

For Reference

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OMRON Corporation

OMRON Relay &amp; Devices Corporation

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## P R O D U C T   S P E C I F I C A T I O N S

Name: POWER RELAY

Model: G6B-1177P-FD-ND-US

Item: DC5, 12, 24V

Registration part number for Customer
Type name :
Type number :

Receipt Stamp (For receipt purpose only)

Handled by

### Distribution

	Copy
Customer	
Sales(      )	

### Revision Record

Mark	Date	Contents

- |   |  |   |
|---|--|---|
| 1. Classification                           | Single stable relay  |   |
| 2. Construction                             |  |   |
| 2.1 Outline dimensions                      | Drawing No. 2 4 8 3 2 0 6 - 0  |   |
| 2.2 Structure drawing                       | Drawing No. — — — — —  |   |
| 2.3 Contact configuration                   | SPST-N0 (1a contact)   |   |
| 2.4 Contact structure                       | Single contact   |   |
| 2.5 Contact material                        | Face material  | — — — — —   |
|   | Base material  | A g S n I n   |
| 2.6 Protective construction                 | Flux protection  |   |
| 3. Standards                                |  |   |
| 3.1 Approved by standard(s)                 | U L  | File No. : E41643   |
|   | C S A  | File No. : LR31928  |
| 3.2 Others                                  | — — — — —  |   |
| 4. Ratings                                  |  |   |
| 4.1 Coil ratings                            | See table 1  |   |
| 4.2 Contact ratings                         |  |   |
| (1) Rated load                              | Resistive load   | 2 5 0 V A C 5 A<br>3 0 V D C 5 A                                  |
|   | Inductive load   | 2 5 0 V A C 2 A<br>(p. f. = 0.4)<br>3 0 V D C 2 A<br>(L/R = 7 ms) |
| (2) Rated carry current                     | 5 A  |   |
| (3) Maximum rated voltage                   | 3 8 0 V A C 1 2 5 V D C  |   |
| (4) Maximum rated current                   | Resistive load   | A C 5 A D C 5 A   |
|   | Inductive load   | A C 5 A<br>(p. f. = 0.4)<br>D C 5 A<br>(L/R = 7 ms)               |
| (5) Maximum switching capacity              | Resistive load   | A C 1 2 5 0 V A D C 1 5 0 W                                       |
|   | Inductive load   | A C 5 0 0 V A<br>(p. f. = 0.4)<br>D C 6 0 W<br>(L/R = 7 ms)       |
| (6) Failure rate (reference value)          | D C 5 V 1 0 m A<br>(P level) ( $\lambda_{60} = 0.1 \times 10^{-6}$ /ops.)              |   |
| 5. Characteristics (initial value)          |  |   |
| 5.1 Contact resistance                      | 3 0 m $\Omega$ MAX.<br>Measured by the voltage drop method with<br>D C 5 V 1 A applied |   |
| 5.2 Must operate voltage (or set voltage)   | See table 1  |   |
| 5.3 Must release voltage (or reset voltage) | See table 1  |   |
| 5.4 Operate time (or set time)              | 1 0 ms MAX. (at rated voltage)   |   |
| 5.5 Release time (or reset time)            | 1 0 ms MAX. (at rated voltage)   |   |
| 5.6 Minimum input pulse width               | — — — ms MIN.<br>(Applicable to latching relay only, at rated voltage)                 |   |

## 5.7 Insulation resistance 500 VDC

- (1) Between coil terminals and contact terminals 1000 MΩ MIN.
- (2) Between non-continuous current-carrying contact terminals  
----- MΩ MIN.
- (3) Between contact terminals of the same polarity  
1000 MΩ MIN.
- (4) Between set coil and reset coil ----- MΩ MIN.
- (5) Between current-carrying terminal and exposed non-current carrying  
metal part. ----- MΩ MIN.

