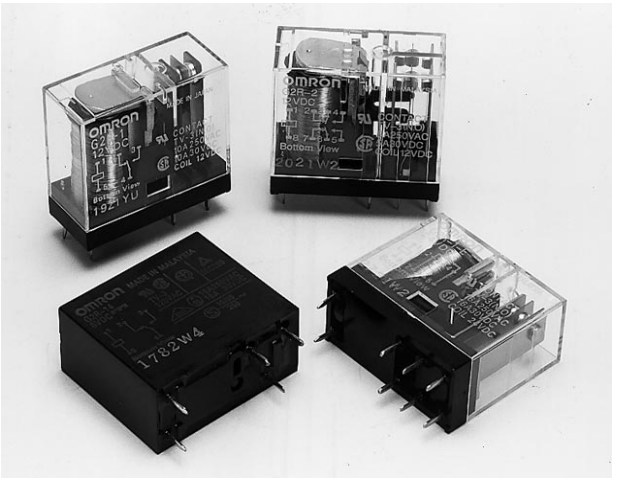
OMRON

PCB Relay

G2R

The Redesigned G2R Power Relay

- Flux protection, pre-tinned terminals now standard.
- 10% to 20% reduction in temperature rise at the contacts.
- High-sensitivity (360 mW) and high-capacity (16 A) types available.
- Creepage distance of 8 mm min. between coil and contact.
- Double-winding latching type also available.
- Models meeting SEV, SEMKO, VDE and BEAB standards available.



SEMKO
BEAB

Ordering Information

Classification		Sealing	Coil ratings	Contact form			
				SPST-NO	SPDT	DPST-NO	DPDT
PCB terminal	General-purpose	Flux protection	AC/DC	G2R-1A	G2R-1	G2R-2A	G2R-2
		Plastic-sealed	AC/DC	G2R-1A4	G2R-14	G2R-2A4	G2R-24
	Twin contact	Flux protection	DC	G2R-1AZ	G2R-1Z	---	---
		Plastic-sealed	DC	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	DC	G2RK-1A	G2RK-1	G2RK-2A	G2RK-2

Model Number Legend:

G2R □-□ □ □ □-□ □-□-□ □

1 2 3 4 5 6 7 8 9 10

1. Relay Function
None: General-purpose
K: Double-winding latching

2. Number of Poles
1: 1 pole
2: 2 poles

3. Contact Form
None: SPDT
A: SPST-NO

4. Contact Type
None: Single
Z: Bifurcated

5. Sealing
None: Flux protection
4: Plastic-sealed

6. Terminals
None: Straight PCB

7. Classification
None: General-purpose
E: High-capacity
H: High-sensitivity

8. Approved Standards
None: UL, CSA, IEC, TUV & VDE certified
SKVD: SEV, SEMKO, VDE certified

9. Contact Material
None: AgCdO
ASI: AgSnIn

10. Rated Coil Voltage

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

2. OMRON has also prepared the above relays with AgSnIn contacts, which are more tolerant of large inrush currents and physical movement compared with relays with standard contacts. When ordering, add "-ASI" to the model number.
Example: G2R-1A-ASI

3. Standard, NO contact type relays are TV-3 class products in accordance with the TV standards of the UL/CSA. Models with AgSnIn contacts are TV-5 class products.
Example: G2R-1A-ASI
When ordering a TV-8 class model, insert "-TV8" into the model number as follows:
Example: G2R-1A-E–ASI–TV8

4. BEAB approval relates to High Capacity type only.

Specifications

■ Coil Ratings (Measured at 23°C ambient)

Rated voltage (AC)		12 VAC	24 VAC	110 VAC	120 VAC	200 VAC	220 VAC	230 VAC	240 VAC
Rated current*	50 Hz	93 mA	46.5 mA	10.2 mA	9.3 mA	5.5 mA	5.1 mA	4.7 mA	4.7 mA
	60 Hz	75 mA	37.5 mA	8.2 mA	7.5 mA	4.5 mA	4.1 mA	3.8 mA	3.8 mA
Coil resistance		65 Ω	260 Ω	5,500 Ω	6,500 Ω	20,200 Ω	25,000 Ω	26,850 Ω	30,000 Ω
Coil inductance	Armature OFF	0.19	0.81	17	21	51.3	57.5	62	65.5
(H) (ref. value)	Armature ON	0.39	1.55	35	42	102	117	124	131
Must operate voltage		80% max. of rated voltage							
Must release voltage		30% max. of rated voltage							
Max. voltage		110% of rated voltage							
Power consumption		Approx. 0.9 VA at 60 Hz							

Rated voltage (DC)		5 VDC	6 VDC	12 VDC	24 VDC	48 VDC	100 VDC
Rated current* (50/60 Hz)		106 mA	88.2 mA	43.6 mA	21.8 mA	11.5 mA	5.3 mA
Coil resistance		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% min. of rated voltage					
Must release voltage		15% min. of rated voltage					
Max. voltage		110% of rated voltage					
Power consumption		Approx. 0.53 W					

