Depth net [mm]         870           Wall clearance back [mm]         160           Wall clearance sidewise [mm]         100           Doors         ************************************	Width net [mm]	1165
Wall clearance back [mm]         160           Wall clearance sidewise [mm]         100           Doors	Height net [mm]	1590
Wall clearance sidewise [mm]         100           Doors         2           Unit doors         2           Internal Dimensions         1000           Width [mm]         1000           Height [mm]         300           Depth [mm]         570           Measures         11           Interior volume [L]         741           Net weight of the unit (empty) [kg]         166           permitted load [kg]         315           Load per rack [kg]         45           Environment-specific data         800           Sound-pressure level [dB(A)]         43           Fixtures	Depth net [mm]	870
Doors           Unit doors         2           Internal Dimensions         1000           Height [mm]         1300           Depth [mm]         570           Measures         1100           Interior volume [L]         741           Net weight of the unit (empty) [kg]         166           permitted load [kg]         315           Load per rack [kg]         45           Environment-specific data         800           Sound-pressure level [dB(A)]         43           Fixtures	Wall clearance back [mm]	160
Unit doors         2           Internal Dimensions         1000           Width [mm]         1000           Height [mm]         570           Measures         741           Net weight of the unit (empty) [kg]         166           permitted load [kg]         315           Load per rack [kg]         45           Environment-specific data         800           Sound-pressure level [dB(A)]         43           Fixtures	Wall clearance sidewise [mm]	100
Internal Dimensions           Width [mm]         1000           Height [mm]         1300           Depth [mm]         570           Measures         Interior volume [L]           Net weight of the unit (empty) [kg]         166           permitted load [kg]         315           Load per rack [kg]         45           Environment-specific data         Energy consumption at 150 °C [Wh/h]           Sound-pressure level [dB(A)]         43           Fixtures         Fixtures	Doors	
Width [mm]         1000           Height [mm]         1300           Depth [mm]         570           Measures         Interior volume [L]         741           Net weight of the unit (empty) [kg]         166           permitted load [kg]         315           Load per rack [kg]         45           Environment-specific data         Energy consumption at 150 °C [Wh/h]         800           Sound-pressure level [dB(A)]         43           Fixtures         Fixtures	Unit doors	2
Height [mm]         1300           Depth [mm]         570           Measures         Interior volume [L]           Net weight of the unit (empty) [kg]         741           Net weight of the unit (empty) [kg]         166           permitted load [kg]         315           Load per rack [kg]         45           Environment-specific data         800           Sound-pressure level [dB(A)]         43           Fixtures         Fixtures	Internal Dimensions	
Depth [mm]         570           Measures         Interior volume [L]         741           Net weight of the unit (empty) [kg]         166           permitted load [kg]         315           Load per rack [kg]         45           Environment-specific data         800           Sound-pressure level [dB(A)]         43           Fixtures         Fixtures	Width [mm]	1000
Measures Interior volume [L] 741 Net weight of the unit (empty) [kg] 166 permitted load [kg] 315 Load per rack [kg] 45 Environment-specific data Energy consumption at 150 °C [Wh/h] 800 Sound-pressure level [dB(A)] 43 Fixtures	Height [mm]	1300
Interior volume [L]         741           Net weight of the unit (empty) [kg]         166           permitted load [kg]         315           Load per rack [kg]         45           Environment-specific data         800           Sound-pressure level [dB(A)]         43           Fixtures         Fixtures	Depth [mm]	570
Net weight of the unit (empty) [kg]       166         permitted load [kg]       315         Load per rack [kg]       45         Environment-specific data       800         Sound-pressure level [dB(A)]       43         Fixtures       Fixtures	Measures	
permitted load [kg]         315           Load per rack [kg]         45           Environment-specific data         800           Sound-pressure level [dB(A)]         43           Fixtures         Fixtures	Interior volume [L]	741
Load per rack [kg]       45         Environment-specific data	Net weight of the unit (empty) [kg]	166
Environment-specific data  Energy consumption at 150 °C [Wh/h] 800  Sound-pressure level [dB(A)] 43  Fixtures	permitted load [kg]	315
Energy consumption at 150 °C [Wh/h] 800 Sound-pressure level [dB(A)] 43 Fixtures	Load per rack [kg]	45
Sound-pressure level [dB(A)] 43  Fixtures	Environment-specific data	
Fixtures	Energy consumption at 150 °C [Wh/h]	800
	Sound-pressure level [dB(A)]	43
Number of shelves (std./max.) 2/16	Fixtures	
	Number of shelves (std./max.)	2/16

