

REACTOR TYPE FURNACES

Vertical Operation or Horizontal Operation - Remote Control - Single Zone

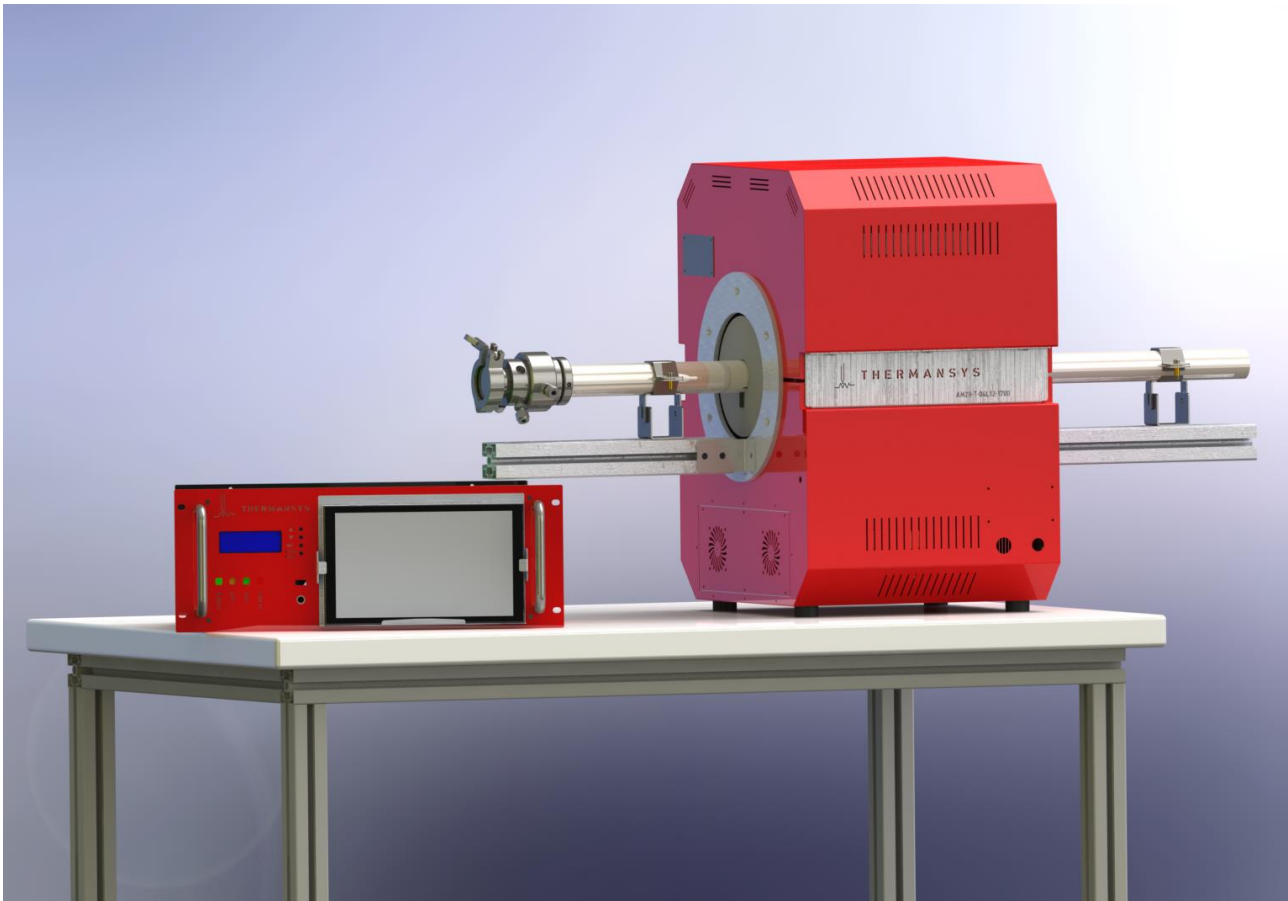
Maximum Continuous Operation Temperature 1750 °C

Model families: RCT-AM2-T-1700/1800

Description.

Being able to reach heat up rates as high as **60 °C per minute**, reach operating temperature of **1800 °C** and maintain it at **1750 °C continuously**, RCT-AM2-T-1700 and RCT-AM2-T-1800 models families represents a truly powerful ultrahigh temperature tubular heating device.