High-sensitivity Relays

Rated voltage		5 VDC	6 VDC	12 VDC	24 VDC	48 VDC
Rated current (50/60 Hz)		71.4 mA	60 mA	30 mA	15 mA	7.5 mA
Coil resistance		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 voltage				
Must release voltage		15% max. of rated voltage				
Max. voltage		110% of rated voltage				
Power consumption		Approx. 0.36 W				

Double-winding Latching Relays

Rated voltage			5 VDC	6 VDC	12 VDC	24 VDC
Set coil	Rated current		167 mA	138 mA	70.6 mA	34.6 mA
	Coil resistance		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 voltage			70% of rated voltage			
Must reset voltage			70% of rated voltage			
Max. voltage			110% of rated voltage			
Power consumption			Set coil: Approx. 850 mW; Reset coil: Approx. 600 mW			

■ Contact Ratings

Flux Protection Relays

Item	Standard		Standard		High-capacity	
Number of poles	1 pole		2 pole		1 pole	
Load	Resistive load (cos∅ = 1)	Inductive load (cos∅ = 0.4; L/R = 7 ms)	Resistive load (cos∅ = 1)	Inductive load (cos∅ = 0.4; L/R = 7 ms)	Resistive load (cos∅ = 1)	Inductive load (cos∅ = 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; 10A at 250 VAC*	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
Rated carry current	10 A		5 A		16 A	
Max. operating voltage	380 VAC, 125 VDC		380 VAC, 125 VDC		380 VAC, 125 VDC	
Max. operating current	10 A		5 A		16 A	
Max. switching capacity	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
Min. permissible load	100 mA at 5 VDC		10 mA at 5 VDC		100 mA at 5 VDC	

Note: * The G2R–2 relay is rated at 10A, 250 VAC for 60,000 operations

Item	Bifurcated contacts		High-sensitivity			
Number of poles	1 pole		1 pole		2 pole	
Load	Resistive load (cos∅ = 1)	Inductive load (cos∅ = 0.4; L/R = 7 ms)	Resistive load (cos∅ = 1)	Inductive load (cos∅ = 0.4; L/R = 7 ms)	Resistive load (cos∅ = 1)	Inductive load (cos∅ = 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. operating voltage	380 VAC, 125 VDC		380 VAC, 125 VDC		380 VAC, 125 VDC	
Max. operating current	5 A		5 A		3 A	
Max. switching power	1,250 VA, 150 W	1,875 VA, 150 W	1,250 VA, 150 W	500 VA, 90 W	750 VA, 90 W	250 VA, 45 W
Min. permissible load	1 mA at 5 VDC		100 mA at 5 VDC		10 mA at 5 VDC	

Plastic-sealed Relays

Item	Standard				Bifurcated contact	
Number of poles	1 pole		2 pole		1 pole	
Load	Resistive load (cos∅ = 1)	Inductive load (cos∅ = 0.4; L/R = 7 ms)	Resistive load (cos∅ = 1)	Inductive load (cos∅ = 0.4; L/R = 7 ms)	Resistive load (cos∅ = 1)	Inductive load (cos∅ = 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. operating voltage	380 VAC, 125 VDC		380 VAC, 125 VDC		380 VAC, 125 VDC	
Max. operating current	8 A		4 A		5 A	
Max. switching capacity	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
Min. permissible load	100 mA at 5 VDC		10 mA at 5 VDC		1 mA at 5 VDC	

Latching Relays

Item	1 pole		2 pole	
Load	Resistive load (cos∅ = 1)	Inductive load (cos∅ = 0.4; L/R = 7 ms)	Resistive load (cos∅ = 1)	Inductive load (cos∅ = 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. operating voltage	380 VAC, 125 VDC		380 VAC, 125 VDC	
Max. operating 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
Min. permissible load	100 mA at 5 VDC		10 mA at 5 VDC	

■ Characteristics

Standard Relays

Item	1 pole	2 pole
Contact resistance	30 mΩ max.	50 mΩ max.
Operate (set) time	15 ms max.	
Release (reset) time	AC: 10 ms max.; DC: 5 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 withstand voltage	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 resistance	Destruction: 10 to 55 Hz, 1.5-mm double amplitude Malfunction: 10 to 55 Hz, 1.5-mm double amplitude	
Shock resistance	Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: 200 m/s^2 when energized (approx. 20G); 100m/s^2 when not energized (approx. 10G)	
Life expectancy	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 temperature	Operating: –40°C to 70°C (with no icing) Storage: –40°C to 70°C (with no icing)	
Ambient humidity	Operating: 35% to 85%	
Weight	Approx. 17 g	

