

Pickering Series 100

Low Thermal EMF SIL/SIP Reed Relays

Direct drive from CMOS

Features

- **SoftCenter®** construction (see adjacent diagram)
- Highest quality instrumentation grade switches
- Thermal EMF about 1 microvolt or less
- Low power consumption, ideal for portable equipment
- Encapsulated in a plastic package with internal mu-metal magnetic screen
- Wide range of switch configurations - 1 Form A, 1 Form B, 2 Form A, 1 Form C
- Two pole relay requires the same board area as the single pole type
- Dry and mercury wetted switches are available with the same pin configuration and footprint
- Insulation resistance greater than $10^{12} \Omega$ for dry Form A devices
- 3, 5, 12 or 24 Volt coils with or without internal diode
- 100% tested for dynamic contact resistance for guaranteed performance

The Pickering Series 100 is a complete range of Single-in-Line (SIL) reed relays primarily intended for direct drive from 4000B CMOS or NMOS logic or similar low current sources. The mercury wetted relays in the range may be driven directly from TTL logic.

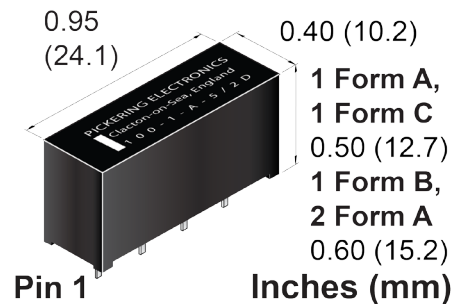
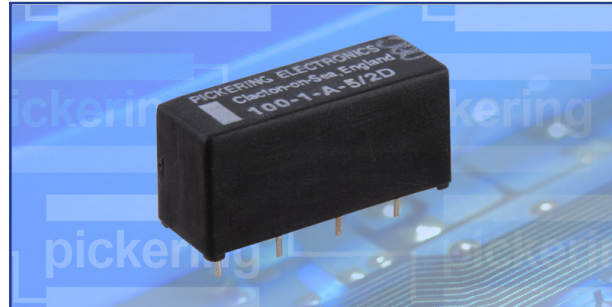
They are also useful for applications where conservation of current is important, for example, battery powered equipment.

The extremely low level of thermal EMF, about 1 microvolt or less, of the dry versions make them ideally suited to applications such as data acquisition or thermocouple switching.

An internal mu-metal magnetic screen is fitted to avoid the effects of magnetic interaction between relays.

If you do not require quite such high coil resistances or if a slightly smaller device is desired, please look also at our Series 101 which may be driven directly by 74HC or 74HCT logic.

Other special parts are also available that may be operated from 3 Volt logic, please contact our Sales Office for further information.



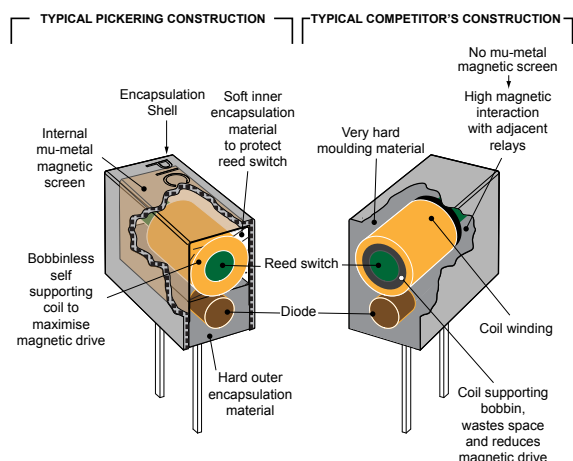
Switch Ratings - Dry switches

- 1 Form A (energize to make), 10 watts at 200V
- 1 Form A (energize to make), 10 watts at 500V
- 1 Form B (energize to break), 10 watts at 200V
- 1 Form C (change-over), 3 watts at 200V
- 2 Form A (energize to make), 10 watts at 200V

Switch Ratings - Mercury Wetted Switches

- 1 Form A (energize to make), 50 watts at 500V
- 1 Form A (Position insensitive), 50 watts at 500V
- 2 Form A (energize to make), 50 watts at 500V

Typical Pickering **SoftCenter®** Construction



Series 100 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	Life expectancy ops typical (see Note ¹ below)	Operate time inc bounce (max)	Release time	Special features
1	A or B	10 W	0.5 A	1.2 A	200	10E9	1.0 ms	1.0 ms	General purpose
2	A	10 W	0.5 A	1.2 A	200	10E9	1.0 ms	1.0 ms	Low level
3	C	3 W	0.25 A	1.2 A	200	10E7	1.0 ms	1.0 ms	Change over
4	A	10 W	0.5 A	1.2 A	500	10E8	1.75 ms	1.75 ms	1000V stand-off

Switch no.2 is particularly good for switching low currents and/or voltages. It is the ideal switch for A.T.E. systems where cold switching techniques are often used. Where higher power levels are involved, switch no.1 is more suitable.

