A Power Relay for a Variety of Purposes with Various Models

- ROHS compliant
- Conforms to EN 61810-1, UL508, CSA22.2, SEV, SEMKO.
- Meets EN60335-1 requirements for household products.
- Clearance and creepage distance: 8 mm/8 m.
- Models with CTI250 material available.
- High-sensitivity (360 mW) and high-capacity (16 A) types available.
- Double-winding latching type available.



Ordering Information -

Cla	ssification	Enclosure	Coil	Contact Form			
		Ratings	Ratings	SPST-NO	SPDT	DPST-NO	DPDT
PCB terminal	General-purpose	Flux protection	AC/DC	G2R-1A	G2R-1	G2R-2A	G2R-2
		Fully sealed		G2R-1A4	G2R-14	G2R-2A4	G2R-24
	Bifurcated contact	Flux protection	DC	G2R-1AZ	G2R-1Z	-	-
		Fully sealed		G2R-1AZ4	G2R-1Z4	-	-
	High-capacity	Flux protection	AC/DC	G2R-1A-E	G2R-1-E	-	-
	High-sensitivity	Flux protection	DC	G2R-1A-H	G2R-1-H	G2R-2A-H	G2R-2-H
	Double-winding latching	Flux protection		G2RK-1A	G2RK-1	G2RK-2A	G2RK-2
Quick connect	General-purpose	Unsealed	AC	G2R-1A-T	G2R1-T	-	-
(upper bracket mounting)			DC	-		-	-

Note: 1. When ordering, add the rated coil voltage to the model number. Example: G2R-1A 12 VDC

Rated coil voltage

2. Models with CTI250 material are also available. Contact your OMRON representative for more details.

Model Number Legend



1. Relay Function

None: Single-side stable K: Double-winding latching

- 2. Number of Poles
 - 1: 1 pole
 - 2: 2 poles
- 3. Contact Form None: □PDT

A: □PST-NO

- 4. Contact Type None: Single Z: Bifurcated
- 5. Enclosure Ratings

None: Flux protection 4: Fully sealed

Specifications -

■ Coil Ratings

- 6. Terminals

None: Straight PCB T: Quick-connect (upper bracket mounting)

- 7. Classification
 - None: General-purpose
 - E: High-capacity
 - H: High-sensitivity
- 8. Safety Standards None: UL/CSA/EN/SEV/TÜV SKVD: UL/CSA/EN/SEV/TÜV/SEMKO
- 9. Rated Coil Voltage
 - Refer to Coil Ratings

Rated voltage	•	12 VAC	24 VAC	100/(110) VAC	120 VAC	200/(220)VAC	220 VAC	230 VAC	240 VAC
Rated Current	50Hz	93 mA	46.5 mA	11 mA	9.3 mA	5.5 mA	5.1 mA	4.7 mA	4.7 mA
	60Hz	75 mA	37.5 mA	9/(10.6) mA	7.5 mA	4.5 (5.3) mA	4.1 mA	3.8 mA	3.8 mA
Coil resistance		65 Ω	260 Ω	4,600 Ω	6,500 Ω	20,200 Ω	25,000 Ω	26,850	30,000 Ω
Coil inductance	Armature OFF	0.19	0.81	13.34	21	51.3	57.5	62	65.5
(H) (ref. value)	Armature ON	0.39	1.55	26.84	42	102	117	124	131
Must operate	voltage	80% max.	of rated vo	oltage					
Must release	voltage	30% min.	of rated vo	Itage					
Max. voltage 140% of rated voltage (at 23°C)									
Power consur	mption	Approx. 0.	.9 VA at 60	Hz (approx. 0.7	' VA at 60 ⊦	Iz)			

Rated voltage		5 VDC	6 VDC	12 VDC	24 VDC	48 VDC	100 VDC
Rated current (50/60Hz)		106 mA	88.2 mA	43.6 mA	21.8 mA	11.5 mA	5.3 mA
Coil resistanc	e	47 Ω	68 Ω	275 Ω	1,100 Ω	4,170 Ω	18,860 Ω
Coil inductance	Armature OFF	0.20	0.28	1.15	4.27	13.86	67.2
(H) (ref. value)	Armature ON	0.39	0.55	2.29	8.55	27.71	93.2
Must operate	voltage	70% max. of rat	ed voltage				
Must release	voltage	15% min. of rate	ed voltage				
Max. voltage 170% of rated voltage (at		oltage (at 23°C)					
Power consur	nption	Approx. 0.53 W					

