Temperature Unit Converter (°C, °F, K, °R)

Convert a temperature between degrees Celsius, degrees Fahrenheit, kelvin and degrees Rankine, with the exact defining relations.

Method: SI Brochure (9th ed.) definition of the kelvin and degree Celsius; NIST SP 811 (2008); ...

Input parameters

Unit system: SI

Parameter	Value	Unit
Temperature (choose its unit)	-40.000	°C

Calculated results

Parameter	Value	Unit
degree Celsius	-40.000	°C
degree Fahrenheit	-40.000	°F
kelvin	233.15	K
degree Rankine	419.67	°R

Notes for this case

- T(K) = T(°C) + 273.15; T(°F) = 1.8 T(°C) + 32; T(°R) = 1.8 T(K). A temperature difference converts without the offsets.

Formula and method

$$T_K = T_{\circ C} + 273.15, \quad T_{\circ F} = 1.8\,T_{\circ C} + 32, \quad T_{\circ R} = 1.8\,T_K$$

Variables

T	Temperature (choose its unit)	K

Method and standards

Exact scale definitions: the kelvin by the SI, the Celsius offset 273.15, and the Fahrenheit and Rankine degrees as 5/9 of a kelvin.

Assumptions and limits

- Absolute temperatures; for differences drop the offsets.

References

- SI Brochure (9th ed.) definition of the kelvin and degree Celsius
- NIST SP 811 (2008)
- Appendix B conversion factors

Report details

Report reference	FCC-CE7T-6KQ8 (the same inputs always give the same reference)
Generated	17 November 2026, 19:54 UTC
Calculator	Temperature Unit Converter (°C, °F, K, °R)
Method last reviewed	12 November 2026
Software release	FireCAD Calc, release of 17 November 2026
Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/general/unit-conversions/temperature-unit-converter

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.