

Model FP 400 | Drying and heating chambers with forced convection and program functions

A BINDER material test chamber with mechanical convection of the FP series provides reliably short drying times and particularly fast heating – even for chambers under full loads.

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
- · Advanced programming options





Model 400

Model 400

MAIN FEATURES

- Temperature range: room temperature plus 5 °C to 300 °C
- APT.line[™] preheating chamber technology
- · Adjustable fan speed
- · Adjustable exhaust air flap
- · Controller with time-segment and real-time programming
- · 2 chrome-plated racks
- Class 2 independent adjustable temperature safety device (DIN 12880)
 with visual alarm
- Computer interface: RS 422

ORDERING INFORMATION

Interior volume [cu.ft.]	Voltage	Option model	Version	ArtNo.
14.1	400 V 3~ 50/60 Hz	Standard	FP400-400V	9010-0265
14.1	208 V 3~ 60 Hz	Standard	FP400UL-208V	9010-0266

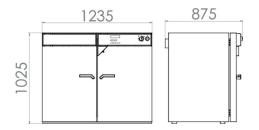


TECHNICAL DATA

Performance Data TemperatureTemperature range 5 °C above ambient temperature to 1°C (1300300Temperature function at 150 °C (± K)2.52.5Temperature function of 150 °C (± K)0.335Recovery time after 50 seconds door open at 150 °C (min)1717Air change dappox) at 150 °C (bn)1818Electrical data80Power frequency [Hz]60060Norminal power [KM]3.43.4Outge (M)3.43.4Outge (M	Description	FP400-400V ¹	FP400UL-208V ¹
Temperature range 5 °C above ambient temperature to [°C]300300Temperature variation at 150 °C [t K]2.52.5Temperature fuctuation at 150 °C [t K]0.30.3Heating-up time to 150 °C [nin]2535Recovery time after 30 seconds door open at 150 °C [min]1717Air change (approx.) at 50 °C [nh]1818Electrical data11Reter Votage [v]400208Power frequency [fk2]50/6060Nominal power [kW]3.43.4Unit fuse [A]3.43.4Unit fuse [A]3.43.4Phase (Nominal voltage)320300Phase (Nominal voltage)320320Phemited load [Ib]198394Load per rack [Ibs]6.36.3Val dearance sidevise [n]3.1523.4Val dearance sidevise [n]3.1523.4Unit [non]3.943.4Unit [non]3.943.4Unit [non]3.1523.4Unit [non]3.1523.4Unit [non]3.1523.5Unit [non]3.1523.52Unit [non]3.1523.52Unit [non]4.74.7Unit [non]4.74.7Unit [non]4.74.7Unit [non]3.1523.52Unit [non]3.1523.52Unit [non]4.74.7Unit [non]4.74.7Unit [non]4.74.7 <t< td=""><td>Article Number</td><td>9010-0265</td><td>9010-0266</td></t<>	Article Number	9010-0265	9010-0266
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 (µm) 35 35 Recovery time after 30 seconds door open at 150 °C (µm) 17 17 Air change daptorx.) at 150 °C (µh) 18 18 Electrical data	Performance Data Temperature		
Temperature fluctuation at 150 °C [± K]0.30.3Heating-up time to 150 °C [min]3535Recovery time after 30 seconds door open at 150 °C [min]1717Air change data	Temperature range 5 °C above ambient temperature to [°C]	300	300
Heating-up time to 150 °C (min) 35 35 Recovery time after 30 seconds door open at 150 °C (min) 17 17 Air change data	Temperature variation at 150 °C [± K]	2.5	2.5
Recovery time after 30 seconds door open at 150 °C [min] 17 17 Air change (approx.) at 150 °C [µh] 18 18 Electrical data	Temperature fluctuation at 150 °C [± K]	0.3	0.3
Air change data 18 18 Air change (approx.) at 150 °C [xh] 18 18 Electrical data	Heating-up time to 150 °C [min]	35	35
