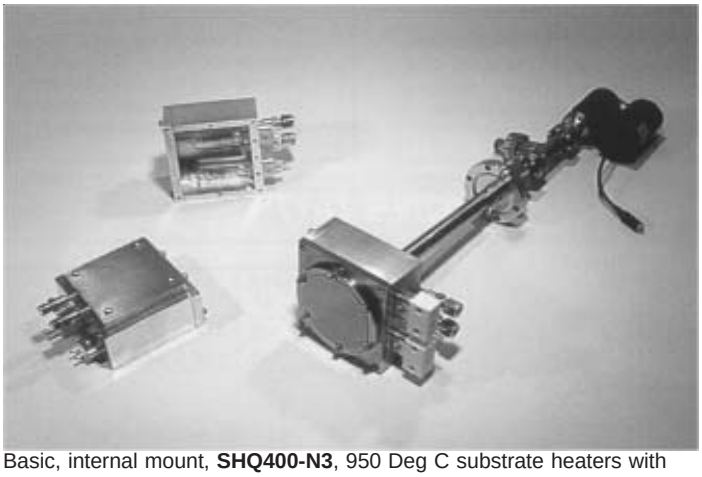
QUARTZ HALOGEN SUBSTRATE HEATERS and CONTROLLERS



Basic, internal mount, **SHQ400-N3**, 950 Deg C substrate heaters with water cooled reflector box (top left). Transferable 3" diameter substrate holder attached to **SHQ400-R3RF**, 850 Deg C substrate heater with motorized rotation, RF/DC bias on 2.75" CF flange (right).

SHQ400-R4RF, 4" rotating substrate heater at 500 Deg C in **ATC 2000** sputtering system (top) **SHQ2000-C**, PID heater controller (bottom).

GENERAL INFORMATION

The AJA International **SHQ400-X Substrate Heaters** delivery up to 2000 Watts of radiant heat to either a fixed or rotating substrate holder allowing substrates to reach temperatures of up to 850 Deg C (rotating) / 950 Deg C (fixed). Models are available for 3" and 4" diameter substrates although either can be used to heat a number of smaller substrates.

Each unit includes (2) UHV compatible quartz halogen lamps, a water cooled reflector box, dual "K type" thermocouple (substrate holder, overtemperature protection), dual ceramic power connectors for lamps, dual vacuum feedthroughs (TC's, lamp power) and vacuum compatible wiring and tubing. Both HV and UHV versions are available. DC and/or RF biasing of the substrate is anoption for both fixed and rotating models.

Lamps can be powered by a variac for very basic applications. AJA International also offers the **SHQ2000-C Programmable Heater Controller** with integral power supply, RS485 computer interface, PID substrate temperature controller, overtemperature controller with indicator lamp, lighted mains and lamp power switches, and all cables and connectors.

SHQ400 Specifications & Dimensions

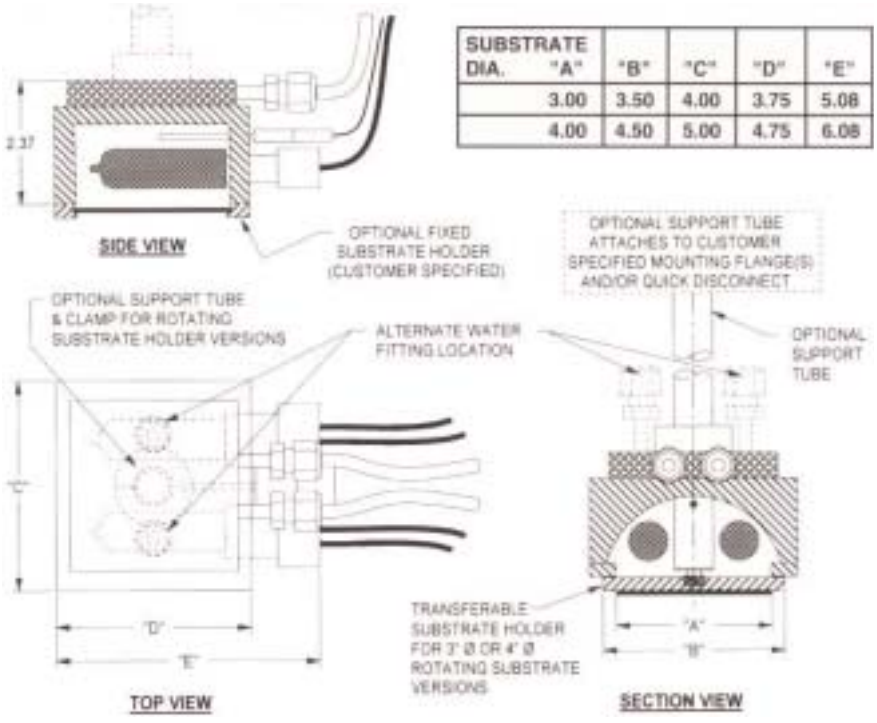
SHQ400 Specifications

Specifications will depend on exact heater/substrate holder configuration. Typical specifications listed below are for a 3" diameter Silicon wafer mounted to rotating substrate holder at 750 Deg C.
The **SHQ2000-C** controller with "soft start" feature was used to power the heater and to monitor temperatures.

Temperature stability: +/- 1.4 Deg C
Temperature uniformity from center to edge of wafer: +/- 0.9%
Maximum reflector box temperature: 138 Deg C.

SHQ2000-C Specifications

Standard 19" instrument rack configuration, 7" high, 17.5" deep. 110 V/ 25 A or 220 V / 15 A (specify) 1 phase, includes 15' cables with connectors.



SUBSTRATE DIA.	"A"	"B"	"C"	"D"	"E"
	3.00	3.50	4.00	3.75	5.08
	4.00	4.50	5.00	4.75	6.08

SHQ400 Checklist

Please define your specific requirements and fax to Pascal Technologies for a formal quotation.

Heat Requirements

In order to define the correct heater / controller configuration, please specify your exact requirements:

- ☐ Substrate size _____
- ☐ Heating to _____
- ☐ Heating in O2, N2, or other reactive gas environment? If so, please specify
  _____
  _____
- ☐ HV Construction
- ☐ UHV Construction
- ☐ DC biased substrate holder
- ☐ RF biased substrate holder
- ☐ Rotating substrate
- ☐ Fixed substrate
- ☐ +/- 180 Deg indexing of substrate
- ☐ Manually loaded substrate
- ☐ Adjustable working distance between substrate and deposition sources(s) Substrate transfered via manipulator (If so, please send sketch showing details and orientation of transfer system)
- ☐ Substrate transfer system and load-lock required
- ☐ Integrated substrate gas ring for reactive gas processing
- ☐ Special requirements_____
  _____
  _____
  _____
- ☐ Internal mounting (only small flanges required for water, TC and power FT's)
- ☐ External mounting (a single large flange is required for heater on extension tube and water, TC and power FT's)

Controller Requirements

- ☐ None, customer to provide.
- ☐ Variac, dual TC readout, cables
- ☐ SHQ2000-C PID temperature controller / power supply with all cables and connectors

Chamber Details

- ☐ New vacuum chamber currently being designed
- ☐ Retrofitting existing vacuum chamber. If retrofitting an existing vacuum chamber, please send a sketch or drawing of the chamber showing available ports, deposition source location(s) and type, general configuration desired and any other relevant details.