



Application Alley

Industrial - Reed Sensor

Detect End Limit Position In Piston And Hydraulic Systems

Using Reed Sensors

Introduction

Finally there is a reliable way to precisely detect the end limit positions of pistons and cylinders, particularly when that detection is critical to the operation and/or can result in a disaster if the detection fails. Mechanical limit switches have been used successfully in the past, but can fail prematurely or may have limited life cycles. Dirty environments can exacerbate the problem. Now designers have turned to the Reed Sensor which uses hermetically sealed reed switches, which are ideal for critical requirements where reliability is essential.

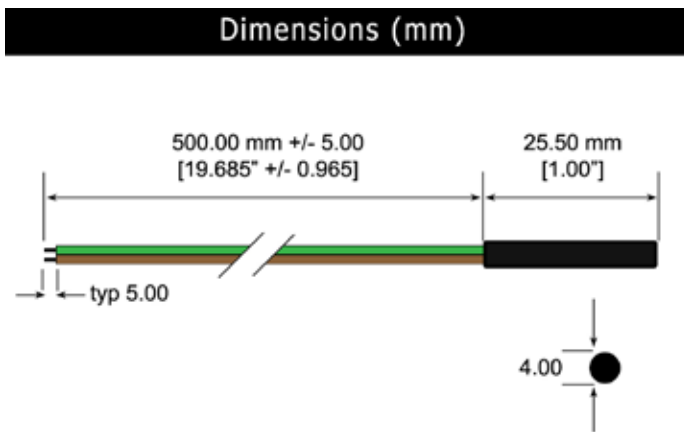


Figure 1. MK14 Sensor physical layout

Features

- The Reed Sensor never comes in contact with the actual movement of the piston
- The reed switch used in the Reed Sensor is hermetically sealed and is therefore not sensitive to dirty environments
- Magnet and Reed Sensor are isolated and have no physical contact by typically having the magnet mounted to the piston movement and the Reed Sensor mounted and positioned to pick on the end limit position/s
- 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

- Anywhere pistons are used and the detection of their end point(s) is/are necessary
- Ideal for applications sensing any kind of end movement even in dirty environments

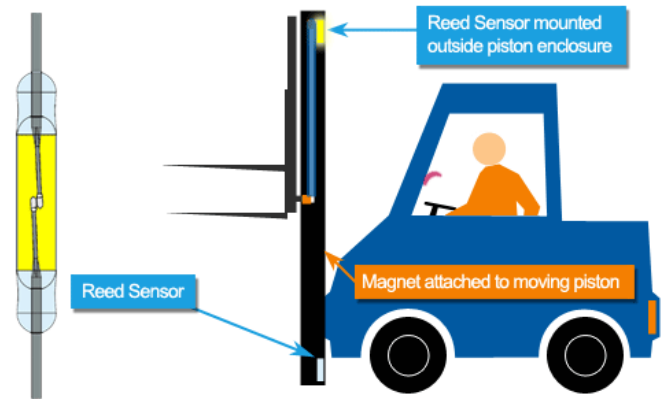


Figure 2. Shows sensor mounted to outside of piston enclosure. When the piston reaches its top end limit position, the magnet actuates the sensor and sounds an alarm.

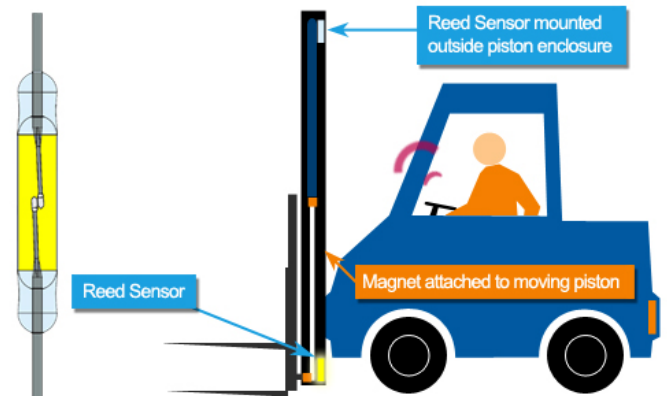


Figure 3. Shows sensor mounted to outside of piston enclosure. When the piston reaches its bottom end limit position, the magnet actuates the sensor and sounds an alarm.

End Position Control for Pistons and Hydraulic Cylinders





Pistons requiring end point position detection are typically millions of mechanical systems.

These systems can range from truck lifts, plows, garbage trucks, fork lifts, special mechanical systems, etc. Most of these environments can be on the dirty side influencing any open or partially sealed switching device. This can in turn cause faulty switching, down time, and potentially costly repairs if the fault occurs when in use. Here the mechanical contacts may stick or remain open. To avoid these failures, designers have designed out the unreliable mechanical switches and gone over to the Reed Sensors, which has dramatically improving the reliability of their systems.

Specifications (@ 20°C) MK14 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	-20	85	°C
Storage temp	-20	85	°C




Standex Electronics's Reed Sensors package hermetically sealed reed switches as their switching element. These reed switches are impervious to dirty, rough environments giving the user the millions of accurate reliable operations they expect. Permanent magnets of various sizes are used for closing and opening the contacts. The magnet and reed sensor do not come into physical contact allowing for convenient, independent mounting.

The reed sensors are mounted on the piston enclosures in a convenient position, but accurately located to carry out their end position sensing. Standex Electronics's reed sensors are available in several packages with various connector or lead options allowing the users to meet exact design details. The magnets can also be packaged in an assortment of ways and are generally mounted to the moving piston. 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.

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	

Consider some of the above and below options in cylindrical and rectangular versions for end limit sensor or other similar applications.

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

**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.

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