High-sensitivity Relays

Rated voltage		5 VDC	6 VDC	12 VDC	24 VDC	48 VDC	
Rated current (50/60Hz) (see Note. 1)		71.4 mA	60 mA	30 mA	15 mA	7.5 mA	
Coil resistance	e (see Note. 1)	70 Ω	100 Ω	400 Ω	1,600 Ω	6,400 Ω	
Coil inductance	Armature OFF	0.37	0.53	2.14	7.80	31.20	
(H) (ref. value)	Armature ON	0.75	1.07	4.27	15.60	62.40	
Must operate	voltage	70% max. of rated	l voltage				
Must release	voltage	15% min. of rated v	voltage				
Max. voltage 170% of rated volta		age (at 23°C)					
Power consur	mption	Approx. 0.36 W					

Note: 1. The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of +15%/_20% (AC rated current) or ±10% (DC coil resistance)

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

 Depending on the type of relay, some relays do not have coil specifications. Contact your Omron representative for more details.

Double-winding Latching Relays

Rated voltage			5 VDC	6 VDC	12 VDC	24 VDC	
Set Coil	Rated current	(see note 1.)	167 mA	138 mA	70.6 mA	34.6 mA	
	Coil resistance	e (see note 1.)	30 Ω	43.5 Ω	170 Ω	694 Ω	
	Coil inductance	Armature OFF	0.073	0.104	0.42	1.74	
	(H) (ref. value)	Armature ON	0.146	0.208	0.83	3.43	
Reset Coil	Rated current		119 mA	100 mA	50 mA	25 mA	
	Coil resistance	,	42 Ω	60 Ω	240 Ω	960 Ω	
	Coil inductance	Armature OFF	0.003	0.005	0.018	0.079	
	(H) (ref. value)	Armature ON	0.006	0.009	0.036	0.148	
Must set volta	ge		70% max. of rated	voltage			
Must reset vol	tage		70% max. of rated voltage				
Max. voltage		140% of rated voltage (at 23°C)					
Power consun	nption		Set coil: Approx. 850 mW; Reset coil: Approx. 600 mW				

Note: 1. The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of ±10%.

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

Contact Ratings

PCB/Flux Protection, Plug-in, Quick-connect Terminal Relays

Item	Gener	ral-purpose, qu	ick-connect term	inal	High-ca	apacity
Number of poles	1 pole		2 poles		1 pole	
Load	Resistive load $(\cos \varphi = 1)$	Inductive load $(\cos\varphi = 0.4; L/R = 7 ms)$	Resistive load $(\cos \varphi = 1)$	Inductive load ($\cos \varphi = 0.4$; L/R = 7 ms)	Resistive load $(\cos \varphi = 1)$	Inductive load $(\cos\varphi = 0.4; L/R = 7 ms)$
Rated Load	10 A at 250 VAC; 10 A at 30 VDC	7.5 A at 250 VAC; 5 A at 30 VDC	5 A at 250 VAC; 5 A at 30 VDC	2 A at 250 VAC; 3 A at 30 VDC	16 A at 250 VAC; 16 A at 30 VDC	8 A at 250 VAC; 8 A at 30 VDC
Contact material	AgSnIn					
Rated carry current	10 A		5 A		16 A	
Max. switching voltage	380 VAC, 125 VDC		380 VAC, 125 VE	C	380 VAC, 125 VD	C
Max. switching current	10 A		5 A		16 A	
Max. switching power	2,500 VA, 300 W	1,875 VA, 150 W	1,250 VA, 150 W	500 VA, 90 W	4,000 VA, 480 W	2,000 VA, 240 W
Failure rate (reference value)	100 mA at 5 VDC		10 mA at 5 VDC		100 mA at 5 VDC	;

Note: 1. P level: $\lambda_{60} = 0.1 \times 10^{-6}$ /operation.

