Application Alley

Appliance - Reed Sensor

Detect And Control Appliance Doors Using A Reed Sensor

Standex Electronics

PARTNER | SOLVE | DELIVER®

Introduction

Appliances, particularly refrigerators and freezers, must have their doors closed at all times. If the door is left open for any length of time the compartments will warm up and the food contained within will begin to spoil. Reed sensors are a simple choice to solve this problem.

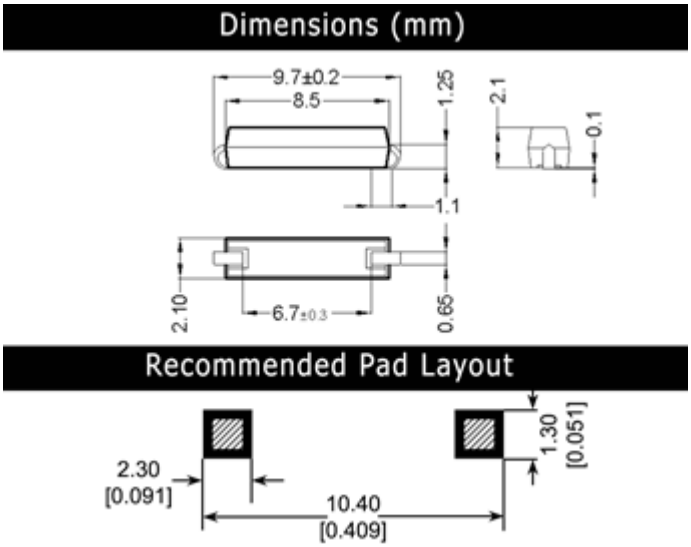

Figure 1. MK17-x-3 Sensor physical layout

Features

- Magnet and Reed Sensor are isolated and have no physical contact by typically having the magnet mounted to the appliance door, and the Reed Sensor mounted and positioned usually on a PCB on the appliance chassis to accurately detect the opening of the door
- The reed switch used in the Reed Sensor is hermetically sealed and is therefore not sensitive to cold, wet, moist environments
- The permanent magnet is not affected by its environment
- Tens of millions of reliable operations
- Surface mount and through hole packages available
- Cylindrical mounting and screw fastening mounting with various connectors available in, made to order lead lengths
- Contacts dynamically tested

Applications

Ideal for sensing the status of appliance doors whether in the open or closed state
Ideal for applications sensing any kind of motion in a host of different configurations

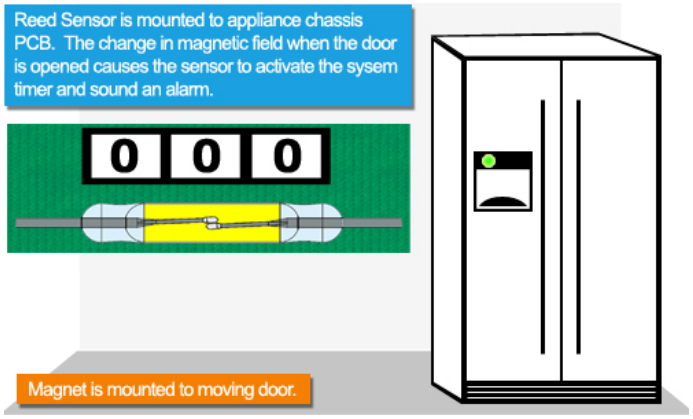

Figure 2. Reed Sensor is mounted to appliance chassis PCB. Magnet is mounted to the moving door. When door is closed the magnetic field of the permanent magnet holds the switch contacts in the closed position.

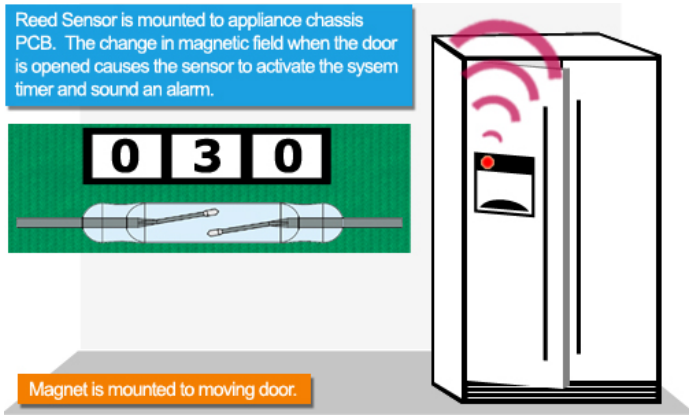

Figure 3. When the door is opened the magnetic field moves out of proximity to the sensor causing the contacts to open and activating the system timer. When timer reaches its limit, the alarm with sound.

Reed Sensors Solve the Problem of Leaving an Appliance Door Open

We have all at one time or another left the refrigerator door open.

Most times its only for a short period of time so no damage is done, but sometimes the time is substantial. In this case, a few things can happen: first, the food in the refrigeration will spoil; and secondly, any ice in the refrigerator will melt and potentially flow onto the floor and perhaps damage it. This same problem can also happen with a freezer.

Appliance designers have chosen the reed sensor to solve the problem. Generally, a magnet is mounted to the door. The reed sensor is usually mounted to a PCB on the chassis of the appliance. When the door is closed the reed sensor is activated. When the door is opened, the contacts open, activating a timer in the electronics. After a specified period of time, an alarm or beeper will be activated alerting the user that the door has been left open. This of course saves them the replacement costs of spoiled food.

