

Model VPO-300

Vacuum Process Oven

up to 300 mm dia. or 300 mm x 300 mm substrate size



Technical and design changes reserved

- For substrate size up to 300mm x 300mm
- Ramp up rate up to 40 K/sec.
Ramp down rate up to 200 K/min.
- Control **SIMATIC®** with 7" touch panel
- Vacuum up to 10^{-3} hPa
(optional up to 10^{-6} hPa)
- Process gas line with MFC for N_2

FEATURES

- Precise ramp up and fast ramp down rates
- Up to 4 gas lines
- Heated by Infrared lamps
- 50 programs with 50 steps each
- Top and bottom heating (selection by Software)
- Small foot print

APPLICATION

- Implantation/Contact Annealing
- RTP, RTA, RTO, RTN
- Operation with inert gases, Oxygen, Hydrogen, Forming gas
- SiAu, SiAl, SiMo Alloying
- Low k dielectrics
- Crystallization & densification
- Si-Solar Wafer Cells on glass by Si-Wafer bonding

Model VPO-300

- **Vacuum Process Oven**
- **Programmable temperature profiles**
- **Record of process data**
- **Process in different gas atmospheres**



The VPO-300

Vacuum Process Oven

refers to a semiconductor manufacturing process which heats silicon wafers to high temperatures (up to 1000 °C) on a timescale of several seconds or less. During cooling, however, wafer temperatures must be brought down slowly to prevent dislocations and wafer breakage due to thermal shock. Such rapid heating rates are often attained by high intensity lamps. These processes are used for a wide variety of applications in

- **semiconductor manufacturing**
- **dopant activation**
- **thermal oxidation**
- **metal reflow and chemical**
- **vapor deposition**

APPLICATION

The VPO-300 Vacuum Process Oven is an excellent tool for various semiconductor

processes with up to 300 mm wafer or 300 mm x 300 mm substrate size. Some examples for applications: Laboratory furnace for all kind of developers implementing and researching new processes, prototype research, environmental research purposes and for small pre-series or series.

PROCESS GASES

The VPO-300 can be used with standard process gases, like Nitrogen, Oxygen, Forming Gas. The chamber is sealed and can easily be cleaned.

GAS FLOW CONTROL

One gas line with Mass Flow Controller (MFC) for Nitrogen (5 nlm = norm liter per minute) is default, three more gas lines (Option: MFC) are possible.

VACUUM

The system is vacuum capable of up to 10^{-3} hPa (optionally up to 10^{-6} hPa).

HEATING

The maximal achievable temperature is 1000 °C. Key features are precisely controlled fast ramp-up (40 K/sec) and excellent ramp-down rates (depend on temperature and loading).

COOLING PROCESS

Parts will be cooled by Nitrogen.

TEMPERATURE DISTRIBUTION

The VPO-300 allows an excellent temperature distribution and homogeneity. Optionally a graphite susceptor can be inserted on the quartz bottom plate.

PROGRAMMING

The VPO-300 is controlled by SIMATIC SPS controller. A 7" touch panel allows a very comfortable programming and control of the process. There can be saved up to 50 programs with 50 steps each (unlimited programs can be down- and uploaded from an external data storage).

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SPECIFICATION

Max. part size	300 mm dia. or 300 mm x 300 mm
Chamber material	Aluminium chamber (chamber area: 350 mm x 350 mm) inclusive quartz glass bottom plate
Chamber height	50 mm (optional: 120 mm)
Vacuum capability	Up to 10^{-3} hPa (optional up to 10^{-6} hPa)
Temperature max.	1000 °C (for max. 10 sec) (higher temp. on request)
Temp. uniformity	$\leq 1\%$ of set temperature (on a 200 mm wafer) (e.g. +/- 3K @ 300 °C)
Heating	Bottom Heating: Infrared lamps cross aligned (18 kW) Top Heating: Infrared lamps cross aligned (18 kW)
Ramp up rate	40 K/sec
Ramp down rate	T= 1000°C > 400°C: 200 K/min, T= 400°C > 100°C: 30 /min
Flow Controller	One Mass Flow Controller for 5 nlm (=norm liter per minute) as default, up to 3 more MFCs are available as option
Controller	SIMATIC® 50 programs with 50 steps each
Chamber cooling	By external water cooling system
Substrate Cooling	By Nitrogen Gas

TECHNICAL DATA

Dimension oven	540 mm x 690 mm x 890 mm (W x D x H)
Weight	120 kg
Electrical connection	2 x [400/230V, 18 kW]

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OPTIONS

VPO-CAB	Floor model with cabinet and integrated Universal Heat Exchanger (UHE)
VPO-MFC	Additional gas line with Mass Flow controller (max. 3 add. gas lines)
VPO-EH	Chamber height 120mm (instead of 50mm) with viewing window (60mm diameter)
VPO-SS	Chamber made of stainless steel (VA 1.4305) polished, instead of aluminium 50mm
VPO-GP	Graphite Plate or Susceptor
VPO-TC	Additional thermocouple to measure on device (plugged in chamber) (max. 3 pcs)
VPO-QP	Quartz glass plate for sealing the top lamp field
VPO-SI	Serial interface between VPO system and external PC
VPO-RC	Remote control of top cover opening and closing
VAC I	Basic Vacuum up to 3 hPa, Vacuum sensor, vacuum valve excl. pump
VAC II	Comfort Vacuum up to 10^{-3} hPa, Pirani Sensor, vacuum valve, excl.pump

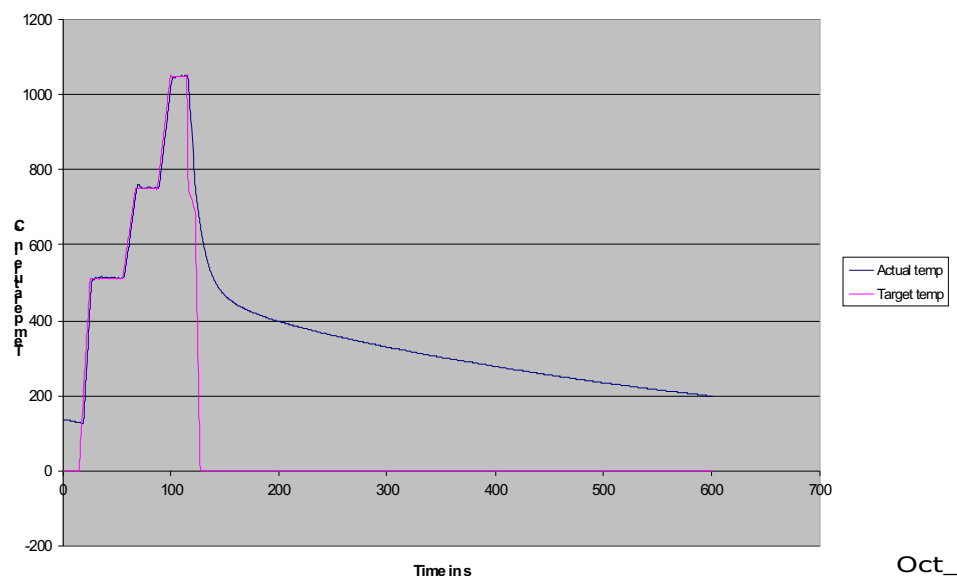
ACCESSORIES

We offer a lot of different kind of closed loop water coolers and different pumps from e.g. Pfeiffer, Edwards, Leybold, Agilent. We recommend the correct configuration for your system.



VSS-300 with cabinet

VPO-1000-300 with 200 mm Si-Wafer Heating-Cooling profile



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