



Application Alley

Utility Meters - Reed Sensor

Measuring Water Flow Volume Using Reed Sensors

Determine If Filter Needs Replacement

Introduction

There are a multitude of applications that require the measurement of the volume of water. Water filters must measure the amount of water passing through them in order to know when to change the filter. In many cases these filters may be directly connected to the tap water in the home. Also many of the newer refrigerators, also used in the home, are directly connected to a filtered water line. Designers have chosen Standex Electronics's reed sensors as an inexpensive way to accurately measure the volume of water passing through these filters.

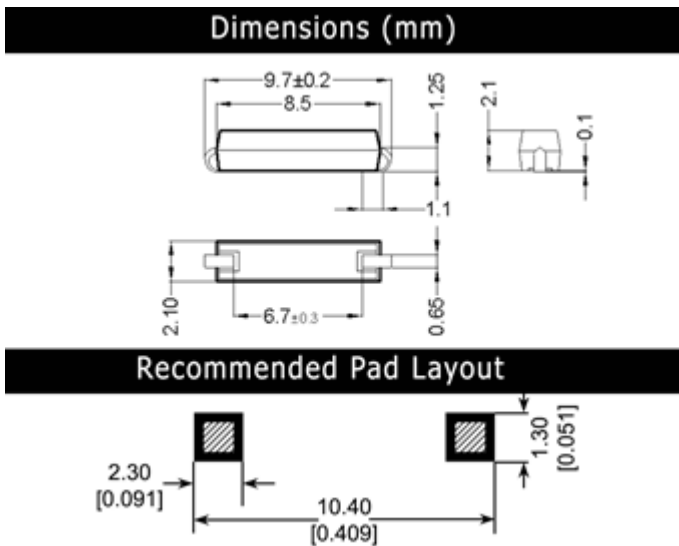


Figure 1. MK17-x-3 Sensor physical layout

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
- Cylindrical hole and screw fastening mounting
- Contacts dynamically tested

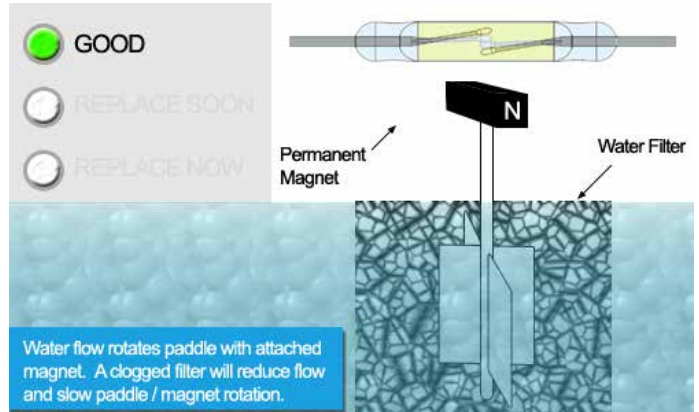


Figure 2. Water flows through unclogged filter producing flow measurement with good filter indicator light.

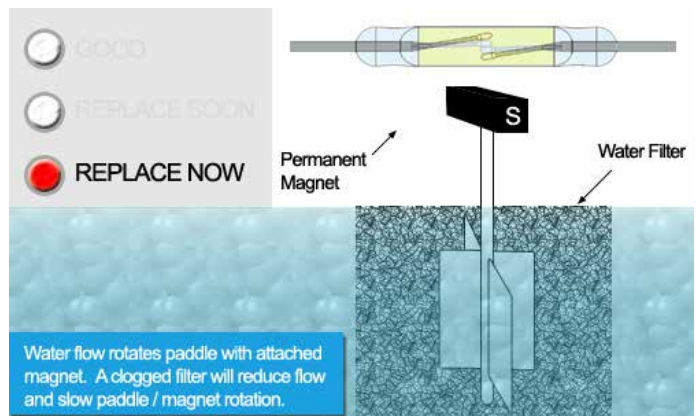


Figure 3. Water flows slower through clogged filter producing measurement with replace filter status light.

Applications

- Ideal for sensing the rotation of a paddle wheel in a water filter
- Ideal for applications sensing rotation in a host of different configurations

Reed Sensors are the Choice for Measuring the Volume of Water Flowing Through Filters

With the potential of ground water pollution on the increase from a host of different sources, many people around the world don't want to take the chance that their drinking water may have carcinogens or other foul tasting contaminants.

An expensive approach is to buy your water in bottled form. Another less expensive approach is to have your water filtered directly in your home. Many people choose the latter approach. With this approach the filters need to be replaced on a regular basis. If this is not done on a timely basis, the filtering becomes ineffective, and may allow the very pollutants one is filtering to begin passing through to the water one drinks. Designers working closely with Standex Electronics's engineers have solved this problem rather effectively and reliably using reed sensors.

Usually a tiny magnet 1 mm in diameter and 1 mm long is mounted on the paddle of a small paddle wheel. This paddle wheel rotates whenever water is flowing through the filter. An exact, accurate volume of water is defined with each full rotation of the paddle wheel. The reed sensor senses each full rotation of the paddle wheel and sends that information to an electronic counter. The electronics then keeps track of the volume that has flowed through the filter. Usually a green light on the filter indicate the filter is in good condition, an amber light may light up indicating it is almost time to change the filter.

When the red light is on the filter must be replaced immediately. In this manner the water drinkers can satiate themselves with clean clear good tasting drinking water.

Specifications (@ 20°C) MK15 & MK06 Series

	Min	Max	Units
Operate Specifications			
Must close distance	5	25	mm
Must open distance	5	25	mm
Hysteresis	Typical 50%		
Load characteristics			
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)

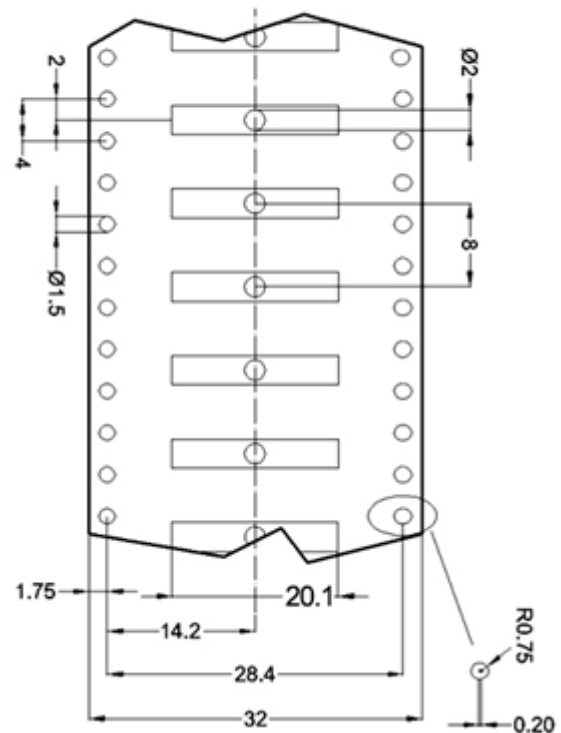










Figure 4. MK15 Tape & Reel

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





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 sens-

ing function. Standex Electronics's sensors are packaged for surface mounting as well as through hole mounting. Also, Standex Electronics has cylinder packages as well as screw fastening packages having lead wires for remote attachment to the electronics.





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	




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	

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.standelectronic.com or by giving us a hello@standelectronic.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.

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