Compact Power Relay that Enables Bidirectional Opening/Closing of 200 VDC, 20 A

- 400 VDC, 20 A / 450 VDC 16 A bidirectional opening/closing is also possible through a contact series connection between two product units
- The 15.2 mm (W) slim size enables opening/closing of 200 VDC, 20 A regardless of the polarity
- High sensitivity of 530 mW coil consumption (further energy-saving effect is realized in an operating environment with a holding voltage of 50%)
- Min. 5.5 mm of insulation distance between the coil and contacts, and high insulation of 10 kV impulse withstand voltage
- A rating of two-contact series connection is acquired through UL/TÜV/CQC

Model Number Legend

G5PZ-1 A □-X

1. Number of Poles  2. Contact Form  3. Rating
1 : 1-pole    A : SPST-NO (1a)  None : Flux protection

Ordering Information

<table>
<thead>
<tr>
<th>Contact form</th>
<th>Enclosure rating</th>
<th>Model</th>
<th>Rated coil voltage</th>
<th>Minimum packing unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPST-NO (1a)</td>
<td>Flux protection</td>
<td>G5PZ-1A-X</td>
<td>12 VDC 24 VDC</td>
<td>80 pcs./Tray</td>
</tr>
</tbody>
</table>

Note 1. When ordering, add the rated coil voltage to the model number.
Example: G5PZ-1A-X DC12
Note: Rated coil voltage
However, the notation of the coil voltage on the product case as well as on the packing will be marked as □□VDC.

Application Examples

- Battery system
- OA equipment
- FA equipment
- UPS

Ratings

 Coil

<table>
<thead>
<tr>
<th>Rated voltage</th>
<th>Item</th>
<th>Rated current (mA)</th>
<th>Coil resistance (Ω)</th>
<th>Must-operate voltage (V) % of rated voltage</th>
<th>Must-release voltage (V) 5% min.</th>
<th>Max. voltage (V) 110% (at 23°C)</th>
<th>Power consumption (mW)</th>
<th>Power consumption with Holding Voltage at 50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 VDC</td>
<td>12 VDC</td>
<td>44.1</td>
<td>272</td>
<td>75% max.</td>
<td>5% min.</td>
<td>110% (at 23°C)</td>
<td>Approx. 530</td>
<td>Approx. 133 *</td>
</tr>
<tr>
<td>24 VDC</td>
<td>24 VDC</td>
<td>22.1</td>
<td>1087</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 1. The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of ±10%.
Note 2. The operating characteristics are measured at a coil temperature of 23°C.
* Power consumption with Holding Voltage is approx. 133 mW (when applying Holding Voltage at 50%). Please confirm the details on page 4, under • Coil Voltage Reduction (Holding Voltage) after Relay Operation.

Contacts

<table>
<thead>
<tr>
<th>Item</th>
<th>Connection method</th>
<th>One-Contact connection</th>
<th>Two-Contact series connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact material</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated load (Resistive load)</td>
<td>20 A at 200 VDC/ 16 A at 250 VDC</td>
<td>20 A at 400 VDC/ 16 A at 450 VDC</td>
<td></td>
</tr>
<tr>
<td>Rated carry current</td>
<td></td>
<td></td>
<td>20 A</td>
</tr>
<tr>
<td>Max. switching voltage</td>
<td></td>
<td>200 VDC</td>
<td>450 VDC</td>
</tr>
<tr>
<td>Max. switching current</td>
<td></td>
<td>277 VAC</td>
<td>20 A</td>
</tr>
</tbody>
</table>
## Characteristics

<table>
<thead>
<tr>
<th>Item</th>
<th>Connection method</th>
<th>One-contact connection</th>
<th>Two-contact series connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact resistance *1</td>
<td></td>
<td>100 mΩ max.</td>
<td></td>
</tr>
<tr>
<td>Operate time</td>
<td></td>
<td>15 ms max.</td>
<td></td>
</tr>
<tr>
<td>Release time</td>
<td></td>
<td>5 ms max.</td>
<td></td>
</tr>
<tr>
<td>Insulation resistance *2</td>
<td></td>
<td>1,000 MΩ min.</td>
<td></td>
</tr>
<tr>
<td>Dielectric strength</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between coil and contacts</td>
<td></td>
<td>4,000 VAC 50/60 Hz 1 min</td>
<td></td>
</tr>
<tr>
<td>Between contacts of the same polarity</td>
<td></td>
<td>1,000 VAC 50/60 Hz 1 min</td>
<td></td>
</tr>
<tr>
<td>Impulse withstand voltage</td>
<td></td>
<td>10 kV (1.2 x 50 μs)</td>
<td></td>
</tr>
<tr>
<td>Vibration resistance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Destruction</td>
<td></td>
<td>10 to 55 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude)</td>
<td></td>
</tr>
<tr>
<td>Malfunction</td>
<td></td>
<td>10 to 55 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude)</td>
<td></td>
</tr>
<tr>
<td>Shock resistance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Destruction</td>
<td></td>
<td>1,000 m/s²</td>
<td></td>
</tr>
<tr>
<td>Malfunction</td>
<td></td>
<td>200 m/s²</td>
<td></td>
</tr>
<tr>
<td>Durability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical</td>
<td></td>
<td>2,000,000 operations min. (at 18,000 operations/h)</td>
<td>10,000 operations at 400 VDC, 20 A</td>
</tr>
<tr>
<td>Electrical</td>
<td></td>
<td>10,000 operations at 200 VDC, 20 A</td>
<td>10,000 operations at 450 VDC, 16 A</td>
</tr>
<tr>
<td>(resistive load) *3</td>
<td></td>
<td>100,000 operations at 200 VDC, 0.25 A</td>
<td>100,000 operations at 450 VDC, 0.25 A</td>
</tr>
<tr>
<td>(Switching frequency 1 sec ON-9 sec OFF at 85°C)</td>
<td></td>
<td></td>
<td>(Switching frequency 1 sec ON-9 sec OFF at 85°C)</td>
</tr>
<tr>
<td>Ambient operating temperature</td>
<td></td>
<td>-40 to 85°C (with no icing or condensation)</td>
<td></td>
</tr>
<tr>
<td>Ambient operating humidity</td>
<td></td>
<td>5 to 85%</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td></td>
<td>Approx. 15 g</td>
<td>Approx. 15 g x 2 pcs.</td>
</tr>
</tbody>
</table>

