

POWER RELAY

1, 2 POLES—5, 10, 16 A

FBR610, 620 SERIES

■ FEATURES

- Maximum switching capacity of 30 VDC, 16 A and 240 VAC, 16 A (single pole, K type)
- 5 kV AC minimum dielectric strength (between coil and contacts)
- 10 kV minimum surge strength (between coil and contacts)
- Coil terminal separated from output terminals to allow easy PC board design
- High reliability design conforming to safety standards Japan Electrical Appliance Control Law (150–300 V)
- UL 508



■ ORDERING INFORMATION

[Example] FBR6 1 3 N D012 -K -CSA
 (a) (b) (c) (d) (e) (f) (g)

| | | |
|-----|---------------------|--|
| (a) | Series Name | FBR6: FBR600 Series |
| (b) | Number of Contacts | 1 : 1 pole 2 : 2 poles |
| (c) | Contact Arrangement | 1 : Form C 3 : Form A 5 : Form B |
| (d) | Enclosure | Nil : Flux free type N : Plastic sealed type |
| (e) | Nominal Voltage | (Example) 012: 12 VDC 024: 24 VDC (refer to the COIL DATA CHART) |
| (f) | Contact Rating | Nil : Standard -K : K type (1 pole ONLY) |
| (g) | Safety Standards | Nil : UL 508 recognized -CSA: UL 508 + CSA recognized -T : VDE + UL 508 + CSA recognized Only for 1 form C and 1 form A standard types, without -K or does not apply to -K type (refer to the SAFETY AND FILE NUMBERS) |

Note: The designation name is stamped on the top of the relay case as follows:

(Example) Designation ordered: FBR611ND024
Stamp: 611ND024

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■ SAFETY STANDARD AND FILE NUMBERS

UL508, (File No. E63614)

C 22.2 No. 0, No. 14 (File No. LR40304 or LR64026)

VDE 0435, 0860 (File No. 5304UG)

| Type | | Safety Standard | | | Nominal voltage | | Contact ratings |
|------------------------------|--------------------|-----------------|------------|------------|-----------------|-----------|--|
| | | UL | CSA | VDE | | | |
| 1 Pole K type Standard | 1 form C, 1 form A | recognized | recognized | recognized | 5 to 60 VDC | UL CSA | 10 A 240 VAC resistive 10 A 30 VDC resistive 1/2 HP 240 VAC, 1/3 HP 120 VAC |
| | 1 form B | | | — | | | |
| | 1 form C | recognized | recognized | — | | | |
| | 1 form A, 1 form B | | | — | | | |
| 2 Poles | standard | recognized | recognized | — | | UL | 10 A 240 VAC resistive 10 A 30 VDC resistive 1/2 HP 240 VAC, 1/3 HP 120 VAC |
| | | | | | | CSA | 6 A 240 VAC resistive 6 A 30 VDC resistive |