PCB/Flux Protection Relays

Item	Bifurcated	d contacts		High-se	ensitivity	
Number of poles	1 pole		1 pole		2 poles	
Load	Resistive load (cosφ = 1)	Inductive load ($\cos\varphi = 0.4$; L/R = 7 ms)	Resistive load (cosφ = 1)	Inductive load ($\cos\varphi = 0.4$; L/R = 7 ms)	Resistive load $(\cos \varphi = 1)$	Inductive load $(\cos\varphi = 0.4; L/R = 7 ms)$
Rated Load	5 A at 250 VAC; 5 A at 30 VDC	2 A at 250 VAC; 3 A at 30 VDC	5 A at 250 VAC; 5 A at 30 VDC	2 A at 250 VAC; 3 A at 30 VDC	3 A at 250 VAC; 3 A at 30 VDC	1 A at 250 VAC; 1.5 A at 30 VDC
Rated carry current	5 A		5 A		3 A	
Max. switching voltage	380 VAC, 125 VD	C	380 VAC, 125 VDC		380 VAC, 125 VDC	
Max. switching current	5 A		5 A		3 A	
Max. switching power	1,250 VA, 150 W	500 VA, 90 W	1,250 VA, 150 W	500 VA, 90 W	750 VA, 90 W	250 VA, 45 W
Failure rate (reference value)	1 mA at 5 VDC		100 mA at 5 VDC)	10 mA at 5 VDC	

Note: P level: $\lambda_{60} = 0.1 \times 10^{-6}$ /operation.

PCB/Fully Sealed Relays

Item		General-purpose	(single contact)		Bifurcate	d contact
Number of poles	1 pole		2 poles		1 pole	
Load	Resistive load $(\cos \varphi = 1)$	Inductive load $(\cos\varphi = 0.4; L/R = 7 ms)$	Resistive load $(\cos \varphi = 1)$	Inductive load ($\cos\varphi = 0.4$; L/R = 7 ms)	Resistive load $(\cos \varphi = 1)$	Inductive load ($\cos\varphi = 0.4$; L/R = 7 ms)
Rated Load	8 A at 250 VAC; 8 A at 30 VDC	6 A at 250 VAC; 4 A at 30 VDC	4 A at 250 VAC; 4 A at 30 VDC	1.5 A at 250 VAC; 2.5 A at 30 VDC	5 A at 250 VAC; 5 A at 30 VDC	2 A at 250 VAC; 3 A at 30 VDC
Rated carry current	8 A		4 A		5 A	
Max. switching voltage	380 VAC, 125 VD	C	380 VAC, 125 VDC		380 VAC, 125 VDC	
Max. switching current	8 A		4 A		5 A	
Max. switching power	2,000 VA, 240 W	1,500 VA, 120 W	1,000 VA, 120 W	375 VA, 75 W	1,250 VA, 150 W	500 VA, 90 W
Failure rate (reference value)	100 mA at 5 VDC	·	10 mA at 5 VDC		1 mA at 5 VDC	

Note: P level: $\lambda_{60} = 0.1 \times 10^{-6}$ /operation.

Latching Relays

Number of poles	1 p	ole	2 p	oles	
Load	Resistive load $(\cos \varphi = 1)$	Inductive load ($\cos \varphi = 0.4$; L/R = 7 ms)	Resistive load $(\cos \varphi = 1)$	Inductive load ($\cos \varphi = 0.4$; L/R = 7 ms)	
Rated Load	5 A at 250 VAC; 5 A at 30 VDC	3.5 A at 250 VAC; 2.5 A at 30 VDC	3 A at 250 VAC; 3 A at 30 VDC	1.5 A at 250 VAC; 2 A at 30 VDC	
Rated carry current	5 A		3 A		
Max. switching voltage	380 VAC, 125 VDC		380 VAC, 125 VDC		
Max. switching current	5 A		3 A		
Max. switching power	1,250 VA, 150 W	875 VA, 75 W	750 VA, 90 W	375 VA, 60 W	
Failure rate (reference value)	100 mA at 5 VDC		10 mA at 5 VDC		

Note: P level: $\lambda_{60} = 0.1 \times 10^{-6}$ /operation.

