



# Automatización Eléctrica

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High Capacity and High Dielectric Strength Miniature Relay with Fully Sealed Construction in 5 A (8 A) SPST-NO (1a), SPST-NC (1b), DPST-NO (2a), DPST-NC (2b) Types

- High sensitive with operating power of 98 mW. (G6B-1114P-US and G6B-1174P-US models)
- High insulation with dielectric strength of 3,000VAC between coil and contacts (impulse withstand voltage of 6 kV).
- Stick packing models are provided in consideration of compatibility to the automatic production line.
- Standard model conforms to UL/CSA standards. Other SEV approved models are also available.
- AgSnIn contacts suitable for loads that generate surge voltage such as inductive load and capacity load etc. are available for the whole product line.
- Ultrasonically cleanable models is available.
- Operation indicator & surge absorption diode are built-in for the whole product line.
- Double-pole type is available for the whole product line.

**RoHS Compliant** 

#### Model Number Legend

# 

#### 1. Relay Function

- None: Single-side stable
  - U : Single-winding latching (G6B□-1114 models only)
  - K : Double-winding latching (G6B□-1114 models only)

#### 2. Number of poles

- 1: 1-pole
- 2: 2-pole

#### 3. Contact Form

- 1: SPST-NO (1a)
- 1: SPST-NO (1a)+SPST-NC (1b)
- 2: DPST-NO (2a)
- 0: DPST-NC (2b)

- 4. Classification
- 1: Standard
- 7: High-capacity

#### 5. Enclosure rating

- 4: Fully sealed
- 7: Flux protection

#### 6. Terminal Shape

- P: PCB terminals
  - Socket mounting terminals

#### 7. Contact material

None: Standard (Ag-alloy (Cd free)) FD : AgSnIn contact (Suitable for DC inductive load with high inrush current)

#### ■Application Examples

· Ideal for output applications of control equipments

#### 8. Operation Indicator Diode Availability

A) 🚯 🛆

None: Standard

ND : Operation indicator & coil surge absorption diode (for -1177 type only)

#### 9. Approved Standards US: UL/CSA

#### 10. Washability

None: Standard U : For ultrasonically cleanable

#### 11. Mounting

None: Mounted directly to PCB P6B : Mounted to Socket

# ■Ordering Information

#### Standard Models (UL, CSA certified)

Number		Contact material	Standard (Ag-all	oy (Cd free))	AgSnIn co	ontact	Minimum
of poles	Relay Function	Contact form	Model	Rated coil voltage	Model	Rated coil voltage	packing unit
	Single-side stable	SPST-NO (1a) (Standard)	G6B-1114P-US	5, 6, 12, 24 VDC	G6B-1114P-FD-US	5, 6, 12, 24 VDC	100 pcs/tray
Olingie	Single-side stable	SPST-NO (1a) (High-capacity)	G6B-1174P-US	5, 6, 12, 24 VDC	G6B-1174P-FD-US	5, 6, 12, 24 VDC	20 pcs/tube
1-pole	Single-winding latching	SPST-NO (1a) (Standard)	G6BU-1114P-US	5, 6, 12, 24 VDC	G6BU-1114P-FD-US	5, 12, 24 VDC	100
	Double-winding latching	SPST-NO (1a)	G6BK-1114P-US	5, 6, 12 VDC	G6BK-1114P-FD-US	5, 6, 12 VDC	pcs/tray
		(Standard)	G0DK-1114P-03	24 VDC	GODK-1114F-FD-03	24 VDC	
	Single-side stable	SPST-NO (1a) (Built-in high-capacity operation indicator & diode)	G6B-1177P-ND-US	5, 12, 24 VDC	G6B-1177P-FD-ND-US	5, 12, 24 VDC	20 pcs/tube
		SPST-NO (1a)+ SPST-NC (1b) (Standard)	G6B-2114P-US	5, 6, 12, 24 VDC	G6B-2114P-FD-US	5, 6, 12, 24 VDC	
2-pole	Single-side stable	DPST-NO (2a) (Standard)	G6B-2214P-US	5, 6, 12, 24 VDC	G6B-2214P-FD-US	5, 6, 12, 24 VDC	100 pcs/tray
		DPST-NC (2b) (Standard)	G6B-2014P-US	5, 6, 12, 24 VDC	G6B-2014P-FD-U	5, 6, 12, 24 VDC	

Note: AgSnIn contact models are highly welding-resistant, and roughening of contacts due to inrush current and inductive load is lessened.

