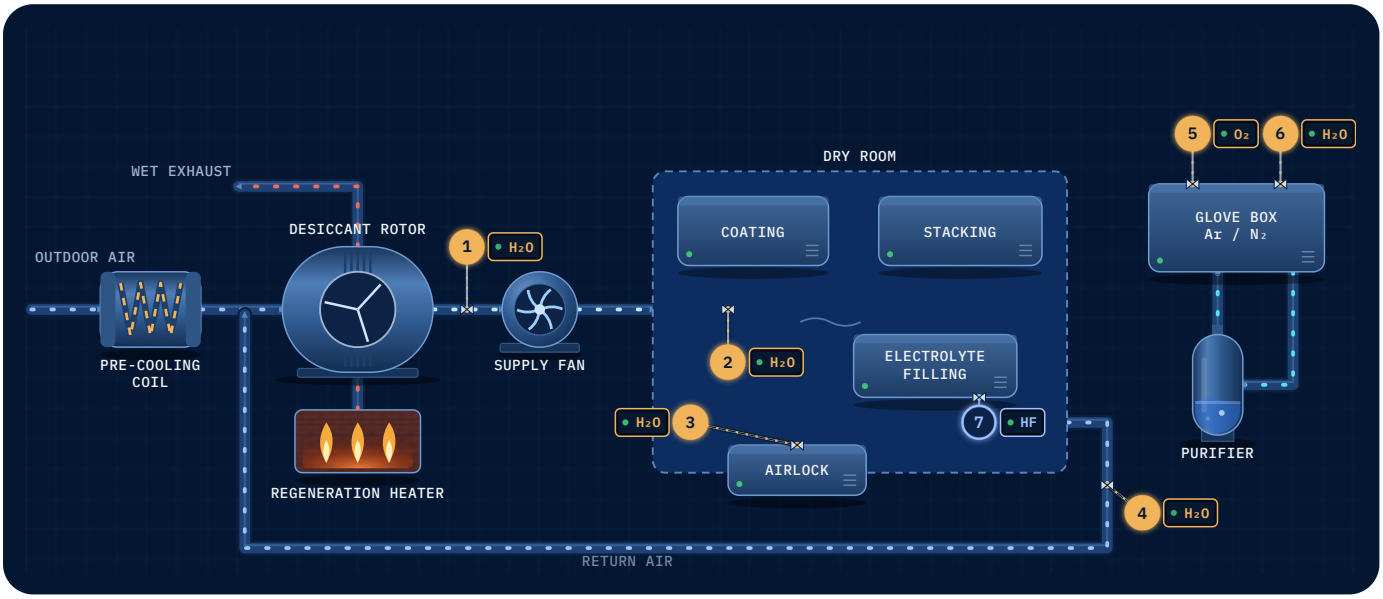
Battery dry rooms: where to measure dew point and oxygen

Follow the air from the desiccant rotor through the dry room and back. Each numbered point shows what is measured, the typical value, why it matters and the instrument that fits.



● YORK instrument ○ Integrated system (supplied through YORK)

How the process works

Lithium-ion cell production needs air far drier than any office or cleanroom. A desiccant dehumidifier dries the air, the dry room holds it, and glove boxes give an even drier argon or nitrogen atmosphere for the most sensitive steps.

1. **Pre-cooling.** A cooling coil removes the bulk of the moisture from outdoor air by condensation.
2. **Desiccant drying.** A rotating desiccant wheel adsorbs the remaining water. A hot regeneration air stream dries the other side of the wheel and leaves as wet exhaust.
3. **Supply to the room.** A fan delivers the dry air to the coating, stacking and electrolyte filling areas.
4. **People and doors.** Operators and airlock openings bring moisture in, so the room dew point varies by zone and by shift.
5. **Return air.** Most of the room air is recirculated through the rotor, which keeps the energy demand manageable.
6. **Glove boxes.** For lithium metal and open electrolyte, glove boxes recirculate argon or nitrogen through a purifier that removes oxygen and water.

Interactive version with animation:
https://www.yorkinstrument.ae/guides/battery-dry-room-measurement-points/

Measurement points

#	POINT	MEASURES	TYPICAL VALUE / LIMIT	RECOMMENDED SOLUTION
1	Desiccant rotor outlet	Supply-air dew point	Down to about −80 °C at start-up in a studied battery microenvironment	DPT830, DM9900
2	Dry room process zones	Room dew point (multi-point)	≤ −30 °C is typical; current dry rooms run between −20 and −50 °C	DPT810, DM9700
3	Airlock and operator zone	Local dew point	In one study a −50 °C set point degraded to −30 °C with an operator present	DPT810
4	Return air	Return-air dew point	Follows the room moisture load; compare it with the supply air	DPT810, DPT-600 Plus
5	Glove box atmosphere	Trace oxygen	Sub-ppm: one university argon glove box specifies < 0.5 ppm of oxygen-containing impurities	POA200, PGA500
6	Glove box atmosphere	Trace moisture	Typically held at low-ppm or sub-ppm water	DPT830
7	Electrolyte filling area	Hydrogen fluoride (HF)	Set by the site's occupational exposure limits	Integrated system: HF monitor (FTIR or electrochemical)

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. Henschel et al., Procedia CIRP 130 (2024) 619–624: dry room microenvironment study — Karlsruhe Institute of Technology (KIT)
2. Designing a dry room for lithium battery manufacturing — Cleanroom Technology
3. Argon-filled gloveboxes: specification — Warsaw University of Technology