High Voltage SIL/SIP Reed Relays

Up to 3 kilovolts Stand-off

Stacking on 0.25 inches pitch

Features

- **Small size**
- **Internal mu-metal magnetic screen**
- **One or two switches in a single package**
- **Form A (energise to make) or Form B (energise to break) configurations**
- **Dry and mercury wetted switches available**
- **3, 5, 12 and 24 Volt coils with or without internal diode**
- **100% tested for dynamic contact resistance for guaranteed performance**

The Series 104 is a range of Single-In-Line reed relays intended for voltages that are beyond the capabilities of conventional SIL reed relays.

They are ideal for such applications as transformer or cable testing or any other automatic test equipment where high voltages are involved.

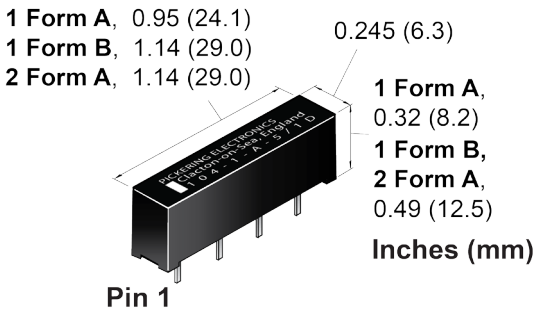
Where mains voltages are switched, for example to control and isolate S.C.R. or triac gates, they are an ideal choice.

One or two Form A (energize to make) or one Form B (energize to break) configurations are available.

The range features an internal mu-metal screen to eliminate problems that would otherwise be experienced due to magnetic interaction when they are closely stacked.

Three types of dry switches are available, capable of standing-off 1, 1.5 or 3kV d.c. The 3kV version has an increased clearance between the switch and coil pins to accommodate the higher voltage. Even higher voltage ratings are available to special order, please contact our sales office for further information.

Mercury wetted devices are also available for applications where bounce free switching is required. These are rated at 1500 volts d.c. stand-off, 500 volts d.c. switching at up to 50 watts.



Switch Ratings - Dry switches

- **1 or 2 Form A (energize to make)**
  1000 Volts d.c. stand-off
  500 Volts d.c. switching at 10 Watts
- **1 or 2 Form A (energize to make)**
  1500 Volts d.c. stand-off
  1000 Volts d.c. switching at 10 Watts
- **1 Form A (energize to make)**
  3000 Volts d.c. stand-off
  1000 Volts d.c. switching at 25 Watts
- **1 Form B (energize to break)**
  1000 Volts d.c. stand-off
  500 Volts d.c. switching at 10 Watts
- **1 Form B (energize to break)**
  1500 Volts d.c. stand-off
  1000 Volts d.c. switching at 10 Watts

Switch Ratings - Mercury switches

- **1 or 2 Form A (energize to make)**
  1500 Volts d.c. stand-off
  500 Volts d.c. switching at 50 Watts

Series 104 switch ratings - The contact ratings for each switch type are shown below:

Switch No	Switch form	Power rating	Max. switch current	Max. carry current	Max. switching volts	Max. stand-off volts	Life expectancy ops typical (see Note[1] below)	Operate time inc bounce (max)	Release time
1	A or B	10 W	0.50 A	1.0 A	500	1000	10E8	1.0 ms	0.3 ms
2	A or B	10 W	0.50 A	1.0 A	1000	1500	10E8	1.0 ms	0.3 ms
3	A	25 W	1.00 A	1.5 A	1000	3000	10E8	1.0 ms	0.3 ms

Coil data and type numbers

Device type	Type Number	Coil (V)	Coil resistance	Max. contact resistance (initial)	Insulation resistance (minimum)		Capacitance (typical) (see Note[2] below)	
					Switch to coil	Across switch	Closed switch to coil	Across open switch
1 Form A (energize to make) Switch No. 1 (1kV)	104-1-A-5/1D 104-1-A-12/1D 104-1-A-24/1D	5 12 24	375 Ω 1000 Ω 3000 Ω	0.15 Ω	10E12 Ω	10E12 Ω	2.5 pF	0.1 pF
1 Form A (energize to make) Switch No. 2 (1.5kV)	104-1-A-5/2D 104-1-A-12/2D 104-1-A-24/2D	5 12 24	375 Ω 1000 Ω 3000 Ω	0.15 Ω	10E12 Ω	10E12 Ω	2.5 pF	0.1 pF
1 Form A (energize to make) Switch No. 3 (3.0kV)	104-1-A-5/3D 104-1-A-12/3D 104-1-A-24/3D	5 12 24	220 Ω 500 Ω 3000 Ω	0.15 Ω	10E12 Ω	10E12 Ω	2.5 pF	0.1 pF
1 Form B (energize to break) Switch No. 1 (1kV)	104-1-B-5/1D 104-1-B-12/1D 104-1-B-24/1D	5 12 24	750 Ω 2000 Ω 3000 Ω	0.20 Ω	10E12 Ω	10E12 Ω	2.5 pF	0.1 pF
1 Form B (energize to break) Switch No. 2 (1.5kV)	104-1-B-5/2D 104-1-B-12/2D 104-1-B-24/2D	5 12 24	750 Ω 2000 Ω 3000 Ω	0.20 Ω	10E12 Ω	10E12 Ω	2.5 pF	0.1 pF
2 Form A (energize to make) Switch No. 1 (1kV)	104-2-A-5/1D 104-2-A-12/1D 104-2-A-24/1D	5 12 24	250 Ω 750 Ω 2000 Ω	0.20 Ω	10E12 Ω	10E12 Ω	See Note[3]	See Note[3]
2 Form A (energize to make) Switch No. 2 (1.5kV)	104-2-A-5/2D 104-2-A-12/2D 104-2-A-24/2D	5 12 24	250 Ω 750 Ω 2000 Ω	0.20 Ω	10E12 Ω	10E12 Ω	See Note[3]	See Note[3]

When an internal diode is required, the suffix D is added to the part number as shown in the table.