Characteristics

Standard Relays

Iter	m	1 Pole	2 Poles			
Contact resistance	•	$30 \text{ m}\Omega \text{ max.}$ (high-capacity type: $100 \text{ m}\Omega \text{ max.}$)	50 mΩ max.			
Operate (set) time		15 ms max				
Release (reset) tim	e	AC: 10 ms max.; DC: 5 ms max. (w/built-in diode: 20 ms max.)				
Max. operating fre	quency	Mechanical: 18,000 operations/hr Electrical: 1,800 operations/hr (under rated load)				
Insulation resistan	ce	1,000 MΩ min. (at 500 VDC)				
Impulse withstand	voltage	10KV 1*40µsec				
Insulation Creepage (Typ)		10.0 mm				
Distance	Clearance (Typ)	9.3 mm				
Tracking Resistance (CTI)		175 V				
Dielectric strength	I	5,000 VAC, 50/60 Hz for 1 min between coil and contacts*; 1,000 VAC, 50/60 Hz for 1 min between contacts of same polarity	5,000 VAC, 50/60 Hz for 1 min between coil and contacts*; 3,000 VAC, 50/60 Hz for 1 min between contacts of different polarity 1,000 VAC, 50/60 Hz for 1 min between contacts of same polarity			
Vibration resistanc	e	Destruction: 10 to 55 to 10 Hz, 0.75mm single Malfunction: 10 to 55 to 10 Hz, 0.75mm single				
Shock resistance		Destruction: 1,000 m/s ² Malfunction: 200 m/s ² when energized; 100 m/	/s ² when not energized			
Endurance		Mechanical: AC coil: 10,000,000 operations min.; DC coil: 20,000,000 operations min. (at 18,000 operations/hr) Electrical:100,000 operations min. (at 1,800 operations/hr under rated load)				
Ambient temperat	ure	Operating: -40°C to 70°C (with no icing)				
Ambient humidity		Operating: 5% to 85%				
Weight		Approx. 17 g				

Note: Values in the above table are initial values.

Accessories (Order Separately)

Connecting Sockets

Number of poles	Applicable Relay model	Track/surface-mounting	Back-mounting Socket		
		Socket	Terminals	Model	
1 pole	G2R-1-	P2RF-05-E	PCB terminals	P2R-05P, P2R-057P	
	S(N)(D)(ND)(NI)(NDI)G2R-13- S (G2R-1A3-S)	P2RF-05	Solder terminals	P2R-05P, P2R-057P P2R-05A	
2 poles	G2R-2-S(N)(D)(ND)(NI)(NDI)	P2RF-08-E	PCB terminals	P2R-08P, P2R-087P	
		P2RF-08	Solder terminals	P2R-08A	

Note: See Dimensions for details on socket size.

Mounting Track

Applicable socket	Description	Model	
Track connecting socket	Mounting track	50 cm (ℓ) x 7.3 mm (t): PFP-50N 1 m (ℓ) x 7.3 mm (t): PFP-100N 1 m (ℓ) x 16 mm (t): PFP-100N2	
	End plate	PFP-M	
	Spacer	PFP-S	
Back connecting socket	Mounting plate	P2R-P*	

*Used to mount several P2R-05A and P2R-08A connecting sockets side by side.

Double-winding Latching Relays

Item	1 Pole	2 Poles	
Contact resistance	30 mΩ max.	50 mΩ max.	
Set time	20 ms max		
Reset time	20 ms max.	20 ms max.	
Min. set/reset signal width	30 ms max.		
Max. operating frequency	Mechanical: 18,000 operations/hr Electrical: 1,800 operations/hr (under rated load)		
Insulation resistance	1,000 MΩ min. (at 500 VDC)		
Dielectric strength	5,000 VAC, 50/60 Hz for 1 min between coil and contacts*; 1,000 VAC, 50/60 Hz for 1 min between contacts of same pole; 1,000 VAC, 50/60 Hz for 1 min between set and reset coil	5,000 VAC, 50/60 Hz for 1 min between coil and contacts*; 3,000 VAC, 50/60 Hz for 1 min between contacts of different poles 1,000 VAC, 50/60 Hz for 1 min between contacts of same pole 1,000 VAC, 50/60 Hz for 1 min between set and reset coil	
Vibration resistance	Destruction: 10 to 55 to 10 Hz, 0.75mm single amplitude (1.5mm double amplitude) Malfunction: 10 to 55 to 10 Hz, 0.75mm single amplitude (1.5mm double amplitude)		
Shock resistance	Destruction: 1,000 m/s² (approx. 100G) Malfunction: Set: 500 m/s² (approx. 50G); 200 m/s² (approx. 20G) Reset: 100 m/s² (approx. 10G)		
Endurance	Mechanical: 10,000,000 operations min (at 18,000 operations/hr) Electrical: 100,000 operations min. (at 1,800 operations/hr under rated load)		
Ambient temperature	Operating: -40°C to 70°C (with no icing)		
Ambient humidity	Operating: 5% to 85%		
Weight	Approx. 17 g (Quick-connect type: approx. 20g)		

Note: Values in the above table are the initial values.