#### Models for Ultrasonically Cleanable

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В	

Number		Contact material	Standard (Ag-allo	oy (CD free))	AgSnIn co	ontact	Minimum
of poles	Relay Function	Contact form	Model	Rated coil voltage	Model	Rated coil voltage	packing unit
	Single-side stable	SPST-NO (1a) (Standard)	G6B-1114P-US-U	5, 6, 12, 24 VDC	G6B-1114P-FD-US-U	6, 12, 24 VDC	
1-pole	Single-winding latching	SPST-NO (1a) (Standard)	G6BU-1114P-US-U	24 VDC	_	_	
	Double-winding latching	SPST-NO (1a) (Standard)	G6BK-1114P-US-U	5, 6, 12, 24 VDC	G6BK-1114P-FD-US-U	12, 24 VDC	100
		SPST-NO (1a)+ SPST-NC (1b) (Standard)	G6B-2114P-US-U	5, 12, 24 VDC	G6B-2114P-FD-US-U	5, 12, 24 VDC	pcs/tray
2-pole	Single-side stable	DPST-NO (2a) (Standard)	G6B-2214P-US-U	5, 6, 12, 24 VDC	G6B-2214P-FD-US-U	5, 12, 24 VDC	
		DPST-NC (2b) (Standard)	G6B-2014P-US-U	5, 12, 24 VDC	G6B-2014P-FD-US-U	5, 12, 24 VDC	

Note: When ordering, add the rated coil voltage to the model number.

Example: G6B-1114P-US 5 VDC

Rated coil voltage

#### Connecting Sockets (Sold Separately)

Applicable relay	Model	Minimum ordering unit
G6B-1114P(-FD)-US-P6B G6B-1174P(-FD)-US-P6B G6B-1177P(-FD)-ND-US-P6B G6BU-1114P-US-P6B	P6B-04P	00
G6BK-1114P-US-P6B	P6B-06P	20 pcs
G6B-2114P-US-P6B G6B-2214P-US-P6B G6B-2014P-US-P6B	P6B-26P	
Removal Tool	P6B-Y1	1 noo
Hold-down Clips	P6B-C2	1 pcs

Note 1. When using by combining sockets of the G6B-1174P-US and P6B-04P models, the rated current will be

5A due to its rated switching current. 2. Use the G6B-\_\_\_P(-FD)-US P6B to mount to a P6B Socket. 3. The hold-down clips of the P6B-C2 model are not suitable for the G6B-1174P and G6B-1177P models since they have different heights.

4. Products with UL/CSA certification marks will be supplied for orders of standard models.

# ■Ratings

#### • Coil: 1-Pole, Single-side Stable Type (Including models for ultrasonically cleanable)

Item	Rated current (mA)	Coil resistance (Ω)	Must operate voltage (V)	Must release voltage (V)	Max. voltage (V)	Power consumption (mW)
Rated voltage	(IIIA)	(52)	%	(11100)		
5 VDC	40	125				
6 VDC	33.3	180	70% max.	10% min.	160%	Approx. 200
12 VDC	16.7	720	70 /o IIIdx.	10 /6 11111.	(at 23°C)	Αρριολ. 200
24 VDC	8.3	2,880				

#### • Coil: 2-Pole, Single-side Stable Type (Including models for ultrasonically cleanable)

Item	Rated current (mA)	Coil resistance (Ω)	Must operate voltage (V)	Must release voltage (V)	Max. voltage (V)	Power consumption (mW)
Rated voltage	(117.7)	(22) %		of rated voltag	le	()
5 VDC	60	83.3				
6 VDC	50	120	80% max.	10% min.	140%	Approx. 300
12 VDC	25	480	00 /0 max.	10 /8 11111.	(at 23°C)	Approx. 300
24 VDC	12.5	1,920				

