VOLTAGE SENSOR

TECHNICAL FIELD

The invention relates to a voltage sensor for powerline and/or cable accessories applications.

BACKGROUND

As electrical power distribution becomes more complex through the advent of renewable energy, distributed generation and the adoption of electric vehicles, intelligent electrical distribution and associated electrical sensing is becoming more useful and even necessary. Useful sensing may include, for example, voltage, current, and the time relationship between voltage and current at various locations within a power distribution network.

SUMMARY

In general, this disclosure is directed to a voltage sensor that can be connected to a power line, cable, or cable accessories. In particular, according to an aspect, a voltage sensor comprises a conductor having a first end and a second end, the first end including a first connection interface and the second end having no connection, and a sensor section including at least one sensor disposed over the conductor, the sensor sensing at least a voltage or a sample of the voltage of the conductor.

In one embodiment, the second end has reduced electric field stress concentration. In a further embodiment, the second end of the conductor has a rounded surface, such as a fully rounded (or semi-hemispherical) surface. In a further embodiment, the second end includes a bulbous rounded surface.

In one embodiment, the sensor section includes a voltage sensor. A first electrode of the voltage sensor can comprise the conductor. Alternatively, the first electrode of the voltage sensor comprises an inner shield layer in contact with the conductor. The voltage sensor further includes an insulation layer disposed over the isolated inner shield layer, and an electrically isolated outer shield layer disposed over the insulation layer.

The above summary of the present invention is not intended to describe each illustrated embodiment or every implementation of the present invention. The details of one or more examples of this disclosure are set forth in the accompanying drawings and the description below. Other features, objects, and advantages of the disclosed techniques will be apparent from the description and drawings, and from the claims.

23. The voltage sensor of claim 1, wherein the second end is shaped to allow for stress control to substantially reduce the probability of partial discharge or electrical failure.

24. The voltage sensor of claim 1, wherein the sensor section includes a voltage sensor having an insulation layer disposed over the conductor, and an electrically isolated outer shield layer disposed over the insulation layer, wherein the conductor forms a first electrode of a capacitor and the electrically isolated outer shield layer comprises a second electrode of the capacitor.

25. The voltage sensor of claim 1, wherein the sensor section is disposed between the first and second ends of the conductor.