

## M series

### Environmental simulation chambers for complex temperature profiles

Because of its individual programming options and ability to operate at maximum temperatures up to 300 °C (572°F), the M series is ideally suited for materials testing and aging tests. The heavy-duty air turbine and a programmable exhaust ventilation flap provide rapid heating-up and ensure that the test temperature is maintained absolutely precise at all levels, with minimal spatial fluctuations; performance as never before.



#### Leistungsmerkmale/Ausstattung:

- Electronically controlled APT.line™ preheating chamber technology
- Temperature range of 5 °C (9 °F) above ambient temperature up to 300 °C (572 °F)
- MCS controller with 25 storable programs of 100 sections each for a maximum of 500 program segments
  - User-friendly LCD screen
  - Easy-to-read menu guide
  - Integrated electronic chart recorder
  - Variety of options for the graphic display of process parameters
  - Real-time clock
- Adjustable ramp function via program editor
- Program-controlled ventilation flap
- High air-exchange rate through high-performance fan
- Adjustable fan speed (0 to 100 %)
- Rear exhaust duct Ø 50 mm (2 inch)
- Independent adjustable temperature safety device, Class 2 (DIN 12880), with optical temperature alarm
- RS 422 interface for communication software APT-COM™ DataControlSystem
- 2 chrome-plated shelves
- BINDER test certificate

	M 53	M 115	M 240	M 400	M 720
<b>Exterior dimensions</b>					
Width (mm/inch)	634 / 25.0	834 / 32.8	1034 / 40.7	1234 / 48.6	1234 / 48.6
Height (inclusive feet/castors) (mm/inch)	779 / 30.7	863 / 34.0	984 / 38.7	1184 / 46.6	1692 / 66.6
Depth (mm/inch)	575 / 22.6	645 / 25.4	745 / 29.3	765 / 30.1	865 / 34.1
Plus door handle (mm/inch)	150 / 5.9	150 / 5.9	150 / 5.9	150 / 5.9	150 / 5.9
Wall clearance rear (mm/inch)	100 / 3.9	100 / 3.9	100 / 3.9	100 / 3.9	100 / 3.9
Wall clearance side (mm/inch)	160 / 6.3	160 / 6.3	160 / 6.3	160 / 6.3	160 / 6.3
Exhaust duct outer- Ø (mm/inch)	52 / 2.1	52 / 2.1	52 / 2.1	52 / 2.1	52 / 2.1
Steam space volume (l/cu.ft.)	77 / 2.7	158 / 5.6	308 / 10.9	498 / 17.6	869 / 30.7
Number of doors	1	1	2	2	2
<b>Interior dimensions</b>					
Width (mm/inch)	400 / 15.8	600 / 23.6	800 / 31.5	1000 / 39.4	1000 / 39.4
Height (mm/inch)	400 / 15.8	480 / 18.9	600 / 23.6	800 / 31.5	1200 / 47.2
Depth (mm/inch)	330 / 13.0	400 / 15.8	500 / 19.7	500 / 19.7	600 / 23.6
Interior volume (l/cu.ft.)	53 / 1.9	115 / 4.1	240 / 8.6	400 / 14.3	720 / 25.7
Shelves, chrome-plated (number standard/max.)	2/5	2/6	2/7	2/10	2/16
Load per rack (kg/lbs.)	15 / 33	20 / 44	30 / 66	35 / 77	45 / 99
Permitted total load (kg/lbs.)	40 / 88	50 / 110	70 / 155	90 / 199	120 / 265
Weight of the unit (empty) (kg/lbs.)	61 / 135	89 / 196	131 / 289	173 / 382	203 / 448
<b>Temperature data</b>					
Temperature range, 5°C (9°F) above ambient up to (°C/°F)	300 / 572	300 / 572	300 / 572	300 / 572	300 / 572
Temperature variation 1)					
at 70 °C (158 °F) (± °C)	0,5	0,6	0,8	0,7	0,7
at 150 °C (302 °F) (± °C)	1,3	1,5	1,5	1,5	1,9
at 300 °C (572 °F) (± °C)	2,8	2,8	2,8	5	4,6
Temperature fluctuation (± °C)	0,3	0,3	0,3	0,3	0,3
Heating-up time 2)					
to 70 °C (158 °F) (Min.)	5	5	6	6	7
to 150 °C (302 °F) (Min.)	15	16	19	18	21
to 250 °C (482 °F) (Min.)	35	36	42	44	51
Recov. time after door was opened for 30 sec. 2)					
at 70 °C (158 °F) (Min.)	1	1	1	1	1
at 150 °C (302 °F) (Min.)	3	3	3	3	3
at 300 °C (572 °F) (Min.)	5	5	5	5	5
<b>Electrical data</b>					
Housing protection acc. to EN 50529	IP 20	IP 20	IP 20	IP 20	IP 20
Nominal voltage (±10 %) 50/60 Hz (V)	230 / 1 N~	230 / 1 N~	230 / 1 N~	400 / 3N~	400 / 3 N~
Nominal power (W)	1200	1600	2700	3400	5000
Energy consumption					
at 70 °C (158°F) (W)	145	230	370	520	570
at 150 °C (302°F)(W)	300	544	850	1200	1320
at 300 °C (572°F) (W)	720	1100	1400	2340	2600