#### • Coil: Single-winding Latching Type (Including models for ultrasonically cleanable)

Item	Rated current	Coil resistance	Must set voltage (V)	Must reset voltage (V)	Max. voltage (V)	Power cor	nsumption
Rated voltage	(mA)	(Ω)	% of rated voltage			Set coil (mW)	Reset coil (mW)
5 VDC	40	125				200	200
6 VDC	33.3	180	70% max.	70% max.	160%		
12 VDC	16.7	720	70 /0 max.	70 /0 IIIax.	(at 23°C)		
24 VDC	8.3	2,880					

#### • Coil: Double-winding Latching Type (Including models for ultrasonically cleanable)

Item	Rated cur	rrent (mA)	Coil resistance (Ω)		Must set voltage (V)	Must set voltage (V)         Must reset voltage (V)         Max. voltage (V)		Power consumption	
Rated voltage	Set coil	Reset coil	Set coil	Reset coil	% of rated voltage			Set coil (mW)	Reset coil (mW)
5 VDC	56	56	89.2	89.2			130% (at 23°C)	280	280
6 VDC	46.8	46.8	128.5	128.5	70% max.	70% max.			
12 VDC	23.3	23.3	515	515	70 /o Illax.	70 /o IIIdx.			
24 VDC	11.7	11.7	2,060	2,060					

#### • Coil: Operation Indicator Model (Flux-resistant type. Do not wash down with water.)

Item	Rated current (mA)	Coil resistance (Ω)	Must operate voltage (V)	Must release voltage (V)	Max. voltage (V)	Power consumption (mW)
Rated voltage (IIIA)		(32)	%	of rated voltag	(11100)	
5 VDC	43	116			100%	Approx. 200
12 VDC	19.7	610	70% max.	10% min.	130% (at 23°C)	Approx. 240
24 VDC	11.3	2,120			(01200)	Approx. 275

Note 1. The rated current and coil resistance are measured at a coil temperature of  $23^{\circ}$ C with a tolerance of  $\pm 10\%$ .

2. The operating characteristics are measured at a coil temperature of 23°C.

 $\ensuremath{\mathsf{3.The}}$  "Max. voltage" is the maximum voltage that can be applied to the relay coil.

#### Contacts

Model	G6B-1114P-US G6BU-1114P-US G6BK-1114P-US G6B-1114P-FD-US G6BU-1114P-FD-US G6BK-1114P-FD-US		G6B-1174F G6B-1177F G6B-1174F G6B-1177F	P-ND-US	G6B-2114P-US G6B-2214P-US G6B-2014P-US G6B-2114P-FD-US G6B-2214P-FD-US G6B-2014P-FD-US			
Load Item	Resistive load	Inductive load $(\cos\phi = 0.4; L/R = 7 ms)$	Resistive load	Inductive load $(\cos\phi = 0.4; L/R = 7 ms)$	Resistive load	Inductive load $(\cos\phi = 0.4; L/R = 7 ms)$		
Contact type			Single					
Contact material		Ag-Alloy (Cd free)						
Rated load	5 A (3 A) at 250 VAC 5 A (3 A) at 30 VDC	2 A (2 A) at 250 VAC 2 A (2 A) at 30 VDC	8 A (5 A) at 250 VAC 8 A (5 A) at 30 VDC	2 A (2 A) at 250 VAC 2 A (2 A) at 30 VDC	5 A (3 A) at 250 VAC 5 A (3 A) at 30 VDC	1.5 A (1.5 A) at 250 VAC 1.5 A (1.5 A) at 30 VDC		
Rated carry current	5 A	5 A (5 A)		(5 A)	5 A (5 A)			
Max. switching voltage			380 VAC,	125 VDC				
Max. switching current	5 A	(5 A)	8 A	(5 A)	5 A (5 A)			

Note 1. The values in the parentheses ( ) are for -FD models only.