Surface Mount Sensor Series

Series	Dimensions	mm	inches	Illustration
MK15	W	2.5	0.098	
	H	2.5	0.098	
	L	19.50	0.768	
MK16	W	2.3	0.091	
	H	2.3	0.091	
	L	15.60	0.614	
MK17	W	2.1	0.083	
	H	2.1	0.083	
	L	9.61	0.378	
MK22	W	2.7	1.060	
	H	2.3	0.091	
	L	15.60	0.614	
MK23-35	W	2.2	0.087	
	H	1.95	0.077	
	L	15.75	0.620	
MK23-66	W	2.2	0.087	
	H	2.7	1.060	
	L	19.60	0.772	
MK23-87	W	2.0	0.079	
	H	2.1	0.083	
	L	15.60	0.614	
MK23-90	W	2.54	0.100	
	H	3.05	0.120	
	L	24.9	0.980	

Specifications (@ 20°C) MK15 & MK06 Series

	Min	Max	Units
Operate Specifications			
Must close distance	5	25	mm
Must open distance	5	25	mm
Hysteresis	Typical 50%		
Load characteristics			
Switching voltage		200	V
Switching current		0.5	Amps
Carry current		1.5	Amps
Contact rating		10	Watts
Static contact resistance		150	mΩ
Dynamic contact resistance	200		mΩ
Breakdown voltage	320		V
Operate time		0.5	msec
Release time		0.1	msec
Operate temp MK06	-20	85	°C
Storage temp MK06	-20	85	°C
Operate temp MK15	-20	130	°C
Storage temp MK15	-20	130	°C

Dimensions (mm)

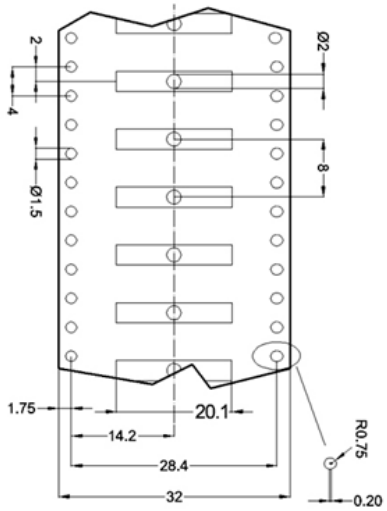

Figure 4. MK15 Tape & Reel

The reed sensor is a excellent choice because it can operate reliably from -50˚C to 150˚C and represents an economical way to carry out the sensing function. Because Standex's sensors use hermetically sealed reed switches that are further packaged in strong high strength plastic, they can be subject to rough treatment and environmental concerns such as grit, water, and moisture without any loss of reliability.

Standex's sensors are packaged for surface mounting as well as through hole mounting. Also, Standex has cylinder packages and well as screw fastening packages having lead wires for remote attachment to the electronics.

Cylindrical Panel Mount Sensor Series

Series	Dimensions	mm	inches	Illustration
MK03	D	5.25	0.207	
	L	25.5	1.004	
MK14	D	4	0.157	
	L	25.5	1.004	
MK18	D	5	0.197	
	L	17	0.669	
MK20/1	D	2.72	0.107	
	L	10	0.394	

Rectangular Panel Mount Sensor Series

Series	Dimensions	mm	inches	Illustration
MK04	W	13.9	0.547	
	H	5.9	0.232	
	L	23.0	0.906	
MK05	W	19.6	0.772	
	H	6.1	0.240	
	L	23.2	0.913	
MK12	W	14.9	0.587	
	H	6.9	0.272	
	L	32.0	1.260	

Through Hole Sensor Series

Series	Dimensions	mm	inches	Illustration
MK06-4	W	3.3	0.130	
	H	3.3	0.130	
	L	12.06	0.475	
MK06-5	W	2.8	0.110	
	H	3.2	0.126	
	L	14.30	0.563	
MK06-6	W	3.3	0.130	
	H	4.2	0.165	
	L	17.24	0.679	
MK06-7	W	3.3	0.130	
	H	4.2	0.165	
	L	19.78	0.779	

**Consult the factory for more options not listed above.

Find out more about our ability to propel your business with our products by visiting www.standexelectronics.com or by giving us a hello@standexelectronics.com today! One of our engineers or solution selling sales leaders will listen to you immediately.

About Standex Electronics

Standex Electronics is a worldwide market leader in the design, engineering, and manufacture of standard and custom electro-magnetic components, including magnetics products and reed switch-based solutions.

Our magnetics offerings include planar, current sense, and conventional low- and high-frequency transformers and inductors. Reed switch-based solutions include Meder, Kent, and KOFU brand reed switches, as well as a complete portfolio of reed relays, and a comprehensive array of fluid level, proximity, motion, water flow, HVAC condensate, hydraulic pressure differential, capacitive, conductive and inductive sensors.

We offer engineered product solutions for a broad range of product applications in the transportation, automotive, medical, test and measurement, military and aerospace, aviation, HVAC, appliance, security and safety, and general power and industrial markets.

Standex Electronics has a commitment to absolute customer satisfaction through a partner, solve, and deliver approach. With a global organization that offers sales support, engineering capabilities, and technical resources worldwide – we implement customer driven innovation that puts the customer first.

For more information on Standex Electronics, visit us on the web at standexelectronics.com.

Contact Information:

Standex Electronics
World Headquarters
4538 Camberwell Road
Cincinnati, OH 45209 USA

Standex Americas (OH)
+1.866.STANDEX (+1.866.782.6339)
info@standexelectronics.com

Standex Electronics Asia (Shanghai)
+86.21.37606000
salesasia@standexelectronics.com

Standex Electronics Europe (Germany)
+49.7731.8399.0
info@standexelectronics.com

Standex Electronics India (Chennai)
+91.98867.57533
kkasaragod@standexelectronics.com

Standex Electronics Japan (Kofu)
+81.42.698.0026
sej-sales@standex.co.jp

Standex Electronics