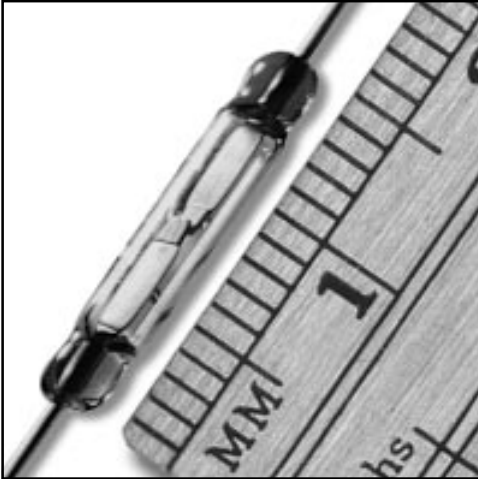


# RI-21 Series



## RI-21 SERIES

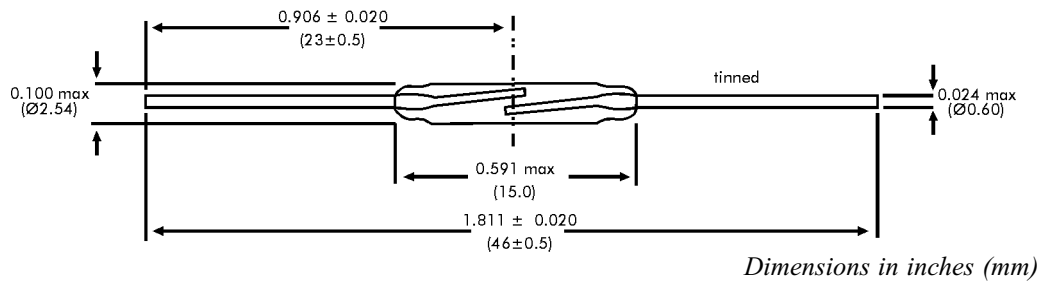
Micro dry-reed switch hermetically sealed in a gas-filled envelope. Single-pole, single-throw (SPST) type, having normally open contacts, and containing two magnetically actuated reeds.

The switch is of the double-ended type and may be actuated by an electromagnet, a permanent magnet or a combination of both.

The device is intended for use in sensors, relays, pulse counters or similar devices.

## RI-21 SERIES FEATURES

- ◆ General purpose reed switch
- ◆ High breakdown voltage
- ◆ Contact layers: Gold, plated ruthenium
- ◆ Superior glass-to-metal seal and blade alignment
- ◆ Excellent life expectancy and reliability



## GENERAL DATA FOR ALL MODELS RI-21

### AT-Customization / Preformed Leads

Besides the standard models, customized products can also be supplied offering the following options:

- Operate and release ranges to customer specification
- Cropped and/or preformed leads

### COILS

All characteristics are measured using the Philips Standard Coil. For definitions of the Philips Standard Coil and the standard MIL Coil, refer to "Application Notes" in the *Reed Switch Technical & Application Information* Section of this catalog.

### Relationship between Philips Standard Coil and Standard MIL Coil

Operate value of standard MIL Coil = 0.74 x operate value of Philips Standard Coil + 2.78 AT.  
Release value of standard MIL Coil = 0.80 x release value of Philips Standard Coil + 0.66 AT.

### LIFE EXPECTANCY AND RELIABILITY

The life expectancy data given below are valid for a coil energized at 1.25 times the published maximum operate value for each type in the RI-21 series.

### No load conditions (operating frequency: 100Hz)

Life expectancy : min.  $10^8$  operations with a failure rate of less than  $10^{-9}$  with a confidence level of 90%.

End of life criteria:

Contact resistance >  $1\Omega$  after 2 ms

Release time > 2 ms (latching or contact sticking).

### Loaded conditions (resistive load: 12 V; 4 mA; 15 mA peak); operating frequency: 170 Hz

Life expectancy: min.  $10^7$  operations with a failure rate of less than  $10^{-8}$  with a confidence level of 90%.

