



# Application Alley

## Automotive - Reed Sensor

*Gas Tank Lid Monitoring Reed Sensor*

### Introduction

In and around the gas tank and its filling lid is consider a highly explosive area. Anything that can possible cause a spark could potentially ignite the fuel. Use of an electromechanical sensor to detect if the lid and fuel cap are in place could potential cause a spark across the sensor contacts. Detecting if the lid and gas cap are in place designers have turned to the Reed Sensor which uses hermetically sealed reed switches, and are further packaged in a tough plastic encapsulation.

#### Dimensions (mm)

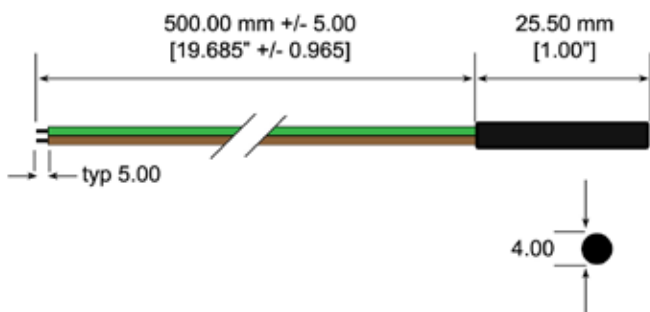


Figure 1. MK14 Sensor physical layout

### Features

- The reed switch used in the Reed Sensor is hermetically sealed and is therefore not sensitive and therefore any sparks across the contacted are hermetically sealed from the environment
- EX approved and intrinsically safe available
- The hermetically sealed reed switch is ideally suited for switching low signal level voltages and currents which do not draw an arc
- Magnet and Reed Sensor are isolated and have no physical contact by typically having the magnet mounted to the lid and the Reed Sensor mounted on the gas cap
- The magnet is not affected by its environment
- Millions of reliable operations
- Cylindrical hole and screw fastening mounting
- Contacts dynamically tested
- Large sensing distances possible

### Applications

- Ideal for sensing gas lid closure and gas cap in place.
- Ideal for applications sensing closure of an assortment of different lids and/or caps

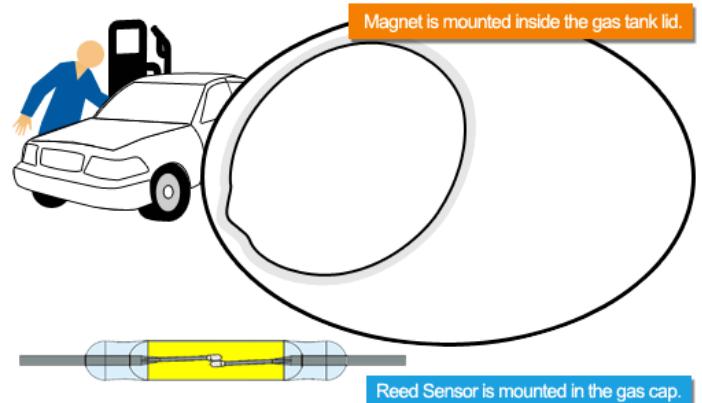


Figure 2. Gas tank lid with magnet is closed activating reed switch contacts to remain closed.

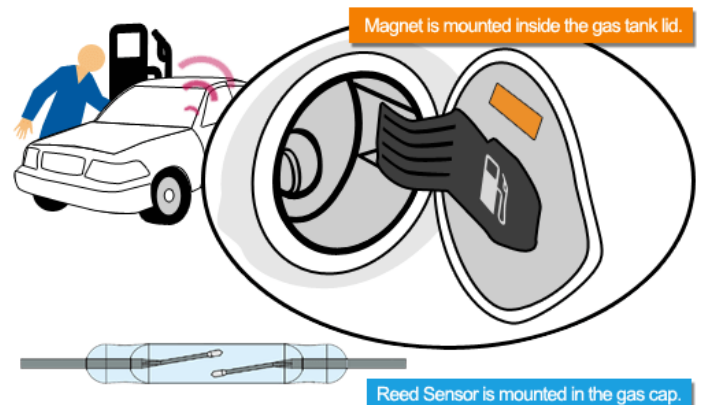


Figure 3. When gas tank lid is opened the magnet moves away from the reed switch sensor causing the contacts to open which activated an alarm.

### Reed Sensors are Ideal for Sensing Gas Lid and Gas Cap are in Place

The immediate area in and around the gas cap can be defined as having a potential explosive atmosphere. Any potential arc or spark could ignite the gasoline. Gas lids and gas caps can easily be forgotten to have closed either by the vehicle operator or by a service attendant. Furthermore, with gasoline prices continuing to rise, gasoline theft directly from the tank is on the rise.

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





To solve the above three problems, designer are now going to Reed Sensors. The sensor indeed serves three purposes: 1 It eliminates the potential of an arc or spark across its contacts making it to the outside world by using hermetically sealed reed switches. In this case, any arc or spark occurring across the contacts is enclosed in the hermetically sealed atmosphere of the reed switch, eliminating itself as a potential ignition device. 2. Generally, a magnet is mounted on the gas lid and the reed sensor is mounted on the gas cap. If both are not in place a signal is sent to the on-board computer

locking the ignition system not allowing the vehicle to be turned on. 3. If the car is in the locked position and an attempt is made to remove the gas lid, this also triggers the on-board computer, which sounds an alarm.




Standex Electronic's line of ATEX approved intrinsically reed sensors are ideal for this application. Electromechanical switches are not hermetically sealed and therefore any arc or spark generated across its contacts could represent a potential ignition point.

Standex Electronics's reed sensors are available in several packages with various connector or lead options allowing the users to meet exact design details. Because of the multitude of design requirements, Standex Electronics has the capability of developing specialized packaging for both the reed sensor and the magnet to meet the user's specific needs.

Consider some of the below option standard options as well.

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	

### 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).

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