


## CMOS Drive SIL/SIP Reed Relays

Direct drive from 74HC or HCT  
Stacking on 0.3 inches pitch

Products highlighted  are available from Rapid Electronics  
[www.rapidonline.com](http://www.rapidonline.com)

### Features

- **SoftCenter®** construction (see adjacent diagram)
- Highest quality instrumentation grade switches
- Board space may be saved by eliminating the need for drivers
- Direct drive from 74HC logic
- Encapsulated in 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

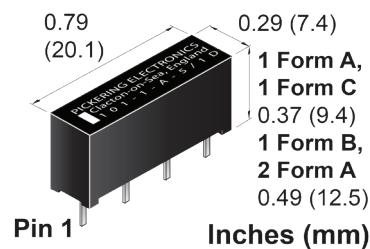
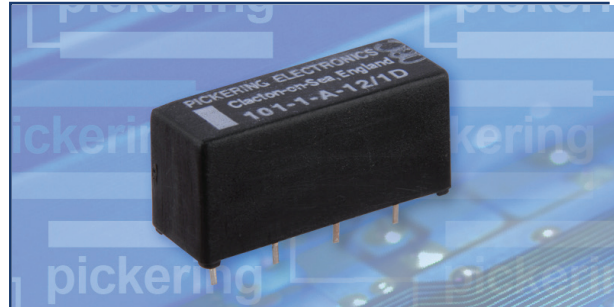
The Series 101 have very high coil resistances. 5 Volt dry versions may be driven directly from 74HC or 74HCT logic without the need for additional drivers.

74HC logic will drive up to 4mA at 5 Volts, therefore a coil resistance of 1600 ohms is desirable to avoid running the IC at its maximum rating; 1600 ohms is the coil resistance of the single pole dry Series 101. They may be stacked on 0.3 inches pitch (7.6mm) and as they have an internal mu-metal magnetic screen, there is no risk of magnetic interaction problems.

Both dry and mercury wetted switches are available in a range of configurations and coil voltages. The switches in the 2 Form A version are vertically stacked so the relay requires the same board area as the 1 Form A type.

A special 1 Form A, 5 Volt version is available with an even higher coil resistance of 3000 ohms. This is particularly suited to applications such as battery powered portable equipment as it requires a coil current of only 1.7 mA. This part, the 101-1-A-5/17 or 17D has the advantage of a lower level of thermal EMF of 3 microvolts or less.

Other special parts are also available that may be operated from 3 Volt logic.



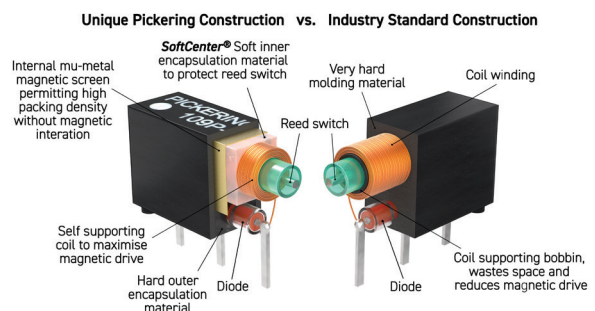
### Switch Ratings - Dry switches

- Single or Double pole Form A (Energize to Make) relays. Up to 1 Amp switching at 20 Watts
- Single pole Form B (Energize to Break) relays. Up to 1 Amp switching at 20 Watts
- Single pole Form C (Change-over) relays. 0.25 Amps switching at 3 Watts

### Switch Ratings - Mercury Wetted Switches

- Single or Double pole Form A (Energize to Make) relays. 2 Amp switching at 50 Watts
- Single pole, Non Position Sensitive, Form A (Energize to Make) relays. 2 Amp switching at 50 Watts

