SURGE VOLTAGE ABSORBING APPARATUS

BACKGROUND OF THR INVENTION

[0001]

The invention relates to a surge voltage absorbing apparatus.

[0002]

The following patent document describes a technique for protecting various electrical apparatuses from a surge voltage. This patent document's claim 1 recites that "a surge protective device comprising: a gas arrestor to which an AC power supply voltage is applied; a varistor group connected in series to the gas arrestor and including high-resistance varistors connected in parallel and each having a varistor voltage set to higher than a peak value of the AC power supply voltage; a resistor connected between both the electrodes of the varistor group for discharging a charge stored in the electrostatic capacitance of the varistor group".

[0003]

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[0004]

However, the parallel connection of the varistors causes a leak current to increase in a normal state. In addition, if the varistors connected in parallel are gradually exhausted, it is difficult to understand how degree they as a whole are exhausted, and they have a problem in maintainability.

SUMMARY OF THE INVENTION

[0005]

~~This~~ Embodiments of the present invention ~~is directed~~seek to provide a surge voltage absorbing apparatus which may achieve~~s~~ a high maintainability.

~~The~~ According to an aspect of the present invention, there is provided a surge voltage absorbing apparatus ~~includes a surge absorbing unit~~comprising a surge absorbing unit group including one or more surge absorbing units, and a control unit for each of the surge absorbing units. ~~The~~ One of the surge absorbing unit~~s~~ includes: a first surge voltage absorbing circuit inserted between two lines on which a surge voltage may occur and including a first surge voltage absorbing element having a couple of terminals and coming to a conductive state when a predetermined voltage or more is applied to the couple of terminals; a relay contact; and a second surge voltage absorbing circuit connected in parallel to the first surge

voltage absorbing circuit and including a second surge voltage absorbing element connected in series to the relay contact and coming to a conductive state when the predetermined voltage or more is applied to the second surge voltage absorbing element. The control circuit is configured to keep the relay contact turned off before detecting the first surge voltage absorbing circuit exhausted and configured to turn on the relay contact when detecting the first surge voltage absorbing circuit exhausted.

[0006]

According to embodiments of the invention, the surge voltage absorbing apparatus may achieves a high maintainability.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

[0007]

FIG. 1 is a block diagram of a surge protective apparatus according to an embodiment of the invention;

FIGS. 2A and 2B are circuit diagrams of surge absorbing units, respectively;

FIGS. 3A, 3B and 3C are waveform charts of units of the surge protective apparatus, respectively;

FIG. 4 is a time chart of the surge protective apparatus;

FIG. 5 is other time chart of the surge protective apparatus; and

FIG. 6 is a circuit diagram of a modification of an SPD (Surge Protective Device).

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0008]

<Whole Configuration of Embodiment>

When a lightning occurs close to a transmission line, a surge voltage caused by an induced lightning is applied to the transmission line. The surge voltage caused by the induced lightning has a voltage of several thousand volts and a current of several hundred to several thousand amperes and a time of several micro seconds to about 20 micro seconds. The surge voltage is larger in energy than a noise or a surge voltage caused by other factors. It is a surge protective apparatus that serves as a device for protecting various electric apparatuses from this surge voltage. Hereafter, the description will be given of a configuration of a surge