

Dual-in-Line DIL/DIP Reed Relays

Up to 10 Watts switching for dry reed

Features

- 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
- Dry and mercury wetted switches are available with the same pin configuration and footprint (see "A useful tip" below)
- 5, 12 and 24 Volt coils with or without internal diode

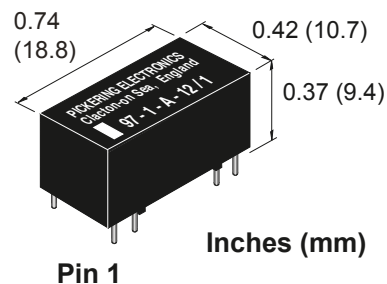
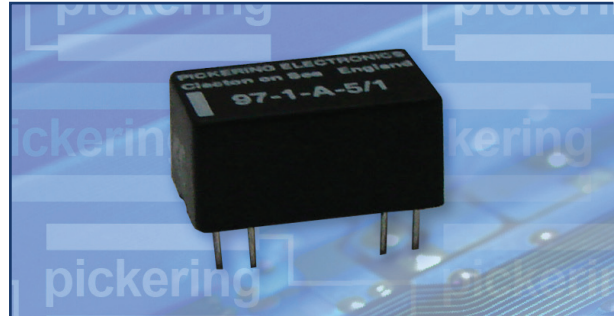
The Series 97 is a range of reed relays with pins in the popular Dual-in-Line format.

Being encapsulated in a plastic package using a very high resistivity epoxy resin gives the device several advantages over the more usual moulded construction. The reed switches are not subjected to the high temperatures and pressures of the transfer moulding process with the inherent risk of damage to the sensitive glass to metal seals. The construction incorporates a mu-metal wrap around the operating coil to eliminate magnetic interaction problems. Higher drive levels are achieved, allowing a full range of switching configurations including 1 or 2 Form A (energize to make), Form C (change-over) and Form B (energize to break) in both dry and mercury wetted types.

If higher coil resistance levels are required, please look at our Series 98 DIL relays which may be driven directly from 74HC or 74HCT CMOS logic.

A useful tip

If there is a chance that you might want to use mercury wetted relays instead of dry relays at a later date, for example to increase switch ratings, lay out the PCB initially as though for the mercury wetted type with pins 1 and 14 uppermost. This allows upgrading later without PCB changes. The mercury versions in the Series 97 have identical pin configurations to the dry types.



Switch Ratings - Dry switches

- 1 Form A (energize to make), 10 watts at 200V
- 1 Form A (energize to make), 10 watts at 300V
- 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

Dry Reed - Series 97 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)	Special features
1	A or B	10 W	0.5 A	1.2 A	200	10 ⁸	General purpose
3	C	3 W	0.25 A	1.2 A	200	10 ⁷	Change over
4	A	10 W	0.5 A	1.2 A	300	10 ⁸	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.

Operating voltages

Coil voltage - nominal	Must operate voltage - maximum at 25°C	Must release voltage - minimum at 25°C
5 V	3.75 V	0.5 V
12 V	9 V	1.2 V
24 V	18 V	2.4 V

Dry Relay - Coil data and type numbers

Device type	Type Number	Coil (V)	Coil resistance	Max. contact resistance (initial)
1 Form A (energize to make) General Purpose Switch No. 1	97-1-A-5/1D	5	500 Ω	0.15 Ω
	97-1-A-12/1D	12	1000 Ω	
	97-1-A-24/1D	24	3000 Ω	
1 Form A (energize to make) High Voltage Switch No. 4	97-1-A-5/4D	5	500 Ω	0.15 Ω
	97-1-A-12/4D	12	1000 Ω	
	97-1-A-24/4D	24	3000 Ω	
1 Form C (change-over) Switch No. 3	97-1-C-5/3D	5	500 Ω	0.20 Ω
	97-1-C-12/3D	12	1000 Ω	
	97-1-C-24/3D	24	3000 Ω	
1 Form B (energize to break) General Purpose Switch No. 1	97-1-B-5/1D	5	1000 Ω	0.15 Ω
	97-1-B-12/1D	12	3000 Ω	
	97-1-B-24/1D	24	3000 Ω	
2 Form A (energize to make) General Purpose Switch No. 1	97-2-A-5/1D	5	500 Ω	0.17 Ω
	97-2-A-12/1D	12	1000 Ω	
	97-2-A-24/1D	24	3000 Ω	

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

Mercury Reed: Series 97 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)	Special features
6	A	50 W	2 A	3 A	500	10 ⁸	Standard Mercury

Mercury Relay: Coil data and type numbers

Device type	Type Number	Coil (V)	Coil resistance	Max. contact resistance (initial)
1 Form A (energize to make) Switch No. 6	97-1-A-5/6D	5	140 Ω	0.075 Ω
	97-1-A-12/6D	12	500 Ω	
	97-1-A-24/6D	24	1500 Ω	

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

Environmental specification

Standard operating temperature range: -20 to +85 °C.

