



# Application Alley

## Appliance - Reed Sensor

*Coffee & Espresso Machines Use Reed Sensors To  
Detect Water Levels And Position*

## Introduction

In many of the newer coffee machines, without permanent water connections for commercial or domestic applications, a low water indicator lamp signals the minimum water level. In this case a permanent magnet is built into a float housing installed in a removable plastic water tank. Sensors in coffee makers play an important role by checking on the status of accessories such as the water tank, milk container, drip tray, grounds container, milk foam attachment, and the cap (capsule machine). Sensors detect the level of water and milk in the tanks, when the grounds container must be emptied, and if there is leakage in the system. Standex's sensors can also be used as an On/Off Switch without creating any noise during the switching process.

- Magnet and Reed Sensor are isolated and have no physical contact by typically having the magnet mounted to the movement and the Reed Sensor mounted and positioned to pick on the end limit position/s
- The magnet is not affected by its environment
- Cylindrical hole and screw fastening mounting
- Contacts dynamically tested
- Large sensing distances possible

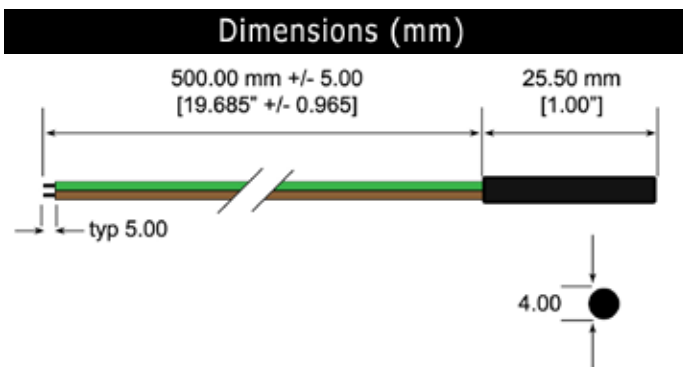


Figure 1. MK14 Sensor physical layout

## Features

- Hermetically sealed
- Millions of reliable operations
- Minimal space required
- Corrosion resistant
- Cost effective solution The reed switch used in the Reed Sensor is hermetically sealed and is therefore not sensitive to spillage or wet environments
- The hermetically sealed reed switch is ideally suited for switching low signal level voltages and currents

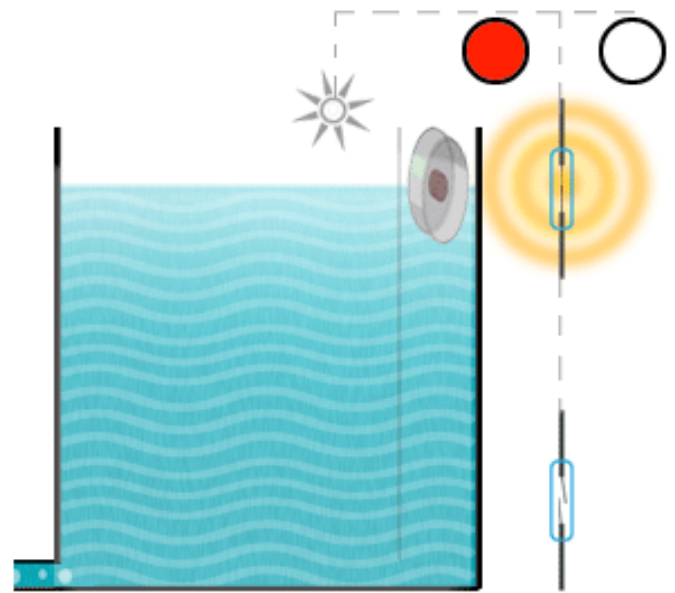


Figure 2. Coffee machine water source is at full level

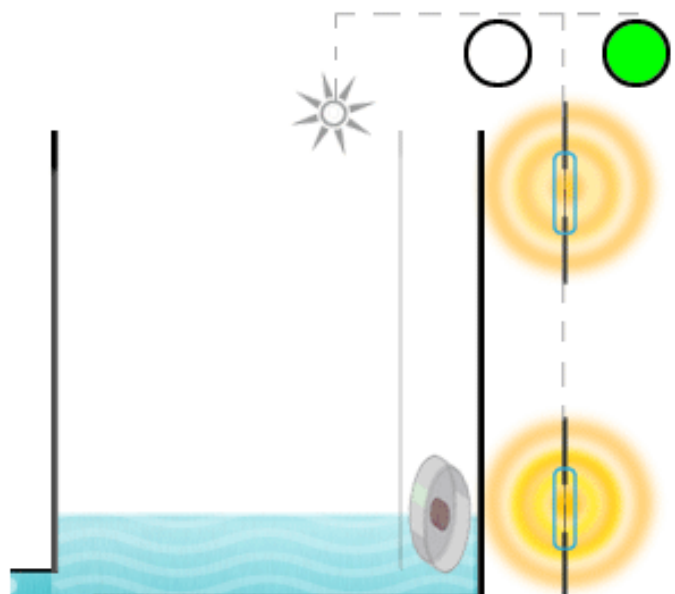


Figure 3. Coffee machine water source is at low level causing switch to activate water switching valve.

## Applications





- Reed Sensors are ideal for use in coffee or espresso machines with removable water tanks or with permanent water connections
- Position detection - water tank, milk tank, grounds container, drip tray, milk foam attachment, cap (capsule machine), on/off switch, selection switch

The positioning of the Reed Switch and the magnetic strength of the magnetic float guarantee the switching of the contacts when the water level drops to the level of the Reed Switch sensor position. By design, the switch sensor remains closed even after the water level continues to drop well below the minimum water level.

In the machine itself, a Reed Switch is mounted behind a plastic or aluminum cover. The magnetic contacts of our MK03 and MK04 series, for example, offer the sensing requirements suitable for this application. The construction of the water tank is

usually designed to insure that at least 2 cups of water remain once the minimum water level has been reached. The Reed Switch will only open (and thereby turn off the low water light) when the water level has been sufficiently refilled such that the magnetic float is above the minimum water level mark.




### 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	

### 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

### 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.

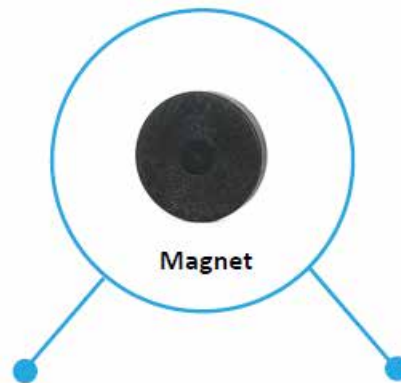
In the case of coffee machines with permanent water connections, the same sensor approach applies except for the fact that the indicator light is removed and a water-switching valve is added.

Generally speaking, this approach works well for all similar fluid level applications.

Standex Electronics offers a wide range of products such as Reed Switches, Reed Sensors, Floats, and Magnetics. We develop and manufacture customized solutions for our customers that specially adapt sensors and float magnets for their products.

Examples of solutions include but are not limited to complete assemblies such as a PCB board including Reed Switches and connectors. Our sensors are available in a wide range of connection options, housing forms, and mounting options.

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.



Standard Options



Custom Options



## 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)

