SYSTEM SPECIFICATION

The system modules are described as below:

Qty

1. CCS MOCVD System

1.1. **CCS Flip Top Reactor for deposition on 3x2" substrates** — 1

- Dual input plenum showerhead injector prepared for cross-flow water cooling
- Graphite Susceptor
- Three zone heater
- Max. Temperature 900°C
- Optical access by three optical ports
- Photo diode array port
- Chamber liner to prevent deposition on the chamber wall
- Single port pyrometer for temperature calibration

**note: external heat exchanger required*

1.2. **Glovebox** — 1

- Nitrogen re-circulation and purification system
- Glove-box pressure control
- Hydrogen gas detection within the glove-box
- Integrated vacuum cleaner
- Integrated vacuum tweezers
- Integrated N_2 blow gun
- Loadlock for substrate and accessory transfer

Note: O_2/ H_2O sensors to be ordered separately

		Qty
1.3.	**Basic gas handling system** - Ventilated gas cabinet - Hydrogen and Nitrogen Carrier gas manifolds - Run Vent switching manifold - Purge channels for Reactor, Heater and Optical Ports *All Mass Flow Controllers are digital and metal sealed*	1

1.4.	**Low Pressure exhaust system**
	- Two stage particulate filtration system
	  * Stage 1: Activated charcoal filter
	  * Stage 2: PALL particulate filter
	- Pressure control for growth chamber
	- Overpressure relief system
	- Leak test access
		1

1.5.	**Ebara dry vacuum pump ESA25D 150m3/hr**	

		Qty
Control System		
1.6.	**Computer Control System** - Including Control Software - PC, Monitor - Data logging	1
1.7.	**Safety System** - Hardwired Safety System - Interlocks for Machinery and Human Safety	1

Pos.	Description	Qty
2.	**Gas Delivery System**	
2.1.	**Standard OM channels with Pusher** *(2xTMGa, 1xTMAl, 1xTEGa, 2xTMIn)* - Source Flow and Pusher MFC, Source Pressure Control	6
2.2.	**Spare Provision for Standard OM channels with Pusher** *(2xN.N.)*	2
2.3.	**Standard Gas channels** *(1xAsH_3, 1xPH_3)* - Source MFC	2
2.4.	**Spare Provision for Standard Gas Channels** *(1xN.N.)*	1
2.5.	**Bubbler change/leak test manifold for 8 OM Sources**	1
2.6.	**Dummy Line** *(1xMO, 1xHydride Stack)* - For Balancing Gas Flow Switching - Digital mass flow controller - Pneumatic 5-way vent/run valve	2
2.7.	**Differential Pressure Balancing** *(2xMO Run/Vent)* between run and vent line	2

		Qty
3. Process Control		
3.1.	**Epison 4 (e.g. 1x TM1n)** - Organometallic Gas Concentration Analyser - Closed loop Source MFC control	1

Pos.	Description	Qty
4. Purification		
4.1.	**Aeronex Purifier CE-2500KF** **For H_2 purification** - manual by-pass shut-off valve - 2 manual isolation valves - Integration in epitaxial system *Note: purifiers have to be shipped separately*	1
4.2.	**Aeronex Purifier CE-2500KF** **For N_2 purification** - manual by-pass shut-off valve - 2 manual isolation valves - Integration in epitaxial system *Note: purifiers have to be shipped separately*	1
4.3.	**Hygrometer on input lines** *(N_2, H_2, AsH_3, PH_3)* - Integrated in MOCVD system	4

		Qty
4.4.	**AERONEX Purifier CE- 300KF 4R** **For AsH_3 purification** - 2 manual by-pass shut-off valves, - Integration in epitaxial system *Note: purifiers have to be shipped separately*	1
4.5.	**AERONEX Purifier CE- 300KF 4R** **For PH_3 purification** - 2 manual by-pass shut-off valves, - Integration in epitaxial system *Note: purifiers have to be shipped separately*	1

		Qty
5. Peripheral Systems		
5.1.	**AIXTOX A2-STe/90** Two stage wet Hydride Scrubber - Tank volume 2 x approx. 90l - Vertical packed-bed counter-flow columns with demister - Integrated safety system *Scrubbing media to be supplied by customer according to manufacturers recommendation*	1

		Qty
6. Extensions		
6.1.	**Heat exchanger** to control showerhead water temperature	1
6.2.	**Black Body Furnace** For ex situ temperature calibration of optical probes	1

		Qty
7. Customer's Specials		
7.1.	**Hygrometer in glovebox recirculation**	1
7.2.	**Oxygen Sensor in glovebox recirculation**	1