



Application Alley

Electronics - Reed Sensor

Heating Systems In Hot Tubs And Spas Use Reed Sensors

Introduction

The number of hot tubs or spas being used around the world for medicinal reasons and for sheer joy are increasingly an essential part of a hot tub is its heating system. There are very high wattage heaters that are designed into hot tubs for quick warm up. If for some reason the water is not flowing and the heaters are activated, the heating element overheat, resulting in some serious damage. Hot tub designers have found a reliable solution using Standex Electronics's reed sensors.

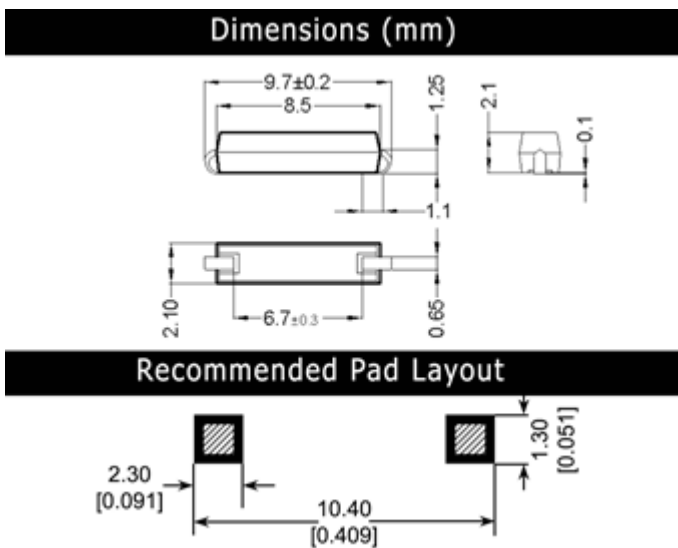


Figure 1. MK17-x-3 Sensor physical layout

Features

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

- Cylindrical hole and screw fastening mounting
- Contacts dynamically tested

Applications

- Ideal for sensing flow by movement of a spring in water flow systems within a hot tub or spa.
- Ideal for applications sensing any flow by movement of a spring in a host of different configurations

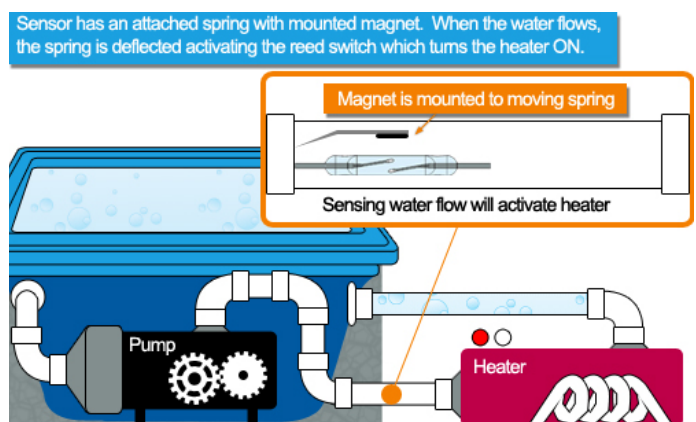


Figure 2. No water is flowing so the spring magnet is retracted away from the reed switch keeping the heating unit OFF.

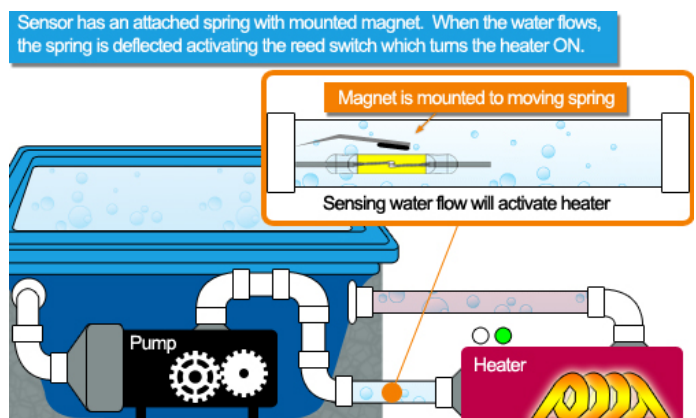


Figure 3. Water flow causes the spring magnet to move into proximity with reed switch causing the contacts to close which switches the heating unit ON.

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

Hot tubs and spas are used around the world with many mounted in back yards, on decks, and in special spa rooms in the house. The hot tubs usually have water heated at approximately 38°C (100°F). To maintain this temperature, thermocouples sense when the temperature drops to a certain level, which will then turn on high wattage heaters. Just prior to this, the water flow system will be energized. Turning on the heaters with the water not flowing will create a potentially dangerous situation because if the water is not flowing the localized water will be super heated and begin boiling. This can then leave areas with no water. With the heaters continuing to heat at high wattage, the plastic vessels housing the water flow system could begin to melt or potentially burn. Spa designers have chosen Standex Electronics's reed sensors as a very reliable solution.

Designers have developed a spring that will deflect when there is water flow in a spa. The spring has a magnet attached to it. When the spring moves, the magnet will move along with it. The reed sensor senses this movement and sends a signal to the electronics alerting it that water is flowing. Armed with this information, the electronics will signal an okay to turn on the heaters when the heat sensors call for more heat. In this way reliable operation is achieved.

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

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)

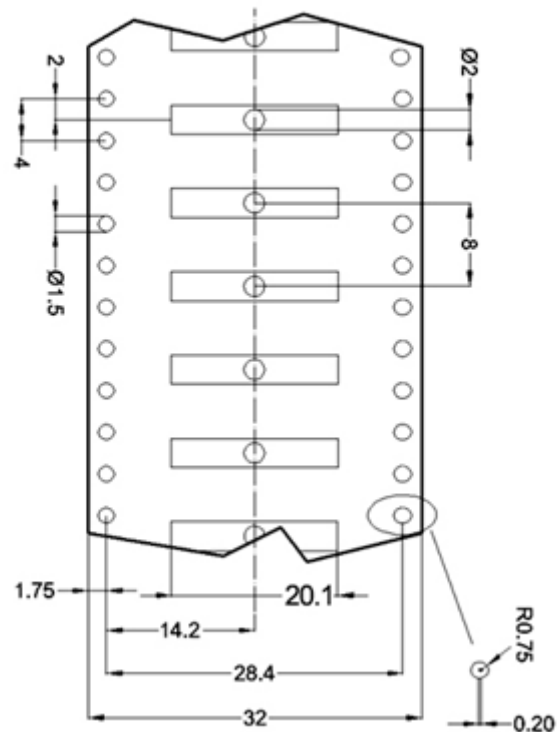










Figure 4. MK15 Tape & Reel

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. Also, Standex Electronics has cylinder packages as well as screw fastening packages having lead wires for remote attachment to the electronics.

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 or by giving us a hello@standexelectronics.com today! One of our engineers or solution selling sales leaders will be happy to assist you.

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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