

# Application Alley

## Automotive - Reed Sensor

*Alarmed Vehicle Hoods Use Reed Sensors*

## Introduction

The most costly items of an automobile are under the hood of the car. Thieves, once the hood of the car is open, can unfasten the engine, battery, etc. very quickly. Having a sensor that is tied into the on-board computer could sound an alarm or the car horn. That is exactly what auto designers have done, using Standex Electronics's reed sensors that sense the movement of the hood sending a signal to the on-board computer. This in turn initiates the alarm.

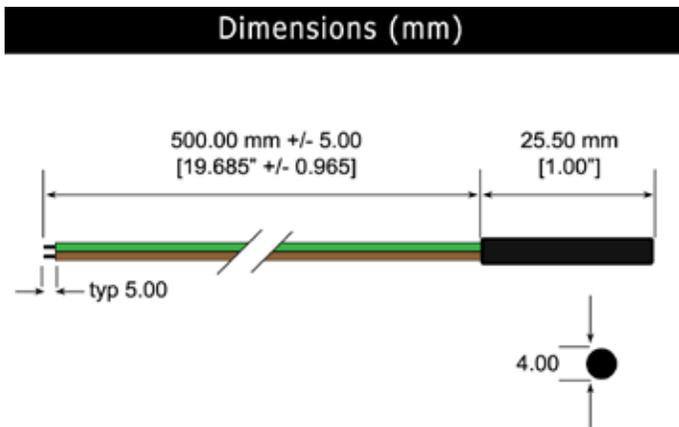


Figure 1. MK14 Sensor physical layout

## Features

- The reed sensors reliably operate between - 50°C to 150°C
- Magnet and Reed Sensor are isolated and have no physical contact by typically having the magnet mounted on the hood and the Reed Sensor mounted and positioned to accurately pick up the motion of the hood
- The reed switch used in the Reed Sensor is hermetically sealed and is therefore not sensitive to rough, wet, dirty environments
- The magnet is not affected by its environment
- Tens of millions of reliable operations
- Cylindrical mounting and screw fastening mounting
- Contacts dynamically tested
- Applications

- Ideal for sensing the motion of a car hood when an auto is sitting idle and not in use
- Ideal for applications sensing any kind of motion in a host of different configuration

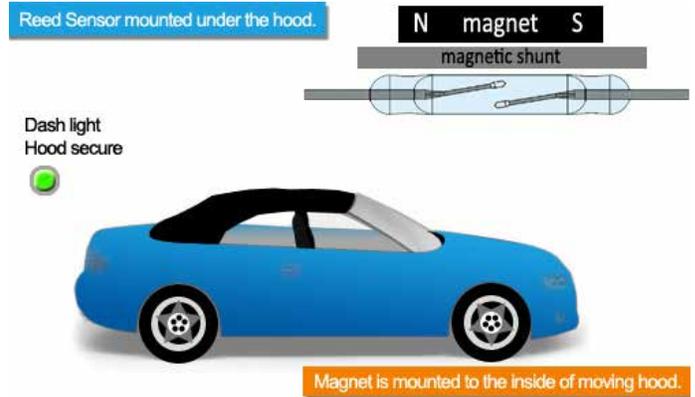


Figure 2. Reed Sensor is mounted inside engine compartment and magnet is mounted to the underside of the hood. A spring loaded ferromagnetic shunt is positioned between the sensor and magnet to shunt magnetic field.

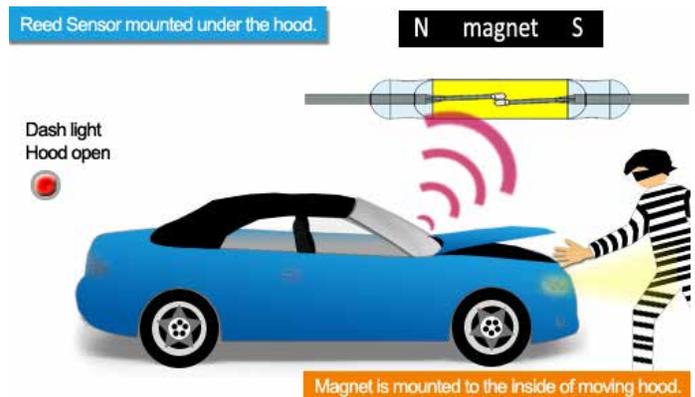


Figure 3. When the hood is opened the magnetic shunt springs out of position causing the magnetic field to actuated the sensor and signal the onboard computer to alarm.

## Reed Sensors Accomplish The Task Of Initiating An Alarm Once The Hood Is Moved When Locked

All of us who own autos have on many occasions left our vehicles unattended in areas that were unprotected from the potential of theft.

Thieves have become expert in opening the hood of an auto even when in the locked position. They are also adept at taking under-the-hood prizes and very quickly. The only way to deter this action is to have the hood armed with an alarm system. Standex Electronics's reed sensors have provided a very secure reliable approach to initiate the alarm action.

Specifications (@ 20°C) MK14 Series			
	Min	Max	Units
<b>Operate Specifications</b>			
Must close distance	5	25	mm
Must open distance	5	25	mm
Hysteresis	Typical 50%		
<b>Load characteristics</b>			
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	-20	85	°C
Storage temp	-20	85	°C

Reed sensors generally use a magnet that is brought into the vicinity of a reed sensor activating the reed sensor. The reverse can also occur, the magnet is moved away from the vicinity of the reed sensor which will also initiate an action. In this application, Standex Electronics has taken a different approach. Working closely with the auto designers Standex Electronics engineers came up with a very reliable and very effective approach. The magnet is mounted to the hood as is typical, but there is a spring loaded thin ferromagnetic rectangular piece of metal that is placed in between the magnet and the reed sensor. This metal piece acts as a magnetic shunt. The magnetic field of the magnet is literally shunted from the reed sensor. The reed sensor essentially does not experience any magnetic field in presence of the shunt. When the hood is opened even slightly, the spring loaded metal shunt springs away from it's position between the magnet and the reed sensor. Now the full strength of the magnet is incident on

the reed sensor closing the contacts. The contact closure sends a signal to the on-board computer, which in turn, turns on the car alarm, beeps the horn and/or flashes the high beam lights. Generally, one and/or all three are generally enough to scare the most ardent thief away.

The reed sensor is an excellent choice because it can operate reliably from -50°C to 150°C and represents an economical way to carry out the sensing

Cylindrical Panel Mount Sensor Series				Illustration
Series	Dimensions			
		mm	inches	
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	

function. Because Standex Electronics'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 dirt, grease, and moisture without any loss of reliability.

Standex Electronics has cylinder packages and well as screw fastening packages having lead wires for remote attachment to the electronics.

#### Rectangular Panel Mount Sensor Series

Series	Dimensions			Illustration
		mm	inches	
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	

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

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

## 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](http://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](mailto:info@standexelectronics.com)

#### Standex Electronics Asia (Shanghai)

+86.21.37606000  
[salesasia@standexelectronics.com](mailto:salesasia@standexelectronics.com)

#### Standex Electronics Europe (Germany)

+49.7731.8399.0  
[info@standexelectronics.com](mailto:info@standexelectronics.com)

#### Standex Electronics India (Chennai)

+91.98867.57533  
[kkasaragod@standexelectronics.com](mailto:kkasaragod@standexelectronics.com)

#### Standex Electronics Japan (Kofu)

+81.42.698.0026  
[sej-sales@standex.co.jp](mailto:sej-sales@standex.co.jp)

