

BOX TYPE FURNACES

1600 °C max.Temperature –MoSi₂ resistors – Zirconia Sintering

Model family: **BOX-AM10-1600**

Description.

BOX-AM10-1600 model is a powerful chamber furnace family concentrating numerous of advantages and providing a single piece solution for the research and small production laboratory.

Best quality MoSi₂ resistors used, known for their long working life under oxidizing atmosphere, are not affected by thermal shock and can withstand very high element power loads thereby provide a heating solution for extremely fast temperature ramping processes. Can be used continuously or intermittently with no restriction.

Taking advantage of the THERMANSYS® PCC (Power Consistent Control) close loop power control management platform and based on accurate true rms Volt/Ampere measurements, these furnaces have optimum performance in terms of Power Factor and EMC standards compliance. Focusing our control management on the specific resistor properties the workable life of the heater is significantly extended and the temperature control is remarkably accurate both under fast ramping and stable point.

Having as major priority the economical operation this furnace was designed with double wall low mass density thermal ceramic insulation serving both as a heat exchanger preheating the incoming air and as a heat barrier improving the overall thermal insulation.

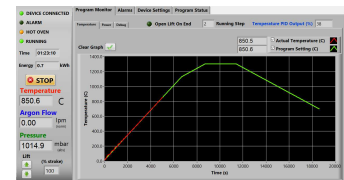
With adjustable air opening in the back side and an exhaust chimney at the top, creating a strong natural convection, the entire volume of the chamber can be refreshed several times per minute. The preheated incoming air is entering and exiting the chamber through multiple holes creating a smooth and temperature uniform laminar air stream through the sample.



Model shown is *BOX-AM10_V4.5-1600*.

Box-AM10-1600 furnaces provide a suitable solution for the sintering of zirconium oxide dental crowns. The zirconia's units should position in ceramic boxlike containers to protect the ware from contamination. Several containers can be stacked into the furnace.

Taking advantage of the optional addition of up to two flow control systems (calibrated for Nitrogen and Air) the user can prepare flow mixtures with preset concentrations of Oxygen in Nitrogen or work under fully inert (Nitrogen) atmosphere. Equipped with a touch screen computer, running the specially developed **PYROLOGISM 2.0** software, these furnaces present a truly unique and friendly operator environment with advanced features.



Key features.

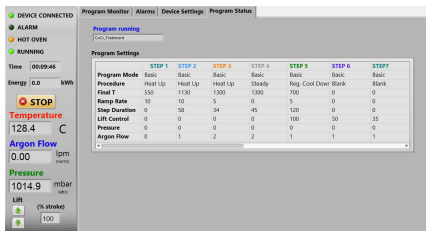
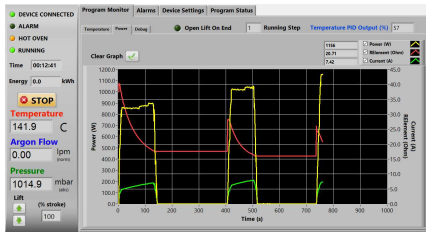
- Control strategy based on Thermansys® PCC (Power Consistent Control) platform insures silent operation and compliance with EMC standards.
- PID control constantly conforms to various load needs. Accurate and uniform temperature profiles.
- Modern double wall construction keeps external surfaces temperature low, emphasizing in operator safety. Internal skin is exclusively made from stainless steel to enhance durability.
- Ergonomic design with no protruding edges, bolts or other features combines stainless steel parts with painted finish parts for an improved esthetic result.
- Lift up door keep hot surfaces away from operator.
- Touch Screen Computer running PYROLOGISM 2.0 software human-machine interface.
- 3 user process thermocouple inputs available (B, E, J, K, N, R, S, T type- software configurable).
- Power and true RMS Current measuring circuits.
- Heater failure, open control thermocouple detection, door open alarms and interlocks. Alarms and events front panel led array.
- Alarm event output (dry contact 3A/250V AC/DC).
- Stand alone over-temperature limiter (Watchdog) with manual reset in accordance with EN 60519-2 to protect the oven and load. Overrides main controller and cut off heater power if user adjustable high limit is reached.