Air dange (approx.) at 150 °C [v/h]1818Electrical data208Power frequency [H2]50/6060Nominal power [k/ŋ]3.4 03.4Init fuse [A]3.x 163.x 16Phase (Nominal voltage)3-3-Phase Nominal voltage)3-3-Measures14.114.1Net weight of the unit (empty) [Ibs]320320Permitted lead [Ibs]198198Load per rack [Ibs]3.943.94Vali clearance back [in]3.943.94Mail clearance sidewise [in]3.943.94Height [in]31.5231.52Deptin [in]30.943.152Deptin [in]48.748.7Height net [in]40.440.4Deptin [in]3.143.14Deptin [in]3.143.14Height net [in]40.73.14Height net [in]3.143.14Height net [in]40.73.14Height net [in]3.143.14Height net [in]3.143.14Height net [in]3.143.14Height net [in]3.143.14Height net [in]3.143.14Height net [in]3.143.14Energy consumption at 150 °C [Wh]3.203.14Fitures120012003.14Fitures12001200Fitures12001200	Recovery time after 30 seconds door open at 150 °C [min]	17	17
Electrical data Rated Voltage [V] 400 208 Power frequency [Hz] 50/60 60 Nominal power [kW] 3.4 3.4 Unit fuse [A] 3 x 16 3 x 16 Phase (Nominal voltage) 3- 3- Measures 3x 16 Phase (Nominal voltage) 3- 3- Measures	Air change data		
Reted Voltage [V]400208Power frequency [Hz]50/6060Nominal power [kW]3.43.4Dutt fuse [A]3.x 163.x 16Phase (Nominal voltage)3.x 163.x 16Phase (Nominal voltage)3.x 163.x 16Measure	Air change (approx.) at 150 °C [x/h]	18	18
Power frequency [Hz] 50/60 60 Nominal power [kW] 3.4 3.4 Unit fuse [A] 3 x 16 3 x 16 Phase (Nominal voltage) 3~ 3~ Measures	Electrical data		
Nominal power [kV] 3.4 3.4 Unit fuse [A] 3 x 16 3 x 16 Phase (Nominal voltage) 3- 3- Measures 14.1 14.1 Interior volume [cu.ft.] 14.1 14.1 Net weight of the unit (empty) [lbs] 320 320 Permitted load [lbs] 198 198 Load per rack [lbs] 77 77 Wall clearance back [in] 6.3 6.3 Wall clearance sidewise [in] 39.4 39.4 Internal Dimensions 99.4 39.4 Widt [in] 39.4 39.4 Height [in] 20.09 20.09 Housing dimensions not incl. fittings and connections 48.7 48.7 Widt net [in] 40.4 40.4 40.4 Depth [in] 30.14 30.14 30.14 Dept het [in] 200 1200 1200	Rated Voltage [V]	400	208
Unit fuse for 3 x 16 3 x 16 Phase (Nominal voltage) 3~ 3- Measures 14.1 14.1 Interior volume [cu.ft.] 14.1 14.1 Net weight of the unit (empty) [bs] 320 320 Permitted load [bs] 198 198 Load per rack [bs] 77 77 Wall clearance back [in] 6.3 6.3 Wall clearance sidewise [in] 39.4 39.4 Internal Dimensions 39.4 39.4 With [in] 39.4 31.52 Depth [in] 20.09 20.09 Height [in] 30.14 48.7 Height [in] 48.7 48.7 Height [in] 30.14 30.14 Depth [in] 30.14 30.14	Power frequency [Hz]	50/60	60
Phase (Nominal voltage) 3- 3- Measures	Nominal power [kW]	3.4	3.4
Measures Interior volume [cu.ft.] 14.1 14.1 Net weight of the unit (empty) [bs] 320 320 Permitted load [bs] 198 198 Load per rack [lbs] 77 77 Wall clearance back [in] 6.3 6.3 Wall clearance sidewise [in] 3.94 3.94 Internal Dimensions 39.4 3.94 Width [in] 39.4 31.52 Depth [in] 20.09 20.09 Housing dimensions not incl. fittings and connections 48.7 48.7 Width net [in] 40.4 40.4 40.4 Depth net [in] 30.14 30.14 30.14 Environment-specific data 200 30.14 30.14 Environment-specific data 30.14 30.14 30.14	Unit fuse [A]	3 x 16	3 x 16
Interior volume [cu.ft.]14.114.1Net weight of the unit (empty) [lbs]320320Permitted load [lbs]198198Load per rack [lbs]7777Wall clearance back [n]6.36.3Wall clearance back [n]3.943.94Uterrande back [n]39.43.94Netterrande back [n]39.43.94Internal Dimensions31.523.94Width [n]30.03.94Height [n]0.0930.9Housing dimensions not incl. fittings and connections30.4Width net [in]48.748.7Height net [in]0.1430.14Depth fin]30.1430.14Environment-specific data2003.014Environment-specific data2003.014Fixtures3.013.01	Phase (Nominal voltage)	3~	3~
Net weight of the unit (empty) [lbs] 320 320 Permitted load [lbs] 198 198 Load per rack [lbs] 77 77 Wall clearance back [in] 6.3 6.3 Wall clearance sidewise [in] 3.94 3.94 Internal Dimensions 99.4 39.4 Width [in] 39.4 39.4 Height [in] 31.52 31.52 Depth [in] 20.09 20.09 Housing dimensions not incl. fittings and connections 48.7 48.7 Width net [in] 40.4 30.14 30.14 Dept het [in] 30.14 30.14 30.14 Environment-specific data J200 1200 J200	Measures		
