

## BOX TYPE FURNACES

### 1700 °C max. Temperature -MoSi<sub>2</sub> resistors KANTHAL HT resistors – Zirconia Sintering

Model family: **BOX-AM10-1700 RF**

### Description.

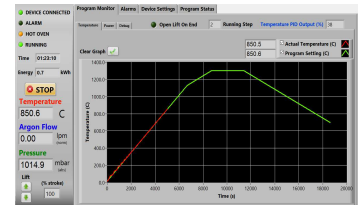
**BOX-AM10-1700 RF** model being able to reach and maintain temperature at **1700 °C continuously** represents an ultra high temperature chamber furnace.

Best quality and highest temperature ratings **KANTHAL Super HT** MoSi<sub>2</sub> resistors used, known for their long working life under thermal cyclic conditions, 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. These heating elements, in addition, having significantly reduced Ferrous content are minimizing the risk of sample contamination providing the best solution for Zirconia sintering. Can be used continuously or intermittently with no restriction.

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 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 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, windows architecture, operator environment with advanced features.



Model shown is **BOX-AM10-V4.0-1700 RF**.

### Key features.

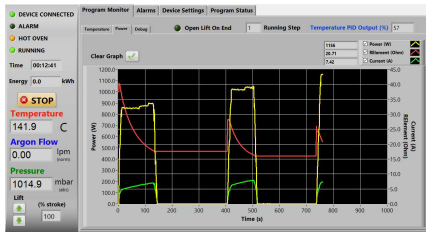
- Control strategy based on Thermansys® PCC (Power Consistent Control) platform insures silent operation and compliance with EMC standards.
- KANTHAL Super HT heating elements provide long life under cycling conditions and minimal risk of sample contamination. Especially suited for Zirconia treatment.
- Modern double wall construction keeps external surfaces temperature low, emphasizing in operator safety. Internal skin is exclusively made from stainless steel to enhance durability.
- 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).
- 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

Ath. Stagiriti 7- Pilea, Thessaloniki Greece, 55534  
tel. 0030 2310 942346, fax. 0030 2310 942336  
e-mai: [info@thermansys.com](mailto:info@thermansys.com)  
[www.Thermansys.com](http://www.Thermansys.com)

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# PYROLOGISM control and monitoring software.



Description	Status	Reset
Open Thermocouple	OK	Over Alarm Reset
Open Circuit	OK	
Short Circuit	OK	
LIR Callback	OK	LIR Alarm Reset
Low Argon Flow	OK	Argon Low Flow Alarm Reset
Vacuum Leak	OK	Vacuum Leak Alarm Reset
Over Temperature Watchdog	OK	Watchdog Alarm Reset

- 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 1700 °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 ±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-AM10-1700 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... _V2.5-1700 RF	1700 x 90	120x140x120	2.0	480x760x520	2200
_V4.0-1700 RF	1700 x 90	120x180x180	4.0	480x800x520	3800
_V6.0-1700 RF	1700 x 90	140x200x220	6.0	500x820x520	5800

\* 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\_V2.0-1700 RF: This Part Number includes one BOX-AM10-1700 RF family furnace having 120x140x120 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-V2.0-1700 RF-LINE1 for air calibration or BOX-AM10-V2.0-1700 RF 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-V2.0-1700 RF-LINE1/2.

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