Contact details

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PYROLOGISM control and monitoring software.



- Quick setting of a single ramp rate to a set point - run on timer function.
- Set-point programming with up to 15 ramp and constant temperature programming steps – graphical inspection of programming.
- Storage and reload of unlimited number of distinct programs.
- Real time chart illustrating control temperature, running set point and user process temperatures with dynamic zoom.
- Real time true-RMS Current (A), Voltage (V) and Power (W) measurements.
- Real time actual Power (W) and totalized Energy (kWh) chart.
- Saves all data on local memory.
- Tools for manual PID tuning and auto-tuning.
- Virtual keyboard, alarm and event message tab.
- Watchdog over temperature limiter monitor/configuration.
- Gas flow, monitoring and control interface pages activated if corresponding optional modules are enabled.
- Versions running at Microsoft® Windows are available for control by a PC through USB port.
- Remotely monitoring and control through network connection.

Specifications and Ordering Information.

Standard features:

- Maximum continuous temperature 1600 °C.
- Operating Power: 208 /240VAC – 50/60Hz.
- Two in depended B type embedded thermocouples for controller and over-temperature limiter feedback.
- Temperature control accuracy ± 1 °C.
- Exposed resistors type.
- Thermocouple inputs:
3 chan. - B, E, J, K, N, R, S, T type- software configurable.
24 bit A/D conversion, 0-45°C cold junction compensated
Typical accuracy $\pm 0.2\%$ f.s @ 25 , resolution 0.1 °C

Optional features:

- Flow controllers:
Number of lines: 1 or 2
Line 1 gas type calibration: Air
Line 2 gas type calibration: Nitrogen (N₂)
Flow range: 0.01-20 std L/min
Accuracy: $\pm 2\%$ of reading for Air
 $\pm 3\%$ of reading for N₂
Typical Control stability: ± 0.1 std L/min.
Temperature (0-50°C), Pressure (0-15 psig) comp.
Filtration: Not provided, user supplied HEPA grade

CE Certified. Compliant with **Low Voltage Directive 2006/95/EC** (harmonized referenced standard EN 61010-1: 2001 and EN 61010-2-010:2003) and **EMC Directive 2004/108/EC** (harmonized referenced standard EN 61326-1:2006).
Produced in **GREECE** following **ISO 9001:2008 quality management system** and **ISO 14001:2004 environmental management system**.

TABLE1. BOX-AM10-1600 Family Models

Model Part Number	Max. Cont. Temp. °C x Heat up time* min	Furnace internal dim. WxHxD mm	Heated Volume liters	Furnace external dim. WxH**xD mm	Nominal Max. Power (W)
BOX-AM10...					
_V1.6-1600	1600 x 55	120x140x100	1.6	480x750x460	2000
_V2.5-1600	1600 x 55	140x160x120	2.5	500x770x520	2600
_V4.5-1600	1600 x 55	140x160x200	4.5	500x770x520	4200
_V7.0-1600	1600 x 55	140x160x320	7.0	500x770x640	6400
_V10-1600	1600 x 55	160x200x320	10.0	520x810x640	7600

* Furnace working with no load.

** Plus 100 mm for chimney

IMPORTANT ORDERING NOTES:

- Models Part Number listed in Table 1 concern complete turn key systems without flow controllers included.

Ordering Examples:

- BOX-AM10_V2.5-1600: This Part Number includes one BOX-AM10-1600 family furnace having 140x160x120 mm internal chamber dimensions including all standard features.

- To order the furnace with one flow controller add at the end of the part number the suffix "LINE X",

e.g: BOX-AM10_V2.5-1600-**LINE1** for air calibration or BOX-AM10_V2.5-1600-**LINE2** for Nitrogen calibration

- To order the furnace with two flow controllers add at the end of the part number the suffix "LINE 1/2",

e.g: BOX-AM10_V2.5-1600-**LINE1/2**.

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