



# Application Alley

## Automotive - Reed Sensor

*Reed Sensor Detects Key In Ignition And Auto Lights Left On*

## Introduction

How often has one forgot and left the keys in the ignition and/or left the main head lights on, only to later return to the car and find the battery dead or the vehicle not even there. The Reed Sensors have come to the rescue. Standex Electronics's Reed Sensors have been chosen as an excellent choice in eliminating these possibilities from happening.

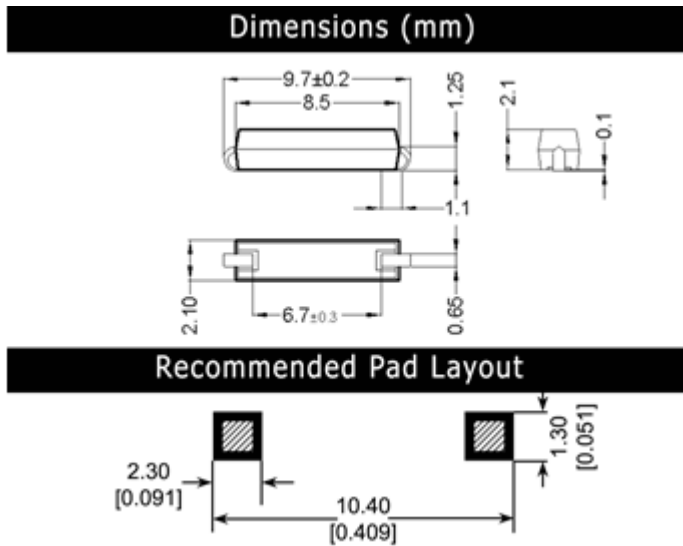


Figure 1. MK17-X-3 Sensor physical layout

## 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 handle and the Reed Sensors mounted and positioned to accurately detect the handle motion
- The reed switch used in the Reed Sensor is hermetically sealed and is therefore not sensitive to rough, wet environments
- The magnet is not affected by its environment
- Tens of millions of reliable operations
- Surface mount and through hole packages available

- Cylindrical hole and screw fastening mounting
- Contacts dynamically tested

## Applications

- Ideal for sensing the motion of a car door handles both internally and/or externally
- Ideal for applications sensing any kind of motion in a host of different configurations

Reed Sensors in door behind handle mechanism.

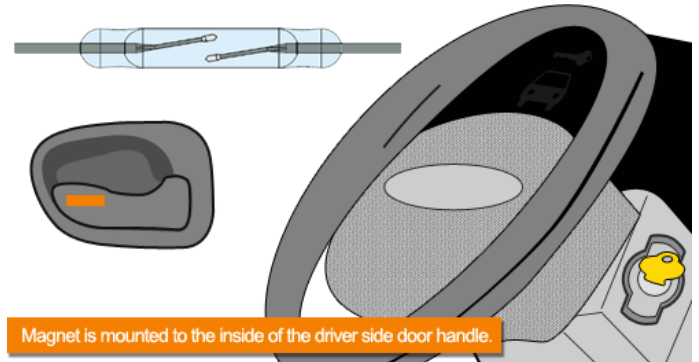


Figure 2. Key is shown in the ignition. Reed switch is not activated unless the driver's door handle is pulled.

Reed Sensors in door behind handle mechanism.

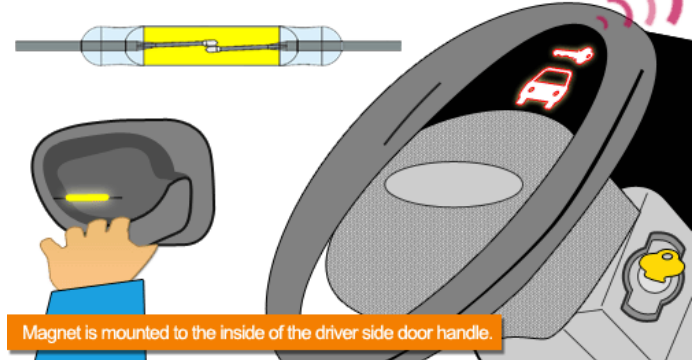


Figure 3. Key is shown in the ignition and driver's door handle is pulled activated the reed switch to sound the alarm indicator.