- 1) value without window
- 2) up to 98 % of the set value

All technical specifications are specified for units with standard equipment at an ambient temperature of 25 °C (77 °F) and a voltage fluctuation of  $\pm 10$  %. All data are determined at 100 % fan speed. The temperature data are 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 values have been specified at a fan speed of 100 %. All indications are average values, typical for units produced in series. We reserve the right to alter technical specifications at all times.



### Access ports

With silicon plugs for inserting external measuring devices into the chamber. Access ports with 10, 30, 50 mm (0.4, 1.2, 2 inch) diameter.



### Door with window and interior lighting

For optimum process control in the interior, available for all equipment sizes.



### Reinforced inner chamber

Includes two reinforced racks for heavy loads. (Total load maximum 250 kg / 551 lbs.)



### Specimen temperature measurement

Additional flexible PT 100 temperature sensor for precise temperature measurement of the specimen with digital temperature display. Recording of measurement data possible via RS 422 interface.



### Calibration certificates

Measurement in the center at specified values. Additional measuring points or test values according to your specification.

	M 53	M 115	M 240	M 400	M 720
Access port with silicone plug	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rack, chrome-plated or stainless steel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rack, perforated, stainless steel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reinforced rack, stainless steel, with 1 set of rack securings (max. 70kg/154lbs.)	-	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reinforced inner chamber, including 2 reinforced racks (max. total load 250kg/552lbs. Load per rack 70kg/154lbs.)	-	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Independent adjustable temperature safety device, Class 3.1 (DIN 12880)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Door with window and interior lighting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Lockable door	O	O	O	O	O
Door gasket, FKM (temperature-resistant up to 200 °C / 392 °F)	O	O	O	O	O
Over-temperature alarm, acoustic, can be switched off	-	-	-	-	-
Analogue temperature output, 4–20mA, with DIN bushing 6 poles	O	O	O	O	O
Additional measuring channel for digital display of specimen temperature	O	O	O	O	O
Mostly gas-tight constructed chamber	O	O	O	-	-
Inert gas connection (gas inlet and outlet)	O	O	-	-	-
Temperature measurement according to DIN 12880-2 or with 9 measuring points with measurement protocol and certificate	O	O	O	O	O
HEPA Fresh-air filter, Class EU 14	O	O	O	O	O
Increased air change rate through stronger fan	X	X	X	X	X
Air change rate measurement according to ASTM D5374 with definition and measurement protocoll	O	O	O	O	O
Serial printer with interface converter for printing temperature logs. Connects to RS 232 printer interface. Includes set of connection cables for RS 422 interface and RS 232/RS 422 interface converter, 230 V	-	-	-	-	-
Potential-free relay outputs accessible with DIN bushing 6 poles	-	-	-	-	-
Calibration certificate	O	O	O	O	O
Extension for calibration certificate (additional values)	O	O	O	O	O
Stable table on castors with locking brakes	O	O	O	O	-
Evaporating dish with rim	O	O	O	O	-
Rubber pads for safe stacking	-	-	-	-	-
Neutral cleaning agent (liquid concentrate)	O	O	O	O	O

O Option - not available

Technical specifications subject to change

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