Pickering Series 105

Single-in-Line SIL/SIP Reed Relays

Up to 20 Watts switching for Dry Reed Relays
Up to 50 Watts switching for Mercury Reed Relays

Features

- **SoftCenter®** construction (see adjacent diagram)
- Highest quality instrumentation grade switches
- 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
- 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. (see "A useful tip" below)
- Insulation resistance greater than $10^{12} \, \Omega$ for dry Form A devices
- 3, 5, 12 and 24 Volt coils with or without internal diode
- 100% tested for dynamic contact resistance for guaranteed performance

The Series 105 is a range of Single-in-Line reed relays, available with a wide variety of switching configurations and switch types, including mercury wetted versions. They feature internal mu-metal magnetic screens which allow high packing density without the risk of magnetic interaction problems.

The Pickering Series 100, 101, 103, 106, 107 and 108 all have the same pin locations as the Series 105. If a reduced coil power is desired, please consider our Series 100 and 101 which may be driven directly from CMOS logic. If a higher packing density is required, smaller devices are available in other Pickering SIL ranges.

In addition to the relays shown on this brochure, many other special types are manufactured to meet customers specific requirements. Please contact our technical sales department for further information or samples.

**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 pin 1 uppermost. This allows uprating later without PCB changes. The mercury versions in the Series 105 have identical pin configurations to the dry types.

The 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

The 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**

Unique Pickering Construction vs. Industry Standard Construction

- Internal mu-metal magnetic screen permitting high packing density without magnetic interaction
- Self supporting coil to maximize magnetic drive
- Hard outer encapsulation material
- SoftCenter® Soft inner encapsulation material to protect need switch
- Very hard molding material
- Coil supporting bobbins, wastes space and reduces magnetic drive
- Coil winding

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

For FREE evaluation samples go to: pickeringrelay.com/samples

pickeringrelay.com
Series 105 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. switch current</th>
<th>Max. switching volts</th>
<th>Life expectancy ops typical (see Note2 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 or B</td>
<td>15 W (9 V Versions) 20 W (12 &amp; 24 V)</td>
<td>1.0 A 1.2 A 200 10 A 200 10 A</td>
<td>2.5 pF 0.5 ms 10 A 10 A 10 A 10 A</td>
<td>1.0 ms 0.5 ms 2.5 pF 0.1 pF</td>
<td>0.2 ms General purpose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>10 W</td>
<td>0.5 A 1.2 A 200 10 A 200 10 A</td>
<td>2.5 pF 0.5 ms 10 A 10 A 10 A 10 A</td>
<td>1.0 ms 0.5 ms 2.5 pF 0.1 pF</td>
<td>0.2 ms Low level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>C</td>
<td>3 W</td>
<td>0.25 A 1.2 A 200 10 A 200 10 A</td>
<td>2.5 pF 0.5 ms 10 A 10 A 10 A 10 A</td>
<td>1.0 ms 0.5 ms 2.5 pF 0.1 pF</td>
<td>0.2 ms Change over</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>A</td>
<td>10 W</td>
<td>0.5 A 1.2 A 200 10 A 200 10 A</td>
<td>2.5 pF 0.5 ms 10 A 10 A 10 A 10 A</td>
<td>1.0 ms 0.5 ms 2.5 pF 0.1 pF</td>
<td>0.2 ms 500 V stand-off</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