Note 1. Values in the table above are the default (ambient temperature 23°C) values.
Note 2. Refer to the Circuit Diagrams for the connection method of a two-contact series connection.
Note 3. Refer to Correct Use when opening/closing a micro load.

*1. Measurement conditions: 5 VDC, 1 A, voltage drop method
*2. Measurement conditions: Measured at the same points as the dielectric strength using a 500 VDC ohmmeter.
*3. This specification is when diode and zener diode are used. For relay coil, please connect diode and zener diode. For more detail, please refer to ●Connection of Diodes to the Operating Coil on page 4.

## Dimensions

**G5PZ-1A-X**

![CAD Data](https://example.com/cad-data.png)

- PCB Mounting Holes (Bottom View)
  - Tolerance: ±0.1 mm
  - Terminal Arrangement/ Internal Connections (Bottom View)
  - (No coil polarity)

*Average value*
G5PZ-X
PCB Power Relay

Circuit Diagrams

- One-Contact Connection
- Two-Contact Series Connection

Note. The diode and zener diode are for the absorption of coil surge. (The coil does not have a polarity.)

The opening/closing part does not have a polarity.

Approved Standards

The approval rating values for overseas standards are different from the performance values determined individually. Confirm the values before use.

UL Recognized: (File No. E41515)

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<th>Contact ratings</th>
<th>Number of test operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>G5PZ-1A-X</td>
<td>1a (One-contact connection)</td>
<td>12, 24 VDC</td>
<td>20 A, 200 VDC (Resistive) 85°C</td>
<td>10,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>16 A, 277 VAC (Resistive) 85°C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1a (Two-contact series connection)</td>
<td>12, 24 VDC</td>
<td>20 A, 400 VDC (Resistive) 85°C *1</td>
<td>10,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>16 A, 450 VDC (Resistive) 85°C *1</td>
<td></td>
</tr>
</tbody>
</table>

*1. Two-contact series connections only comply with UL standards

EN/IEC, TÜV Certified: (Certificate No. R50408241)

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CQC Certified: (Certificate No. CQC21002317552)

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<td></td>
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</tr>
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Creepage distance (required value) 8 mm min. (IEC/UL)
Clearance (required value) 5.5 mm min. (IEC/UL)
Insulation material group III a
Type of insulation
- coil-contact circuit  Basic (500 V, OV-cat.III, up to 2,000 m above sea level)
- open contact circuit Micro disconnection
Rated insulation voltage 500 V
Pollution degree 3
Rated voltage system 500 V
Category of protection (IEC61810-1) RT II
Flammability class (UL94) V-0
Coil insulation system (UL) Class F
Precautions

Please refer to “PCB Relays Common Precautions” for correct use.

Warning
As this relay is a high-voltage and high-current type, there is a risk of abnormal heat generation, smoke generation or fire if you use the relay with a contact voltage, current, or for a number of times beyond the specified range. Use only within the specified ranges.

Correct Use

Handling
This product has a flux-resistant protection structure. Therefore, do not perform immersible cleaning.

Coil Voltage Reduction (Holding Voltage) after Relay Operation
  • If the coil voltage is reduced to the holding voltage after relay operation, first apply the rated voltage to the coil for at least 100 ms, as shown below.
  • A voltage of at least 50% of the rated voltage is required for the coil holding voltage. Do not allow voltage fluctuations to cause the coil holding voltage to fall below this level.

Connection of Diodes to the Operating Coil
  • Connect a diode and zener diode to the relay coil (refer to the following figure).
  • The diodes are for coil surge absorption. Switching performance may be affected if only a diode is used, so use in combination with a zener diode.

Relay Service Life
  • These relays must be used for high DC voltages. The final failure mode is failure to break the circuit. In a worst-case scenario, burning may extend to surrounding components.
  • The electrical durability of these relays is specified as the number of load switching operations under a resistive load and OMRON-specified standard testing conditions.
  • The coil drive circuit, ambient environment, switching frequency, or load conditions (e.g., inductive load or capacitor load) may reduce the service life and possibly lead to failure to break. Always confirm the service life in the actual equipment.

Micro Loads
These power relays are suitable for switching and breaking high-capacity DC. At high-voltage and low-current, breaking characteristics may become unstable. For switching applications at a range between 0.5 A and 2 A, please consult us.

Installation Intervals
When using a two-contact series connection, ensure an interval of at least 10 mm between the product units.

Electrical Appliances and Materials Safety Act
The G5PZ-X series does not comply with the Electrical Appliances and Materials Safety Act. Please select our relays carefully in accordance with the application you wish to use the product for.