Constructed using lightweight insulation and powered from high quality Molybdenum Disilicide (MoSi₂) elements, selected from KANTHAL SUPER® heating systems programs, these families are ideal choices for reliable, very accurate and uniform temperature control processes up to **1750 °C continuously**. Offered as single zone models and designed in two configurations, for horizontal or for vertical operation using an appropriate stand can be used continuously or intermittently with no restriction.



Focusing our control management on the specific resistor properties the workable life of the heater is significantly extended without partially sacrifice the extremely fast heating rates that can provide, using conservative control techniques.

 HELLENIC PRODUCT.

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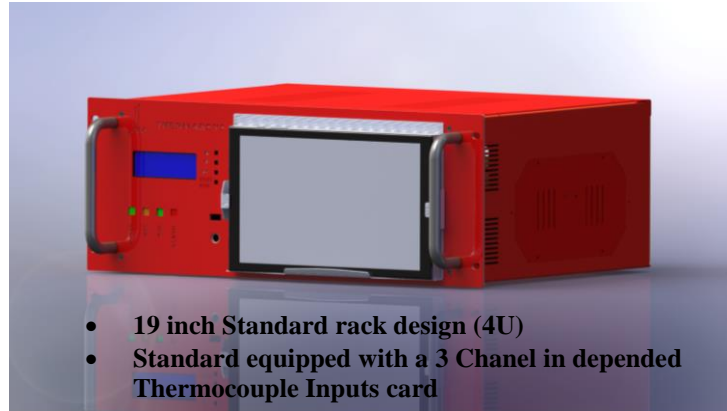
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PYROMODULAR System at a Glance.

Operated through the specially developed **PYROLOGISM 2.0** software and equipped with a touch screen computer **PYROMODULAR** is a state of the art control, monitoring and data acquisition system. Taking advantage of the optional expanding capabilities of this system the user can not only just control the furnace but create a fully instrumented and totally integrated high temperature reactor system.

PYROMODULAR Main Controller.

Standard equipped with a Digital LCD display temperature controller providing 15 step programming with 1 program storage.



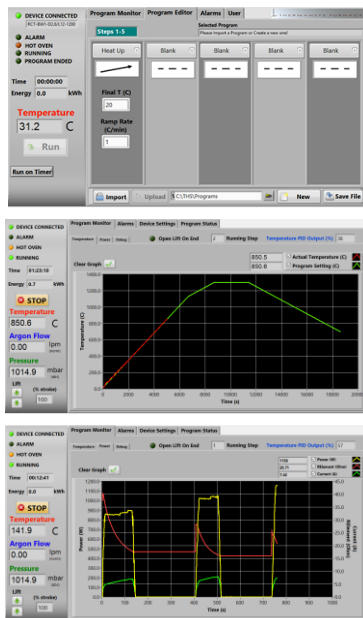
Optionally equipped with a remote, Touch Screen Computer, running the specially designed **PYROLOGISM 2.0** software. Provides a really unique and friendly, windows oriented architecture interface with multiple, advanced features and peripherals.

PYROMODULAR- Modules Palette

Each Pyromodular Main Controller can be connected with one or all of the following optional modules:

- PM – Gas Flow and Pressure Gas flow control manifold with Mass Flow Controllers for process gas control.
- PM – Gas Analyzers In line low cost embedded IR analyzers.
- PM – Vacuum Rough (up to 10^{-3} torr) and High (up to 10^{-7} torr) complete vacuum systems.

“For detailed information and ordering please contact our sales team.”



PYROLOGISM 2.0 control and monitoring software.

- Programming with up to 15 Temperature programming steps. Graphical inspection.
- Storage and reload of unlimited number of distinct programs.
- Continuous monitoring of control Temperature and In depended thermocouple inputs.
- Real time graphical presentation of executed program data.
- Data file creation for all executed programs. Saves all data on local memory.
- Real time actual Power (W) and totalized Energy (kWh) chart.
- Alarm and event message tab. Overheating Alarm, open Thermocouple Alarm, Heater Alarm.
- Programmable over temperature limiter monitor/configuration.
- Remote control through network connection.
- Gas flow and pressure, gas analyzers signals, monitoring and control interface pages activated if corresponding PM modules are enabled.
- Power Safe, Uninterrupted Power Supply backup configuration. Recovers program after short term power failure.