Permitted load [lbs] 198 198 Load per rack [lbs] 77 77 Wall clearance back [in] 6.3 6.3 Wall clearance sidewise [in] 3.94 3.94 Internal Dimensions 99.4 39.4 With [in] 39.4 31.52 Depth [in] 20.09 20.09 Housing dimensions not incl. fittings and connections 48.7 48.7 Width net [in] 40.4 40.4 40.4 Depth net [in] 30.14 30.14 30.14 Environment-specific data 1200 1200 1200	Interior volume [cu.ft.]	14.1	14.1
Load per rack [lbs] 77 77 Wall clearance back [in] 6.3 6.3 Wall clearance sidewise [in] 3.94 3.94 Internal Dimensions 99.4 39.4 Width [in] 39.4 39.4 Height [in] 31.52 31.52 Depth [in] 20.09 20.09 Housing dimensions not incl. fittings and connections 48.7 48.7 Width net [in] 40.4 40.4 10.4 Depth ter [in] 30.14 30.14 10.14 Environment-specific data Load 1200 1200 1200	Net weight of the unit (empty) [lbs]	320	320
Wall clearance back [in] 6.3 6.3 Wall clearance sidewise [in] 3.94 3.94 Internal Dimensions 39.4 39.4 Width [in] 39.4 39.4 Height [in] 31.52 31.52 Depth [in] 20.09 20.09 Housing dimensions not incl. fittings and connections 48.7 48.7 Width net [in] 40.4 40.4 Depth net [in] 30.14 30.14 Environment-specific data 1200 1200	Permitted load [lbs]	198	198
Wall clearance sidewise [in] 3.94 3.94 Internal Dimensions 39.4 39.4 Width [in] 39.4 39.4 Height [in] 31.52 31.52 Depth [in] 20.09 20.09 Housing dimensions not incl. fittings and connections 48.7 Width net [in] 40.4 40.4 Depth net [in] 30.14 30.14 Energy consumption at 150 °C [Wh/h] 1200 1200	Load per rack [lbs]	77	77
Internal Dimensions Width [in] 39.4 39.4 Height [in] 31.52 31.52 Depth [in] 20.09 20.09 Housing dimensions not incl. fittings and connections 48.7 48.7 Width net [in] 40.4 40.4 Depth net [in] 30.14 30.14 Environment-specific data 1200 1200	Wall clearance back [in]	6.3	6.3
Width [in] 39.4 39.4 Height [in] 31.52 31.52 Depth [in] 20.09 20.09 Housing dimensions not incl. fittings and connections 48.7 48.7 Width net [in] 40.4 40.4 40.4 Depth net [in] 30.14 30.14 30.14 Environment-specific data T T T	Wall clearance sidewise [in]	3.94	3.94
Height [in] 31.52 31.52 Depth [in] 20.09 20.09 Housing dimensions not incl. fittings and connections 48.7 48.7 Width net [in] 40.4 40.4 Depth net [in] 30.14 30.14 Environment-specific data 1200 1200	Internal Dimensions		
Depth [in] 20.09 20.09 Housing dimensions not incl. fittings and connections 48.7 48.7 Width net [in] 40.4 40.4 Depth net [in] 30.14 30.14 Depth net [in] 1200 1200	Width [in]	39.4	39.4
Housing dimensions not incl. fittings and connections Width net [in] 48.7 Height net [in] 40.4 Depth net [in] 30.14 Environment-specific data 1200 Energy consumption at 150 °C [Wh/h] 1200	Height [in]	31.52	31.52
Width net [in] 48.7 48.7 Height net [in] 40.4 40.4 Depth net [in] 30.14 30.14 Environment-specific data 1200 1200	Depth [in]	20.09	20.09
Height net [in] 40.4 40.4 Depth net [in] 30.14 30.14 Environment-specific data 1200 1200 Energy consumption at 150 °C [Wh/h] 1200 1200 Fixtures 1200 1200	Housing dimensions not incl. fittings and connections		
Depth net [in] 30.14 30.14 Environment-specific data 1200 1200 Energy consumption at 150 °C [Wh/h] 1200 1200	Width net [in]	48.7	48.7
Environment-specific data Energy consumption at 150 °C [Wh/h] 1200 1200 Fixtures	Height net [in]	40.4	40.4
Energy consumption at 150 °C [Wh/h] 1200 1200 Fixtures	Depth net [in]	30.14	30.14
Fixtures	Environment-specific data		
	Energy consumption at 150 °C [Wh/h]	1200	1200
Number of shelves (std./max.)2/102/10	Fixtures		
	Number of shelves (std./max.)	2/10	2/10

