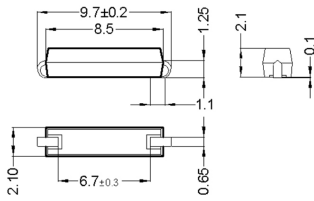


Dimensions (mm)



Recommended Pad Layout

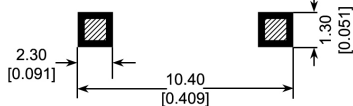


Figure 1. MK17-X-3 Sensor physical layout

Features

- The reed switch used in the Reed Sensor is hermetically sealed and is therefore not sensitive rough wet environments
- The reed sensors reliably operate between - 50°C to 150°C
- Magnet and Reed Sensor are isolated and have no physical contact by typically having the magnet mounted on the motor and the Reed Sensors mounted and positioned to accurately detect the motor rotation
- The magnet is not affected by its environment
- Tens of millions of reliable operations
- Surface mount and through hole packages available
- Cylindrical hole and screw fastening mounting
- Contacts dynamically tested

Applications

- Ideal for sensing motor rotation associated with power windows
- Ideal for applications sensing any kind of motor rotation in a host of different configurations

Introduction

Power windows have been improving their performance over the years and now use Reed Sensors to control the motors as they reach their end limits. Also, if an object impedes the window's progress slowing the window's progress, this slowdown must be detected, particularly when going in the closing position. This is particularly important if one's arm or hand is between the top of the window and door. Reed Sensors have been an excellent choice capable of accomplishing all three requirements in a reliable manner.

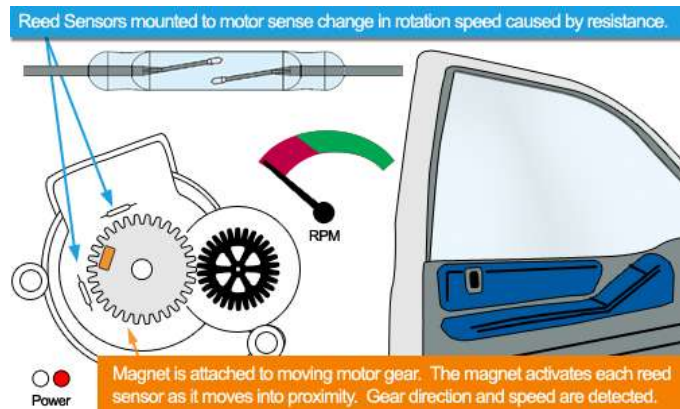


Figure 2. Close-up of window motor with power off.

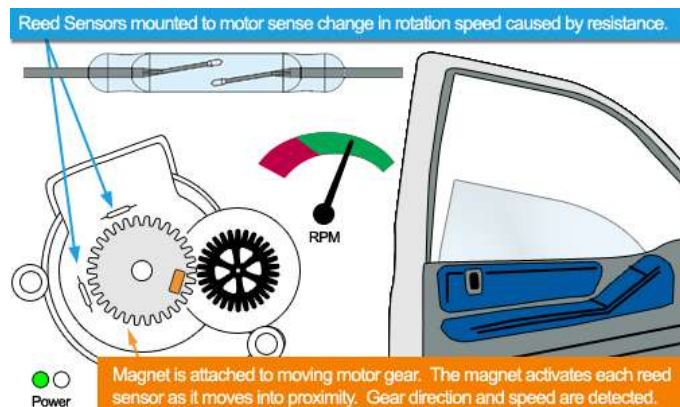


Figure 3. Window motor is running and sensors sense rotation speed and direction.

Power Windows End Points Are Reliably Controlled By Reed Sensors

Power windows have undergone dramatic changes in the controls. Originally the end limits were controlled by mechanical limit switches that were subject to the environment, which would eventually effect their reliability over the useful life of the window. If one's hand got caught between the window and the door, there was no way to sense this condition. Of course this resulted in some severely pinched and broken fingers. The designer developed away to sense when the motor slowed down which caused a surge in the current flow to the motor. This surge occurred when the window reached its end limits or when an object showed resistance to window movement. This approach improved the reliability and now detected the existence of a hand impeding the window from shutting. This approach had some flaws particularly when subjected to temperature extremes and used many costly electronic components. Designers finally discovered a clever way to solve all the problems associated with power windows in an economical way using MEDER's reed sensors.

Specifications

Operate specs	Min	Max	Units
Must close distance	5	25	mm
Must open distance	5	25	mm
Hysteresis	Typical 50%		

Load Characteristics	Min	Max	Units
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	-35	85	°C
Operate Temp MK15	-20	130	°C
Storage Temp MK15	-35	130	°C

Dimensions (mm)

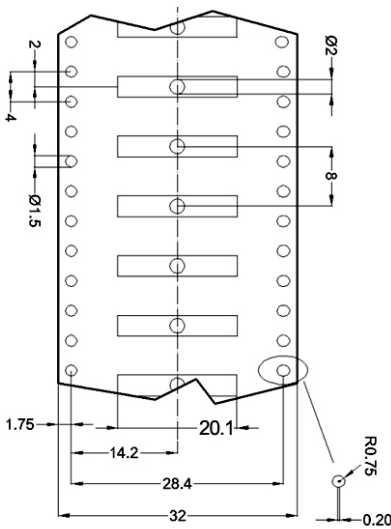








Figure 3. MK15 Tape & Reel





MEDER's reed sensors use hermetically sealed reed switches that are further packaged in strong high strength plastic, which virtually eliminates any environmental effects on their reliability particularly over the temperature extremes. The magnet is mounted on the motor and two reed sensors are mounted in a convenient manner detecting each rotation of the motor. Using two reed switches allows the designer to determine the direction of motor and therefore the direction of the window movement. The design of the motors used slow their rotation once they encounter any resistance. This is immediately sensed by the reed sensors showing the change in rotation speed, which in turn sends a signal to the electronics turning off the motor. In this way the end limits are reliably detected as well as the detection of any resistance to the window movement before it reaches its end limits.

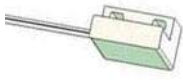


MEDER's sensors are packaged for surface mounting as well as through hole mounting. Also, MEDER has cylinder packages and well as screw fastening packages having lead wires for remote attachment to the electronics.

Surface Mount 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 Series				Illustration
Series	Dimensions		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 Series				Illustration
Series	Dimensions		mm	
	inches			
MK03	Dia	5.25	0.207	
	L	25.5	1.004	
MK14	Dia	4	0.157	
	L	25.5	1.004	
MK18	Dia	5	0.197	
	L	17	0.669	
MK20/1	Dia	2.72	0.107	
	L	10	0.394	

Rectangular Screw Flange Mount Series				Illustration
Series	Dimensions		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.