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.	
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 withstand voltage	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 Hz, 1.5 mm double amplitude Malfunction: 10 to 55 Hz, 1.5 mm double amplitude	
Shock resistance	Destruction: 1,000 m/s^2 (approx. 100G) Malfunction: Set: 500 m/s^2 (approx. 50G); 200m/s^2 (approx. 20G) Reset: 100 m/s^2 (approx. 10G)	
Life expectancy	Mechanical: 10,000,000 operations min (at 18,000 operations/hr) Electrical: 100,000 operations min. (at 1,800 operations/hr under rated load)	
Weight	Approx. 17 g	

■ Approved Standards

UL 508 (File No. E41643)/CSA 22.2 No.0, No.14 (File No. LR31928)

Model	Contact form	Coil ratings	Contact ratings
G2R-1 G2R-14 G2R-1-H	SPDT	3 to 110 VDC 3 to 240 VAC	10 A, 30 VDC (resistive) 10 A, 250 VAC (general use) 5 A, 277 VAC (general use) 360 WT, 120 VAC (tungsten, 250 cycles) TV-3 (NO contact only)
G2R-1A G2R-1A4 G2R-1A-H	SPST-NO		1/4 hp, 125 VAC, 1/2 hp, 250 VAC 1/2 hp, 277 VAC
G2R-1-E	SPDT		16 A, 30 VDC (resistive, NO contact only) 360 WT, 120 VAC (tungsten, 25,000 cycles) 16 A, 250 VAC (general use, NO contact only)
G2R-1A-E	SPST-NO		TV-3 (NO contact only); 1/3 hp, 120 VAC, 1/2HP 120 VAC (UL only) 3 A, 240 VAC (pilot duty)
G2R-2 G2R-24 G2R-2-H	DPDT		5A, 30 VDC (resistive); 5 A, 240 VAC (resistive) 5 A, 250 VAC (general use), TV-3 (NO contact only) 1/10 hp, 120 VAC, (UL only); 1/10 hp, 125 VAC, 1/10 hp, 250VAC; 1/6hp, 120VAC; 1/4 hp 240VAC (UL only); 1/3 hp, 240VAC; 1/6 hp, 265VAC; 1/3 hp, 265 VAC
G2R-2A G2R-2A4 G2R-2A-H	DPST-NO		
G2R-1A-ASI	SPST-NO		10 A, 30 VDC (resistive) 10 A, 250 VAC (general use) 600 WT, 120 VAC (tungsten, 25,000 cycles) TV-5(nNo contact, UL only), /TV-8 (NO) 1/4 hp, 125 VAC; 1/2 hp, 125 VAC 1/2 hp, 277 VAC

SEV

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

SEMKO

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

TÜV (VDE File 0435)

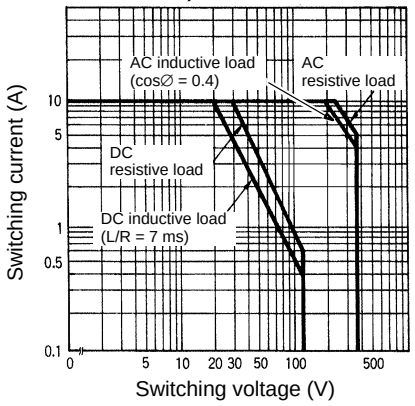
Contact form	Coil ratings	Contact ratings
1 poles	3, 5, 6, 12, 18, 24, 48, 60, 110 VDC 6, 12, 24, 50, 100, 110, 120 VAC	16 A, 250 VAC (cos∅ = 1.0) (AgInO contact) 9 A, 250 VAC (cos∅ = 0.4) (AgInO contact) 16 A, 30 VDC (0 ms) (AgInO contact) 5 A, 30 VDC (40 ms) (AgInO contact) 1 A, 250 VAC (cos∅ = 1.0); 0.75 A, 250 VAC (cos∅ = 0.4) 1 A, 30 VDC (0 ms); 10 A, 250 VAC (cos∅ = 1.0) 7.5 A, 250 VAC (cos∅ = 0.4); 10 A, 30 VDC (0 ms)
2 poles		5 A, 250 VAC (cos∅ = 1.0); 2 A, 250 VAC (cos∅ = 0.4) 5 A, 30 VDC (0 ms)

