



Application Alley

Electrosurgical Generators - Reed Relays

Surgeons Today Prefer Electronic Scalpels That Use Reed Relays In Their Electrosurgical Generators

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 Electronics's reed relays to accomplish both.

- 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.

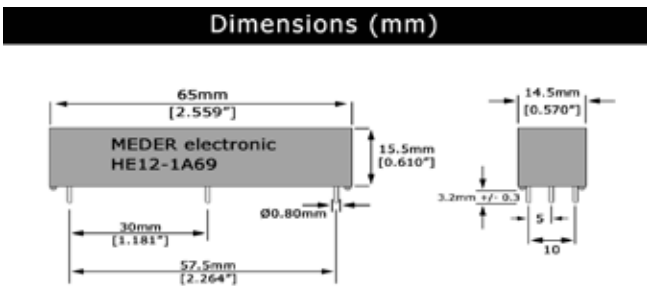


Figure 1. BE Physical layout

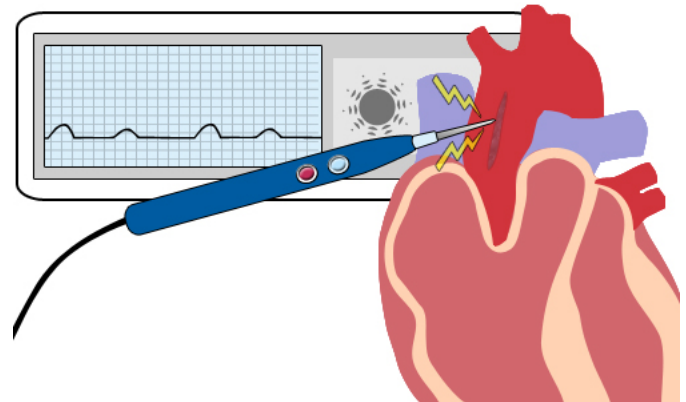


Figure 2. Electronic scalpel shown cauterizing incision as it cuts, preventing bleeding during surgical procedure.

Features

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

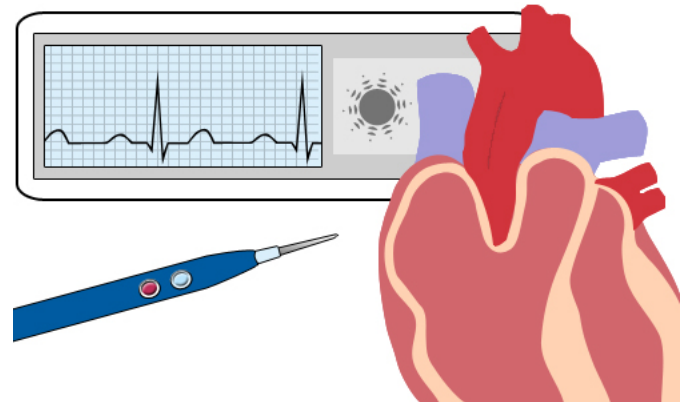


Figure 3. Heart is repaired with electronic scalpel and normal heart rhythm returns.

Applications

- Ideal for use in surgical generators operating surgical scalpels

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 Electronics designers using this type hermetic reed switch, have developed a very reliable reed relay that meets the above critical requirements.

Standex Electronics's HE Series was designed for

Specifications (@ 20°C) HE Series

	Min	Typ	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



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 Electronics'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

Series		Dimensions		Illustration	
		mm	inches		
HE	W	14.5	0.570		
	H	15.5	0.610		
	L	65.0	2.559		
HM	W	19.0	0.748		
	H	19.8	0.780		
	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.standexelectronics.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 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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