°G

THE GALLIERA TEMPERATURE SCALE

Definition and Specification

Version 1.1

$$T_G = 2\,T_C$$

Author: Joseph Galliera

Specification established: 18 August 2026

Place: Philadelphia, Pennsylvania, USA

Status: Revised specification - defining relationship unchanged

Version 1.1 DOI: 10.5281/zenodo.22048681

Revision issued: 21 August 2026

Version 1.0 DOI: 10.5281/zenodo.21999740

A simple Celsius-derived scale for human-scale temperature communication.

Founding statement

The Galliera temperature scale (°G) was formally established by Joseph Galliera on 18 August 2026 in Version 1.0. The defining relationship remains exact and unchanged in this Version 1.1 revision: the numerical temperature reading in degrees Galliera is twice the numerical reading in degrees Celsius. Version 1.1 expands the quantitative rationale and comparison with Celsius and Fahrenheit while preserving the original definition.

The core definition is intentionally minimal. The scale does not introduce a new physical temperature quantity, a new thermodynamic zero, or a new calibration method. It is a numerical rescaling of Celsius intended primarily for everyday human communication, particularly where half-degree Celsius increments are useful but whole-number settings and readings are preferable.

Abstract

The Galliera temperature scale, symbol °G, is a Celsius-derived temperature scale defined by T_G = 2 T_C. One degree Galliera is therefore equal in interval size to 0.5 °C (0.5 K), and the scale shares the Celsius zero point. The design goal is to retain the conceptual simplicity of Celsius while giving common human-environment temperatures finer whole-integer representation. For example, thermostat settings of 20.0, 20.5, 21.0, and 21.5 °C become 40, 41, 42, and 43 °G. Across the same 0-40 °C physical span, Celsius provides 40 one-degree intervals, Fahrenheit provides 72, and Galliera provides 80. Between the freezing and boiling points of water at 1 atm, the corresponding counts are 100, 180, and 200. These are representational differences, not claims of greater physical measurement precision. The intended domain is everyday weather, indoor climate control, education, and other human-facing temperature communication.

1. Scope and design principles

The Galliera scale is proposed as an everyday, human-facing scale rather than as a replacement for Kelvin in thermodynamics or for Celsius in scientific standardization. Its defining choices are guided by five principles:

- Simple conversion: multiply Celsius by two; divide Galliera by two.
- A familiar zero: 0 °G is exactly 0 °C.
- Whole-number representation of common 0.5 °C increments, yielding twice as many whole-degree intervals as Celsius across the same physical span.
- Numerical values that map naturally onto everyday human temperature experience.
- No attempt to reproduce Fahrenheit exactly or to add an arbitrary offset merely for familiarity.

2. Normative definition

The Galliera scale is defined exactly by:

$$T_G = 2\,T_C$$

and therefore:

$$T_C = T_G / 2$$

where T_G is a numerical temperature expressed in degrees Galliera and T_C is the corresponding numerical temperature expressed in degrees Celsius.

2.1 Zero point

The Galliera and Celsius scales share the same zero point: 0 °G = 0 °C. Consequently, the conventional freezing point reference of water is approximately 0 °G under the same conditions in which it is described as 0 °C.

2.2 Unit interval

For temperature differences, 1 °G corresponds exactly to 0.5 °C and 0.5 K. A temperature difference of 1 °G also corresponds to 0.9 °F.

$$\mathbf{1\ °G\ interval = 0.5\ °C = 0.5\ K = 0.9\ °F\ interval}$$

3. Name, symbol, and terminology

The unit name is degree Galliera (plural: degrees Galliera). The preferred symbol is °G. In technical typography, a space is recommended between the numerical value and the symbol, for example 42 °G.

3.1 Why the letter G?

The choice of G is partly eponymous - Galliera is the author's surname - but several additional characteristics made the symbol feel unusually appropriate during development of the scale. These observations are design rationale, not part of the mathematical definition.

- Continuity with established naming conventions: temperature scales commonly use the name of a person associated with their definition, such as Celsius, Fahrenheit, Kelvin, and Rankine.
- Visual relationship to C: in many typefaces, capital G retains the open circular form of C while adding a short internal or horizontal stroke. That makes °G visually related to °C without being confusable with it.
- Alphabetic relationship to Fahrenheit: G immediately follows F in the alphabet. This provides a small mnemonic connection to °F while the mathematical construction remains Celsius-based.
- Humanistic mnemonic: G lies between F and H, allowing H to serve informally as a reminder of the scale's humanistic or human-centered design objective. This is a mnemonic, not a formal derivation of the symbol.

A separate coincidence is the existence of the Palais Galliera, the Paris Fashion Museum. The museum is unrelated to the temperature scale and played no role in its technical definition; the shared name is noted only as an interesting cultural association.