Engineering Data

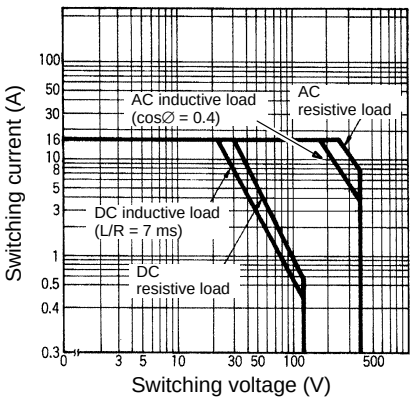
Life Expectancy

Max. Switching Capacity

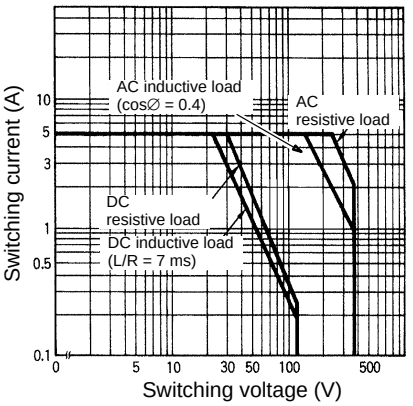
G2R-1, G2R-1A



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

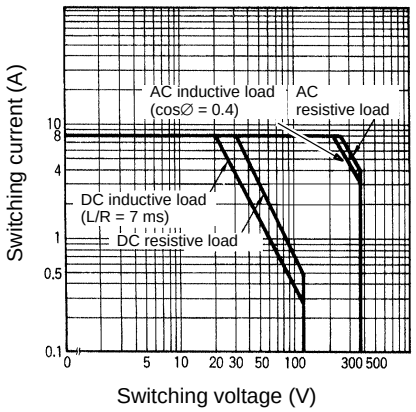


G2R-1Z, G2R-1AZ

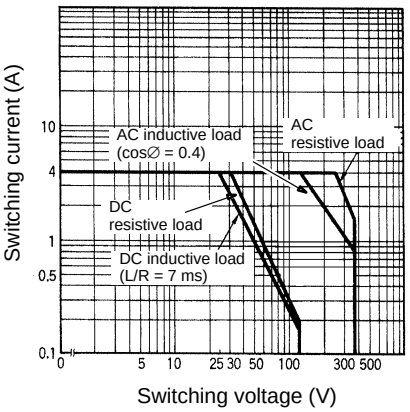


Plastic-sealed Relays

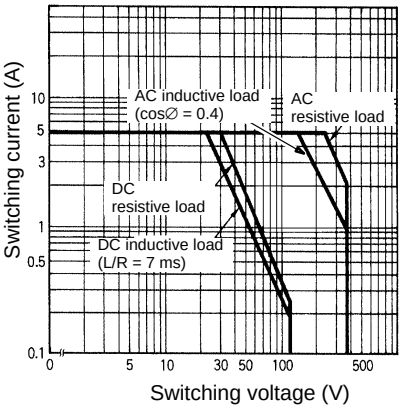
G2R-14, G2R-1A4



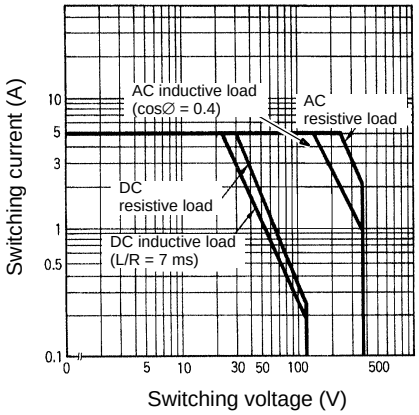
G2R-24, G2R-2A4



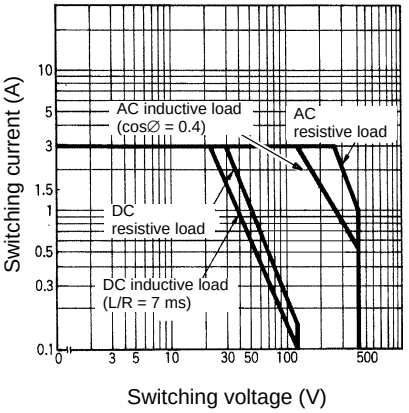
G2R-1Z4, G2R-1AZ4



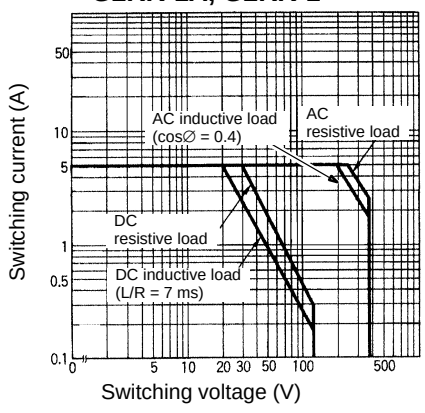
G2R-1-H, G2R-1A-H, G2R-2 G2R-2A



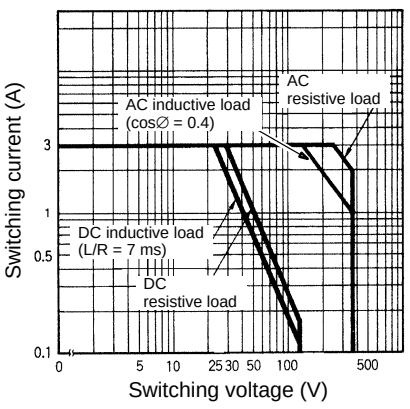
G2R-2-H, G2R-2A-H



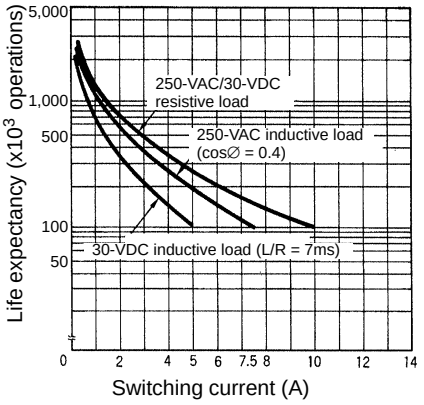
