

## BOX TYPE FURNACES

### 1800 °C max. Temperature -MoSi<sub>2</sub> resistors

Model family: **BOX-AM10-1800**

### Description.

**BOX-AM10-1800** model being able to reach **1800 °C** and maintain temperature at **1750 °C continuously** represents an ultrahigh temperature chamber furnace.

Operated through the specially developed **PYROLOGISM** software and equipped with a touch screen Computer, **BOX-AM10-1800** furnace is a state of the art high temperature Furnace.

Best quality and highest temperature ratings KANTHAL® Super 1900 MoSi<sub>2</sub> 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. This furnace is constructed with multilayer fibrous, low mass density, and high thermal shock resistance thermal ceramic Al<sub>2</sub>O<sub>3</sub> insulation. Having as major priority the economical operation the multilayered insulation boards are creating double wall between them serving both as a heat exchanger preheating the incoming air and as a heat barrier improving the overall thermal insulation.



*Model shown is BOX-AM10-V4-1800.*

With adjustable air opening at the back 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 the chamber through multiple holes creating a smooth and temperature uniform laminar air stream through the sample. Using **THERMANSYS® PCC** (Power Consistent Control) close loop power control management platform, 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 their life is significantly extended and the temperature control is remarkably accurate both under fast ramping and stable point.

Taking advantage of the optional addition of up to two flow control systems (calibrated for Nitrogen and/or Air) the user can prepare flow mixtures with preset concentrations of Oxygen in Nitrogen or work under fully inert (Nitrogen) atmosphere. The specially developed **PYROLOGISM 2.0** software, is also controlling and monitoring the two optional flow control systems.



### Key features.

- Control strategy based on Thermansys® PCC (Power Consistent Control) platform insures silent operation and compliance with EMC standards.
- PID control. 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 corrosion resistant RAL (electrostatically) painted finish parts for an improved esthetic result.
- Lift up door keep hot surfaces away from operator.
- USB and Ethernet ports for connection to a PC
- 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).
- Threaded ports facing the heated chamber at the rear panel for Thermocouple probe installation.
- 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.

Having in mind user’s convenience and daily work facilitation, Thermansys® design and develop a special windows architecture software providing a friendly human machine interface solution with advanced features:



- Temperature controller covering the entire range of operation temperature (50-1800 °C) can perform a simple setting of a single ramp rate to a set point but also a fully programmable ramp and constant temperature sequence.
- 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.
- Run on timer function (7 day).
- 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.
- **Pyrologism** software 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 1800/1750 °C.
- Operating Power: 208 /240VAC – 50/60Hz.
- Two in depended B type embedded thermocouples for controller and over-temperature limiter. Resolution 0.1 °C
- Temperature control accuracy ±1 °C.
- Resistors type: MoSi<sub>2</sub>, fully exposed.
- User 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 ±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 (N<sub>2</sub>)  
Flow range: 0.01-20 std L/min  
Accuracy: ±2% of reading for Air  
±3% of reading for N<sub>2</sub>  
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-AM10-1800 Family Models**

Model Part Number	Heat up time* ( min)	Furnace internal dim. WxHxD mm	Nominal Heated Volume (Liters)	Furnace external dim. WxH**xD mm	Max. Power (W) / Total No. Of resistors
<b>BOX-AM10...</b>					
<b>_V3-1800</b>	90	150x150x120	3	520x780x520	3000/ 2
<b>_V4-1800</b>	90	150x150x150	4	520x780x520	4800/4
<b>_V6-1800</b>	90	160x150x240	6	540x780x580	6200/6
<b>_V8-1800</b>	90	160x200x240	8	540x830x580	9000/6

\* 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\_V3-1800: This Part Number includes one BOX-AM10-1800 family furnace having 150x150x120 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-V3-1800-**LINE1** for air calibration or BOX-AM10-V3-1800-**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-V3-1800-**LINE1/2.**

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