Note: The upper temperature limit can be extended to +125 °C if the coil drive voltage is increased to accommodate the resistance/temperature coefficient of the copper coil winding. This is approximately 0.4% per °C. This means that at 125 °C the coil drive voltage will need to be increased by approximately $40 \times 0.4 = 16\%$ to maintain the required magnetic drive level. Please contact sales@pickeringrelay.com for assistance if necessary.

Vibration: Maximum 20 G **Shock:** Maximum 50 G

Note! 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 1×10^8 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.

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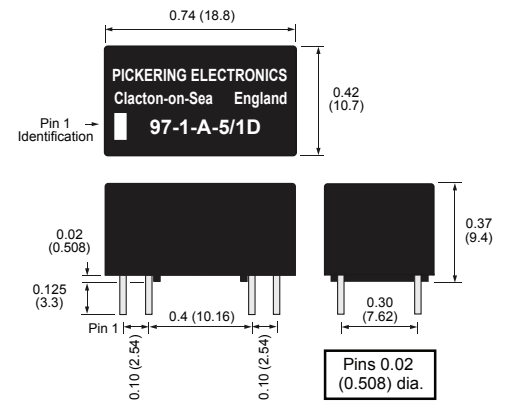
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For a full list of agents and representatives visit: pickeringrelay.com/agents

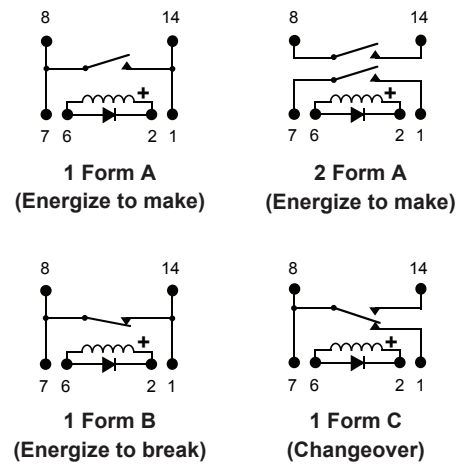


Pin Configuration and Dimensional Data

Dimensions in Inches (Millimeters in brackets)



Schematics are shown from UNDERNEATH the relay.



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 Pickering relay products can be downloaded here: pickeringrelay.com/3d-models

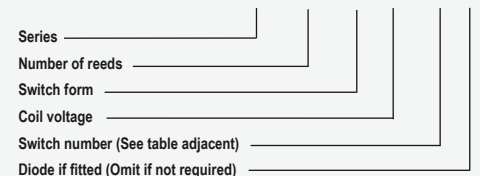
Mercury Relays



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

Order Code

97 - 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

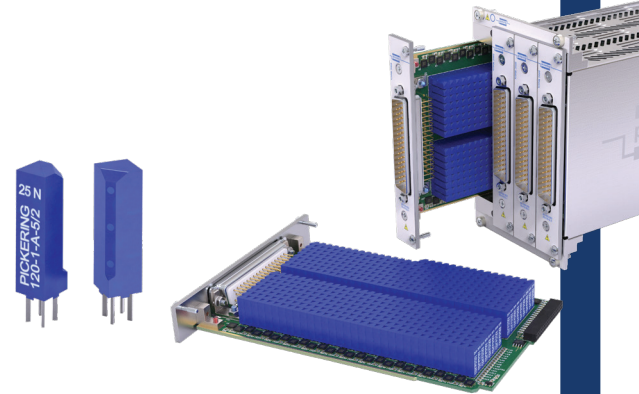
Please ask us for a FREE evaluation sample.

Why Pickering Electronics?

Because Quality Matters

Pickering Electronics continue to lead the high-end reed relay market through innovative product design, high performance components and exceptional quality control.

Part of the privately-owned Pickering Group, company operations employ around 200 staff across quality accredited factories in the UK and Czech Republic, supplying demanding Aerospace, Infrastructure, Test & Measurement and ATE applications worldwide.



Reliability through quality – 50 Year reputation for exceptional product life longevity derived from continuous staged manufacturing inspection, strenuous full range thermal cycling and 100% testing for all operating parameters.



Reliability through design – Environmentally compliant designs and unique Softcenter® technology combine to create an optimised assembly that minimises internal lifetime stresses, extending working life and contact stability.



Switching Performance – Compared with common bobbin based products, our formless coil constructions maximise magnetic efficiency resulting in faster switching speeds, optimal switching action and several orders of extended lifetime at operational extremes.



Cost & Size Performance – Industry leading mu-metal magnetically screened packages deliver ultra-high PCB packing densities, saving significant cost and space.



Designers toolkit – Free samples, worldwide tech support and an unrivalled range of specialist and custom devices, Pickering engineers work alongside customers to deliver problem solving solutions for complex and challenging applications.



Quality Assurance and compliance - certified to ISO 9001-2015 and audited by the British Standards Institution. Committed to RoHS & REACH compliance.



Distribution – An established global network of group sales offices supported by local agents and distributors, Pickering operate an established logistical supply chain worldwide.



The Pickering Group – Employing around 400 staff across 8 sites in the UK and CZ, Pickering Electronics are a key technology partner for Pickering Interfaces and Pickering Connect, supporting the design and manufacture of high performance modular signal switching and simulation systems.