G2RK-1A, G2RK-1



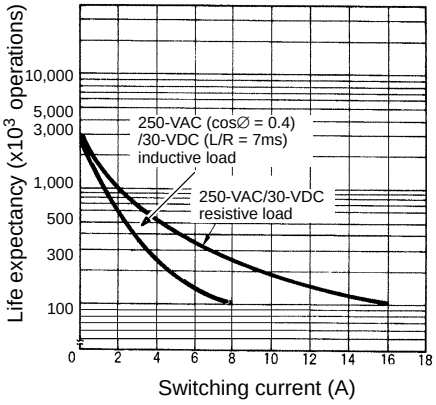
G2RK-2A, G2RK-2



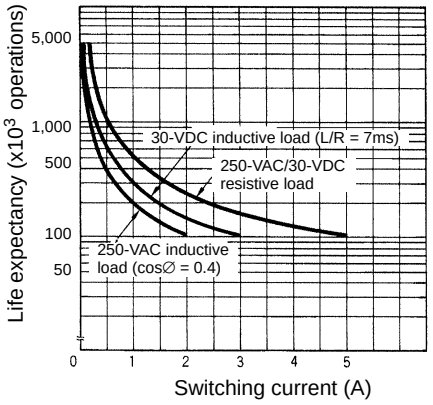
Flux Protection
G2R-1, G2R-1A



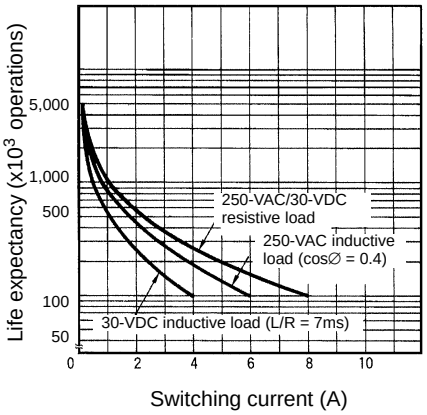
G2R-1-E, G2R-1A-E



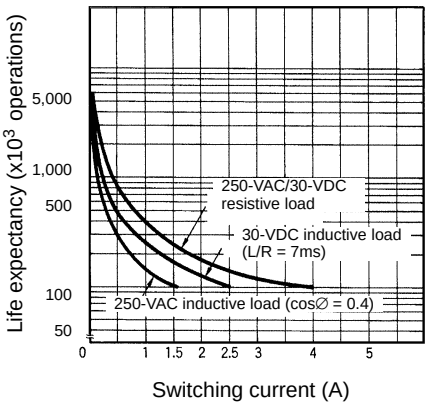
G2R-1Z, G2R-1AZ



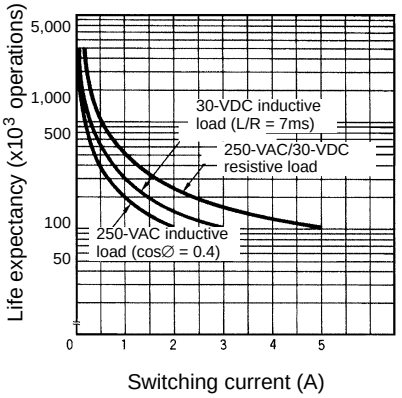
Plastic-sealed Relays
G2R-14, G2R-1A4



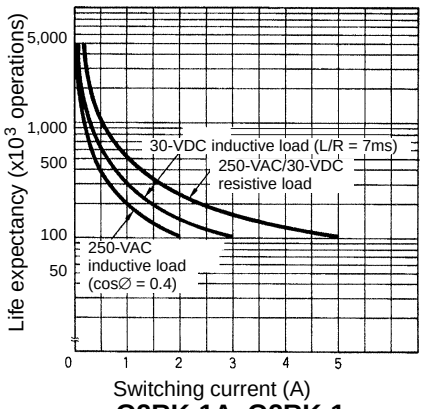
G2R-24, G2R-2A4



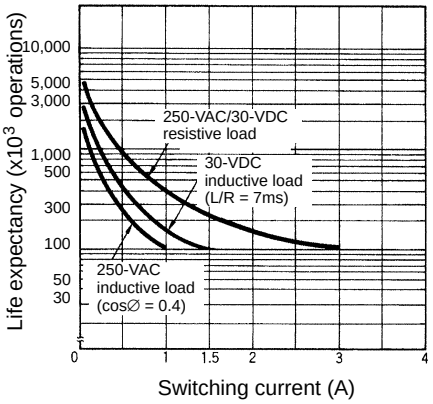
G2R-1Z4, G2R-1AZ4



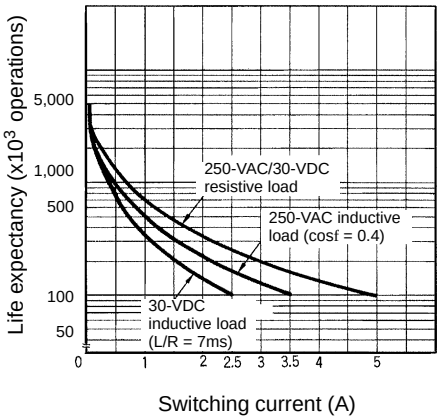
G2R-1-H, G2R-1A-H, G2R-2
G2R-2A, G2R-2-S



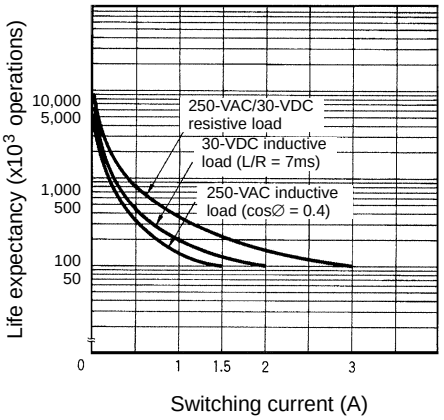
G2R-2-H, G2R-2A-H



G2RK-1A, G2RK-1



G2RK-2A, G2RK-2

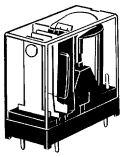