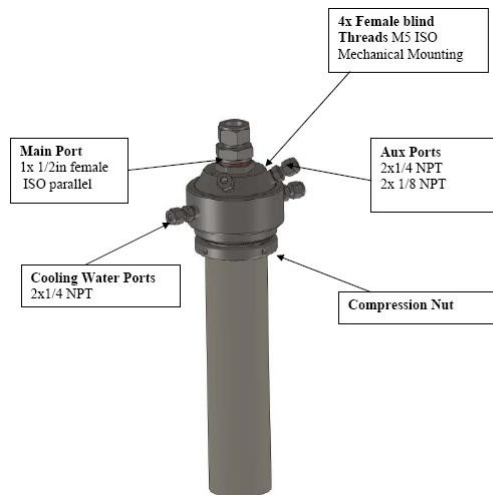
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Accessories Available.

End Gas Sealing Flanges and Manifolds.



THERMANSYS® is providing work-tube End Gas Sealing Flanges for vacuum or pressure conditions.

These flanges are provided with Main Port either with hydraulic thread port or with Clamp Flange (CF) port for gases inlet/outlet-connection to the tubing network. Cooling fluid recirculation compartment is standard and is removable. Up to four peripheral threads are available serving as ports for instrumentation mounting (e.g thermocouples, pressure sensors).

Versions with Clamp Flange (CF) port design provide quick-open loading port and optionally a quartz sight window.

THERMANSYS® End Gas Sealing Flanges are supplied for work tubes diameters from 1'' to 3''. Their design allows use with tubes having diameter tolerance $\pm 10\%$.

Standard versions material of construction is Stainless Steel ASME 304. Optionally for corrosive applications Stainless Steel ASME 316 is available and Aluminum for a light weight solution (recommended for thin wall Quartz tube reactors).

Work-tubes.

Several work tube materials to choose from:

- Dense ceramic Alumina work-tubes for the highest temperature applications.
- Quartz work-tubes for maximum chemical inertia and for aggressive environments to work under vacuum or low pressure conditions up to 1100 °C continuously.
- KANTHAL® APM™/APMT metallic (FeCrAl based) work-tubes to serve under vacuum or pressure up to 1250 °C.

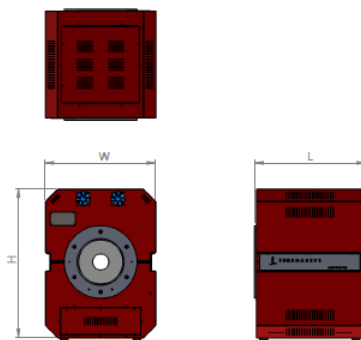
Mounting Stands.

Assembled and constructed using BOSCH-REXROTH® structural profile systems these stands provide the ideal solution for vertical furnace stand alone positioning plus reactor and instrumentation mounting. Using the commercially available accessories, tubing and cable routing is easy and professionally accomplished. Stands with electronically actuated furnace move-up and down provide a solution for heating zone moving along the reactor length.

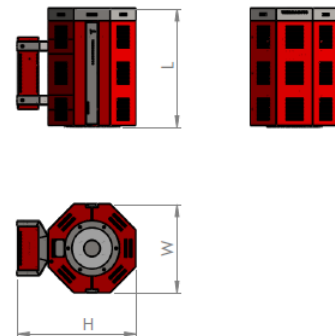
For detailed information and ordering please refer to our Technical Bulletin "Reactor Type Furnaces–Mounting Stands"

Please contact our sales team for detailed information and ordering on our Tube Furnace Accessories optional equipment.

Technical Drawings.



Drawing 1. RCT-AM2H-T-....-1700/1800 Furnace



Drawing 2. RCT-AM2V-T-....-1700/1800 Furnace

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Specifications and Ordering Information.