2. Use the -FD type for inductive load and switching load which contact roughening is small.

# ■Characteristics

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	Model	G6B-1114P-US G6B-1114P-FD-US G6B-1174P-US G6B-1174P-FD-US	G6BU-1114P-US	G6BK-1114P-US	G6B -1177P(-FD)-ND-US	G6B-2114P-US G6B-2114P-FD-US G6B-2214P-US G6B-2214P-FD-US G6B-2014P-US G6B-2014P-FD-US	
Item Classification		Single-side stable	Single-winding latching	Double-winding latching	Built-in operation indicator & surge absorption diode	Single-side stable	
Contact resistance	*1			30 m $\Omega$ max.			
Operate (set) time				10 ms max.			
Release (reset) tim	e			10 ms max.			
Min. set pulse width	า	-	15 ms (	at 23°C)	-	-	
Min. reset pulse wid		-	15 ms (	at 23°C)	-	-	
Insulation resistance	se *2	1,000 MΩ min.					
	Between coil and contacts	3,000 VAC, 50/60 Hz for 1 min 2,000 VAC, 50/60 Hz for 1 min		3,000 VAC, 50/60 Hz for 1 min			
Distantia stars at	Between contacts of the same polarity		1,00	min			
Dielectric strength	Between contacts of different polarity	-			1	2,000 VAC, 50/60 Hz for 1 min	
	Between set and reset coils	-	-	250 VAC, 50/60 Hz for 1 min		-	
Impulse withstand	voltage (between coil and contacts)	$6 \text{ kV} 1.2  imes 50 \ \mu\text{s}$		$2 \times 50 \ \mu s$	6 kV 1.2	•	
Vibration	Destruction	10	to 55 to 10 Hz, 0.75 m	nm single amplitude (1	.5 mm double amplitu	de)	
resistance	Malfunction	10	to 55 to 10 Hz, 0.75 m	nm single amplitude (1	.5 mm double amplitu	de)	
Shock resistance	Destruction			1,000 m/s <sup>2</sup>			
Chock resistance	Malfunction	100 m/s <sup>2</sup>		m/s²	100	m/s <sup>2</sup>	
Durability	Mechanical		, , ,	erations min. (at 18,00	1 /		
· ·	Electrical	100,000 operation min. (at 1,800 operations/hr under rated load)					
Failure rate (P leve	l) (reference value) *3	10 mA at 5 VDC					
Ambient operating	temperature	-25°C to 70°C (with no icing or condensation)					
Ambient operating	humidity			5% to 85%			
Weight		Approx. 3.5 to 4.6 g	Approx. 3.5 g	Approx. 3.7 g	Approx. 5.4 g	Approx. 4.5 g	

G 6 B

Note 1. The values here are initial values.
2. The G6B-1177P(-FD)-ND model is flux-resistant. Do not wash it down with water.
\*1. The contact resistance was measured with 1 A at 5 VDC using a voltage-drop method.
\*2. Measurement conditions: The insulation resistance was measured with a 500 VDC megohmmeter at the same locations as the dielectric strength was measured. (Except the location between set/reset coil)
\*3. This value was measured at a switching frequency of 120 operations/min.

# G6B

G6B-2114P-US

G6B-2214P-US

G6B-2014P-US

G6B-2114P-FD-US

G6B-2214P-FD-US

G6B-2014P-FD-US

5

DC resistive load

DC inductive load (L/R = 7 ms)

30

50 100

€<sup>100</sup>

Switching current

50

30

10

1.5

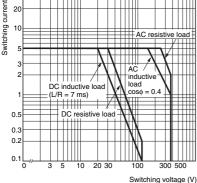
0.5

0.3

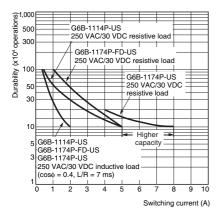
0.1

# Engineering Data

#### Maximum Switching Current G6B-1114P-US G6B-1174P-FD-US € 40 20



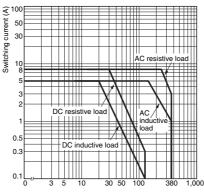
Durability G6B-1114P-US G6B-1174P-US G6B-1174P-FD-US



• Ambient Temperature vs. Must

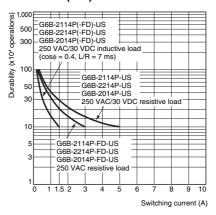
**Operate and Must Release Voltage** 

#### G6B-1174P-US



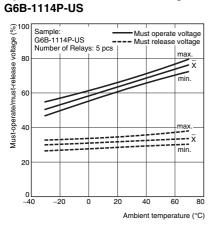
#### Switching voltage (V)

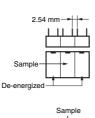
#### G6B-2114P(-FD)-US G6B-2214P(-FD)-US G6B-2014P(-FD)-US



