

# RI-03 Series



## RI-03 SERIES

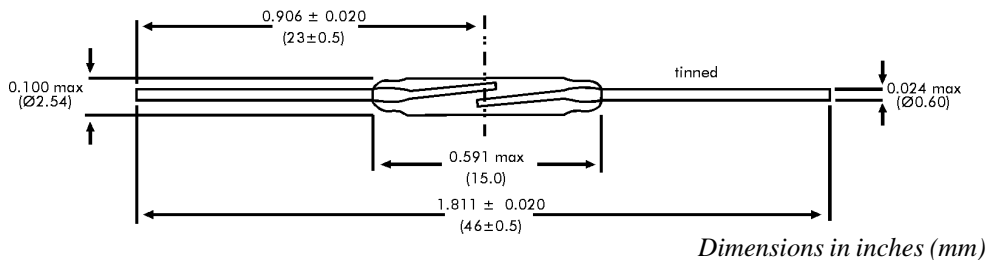
Micro dry-reed switch hermetically sealed in a gas-filled envelope. Single-pole, single-throw (SPST) type, having normally open contacts, and containing two magnetically actuated reeds.

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-03 SERIES FEATURES

- ◆ Ideal for general purpose reed relays and sensors
- ◆ Contact layers: Gold/copper, sputtered or plated ruthenium (can vary)
- ◆ Superior glass-to-metal seal and blade alignment



## GENERAL DATA FOR ALL MODELS RI-03

### 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-03 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.  $10^6$  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-03 Series

## Model Number

RI-03AAA RI-03AA RI-03A RI-03B

## Parameters

## Test Conditions Units

### Operating Characteristics

Operate Range		AT	6-16	14-23	18-32	28-52
Release Range		AT	3-15.5	6-21	7-27	10-36
Operate Time - including bounce (typ.)		ms	0.1(20AT)	0.25(29AT)	0.25(34AT)	0.25(45AT)
Bounce Time (typ.)		ms	0.05(20AT)	0.15(29AT)	0.15(34AT)	0.15(45AT)
Release Time (max)		$\mu$ s	70(20AT)	30(29AT)	30(34AT)	30(45AT)
Resonant Frequency (typ.)		Hz	5500	5500	5500	5500

### Electrical Characteristics

Switched Power (max)		W	5	10	10	10
Switched Voltage DC (max)		V	160	200	200	200
Switched Voltage AC, RMS value (max)		V	110	140	140	140
Switched Current DC (max)		mA	250	500	750	1000
Switched Current AC, RMS value (max)		mA	250	500	750	1000
Carry Current DC (max)		A	1	1.5	2.5	2.5
Breakdown Voltage (min)		V	225	250	300	350
Contact Resistance (initial max)	(energization)	m $\Omega$	120 (20 AT)	120 (25 AT)	120 (30AT)	120 (40 AT)
Contact Resistance (initial typ.)	(energization)	m $\Omega$	70 (20 AT)	70 (25 AT)	70 (30 AT)	70 (40 AT)
Contact Capacitance (max)	without test coil	pF	0.3	0.3	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>

### 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.