



# Application Alley

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## Data Acquisition Systems - Reed Relays

Reed Relays Maintain Data Signal Integrity



Custom  
Engineered  
Solutions for  
Tomorrow

## Introduction

Throughout the industrial world, data acquisition and scanning instruments are used to scan and acquire data from various data collection sensors. These may be in the form of thermocouples, pressure transducers, and an assortment of other types of transducers. For a given requirement, there could be 100s of data points that need to be scanned for data and then stored or displayed. This data once gathered can then be graphed for trends, trip points, or alarm activation. In most cases, reed relays are desirable for the electrical scanning of the signals because generally, the transducers output very small voltages and currents. Maintaining signal integrity is critical for proper measurement.

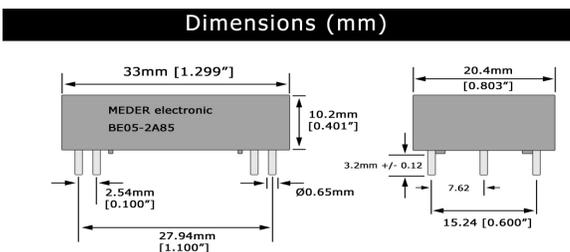


Figure 1. BE Physical layout

## Features

- Ability to withstand up to 4000 volts across the contacts
- Ability to Switch up to 1000 Volts
- Dielectric strength of 5000 volts between switch to coil

- Contacts dynamically tested
- Capable of switching a billion operations at low level
- High quality and reliability
- Very small size
- Ability to switch up to 1 amp
- Insulation resistance >  $10^{12}$  Ohms
- Low offset voltage <  $1\mu\text{V}$

## Applications

- Ideal for use in an assortment of industrial applications where data acquisition and scanning are necessary.

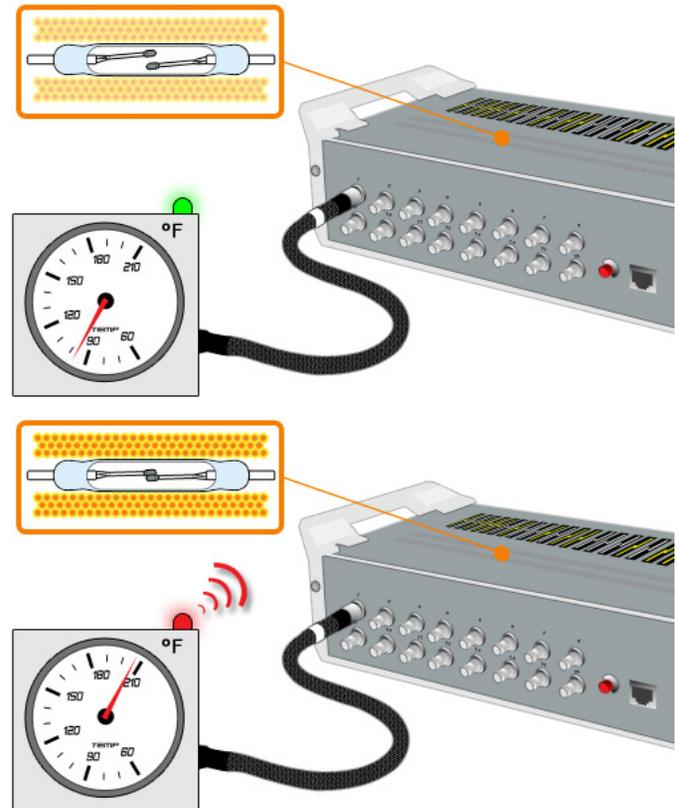


Figure 2. Reed Relays used in a data acquisition system sense when the temperature has reach a high point and signals an alarm.

## Reed Relays - a Reliable Approach in Acquiring Data in an Industrial Environment

Gathering data in industrial environments can be a harrowing experience. Transducers like thermocouples, output very small voltages, and many times are located in remote areas. This in itself is a major undertaking to get these small signals back to the main system where it can be amplified, stored and/or displayed. The long cables will have a distributed capacitance to deal with, and potential common mode voltages may be present. To further make things difficult, there are normally several such lines all coming back to one system, where the incoming data needs to be scanned and stored. Having a switching device that can deal with high parasitic capacitance and potential common mode voltages, while maintaining signal integrity is no easy undertaking.

Specifications (@ 20°C) BE Series				
	Min	Typ	Max	Units
<b>Coil Characteristics*</b>				
Coil resistance	45	50	55	Ohms
Coil voltage		5		Volts
Pull-In max.			3.3	Volts
Drop-Out min.	0.65			Volts
<b>Load characteristics</b>				
Contact rating			100	Watts
Switching voltage	0		1000	Volts
Switching current	0		1.0	Amps
Carry current	0		2.5	Amps
Max carry current for 5 Ms			5.0	Amps
DC contact resistance			150	mΩ
Dynamic contact resistance			200	mΩ
Breakdown voltage	3000			Volts
Operate time			1.0	msec
Release time			100	μsec
Operate temp	-20		70	°C
Storage temp	-40		85	°C

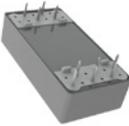
\*Coil parameters will vary by 0.2% / 1 °C

Electromechanical relays are notorious for building up films on their contacts and then make it impossible to switch small signals. Semiconductor switching components generally have high output capacitance that can swamp out the signal that you are trying to detect. The signals are ultra small currents in the range of pico amps ( $< 1 \times 10^{-12}$  amps), and/or very small voltages in the micro or nano volt range ( $< 1 \times 10^{-6}$  or  $10^{-9}$  volts).

Reed Relay's with only 0.2 pico-farads across the open contacts offer that ability to maintain signal integrity. Standex-Meder's reed relays offer an assortment of reed relays with voltage offset less than one microvolt. Their ability to switch millions of operations containing stray capacitance and/or common mode voltages make them the ideal switching source for small signal scanning systems.

Some of Standex-Meder's designs are capable of withstanding 4000 Volts minimum across the open contacts. The contacts can also switch up to 1000 volts as well. This supplies plenty of safety factor for common mode voltages ever being coupled back to the scanning system. EX-i and intrinsically safe reed relays are also available. 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. Because the contacts are hermetically sealed they are fundamentally safe for use in dusty, potentially explosive atmospheres. 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 at low level.

### Through Hole Reed Relay Series

Series	Dimensions		Illustration
	mm	inches	
BE	W	10	
	L	10	
	H	33	
MS	W	3.8	
	L	6.80	
	H	15.20	
SIL	W	5.08	
	L	7.80	
	H	19.80	

### Surface Mount Reed Relay Series

Series	Dimensions		Illustration
	mm	inches	
SRF	W	4.00	
	H	3.20	
	L	7.50	
CRF	W	4.4	
	H	3.5	
	L	8.6	

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