- Maximum continuous temperature:
 - 1650°C for RCT-AM2H/V-T-1700 Models
 - 1750°C for RCT-AM2H/V-T-1800 Models
- Operating Power: 208 /240VAC – 50/60Hz.
- B type embedded thermocouples. Two in depended thermocouples for controller and over-temperature limiter
- Operation mounting orientation:
 - Horizontal for RCT-AM2H-T-1700/1800 Models
 - Vertical for RCT-AM2V-T-1700/1800 Models
- Temperature control accuracy ± 1 °C.
- Heating/cooling rate 0.1-50 °C/min, setting resolution 0.1
- Exposed resistors type.
- Single zone configuration models.
- In depended Thermocouple inputs: 3 chan. - B, K, R, S type -software configurable.

Optional features:

- Remote, touch screen temperature computer, running the specially designed PYROLOGISM 2.0 software on a 10.0in Tablet PC
Add suffix _TSC
- Programmable stand-alone over-temperature limiter (Watchdog) with manual reset in accordance with EN 60519-2 to protect the heater and load,
Add suffix _WD
- UPS (Uninterrupted Power Supply) that will keep system alive for short periods of power failure and restore program after power recovery
Add suffix _UPS

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. RCT-AM2H-T-1700/1800 Models for Horizontal Operation

Model Part Number	Max. Cont. Temp. °C x Heat up time* min	Furnace I.D. mm x Heated length mm	Uniform Temp. length mm ± 1 °C approx. **	Furnace external dim. WxHxL mm see drawing I	Nominal Max. Power (W)
RCT-AM2H-T-...					
_D2/L12-1700/1800	1650/1750 x 90	20x120	80	385x540x352	1400
_D4/L12-1700/1800	1650/1750 x 90	40x120	80	405x560x352	1600
_D6/L12-1700/1800	1650/1750 x 90	60x120	80	425x590x346	1800
_D6/L20-1700/1800	1650/1750 x 90	60x200	120	425x590x426	2200
_D6/L28-1700/1800	1650/1750 x 90	60x280	200	425x590x506	3800
_D9/L28-1700/1800	1650/1750 x 90	90x280	200	455x630x506	5400
_D9/L32-1700/1800	1650/1750 x 90	90x320	240	455x630x546	6400

TABLE1. RCT-AM2V-T-1700/1800 Models for Vertical Operation

Model Part Number	Max. Cont. Temp. °C x Heat up time* min	Furnace I.D. mm x Heated length mm	Uniform Temp. length mm ± 1 °C approx. **	Furnace external dim. WxHxL mm see drawing I	Nominal Max. Power (W)
RCT-AM2V-T-...					
_D2/L12-1700/1800	1650/1750 x 90	20x120	80	420x540x460	1400
_D4/L12-1700/1800	1650/1750 x 90	40x120	80	440x560x460	1600
_D6/L12-1700/1800	1650/1750 x 90	60x120	80	460x580x460	2000
_D6/L20-1700/1800	1650/1750 x 90	60x200	120	460x580x540	2200
_D6/L28-1700/1800	1650/1750 x 90	60x280	200	460x580x620	3800
_D9/L28-1700/1800	1650/1750 x 90	90x280	200	490x600x620	5400
_D9/L32-1700/1800	1650/1750 x 90	90x320	240	490x600x660	6400

* Furnace working with no load and both ends closed

** Simulated indicative data. Valid for dense alumina process reactor fit to furnace diameter and with both ends plugged. Actual performance may vary depending on orientation, load mass and placement, reactor size and process gas flow existence.

IMPORTANT ORDERING NOTES:

- Models Part Number listed in Tables 1 and 2 concern complete turn key systems with PYROMODULAR main controller included.

NOTE: All models with Nominal Max. Power higher than 4200W are supplied with a 19in rack console with wheels housing PYROMODULAR system and another 4-6 U 19in box containing furnace transformers.

Ordering Example:

RCT-AM2H-T_D6/L20-1800: This Part Number includes one horizontal operation furnace with maximum continuous operation temperature 1750 °C having 60mm internal diameter, 200mm heated length and one PYROMODULAR Main Controller.

RCT-AM2H-T_D6/L20-1800_TSC: This Part Number includes the system described above with Remote, touch screen temperature computer, running the specially designed PYROLOGISM 2.0 software on a 10.0in Tablet PC

- To order only the furnace add at the end of the part number the suffix "Single", e.g. RCT-AM2H-T_D6/L20-1800_Single.

- Optional furnace accessories or mounding stands are ordered separately according to the respective data sheet ordering information.

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