Approved Standards UL 508 (File No. E41643), CSA 22.2 No.14 (File No. LR31928)

Model	Contact form	Coil ratings	Contact ratings
G2R-1 G2R-14 G2R-1-H G2R-1-S G2R-1-T	SPDT	3 to 110 VDC 3 to 240 VAC	10 A, 30 VDC (resistive) 10 A, 250 VAC (general use) TV-3 (NO contact only)
G2R-1A G2R-1A4 G2R-1A-H G2R-1A-H G2R-1A-S G2R-1A-T	SPST-NO	_	
G2R-1-E	SPDT		16 A, 30 VDC (resistive, NO contact only) 16 A, 250 VAC (general use, NO contact only)
G2R-1A-E	SPST-NO		TV-3 (NO contact only); (1/3 hp, 120 VAC For UL)
G2R-2 G2R-24 G2R-2-H G2R-2-S	DPDT		5 A, 30 VDC (resistive) 5 A, 250 VAC (general use) TV-3 (NO contact only)
G2R-2A G2R-2A4 G2R-2A-H G2R-2A-S	DPST-NO		
G2R-1A-ASI	SPST-NO		10 A, 30 VDC (resistive) 10 A, 250 VAC (general use) TV-5/TV-8 (NO contact only), (For UL) TV-8 (NO contact only); 1/4 hp, 125 VAC (For CSA)

SEV

Contact form	Coil ratings	Contact ratings
1 pole	3 to 110 VDC 3 to 240 VAC	16 A, 250 VAC1 (AgSnIn contact) 16 A, 30 VDC1 (AgSnIn contact) 10 A, 250 VAC1 5 A, 250 VAC3 10 A, 30 VDC1
2 poles		5 A, 250 VAC1 2 A, 380 VAC1 5 A, 30 VDC1

SEMKO

Contact form	Coil ratings	Contact ratings
1 pole	3 to 110 VDC 3 to 240 VAC	10/80 A, 250 VAC 3/100 A, 250 VAC 16/128 A, 250 VAC (AgSnIn contact)
2 poles		5/40 A, 250 VAC

TÜV (EN61810-1)

Contact form	Coil ratings	Contact ratings
1 pole	3 to 110 VDC, 6 VAC to 240 VAC (for Standard coil) 3 to 48 VDC (for K, U coil) 3 to 70 VDC (for H coil)	10 A, 250 VAC (cosφ = 1.0) 10 A, 30 VDC (0 ms) 16 A, 250 VAC (cosφ = 1.0) (AgSnIn contact)
2 poles		$\begin{array}{l} 8 \mbox{ A, 250 VAC } (cos \phi = 0.4) \\ 5 \mbox{ A, 250 VAC } (cos \phi = 1.0) \\ 5 \mbox{ A, 30 VDC } (0 \mbox{ ms}) \\ 2.5 \mbox{ A, 250 VAC } (cos \phi = 0.4) \end{array}$

EN 61810-1 (VDE)

Contact form	Coil ratings	Contact ratings
1 pole	5, 6, 9, 12, 18, 24, 48, 60, 100, 110 VDC 12, 18, 24, 48, 50, 100/(110), 110, 120, 200/(220), 220, 230, 240 VAC	10 A, 250 VAC (cosφ = 1.0) 10 A, 30 VDC (0 ms) 16 A, 250 VAC (cosφ = 1.0)
2 poles	5, 6, 9, 12, 18, 24, 48, 60, 100, 110 VDC 12, 18, 24, 48, 50, 100/(110), 110, 120, 200/(220), 220, 230, 240 VAC	5 A, 250 VAC (cosφ =1.0) 5 A, 30 VDC (0 ms)

Engineering Data

Maximum Switching Power

Flux Protection/Plug-in Relays G2R-1, G2R-1A, G2R-1-T, G2R-1A-T

AC inductive load $(\cos \phi = 0.4)$

DC inductive load (L/R = 7 ms)