4. Rationale: whole-number human-interface resolution

The practical motivation for doubling Celsius is most apparent in climate controls and other human-facing displays. Many thermostats and HVAC interfaces benefit from 0.5 °C steps. On Celsius displays, those steps alternate between integers and half-integers. Galliera maps the same sequence onto consecutive integers without changing the underlying temperature resolution.

Celsius	Galliera	Interpretation
20.0 °C	40 °G	Integer
20.5 °C	41 °G	Next integer
21.0 °C	42 °G	Next integer
21.5 °C	43 °G	Next integer
22.0 °C	44 °G	Next integer
22.5 °C	45 °G	Next integer

This is a representational advantage, not a claim of greater metrological precision. A sensor capable of resolving 0.5 °C is equally capable of resolving 1 °G; the information content is the same. The advantage described here concerns the number and spacing of whole-number labels available to people using a display or communicating a temperature.

4.1 Whole-number granularity across common physical ranges

A useful way to compare everyday scales is to hold the physical temperature span constant and count the one-degree intervals each notation provides. Under this specific whole-number-display criterion, Galliera is finer than both Celsius and Fahrenheit: 1 °G is a 0.5 °C interval, whereas 1 °F is a 5/9 °C interval (approximately 0.556 °C). Consequently, the Galliera unit interval is 10% smaller than a Fahrenheit degree and 50% the size of a Celsius degree.

For an ordinary human/environmental span from 0 to 40 °C, the same physical range is 32 to 104 °F and 0 to 80 °G. The numerical spans therefore contain 40 Celsius one-degree intervals, 72 Fahrenheit one-degree intervals, and 80 Galliera one-degree intervals. Extending the range to 50 °C gives 50, 90, and 100 intervals respectively. Between the freezing and boiling points of water at standard atmospheric pressure (1 atm), the counts are 100, 180, and 200.

Same physical span	Celsius	Fahrenheit	Galliera
0 to 40 °C common human/environmental span	40 intervals 0 to 40 °C	72 intervals 32 to 104 °F	**80 intervals** **0 to 80 °G**
0 to 50 °C extended hot-weather span	50 intervals 0 to 50 °C	90 intervals 32 to 122 °F	**100 intervals** **0 to 100 °G**
Water: freezing to boiling at 1 atm	100 intervals 0 to 100 °C	180 intervals 32 to 212 °F	**200 intervals** **0 to 200 °G**

The word 'intervals' is intentional: a span from 0 to 40 contains 40 one-degree intervals but 41 integer labels when both endpoints are counted. This comparison concerns notation and human-interface granularity only. It does not imply that a thermometer or sensor becomes more accurate merely by displaying Galliera values.

5. Human-scale anchor points

The multiplier of two also yields a compact set of memorable everyday anchor points while preserving zero at freezing. These values are illustrative rather than additional definitions.

Reference	Galliera	Celsius	Fahrenheit
Water freezes	0 °G	0 °C	32 °F
Cool indoor temperature	36 °G	18 °C	64.4 °F
Typical room temperature	40 °G	20 °C	68 °F
Warm room	44 °G	22 °C	71.6 °F
Warm day	50 °G	25 °C	77 °F
Hot day	60 °G	30 °C	86 °F
Nominal body temperature	74 °G	37 °C	98.6 °F
Very hot weather	80 °G	40 °C	104 °F
Extreme outdoor heat	100 °G	50 °C	122 °F
Water boils*	200 °G	100 °C	212 °F

*At standard atmospheric pressure; actual boiling temperature varies with pressure and composition.

6. Conversion formulas

6.1 Celsius

$$T_G = 2\,T_C \qquad T_C = T_G / 2$$

6.2 Fahrenheit

$$T_F = 0.9\,T_G + 32$$

$$T_G = (T_F - 32) / 0.9$$

The offset in the Fahrenheit conversion applies to absolute scale readings. For temperature differences only, 1 °G = 0.9 °F.

Specification established 18 August 2026 ● Joseph Galliera
Version 1.1 ● 10.5281/zenodo.22048681

7. Relationship to Celsius, Fahrenheit, and Kelvin

Galliera is deliberately closer in structure to Celsius than to Fahrenheit. It preserves the Celsius zero and differs only by scale factor. The resulting everyday numbers can sometimes feel more Fahrenheit-like because the numerical spacing is finer, but matching Fahrenheit values was not a design objective. For temperature intervals, 1 °G = 0.5 °C, while 1 °F = 5/9 °C ≈ 0.556 °C. Thus Galliera supplies about 11.1% more whole-degree intervals than Fahrenheit over any identical physical span (for example, 80 versus 72 across 0-40 °C), while also retaining 0 at the Celsius freezing reference.

Kelvin remains the appropriate absolute thermodynamic scale. Galliera has no special status at absolute zero and is not proposed as a thermodynamic replacement. Absolute zero corresponds to -546.30 °G because -273.15 °C × 2 = -546.30 °G.

