DESCRIPTION

TITLE OF INVENTION: ELECTROMAGNETIC WAVE DETECTION DEVICE

TECHNICAL FIELD

[0001] The present disclosure relates to an electromagnetic wave detection device that detects an electromagnetic wave from an electromagnetic wave generation source to be measured.

BACKGROUND ART

[0002] An electromagnetic wave detection device that detects an electromagnetic wave in order to know an abnormality of an electronic device or the like is known, and as one such electromagnetic wave detection device, an insulation monitoring device of a metal-closed distribution board that detects a partial discharge electromagnetic wave generated by an insulation abnormality is proposed by Patent Literature 1.

Patent Literature 1 discloses an insulation monitoring device of a metal-closed distribution board in which a discharge detection unit, including an antenna for detecting an electromagnetic wave and an amplifier for amplifying a detection signal of the antenna, is disposed in a housing of the metal-closed distribution board, and an insulation determination unit for monitoring presence or absence of a signal component due to an electromagnetic wave generated from an output signal of the amplifier due to partial discharge caused at the time of insulation abnormality is provided.

CITATION LIST

PATENT LITERATURE

[0003] Patent Literature 1: JP 2005-265684 A

SUMMARY OF INVENTION

TECHNICAL PROBLEM

[0004] Since the insulation monitoring device disclosed in Patent Literature 1 is intended for a metal-closed distribution board, a discharge detection unit that detects an electromagnetic wave is disposed of in the housing of the metal-closed distribution board.

On the other hand, there is a demand for an electromagnetic wave detection device that detects an abnormality by disposing of an electromagnetic wave detection device in a space in which an electromagnetic wave generation source to be measured is disposed of and a different space divided by a partition plate that attenuates an electromagnetic wave such as metal and detecting an electromagnetic wave from the electromagnetic wave generation source.

[0005] The present disclosure has been made in view of the above points, and an object of the present disclosure is, in a first space in which an electromagnetic wave generation source is disposed and a second space partitioned by a partition plate that attenuates propagation of an electromagnetic wave and different from the first space, to obtain an electromagnetic wave detection device capable of detecting, in the second space, an electromagnetic wave from the electromagnetic wave generation source disposed of in the first space.

SOLUTION TO PROBLEM

[0006] An electromagnetic wave detection device according to the present disclosure is an electromagnetic wave detection device comprising an electromagnetic wave observation unit and a detecting unit, the detecting unit disposed in a second space partitioned from a first space in which the electromagnetic wave generation source is disposed of by a partition plate to attenuate propagation of an electromagnetic wave and in which there is not the electromagnetic wave generation source, the electromagnetic wave observation unit including a metal wire having a penetrating portion to penetrate a through hole formed in the partition plate through the first space and the second space while being separated from a peripheral wall of the through hole, a protruding portion to

protrude from the penetrating portion to the first space apart from a surface of the partition plate without contact and receive the electromagnetic wave from the electromagnetic wave generation source, and an extending portion to extend from the penetrating portion to the second space apart from a rear surface of the partition plate without contact and a coil connected between one end of the extending portion of the metal wire and the ground point, wherein the detecting unit detects a voltage between both terminals of the coil.

ADVANTAGEOUS EFFECTS OF INVENTION

[0007] According to the present disclosure, detection of an electromagnetic wave from an electromagnetic wave generation source disposed in a first space can be performed with good sensitivity in a second space by using an electromagnetic wave observation unit having a simple structure including a metal wire having a penetrating portion, a protruding portion protruding to the first space, and an extending portion 13 extending to the second space, and a coil connected between one end of the extending unit of the metal wire and the ground point, by detecting a voltage between both terminals of coils by the detecting unit, while the current based on the electromagnetic wave received by the protruding portion due to parasitic components occurred between the protruding portion and the partition plate is suppressed to flow directly to the partition plate through parasitic components from the protruding portion, enabling to receive a voltage between both terminals of the coil by the detecting unit and is avoided to lower S/N ratio.

BRIEF DESCRIPTION OF DRAWINGS

[0008] FIG. 1 is a configuration diagram illustrating an electromagnetic wave detection device according to a first embodiment.

FIG. 2 is a configuration diagram illustrating an electromagnetic wave detection device according to a second embodiment.

FIG. 3 is a configuration diagram illustrating an electromagnetic wave

partition plate 200 while being separated from a peripheral wall of the through hole, a protruding portion 12 that protrudes from the penetrating portion 11 to the first space A and receives an electromagnetic wave from the electromagnetic wave generation source 100, and an extending portion 13 that extends from the penetrating portion 11 to the second space B; and a first passive element circuit 14 in which one terminal is connected to one end of the extending portion 13 of the first metal wire and the other terminal is connected to a ground point 301.

[0185] The first detection unit 20 is a contact sensor of an active probe, such as a high-impedance probe or a field effect transistor probe, that accurately detects a voltage between both terminals of the first passive element circuit 14.

The first electromagnetic wave observation unit 10 and the first detection unit 20 in the abnormal electromagnetic wave detecting unit are the same as the electromagnetic wave observation unit 10 and the detection unit 20 in the electromagnetic wave detection device according to the eighth embodiment or the ninth embodiment.

[0186] The disturbance noise detection unit includes a second electromagnetic wave observation unit 10R and a second detection unit 20R.

The disturbance noise detection unit detects an electromagnetic wave that is disturbance noise present in a fifth space E.

The fifth space E is a space partitioned from the first space A by the third partition plate 240 and partitioned from the second space B by the partition plate 200.

The third partition plate 240 attenuates the propagation of the electromagnetic wave. The material of the third partition plate 240 is the material of the partition plate 200 or a similar material.

[0187] The partition plate 200 is formed with a second through hole 200R that