NOT FOR NEW DESIGNS

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■ SPECIFICATIONS

| Item | | 1 Pole type | | | 2 Poles type |
|----------------|---|---|--|--|---------------------------|
| | | Standard | K type | | |
| | | | 1 form A, B | 1 form C | |
| Contact | Arrangement | 1 form C, A, B | 1 form A, B | 1 form C | 2 form C, A, B |
| | Material | Silver-cadmium oxide | | | |
| | Resistance (initial) | Maximum 100 mΩ (at 1 A 6 VDC) | | | |
| | Ratings (resistive load) | 10 A 240 VAC 10 A 30 VDC | 16 A 240 VAC 16 A 30 VDC | 10 A 240 VAC 10 A 30 VDC | 5 A 240 VAC 5 A 30 VDC |
| | Maximum Carrying Current | 14 A | 16 A | | 7 A |
| | Maximum Switching Power | 2,400VA or 300W | 3,840VA or 480W | 2,400 VA or 300W | 1,200 VA or 150 W |
| | Max. Switching Voltage* ¹ | 250 VAC or 125 VDC | | | |
| | Minimum Switching Load* ² | 0.5 W (5 V, 100 mA) | | | |
| Coil | Power Consumption | Rated | Approximately 0.5 W (at 20°C) | | |
| | | Operate | Approximately 0.35 W (at 20°C) | | |
| | Operating Temperature | -40°C to +70°C (no frost) (refer to the CHARACTERISTIC DATA) * ³ | | | |
| | Operating Humidity | 45 to 85%RH | | | |
| Time Value | Operate (at nominal voltage) | Maximum 15 ms | | | |
| | Release (at nominal voltage) | Maximum 5 ms | | | |
| Insulation | Resistance (initial) | Minimum 100 MΩ (at 500 VDC) | | | |
| | Dielectric Strength | Between open contacts | 1,000 VAC 1 minute | | |
| | | Between coil and contacts | 5,000 VAC 1 minute | | |
| | | Between adjacent contacts | — | | |
| Surge Strength | 10,000 V (at 1.2 × 50 μs) | | | | |
| Life | Mechanical | 20 × 10 ⁶ operations minimum | | | |
| | Electical (refer to the REFERENCE DATA) | DC | 1 × 10 ⁵ operations minimum (at contact rating) | | |
| | | AC | 2 × 10 ⁵ ops. min. | 1 × 10 ⁵ operations minimum (at contact rating) | |
| Other | Vibration Resistance | Misoperation | 10 to 55 Hz (double amplitude of 1.5 mm) | | |
| | | Endurance | 10 to 55 Hz (double amplitude of 1.5 mm) | | |
| | Shock Resistance | Misoperation | 100 m/s ² (11 ± ¹ ms) | | |
| | | Endurance | 500 m/s ² (11 ± ¹ ms) | | |
| | Weight | Approximately 16 g | | | |

*¹ If the switching voltage exceeds the rated contact voltage.

*² Values when switching a resistive load at normal room temperature and humidity, and in a clean environment. The minimum switching load varies with the switching frequency and operation environment.

*³ Based on UL Class A coil insulation system.

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■ COIL DATA CHART

| MODEL | | | Nominal voltage | Coil resistance ($\pm 10\%$) | Nominal current (at nominal voltage) approx. | Must operate voltage | Must release voltage | Maximum allowable voltage | Nominal power | Coil temperature rise |
|---|--------------|--|-----------------|--------------------------------|--|-----------------------------|-----------------------------|-----------------------------|-------------------------------------|-------------------------------------|
| 1 Pole type | | 2 Poles type | | | | | | | | |
| Standard | K type | Standard | | | | | | | | |
| <input type="checkbox"/> FBR611, 611N <input type="checkbox"/> FBR613, 613N <input type="checkbox"/> FBR615, 615N | | FBR621, 621N FBR623, 623N FBR625, 625N | | | | | | | | |
| FBR61□D005 | FBR61□D005-K | FBR62□D005 | 5 VDC | 50 Ω | 100 mA | 70% max. of nominal voltage | 10% min. of nominal voltage | Refer to the REFERENCE DATA | Approx. 500 mW (at nominal voltage) | Approx. 35 deg (at nominal voltage) |
| FBR61□D006 | FBR61□D006-K | FBR62□D006 | 6 VDC | 72 Ω | 83 mA | | | | | |
| FBR61□D009 | FBR61□D009-K | FBR62□D009 | 9 VDC | 160 Ω | 56 mA | | | | | |
| FBR61□D012 | FBR61□D012-K | FBR62□D012 | 12 VDC | 285 Ω | 42 mA | | | | | |
| FBR61□D018 | FBR61□D018-K | FBR62□D018 | 18 VDC | 640 Ω | 28 mA | | | | | |
| FBR61□D024 | FBR61□D024-K | FBR62□D024 | 24 VDC | 1,150 Ω | 21 mA | | | | | |
| FBR61□D048 | FBR61□D048-K | FBR62□D048 | 48 VDC | 4,600 Ω | 10 mA | | | | | |
| FBR61□D060 | FBR61□D060-K | FBR62□D060 | 60 VDC | 7,200 Ω | 8 mA | | | | | |

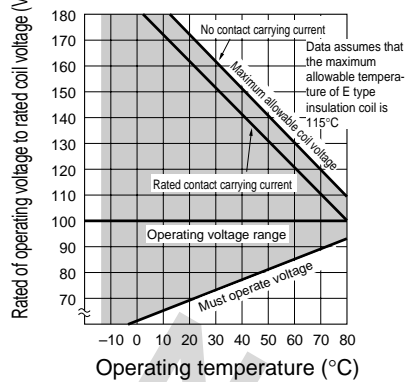
Note: All values in the table are measured at 20°C.