Dimensions

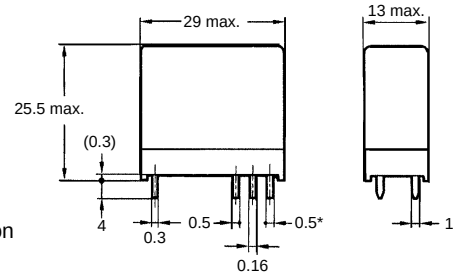
Note: 1. Orientation marks are indicated as follows:

Relays with PCB Terminals

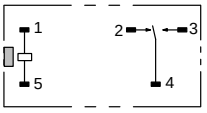
SPDT Relays
G2R-1, G2R-1Z, G2R-1-H



The illustration shows the G2R-1.

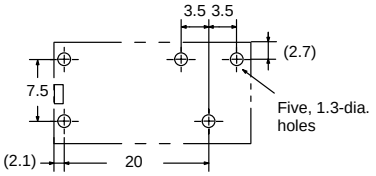


Terminal Arrangement/ Internal Connections (Bottom View)

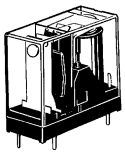


Mounting Holes (Bottom View)

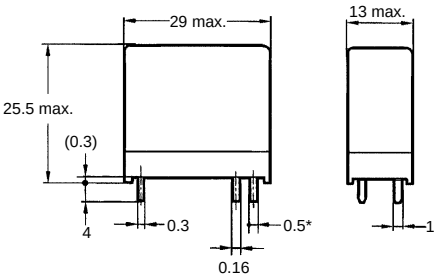
Tolerance: ±0.1

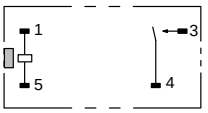


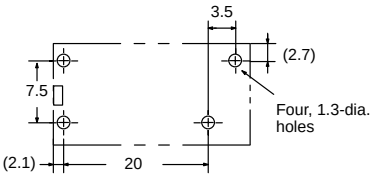
SPST-NO Relays
G2R-1A, G2R-1AZ, G2R-1A-H



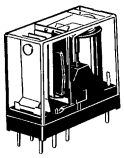
The illustration shows the G2R-1A.