### Typical Pickering **SoftCenter®** Construction



**Series 101 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 <sup>1</sup> below)	Operate time inc bounce (max)	Release time	Special features
1	A or B	15 W ( 5 V Versions) 20 W (12 & 24 V)	1.0 A	1.2 A	200	10 <sup>9</sup>	1.0 ms	0.75 ms	General purpose
2	A	10 W	0.5 A	1.2 A	200	10 <sup>9</sup>	1.0 ms	0.75 ms	Low level
3	C	3 W	0.25 A	1.2 A	200	10 <sup>7</sup>	1.25 ms	1.0 ms	Change over
4	A	10 W	0.5 A	1.2 A	400	10 <sup>8</sup>	1.0 ms	0.75 ms	500V 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 <sup>2</sup> below)	
					Switch to coil	Across switch	Closed switch to coil	Across open switch
1 Form A (energize to make) General Purpose Switch No. 1	101-1-A-3/1D	3	800 Ω	0.15 Ω	10 <sup>12</sup> Ω	10 <sup>12</sup> Ω	2.5 pF	0.1 pF
	101-1-A-5/1D	5	1600 Ω					
	101-1-A-12/1D	12	6000 Ω					
	101-1-A-24/1D	24	6000 Ω					
1 Form A (energize to make) Low Level Switch No. 2	101-1-A-3/2D	3	1600 Ω	0.12 Ω	10 <sup>12</sup> Ω	10 <sup>12</sup> Ω	2.5 pF	0.1 pF
	101-1-A-5/2D	5	1600 Ω					
	101-1-A-12/2D	12	6000 Ω					
	101-1-A-24/2D	24	6000 Ω					
1 Form A (energize to make) High Voltage Switch No. 4	101-1-A-5/4D	5	1600 Ω	0.15 Ω	10 <sup>12</sup> Ω	10 <sup>12</sup> Ω	2.5 pF	0.1 pF
	101-1-A-12/4D	12	6000 Ω					
	101-1-A-24/4D	24	6000 Ω					
1 Form C (change-over) Switch No. 3	101-1-C-3/3D	3	700 Ω	0.20 Ω	10 <sup>12</sup> Ω	10 <sup>10</sup> Ω	See Note <sup>3</sup>	See Note <sup>3</sup>
	101-1-C-5/3D	5	1600 Ω					
	101-1-C-12/3D	12	6000 Ω					
	101-1-C-24/3D	24	6000 Ω					
1 Form B (energize to break) General Purpose Switch No. 1	101-1-B-5/1D	5	3000 Ω	0.15 Ω	10 <sup>12</sup> Ω	10 <sup>12</sup> Ω	2.5 pF	0.1 pF
	101-1-B-12/1D	12	6000 Ω					
2 Form A (energize to make) General Purpose Switch No. 1	101-2-A-5/1D	5	1000 Ω	0.17 Ω	10 <sup>12</sup> Ω	10 <sup>12</sup> Ω	See Note <sup>3</sup>	See Note <sup>3</sup>
	101-2-A-12/1D	12	3000 Ω					
	101-2-A-24/1D	24	6000 Ω					
2 Form A (energize to make) Low Level Switch No. 2	101-2-A-3/2D	3	1000 Ω	0.15 Ω	10 <sup>12</sup> Ω	10 <sup>12</sup> Ω	See Note <sup>3</sup>	See Note <sup>3</sup>
	101-2-A-5/2D	5	1000 Ω					
	101-2-A-12/2D	12	3000 Ω					
	101-2-A-24/2D	24	6000 Ω					
1 Form A (energize to make) Special Extra Sensitive Version Low Level Switch No. 2	101-1-A-5/17D	5	3000 Ω	0.12 Ω	10 <sup>12</sup> Ω	10 <sup>12</sup> Ω	2.5 pF	0.1 pF

