# General-purpose Relay

### Slim and Space-saving Power Plug-in Relay

- Reduces wiring work by 60% when combined with the P2RF-□-PU Push-In Plus Socket (according to actual OMRON measurements).
- Lockable test button models available.
- Built-in mechanical operation indicator.
- Provided with nameplate.
- AC type is equipped with a coil-disconnection self-diagnostic function (LED type).
- High switching power (1-pole: 10 A).

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For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

(S): Models with mechanical operation indicator and Nameplate

### **Model Number Structure**

### **Model Number Legend**



NDI: LED indicator and diode with test button

Note: Contact your OMRON representative for Relays with gold-plated contacts.

### Ordering Information When your order, specify the rated voltage.

### **List of Models**

Classification	Coil ratings	Contact form		
	Containigs	SPDT	DPDT	
General-purpose		G2R-1-S (S)	G2R-2-S (S)	
LED indicator	AC 24, 110, 120, 230, 240	G2R-1-SN (S)	G2R-2-SN (S)	
LED indicator with test button	<b>DO</b> 0, 12, 24, 40	G2R-1-SNI (S)	G2R-2-SNI (S)	
Diode		G2R-1-SD (S)	G2R-2-SD (S)	
LED indicator and diode	DC 6, 12, 24, 48	G2R-1-SND (S)	G2R-2-SND (S)	
LED indicator and diode with test button		G2R-1-SNDI (S)	G2R-2-SNDI (S)	

4. Rated Coil Voltage

5. Mechanical operation indicator and Nameplate

2. Refer to Connecting Sockets, below, for applicable Socket models.

 When ordering, add the rated coil voltage and "(S)" to the model number. Rated coil voltages are given in the coil ratings table. Example: G2R-1-S <u>12 VDC</u> (S)

-Rated coil voltage

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### Accessories (Order Separately) Connecting Sockets

		Track/surface-n	nounting Socket	Back-mounting Socket		
Applicable Relay model		Push-In Plus Terminal Blocks	Screw terminals * PCB termina		Solder terminals	
No. of poles		Model	Models	Models	Model	
1 pole	G2R-1-S (S)	P2RF-05-PU	P2RF-05 P2RF-05-E	P2R-05P P2R-057P	P2R-05A	
2 poles	G2R-2-S (S)	P2RF-08-PU	P2RF-08 P2RF-08-E	P2R-08P P2R-087P	P2R-08A	

\* The structure of P2RF-----E models provides finger protection. Round terminals cannot be used. Use forked crimp terminals.

# Accessories for Push-In Plus Terminal Block Sockets (P2RF-□-PU) Short Bars

Pitch	No. of poles	Colors	Model *	Minimum order (quantity)
7.75 mm	2		PYDN-7.75-020	
	3	Red (R) Blue (S) Yellow (Y)	PYDN-7.75-030	
	4		PYDN-7.75-040	10
	20		PYDN-7.75-200	
15.5 mm	8		PYDN-15.5-080	

**Note:** Use the Short Bars for crossover wiring within one Socket or between Sockets. \* Replace the box  $(\Box)$  in the model number with the code for the covering color.

#### Labels

Model	Minimum order (sheet) (quantity per sheet)
XW5Z-P4.0LB1	5 1 sheet (60 pieces)

### **Mounting Tracks**

Applicable Socket	Description		Model	Minimum order (quantity)	
Track-connecting Socket		50 cm (ℓ) × 7.3 mm (t):	PFP-50N		
	Mounting track	1 m (ℓ) × 7.3 mm (t):	PFP-100N		
		1 m (ℓ) × 16 mm (t):	PFP-100N2		
	End plate *1		PFP-M	10	
	Spacer		PFP-S	10	
Back-connecting Socket	Mounting plate *2		P2R-P	1	

\*1. When mounting DIN rail, please use End Plate (PFP-M).

\*2. Used to mount several P2R-05A and P2R-08A Connecting Sockets side by side.

### Specifications

### **Coil Ratings**

Rated voltage		Rated current*		Coil	Coil indu (ref. v	ctance (H) /alue)	Must operate voltage	Must release voltage	Max. voltage	Power consumption
		50 Hz	60 Hz	Tesistance	Armature OFF	Armature ON	% of rated voltage		(approx.)	
	24 V	43.5 mA	37.4 mA	253 Ω	0.81	1.55			ax. 110%	0.9 VA at 60 Hz
	110 V	9.5 mA	8.2 mA	5,566 Ω	13.33	26.83				
AC	120 V	8.6 mA	7.5 mA	7,286 Ω	16.13	32.46	80% max.	ax. 30% max.		
	230 V	4.4 mA	3.8 mA	27,172 Ω	72.68	143.90	-			
	240 V	4.2 mA	3.7 mA	27,800 Ω	90.58	182.34				

Rated voltage		Rated current*	Coil	Coil inductance (H) (ref. value)		Must operate voltage	Must release voltage	Max. voltage	Power consumption
	-		resistance	Armature OFF	Armature ON	% of rated voltage		(approx.)	
	6 V	87.0 mA	69 Ω	0.25	0.48		15% min.	110%	
DC	12 V	43.2 mA	278 Ω	0.98	2.35	70% max			0.52.14
DC	24 V	21.6 mA	1,113 Ω	3.60	8.25	70% max.			0.55 W
	48 V	11.4 mA	4,220 Ω	15.2	29.82				

Note: 1. The rated current and coil resistance are measured at a coil temperature of 23°C with tolerances of +15%/-20% for the AC rated current and  $\pm 10\%$  for the DC coil resistance.

