



# Application Alley

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## Electrometers - Reed Relays

**Electrometers Use Reed Relays in Their Detection Circuits**



Custom  
Engineered  
Solutions for  
Tomorrow

**Introduction**

Electrometers are used to measure ultra low currents at the sub-pico amp level. These electrometers are often used in radiation detection, where the radiation going through a gas cylinder ionizes the gas it comes in contact with. Ultra small currents are generated from the ionization, they need to be detected, switched into an operational amplifier, and then quantified for an early alert of the radiation level. Semiconductors have too much capacitance literally ‘swallowing up’ these signals. Electromechanical relays have too much leakage current and the film buildup on the contacts that needs to be broken for current to flow, never happens with these small signals. The only switch that can handle this environment is the Reed Relay. Standex-Meder’s specially designed reed relays meet the requirements necessary to switch and carry this low signals.

usually have an inert gas container with high voltage plates mounted within the gas container. Any radiation passing through the gas will

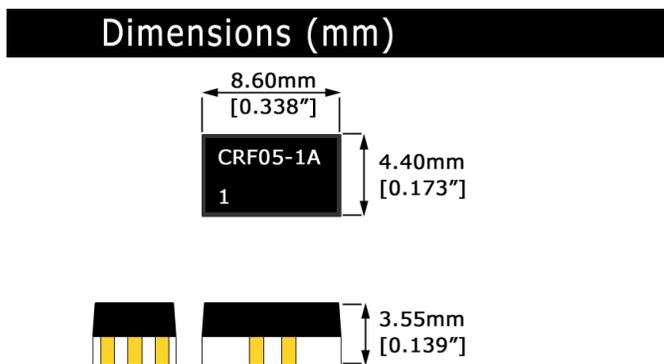


Figure 1. CRF physical layout

**Electrometers Use Reed Relays for Switching and Carrying Small Signals**

Today with the vast amount of electric power being generated by nuclear generators and the threat of nuclear bombs ever-present, there is a need for detecting small nuclear radiation levels. Electrometers have been used as the most accurate way of detecting even the smallest amount of radiation. These electrometers

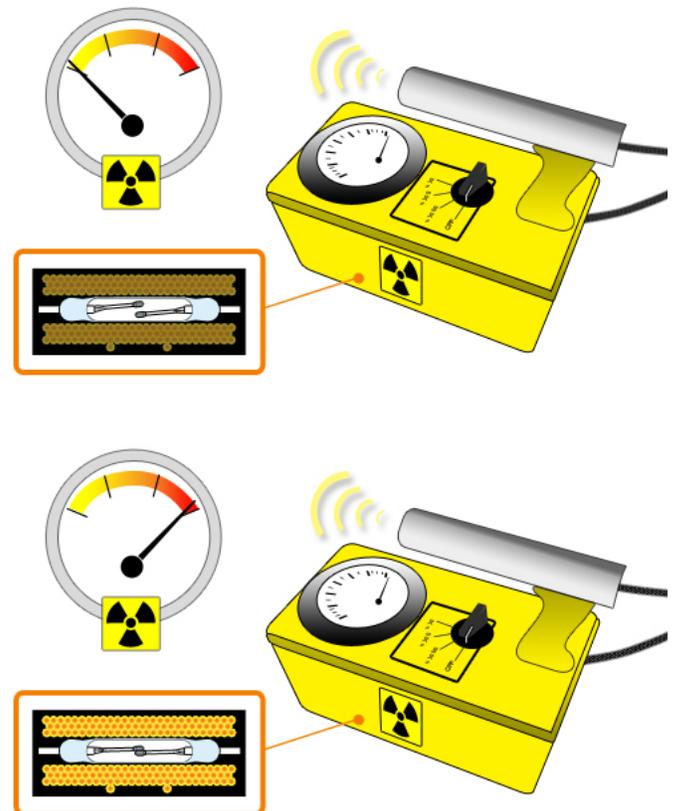


Figure 2. Reed Relays switch low signals in electrometers.

create ionization. With this ionization, a small current will flow. This sub-pico amp current needs to be detected and then sent to an operational amplifier where the information can be quantified, compared and analyzed. Reed relays represent the only technology that can successfully switch and pass these small signals without losing signal integrity. Standex-Meder’s has specialized in these types of applications and therefore has several series and special designs capable of getting the job done.

**Features**

- High quality and reliability
- Very small size
- Insulation resistance > 10<sup>14</sup> Ohms
- Capable of switching and carrying fempto amps
- Dielectric strength across the contacts 200volts
- Contacts dynamically tested
- Low stable contact resistance
- Long life with up to a billion reliable operations

Specifications (@ 20°C) CRF Series				
	Min	Typ	Max	Units
<b>Coil characteristics</b>				
Coil resistance	135	150	165	Ω
Coil voltage		5.0		V
Pull-In			3.75	V
Drop-Out	0.85			V
<b>Switch characteristics</b>				
Contact rating			10	Watts
Switching voltage			170	V
Switching current			0.5	Amps
Carry current			0.5	Amps
Static contact resistance			250	mΩ
Dynamic contact resistance			250	mΩ
Dielectric from voltage across the contacts	210			V
Dielectric from voltage coil to contacts	1500			V
Insertion Loss (@ the -3 dB down point)			7	GHz
Operate time			0.1	msec
Release time			20	µsec
Operate temp	-10		100	°C
Storage temp	-55		125	°C

\*Coil parameters will vary by 0.2% /oC

**Applications**

- Ideal for use with systems that are switching an assortment of signals from DC to 15 GHz

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Surface Mount RF Reed Relay Series				
Series	Dimensions	mm		Illustration
		mm	inches	
SRF	W	4.0	0.157	
	H	3.2	0.126	
	L	7.5	0.295	
CRF	W	4.4	0.173	
	H	3.5	0.137	
	L	8.6	0.338	

Through Hole Reed Relay Series

Series	Dimensions			Illustration
		mm	inches	
HI	W	7.5	0.295	
	H	7.9	0.311	
	L	28.0	1.102	

Standex-Meder's offers both standard through hole and surface mount in very small packages. All materials are selected for extremely high resistivity to avoid any potential leakage paths.

Standex-Meder's reed relays use hermetically

sealed reed switches that are further packaged in strong high strength thermoset molding compound, and can therefore be subject to various environments without any loss of reliability. 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](http://www.standexmeder.com) or by giving us a [hello@standexelectronics.com](mailto:hello@standexelectronics.com) today! One of our brilliant engineers or solution selling sales leaders will listen to you immediately.