## 5.8 Dielectric strength(leakage current 3mA 50/60Hz for 1minute)

- (1) Between coil terminals and contact terminals  
AC 3000 V
- (2) Between non-continuous current-carrying terminals  
AC ----- V
- (3) Between contact terminals of the same polarity  
AC 1000 V
- (4) Between set coil and reset coil AC ----- V
- (5) Between current-carrying terminal and exposed non-current carrying  
metal part. AC ----- V

## 5.9 Temperature rise

- (1) Coil 50°C MAX.  
(by the coil resistance method) at. 70°C  
Applied voltage of coil : 100 %  
of rated voltage ---Hz  
Carry current of contact 8 A
- (2) Contact 65°C MAX.  
(by the thermometer method) at. ---°C  
Applied voltage of coil : 100 %  
of rated voltage ---Hz  
Carry current of contact 8 A

## 5.10 Vibration

- (1) Mechanical durability Must be free from any abnormality in both  
the construction and characteristics after the  
relay is subjected to a variable vibration of  
0.75mm single amplitude(1.5mm double amplitude)  
at a vibration frequency of 10-55-10 Hz  
in each direction for 2 hours.
- (2) Malfunction durability Contacts must not open for 1ms  
(When energized) or longer after the relay is subjected to a  
variable vibration of 0.75mm single amplitude  
or set status (1.5mm double amplitude) at a vibration frequency  
of 10-55-10 Hz in each direction for 1 cycle.
- (When not energized) Contacts must not open for ---ms  
or reset status or longer after the relay is subjected to a  
variable vibration of ---mm single amplitude  
(---mm double amplitude) at a vibration frequency  
of 10-55-10 Hz in each direction for 1 cycle.

## 5.11 Shock

- (1) Mechanical durability Must be free from any abnormality in both  
the construction and characteristics after the  
relay is subjected to a shock of 1000m/s<sup>2</sup>  
in each direction 3 times.

(2) Malfunction durability (When energized) or set status	Contacts must not open for 1 ms or longer after the relay is subjected to a shock of 1 0 0 m/s <sup>2</sup> in each direction 3 times.
(When not energized) or reset status	Contacts must not open for ---ms or longer after the relay is subjected to a shock of ---m/s <sup>2</sup> in each direction ---times.
5.12 Terminal strength	Must be free from any abnormality after a tensile stress of 9.8 N is applied to the terminal in any direction vertical to the terminal tip for 10 seconds. Any deformation of the terminal by the load shall not be regarded as a mechanical damage.
5.13 Temperature resistance (1) Heat resistance	Must be free from any abnormality in both the construction and characteristics after the relay is left in a temperature of $85 \pm 2^{\circ}\text{C}$ for 16 hours and then in room temperature and humidity for 2 hours.
(2) Cold resistance	Must be free from any abnormality in both the construction and characteristics after the relay is left in a temperature of $-55 \pm 3^{\circ}\text{C}$ for 72 hours and then in room temperature and humidity for 2 hours.
5.14 Moisture resistance	Must be free from any abnormality in both the construction and characteristics after the relay is left in a humidity of 90 to 95% RH for 48 hours at a temperature of $40 \pm 2^{\circ}\text{C}$ , and then in room temperature and humidity for 2 hours. Insulation resistance, however, must be 5 MΩ MIN.
5.15 Soldering heat resistance	Must be free from any abnormality in both the construction and characteristics after the terminals are dipped into molten solder at $260 \pm 5^{\circ}\text{C}$ for $10 \pm 1$ seconds and then left in room temperature and humidity for 2 hours.
5.16 Endurance	(1) Mechanical endurance 50,000,000 operations MIN. (under no load at operating frequency of 18,000 operations/hour) (2) Electrical endurance 100,000 operations MIN. (under rated load, at operating frequency of 1,800 operations/hour)

※Unless otherwise specified, the above mentioned item 4 (Ratings) and 5 (Characteristics) values are under the standard conditions of Ambient temperature 23°C and Humidity 65%RH.

## 6. Storage conditions

- (1) Store in locations in normal temperature, humidity and atmosphere pressure.
- (2) Environments
  - Store in locations where the product or container is not exposed to corrosive gas such as hydrogen sulfide gas or salty air.
  - Store in locations where no visible dust exists.
  - Store in locations where the product is not exposed to the direct ray of the sun and rain, snow.Also please do not apply the force to product which may result in the deformation or a change in quality of the product.

## 7. Operating conditions

Use the product under the following conditions.

- 7.1 Ambient temperature       $-25$  to  $+70^{\circ}\text{C}$   
(without freezing or condensation)

- 7.2 Relative humidity       $5$  to  $85\%$  RH

- 7.3 Mounting direction      F r e e

### 7.4 Enviroments

- (1) Use in locations where the product is not exposed to corrosive gas such as hydrogen sulfide gas or salty air.
  - (2) Use in locations where no visible dust exists.
  - (3) Use in locations where the product is not exposed to the direct ray of the sun and rain, snow.
- Also please do not apply the force to product which may result in the deformation or a change in quality of the product.