Dry Relay - 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 Note2 below)</th>
<th>Special features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Form A (energize to make)</td>
<td>General Purpose Switch No. 1</td>
<td>105-1-A-5/1D 105-1-A-12/1D 105-1-A-24/1D</td>
<td>5 12 24</td>
<td>500 Ω 1000 Ω 3000 Ω</td>
<td>0.15 Ω 10 Ω 10 Ω</td>
<td>2.5 pF 0.1 pF</td>
<td></td>
</tr>
<tr>
<td>1 Form A (energize to make)</td>
<td>Low Level Switch No. 2</td>
<td>105-1-A-3/2D 105-1-A-12/2D 105-1-A-24/2D</td>
<td>3 12 24</td>
<td>500 Ω 1000 Ω 3000 Ω</td>
<td>0.12 Ω 10 Ω 10 Ω</td>
<td>2.5 pF 0.1 pF</td>
<td></td>
</tr>
<tr>
<td>1 Form A (energize to make)</td>
<td>High Voltage Switch No. 4</td>
<td>105-1-A-6/2D 105-1-A-12/4D 105-1-A-24/4D</td>
<td>2 6 24</td>
<td>500 Ω 1000 Ω 3000 Ω</td>
<td>0.20 Ω 10 Ω 10 Ω</td>
<td>See Note1 See Note2</td>
<td></td>
</tr>
<tr>
<td>1 Form C (change-over)</td>
<td>Switch No. 3</td>
<td>105-1-C-12/3D 105-1-C-24/3D 105-1-C-24/2D</td>
<td>2 12 24</td>
<td>500 Ω 1000 Ω 3000 Ω</td>
<td>0.15 Ω 10 Ω 10 Ω</td>
<td>See Note1 See Note2</td>
<td></td>
</tr>
<tr>
<td>1 Form B (energize to break)</td>
<td>General Purpose Switch No. 1</td>
<td>105-1-B-5/1D 105-1-B-12/1D 105-1-B-24/1D</td>
<td>5 12 24</td>
<td>1000 Ω 3000 Ω 3000 Ω</td>
<td>0.15 Ω 10 Ω 10 Ω</td>
<td>2.5 pF 0.1 pF</td>
<td></td>
</tr>
<tr>
<td>2 Form A (energize to make)</td>
<td>General Purpose Switch No. 1</td>
<td>105-2-A-5/1D 105-2-A-12/1D 105-2-A-24/1D</td>
<td>5 12 24</td>
<td>500 Ω 1000 Ω 3000 Ω</td>
<td>0.17 Ω 10 Ω 10 Ω</td>
<td>See Note1 See Note2</td>
<td></td>
</tr>
<tr>
<td>2 Form A (energize to make)</td>
<td>Low Level Switch No. 2</td>
<td>105-2-A-5/2D 105-2-A-12/2D 105-2-A-24/2D</td>
<td>12 12 24</td>
<td>500 Ω 1000 Ω 3000 Ω</td>
<td>0.15 Ω 10 Ω 10 Ω</td>
<td>See Note1 See Note2</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.

Mercury Reed: Series 105 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. switch current</th>
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<th>Life expectancy ops typical (see Note2 below)</th>
<th>Operate time inc bounce (max)</th>
<th>Release time</th>
<th>Special features</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>A</td>
<td>50 W</td>
<td>2 A 3 A 500 10 A 500 10 A</td>
<td>140 Ω 500 Ω 1500 Ω</td>
<td>0.075 Ω 10 Ω 10 Ω</td>
<td>4 pF 0.1 pF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>A</td>
<td>50 W</td>
<td>2 A 3 A 500 10 A 500 10 A</td>
<td>140 Ω 500 Ω 1500 Ω</td>
<td>0.100 Ω 10 Ω 10 Ω</td>
<td>4 pF 0.1 pF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Form A (energize to make)</td>
<td>Switch No. 6</td>
<td>105-2-A-5/6D 105-2-A-12/6D 105-2-A-24/6D</td>
<td>10 24 24</td>
<td>500 Ω 1000 Ω 1500 Ω</td>
<td>0.100 Ω 10 Ω 10 Ω</td>
<td>See Note1 See Note2</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.

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 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

Pin Configuration and Dimensional Data
Dimensions in inches (Millimeters in brackets)

<table>
<thead>
<tr>
<th>Device type</th>
<th>Type Number</th>
<th>Pin Configuration and Dimensional Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Form A (energize to make)</td>
<td>105-1-A-5/1D 105-1-A-12/1D 105-1-A-24/1D</td>
<td></td>
</tr>
<tr>
<td>1 Form C (change-over)</td>
<td>105-1-C-12/3D 105-1-C-24/3D 105-1-C-24/2D</td>
<td></td>
</tr>
<tr>
<td>2 Form A (energize to make)</td>
<td>105-2-A-5/6D 105-2-A-12/6D 105-2-A-24/6D</td>
<td></td>
</tr>
</tbody>
</table>

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 105 relays are fitted with an internal mu-metal magnetic screen which permits side-by-side stacking.

Order Code
<table>
<thead>
<tr>
<th>Series</th>
<th>Number of reeds</th>
<th>Switch form</th>
<th>Coil voltage</th>
<th>Switch number</th>
<th>Diode if fitted (Omit if not required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>105 - 1</td>
<td>A - 5 / 2 D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.