DESIGNS FOR NEW

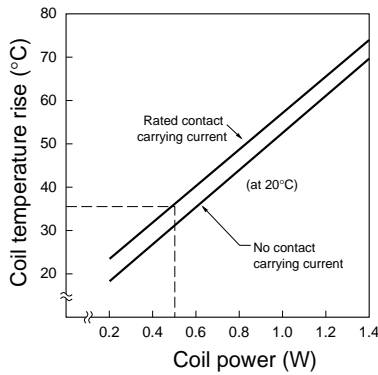
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CHARACTERISTIC DATA

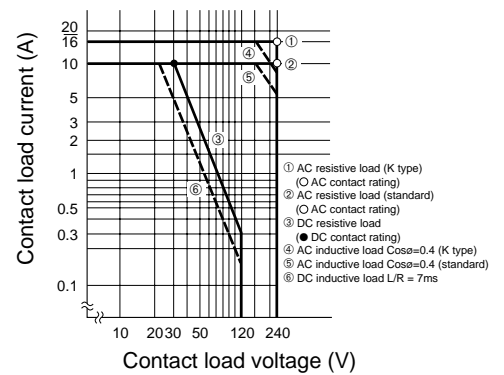
Range of operation temperature and voltage



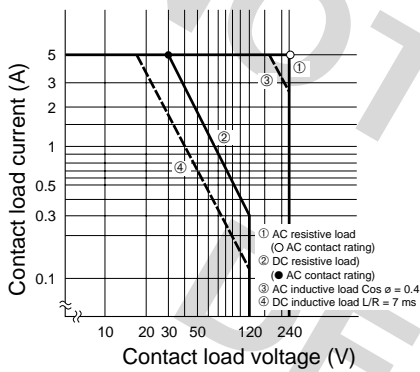
Coil temperature rise data



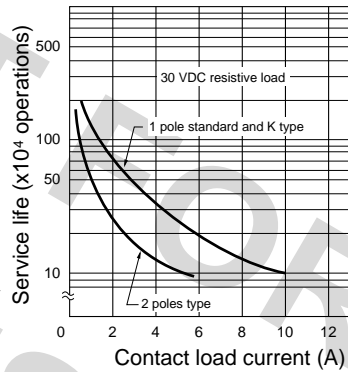
Maximum switching capacity (1 pole type)



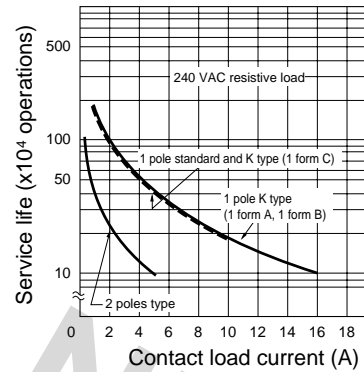
Maximum switching capacity (2 poles type)



Life curves (DC load)

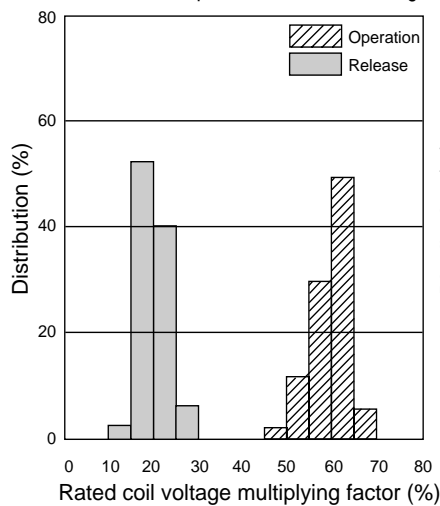


Life curves (AC load)

