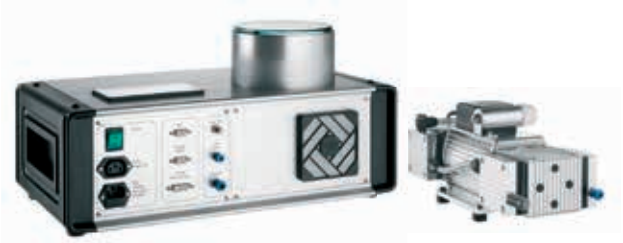
MBE
KOMPONENTEN | DR. EBERL

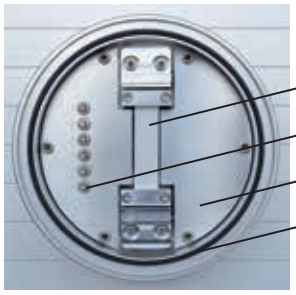
COMPACT RAPID THERMAL ANNEALING SYSTEM AO 600

- Fast ramping up to 600°C
- Vacuum, inert gas or forming gas operation
- Interactive programmable controller for temperature and pressure profiles
- Six contacts for electrical in-situ measurements; analog output for pressure and temperature measurements
- Applications: RTP / RTA processing, ohmic contact formation, device testing

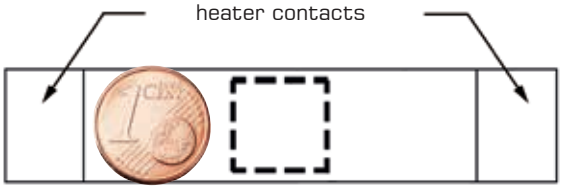
Multifunctional table top oven AO 600



Backside view of AO 600 with connections for power, gas and interfaces and dry running diaphragm pump



View onto annealing chamber of the Compact Rapid Thermal Annealing System AO 600



Full-scale sketch of the heater plate display; the 1 Euro Cent coin illustrates the proportions. The dashed line marks the uniform temperature area (12x12 mm^2).

The Compact Rapid Thermal Annealing System AO 600 is a complete tabletop annealing system with small footprint.

Sample recipient, power supply and control hardware are integrated in a compact 3U box. It is operated in combination with a dry running diaphragm pump providing vacuum down to less than 5 mbar.

A variety of thermal treatment processes such as RTA of semiconductor samples can be performed. The integrated micro-controller unit allows free definition of procedures with up to 30 steps. Within the internal memory 20 user programs can be stored. Interactive process control for each programm step is possible by 8 input and 4 output signals. Further analog 0...10 V signals allow process logging of temperature and pressure measurements.

The direct current driven heater plate is made of thin film Al_2O_3 for resistive heating. Temperature measurement is done by means of a PT 100 sensor directly soldered to the heater.

Sample processing can be done in low vacuum, inert gas (Ar, N_2, etc.) or forming gas atmosphere to avoid sample contamination or oxidation.

A large glass plate on top provides easy access to the recipient. Observing the sample during the annealing process with a microscope is thus possible.

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

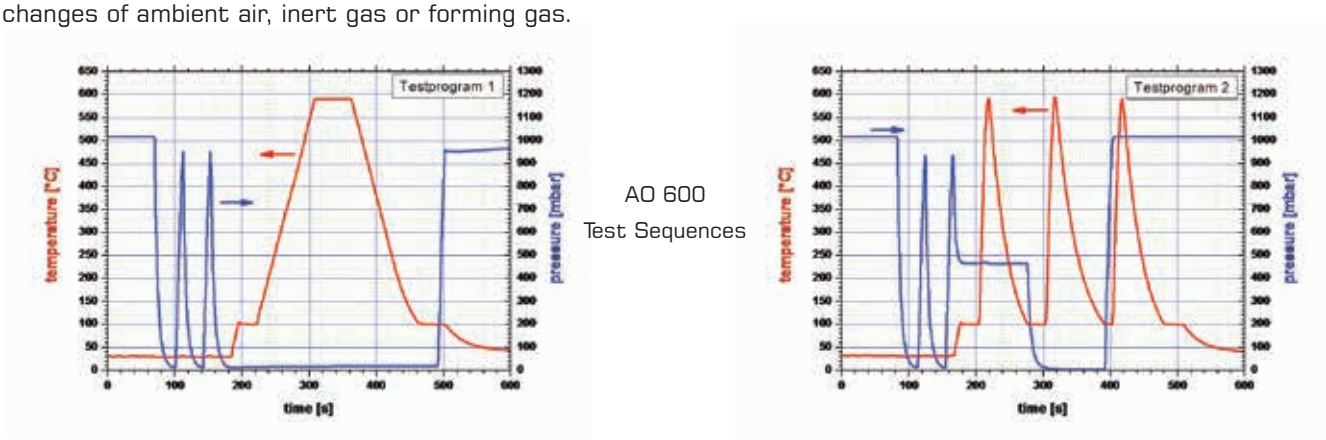
A full-scale sketch of the heater plate is shown in the figure on the left.

Applications

Typical applications for the Rapid Thermal Annealing Systems AO 600 are the following:

- General RTP / RTA sample processing
- Electrical contact formation
- Diffusion processes and indiffusion studies
- Device testing under different temperature, gas and vacuum levels
- Investigation of intermixing effects
- Material alloying processes
- Gas sensor characterization / development
- Thermochromic material

The following diagrams are examples for practicable AO 600 sequences. The red diagrams show programmable temperature ramping and feasible rapid temperature changes while the blue diagrams indicate possible pressure changes of ambient air, inert gas or forming gas.



AO 600
Test Sequences

Technical Data

Temperature range	RT up to 600°C
Temperature stability	< 1 K
Heating up speed	up to 50 K/s (vacuum anneal)*
Cooling down speed	up to 12 K/s (gas flow anneal)*
Heater plate dimensions	15 mm x 30 mm
Useful max. sample dimensions	12x12 mm^2
Min. operating pressure	< 5 mbar
Max. inlet gas pressure	1.2 bar abs (inert gas or forming gas)
Power supply	100-230 V AC / 50 ... 60 Hz

* depends on sample temperature

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