

# TSO ROTARY REACTOR TUBE FURNACE RANGE



**Carbolite Gero'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.

## 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 Gero'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 rotating 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



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  
**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 Gero EPC3016P1 controller
- | Three zone furnaces fitted with Carbolite Gero CC-T1 touch-screen controller

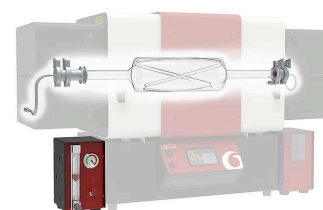
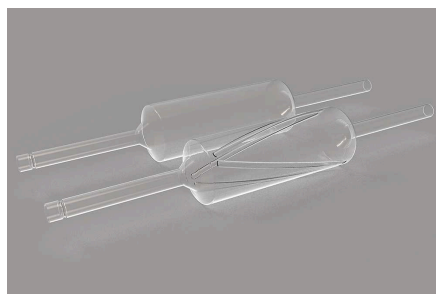
**OPTIONS**

- | 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 with digital communication options is available. More Information.

## TSO ROTARY REACTOR TUBE FURNACE RANGE

**ACCESSORIES**TSO ROTARY REACTOR TUBE  
FURNACE RANGE**MODIFIED  
ATMOSPHERE**

The Carbolite Gero 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)

## TSO ROTARY REACTOR TUBE FURNACE RANGE

**MOUNTING CONFIGURATIONS**

This range of tube furnaces is supplied in one of two standard mounting configurations.

1. For heated lengths up to 600 mm the furnace body is mounted on top of the control box. The furnace body can easily be detached and separated for remote operation.
2. For heated lengths of 800 mm and above the furnace body and control box are always separate.

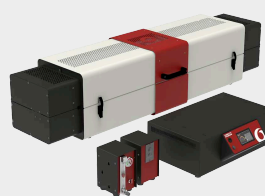
Both configurations include a 2 metre cable (incl. plug and socket) between the furnace body and control box. This flexible arrangement allows for easy conversion to optional mounting arrangements e.g. attaching to a vertical stand, a mounting bracket or inside a fume cupboard.

**FURNACE BODY ON TOP OF CONTROL BOX**

Standard configuration for heated lengths up to 600 mm

**DETACHABLE FURNACE BODY**

Easy conversion to optional mounting arrangements

**FURNACE BODY AND SEPARATE CONTROL BOX**

Standard configuration for heated lengths of 800 mm and above

**OPTION: 4 M CABLE EXTENSION**

The 4 m long extension results in a total of 6 m between the furnace body and control box

TSO ROTARY REACTOR TUBE FURNACE RANGE

## TECHNICAL DATA

	TSO1 11/400	TSO1 11/600	TSO1 11/800
<b>Max temp (°C)</b>	1100	1100	1100
<b>Number of heated zones</b>	1	1	1
<b>Reaction chamber dimensions (mm)</b>	Ø 120 x 330	Ø 120 x 530	Ø 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>	315°	315°	315°
<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

	TSO1 11/1000	TSO3 11/600	TSO3 11/800
Max temp (°C)	1100	1100	1100
Number of heated zones	1	3	3
Reaction chamber dimensions (mm)	Ø 120 x 930	Ø 120 x 530	Ø 120 x 730
Reaction chamber capacity (ml)	1740	990	1360
Oscillation frequency per min	1 to 8	1 to 8	1 to 8
Rotation in each direction	315°	315°	315°
Dimensions: External H x W x D (mm) lid closed	445 x 1715 x 575*	665 x 1315 x 575	445 x 1515 x 575*
Dimensions: External H x W x D (mm) lid open	705 x 1715 x 655*	930 x 1315 x 655	705 x 1515 x 655*
Max power (W)	3810	2510	3160
Weight (kg)	137	106	119

#### TSO3 11/1000

Max temp (°C)	1100
Number of heated zones	3
Reaction chamber dimensions (mm)	Ø 120 x 930
Reaction chamber capacity (ml)	1740
Oscillation frequency per min	1 to 8
Rotation in each direction	315°
Dimensions: External H x W x D (mm) lid closed	445 x 1715 x 575*
Dimensions: External H x W x D (mm) lid open	705 x 1715 x 655*
Max power (W)	3810
Weight (kg)	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

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

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