2. The AC coil resistance and inductance values are reference values only (at 60 Hz).

3. Operating characteristics were measured at a coil temperature of 23°C.

4. The maximum voltage is the maximum possible value of the voltage that can be applied to the relay coil. It is not the maximum voltage that can be applied continuously.

### **Contact Ratings**

Number of poles	1 pole		2 poles		
Load	Resistive load (cos	Inductive load ( $\cos\phi = 0.4$ ; L/R = 7 ms)	Resistive load $(\cos\phi = 1)$	Inductive load ( $\cos\phi = 0.4$ ; 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	
Rated carry current	10 A		5 A		
Max. switching voltage	440 VAC, 125 VDC		380 VAC, 125 VDC		
Max. switching current	10 A		5 A		
Max. switching power	2,500 VA, 300 W	1,875 VA, 150 W	1,250 VA, 150 W	500 VA, 90 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 \* This value was measured at a switching frequency of 120 operations per minute.

### Characteristics

Item		1 pole	2 poles		
Contact configration	SPDT				
Contact structure	Single				
Contact resistance	100 m $\Omega$ max.				
Operate (set) time	15 ms max.				
Release (reset) time	AC: 10 ms max (w/built-in diod	x.; DC: 5 ms max. e: 20 ms max.)	AC: 15 ms max.; DC: 10 ms max. (w/built-in diode: 20 ms max.)		
Max. operating frequency	Mechanical: Electrical:	18,000 operations/hr 1,800 operations/hr (under rated lo	ad)		
Insulation resistance	1,000 MΩ min.	(at 500 VDC)			
Dielectric strength *	5,000 VAC, 50, contacts; 1,000 VAC, 50/ same polarity	/60 Hz for 1 min between coil and /60 Hz for 1 min between contacts of	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: Malfunction:	10 to 55 to 10 Hz, 0.75 mm single 10 to 55 to 10 Hz, 0.75 mm single	amplitude (1.5 mm double amplitude) amplitude (1.5 mm double amplitude)		
Shock resistance	Destruction: Malfunction:	1,000 m/s <sup>2</sup> 200 m/s <sup>2</sup> when energized; 100 m/s	<sup>2</sup> when not energized		
Endurance	Mechanical: Electrical:	chanical: AC coil: 10,000,000 operations min.; DC coil: 20,000,000 operations min. (at 18,000 operations/hr) ctrical: 100,000 operations min. (at 1,800 operations/hr under rated load)			
Ambient temperature	Operating:	Operating: -40°C to 70°C (with no icing or condensation)			
Ambient humidity	Operating:	5% to 85%			
Weight	Approx. 20 g				

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

\* These values are relay only. Prease refer to the "Products Related to Common Sockets and DIN Tracks Data Sheet" for connecting sockets.

### Approved Standards UL 508 (File No. E41643)

Model	Contact form	Coil ratings	Contact ratings	Opera- tions
G2R-1-S (S)	SPDT	5 to 110 VDC 6 to 240 VAC	10 A, 30 VDC (resistive) 10 A, 250 VAC (general use)	100 × 10 <sup>3</sup>
(-)			TV-3 (NO contact only)	25 × 10 <sup>3</sup>
G2R-2-S (S)	DPDT		5 A, 30 VDC (resistive) 5 A, 250 VAC (general use)	100 × 10 <sup>3</sup>
			TV-3 (NO contact only)	25 × 10 <sup>3</sup>

### CSA 22.2 No.0, No.14 (File No. LR31928)

Model	Contact form	Coil ratings	Contact ratings	Opera- tions
G2R-1-S (S)	SPDT		10 A, 30 VDC (resistive) 10 A, 250 VAC (general use)	100 × 10 <sup>3</sup>
( )		5 to 110 VDC 6 to 240 VAC	TV-3 (NO contact only)	25 × 10 <sup>3</sup>
G2R-2-S (S)	DPDT		5 A, 30 VDC (resistive) 5 A, 250 VAC (general use)	100 × 10 <sup>3</sup>
			TV-3 (NO contact only)	25 × 10 <sup>3</sup>

### IEC/VDE (Certificate No. 40015012 EN 61810-1)

Contact form	Coil ratings	Contact ratings	Operations
1 pole	6, 12, 24, 48 VDC 24, 110, 120, 230, 240 VAC	5 A, 440 VAC (cos¢ = 1.0) 10 A, 250 VAC (cos¢ = 1.0) 10 A, 30 VDC (0 ms)	100 × 10 <sup>3</sup>
2 poles	6, 12, 24, 48 VDC 24, 110, 120, 230, 240 VAC	5 A, 250 VAC (cosø =1.0) 5 A, 30 VDC (0 ms)	100 × 10 <sup>3</sup>