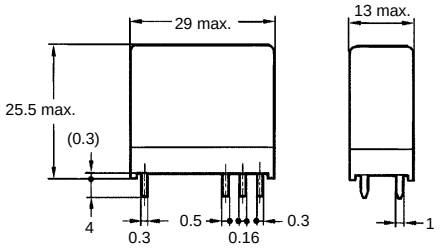


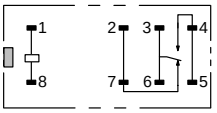


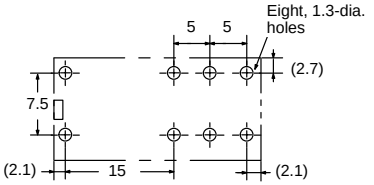


SPDT/High-capacity Relays
G2R-1-E

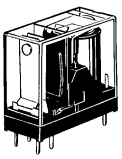


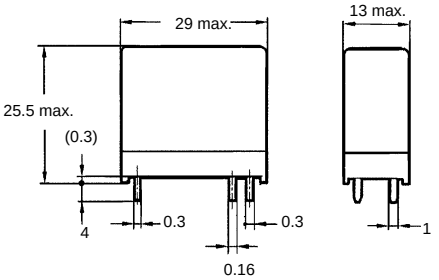


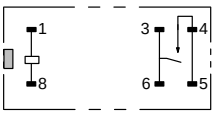


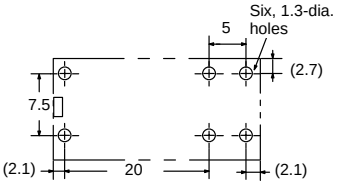


SPST-NO/High-capacity Relays
G2R-1A-E









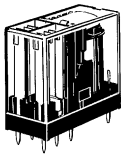
Relays with PCB Terminals

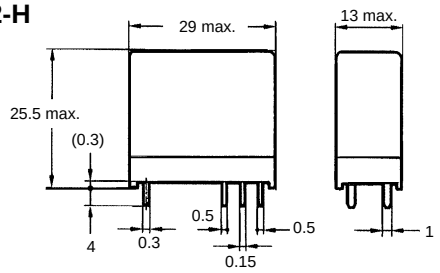
Terminal Arrangement/ Internal Connections (Bottom View)

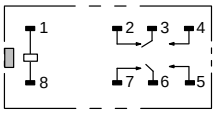
Mounting Holes (Bottom View)

