RI-21 Series

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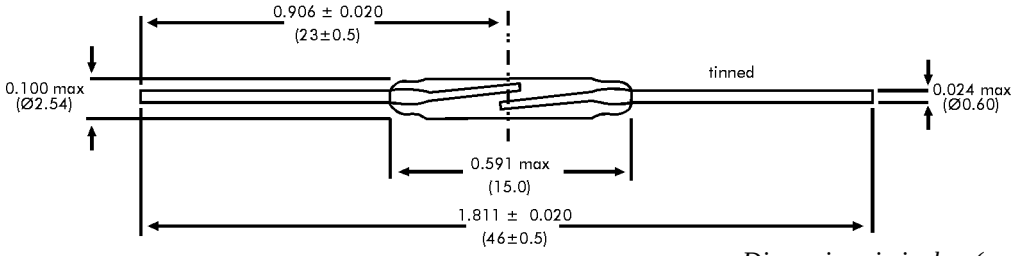
Micro dry-reed switch hermetically sealed in a gas-filled envelope. Single-pole, single-throw (SPST) type, having normally open contacts, and containing two magnetically actuated reeds.

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



Dimensions in inches (mm)

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 > 1Ω 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 > 2Ω 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.

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Model Number			RI-21AAA	RI-21AA	RI-21A	RI-21B	RI-21C
Parameters	**Test Conditions**	**Units**					
Operating Characteristics							
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	μs	70	30	30	30	30
Resonant Frequency (typ.)		Hz	5500	5500	5500	5500	5500
Electrical Characteristics							
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 Ω	100 (20 AT)	100 (25 AT)	100 (30AT)	100 (40 AT)	100 (40 AT)
Contact Resistance (initial typ.)	(energization)	m Ω	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 ≤ 45%	M Ω	10^6	10^6	10^6	10^6	10^6

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_1 (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 ±10 °C for 3.5 ±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.