## Rl-27 Series Dry Reed Switch



## RI-27 Series

Pico dry-reed switch hermetically sealed in a gas-filled glass 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 relays, sensors, pulse counters or similar devices.

## RI-27 Series Features

- Ideal for ATE switching
- Contact layers: gold, sputtered ruthenium
- Superior glass-to-metal seal and blade alignment
- Excellent life expectancy and reliability


General data for all models RI-27
Dimensions in inches (mm)

## 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, refer to the Reed Switch Technical \& Application Information Section of this catalog.

## 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-27 series.

No-load conditions (operating frequency: $\mathbf{1 0 0} \mathbf{~ H z )}$ Life expectancy: min. $10^{9}$ operations with a failure rate of less than $2 \times 10^{-10}$ with a confidence level of $90 \%$.

End of life criteria:
Contact resistance $>1 \Omega$ after 2 ms
Release time $>2 \mathrm{~ms}$ (latching or contact sticking).

## Loaded conditions (resistive load: $\mathbf{5}$ V; 100 mA; operating frequency: $125 \mathbf{H z}$ )

## RI-27AAA

Life expectancy: min. $2 \times 10^{7}$ operations with a failure rate of less than $10^{-8}$ with a confidence level of $90 \%$.

End of life criteria:
Contact resistance > $1 \Omega$ after 2.5 ms
Release time $>1 \mathrm{~ms}$ (latching or contact sticking).

## RI-27AA; RI-27A

Life expectancy: min. $5 \times 10^{7}$ operations with a failure rate of less than $0.5 \times 10^{-8}$ with a confidence level of $90 \%$.

End of life criteria:
Contact resistance $>1 \Omega$ after 2.5 ms
Release time $>1 \mathrm{~ms}$ (latching or contact sticking).

## Loaded conditions (resistive load: 12 V ; 4 mA ; ( $\mathbf{1 5}$

 mA peak); operating frequency: $170 \mathbf{H z}$ )
## RI-27AAA Not applicable.

RI-27AA; RI-27A
Life expectancy: min. $45 \times 10^{6}$ operations (tested up to $50 \times 10^{6}$ operations).

## RI-27 Series Dry Reed Switch

| Model Number |  | RI-27AAA | RI-27AA | RI-27A |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Parameters | Test Conditions | Units |  |  |


| Operating Characteristics |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Operate Range |  | AT | 10-19 | 16-25 | 20-34 |
| Release Range |  | AT | 4-16 | 5-18 | 7-19.5 |
| Operate Time - including bounce (typ.) | (energization) | ms | 0.25 (24 AT) | 0.25 (31 AT) | 0.25 (42.5 AT) |
| Bounce Time (typ.) | (energization) | ms | 0.05 (24 AT) | 0.05 (31 AT) | 0.05 (42.5 AT) |
| Release Time (max) | (energization) | $\mu \mathrm{s}$ | 30 (24 AT) | 30 (31 AT) | 30 (42.5 AT) |
| Resonant Frequency (typ.) |  | Hz | 6700 | 6700 | 6700 |
| Electrical Characteristics |  |  |  |  |  |
| Switched Power (max) |  | W | 10 | 10 | 10 |
| Switched Voltage DC (max) |  | V | 180 | 200 | 200 |
| Switched Voltage AC, RMS value (max) |  | V | 130 | 140 | 140 |
| Switched Current DC (max) |  | mA | 500 | 500 | 500 |
| Switched Current AC, RMS value (max) |  | mA | 500 | 500 | 500 |
| Carry Current DC; AC, RMS value (max) |  | A | 1.5 | 1.75 | 1.75 |
| Breakdown Voltage (min) |  | V | 180 | 240 | 280 |
| Contact Resistance (initial max) | (energization) | $\mathrm{m} \Omega$ | 115 (20 AT) | 115 (25 AT) | 115 (25 AT) |
| Contact Resistance (initial typ.) | (energization) | $\mathrm{m} \Omega$ | 90 (20 AT) | 90 (25 AT) | 90 (25 AT) |
| Contact Capacitance (max) | without test coil | pF | 0.3 | 0.3 | 0.25 |
| Insulation Resistance (min) | RH $\leq 45 \%$ | $\mathrm{M} \Omega$ | $10^{6}$ | $10^{6}$ | $10^{6}$ |

End of life criteria:
Contact resistance $>2 \Omega$ after 4 ms
Release time $>0.7 \mathrm{~ms}$ (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 100 mg ; and can be mounted in any position.

## Shock

## RI-27AA; RI-27A

The switches are tested in accordance with "IEC 68-227 ", 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 68-26", test Fc (acceleration 10 G ; 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 $\mathrm{Ua}_{1}$ (load 10 N ).

## Operating and Storage Temperature

Operating ambient temperature; min: $-55^{\circ} \mathrm{C}$; max: $+125^{\circ} \mathrm{C}$.
Storage temperature; min: $-55^{\circ} \mathrm{C}$; max: $+125^{\circ} \mathrm{C}$.
Note: Temperature excursions up to $150^{\circ} \mathrm{C}$ 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 $350 \pm 10^{\circ} \mathrm{C}$ for $3.5 \pm 0.5 \mathrm{~s}$. Solderability is tested in accordance with "IEC 68-2-20" test Ta, method 3: solder globule temperature $235^{\circ} \mathrm{C}$; ageing 1 b : 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.

