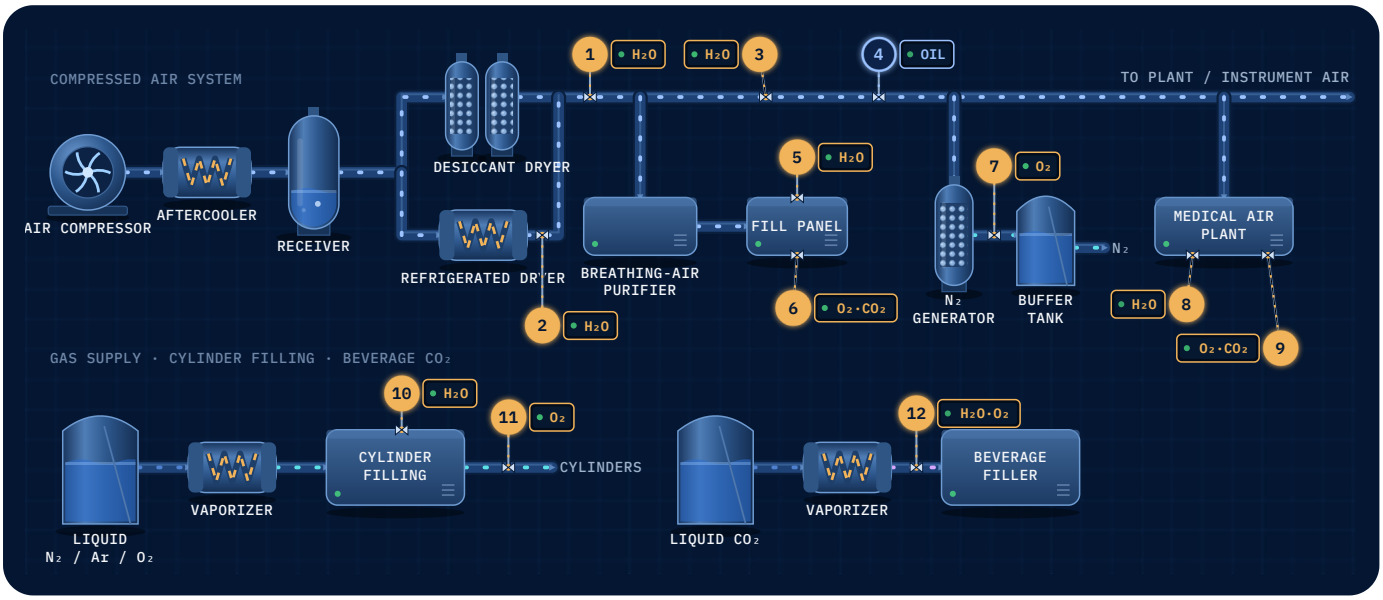
Compressed air and industrial gases: where to measure dew point, O_2 and CO_2

Follow the air from the compressor to the dryer, the breathing-air fill panel, the nitrogen generator and the medical air plant, then the cylinder-filling and beverage CO_2 lines. Each numbered point shows the limit and the analyzer that fits.



● YORK instrument ○ Integrated system (supplied through YORK)

How the process works

Most plants make their own compressed air and many make their own nitrogen. Gas companies fill cylinders, and drink producers use CO_2 from bulk tanks. In each case a quality limit is written into a standard, and an analyzer proves the gas meets it.

1. **Compression.** The compressor, aftercooler and receiver deliver air saturated with water, plus oil and particles.
2. **Drying.** A refrigerated dryer reaches a pressure dew point of about +3 °C (ISO 8573-1 Class 4). A desiccant dryer reaches −40 °C or −70 °C (Class 2 or 1).
3. **Distribution.** Dry air feeds plant and instrument air, and the special users downstream.
4. **Breathing air.** A purifier removes water, oil, CO_2 and CO before high-pressure cylinders are filled.
5. **Nitrogen generation.** Membrane or PSA units separate nitrogen from compressed air; residual oxygen measures their purity.
6. **Medical air.** A dedicated plant purifies air to the pharmacopoeia monograph.
7. **Cylinder filling and beverage CO_2.** Liquid gases are vaporized and filled into cylinders, or fed to a beverage filler, after a final purity check.

