

A row of five utility meters mounted on a wall. The meters are white with black and red accents. The first meter on the left is in focus, showing its display and some text. The other meters are slightly out of focus, creating a sense of depth. The background is a dark, textured wall.

# Application Alley

## Utility Meters - Reed Sensor

*Utility Meters Use Reed Sensors To Measure Water Flow, Gas  
and Electricity*

## Introduction

Most households and businesses have meters reading and recording the volume of water used, the volume of gas used and/or the amount of electricity being used. Most of these meters used reed sensors to count and measure the usage for each household. This is done in a power efficient and tamper proof way using reed sensors.

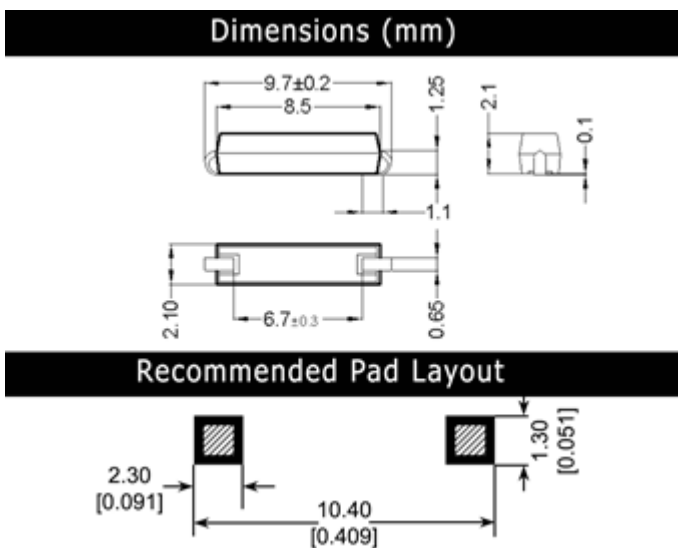


Figure 1. MK17-x-3 Sensor physical layout

## Features

- Magnet and Reed Sensor are isolated and have no physical contact by typically having the magnet mounted to a rotating disk, and the Reed Sensor is mounted strategically such that the magnetic field of magnet will be sensed with each rotation of the disk.
- The reed switch used in the Reed Sensors is hermetically sealed and is therefore not sensitive to its surrounding environment
- The magnet is not affected by high and low temperature environments
- Tens of millions of reliable operations
- Surface mounting and through hole mounting
- Contacts dynamically tested

## Applications

- Ideal for sensing the rotation of disks in utility metering requirements
- Ideal for applications sensing rotation in a host of different configurations

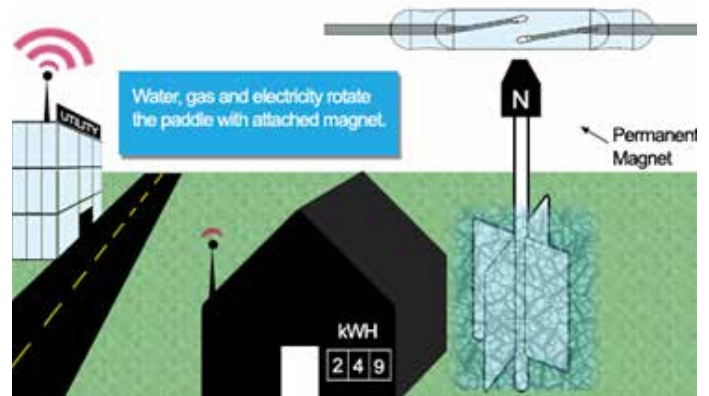


Figure 2. Paddle rotates magnet which actuates switch contacts.

