Pickering Series 98

CMOS Drive DIL/DIP Reed Relays
Direct drive from 74HC or HCT

Features

- **SoftCenter®** construction
- Pin compatible with standard DIL relays
- Board space may be saved by eliminating drivers
- 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
- 100% tested for dynamic contact resistance for guaranteed performance

The Pickering Series 98 is a range of Dual-In-Line relays, electrically equivalent to the Series 101 CMOS drive, Single-In-Line types, but pin compatible with standard DIL relays. The range features very high coil resistances, the 5 volt dry devices may be driven directly from 74HC or 74HCT logic without the need for additional drivers. Naturally, high resistance 12 and 24 volt coils are also available in this series.

74HC logic will drive up to 4mA at 5 volts which means that a nominal coil resistance of 1600 ohms is required to avoid running the IC at its maximum rating; 1600 ohms is the coil resistance of the single pole dry Series 98. A special model with an even higher coil resistance of 3000 ohms is also available, our type number 98-1-A-5/17D (the D suffix indicates an internal diode).

It is often possible to replace TTL ICs with their equivalent CMOS ones and replace standard DIL relays with Pickering Series 98, to obtain the benefits of CMOS without any circuit or PCB redesign.

The range like its SIL equivalent has an internal mu-metal screen to enable high packing density with negligible interaction between adjacent devices.

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 uprating later without PCB changes. The mercury versions in the Series 98 have identical pin configurations to the dry types.

### Switch Ratings - Dry switches
- 1 Form A (energize to make), 10 or 15 watts at 200V
- 1 Form A (energize to make), 10 watts at 300V
- 1 Form B (energize to break), 15 watts at 200V
- 1 Form C (change-over), 3 watts at 200V
- 2 Form A (energize to make), 10 or 15 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
Dry Relay - Coil data and type numbers

<table>
<thead>
<tr>
<th>Device type</th>
<th>Type Number</th>
<th>Coil (Ω)</th>
<th>Max. resistance</th>
<th>Max. switching current</th>
<th>Max. switching voltage (V)</th>
<th>Life expectancy (see Note1 below)</th>
<th>Insulation resistance (minimum)</th>
<th>Capacitance (typical) (see Note2 below)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Form A (energize to make)</td>
<td>98-1-A-5/1D</td>
<td>5</td>
<td>98-1-A-12/1D</td>
<td>12</td>
<td>24</td>
<td>1600 0</td>
<td>0.15 Ω</td>
<td>10^2 Q</td>
</tr>
<tr>
<td>1 Form B (energize to break)</td>
<td>98-1-B-5/1D</td>
<td>5</td>
<td>98-1-B-12/1D</td>
<td>12</td>
<td>24</td>
<td>1600 0</td>
<td>0.15 Ω</td>
<td>10^2 Q</td>
</tr>
<tr>
<td>2 Form A (energize to make)</td>
<td>98-2-A-5/3D</td>
<td>5</td>
<td>98-2-A-12/3D</td>
<td>12</td>
<td>24</td>
<td>1600 0</td>
<td>0.15 Ω</td>
<td>10^2 Q</td>
</tr>
</tbody>
</table>

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

Mercury Relay: Series 98 switch ratings

<table>
<thead>
<tr>
<th>Switch No</th>
<th>Switch form</th>
<th>Power rating</th>
<th>Max. switching current</th>
<th>Max. switching voltage (V)</th>
<th>Life expectancy (see Note1 below)</th>
<th>Insulation resistance (minimum)</th>
<th>Capacitance (typical) (see Note2 below)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>A</td>
<td>50 W</td>
<td>2 A</td>
<td>3 A</td>
<td>500</td>
<td>10^4</td>
<td>1.75 ms</td>
</tr>
<tr>
<td>8</td>
<td>A</td>
<td>50 W</td>
<td>2 A</td>
<td>3 A</td>
<td>500</td>
<td>10^4</td>
<td>1.75 ms</td>
</tr>
</tbody>
</table>

Mercury Relay: Coil data and type numbers

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<th>Max. resistance</th>
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</thead>
<tbody>
<tr>
<td>1 Form A (energize to make)</td>
<td>98-1-A-5/1D</td>
<td>5</td>
<td>98-1-A-12/1D</td>
<td>12</td>
<td>24</td>
<td>1600 0</td>
<td>0.15 Ω</td>
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</tr>
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</table>

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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) or ‘cold’ switching, typical life is approx 1 x 10^6 ops. At the maximum load (resistive), typical life is 1 x 10^5 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 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

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.

Order Code
98 - 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.