thermally responsive switch is covered by a resin 121 serving as an electrically insulative coating. The resin 121 significantly reduces the heat conductivity of the sealed container 102. Thus, development of technologies for improving heat conductivity of the sealed container, serving as the main body of the thermally responsive switch, is desired. The type of electrically insulative resin used in this case is applied so as to cover the cover plate and the conductive terminal pin in order to secure insulation distance between the cover plate and the conductive terminal pin. The so-called internal protector belonging to the technical field of the present invention requires at least 2 mm of insulation distance (creepage distance). However, it is difficult to obtain 2 mm of insulation distance by the filler alone which is used for securing the conductive terminal pin. Thus, the required insulating distance is obtained by providing the above described type of electrically insulative resin.

[0006]

Embodiments of the present invention seek to provide a thermally responsive switch in which heat conductivity of the sealed container can be improved while providing an electrically insulative resin for obtaining insulation distance.

MEANS FOR OVERCOMMING THE PROBLEMS

[0007]

Embodiments of the present invention provides a thermally responsive switch primarily characterized by a through hole for securing a conductive terminal pin configured by a cylindrical portion

formed by outwardly projecting a cover plate and only the cylindrical portion, the filler, and the conductive terminal pin being covered by an electrically conductive resin.

[0007a]

A first aspect of the present invention provides a thermally responsive switch comprising:

a sealed container formed of a metal housing and a cover plate secured airtight to an open end of the housing;

a couple of conductive terminal pins respectively inserted into a couple of through holes provided on the cover plate and respectively secured airtight by an electrically insulative filler;

a stationary contact secured to one of the conductive terminal pins inside the sealed container;

a heater having one end connected to the other of the conductive terminal pins inside the sealed container and the other end connected to the cover plate;

a thermally responsive plate draw molded into a dish-like shape having one end connected to an inner surface of the housing and being configured to invert a direction of curvature thereof at a predetermined temperature; and

a movable contact provided on the other end of the thermally responsive plate and configuring a pair of a make and break contact with the stationary contact,

wherein when the make and break contact is welded, the heater is configured to melts so that an electric path is cutoff, and

wherein the through holes are configured by cylindrical

portions formed by projecting the cover plate outward, only the cylindrical portions, the filler, and the conductive terminal pins being covered by an electrically insulative resin.

[0007b]

A second aspect of the present invention provides a method of manufacturing a thermally responsive switch provided with a sealed container formed of a metal housing and a cover plate secured airtight to an open end of the housing; a couple of conductive terminal pins respectively inserted into a couple of through holes provided on the cover plate and respectively secured airtight by an electrically insulative filler; a stationary contact secured to one of the conductive terminal pins inside the sealed container; a heater having one end connected to the other of the conductive terminal pins inside the sealed container and the other end connected to the cover plate; a thermally responsive plate draw molded into a dish-like shape having one end connected to an inner surface of the housing and being configured to invert a direction of curvature thereof at a predetermined temperature; and a movable contact provided on the other end of the thermally responsive plate and configuring a pair of a make and break contact with the stationary contact, in which, when the make and break contact is welded, the heater melts so that an electric path is cutoff, the method comprising:

forming the through holes by cylindrical portions being formed by projecting the cover plate outward; and

covering only the cylindrical portions, the filler, and the conductive terminal pins with an electrically insulative resin by solidifying a melt of a ring-shaped resin material at end portions of the cylindrical portions.

[0008]

Thus, instead of covering most of the outer surface of the cover plate configuring the sealed container by the resin, only a significantly small portion including the end portion of the cylindrical portion is covered by the resin. As a result, heat conductivity of the sealed container, configuring the main body of the thermally responsive switch, can be significantly improved compared to the conventional technology in which most of the outer surface of the cover plate was covered by the resin. Further, the through hole is configured by the cylindrical portion formed by outwardly projecting the cover plate and can thereby allow the thickness of the filler (glass) to be maintained. As a result, it is possible to maintain the strength of the portion where the conductive terminal pin is mounted while allowing the thickness of most of the cover plate to be reduced. It is thus, possible to significantly improve the heat conductivity of the sealed container. Further, the cylindrical portion projecting from the cover plate increases the surface area, i.e. the area of heat conduction of the entire cover plate, which can also contribute in improving the heat conductivity of the sealed container.

[0009]

In the thermally responsive switch of the present invention, the shape of the resin material forming the resin prior to being melted preferably has an inner diameter greater than the outer