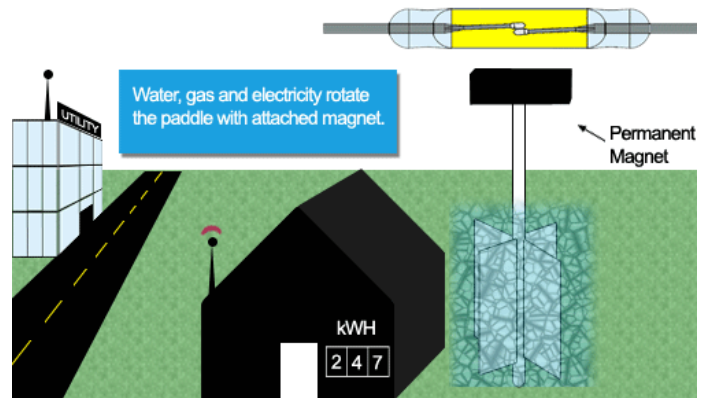


Figure 3. Switch actuation measures flow and sends reading to meter which transmits wirelessly to utility headquarters.

## Reed Sensors are the Choice for Measuring Utility Usage

Power and water utility companies around the world have come to select reed sensors as the technology of choice for determining the usage at each home or workplace.

The older mechanical counters were expensive and wrought with breakdown along with faulty counting. They were also subject to the extremes of weather where they could react adversely. Its easy to build in redundancy and make the meters tamper proof using reed sensors as well.

Most of the utility meters convert the flow of water, gas, and/or electricity to the movement of a rotating disk. Each rotation is directly equated to a given volume of water or gas. In the case of electricity, each rotation directly equates to a given amount of kilowatt hours usage. Usually a magnet is mounted on this rotating disk. Whenever the disk completes a revolution the reed sensor, which is conveniently mounted on a PCB, is so positioned to sense each revolution of the magnet.

When the reed sensor senses the revolution, it sends a signal back to the electronics which is duly recorded using an electronic counter. In this way the exact volume used is accurately recorded along with accurate recordings of the amount of kilowatt hours of electricity used. Meter readers can then come by or have the usage information sent to them wirelessly. Then of course, the dreaded part for the user occurs where the bill is formulated and sent to the customer.

There are other reed sensors used in the same circuitry that are also strategically placed as well. If one tries to stop the reed sensor from sensing each rotation by using a strong external magnet, these other reed sensors will activate triggering an alarm.

Because Standex Electronics's sensors use hermetically sealed reed switches that are further packaged in strong high strength plastic, they can be subject to various environments without any loss of reliability.

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)

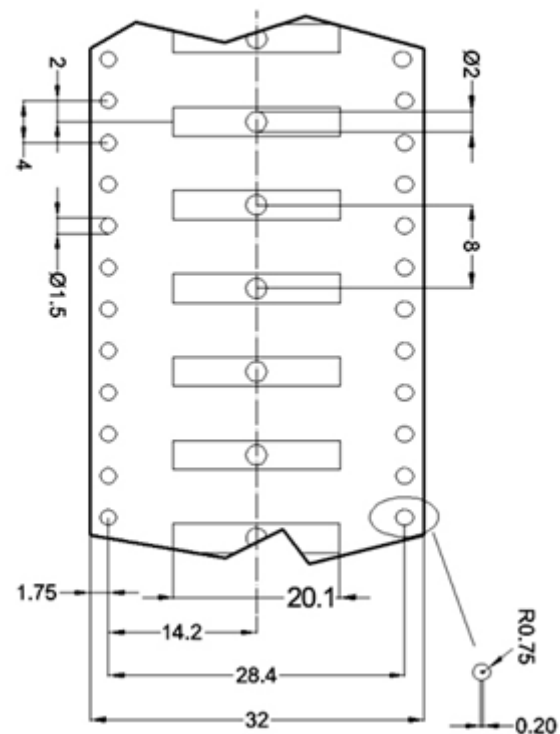














Figure 4. MK15 Tape & Reel

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	

The reed sensor is an excellent choice because it can operate reliably over a wide temperature range, and represents an economical way to carry out the

sensing function. Standex Electronics's sensors are packaged for surface mounting as well as through hole mounting.

Consider some of the above and below options in surface mount and through hole versions for meter reading or similar applications.

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	

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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