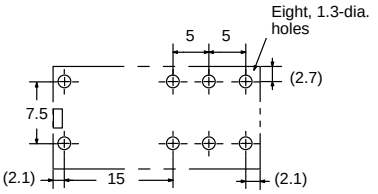
Tolerance: ±0.1

DPDT Relays
G2R-2, G2R-2-H

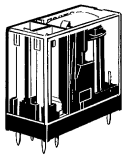


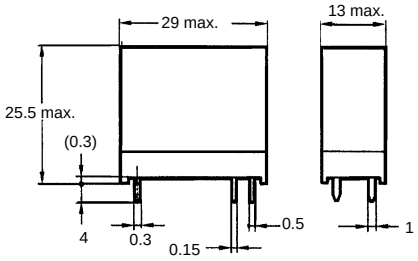


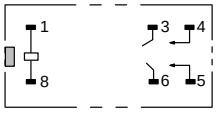


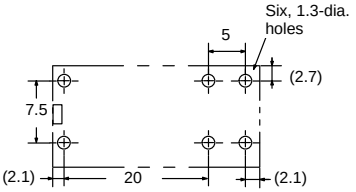


DPST-NO Relays
G2R-2A, G2R-2A-H

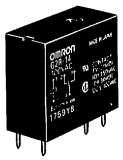


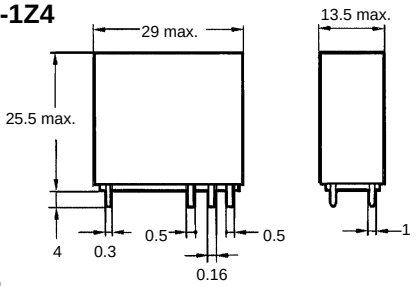


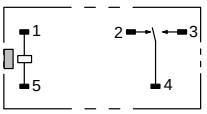


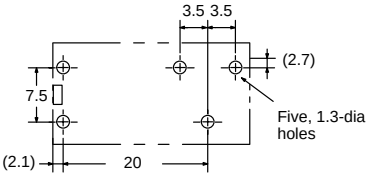


SPDT Relays
G2R-14, G2R-1Z4

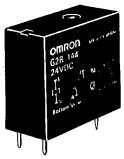


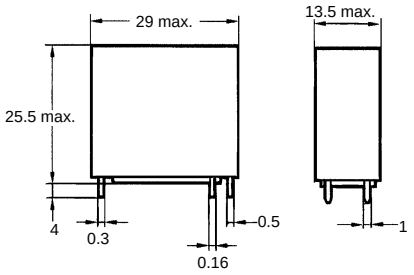


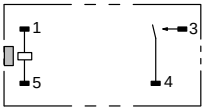


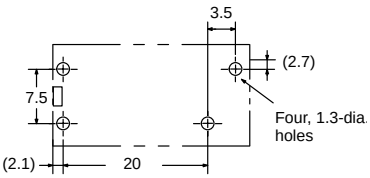


SPST-NO Relays
G2R-1A4, G2R-1AZ4

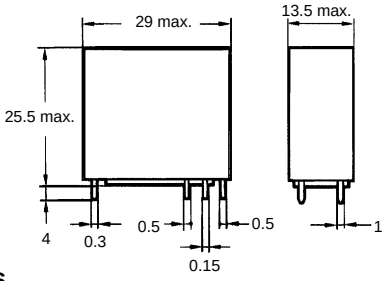


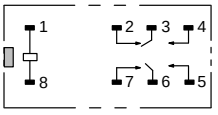


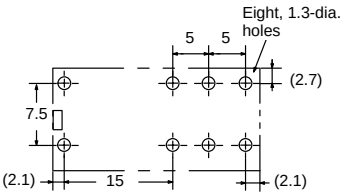




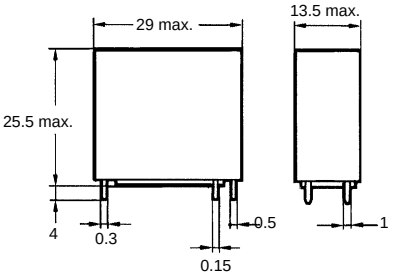
DPDT Relays
G2R-24

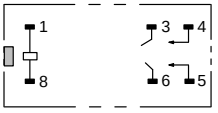


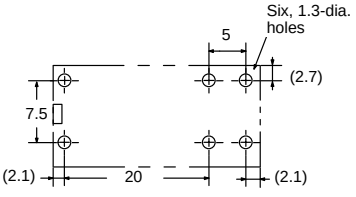




DPST-NO Relays
G2R-2A4

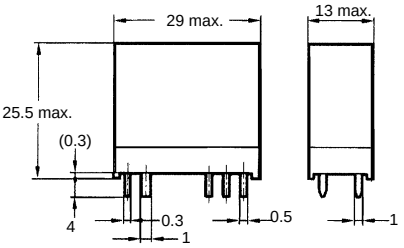




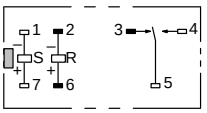


Double-winding Latching Relays with PCB Terminals

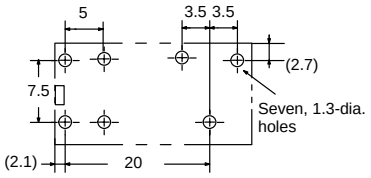
SPDT Relays
G2RK-1



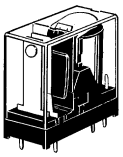
Terminal Arrangement/ Internal Connections (Bottom View)

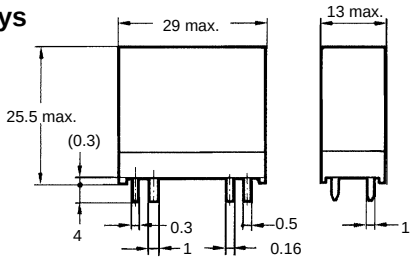


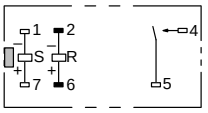
Mounting Holes (Bottom View)
Tolerance: ±0.1

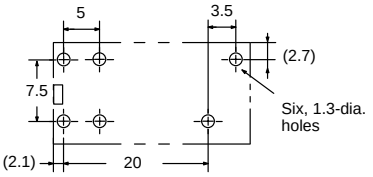


SPST-NO Relays
G2RK-1A

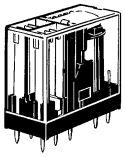


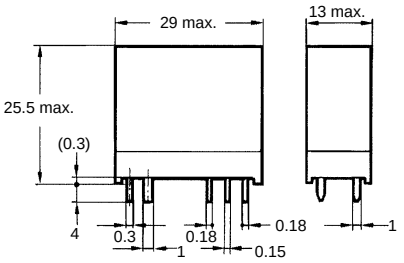


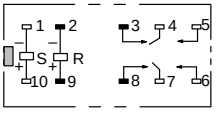


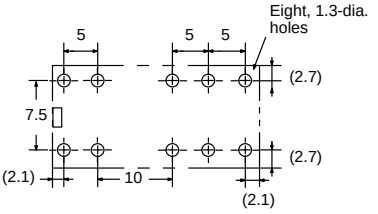


DPDT Relays
G2RK-2

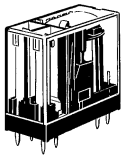


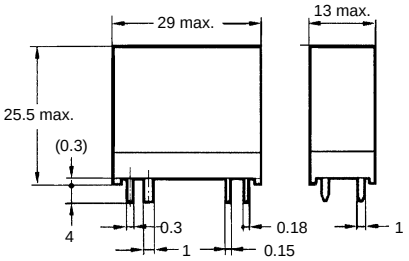


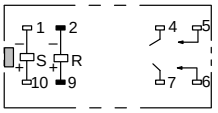


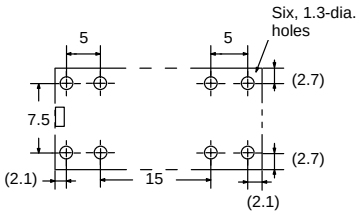


DPST-NO Relays
G2RK-2A





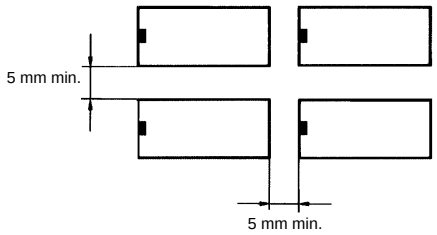




Precautions

■ Mounting

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.