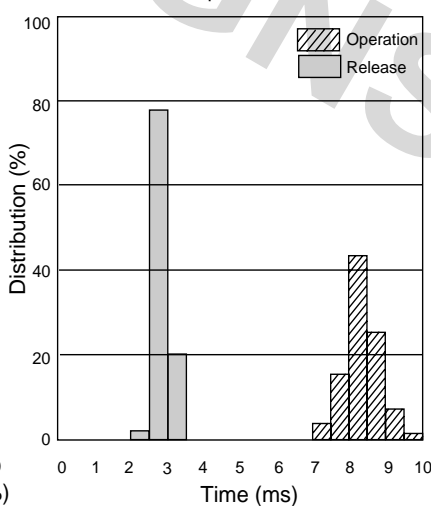


REFERENCE DATA

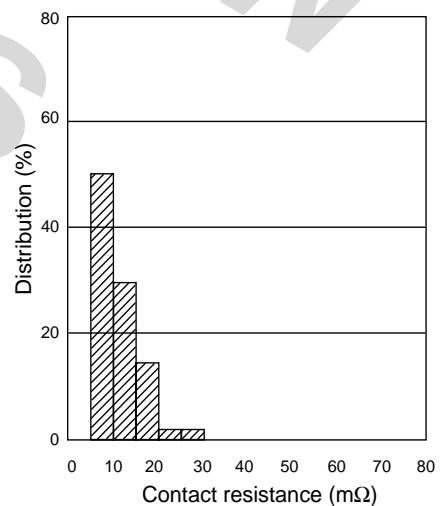
Distribution of operate and release voltage



