Oki Sensor Device Corporation

Perhaps you are familiar with the reed switch. So named because its electrodes resemble the stems of a reed, a reed switch has a very simple construction with two or three reed electrodes sealed in a small glass tube (Fig. 1).

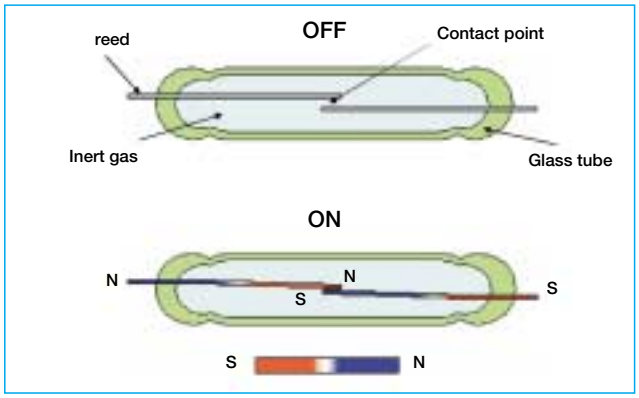

Fig. 1 Operating principles of the reed switch

Unfortunately, the reed switch is not widely known because people are not exposed to it much. However, by encapsulating the electrode contacts in a glass tube and filling the tube with inert gas, the electrodes are not greatly affected by external factors, such as temperature and humidity and corrosive gases. This feature allows the reed switch to be used in various fields.

Since the reed switch is turned on and off only by variations in a magnetic field applied externally, the switch does not require power necessary for turning other switches on and off. All that is required is the reed switch and a magnet. When a magnetic field is brought near the reed switch, an induction field is generated around the reed electrodes, which are formed of a ferromagnetic material. As a result, the contact points on the two electrodes are magnetized as a north pole and a south pole and contact each other through mutual attraction.

A reed switch can be used, for example, to detect the opening and closing of a door, such as the door of a house or a refrigerator, by mounting a magnet on the door or door frame and a reed switch on the other. When the door is closed, bringing the magnet close to the reed switch, the contacts in the reed switch meet and close the circuit.

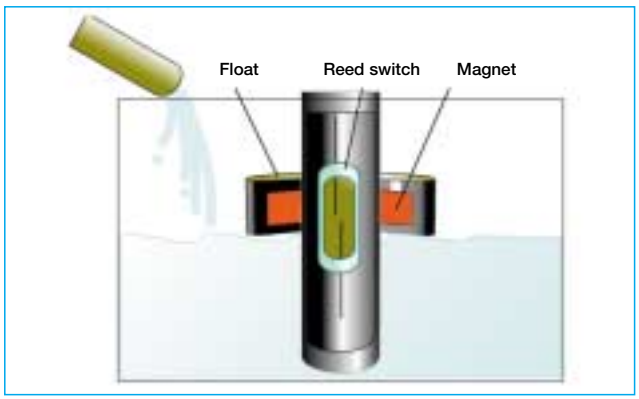

Fig. 2 Float sensor

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The reed switch is also used in the float sensor to detect fluid levels. In combination with a magnet, this switch has many other applications, as well. In particular, the float switch is indispensable for detecting the flow rate of gas and water, and in automotive applications that require high reliability.

Another method frequently used for operating the reed switch consists of winding a coil around the switch and applying a current to the coil to generate a magnetic field. A reed switch wrapped by a coil and covered with a protective resin or the like is called a reed relay.

A major application for reed switches is an IC tester. In addition to their reliability-they can endure hundreds of millions of on/off operations-the reed switch is used for its good high-frequency property. The reed switch was initially developed for use in a crossbar telephone switchboard. Later the diameter of the switch was reduced from its initial 30 mm or more to its current minimum of 7 mm to be provided in keyboards and the like.

In recent years, however, electronic equipment has been developed with more functions and an increased number of mounted parts, as represented by the cellular phone. Hence, there has been much demand to make each part lighter and more compact.

Similarly, there have been numerous calls to improve the efficiency of accommodating parts in industrial equipment and automobiles, in order to mount a large number of parts in a smaller space. At present it is believed theoretically that the reed switch can be reduced to a minimum of 5 mm in diameter.

Today, reed relays utilizing micromachine technology (MMR: micromachined relays) are being developed. Our company is also developing reed switches using micromachine technology as a core product for the ensuing period.

By taking advantage of the feature of reed switches (the open and closing of contact points through magnetism), we can provide more compact microsize reed switches with high integration. It is our hope that we can fill the needs of a wide-range of users by producing reed switches, not just for current applications, but also for markets that cannot yet utilize reed switches; and to uncover and create new applications.