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) General Purpose Switch No. 1	100-1-A-5/1D	5	3300 Ω	0.15 Ω	10E12 Ω	10E12 Ω	3.5 pF	0.1 pF
	100-1-A-12/1D	12	6800 Ω					
	100-1-A-24/1D	24	6800 Ω					
1 Form A (energize to make) Low Level Switch No. 2	100-1-A-3/2D	3	2000 Ω	0.12 Ω	10E12 Ω	10E12 Ω	3.5 pF	0.1 pF
	100-1-A-5/2D	5	3300 Ω					
	100-1-A-12/2D	12	6800 Ω					
1 Form A (energize to make) High Voltage Switch No. 4	100-1-A-5/4D	5	2200 Ω	0.15 Ω	10E12 Ω	10E12 Ω	3.5 pF	0.1 pF
	100-1-A-12/4D	12	6800 Ω					
	100-1-A-24/4D	24	6800 Ω					
1 Form C (change-over) Switch No. 3	100-1-C-5/3D	5	3300 Ω	0.20 Ω	10E12 Ω	10E10 Ω	See Note ³	See Note ³
	100-1-C-12/3D	12	6800 Ω					
	100-1-C-24/3D	24	6800 Ω					
1 Form B (energize to break) General Purpose Switch No. 1	100-1-B-5/1D	5	2700 Ω	0.17 Ω	10E12 Ω	10E12 Ω	See Note ³	See Note ³
	100-1-B-12/1D	12	6000 Ω					
	100-1-B-24/1D	24	6000 Ω					
2 Form A (energize to make) General Purpose Switch No. 1	100-2-A-5/1D	5	2700 Ω	0.20 Ω	10E12 Ω	10E12 Ω	See Note ³	See Note ³
	100-2-A-12/1D	12	6000 Ω					
	100-2-A-24/1D	24	6000 Ω					
2 Form A (energize to make) Low Level Switch No. 2	100-2-A-5/2D	5	2700 Ω	0.18 Ω	10E12 Ω	10E12 Ω	See Note ³	See Note ³
	100-2-A-12/2D	12	6000 Ω					
	100-2-A-24/2D	24	6000 Ω					

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

Mercury Reed: Series 100 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	Life expectancy ops typical (see Note ¹ below)	Operate time (max)	Release time	Special features
6	A	50 W	2 A	3 A	500	10E8	2.0 ms	2.0 ms	Standard Mercury
8	A	50 W	2 A	3 A	500	10E8	2.0 ms	2.0 ms	Position Insensitive

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	100-1-A-5/6D	5	500 Ω	0.100 Ω	10E12 Ω	10E11 Ω	5 pF	0.3 pF
	100-1-A-12/6D	12	2000 Ω					
	100-1-A-24/6D	24	3300 Ω					
1 Form A (energize to make) Position Insensitive Switch No. 8	100-1-A-5/8D	5	370 Ω	0.120 Ω	10E12 Ω	10E11 Ω	5 pF	0.3 pF
	100-1-A-12/8D	12	1000 Ω					
	100-1-A-24/8D	24	3300 Ω					
2 Form A (energize to make) Switch No. 6	100-2-A-5/6D	5	370 Ω	0.150 Ω	10E12 Ω	10E11 Ω	See Note ³	See Note ³
	100-2-A-12/6D	12	1000 Ω					
	100-2-A-24/6D	24	3300 Ω					

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

Note¹ 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 1×10^9 ops. At the maximum load (resistive), typical life is 1×10^7 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.

Note² Capacitance across open switch

The capacitance across the open switch was measured with other connections guarded.

Note³ Capacitance values

The value will depend upon on the mode of connection/guarding of unused terminals. Please contact technical sales for details.

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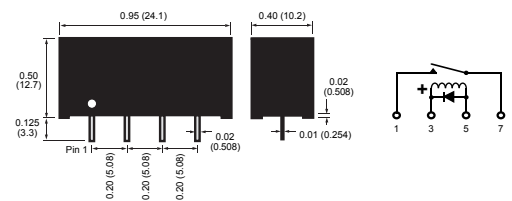


ISO9001 Manufacture of
Reed Relays FM 29036

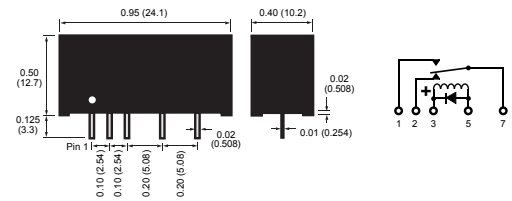
Pin Configuration and Dimensional Data

Dimensions in Inches (Millimeters in brackets)

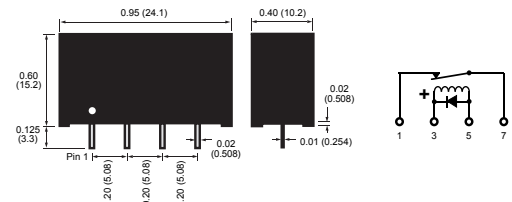
1 Form A (Energize to make)



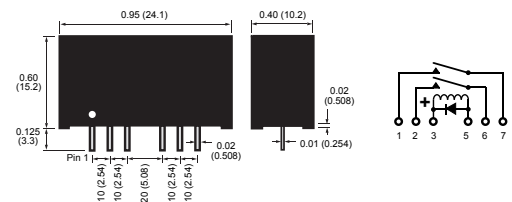
1 Form C (Changeover)



1 Form B (Energize to break)



2 Form A (Energize to make)



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.

Mercury Relays

With the exception of the position insensitive type, mercury relays should be mounted vertically with pin 1 uppermost.

Internal Mu-metal Magnetic Screen

The Series 100 relays are fitted with an internal mu-metal magnetic screen which permits side-by-side stacking on 0.4 inches pitch.

Order Code

100 - 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.