Switching current (A)

10

5

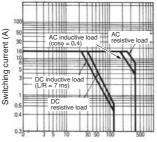
1

0.5

0.1

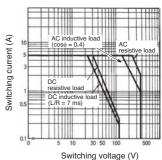
DC resistive load ГГ

AC resistiv G2R-1-E, G2R-1A-E



Switching voltage (V)

G2R-1Z, G2R-1AZ



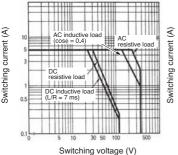
G2R-1-H, G2R-1A-H, G2R-2, G2R-2A

10 20 30 50

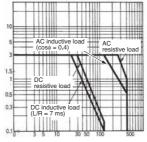
Switching voltage (V)

100

500

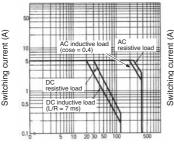


G2R-2-H, G2R-2A-H



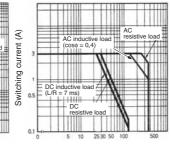
Switching voltage (V)





Switching voltage (V)



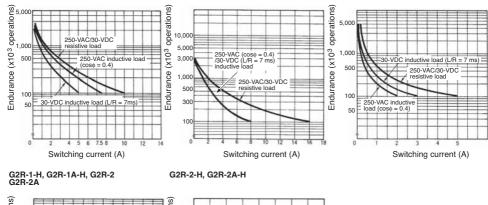


Switching voltage (V)

Fully Sealed Relays G2R-14, G2R-1A4 G2R-24, G2R-2A4 G2R-1Z4, G2R-1AZ4 Switching current (A) € ₹ AC inductive load $(\cos \phi = 0.4)$ AC resistive Switching current (Switching current AC inductive $(\cos \phi = 0.4)$ AC ŧ AC res resistive load 10 AC inductive load $(\cos \phi = 0.4)$ DC resistive load DC inductive load (L/R = 7 ms) DC resistive load ρċ -----resisti DC inductive load (L/R = 7 ms) DC inductive load (L/R = 7 ms) 0.5 0.4 0.5 ++++ 0.1 0.1 0.1 20 30 50 300 50 50 10 30 50 Switching voltage (V) Switching voltage (V) Switching voltage (V)

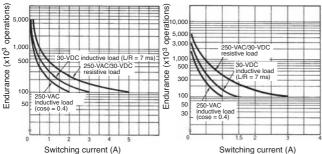
Endurance

Flux Protection/Plug-in Relays G2R-1, G2R-1A, G2R-1-T, G2R-1A-T



G2R-1Z, G2R-1AZ

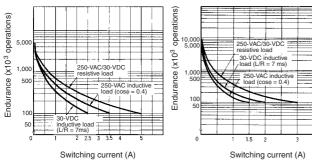
G2R-1-E, G2R-1A-E



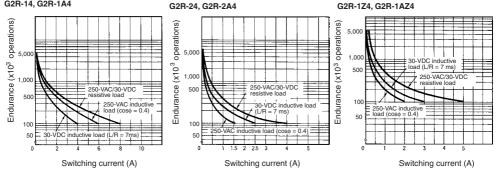
Engineering Data (cont.)