1 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

Designation	Description	*	ArtNo.
	back		
	10 mm	01	8012-1286
	30 mm	01	8012-1370
	50 mm	01	8012-1386
	left		
	10 mm	01	8012-1279
	30 mm	01	8012-1362
	50 mm	01	8012-1378
	100 mm	01, 11	8012-1510
Access port with silicone			
blug	10 mm	01	8012-1272
	30 mm	01	8012-1357
	50 mm	01	8012-1374
	100 mm	01, 11	8012-1507
	top		
	10 mm	01	8012-1265
	30 mm	01	8012-1366
	50 mm	01	8012-1382
	100 mm	01, 10	8012-1389
Analog output 4-20 mA	for temperature values (output not adjustable)	02	8012-0481
Calibration certificate,	for temperature; for extending the measurement in center of chamber to include another test temperature		8012-1119
expanded			
	for temperature, measurement in center of chamber at specified temperature	-	8012-1138
Calibration certificate,	temperature measurement incl. certificate and 27 measuring points at specified temperature	-	8012-1597
emperature	temperature measurement incl. certificate, 15- 18 measuring points at specified temperature	-	8012-1576
	temperature measurement incl. certificate, 9 measuring points at specified temperature	-	8012-1555
Class 3.1 independent emperature safety device	with visual alarm (DIN 12880)	04, 12	8012-1149
Door gasket	made of FKM, silicone-free	03	8012-1311
Door lock	lockable door handle	-	8012-1255
	to increase air change rates		
an, reinforced	400 V option model	-	8012-1200
HEPA air filter	On fresh air supply for unit; filter classification H14 (acc. to. EN 1822-1:2009, > 99.995% at 0.3 μm)	-	8012-1169
nner chamber, reinforced	including 2 reinforced racks	_	8012-1257
Measurement of air exchange rate	in accordance with ASTM D5374, definition and protocol according to ambient temperature	-	8012-1198
Pt 100 temperature sensor	additional flexible Pt 100, interior, for displaying the temperature on the unit display	-	8012-0504
	viewing window in each door, 290 x 470 mm, and 30 W interior lighting		
/iewing window and nterior lighting	208 V option model	-	8012-0240
	400 V option model	-	8012-0060
	for controlling 3 relay contacts via program regulators, accessible via 6-pin DIN socket (max. 24 V - 2.5 A)		
Zero voltage relay	120/208 V option model	-	8012-0472
contacts	230/400 V option model	-	8012-0471