## 8. Others

- 8.1 This relay can not be immersion-cleaned.

- 8.2 Please note the coil polarity, because LED indicator and diode is connected in parallel with coil.

## 9. PRECAUTIONS

(1) Following terms are defined as below.

- 1) Conditions; Use conditions, rating, performance, operating environment, handling procedure, precautions and/or prohibited use described in this “product specifications”, documentations or manuals
- 2) User Application; Application of this product by a customer, including but not limited to embedding this product into customer's components, electronic circuit boards, devices, equipments or systems
- 3) Fitness; (a) Fitness, (b) performance, (c) no infringement of intellectual property of third party, (d) compliance with laws and regulations and (e) conformity to various standards

(2) Note about this specification

- 1) The product may be discontinued or change its specification without prior notice, unless the specification is not returned or the product is not ordered within one year after issue of this specification. Please confirm current specifications if you return this specification or you place an order of this product one year after issue of this specification.
- 2) Rating and performance is tested separately. Combined conditions are not warranted.
- 3) Reference data is intended to be used just for reference. Omron does not warrant that the product can work properly in the range of reference data.
- 4) Examples are intended for reference. Omron does not warrant the fitness in usage of the examples.
- 5) Omron may, at its discretion, change factors other than rating, performance, structure, outside dimensions or mounting dimensions.

(3) Note about adoption and use

- 1) Please use the product in conformance to the conditions, including rating and performance.
- 2) Please confirm the fitness and decide whether or not the product is able to be adopted in User Application.
- 3) Omron will not warrant any items in (1) 3) (b) ~ (e) of User Application nor the fitness.
- 4) If you use the product in the application below, please ensure followings; (i) allowance in aspect of rating and performance, (ii) safety design which can minimize danger of the User Application when the product does not work properly and (iii) periodical maintenance of the product and the User Application.
- (a) Applications requiring safety, including, without limitation, nuclear control facilities, combustion facilities, aerospace and aviation facilities, railroad facilities, elevating facilities, amusement facilities, medical facilities, safety devices or other applications which has possibility to influence lives or bodies
- (b) Applications requiring high reliability, including, without limitation, supplying systems of gas, water and electric power and applications handling right, title, ownership or property, such as payment systems
- (c) Applications in a harsh condition or environment, including, without limitation, outdoor facilities, facilities with potential of chemical contamination or electromagnetic interference, facilities with vibration or impact and facilities on continual operation for a long period
- (d) Applications under conditions or environment which are not described in this specification
- 5) This product is not intended to be used in automotive applications (including two wheel vehicles). Please do not use this product in the automotive application.

- (4) Warranty
  - 1) Warranty period; One year after your purchase
  - 2) Warranty; Omron will provide, free of charge, replacements of the same number of malfunctioning products
  - 3) Exceptions; This warranty does not cover malfunctions caused by any of the following.
    - (a) Usage in the manner other than its original purpose
    - (b) Usage out of the condition
    - (c) Cause which could not be foreseen by the level of science and technology at the time of shipment of the product
    - (d) Cause outside Omron or the product, including force majeure such as disasters
- (5) The warranty described in this “conditions” is a whole and sole liability for the products. There are no other warranties, expressed or implied. Omron and distributors are not liable for any damages arisen from or relating to the products.
- (6) Please comply with laws and regulations of security trade control in relevant countries if you export or provide a nonresident with the product or technical information.

## 1 0. Coil rating (table 1)

Rated voltage (V)	Rated current (mA)	Coil resistance ( $\Omega$ )	Must operate voltage	Must release voltage	Rated power consumption (W)	Permissible voltage range
D C 5	4 3.0	116(125)	70%max of rated voltage	10%min of rated voltage	Approx. 0.2	90~130% of rated voltage
D C 1 2	1 9.7	610(720)			Approx. 0.24	
D C 2 4	1 1.3	2120(2880)			Approx. 0.275	

The value of above list are applied under ambient temperature 23°C, and tolerance of current and coil resistance  $\pm 10\%$ .

Permissible voltage range at 70°C : 90%~110% of rated voltage.

Coil resistance ( ) : It shows only coil resistance.



