

Atomic Hydrogen Source (HLC)

sales@createc.de | www.createc.de

Atomic hydrogen is very reactive and allows the cleaning of various substrates (like GaAs, InP, etc.). In addition, it can be also used for surfactant growth of epitaxial layers. Molecular hydrogen gas flows through a tube passing a hot filament which is located at the end of this tube and which is heated up to 2800 °C. By this an excellent cracking efficiency of molecular into atomic hydrogen is achieved. Using a high precision valve the hydrogen gas pressure can be directly adjusted. A very accurate pressure control is possible with a mass flow controller, which is mounted between the hydrogen gas bottle and the leak valve.

How to clean a GaAs wafer inside a MBE System with atomic hydrogen?

The following conditions are recommended:

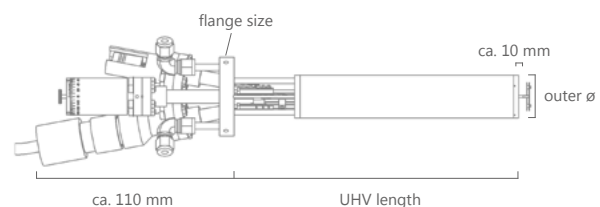
TEMP. MEASURED BY THERMOCOUPLE	1100 °C
HEATING CURRENT	10 A AC (or DC)
HEATING VOLTAGE	11,5 V AC (or DC)
HEATING POWER	120 W
FLOW OF H ₂ (if used a MFC)	0,4 sccm
BACKGROUND PRESSURE H ₂ IN THE UHV CHAMBER	approx. 4 - 5 x 10 ⁻⁶ mbar
DISTANCE BETWEEN THE WAFER AND THE CRACKER	approx. 120 mm
WAFER TEMP.	250 °C

Under these conditions the Oxide desorbs after approximately one to two minutes (typically the wafer remains for 20 to 30 minutes). This procedure provides a significant improvement of the grown layer quality, except on structured wafer surfaces.

TYPE	HLC	HLC-T
TEMPERATURE RANGE	200 - 2300 °C	200 - 2800 °C
HEATING SYSTEM	filament radiation heating	resistive cylinder heating
TEMPERATURE STABILITY	± 0.1 °C depending on the PID controller	
CRACKING EFFICIENCY	<30%	>80%
THERMOCOUPLE	type C (or as specified)	
MAX. OUTGAS TEMP.	2900 °C	
MAX. POWER	280 W	350 W
MAX. CURRENT	25 A	38.7 A @ 9 V
BAKE-OUT TEMP.	250 °C	
FLANGE SIZE	DN 40 CF 63 (others on request)	
MAX. OUTER DIAMETER	38 mm (or as specified)	
MIN. UHV LENGTH	180 mm	
GAS CONNECTION	DN 16 CF	
COOLING	integrated water cooling	
COOLING DATA	water consumption:	1l/min
	temperature:	5 - 15 °C
	connection:	ø 6 mm

How to order?

Individual Cell Request 

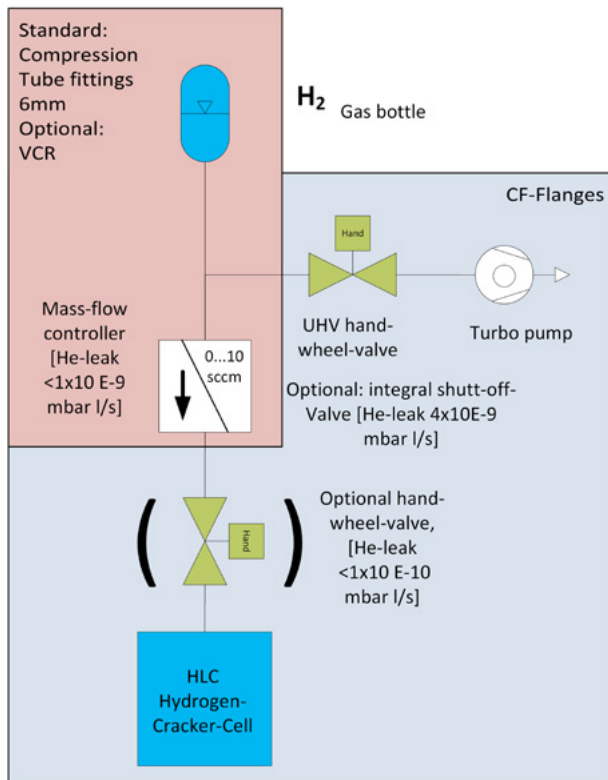


Atomic Hydrogen Source (HLC)

sales@createc.de | www.createc.de

AIR-SIDE GASLINE CONNECTIONS

Pressure controlled with
a mass-flow-controller



Pressure adjusted with a
manual leak valve