Mercury Reed: Series 104 switch ratings - The contact ratings for each switch type are shown below:

Switch No	Switch form	Power rating	Max. switch current	Max. carry current	Max. switching volts	Max. stand-off volts	Life expectancy ops typical (see Note[1] below)	Operate time (max)	Release time
6	A	50 W	2.00 A	3.00 A	500	1500	10E8	1.5 ms	1.0 ms

Mercury Relay: Coil data and type numbers

Device type	Type Number	Coil (V)	Coil resistance	Max. contact resistance (initial)	Insulation resistance (minimum)		Capacitance (typical) (see Note[2] below)	
					Switch to coil	Across switch	Closed switch to coil	Across open switch
1 Form A (energize to make) Switch No. 6 (1.5kV)	104-1-A-5/6D 104-1-A-12/6D 104-1-A-24/6D	5 12 24	100 Ω 500 Ω 1500 Ω	0.12 Ω	10E12 Ω	10E11 Ω	3 pF	0.1 pF
2 Form A (energize to make) Switch No. 6 (1.5KV)	104-2-A-5/6D 104-2-A-12/6D 104-2-A-24/6D	5 12 24	50 Ω 275 Ω 1000 Ω	0.15 Ω	10E12 Ω	10E11 Ω	See Note[3]	See Note[3]

When an internal diode is required, the suffix D is added to the part number as shown in the table.

Note[1] Life expectancy
The life of a reed relay depends upon the switch load and end of life criteria. For example, for an 'end of life' contact resistance specification of 1 Ω, switching low loads (10 V at 10 mA resistive) or when 'cold' switching, typical life is approx 1 x 10^8 ops. At the maximum load (resistive), typical life is 1 x 10^7 ops. In the event of abusive conditions, e.g. high currents due to capacitive inrushes, this figure reduces considerably. Pickering will be pleased to perform life testing with any particular load condition.

Note[2] Capacitance across open switch
The capacitance across the open switch was measured with other connections guarded.

Note[3] Capacitance values
The value will depend upon on the mode of connection/guarding of unused terminals. Please contact technical sales for details.

Mercury Relays

UP

Mercury relays should be mounted vertically with pin 1 uppermost. Pin 1 is marked with a bar on the top face of the relay.

Internal Mu-metal Magnetic Screen

The Series 104 relays are fitted with an internal mu-metal magnetic screen which permits side-by-side stacking.

Main contact:
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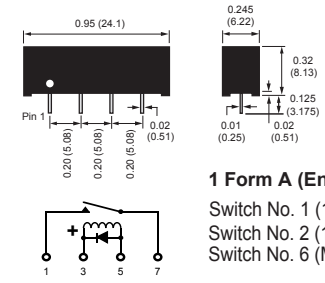
For a full list of agents and representatives visit: **pickeringrelay.com/agents**

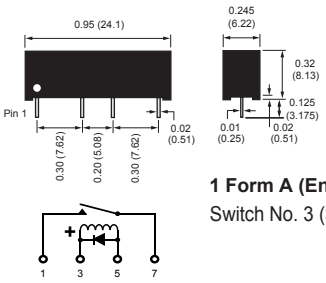
ISO9001 Manufacture of Reed Relays FM 29036

Pin Configuration and Dimensional Data

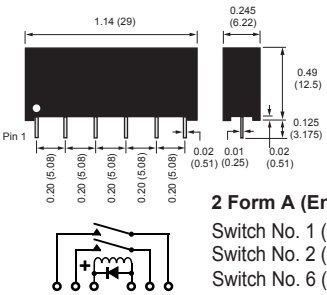
Dimensions in Inches (Millimeters in brackets)



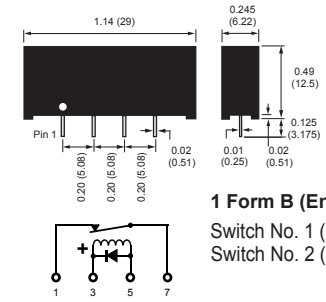
1 Form A (Energize to make)
Switch No. 1 (1 kV stand-off)
Switch No. 2 (1.5 kV stand-off)
Switch No. 6 (Mercury Wetted)



1 Form A (Energize to make)
Switch No. 3 (3 kV stand-off)



2 Form A (Energize to make)
Switch No. 1 (1 kV stand-off)
Switch No. 2 (1.5 kV stand-off)
Switch No. 6 (Mercury Wetted)



1 Form B (Energize to break)
Switch No. 1 (1 kV stand-off)
Switch No. 2 (1.5 kV stand-off)

Important: Where the optional internal diode is fitted or for all Form B types, the correct coil polarity must be observed, as shown by the + symbol on the schematics.

3D Models: Interactive models of the complete range of Pickering relay products can be downloaded from the web site.

Order Code

104 - 1 - A - 5 / 2 D

- Series
- Number of reeds
- Switch form
- Coil voltage
- Switch number (See table adjacent)
- Diode if fitted (Omit if not required)

Help

If you need any technical advice or other help, for example, any special tests that you would like carried out, please do not hesitate to contact our Technical Sales Department. We will always be pleased to discuss Pickering relays with you.
email: techsales@pickeringrelay.com

Please ask us for a FREE evaluation sample.