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Number of poles	Coil ratings	Contact ratings	Operations	
1 pole	5 to 110 VDC 6 to 240 VDC	10 A, 250 VAC (general use) 7.5 A, 250 VAC (PF0.4) 10 A, 30 VDC (resistive) 5A, 30VDC (L/R=7ms)	100 × 10 <sup>3</sup>	
2 poles	5 to 110 VDC 6 to 240 VDC	5 A, 250 VAC (general use) 2 A, 250 VAC (PF0.4) 5 A, 30 VDC (resistive) 3A, 30VDC (L/R=7ms)	100 × 10 <sup>3</sup>	

### **Engineering Data**

### **Maximum Switching Power**



#### Endurance



Ambient Temperature vs Maximum Coil Voltage



Ambient temperature (°C)

### **Dimensions**

(Unit: mm)

Note: All units are in millimeters unless otherwise indicated.

### SPDT Relays

G2R-1-S (S), G2R-1-SN (S), G2R-1-SNI (S) G2R-1-SD (S), G2R-1-SND (S), G2R-1-SNDI (S)





17.5









G2R-1-SN (S), G2R-1-SNI (S) (AC) G2R-1-SN (S), G2R-1-SNI (S) (DC)



G2R-1-SND (S), G2R-1-SNDI (S) (DC)



### **DPDT Relays**

G2R-2-S (S), G2R-2-SN (S), G2R-2-SNI (S) G2R-2-SD (S), G2R-2-SND (S), G2R-2-SNDI (S)

0.5







**Terminal Arrangement/Internal Connections** (Bottom View)

G2R-2-S (S)

91

8

°2 93 <u></u>م

67 96

11

8

G2R-2-SD (S) (DC)





G2R-2-SN (S), G2R-2-SNI (S) (AC)

G2R-2-SN (S), G2R-2-SNI (S) (DC) °2 °3 °4 61 o7 6 65 φ**8** 

G2R-2-SND (S), G2R-2-SNDI (S) (DC)

2 , 3

7

6





### G2R-□-S (S)

### Track/Surface Mounting Sockets P2RF-05-PU





56.5 max.



P2RF-08-PU







**Terminal Arrangement/** Internal Connection Diagram (Top View) Mounting Hole A2 A1 Dimensions Two M4 screw holes or two 4-dia. holes 108 12 22 (7) (2) 14 24 (4) (5) -11 21 Note: Pull out the hooks to (6) (3) mount the Relay Note: The numbers in with screws. parentheses are traditionally used terminal numbers.

#### Accessories for P2RF-□-PU Short Bars PYDN-7.75-□□ (7.75 mm)



### PYDN-15.5-080 (15.5 mm)



Application	Pitch	No. of poles	L (Length)	Colors	Model *	Maximum carry current
For Contact terminals (common)	7.75 mm	2	15.1	Red (R) Blue (S)	PYDN-7.75-020	20 A
		3	22.85		PYDN-7.75-030	
		4	30.6		PYDN-7.75-040	
		20	154.6	Yellow (Y)	PYDN-7.75-200	
For Coil terminals	15.5 mm	8	115.85		PYDN-15.5-080	

\* Replace the box ( $\Box$ ) in the model number with the code for the covering color.

Note: 1. Use the Short Bars for crossover wiring within one Socket or between Sockets.
2. When using short bar to coil terminals of P2RF-□-PU, A1 terminal cannot be used. In case crossover wiring of A1 terminal side is needed, crossover wiring using A1 terminals by wire is possible.

Short bar correspondence table

	Contact terminal	Coil terminal		
	(Common)	A1	A2	
P2RF-DD-PU	Available		О	

### G2R-□-S (S)





### Mounting Height of Relay with Track/Surface Mounting Sockets



### **Back-connecting Sockets**









P2RF-□-E Socket

67.0 70.5



### G2R-□-S (S)





### **Mounting Tracks**



#### **End Plate** Spacer 16 PFP-M PFP-S 12 6.2 18 35.5 35.3 34.8 44.3 .8 11.5 1.3 -4 8 M4 x 8 pan 16.5 head screw

### **Mounting Plate**

### P2R-P



### **Safety Precautions**

Be sure to read the *Common Precautions for All Relay* in the website at the following URL: http://www.ia.omron.com/.

Refer to *Products Related to Common Sockets and DIN Tracks* for precautions on the applicable Sockets. Refer to *PYF-*\_\_\_-*PU/P2RF-*\_\_-*PU* for precautions on Push-In Plus Terminal Block Sockets.

### Warning Indications



### ▲ Cation

- Do not use the test button for any purpose other than testing. Be sure not to touch the test button accidentally as this will turn the contacts ON. Before using the test button, confirm that circuits, the load, and any other connected item will operate safely.
- Check that the test button is released before turning ON relay circuits.
- If the test button is pulled out too forcefully, it may bypass the momentary testing position and go straight into the locked position.
- Use an insulated tool when you operate the test button.

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