<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 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	*	ArtNo.
	left		
	10 mm	01	8012-1276
	30 mm	01	8012-1016
	50 mm	01	8012-1020
	100 mm	01	8012-1027
	right		
	10 mm	01	8012-1269
Access port with silicone	30 mm	01	8012-1015
plug	50 mm	01	8012-1019
	100 mm	01	8012-1028
	top		
	10 mm	01	8012-1263
	30 mm	01	8012-1364
	50 mm	01	8012-1380
	100 mm	01, 10	8012-1671
Analog output 4-20 mA	for temperature values (output not adjustable)	02	8012-1624
Calibration certificate,	for temperature; for extending the measurement in center of chamber to include another test temperature	-	8012-1116
жранаса	for temperature, measurement in center of chamber at specified temperature	_	8012-1135
	temperature measurement incl. certificate and 27 measuring points at specified temperature	_	8012-1594
Calibration certificate, emperature	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 emperature safety	with visual alarm (DIN 12880)	04, 12	8012-1643
Clock	battery-backed	_	8012-1641
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	8012-1833
Door lock	lockable door handle	_	8012-1818
Ethernet interface	for communication software		8012-0989
Fan, reinforced	for increased air change rates, incl. uprated heat output for faster heating up time and improved recovery time; max. 300 °C; not in conjunction with load management option		0012-0303
an, remorced	400 V option model	_	8012-1062
Heating output,	For faster heating up time and improved recovery time; max. 300 °C; not in conjunction with load management option		
reinforced	400 \( \tau \);	_	8012-1061
	400 V option model		
	On fresh air supply for unit; filter classification H14 (acc. to. EN 1822-1:2009, > 99.995% at 0.3 μm)	_	8012-1099
HEPA air filter nner chamber, einforced		-	
HEPA air filter	On fresh air supply for unit; filter classification H14 (acc. to. EN 1822-1:2009, > 99.995% at 0.3 µm)	-	
HEPA air filter nner chamber, einforced	On fresh air supply for unit; filter classification H14 (acc. to. EN 1822-1:2009, > 99.995% at 0.3 µm)  max. total load 350 kg	-	8012-1821
HEPA air filter nner chamber, einforced	On fresh air supply for unit; filter classification H14 (acc. to. EN 1822-1:2009, > 99.995% at 0.3 µm)  max. total load 350 kg  with lid made from 18/8 stainless steel, stackable, dimensions: 230 x 133 x 45 mm	-	8012-1821
HEPA air filter nner chamber, einforced	On fresh air supply for unit; filter classification H14 (acc. to. EN 1822-1:2009, > 99.995% at 0.3 µm)  max. total load 350 kg  with lid made from 18/8 stainless steel, stackable, dimensions: 230 x 133 x 45 mm  small	-	8012-1821 4022-0123
HEPA air filter nner chamber, einforced	On fresh air supply for unit; filter classification H14 (acc. to. EN 1822-1:2009, > 99.995% at 0.3 µm)  max. total load 350 kg  with lid made from 18/8 stainless steel, stackable, dimensions: 230 x 133 x 45 mm  small  with lid made from 18/8 stainless steel, stackable, dimensions: 315 x 215 x 60 mm  large	-	8012-1821 4022-0123
HEPA air filter	On fresh air supply for unit; filter classification H14 (acc. to. EN 1822-1:2009, > 99.995% at 0.3 µm)  max. total load 350 kg  with lid made from 18/8 stainless steel, stackable, dimensions: 230 x 133 x 45 mm  small  with lid made from 18/8 stainless steel, stackable, dimensions: 315 x 215 x 60 mm  large  with two 15 W light bulbs	-	8012-1821 4022-0123 4022-0124
HEPA air filter  Inner chamber, einforced  Instrument tray  Interior lighting  Measurement of air	On fresh air supply for unit; filter classification H14 (acc. to. EN 1822-1:2009, > 99.995% at 0.3 µm)  max. total load 350 kg  with lid made from 18/8 stainless steel, stackable, dimensions: 230 x 133 x 45 mm  small  with lid made from 18/8 stainless steel, stackable, dimensions: 315 x 215 x 60 mm  large	-	8012-1821 4022-0123 4022-0124 8012-1825
HEPA air filter  nner chamber, einforced  nstrument tray	On fresh air supply for unit; filter classification H14 (acc. to. EN 1822-1:2009, > 99.995% at 0.3 µm)  max. total load 350 kg  with lid made from 18/8 stainless steel, stackable, dimensions: 230 x 133 x 45 mm  small  with lid made from 18/8 stainless steel, stackable, dimensions: 315 x 215 x 60 mm  large  with two 15 W light bulbs  400 V option model	-	8012-1099 8012-1821 4022-0123 4022-0124 8012-1825 8012-1195