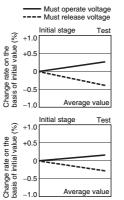
#### Mutual Magnetic Interference

#### G6B-1114P-US





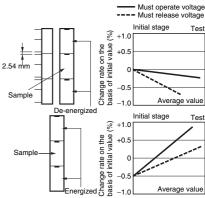




Average value

-1.0

# G6B-1114P-US



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G 6 B

Switching voltage (V)

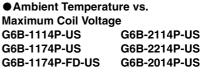
300 500 1,000

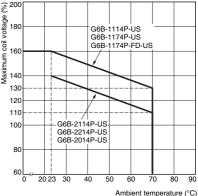
AC inductive

 $(\cos\phi = 0.4)$ 

istive

Ź AC resisti





Note: The maximum coil voltage refers to the maxi-mum value in a varying range of operating power voltage, not a continuous voltage.

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# G6B

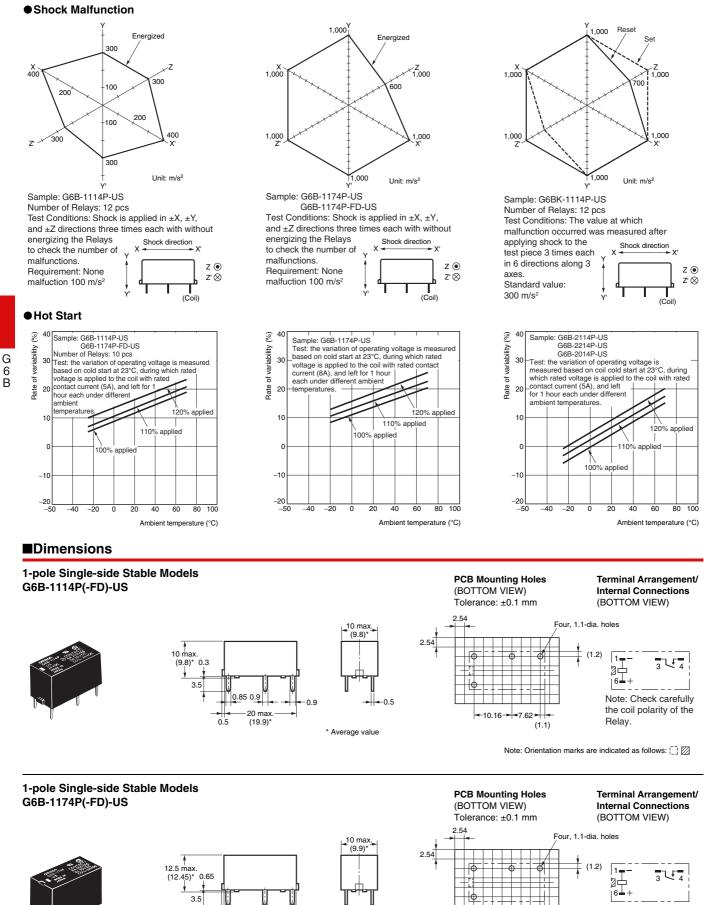
# PCB Power Relay

Note: Check carefully

the coil polarity of the

Relay.

Note: Orientation marks are indicated as follows:



6

3.5

0.85 0.9

0.45

20.2 max

(20.0)

-0.9

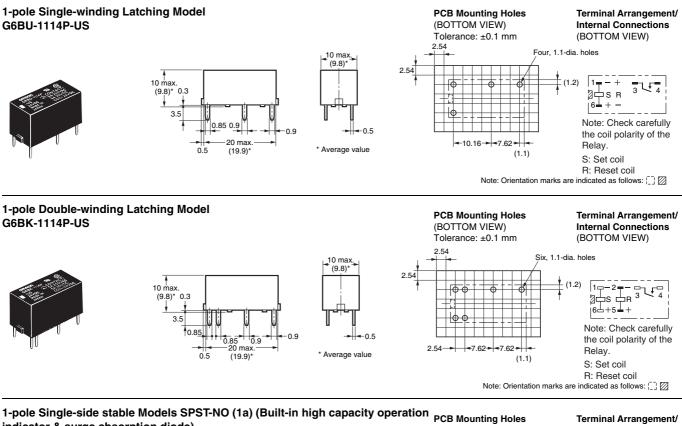
⊢0.5

\* Average value

◄ 10.16 ► ₹7.62 ►

(1.2)

