

Pickering Series 86, 87

High Sensitivity Reed Relays

Dry and mercury wetted

Features

- Encapsulated in a plastic package with internal mu-metal magnetic screen
- Wide range of switch configurations
- Dry and mercury wetted switches are available with the same pin configuration and footprint (see "A useful tip" below)
- 5, 12 or 24 Volt coils with or without internal diode

These ranges of reed relays are essentially the same as the dry Series 80 and 85 and the mercury wetted Series 88 and 89 but with coil resistances between 2 and 3 times higher. This feature is particularly useful when using large numbers of relays, to reduce overall current requirements and heating effects, or when the available coil drive power is restricted, for example, in battery operated equipment.

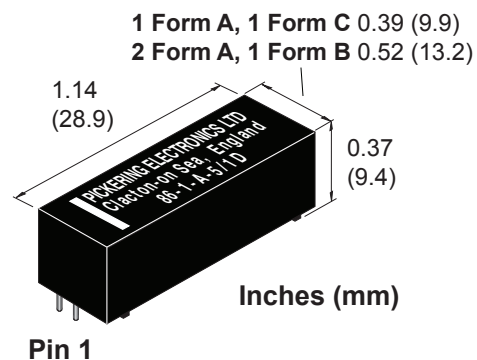
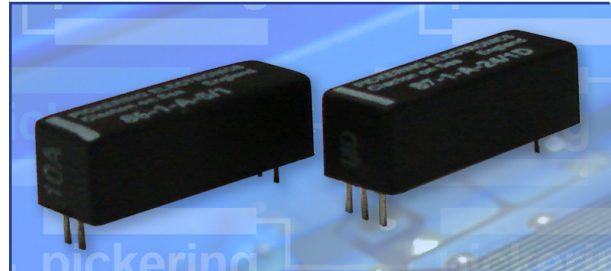
Many special resistances are available, and relays can be designed to customers specific requirements.

These Pickering reed relays fit straight onto P.C. boards with pins on 0.1 inch grid. They are completely protected, being encapsulated with plastic covers. All relays are fitted with internal magnetic screens to avoid stray magnetic interaction between adjacent relays.

The Series 86 and 87 are electrically identical ranges but offer alternative pin configurations. These are shown overleaf.

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. This allows uprating later without PCB changes.



Switch Ratings - Dry Switches

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

Series 86, 87 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	10E8	General purpose
7	C	3 W	0.25 A	1.2 A	200	10E7	Change over

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

Series 86, 87 Coil data and type numbers

Device type	Type Number Series 80	Type Number Series 85	Coil (V)	Coil resistance	Max. contact resistance (initial)
1 Form A (energize to make) General Purpose Switch No. 1	86-1-A-5/1D	87-1-A-5/1D	5	1000 Ω	0.15 Ω
	86-1-A-12/1D	87-1-A-12/1D	12	3000 Ω	
	86-1-A-24/1D	87-1-A-24/1D	24	6000 Ω	
1 Form B (energize to make) General Purpose Switch No. 1	86-1-B-5/1D	87-1-B-5/1D	5	1000 Ω	0.15 Ω
	86-1-B-12/1D	87-1-B-12/1D	12	3000 Ω	
	86-1-B-24/1D	87-1-B-24/1D	24	6000 Ω	
1 Form C (change-over) Switch No. 7	86-1-C-5/7D	87-1-C-5/7D	5	1000 Ω	0.20 Ω
	86-1-C-12/7D	87-1-C-12/7D	12	3000 Ω	
	86-1-C-24/7D	87-1-C-24/7D	24	6000 Ω	
2 Form A (energize to make) General Purpose Switch No. 1	86-2-A-5/1D	87-2-A-5/1D	5	1000 Ω	0.15 Ω
	86-2-A-12/1D	87-2-A-12/1D	12	3000 Ω	
	86-2-A-24/1D	87-2-A-24/1D	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 86, 87 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
8	A	50 W	2 A	3 A	500	10E8	Standard Mercury

Mercury Relay: Series 86, 87 Coil data and type numbers

Device type	Type Number Series 88	Type Number Series 89	Coil (V)	Coil resistance	Max. contact resistance (initial)
1 Form A (energize to make) Switch No. 8	86-1-A-5/8D	87-1-A-5/8D	5	350 Ω	0.07 Ω
	86-1-A-12/8D	87-1-A-12/8D	12	1000 Ω	
	86-1-A-24/8D	87-1-A-24/8D	24	3000 Ω	

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

Environmental specification

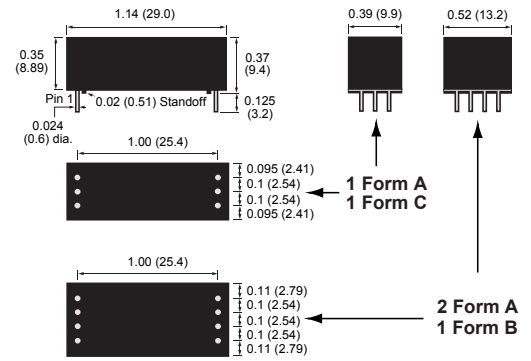
Standard operating temperature range: -20 to +85 °C.
Note: The upper temperature limit can be extended to +125 °C if the coil drive voltage is increased to accommodate the resistance/temperature coefficient of the copper coil winding. This is approximately 0.4% per °C. This means that at 125 °C the coil drive voltage will need to be increased by approximately 40 x 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 x 10⁸ ops. At the maximum load (resistive), typical life is 1 x 10⁷ 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.

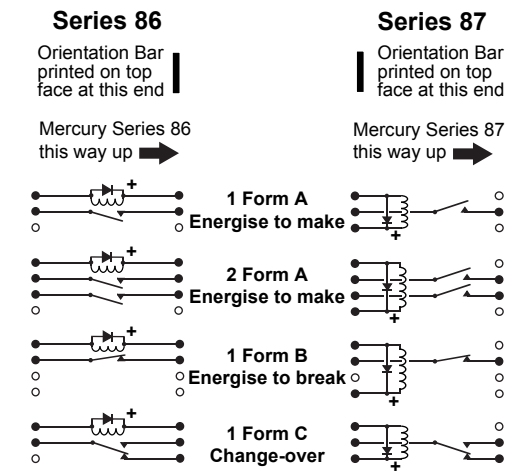
Dimensional Data

Dimensions in Inches (Millimeters in brackets)



Pin Configurations

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 the complete range of Pickering relay products can be downloaded from the web site.

Mercury Wetted Versions

Mercury wetted relays should be mounted vertically in the direction of the arrow printed on the package.

Order Code

86 - 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.

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