* Notes > See last page





ACCESSORIES



Designation	Description	*	ArtNo.
APT-COM™ 4 BASIC-	for simple logging and documentation requirements with up to 5 networked units.		
Edition	version 4, BASIC edition	19	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.		
Edition	version 4, GLP edition	19	9053-0042
APT-COM™ 4	convenient unit and user management built on the BASIC edition. Suitable for networking up to 100 units.		
PROFESSIONAL- Edition	version 4, PROFESSIONAL edition	19	9053-0040
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	8012-082
	with lid made from 18/8 stainless steel, stackable, dimensions: 230 x 133 x 45 mm	-	4022-012
Instrument tray	with lid made from 18/8 stainless steel, stackable, dimensions: 315 x 215 x 60 mm	-	4022-012
pH-neutral detergent	concentrated, for gentle remove of residual contaminants; 1 kg	-	1002-001
	IQ/OQ documents – supporting documents for validation performed by customers, consisting of: IQ/OQ checklists incl. calibration guide and comprehensive unit documentation; parameters: temperature, CO ₂ , O ₂ , pressure, depending on unit		
	Digital in PDF format	-	7057-000
	Hard copy inside folder	-	7007-000
Qualification documents	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, CO ₂ , O ₂ – or pressure, depending on unit		
	Digital in PDF format	-	7057-000
	Hard copy inside folder	-	7007-000
Daala	chrome plated	-	6004-000
Rack	stainless steel	-	6004-001
Rack accessories	fasteners (1 set of 4) for additional security of racks	-	8012-053
Rack, reinforced	stainless steel, with fasteners (1 set of 4)	-	8012-034
Rubber pads	set anti-slip feet	-	8012-188
Shelf, perforated	Stainless steel	-	6004-003
	stable cart, casters with locking brakes, dimensions: W 1,300 x D 800 x H 780 mm		9051-001

* Notes > See last page

SERVICES

Designation	Description	*	ArtNo.
Installation services			
Unit installation	Unpacking and setting up of unit, connecting to existing connections, and checking function	13, 18	DL10-0100
Unit instructions	Unit function instructions for operation and programming of the controller	18	DL10-0500
Preventive maintenance			
Maintenance	Functional testing of all electrical and mechanical components, short calibration, documentation in the maintenance schedule	14, 18	DL20-0200
Calibration services			
Measurement of air exchange rate	including certificate (in accordance with ASTM D5374)	14, 16, 17, 18	DL33-000
Temperature calibration	Expansion – including certificate, each additional measuring point in center of chamber at specified test temperature	14, 16, 17, 18	DL30-0102
	Temperature calibration with 1 measuring point in center of chamber at a specified test temperature, including certificate	14, 16, 17, 18	DL30-0107
Temperature measurement, 18 measuring points	Temperature measurement with 18 measuring points at a specified test temperature, including certificate	14, 16, 17, 18	DL30-011
Temperature measurement, 27 measuring points	Temperature measurement with 27 measuring points at a specified test temperature, including certificate	14, 16, 17, 18	DL30-012

* Notes > See last page



Designation	Description	*	ArtNo.
Temperature measurement, 9 measuring points	Temperature measurement with 9 measuring points at a specified test temperature, including certificate	14, 16, 17, 18	DL30-0109
Validation services			
Execution of IQ/OQ	Execution of IQ/OQ in accordance with qualification folder	15, 18	DL41-0200
Execution of IQ/OQ/PQ	Execution of IQ/OQ/PQ in accordance with qualification folder	15, 18	DL44-0500
Warranty service			
Warranty extension from 2 to 3 years	The warranty is extended from 2 to 3 years from the delivery date, wear parts are excluded	-	DL00-5041
Warranty extension from 2 to 5 years	The warranty is extended from 2 to 5 years from the delivery date, wear parts are excluded	-	DL00-5042

* 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. 04
- 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.
- Not available on 23- or 53-liter units. Only available on units rated for 230 V or 400 V. 11 12
- 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. Calibration is performed according to the BINDER factory standard. 17
- 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 18 include a country-specific added fee (available on request).
- For additional accessories, refer to the Process documentation chapter. 19

BINDER GmbH Tuttlingen, Germany TEL +49 7462 2005 0 FAX +49 7462 2005 100 info@binder-world.com www.binder-world.com

BINDER Asia Pacific (Hong Kong) Ltd. Kowloon, Hong Kong, P.R. China TEL +852 39070500 FAX +852 39070507 asia@binder-world.com www.binder-world.com

BINDER Environmental Testing Equipment (Shanghai) Co., Ltd. Shanghai, P.R. China TEL +86 21 685 808 25 FAX +86 21 685 808 29 china@binder-world.com www.binder-world.com

Representative Office for CIS Moscow. Russia TEL +7 495 988 15 16 FAX +7 495 988 15 17 russia@binder-world.com www.binder-world.com

BINDER Inc. Bohemia, NY, USA TEL +1 631 224 4340 FAX +1 631 224 4354 usa@binder-world.com www.binder-world.us