Application Alley

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Electrosurgical Generators -Reed Relays

Surgeons Today Prefer Electronic Scalpels That Use Reed

Relays In Their Electrosurgical Generators



Custom Engineered Solutions for Tomorrow

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Introduction

Approximately 95% of new, surgically equipped operating rooms use electronic scalpels. These electronic scalpels cut and instantly cauterize the area stopping any bleeding. This greatly helps doctors focus on the job at hand, while not having the area of surgical interest being obliterated with blood. However, to perform this operation electronically requires the use of high voltage, high current and a relatively high operating frequency. This immediately brings the added concern of electric shock to the patients, nurses and doctors. So a key element to successful electronic scalpels is high reliability and safety. Medical equipment designers have chosen Standex-Meder's reed relays to accomplish both.



Figure 1. BE Physical layout

Features

- High reliability
- Ability to carry RF currents up to 6 AmpsAbility to carry high power with up to a 1
- Ability to carry high power with up to a 1 MHz envelope
- Dielectric strength across the contacts 10,000 volts
- Contacts dynamically tested

Applications

• Ideal for use in surgical generators operating surgical scalpels

• Ability to use in power radio transmitters in the 3 MHz to 30 MHz range

Electronic Scalpels Use High Power Reed Relays

Most of today's modern hospitals around the world are now equipped with new state of the art surgical operating rooms. Among the many modern instruments are new surgical generators used as electronic scalpels. These scalpels eliminate the messy aftermath of blood flow in the area to be surgically repaired by cauterizing as it cuts. It allows doctors to clearly see the area under surgical review allowing the doctor to quickly perform the operation in a clean efficient process with the best possible results.



Figure 2. Electronic scalpel shown cauterizing incision as it cuts, preventing bleeding during surgical procedure.



Figure 3. Heart is repaired with electronic scalpel and normal heart rhythm returns.



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To obtain the best possible cutting and cauterizing results requires a rather high current and voltage typically applied at 0.5 MHz to 2 MHz. This high power envelope can be lethal to doctors, nurses and of course the patients themselves if care isn't taken to use the most reliable switching solution. There is only one switching technology that can be considered to handle the high frequency, the high current, and the high voltage in a reliable manner - reed relays. Because high frequency travels on the outside (skin) of its conductor, care has to be taken with potential heat buildup. To get around this, copper plated reed switches are used. This dramatically reduces any heat buildup and allows for higher currents to be carried through the relay. Standex-Meder designers using this type hermetic reed switch, have developed a very reliable reed relay that meets the above critical requirements.

Specifications (@ 20°C) HE Series							
	Min	Тур	Max	Units			
Coil Characteristics*							
Coil resistance	45	50	55	Ohms			
Coil voltage		5		Volts			
Pull-In max.			3.5	Volts			
Drop-Out min.	0.65			Volts			
Load characteristics							
Contact rating			50	Watts			
Switching voltage	0		7500	Volts			
Switching current	0		3.0	Amps			
Carry current	0		6.0	Amps			
Max carry current for 5 Ms			10.0	Amps			
DC contact resistance		150	150	mΩ			
Dynamic contact resistance		200	200	mΩ			
Breakdown voltage across contacts	10,000			Volts			
Breakdown voltage switch to coil	10,000			Volts			
Operate time			3.0	msec			
Release time			1.5	msec			
Operate temp	-20		70	°C			
Storage temp	-30		100	°C			
*Coil parameters will vary by 0.2% / 1 °C							

Standex-Meder's HE Series was designed for this very requirement. This series can carry these power requirements for years of satisfactory usage for the life time of the electrosurgical generator. To meet the high voltage standoff of 10,000 volts an evacuated reed switch is used.

The HE along with its sister HM series together offer many options concerning packaging, pin outs, use of high insulation resistance wire, and multiple switches in the same package. Also, these series offer the relays in a normally closed contact configuration as well.

Standex-Meder's reed relays use hermetically sealed reed switches that are further packaged in strong high strength plastic, and can therefore be subject to various environments without any loss of reliability.

Through Hole Reed Relay Series							
	Dimer	nstions					
		mm	inches	Illustration			
Series							
HE	W	14.5	0.570	and the second			
	Н	15.5	0.610				
	L	65.0	2.559				
HM	W	19.0	0.748				
	Н	19.8	0.780	1 mm man			
	L	68.0	2.677				

The reed relay is an excellent choice because it can operate reliably over a wide temperature range, and represents an economical way to carry out billions of switching operations.

Find out more about our ability to propel your business with our products by visiting www.standexmeder.com or by giving us a hello@standexelectronics.com today! One of our brilliant engineers or solution selling sales leaders will listen to you immediately.



About Standex-Meder Electronics

Standex-Meder Electronics is a worldwide market leader in the design, development and manufacture of standard and custom electro-magnetic components, including magnetics products and reed switch-based solutions.

Our magnetic offerings include planar, Rogowski, current, and low- and high-frequency transformers and inductors. Our reed switch-based solutions include Meder, Standex and OKI 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 spectrum of product applications in the automotive, medical, test and measurement, military and aerospace, as well as appliance and general industrial markets.

Standex-Meder Electronics has a commitment to absolute customer satisfaction and customer-driven innovation, with a global organization that offers sales support, engineering capabilities, and technical resources worldwide.

Headquartered in Cincinnati, Ohio, USA, Standex-Meder Electronics has eight manufacturing facilities in six countries, located in the United States, Germany, China, Mexico, the United Kingdom, and Canada.

For more information on Standex-Meder Electronics, please visitus on the web at www.standexmeder.com.

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