

Gauges and Thermometers for Refrigeration Service — Classes, Scales and Clamp-On Probes

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Choosing panel and service gauges: accuracy class, glycerine filling against pulsation, refrigerant temperature scales, high-side Ø80 class-1.0 gauges, dial thermometers and K-type clamp-on pipe probes for superheat work — with calibration sanity checks.

Gauge anatomy that matters

Accuracy class is the percent-of-full-scale error band: class 1.0 on an 80 mm dial is the service standard (the stocked high-side gauges: HP Ø80 class 1.0, HP Ø80 class 1.0, R410A scales); class 1.6 suits rough indication. Pick the range so the working point sits mid-scale — a gauge living at 90 % of span is neither accurate nor durable. Glycerine filling damps pulsation and vibration — the right call on compressor-adjacent mounting and on the recovery rig: " 1/15 bar filled, rear flange covers LP/vacuum-side panel duty.

Refrigerant scales print saturation temperature rings per refrigerant next to the pressure arc. They read correctly only for the printed fluids — an R410A-scaled gauge (as above) tells saturation truth about R410A and misleads on R134a. With today's refrigerant diversity, the robust habit is reading pressure and converting via a slide or app; the printed rings then serve as the sanity check.

Thermometers

Dial (bimetal/vapour) thermometers carry the cold-room and duct duty: " 40/+40 °C Ø100 with bracket and the compact Ø50 version — mount the stem in the return-air stream, not against a wall, and give any remote-capillary type a drip loop. For electronic work, the probe family in the controller guide applies (PTC/NTC per instrument); for compressor diagnostics an electronic thermometer with surface probes beats dials by an order of magnitude.

Clamp-on pipe probes and superheat

Superheat and subcooling live on pipe-surface temperature, and the measurement is only as good as the thermal contact: spring-loaded K-type clamp-on probes — Fluke 80PK-8 (6.4–34.9 mm pipes) and 80PK-10 (32–64 mm) — grip the tube with repeatable force and shield the junction from ambient. Method: clean the contact spot to bare metal, clamp on the top half of a horizontal run (oil films pool low), insulate over the probe for low-temperature lines, let it settle. Superheat = measured suction temperature " saturation temperature from pressure at the same point; subcooling mirrors it on the liquid side. Both need pressure and temperature taken together — hence gauge + probe as a pair, at the component the diagnosis concerns.

Calibration sanity without a lab

Zero check: vented gauge reads zero (filled gauges: check the fill plug is vented per instructions or readings offset with altitude/temperature).

Ice-point check for thermometers and probes: stirred ice-water slurry = 0.0 °C; log the offset, replace what drifts.

Cross-check against saturation: on a stable system with known refrigerant, a surface probe at the mid-evaporator and the LP gauge must agree through the P-T relation within the instruments' classes — disagreement "e a couple of kelvin means an instrument, a mixed refrigerant or a pressure drop worth investigating.

Service instruments get dates: a calibration label, even an internal one, turns 'probably fine' into a system; electronic refrigerant scales (WS-055, 0–50 kg / 2 g) join the same regime for charge-by-weight work.

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