

Domestic and White Goods

Shock and vibration, and extremes of humidity and temperature are faced by most domestic goods. Reed sensors come in packages which withstand all of the above. They also have the added advantage of directly switching 110V / 230V AC line voltage. The most widely used white goods applications are listed below.

Commercial Coffee Machines

Commercial coffee, tea, and milk vending machines need to dispense enough milk or water for exactly one cup. This can be accomplished by filling up a secondary reservoir fitted with a float and a reed switch which comes on when the reservoir is filled up to 200 ml. This signal can then be used to trigger other solenoids or pumps which stop the main reservoir output and open the drain valve from the secondary reservoir to dispense the liquid into a cup. Using a narrow and long secondary reservoir ensures that errors in measurement do not exceed 5 ml. Suitable products: **MS-324** miniature flat pack sensors, **MS-10x** PCB mountable sensors, and **MS-216** cylindrical sensors.

Domestic Coffee Machines

Domestic coffee machines use an inlet water hose which is triggered by a solenoid to fill up the water reservoir whenever needed. As the water drains, the float comes down and activates a reed sensor, and this signal can be used to trigger the input water solenoid. In machines without an incoming water pipe inlet, a float can be fitted on to a stem on the reservoir cap with a reed sensor mounted just outside the reservoir. This way, when the water level gets to a near low, an indication is given by the reed sensor and the reservoir can be taken out for refilling. Suitable products: **MS-401** float switches, and **SM-1322** and **IL-2022** reed switches with cropped leads, in level sensors.

Level Sensing in Washing Machines and Dish Washers

Washing machines and dishwashers have reservoirs to hold detergent, and fabric or water softeners. A window is usually given behind the door of the appliance to check the level. With time, this window gets stained, and it is difficult to view the exact level. For such applications, a small foamed magnet on a spindle can be fixed to the reservoir cap, and a reed sensor can be mounted outside. When the reservoir reaches a near empty level, the reed sensor signals the processor which lights up an LED on the panel. Special reed sensors can be used to switch line voltages directly without the need for any step down. Suitable products: **MS-216** and **MS-214** cylindrical sensors, and **MS-10x** miniature PCB mountable reed sensors.

Door position sensing for Appliances

In washing machines and dish washers, the processor needs to know that the door is closed, so that the automatic cycle can be started and water can be pumped into the system. In refrigerators and deep freezers, a door left slightly ajar may spoil lot of frozen goods inside. A reed sensor mounted inside the appliance and a magnet on the door can solve all these problems. In addition, the reed sensor can also be used to trigger the lights inside appliances such as refrigerators. Suitable products: **MS-328** flat pack sensors, and **MS-216-L** cylindrical sensors.

Dish washer spray arm jam detection

When dish washers are working, the high power water spray could dislocate some of the lighter dishes in the carrier and lodge them along the spray arms path. The next time the spray arm passes, it could jam the system. Reed sensors can be mounted at the end positions of the spray arms and in strategic position along its path. The spray arm, having the magnet will trigger the reed sensors consecutively, within a specific time span which is proportional to its speed. If a jam occurs, and the set time period between two reed sensor points has exceeded, the processor can stop the machine and indicate a jam on the panel. Suitable products: **MS-216** cylindrical sensors and **MS-324** miniature flat pack sensors.

Rice cooker heater control

After rice has cooked, rice cookers need to keep the rice warm at say, 70°C. This can be achieved by using a thermal reed switch designed to cut off at 75°C and cut in at 65°C. This opening and closing signal can be used to trigger a relay or a contactor, which directly switches the heaters. Some rice cookers also have reed sensors to detect whether the lid has been placed properly so that heater is not turned on continuously. Suitable products: **TRS-P** 60W thermal reed sensors.

Instant Water heaters and power showers

Bathrooms appliances such as heaters and power showers use reed switch based flow sensors. As soon as the shower is turned on, the flow sensor detects this and the signal can be used to turn the heater or the shower pump on. In addition to switching on the heaters, thermal reed switches can be used to cut in and cut out the heaters to keep the water at a comfortable temperature. When the shower is turned off, the flow switch will sense this and turns the heater or the pump off. Suitable products: **MM-1018** and **RM-1318** miniature reed switches in flow sensors, and **TRS-W** 10W thermal reed sensors.

Motor direction changing in Electric Tooth Brushes

Electric toothbrushes have to change the direction of the motor when switching from the top row of teeth to the bottom row. This can be done by mounting a reed sensor inside the electric toothbrush, with a magnet sliding in a groove on the outside. With this kind of setup, the motor direction can be changed easily with just minor tilts of the electric toothbrush which moves the magnet outside and changes the state of the reed sensor. Another use of a reed sensor is in place of the main on/off switch. Since electric toothbrushes get wet, a normal mechanical switch is not suitable and a similar mechanism like the slide switch, but only not so free sliding, can be used for this application. Suitable products: **MS-10x** miniature PCB mountable reed sensors, and **R3** miniature SMD reed sensors.

Due to continual improvement, specifications are subject to change without notice

www.rre.in

27 December 2013

Domestic and White Goods

Over current protection in Food Processors and Mixers

Mixers, food processors and grinders have an inbuilt over current protection which cuts off the power to the motor whenever the grinding blades or mechanical parts get obstructed. A reed switch can be used to build a current sensing relay which senses the exact current limit allowed to the motor. This relay operates at currents below the current limit and breaks contact at anything higher. Normally open and normally closed current sensors can be used for such applications. Suitable products: **LV-1925** and **HB-2232** reed switches in relays.

Temperature control in deep freezers, coolers, heaters, and aquariums

In deep freezers, coolers and heaters, the temperature needs to be maintained within a precise window. Thermal reed sensors can be designed having windows as small as 2°C up to 10°C and can switch up to 60W directly. The sensor can control the switching on and switching off points of compressors in deep freezers and fans in coolers. Thermal reed switches can also be used in aquariums by switching heaters in the water to keep the temperature exactly between 25°C and 30°C. Suitable products: **TRS-M** thermal switches and **TRS-W** thermal reed sensors.

Washing machine vibration detection

Reed switches are used in bi-directional vibration sensors. A magnet and a very precise tension spring is inserted into a cylindrical housing and sealed on both ends. Two of these cylindrical assemblies are mounted on either side of a reed switch in such a way that their magnets face opposite direction. Depending on the amplitude of the vibrations that need to be sensed, different tension springs are used. During the drying cycle, when the vibration of the washing machine drum exceeds a limit over which the washing machine itself will start to move around, the magnets actuate the reed switch. Vibration sensors can be built to detect vibrations from 1G to 10G in normally open and normally closed versions. Suitable products: **MM-1018** and **UM-0018** ultra-miniature reed switches used in shock sensors.

Sewing machine pedals

Pedals in sewing machines use a potentiometric or a similar arrangement as a wound coil with a moving carbon brush to control speed of the stitching motor. The disadvantage of such a system is that the carbon brush wears out and the stitching speed varies over time. A reed sensor array inside the pedal housing with a magnet mounted under the pedal, actuates each of the reed sensors one by one as the pedal is depressed. The output from the reed sensors is suitably decoded and is used to control the motor speed. This way, the stitching speed remains constant with respect to the depressed position of the foot pedal and there is no chance of dirt or oil affecting the system. Suitable products: Goal post formed **MM-1018** micro-miniature reed switches and **MS-10x** miniature PCB mountable reed sensors.

Due to continual improvement, specifications are subject to change without notice

www.rre.in

27 December 2013