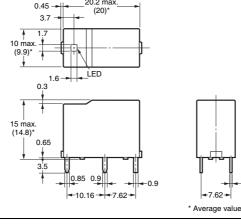
# **PCB** Power Relay



indicator & surge absorption diode) 20.2 max

G6B-1177P(-FD)-ND-US





(BOTTOM VIEW) Tolerance: ±0.1 mm

2.54

2.54

-0.5

0.3

7.62-

\* Average value

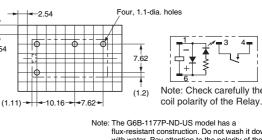
-7.62-

#### **Terminal Arrangement/** Internal Connections (BOTTOM VIEW)

G

6

В



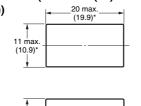
Note: Check carefully the

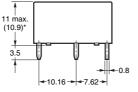
flux-resistant construction. Do not wash it down with water. Pay attention to the polarity of the coil since the LED and surge absorption diode are built-in.

2-poles Single-side stable Models (SPST-NO (1a) + SPST-NC (1b), 20 ma DPST-NC (2c), SPST-NO(1a))











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7.62

(1.7)

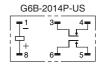
-2.54

(1.11)

#### **Terminal Arrangement/** Internal Connections (BOTTOM VIEW)

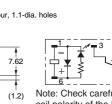








Note: Check carefully the coil polarity of the Relay.



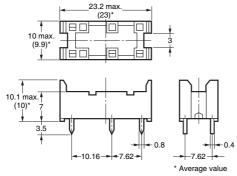


# Connecting Sockets Dimensions

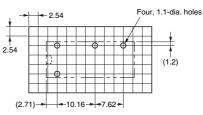
#### Socket for 1-pole Single-winding Latching Model and Single-side Stable Model

P6B-04P



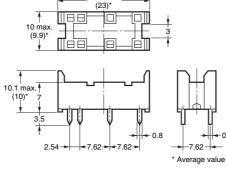




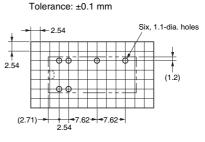


Socket for 1-pole Double-winding Latching Model P6B-06P 3.2 max (23)\*



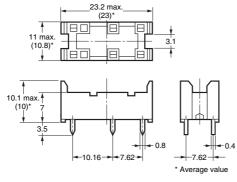


**PCB Mounting Holes** (BOTTOM VIEW)

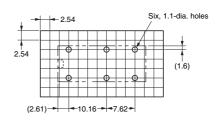


#### Double-ocket/Double-pole Single-side Stable P6B-26P



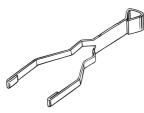


PCB Mounting Holes (BOTTOM VIEW) Tolerance: ±0.1 mm



# Removal Tool

P6B-Y1



# ■Hold-down Clips

P6B-C2



-04

# Related Products

The G6B-4 Terminal Relay series with 4-point output is also available. For details, contact your OMRON sales representative.

# ■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. E41643)

Model	Contact form	Coil ratings	Contact ratings	Number of test operations		
			5 A, 250 VAC (General Use) at 80°C	6 000		
G6B-1114P-US	4	3 to 24 VDC	5A, 30 VDC at 80°C	6,000		
G6B-1114P-FD-US	I		1/8HP, 250 VAC at 80°C	1.000		
			1/6HP, 250 VAC at 80°C	1,000		
G6B-1174P-US	-	3 to 24	8 A, 250 VAC (General Use) at 80°C			
G6B-1174P-FD-US	I	VDC	8 A, 30 VDC at 80°C			
G6B-2114P(-FD)-US		3 to 48	5 A, 250 VAC (General Use) at 40°C	6,000		
G6B-2214P(-FD)-US G6B-2014P(-FD)-US	2	VDC	5 A, 30 VDC at 40°C			

