



## COMPACT RAPID THERMAL ANNEALING SYSTEM AO 500



**AO 500 Compact Rapid Thermal Annealing System with dry running diaphragm pump**

- applications:
  - RTA processing
  - ohmic contact formation
  - diffusion processes
- operating temperature up to 500°C
- suitable for inert gas (Ar, N<sub>2</sub>, etc.) and forming gas
- dry running diaphragm pump included

The Compact Rapid Thermal Annealing System AO 500 is a complete tabletop annealing system with small footprint. The oven itself as well as all power supply and control hardware are housed in a compact 3U box. It is used in combination with a dry running diaphragm pump which provides the necessary vacuum (down to 5 mbar) and is included in the delivery.

Applications of the AO 500 are thermal treatment processes such as RTA of semiconductor samples, forming of electrical contacts and investigation of intermixing and temperature stability effects in semiconductors.

The direct current driven heater plate is made of thin film Al<sub>2</sub>O<sub>3</sub>. Temperature measurement is done by means of a PT 100 sensor which is in direct contact with the heater. Operation can be done under vacuum or, alternatively, in inert gas (Ar, N<sub>2</sub>, etc.) or forming gas atmosphere to avoid sample contamination or oxidation.

A large glass pane on top gives easy optical access to the recipient. In this way it is possible to use a microscope for observing the sample during the annealing process.

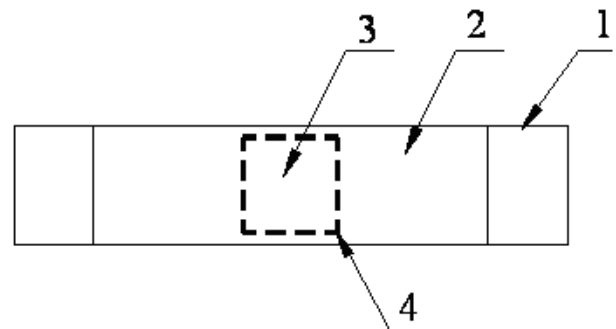
The recipient of the AO 500 is equipped with additional electrical feedthroughs (max. current 1A, max. voltage 50V) which can be applied for in-situ resistance monitoring during the annealing process or I-V-characterization of the sample using the integrated contact pins.

A sketch of the hot plate is shown on the right.

- 1 contact area on backside
- 2 resistive heating via metal film on backside
- 3 temperature measurement (PT 100 sensor) on backside
- 4 the sample should be placed in the area marked by a dashed line (12mmx12mm)



**Backside view of the AO 500 with connections for power, gas and interfaces**



**Sketch of the hot plate**

## Applications

Typical applications for the AO 500 Compact Rapid Thermal Annealing System are the following:

- general RTA sample processing
- electrical contacts formation
- sample annealing for diffusion processes
- investigation of intermixing effects
- investigation of temperature stability

## Technical Data

<b>Temperature range</b>	RT up to 500°C
<b>Temperature stability</b>	±1K (absolute)
<b>Heating up speed</b>	up to 50K/s (vacuum anneal)
<b>Cooling down speed</b>	up to 12K/s (gas flow anneal)
<b>Substrate dimensions</b>	< 12mm x 12mm
<b>Min. operating pressure</b>	5 mbar
<b>Max. inert gas pressure</b>	1.2 bar abs (inert gas, or forming gas)
<b>Power supply</b>	230 V/50 Hz

View onto annealing chamber of the Compact Rapid Thermal Annealing System AO 500

1. electrical heater contacts
2. heater plate
3. contact pins for substrate measurement
4. o-ring seal



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