Pickering Series 131

High Voltage Mini-SIL Single-in-Line SIL/SIP Reed Relays
Minimum 1500V Stand-off

Features
- Choice of 3, 5 or 12 Volt coils, with optional internal diode
- 1 Form A (energize to make) SPST N.O. configuration
- Smallest high voltage reed relay currently available
- Switching up to 0.7 Amps, 10 Watts
- Internal mu-metal magnetic screen allows side by side stacking without magnetic interaction
- 100% tested for dynamic contact resistance
- Unique SoftCenter® construction (see diagram below)
- Highest quality vacuumed, sputtered ruthenium reed switches
- Ideal for cable testers, mixed signal/semiconductor testers, backplane testers, high voltage instrumentation, in-circuit test equipment or other applications where high voltage capability is required.

The Pickering Series 131 is a new range of very small Single-in-Line Reed Relays intended for voltages very much higher than standard small SIL relays. The vacuumed, sputtered ruthenium reed switches have a superb low level performance also, which makes them an ideal choice where a wide range of signals are involved.

The range is based on the long established Series 113 style of plastic package with an internal mu-metal magnetic screen which allows high packing density and are made using Pickering’s SoftCenter® construction.

Application Note:
For stand-off voltages at the upper range of the specification; increases in the contact resistance at low signal levels may be observed. This is a characteristic of the switch. For new applications or for further information please contact our Technical department.
### Series 131 switch ratings - The contact ratings for each switch type are shown below:

<table>
<thead>
<tr>
<th>Switch No</th>
<th>Switch form</th>
<th>Power rating</th>
<th>Max. switching current</th>
<th>Max. switching volts (see Note 1)</th>
<th>Min. stand-off volts</th>
<th>Life expectancy ops typical (see Note 2) below</th>
<th>Operate time inc bounce (max)</th>
<th>Release time</th>
<th>Special features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>10 W</td>
<td>0.7 A</td>
<td>1.25 A</td>
<td>1000</td>
<td>1500</td>
<td>10 ms</td>
<td>0.2 ms</td>
<td>High voltage</td>
</tr>
</tbody>
</table>

**Operating voltages**

<table>
<thead>
<tr>
<th>Coil voltage</th>
<th>Must operate voltage - maximum at 25°C</th>
<th>Must release voltage - minimum at 25°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 V</td>
<td>2.25 V</td>
<td>0.3 V</td>
</tr>
<tr>
<td>5 V</td>
<td>3.75 V</td>
<td>0.5 V</td>
</tr>
<tr>
<td>12 V</td>
<td>9 V</td>
<td>1.2 V</td>
</tr>
</tbody>
</table>

### Coil data and type numbers

<table>
<thead>
<tr>
<th>Device type</th>
<th>Type Number</th>
<th>Coil (V)</th>
<th>Coil resistance</th>
<th>Max. contact resistance (initial)</th>
<th>Insulation resistance (minimum)</th>
<th>Capacitance (typical) (see Note 2) below</th>
<th>Switch across switch</th>
<th>Across open switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Form A (energize to make)</td>
<td>131-1-A-3/1DR</td>
<td>3</td>
<td>100 Ω</td>
<td>0.17 Ω</td>
<td>10³ Ω</td>
<td>10³ Ω</td>
<td>2.5 pF</td>
<td>0.1 pF</td>
</tr>
<tr>
<td></td>
<td>131-1-A-5/1DR</td>
<td>5</td>
<td>250 Ω</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>131-1-A-12/1DR</td>
<td>12</td>
<td>750 Ω</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When an internal diode is required, the suffix D is added to the part number as shown in the table. When red printing is required, the suffix R 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 1** Switching Voltage

This high voltage rating is for RESISTIVE loads only. At these high voltages, even stray capacitance can generate very high current pulses, which can damage the contact plating causing welding of the reed switch. If there is capacitance in circuit, provision should be made to limit the surge, to within the current and power ratings of the relay.

**Note 2** 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 10⁶ ops. At the maximum load (resistive), typical life is 1 x 10⁴ 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 3** Capacitance across open switch

This is measured with all other component leads connected to the guard terminal of the measuring bridge.

**Note 4** Contact Resistance

As part of our continuous product evaluation program Pickering have identified a characteristic with our Series 131. For stand-off voltages at the upper range of the specification increases in the contact resistance at low signal levels may be observed. This characteristic has always been present and if an application has used these parts and not been affected we do not believe any action needs to be taken.

For new applications or for further information please contact our Technical department.

**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

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**Pin Configuration and Dimensional Data**

Dimensions in inches (Millimeters in brackets)

**Order Code**

### 3D Models: Interactive models of the complete range of Pickering relay products can be downloaded from the web site.

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