G2RK-1A, G2RK-1

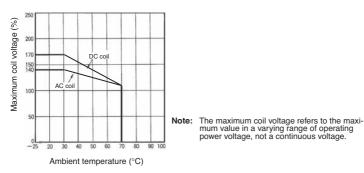
G2RK-2A, G2RK-2



Fully sealed Relays G2R-14, G2R-1A4



Ambient Temperature vs Maximum Coil Voltage

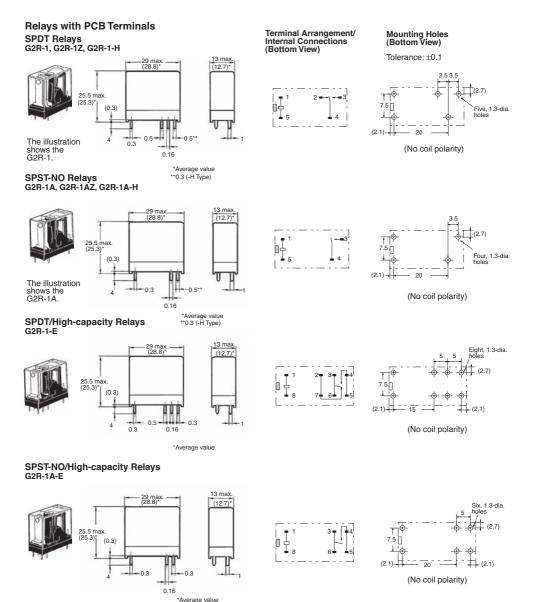


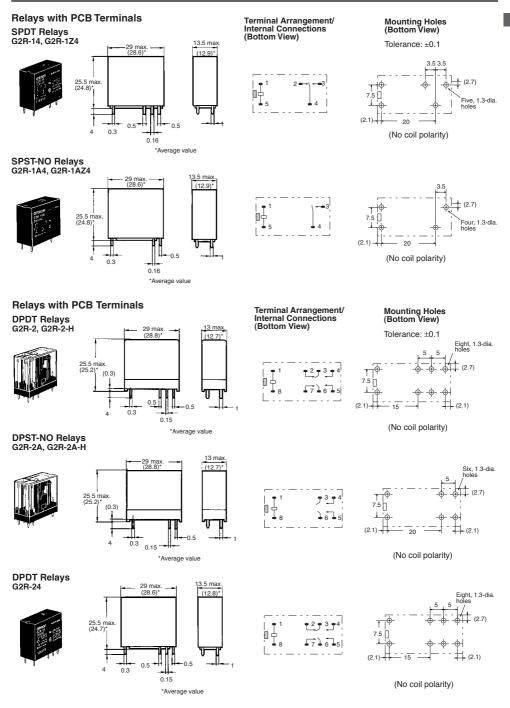
Power Relays

Dimensions

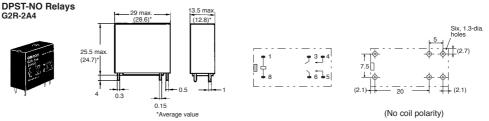
Note: 1. All units are in millimetres unless otherwise indicated.

2. Orientation marks are indicated as follows:



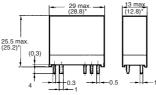


Power Relays



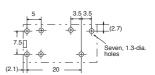
Double-winding Latching Relays with PCB Terminals





*Average value

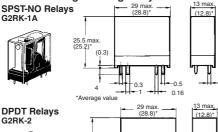




(After confirming coil polarity, wire correctly.)

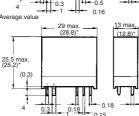
Double-winding Latching Relays with PCB Terminals





DPDT Relays G2RK-2

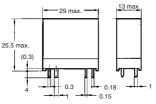




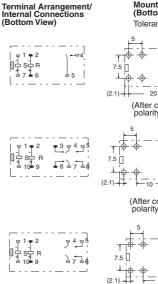
*Average value

DPST-NO Relays G2RK-2A

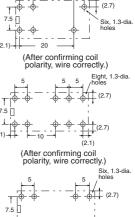




1



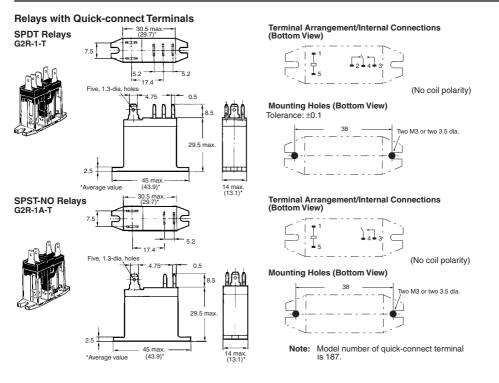
Mounting Holes (Bottom View) Tolerance: ±0.1 3.5



15 (2.1) (After confirming coil

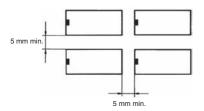
(2.7)

polarity, wire correctly.)



Precautions

When mounting a number of relays on a PCB, be sure to provide a minimum mounting space of 5 mm between the two juxtaposed relays as shown below.



The above minimum mounting space is necessary due to mutual thermal interference generated by the relays. This restriction may be ignored, however, depending on the operating conditions of the relays. Consult OMRON for details.

There is no restriction on the mounting direction of each relay on the PCB.

When using this circuit, confirm the set and reset states and then take into account the circuit constant.