Distribution of operate and release time



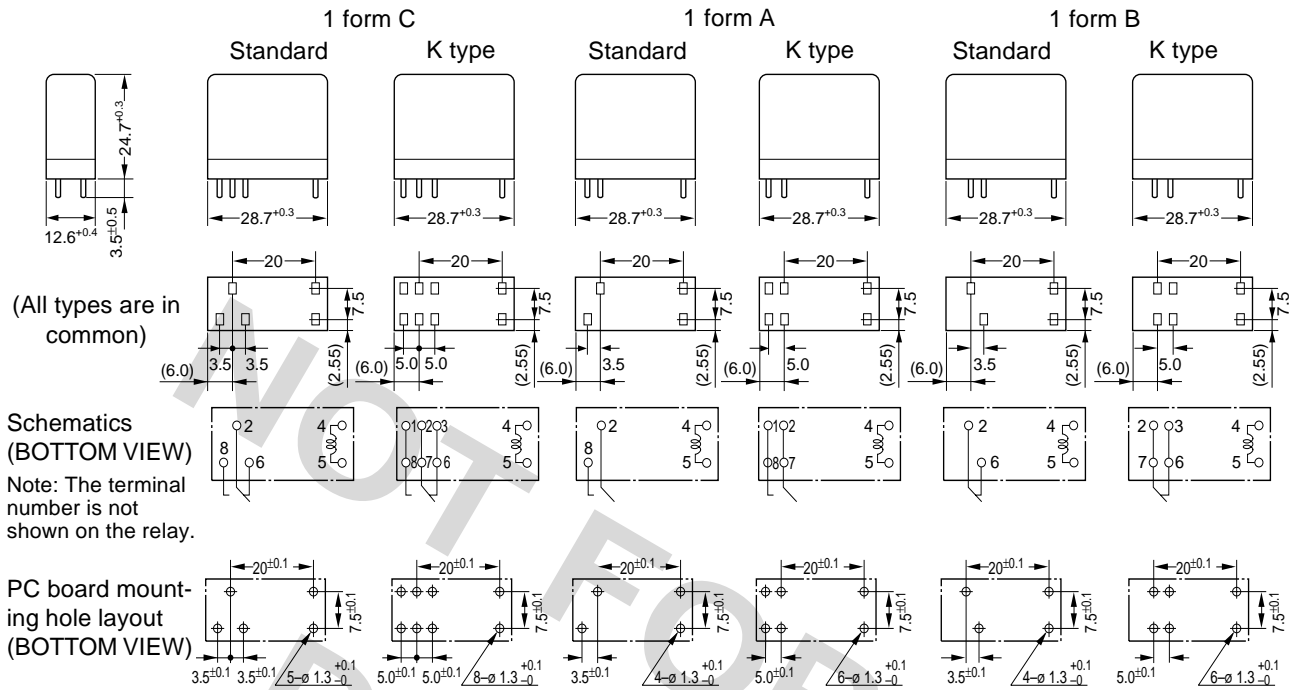
Distribution of contact resistance



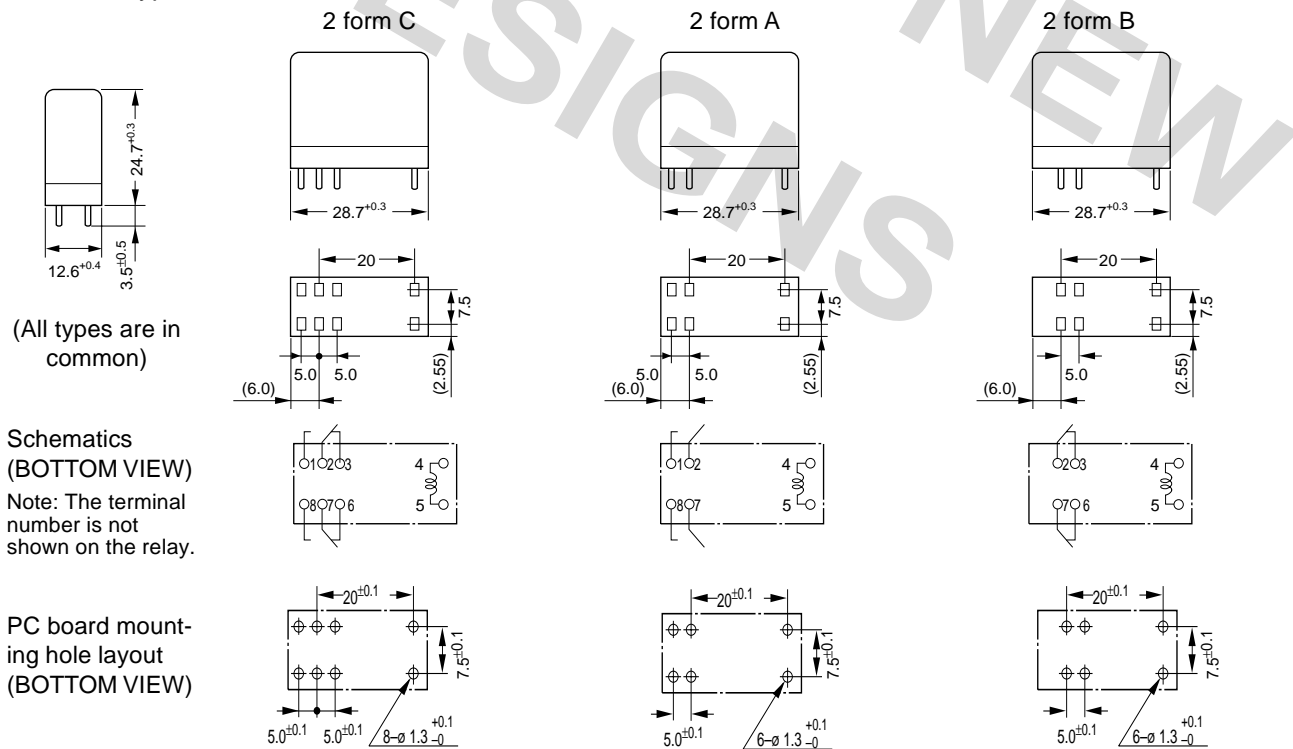
FBR610, 620 SERIES

■ DIMENSIONS

1. 1 Pole type



2. 2 Poles type



Unit: mm

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