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

**Mercury Reed: Series 101 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 <sup>1</sup> below)	Operate time (max)	Release time	Special features
6	A	50 W	2 A	3 A	500	10 <sup>8</sup>	1.75 ms	1.75 ms	Standard Mercury
8	A	50 W	2 A	3 A	500	10 <sup>8</sup>	1.75 ms	1.75 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 <sup>2</sup> below)	
					Switch to coil	Across switch	Closed switch to coil	Across open switch
1 Form A (energize to make) Switch No. 6	101-1-A-5/6D	5	375 Ω	0.075 Ω	10 <sup>12</sup> Ω	10 <sup>11</sup> Ω	4.5 pF	0.08 pF
	101-1-A-12/6D	12	1000 Ω					
	101-1-A-24/6D	24	3000 Ω					
1 Form A (energize to make) Position Insensitive Switch No. 8	101-1-A-5/8D	5	375 Ω	0.100 Ω	10 <sup>12</sup> Ω	10 <sup>11</sup> Ω	4.5 pF	0.08 pF
	101-1-A-12/8D	12	1000 Ω					
	101-1-A-24/8D	24	3000 Ω					
2 Form A (energize to make) Switch No. 6	101-2-A-5/6D	5	150 Ω	0.100 Ω	10 <sup>12</sup> Ω	10 <sup>11</sup> Ω	See Note <sup>3</sup>	See Note <sup>3</sup>
	101-2-A-12/6D	12	650 Ω					
	101-2-A-24/6D	24	2000 Ω					

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

**Note<sup>1</sup> 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<sup>9</sup> ops. At the maximum load (resistive), typical life is 1 x 10<sup>7</sup> 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<sup>2</sup> Capacitance across open switch**

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

**Note<sup>3</sup> 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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For a full list of agents and representatives visit: [pickeringrelay.com/agents](http://pickeringrelay.com/agents)

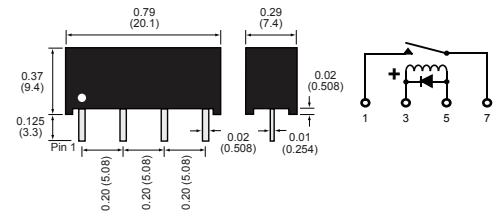


ISO9001 Manufacture of Reed Relays FM 29036

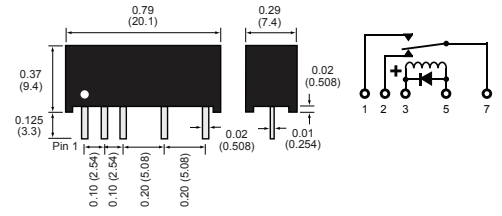
**Pin Configuration and Dimensional Data**

Dimensions in Inches (Millimeters in brackets)

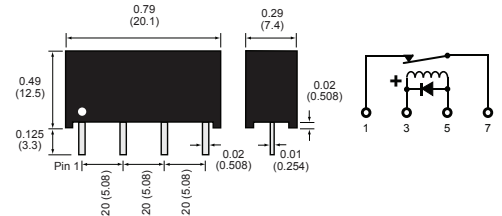
**1 Form A (Energize to make)**



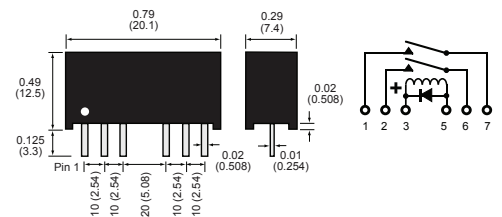
**1 Form C (Changeover)**



**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**

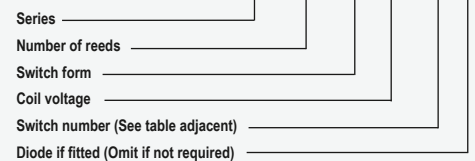
With the exception of the position insensitive type, mercury relays should be mounted vertically with pin 1 uppermost.

**Internal Mu-metal Magnetic Screen**

The Series 101 relays are fitted with an internal mu-metal magnetic screen which permits side-by-side stacking on 0.3 inches pitch.

**Order Code**

101 - 1 - A - 5 / 2 D



**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](mailto:techsales@pickeringrelay.com)

**Please ask us for a FREE evaluation sample.**