Air Liquide

Candi range

Candi™ Bubbler

The Candi™ Bubbler system is designed to control pressure, temperature, precursor liquid level and carrier gas flow ensuring consistent gas flow and precursor concentration to the downstream reactor process.

Applications

Typical applications:

CVD, ALD and EPI

Used in:

- Semiconductor,
- Optical fiber
- Coating industries
- Compound semiconductor
- Solar industry

Typical media

For epitaxy:

- Tri- or Tetra-chlorosilane, (SiCl3, SiCl4)
- Germanium chloride, (GeCl4)

For ALD: Trimethylaluminum (TMA)

For MOCVD: Trimethylgallium (TMGa)...

Operation

An internal process tank is filled with the liquid precursor. Temperature, pressure and liquid level are accurately controlled.

On customer request, the carrier gas is injected at the liquid downhole and is being saturated while bubbling through the liquid.

Concentration or precursor quantity is adjusted by selecting the targeted temperature and pressure.

- ✓ Variable flowrate with stable concentration
- ✓ Individual bubbler or centralised distribution
- ✓ Up to 30 lpm of 12% TMGa in carrier gas
- ✓ Candi™ Bubbler can either include shuttle canister up to 20 liters inside the cabinet or be fed with an external liquid source

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Product description

Features

- Carrier gas filtration and pressure regulation
- Purging capabilities for maintenance purpose
- Accurate delivery pressure control (± 20 mbar)
- Accurate temperature control (± 0.15°C)
- Bubbler precursor level control
- Liquid refill management
- Specific process tank refill piping design
- PLC based technology with 12" color touch screen Human Machine Interface (HMI)
- Ethernet communication port for SCADA monitoring
- Customized signal interface

Options

- On board shuttle drum (adaptable to any SEMI-compliant shuttle canister up to 20 L)
- On line concentration monitoring
- On-board vacuum pump
- Carrier gas purifier
- Multiple point of use:
  - 2 on-board outlet processes
  - Valves Manifold Box (VMB)
- External temperature management device
- Different communication protocols available
- Start-up and operator training

Reliability

- MTBF*: > 10,000 hours
- Uptime: 99.99%

**Mean Time Between Failures*

Safety features

- Liquid trap to contain liquid accidentally sent to the vent line
- Fully automatic distribution and canister change-out sequences
- Easy to reach "Emergency Machine Off" button
- Standard exhaust flow alarm
- Fire and gas detection alarms if needed
- Leak detection
- Open door detection
- Individual pressure switch and relief valve on pressurized gas lines
- N_2 deluge and drain line for pyrophoric molecules
- Timers for pressurization / depressurization of each tank, for process tank refill
- Explicit alarm messages
- Reduced operator intervention
- Critical functions protected by multi-level password

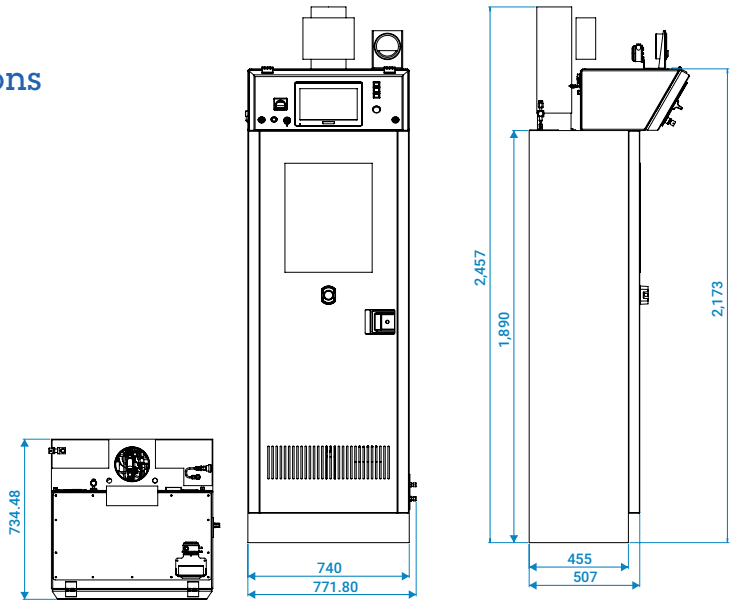
Technical specifications

Utility requirements

Carrier gas	Depends on targeted flowrate and concentration
Purge gas	Up to 7 barg, UHP, min-max: 3-10 Nm^3 /h
Pneumatics	7 barg, min-max: 2-5 Nm^3 /h
Exhaust	200 Nm^3/h
Vacuum	< 2 Torr
Power	UPS, 110/240 VAC, 50/60 Hz, 1 kVA

Certifications

CE Mark



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Air Liquide

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