LOAD-CORRECTED TEMPERATURE · ABSOLUTE METHOD

$T_{maxcorr}$ load-correction *cheat sheet.*

A component measured at partial load reads cooler than it will at full nameplate load, so a raw temperature understates a real fault. The load-corrected maximum scales the allowable rise by the square of the load ratio, giving a defensible limit to judge against.

01 / FORMULA The corrected maximum

INFRASPECTION INSTITUTE STANDARD §11.6

$$T_{maxcorr} = [\,(A_{meas} / A_{rated})^2 \times T_{rated\ rise}\,] + T_{amb\ meas}$$

A_{meas} / A_{rated} measured & rated load (amps) · $T_{rated\ rise}$ rated rise from table · $T_{amb\ meas}$ ambient at scan

Read the verdict as a comparison: if the measured component temperature T_{meas} is at or below $T_{maxcorr}$, it is within tolerance for the load it was carrying; if it exceeds it, the component is running hot and warrants corrective action. The ratio is squared because resistive heating rises with the square of current (I^2R).

02 / RATED RISE Common component reference (°C)

COMPONENT	RATED AMBIENT	RATED RISE	MAX ALLOWABLE
Connectors — silver / silver alloy	40	40	80
Connectors — copper, copper alloy, aluminum	40	50	90
Circuit breakers — molded case	40	20	60
Circuit breakers — all others	40	30	70
Fuses	40	30	70
Disconnects, switches, insulators & supports	40	30	70
Bushings — transformer, lower end	40	55	95
Transformer — dry type, Class 105 windings	30	55	85

Values per Infraspection Institute reference tables. Full component list (motor windings, coils & relays, generators, additional insulation classes) is built into the live calculator on the Tools page.

03 / WORKED EXAMPLE Copper connector at half load

GIVEN · COPPER CONNECTOR, RATED RISE 50°C

A_{meas} 50 A A_{rated} 100 A T_{amb} 30°C T_{meas} 48°C

SOLVE

Load ratio = $(50 / 100)^2 = 0.25$ (50% load)

$T_{maxcorr} = [0.25 \times 50] + 30 =$ **42.5°C**

48°C > 42.5°C → **EXCEEDS LIMIT**

WHY IT MATTERS

At 48°C the connector looks mildly warm and a raw reading might pass it. But it was at half its rated current. Corrected to full load it is already **5.5°C over** the maximum, so the fault is real and worsens as load climbs. Reverse it too: gear that reads acceptable at light load can still be failing — never clear it from an image taken below **40% load**.

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lookmanagementgroup.com · run the live calculator on the Tools page