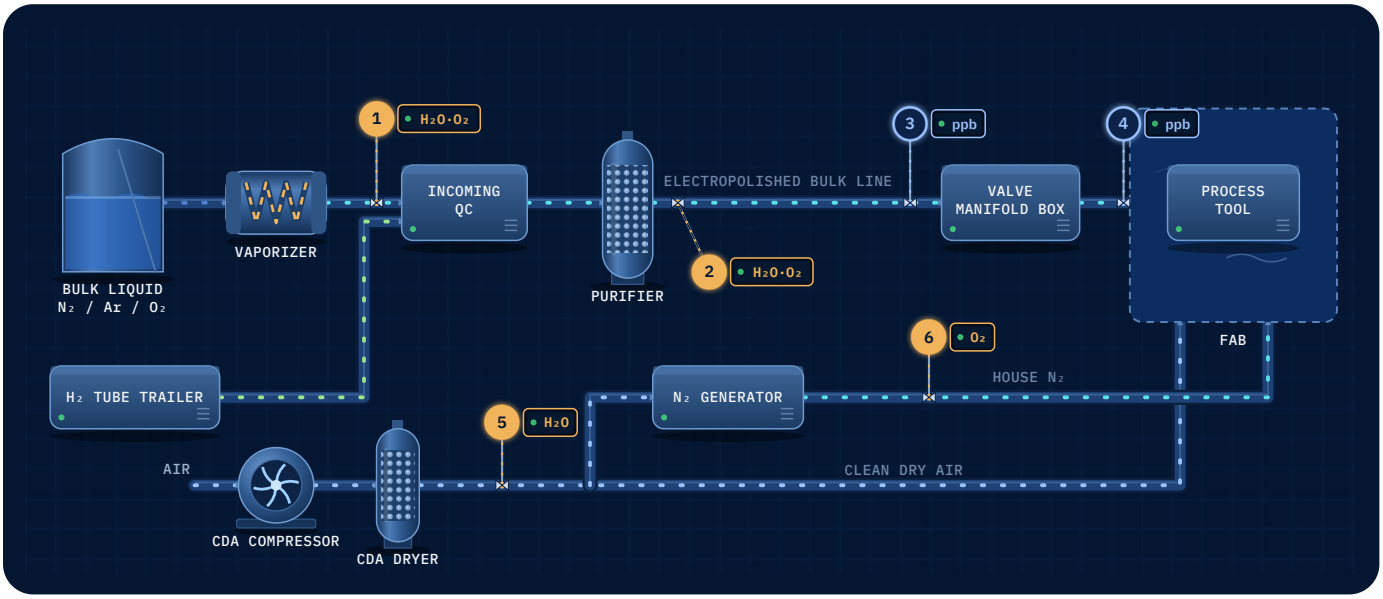
Semiconductor gases: where to measure moisture and oxygen

Follow bulk gas from the storage tank to the process tool, and clean dry air from the compressor to the fab. Each point shows what is measured and which analyzer fits.



YORK instrument Integrated system (supplied through YORK)

How the process works

Fabs use bulk nitrogen, argon, oxygen and hydrogen at sub-ppb impurity levels. YORK instruments screen incoming gas, watch purifiers and check CDA and house nitrogen; ppb and ppt certification uses dedicated trace analyzers.

1. **Bulk supply.** Liquid gases from on-site tanks are vaporized; hydrogen often arrives by tube trailer.
2. **Incoming QC.** Each delivery is screened before it reaches the purifier.
3. **Purification.** Point-of-entry purifiers take moisture, oxygen, CO_2 and hydrocarbons down to the sub-ppb level.
4. **Distribution.** Electropolished stainless lines and valve manifold boxes carry the gas to each tool.
5. **Utilities.** Clean dry air and house nitrogen feed pneumatic valves, purges and inerting across the fab.

Interactive version with animation:
https://www.yorkinstrument.ae/guides/semiconductor-high-purity-gas-measurement-points/

Measurement points

#	POINT	MEASURES	TYPICAL VALUE / LIMIT	RECOMMENDED SOLUTION
1	Incoming tube trailer / bulk tank check	Moisture and oxygen (screening)	Before the purifier, moisture can exceed 10 ppm	DPT830, POA200
2	Purifier outlet (breakthrough watch)	Moisture and oxygen (screening)	Should be below the analyzer floor; any rise signals breakthrough	DPT830, POA200
3	Bulk distribution after the purifier	H_2O, O_2, CO_2, CH_4	Below 1 ppb; industry roadmap target below 100 ppt	Integrated system: atmospheric-pressure ionization mass spectrometer (APIMS), cavity ring-down spectroscopy (CRDS) or a specialised trace GC
4	Point of use at the tool	H_2O, O_2, CO_2, CH_4	Sub-ppb; consistency at the point of use matters more than the bulk number	Integrated system: APIMS, CRDS or specialised trace GC
5	Clean dry air (CDA) dryer outlet	Pressure dew point	Set by the fab specification	DPT830, DPT810
6	House nitrogen generator outlet	Residual oxygen	Set by the fab specification	POA200, PGA500

Typical values from published standards, regulations and technical literature. Your contract, licensor or plant specification always governs. Integrated systems are supplied by YORK through its partner integration factory.

Key references

1. Bulk gas purity and APIMS measurement — Solid State Technology / Semiconductor Digest