## Locking Power Door Can be Done Reliably Using Reed Sensors

All systems have their shortcomings and when it comes to automobiles a few are worth mentioning and focusing on: 1. the possibility of leaving one's auto with the keys still in the ignition; and 2. is leaving the main head lights on. Obviously, the vehicle can be stolen in the former and the battery drains in the latter. Auto designers have taken different approaches to solve the problem but none have heretofore been the perfect approach. However, now Standex Electronics' engineers are working with auto designers and using Standex Electronics's reed sensors very successfully to solve these problems. Generally the last person out of the car and the one in control of the keys and light switch is the driver. So it makes sense to attack the problem from the driver's position. And that is exactly what has happened.

To exit the vehicle the driver must engage the door handle to leave the vehicle. In this case, the auto makers have cleverly designed a magnet into the handle. Standex Electronics's reed sensors are strategically placed internally in the door to sense this motion. When the reed sensor is activated, the on-board computer checks to see if the keys are still in the ignition and if the main lights are still on. If either are detected a beeping noise is sounded alerting the driver that something is amiss. This approach has already successfully kept many thousands of cars from being stolen and a corresponding number of batteries not to be drained unexpectedly.

The reed sensor is an excellent choice because it can operate reliably from  $-50^{\circ}\text{C}$  to  $150^{\circ}\text{C}$  and represents an economical way to carry out the sensing function.

### Specifications (@ 20°C) MK15 & MK06 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 MK06	-20	85	°C
Storage temp MK06	-20	85	°C
Operate temp MK15	-20	130	°C
Storage temp MK15	-20	130	°C

## Dimensions (mm)

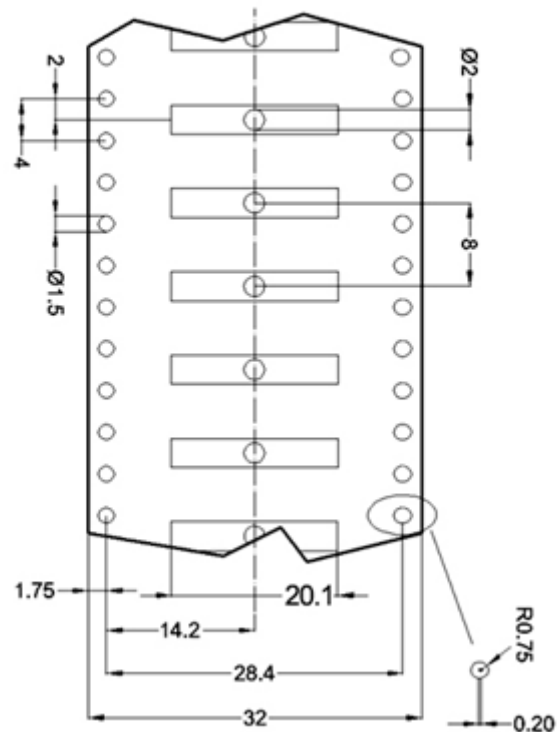










Figure 4. MK15 Tape & Reel

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.









#### Through Hole Sensor Series

Series	Dimensions		Illustration	
	mm	inches		
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	

#### Cylindrical Panel Mount Sensor Series




Series	Dimensions		Illustration	
	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	

#### Surface Mount Sensor Series

Series	Dimensions		Illustration	
	mm	inches		
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	

Standex Electronics's sensors are packaged for surface mounting as well as through hole mounting. Also, 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	

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

Consider some of the above options in surface mount, through hole, cylindrical and rectangular versions for water flow sensors or similar applications.

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.

## 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).

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