8. Illustrative seasonal ranges

The following broad bands are useful examples for temperate four-season climates. They are intentionally descriptive rather than definitional; seasons vary substantially with latitude, elevation, continentality, and local climate.

Season	Galliera range	Celsius equivalent
Winter	-10 to 30 °G	-5 to 15 °C
Spring / Autumn	10 to 50 °G	5 to 25 °C
Summer	40 to 90 °G	20 to 45 °C

These ranges overlap intentionally. Seasons are not discrete temperature bins, and transition periods commonly share temperatures with adjacent seasons.

9. Intended uses

- Thermostats and climate-control interfaces
- Everyday weather reporting and conversation
- Educational comparison of temperature scales
- Human-comfort and building-environment displays
- Personal, consumer, and graphical temperature communication

The scale may also be used in technical contexts where its conversion is clearly stated, but this specification does not propose replacing SI temperature units or existing metrological standards.

10. Non-goals and limitations

- Galliera does not provide greater physical measurement precision than Celsius or Fahrenheit; it changes numerical representation and whole-number granularity.
- Galliera is not an absolute temperature scale.
- The seasonal and comfort examples are not universal climatic definitions.
- The scale does not attempt to make Fahrenheit obsolete or to reproduce Fahrenheit reference values.
- This specification does not claim adoption by standards organizations, scientific bodies, or public agencies.

11. Versioning and canonical identity

Version 1.0 established the canonical identity of the Galliera temperature scale through the exact relationship $T_G = 2\,T_C$ and the symbol °G. Version 1.1 preserves that identity unchanged and adds an explicit quantitative comparison of whole-number interval counts across equivalent Celsius, Fahrenheit, and Galliera temperature spans.

A change to the defining relationship $T_G = 2\,T_C$ would constitute a different temperature scale rather than a revision of the Galliera scale.

For archival publication, each released version should retain its own version number and date. If deposited in a repository that provides persistent identifiers, the DOI or equivalent identifier should be cited as the canonical public reference.

12. Authorship and historical note

Joseph Galliera conceived the scale through consideration of how Celsius and Fahrenheit function in everyday use, particularly the practical annoyance of half-degree Celsius thermostat increments. Several alternative formulations were considered, including approaches that would more closely mimic Fahrenheit. The final design deliberately rejected additional offsets and complexity in favor of the simplest relationship that met the human-interface objective: exactly twice Celsius. During subsequent explanation and review, the same design benefit was made more explicit quantitatively: over an identical physical range, Galliera provides twice as many whole-degree intervals as Celsius and about 11.1% more than Fahrenheit.

The name Galliera follows the historical convention of eponymous temperature scales while also yielding the compact symbol °G. The visual and alphabetic associations described in Section 3.1 were supporting reasons for retaining the symbol after the mathematical relationship had been selected.

13. Canonical citation

Recommended citation:

Galliera, Joseph. The Galliera Temperature Scale (°G): Definition and Specification, Version 1.1. Philadelphia, Pennsylvania, USA, 21 August 2026. DOI: 10.5281/zenodo.22048681.

14. Publication record

Field	Canonical value
Name	Galliera temperature scale
Symbol	°G
Author / originator	Joseph Galliera
Version	1.1
Specification established	18 August 2026; Version 1.1 issued 21 August 2026
Defining relationship	T_G = 2 T_C
Place	Philadelphia, Pennsylvania, USA
Repository	Zenodo recommended
DOI	10.5281/zenodo.22048681
Recommended license	CC BY 4.0 for this document
Previous version	Version 1.0 - DOI 10.5281/zenodo.21999740

Appendix A. Quick-reference table

Galliera	Celsius	Fahrenheit
-40 °G	-20 °C	-4 °F
-30 °G	-15 °C	5 °F
-20 °G	-10 °C	14 °F
-10 °G	-5 °C	23 °F
0 °G	0 °C	32 °F
10 °G	5 °C	41 °F
20 °G	10 °C	50 °F
30 °G	15 °C	59 °F
40 °G	20 °C	68 °F
50 °G	25 °C	77 °F
60 °G	30 °C	86 °F
70 °G	35 °C	95 °F
80 °G	40 °C	104 °F
90 °G	45 °C	113 °F
100 °G	50 °C	122 °F

Appendix B. Informative note on Palais Galliera

Palais Galliera is the Paris Fashion Museum in Paris, France. Its name is historically associated with the Duchess of Galliera and is unrelated to the Galliera temperature scale defined in this document. The coincidence is culturally interesting but has no technical significance for the scale.

Document notes

This Version 1.1 revision was prepared for archival publication as a new Zenodo version and is identified by DOI 10.5281/zenodo.22048681. Version 1.0 remains permanently citable at DOI 10.5281/zenodo.21999740. Once Version 1.1 is published, later corrections or expansions should again be issued as a new version rather than silently replacing the archived files.