



## TSO ROTARY REACTOR TUBE FURNACE RANGE

**Carbolite's versatile new TSO rotary / oscillatory reactor tube furnace range incorporates high-quality heating elements and innovative thermal insulation design to achieve first class performance while maintaining both reduced case temperatures and power consumption.**

The TSO tube furnace body is split into two halves and hinged at the rear; pneumatic dampening struts at either end provide a smooth opening action. The ability to open the furnace makes it easier for operators to insert vessels, such as reactors, with end flanges that would make them difficult to insert into a non-split furnace.

The TSO rotary reactor tube furnace has been specially designed for the processing or testing of powdered or granular materials at high temperatures. A quartz vessel is fitted within the furnace into which materials are placed. A variable speed drive system rotates the vessel within the heated zone by 314° to create an oscillatory motion. Optional accessory packages offer standard or fluted vessels, and the ability to operate under either air or a modified gas atmosphere.



[Click to view video](#)

Product Video: TSO Rotary Reactor Tube Furnace Range

## OVERVIEW

**Max temp**

1100 °C

**Reactor vessel Ø**

120 mm

**Heated length(s)**

400, 600, 800, 1000  
mm

**Number of heated  
zones**

1 zone or 3 zones

**Orientation**

horizontal

### TSO ROTARY REACTOR TUBE FURNACE RANGE

## LEADING HEAT TECHNOLOGY

Carbolite's new tube furnace range is at the pinnacle of furnace design. The culmination of over 80 years of experience in thermal engineering; combining the latest technological developments with solid construction, high-quality components and a sleek, modern aesthetic.

The oscillatory motion of the TSO rotary reactor tube furnace helps increase the surface area of the sample material exposed to the atmosphere within the vessel, helping to speed up reaction times and improve the overall yield.

### HIGH QUALITY HEATING ELEMENTS

- | Excellent temperature uniformity
- | Fast heat-up and cool-down rates
- | Unsurpassed temperature uniformity along the entire heated length

### HIGH QUALITY THERMAL INSULATION

- | Low energy consumption
- | Low external case temperature
- | Designed for longevity

? CLICK ME! - AR-MODEL

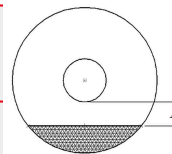


By viewing this webpage on a compatible mobile device you can click the 'cube' icon that allows you to view an augmented reality image of the product.

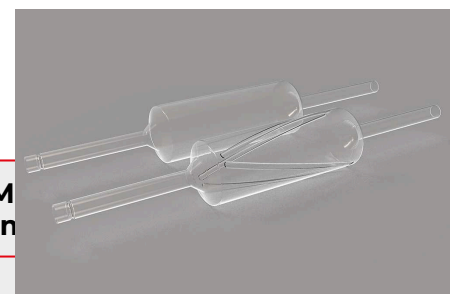
## TSO ROTARY REACTOR TUBE FURNACE RANGE

### TSO VESSEL CAPACITY

Heated length (mm)	Reaction chamber length (mm)	Capacity (ml)
400	330	620
600	530	990



16%



M  
n

2000 Rotary reactor vessel  
20

800	730	1360	16%	2700	20
1000	930	1740	16%	3500	20

TSO ROTARY REACTOR TUBE FURNACE RANGE  
**TEMPERATURE CONTROL & COMMUNICATIONS**



CC-T1 Touch Screen Controller

**TSO rotary tube furnaces are equipped with ethernet communications and a programmable controller with 24 segments as standard:**

- | Single zone furnaces fitted with Carbolite EPC3016P1 controller
- | Three zone furnaces fitted with Carbolite AriesPlus touch-screen controller

**OPTIONS**

- | Over-temperature protection (recommended to protect valuable contents and for unattended operation); 1600°C models are equipped with this option as standard
- | A range of sophisticated digital controllers, multi-segment programmers and data loggers is available. These can be fitted with RS485 or Ethernet communications. More Information.

TSO ROTARY REACTOR TUBE FURNACE RANGE

**ACCESSORIES**

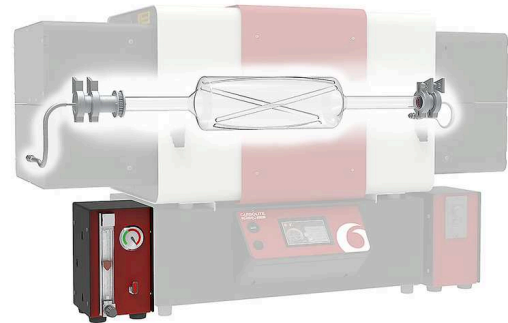
TSO ROTARY REACTOR TUBE FURNACE RANGE

**MODIFIED ATMOSPHERE**

The Carbolite TSO rotary reactor tube furnace range may be equipped with gas connections to accommodate modified atmosphere applications.