End of life criteria:

Contact resistance >  $2\Omega$  after 4 ms

Release time > 0.7 ms (latching or contact sticking).

Switching different loads involves different life expectancy and reliability data. Further information is available on request.

### MECHANICAL DATA

Contact arrangement is normally open; lead finish is tinned; net mass is approximately 0.19 g; and can be mounted in any position.

# RI-21 Series

Model Number			RI-21AAA	RI-21AA	RI-21A	RI-21B	RI-21C
Parameters	Test Conditions	Units					
<b>Operating Characteristics</b>							
Operate Range		AT	8-16	14-23	18-32	28-52	46-70
Release Range		AT	4-14	7.5-17.5	8-22	12-29	16-32
Operate Time - including bounce (typ.)	energization 100 AT	ms	0.1	0.25	0.25	0.25	0.25
Bounce Time (typ.)	energization 100 AT	ms	0.05	0.15	0.15	0.15	0.15
Release Time (max)	energization 100 AT	$\mu$ s	70	30	30	30	30
Resonant Frequency (typ.)		Hz	5500	5500	5500	5500	5500
<b>Electrical Characteristics</b>							
Switched Power (max)		W	10	10	10	10	10
Switched Voltage DC (max)		V	200	200	200	200	200
Switched Voltage AC, RMS value (max)		V	250	250	250	250	250
Switched Current DC (max)		mA	500	500	500	500	500
Switched Current AC, RMS value (max)		mA	500	500	500	500	500
Carry Current DC; AC, RMS value (max)		A	1	1.5	2.5	2.5	2.75
Breakdown Voltage (min)		V	225	325	375	500	650
Contact Resistance (initial max)	(energization)	m $\Omega$	100 (20 AT)	100 (25 AT)	100 (30AT)	100 (40 AT)	100 (40 AT)
Contact Resistance (initial typ.)	(energization)	m $\Omega$	70 (20 AT)	70 (25 AT)	70 (30 AT)	70 (40 AT)	70 (40 AT)
Contact Capacitance (max)	without test coil	pF	0.3	0.3	0.25	0.25	0.25
Insulation Resistance (min)	RH $\leq$ 45%	M $\Omega$	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>

## SHOCK

The switches are tested in accordance with "IEC 68-2-27", test Ea (peak acceleration 150 G, half sinewave; duration 11 ms). Such a shock will not cause an open switch (no magnetic field present) to close, nor a switch kept closed by an 80 AT coil to open.

## VIBRATION

The switches are tested in accordance with "IEC 68-2-6", test Fc (acceleration 10G; below cross-over frequency 57 to 62 Hz; amplitude 0.75 mm; frequency range 10 to 2000 Hz, duration 90 minutes). Such a vibration will not cause an open switch (no magnetic field present) to close, nor a switch kept closed by an 80 AT coil to open.

## MECHANICAL STRENGTH

The robustness of the terminations is tested in accordance with "IEC 68-2-21", test Ua<sub>1</sub> (load 40 N).

## OPERATING AND STORAGE TEMPERATURE

Operating ambient temperature; min: -55°C; max: +125°C.

Storage temperature; min: -55°C; max: +125°C.

**Note:** Temperature excursions up to 150°C may be permissible. For more information contact your nearest Coto Technology sales office.

## SOLDERING

The switch can withstand soldering heat in accordance with "IEC 68-2-20", test Tb, method 1B:solder bath at 350  $\pm$ 10 °C for 3.5  $\pm$ 0.5 s. Solderability is tested in accordance with "IEC 68-2-20", test Ta, method 3: solder globule temperature 235°C; ageing 1b: 4 hours steam.

## WELDING

The leads can be welded.

## MOUNTING

The leads should not be bent closer than 1 mm to the glass-to-metal seals. Stress on the seals should be avoided. Care must be taken to prevent stray magnetic fields from influencing the operating and measuring conditions.