

Material test chamber with forced convection

The forced convection of an FP series chamber provides reliably short drying times and particularly fast heating - even for chambers under full loads.



Advantages:

- The specialist for demanding heating profiles
- Adjustable high air exchange rate
- "Made in Germany" quality

Areas of application:



Electronics /
Semiconductor Industry



Plastics Industry



Surface Technology

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Features	Customer benefits	Characteristics
APT.line™ temperature technology	<ul style="list-style-type: none"> • Identical test conditions throughout the chamber interior • Independent of specimen size and quantity 	APT.line for maximum precision™ <ul style="list-style-type: none"> • Uniform circulation even under full load • Homogeneous temperature conditions throughout test specimens
Performance characteristics	<ul style="list-style-type: none"> • Broad range of applications • Short warm up times • Suitable for numerous industry standards 	<ul style="list-style-type: none"> • High air exchange rate • Adjustable fan speed • Large power reserves • Temperature range up to 300 °C
Inner chamber concept	<ul style="list-style-type: none"> • Maximum occupational safety • Easy loading and unloading of specimen material • Easy cleaning 	<ul style="list-style-type: none"> • Inner chamber made of stainless steel • Very tight door closure with 2-point door latch • Low heat dissipation due to 60 mm insulation • Rack with tilt protection • No permanent fixtures
Quality	<ul style="list-style-type: none"> • Reliable devices with long service lives • Short delivery times • Minimal maintenance and operating costs 	<ul style="list-style-type: none"> • Premium quality made in Germany • Highly automated series production • High-quality materials, state-of-the-art production technology • High standard according to DIN 12880 (27-point measurement)
Accessories and Services	<ul style="list-style-type: none"> • Flexible solution in terms of size, type and equipment • Numerous options for special applications • BINDER INDIVIDUAL for customer-specific solutions • Worldwide BINDER Service 	Comprehensive product portfolio <ul style="list-style-type: none"> • Size 53 to 720 liters • Additional product lines: Drying ovens, safety drying ovens, vacuum drying ovens, climate chambers • Voltage variants and certificates (UL) • Various options: Door with viewing window, access ports, reinforced design for heavy loads, Data Logger Kits • Worldwide service network

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- Electronically controlled APT.line™ preheating chamber assuring temperature accuracy and reproducible results
- Temperature range from 5 °C above ambient temperature to 300 °C
- MP controller with 2 programs with 10 sections each, or alternatively 1 program with 20 sections
- The time of an individual program step can be set to max. 99.59 hours or 999.59 hours. This adjustment applies to all program sections.
 - Integrated weekly program timer with real-time function
 - Adjustable ramp function via program editor
- Digital temperature setting with an accuracy of one degree
- Adjustable fan speed
- Adjustable ventilation by means of front ventilation flap slide and rear exhaust Ø 50 mm
- Elapsed time indicator
- Independent adjustable temperature safety device class 2 (DIN 12880), with visual temperature alarm
- RS 422 interface for use with APT-COM™ DataControlSystem communication software or switch over to printer output with RS 232 / RS 422 interface converter
- Units up to 115 liters are stackable
- 2 chrome-plated racks included
- BINDER test certificate

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FP 400

▶ Exterior dimensions	
Width (mm)	1234
Height (incl. feet) (mm)	1022
Depth (mm)	765
Plus door handle and connection (mm)	105
Wall clearance, rear (mm)	100
Wall clearance, side (mm)	160
Exhaust duct (outer Ø mm)	52
Steam space volume (l)	498
Number of doors (ea.)	2

▶ Interior dimensions	
Width (mm)	1000
Height (mm)	800
Depth (mm)	500
Interior volume (l)	400
Racks (number standard/max.)	2 / 10
Load per rack (kg)	35
Permitted total load (kg)	90
Weight (empty) (kg)	145

▶ Temperature data	
Temperature range approx. 5 °C above ambient temperature to (°C)	300
Temperature variation	
at 70 °C (± K)	1
at 150 °C (± K)	2,5
at 300 °C (± K)	4,8
Temperature fluctuation (± K)	0,3
Warm-up time 1)	
to 70 °C (min.)	18
to 150 °C (min.)	35
to 250 °C (min.)	60
Recovery time after doors were open for 30 sec. 1)	
at 70 °C (min.)	2
at 150 °C (min.)	17
at 300 °C (min.)	21