# CSA Certified: (File No. LR31928)

-					
Model	Contact form	Coil ratings	Contact ratings	Number of test operations	
G6B-1114P-US G6B-1114P-FD-US	1	3 to 24 VDC	5 A, 250 VAC (General Use) at 80°C	6,000	
			5A, 30 VDC at 80°C	0,000	
			1/6HP, 250 VAC at 80°C	- 1,000	
			360WT, 120 VAC at tungsten 80°C		
G6B-1174P-US G6B-1174P-FD-US	1	3 to 24 VDC	8 A, 250 VAC (General Use) at 80°C	6,000	
			8 A, 30 VDC at 80°C		
G6B-2114P(-FD)-US G6B-2214P(-FD)-US G6B-2014P(-FD)-US	2	3 to 48 VDC	5 A, 250 VAC (General Use) at 40°C		
			5 A, 30 VDC at 40°C		

#### EN/IEC, TÜV Certified: (Registration No. R50158246)

Model	Contact form	Coil ratings	Contact ratings	Number of test operations
G6B-1114P-US	1	3 to 48 VDC	5 A, 250 VAC (cos = 1) at 70°C	20,000
			2 A, 250 VAC (cos = 0.4) at 70°C	
			5 A, 30 VDC (L/R = 0 ms) at 70°C	
G6B-1174P-US	1	3 to 48 VDC	8 A, 250 VAC (cosφ = 1) at 70°C	
			2 A, 250 VAC (cosφ = 0.4) at 70°C	
			8 A, 30 VDC (L/R = 0 ms) at 70°C	
G6B-2114P-US G6B-2214P-US G6B-2014P-US	2	3 to 48 VDC	5 A, 250 VAC (cosφ = 1) at 70°C	
			1.5 A, 250 VAC (cos∳ = 0.4) at 70°C	
			5 A, 30 VDC (L/R = 0 ms) at 70°C	

## Precautions

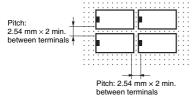
#### ● Please refer to "PCB Relays Common Precautions" for correct use.

#### Correct Use

#### Mounting

 When installing more than two Relays side by side on a PCB, keep the gaps as shown below.

It may cause a malfunction if heat is not dissipated smoothly from the Relay.



- No specified mounting direction.
- Mounting Height of Sockets and Precautions

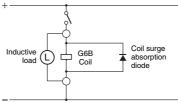
G

6

B

- Hold-down clips (for mounting and removal) are also available.(For P6B-C2 model) However, it is not suitable for G6B-1174P and G6B-1177P models.
- Removal tool is also available.
   (For P6B-Y1 model) However, it is not suitable for G6B-1177P model.

- Inhibit Circuit of the G6B-1177P(-FD)-ND-US Model
- Do not use under conditions in which a surge is included in the power supply, such as when an inductive load is connected in parallel to the coil. Doing so will cause damage to the installed (or built-in) coil surge absorbing diode.

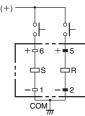


#### Using SPDT contact of the SPST-NO+SPST-NC Relay

 Do not construct a circuit so that overcurrent and burning occur if the NO, NC and SPDT contacts are short-circuited with the SPST-NO+SPST-NC Relay.Arcing may generate short-circuiting between contacts if there is short-circuiting because of conversion to the MBB contact caused by asynchronous operation of the NO and NC contacts, the interval between the NO and NC contacts is small, or a large current is left open.

#### Other precautions

- The P6B model has a flux-resistant construction. Do not wash it down with water.
- Perform wiring of No.1 and No. 2 of the X terminal as COM for double-winding latching as shown below. The operation stability improves by doing this.



- Check carefully the coil polarity (+ and -) of the Relay G6B-1177P(-FD)-ND-US.
   Do not reverse the polarity when connecting. Otherwise the built-in coil surge absorption diode may be damaged.
- This Relay is a Power Relay which is suitable for power load switching. Do not use the G6B for signal purposes such as micro load switching under 100 mA.

Application examples provided in this document are for reference only. In actual applications, confirm equipment functions and safety before using the product.
Consult your OMRON representative before using the product under conditions which are not described in the manual or applying the product to nuclear control systems, railroad systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, safety equipment, and other systems or equipment that may have a serious influence on lives and property if used improperly. Make sure that the ratings and performance characteristics of the product provide a margin of safety for the system or equipment, and be sure to provide the system or equipment with double safety mechanisms.

Note: Do not use this document to operate the Unit.

#### OMRON Corporation Electronic and Mechanical Components Company

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