Interactive version with animation:
https://www.yorkinstrument.ae/guides/industrial-gases-compressed-air-measurement-points/

Measurement points

#	POINT	MEASURES	TYPICAL VALUE / LIMIT	RECOMMENDED SOLUTION
1	Desiccant dryer outlet	Pressure dew point	ISO 8573-1 water classes: Class 1 ≤ −70 °C, Class 2 ≤ −40 °C, Class 3 ≤ −20 °C	DPT810, DPT830
2	Refrigerated dryer outlet	Pressure dew point	ISO 8573-1: Class 4 ≤ +3 °C, Class 5 ≤ +7 °C, Class 6 ≤ +10 °C	DM9200
3	Distribution header / point of use	Pressure dew point (audit)	The class specified for each user, checked at the point of use	DPT-600 Plus, DM9600P
4	Distribution header / point of use	Oil and particles	ISO 8573-1 oil classes: Class 1 ≤ 0.01, Class 2 ≤ 0.1, Class 3 ≤ 1, Class 4 ≤ 5 mg/m³	Integrated system: oil-vapour monitor (PID) and laser particle counter
5	Breathing-air cylinder fill panel	Water content	≤ 50 mg/m³ (≈ 67 ppmv) for 200 bar fills; ≤ 30 mg/m³ (≈ 40 ppmv) for 300 bar fills (Norwegian regulation)	DPT-600 Plus, DPT810
6	Breathing-air cylinder fill panel	O_2, CO_2 and CO	O_2 21 ± 0.5 %; CO_2 ≤ 500 ppm; CO ≤ 10 ppm; oil ≤ 1 mg/m³ (Norwegian regulation)	POA300, PGA520; Integrated system: electrochemical CO analyzer
7	Nitrogen generator outlet	Residual oxygen	Membrane units leave percent-level O_2; PSA units reach ppm level. The limit is your inerting specification	POA300, PGA530, POA3500, POA200, PGA500
8	Medical air plant outlet	Water	≤ 67 ppm (≈ −46 °C dew point at atmospheric pressure) in pharmacopoeia monographs	DPT810, DM9600
9	Medical air plant outlet	O_2, CO_2 and trace contaminants	O_2 19.5–23.5 %; CO_2 ≤ 500 ppm; CO ≤ 5 ppm; SO_2 ≤ 1 ppm; NO + NO_2 ≤ 2 ppm; oil ≤ 0.1 ppm	POA3500, POA300, PGA520; Integrated system: CO, NOx, SO_2 and oil analyzers
10	Cylinder filling manifold	Water in N_2, Ar, O_2	GB/T 8979-2025 nitrogen: < 15 ppm (pure), < 3 ppm (high purity), < 0.5 ppm (ultrapure)	DPT830, DM9900
11	Cylinder filling manifold	Trace O_2 in N_2 and Ar; purity of O_2	GB/T 8979-2025 nitrogen: O_2 < 50 ppm (pure), < 3 ppm (high purity), < 0.1 ppm (ultrapure)	POA200, PGA500, POA3500
12	Beverage CO_2 after the vaporizer	Water and oxygen in CO_2	ISBT guideline: H_2O ≤ 20 ppm v/v (≈ −55 °C frost point at 1 atm); O_2 ≤ 30 ppm v/v	DPT830, DM9600; Integrated system: trace O_2 analyzer qualified for CO_2 service

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. ISO 8573-1:2010 Compressed air: Contaminants and purity classes — ISO
2. Regulations concerning action and limit values, Section 5-5 (breathing air) — Norwegian Labour Inspection Authority
3. Farmacopeia Brasileira 7th ed., Vol. II: Medical Gases — ANVISA
4. GB/T 8979-2025 Pure nitrogen, high-purity nitrogen and ultrapure nitrogen (table preview) — chinesestandard.net