Temperature Measurement Fault Finding Guide

Vendor neutral fault finding guide for field technicians

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Before you start

- Permit, isolation and control room informed.
- Put the loop in manual or inhibit trips as authorised.
- Use certified test equipment in hazardous areas.
- Record as found readings before changing anything.

Quick checks

- Sensor type and wiring match configuration?
- Resistance or mV at ambient sensible?
- Element touches well bottom?
- Compare with a portable probe.

Symptoms, causes and fixes

Symptom	Likely causes	Checks and fixes
Reads upscale or fault	Open element or wire, burnout detection	Check continuity at head; replace element
Moves wrong way	Thermocouple polarity reversed	Swap at transmitter; check colour code
Few °C offset (TC)	Copper or wrong extension cable, CJC error	Use correct cable to CJC point
Few °C offset (RTD)	2 wire leads, wrong alpha or sensor type, mismatched 3 wire leads	Check wiring and configuration
Reads near ambient	Element not reaching well bottom, wrong length	Spring load element; check length
Slow response	Air gap in thermowell, heavy well	Fit correct element; consider tapered well
Noisy	Grounded TC with earth loop, VFD noise	Use isolated transmitter; shield and segregate

Quick values

- Pt100: 100 Ω at 0 °C, 109.73 Ω at 25 °C, 138.51 Ω at 100 °C.
- Type K: about 1.0 mV at 25 °C, 4.096 mV at 100 °C.
- Add CJC in mV, never in °C.