

What Is the Difference Between a Magnetometer, Gaussmeter, and Teslameter?

What is a Magnetic Field?

The term magnetic field represents a vector quantity that defines the influence of magnetism on a dynamic electric current, magnetic materials, and electric charges. The moving substances experience a specific magnitude of force perpendicular to the magnetic field and its velocity.

The magnetic field of a permanent magnet pull on or attracts ferromagnetic materials like iron. It may repel or draw in other magnetic substances depending on a few factors. In addition to that, a magnetic field whose magnitude or value varies with a change or shift in location will exert or apply a force on a variety of non-magnetic substances. It does so by exercising an influence on the motion or movement of the electrons in the outer atom.

A magnetic field surrounds different and diverse magnetized materials. It gets created or generated by electric currents like those applied in electromagnets. It also gets produced by the electric fields that do not remain consistent and vary with time. As the location changes or electric charges keep moving, the magnitude of the strength and the direction of a magnetic field varies. Thus, it gets described mathematically using a function. It is possible by allotting a vector quantity to each position or point of space, also known as a vector field.

What is meant by Hall Effect?

Hall Effect is the generation or production of a difference in the voltage present across an electrical conductor. It runs transverse to the electric current in the conducting material. Additionally, it works on an applied magnetic field that runs perpendicular to the current. Edwin hall was the first person to discover this phenomenon in 1879.

Hall Effect becomes visible or observable in a magnetic field applied perpendicularly. It runs across voltage contacts on the edge of a metal plate or semiconductor.

It displays the apparent reversal in sign compared to the standard Hall Effect. It depends solely on the current induced from within the void.

What is a Magnetometer?



MAGNETOMETERS

A magnetometer refers to an electric appliance capable of assessing the value of a magnetic field in a specific place or area. The device also has the functions and features to

measure the magnitude of the magnetic dipole moment of various magnetic constituents, materials, and substances. For example, it can gauge the required parameter for ferromagnets.

A magnetometer calculates the value by evaluating and judging the effect that the magnetic dipole moment applies or has on the induced current that originates in a particular current-carrying coil. Additionally, some magnetometers can estimate other factors of the magnetic field. They can consist of their relative change, strength, and direction.

What is a Gaussmeter?

A gaussmeter is another kind or variety of electrical device that can calculate the intensity of a constricted magnetic field and estimate its direction. It is also known as the modern version of a gauss [magnetometer](#). It comprises parts such as a meter, a gauss sensor or probe, and a cable joining or connecting the two components. This appliance works by following the basis or principle of the Hall Effect discovered by Edwin Hall in 1879.

A gaussmeter displays the calculated measurements of an electromagnetic wave in Gauss (G), milliTesla (mT), microTesla (μ T), or milliGauss (mG) units. It can detect and discover the dynamic electromagnetic fields associated with alternating current (AC) or the steady permanent magnetic fields related to direct current (DC).

A gaussmeter works primarily with and for small-sized magnetic fields. If the measurement needs to get done for a large one, the best choice of instrument is a tesla meter. It is similar to a gaussmeter but comes graduated in larger units of tesla.

What is a Teslameter?

A teslameter is a type of gaussmeter. It gets used to measure the intensity and direction of alternating current, pulse, and direct current magnetic fields. They work for the ones that

have a significant area of coverage and spread. They calculate the values in units of tesla (T), microTesla (μT), or milliTesla (mT).

What are the Differences between a Magnetometer, Gaussmeter, and Teslameter?

To most people, a magnetometer, a gaussmeter, and a teslameter may seem the same. However, the three electrical devices have subtle yet significant differences among them. These dissimilarities determine their range and scope of application and the manner or fashion in which they can get used. They also establish the points of their pros and cons.

Some differences between a magnetometer, a gaussmeter, and a teslameter consist of the following:

▪ Measurement Unit

A magnetic field is a vector quantity whose measurement value remains characterized by its direction and strength or magnitude. In general, the latter parameter gets represented in the unit of tesla in the SI system. It is gauss in the CGS system. The relation between the two is that one tesla is equal to 10,000 gauss.

Gaussmeters and teslameters are instruments that calculate the value of the intensity of a magnetic field in the gauss and tesla units, respectively. In a few cases or circumstances, the term magnetometer represents an electrical appliance that measures the magnitude less than one milliTesla (mT) and gaussmeter for those more than one milliTesla (mT).

▪ Size of the Magnetic Field

A magnetometer can measure the intensity or strength of a magnetic field of considerable size. Hence, they can get used for the purpose in any corner of the Earth and even in

space.

On the other hand, a gaussmeter and a teslameter calculate the same values of intensity. However, they do so for a comparatively smaller size of a magnetic field. Between the two, the latter instrument has the ability and capability of estimating the parameter for the larger field.

A gaussmeter and magnetometer can get differentiated on the basis or factor of the level of sensitivity they provide and use. The former are high-strength devices that calculate the intensity of the magnetic field by more than one milliTesla (mT). On the other hand, the latter gets used for applications related to high sensitivity of less than one milliTesla (mT).