## OPTIONS

- | Standard or fluted reactor vessels
- | Gas connection kit to enable operation under modified atmospheres
- | Inert gas package modules allow for the use of up to 3 non-reactive gases (available with either manual or automatic control)



Rotary reactor inside of TSO furnace

## TSO ROTARY REACTOR TUBE FURNACE RANGE

### MOUNTING CONFIGURATIONS



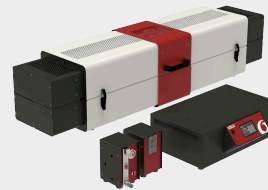
#### FURNACE BODY ON TOP OF CONTROL BOX

Configuration for heated lengths up to 600 mm



#### DETACHABLE FURNACE BODY

Easy conversion to optional mounting arrangements



#### FURNACE BODY AND SEPARATE CONTROL BOX

Configuration for heated lengths of 800 mm and above



#### OPTION: 4 M CABLE EXTENSION

4 m long extension results in a total of 6 m between furnace body and control box (125 mm Ø models include plug and socket)

TSO ROTARY REACTOR TUBE FURNACE RANGE

**TECHNICAL DATA**

	<b>TSO1 11/400</b>	<b>TSO1 11/600</b>	<b>TSO1 11/800</b>
<b>Max temp (°C)</b>	1100	1100	1100
<b>Number of heated zones</b>	1	1	1
<b>Reaction chamber dimensions (mm)</b>	∅ 120 x 330	∅ 120 x 530	∅ 120 x 730
<b>Reaction chamber capacity (ml)</b>	620	990	1360
<b>Oscillation frequency per min</b>	1 to 8	1 to 8	1 to 8
<b>Rotation in each direction</b>	314°	314°	314°
<b>Dimensions: External H x W x D (mm) lid closed</b>	665 x 1115 x 575	665 x 1315 x 575	445 x 1515 x 575*
<b>Dimensions: External H x W x D (mm) lid open</b>	930 x 1115 x 655	930 x 1315 x 655	705 x 1515 x 655*
<b>Max power (W)</b>	1860	2510	3160
<b>Weight (kg)</b>	88	106	119

	<b>TSO1 11/1000</b>	<b>TSO3 11/600</b>	<b>TSO3 11/800</b>
<b>Max temp (°C)</b>	1100	1100	1100
<b>Number of heated zones</b>	1	3	3
<b>Reaction chamber dimensions (mm)</b>	ø 120 x 930	ø 120 x 530	ø 120 x 730
<b>Reaction chamber capacity (ml)</b>	1740	990	1360
<b>Oscillation frequency per min</b>	1 to 8	1 to 8	1 to 8
<b>Rotation in each direction</b>	314°	314°	314°
<b>Dimensions: External H x W x D (mm) lid closed</b>	445 x 1715 x 575*	665 x 1315 x 575	445 x 1515 x 575*
<b>Dimensions: External H x W x D (mm) lid open</b>	705 x 1715 x 655*	930 x 1315 x 655	705 x 1515 x 655*
<b>Max power (W)</b>	3810	2510	3160
<b>Weight (kg)</b>	137	106	119

**TSO3 11/1000**

<b>Max temp (°C)</b>	1100
<b>Number of heated zones</b>	3
<b>Reaction chamber dimensions (mm)</b>	∅ 120 x 930
<b>Reaction chamber capacity (ml)</b>	1740
<b>Oscillation frequency per min</b>	1 to 8
<b>Rotation in each direction</b>	314°
<b>Dimensions: External H x W x D (mm) lid closed</b>	445 x 1715 x 575*
<b>Dimensions: External H x W x D (mm) lid open</b>	705 x 1715 x 655*
<b>Max power (W)</b>	3810
<b>Weight (kg)</b>	137

**PLEASE NOTE**

- | Maximum continuous operating temperature is 1100 °C
- | All furnaces are equipped with thermocouple type N
- | \* Furnace with separate control box

**MODEL NAMES EXPLAINED**

TSO <b>1</b> 11/ 600	Number of heated zones: 1 zone or 3 zones
TSO1 <b>11</b> /600	Max temp: <b>1100</b> °C
TSO1 11/ <b>600</b>	Heated length(s): <b>400, 600, 800, 1000</b> mm

[www.carbolite.com/tso](http://www.carbolite.com/tso)