The symbol for voltage is

The symbol for voltage is

The volt (symbol: V) is the unit of electric potential, electric potential difference (voltage), and electromotive force in the International System of Units (SI).[1]

One volt is defined as the electric potential between two points of a conducting wire when an electric current of one ampere dissipates one watt of power between those points.[2] It can be expressed in terms of SI base units (m, kg, s, and A) as

Equivalently, it is the potential difference between two points that will impart one joule of energy per coulomb of charge that passes through it. It can be expressed in terms of SI base units (m, kg, s, and A) as

It can also be expressed as amperes times ohms (current times resistance, Ohm''s law), webers per second (magnetic flux per time), watts per ampere (power per current), or joules per coulomb (energy per charge), which is also equivalent to electronvolts per elementary charge:

The volt is named after Alessandro Volta. As with every SI unit named for a person, its symbol starts with an upper case letter (V), but when written in full, it follows the rules for capitalisation of a common noun; i.e., volt becomes capitalised at the beginning of a sentence and in titles but is otherwise in lower case.

Historically the "conventional" volt, V90, defined in 1987 by the 18th General Conference on Weights and Measures[3] and in use from 1990 to 2019, was implemented using the Josephson effect for exact frequency-to-voltage conversion, combined with the caesium frequency standard. Though the Josephson effect is still used to realize a volt, the constant used has changed slightly.

For the Josephson constant, KJ = 2e/h (where e is the elementary charge and h is the Planck constant), a "conventional" value KJ-90 = 0.4835979 GHz/mV was used for the purpose of defining the volt. As a consequence of the 2019 revision of the SI, as of 2019 the Josephson constant has an exact value of KJ = 483597.84841698... GHz/V, which replaced the conventional value KJ-90.

This standard is typically realized using a series-connected array of several thousand or tens of thousands of junctions, excited by microwave signals between 10 and 80 GHz (depending on the array design).[4] Empirically, several experiments have shown that the method is independent of device design, material, measurement setup, etc., and no correction terms are required in a practical implementation.[5]

In the water-flow analogy, sometimes used to explain electric circuits by comparing them with water-filled pipes, voltage (difference in electric potential) is likened to difference in water pressure, while current is proportional to the amount of water flowing. A resistor would be a reduced diameter somewhere in the piping or something akin to a radiator offering resistance to flow.

The relationship between voltage and current is defined (in ohmic devices like resistors) by Ohm''s law. Ohm''s Law is analogous to the Hagen-Poiseuille equation, as both are linear models relating flux and potential in their respective systems.

The voltage produced by each electrochemical cell in a battery is determined by the chemistry of that cell (see Galvanic cell ? Cell voltage). Cells can be combined in series for multiples of that voltage, or additional circuitry added to adjust the voltage to a different level. Mechanical generators can usually be constructed to any voltage in a range of feasibility.

Voltage can be described in numerous ways, but the most popular voltage definition is that voltage is the total work required to move a unit of charge between two points in a static electric field. Voltage is also referred to as electric potential difference, electric pressure or electric tension. In this article, let us learn more about voltage definition, SI unit of voltage, and other electrical units.