<sup>\*</sup> Notes > See last page



Designation	Description	*	ArtNo.
Pt 100 temperature sensor	additional flexible Pt 100, interior, for displaying the temperature on the unit display		8012-1620
Rack, heavy load	Stainless steel, max. load per rack 70 kg	-	6004-0204
Racks	chrome-plated		6004-0171
	stainless steel	-	6004-0155
Shelf, perforated	Stainless steel	-	6004-0187
	APT-COM™ communications software		
	version 2 to 3, GLP edition	19	9053-0016
	version 3, BASIC edition	19	9053-0014
Software	version 3, GLP edition	19	9053-0015
	version 3, STANDARD edition	19	9053-0013
	APT-COM™ communications software, price: for free		
	version 3, GLP DEMO Edition	19	9053-0008
Viewing window and interior lighting	viewing window (triple insulating glass) in door, 300 x 480 mm, and 30 W interior		
	400 V option model	-	8012-1831

<sup>\*</sup> Notes > See last page

## **SERVICES**

Designation	Description	*	ArtNo.
Installation services			
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	DL10-0400
Preventive maintenance			
Preventive maintenance	Executive of equipment inspection according to maintenance plan	14, 18	DL20-0200
Calibration services			
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
Validation services			
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
Warranty service			
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

<sup>\*</sup> Notes > See last page



#### **NOTES**

- Condensation may occur in the area around the access port. Access ports may be placed in custom locations for an additional charge. 01 02
- UL mark is not granted when this option is used. Heat resistant only to max. 200 °C.
- 03
- Only available on units rated for 230 V.
- Heating-up time may increase as a result of the lower heat conductivity.
- The additional heat input may affect the temperature behavior.
- Not in conjunction with the optional access port, door with window and interior lighting. 09
- Not available on 23-liter units.
- Not available on 23- or 53-liter units.
- 10 11 12 Only available on units rated for 230 V or 400 V.
- Installation and connections take place at unit location; transport within the company only upon consultation.
- We recommend a BINDER service contract to cover unit inspections, calibrations and validations.
- OQ according to Yellow Paper = completed factory validation documentation of all OQ checklists.
- Sensor calibration is performed in an accredited calibration laboratory.
- 17
- Calibration is performed according to the BINDER factory standard.

  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).
- For additional accessories, refer to the Process documentation chapter.
- 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.