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FP 400

▶ Ventilation data	
Ventilation	
at 70 °C (x/h)	17
at 150 °C (x/h)	18
at 300 °C (x/h)	16

▶ Electrical data	
IP protection class acc. to EN 60529	IP 20
Voltage ($\pm 10\%$) 50 / 60 Hz (V)	400 3N~
Nominal power (kW)	3,4
Energy consumption	
at 70 °C (W)	520
at 150 °C (W)	1200
at 300 °C (W)	2340

1) To 98% of the set value

All technical data are specified for units with standard equipment at an ambient temperature of 25 °C and a line voltage fluctuation of $\pm 10\%$. The temperature data is determined 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 figures are typical average values for series devices. We reserve the right to alter technical specifications at any time.

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Numerous access ports

With silicone plugs for introducing external measuring instruments into the chamber, access ports with 10, 30, 50, 100 mm diameters.



Temperature measurement of the specimen

Additional PT 100 temperature sensor for accurate temperature measurement of the specimen and digital display of measured values. Recording of measured data via RS 422 interface possible.



Calibration certificate & validation

BINDER can significantly reduce the workload in qualifying and validating devices. Nobody knows our devices as well and has as much experience in certifications as we do.

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FP 400

Access ports with silicone plug, 10, 30, 50, 100 mm	<input type="radio"/>
HEPA fresh-air filter, Class H 14 (according to EN 1822, min. 99.999% for 0.3 µm particles)	<input type="radio"/>
Fasteners for additional security for racks (1 set of 4)	<input type="radio"/>
Anti-slip rubber pads for safe stacking (1 set of 4 pieces)	<input type="radio"/>
Measurement of air exchange rate according to ASTM D5374, with definition and protocol according to ambient temperature (measurement in factory)	<input type="radio"/>
Temperature measurement acc. to DIN 12880 (27 measuring points) at 150 °C or at specified temperature with measuring protocol and certificate	<input type="radio"/>
Calibration certificate, measurement in center of chamber at 150 °C or at specified testing temperature	<input type="radio"/>
Extension to calibration certificate. Each additional measurement at additional measuring point or testing temperature	<input type="radio"/>
Additional measuring channel for digital display of specimen temperature with flexible PT 100 temperature sensor, measured data recorded via RS 422 interface	<input type="radio"/>
Independent temperature safety device class 3.1 (DIN 12880) with optical alarm	<input type="radio"/>
Analog output for temperature 4 - 20 mA with 6-pin DIN socket (output not adjustable)	<input type="radio"/>
Zero-voltage relay outputs accessible via 6-pin DIN socket. Additional module for controlling 2 relay outputs via 2 of the programmable controller's contacts. Zero-voltage relay outputs can be switched on and off either automatically and manually	<input type="radio"/>
Data Logger Kit T 350: For continuous temperature recording of 0 °C to 350 °C. Kit includes 1 data logger, PT 100 sensor with 2 m Teflon extension cable and 1 fixture for mounting to the BINDER unit	<input type="radio"/>
Data Logger Software: Configuration and evaluation software for all BINDER Data Logger Kits, incl. data cable	<input type="radio"/>
Rack, chrome-plated	<input type="radio"/>
Rack, stainless steel	<input type="radio"/>
Reinforced rack, stainless steel, with 1 set of fasteners (4 pieces), max. load 70 kg	<input type="radio"/>
Perforated shelf, stainless steel	<input type="radio"/>
Door lock	<input type="radio"/>
Door gasket, FKM (Viton)	<input type="radio"/>
Reinforced inner chamber, including 2 reinforced racks (maximum total load 250 kg, max. load per rack 70 kg)	<input type="radio"/>
2 doors each with window 470 x 290 mm and interior lighting (30 W)	<input type="radio"/>
Increased air-exchange rate through high-performance fan	<input type="radio"/>

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