

COMPACT HIGH POWER RELAY

1 POLE—30 A (28 VDC) (FOR 24 V BATTERY AUTOMOTIVE APPLICATIONS)

FBR57 SERIES

RoHS compliant

■ FEATURES

- High power contact capacity
(carrying current: 40 A/2 minutes, 30 A/1 hour)
- Suitable for controlling 24 V motors in trucks and other large vehicles
- High heat resistance and extended operating voltage
- RoHS compliant since date code: 0627
Please see page 7 for more information



■ ORDERING INFORMATION

[Example] FBR57 N D24 – W **
 (a) (b) (c) (d) (e)

(a)	Series Name	FBR57 : FBR57 Series relay for 24 V battery (contact gap 0.8 mm)
(b)	Enclosure	N : Plastic sealed type
(c)	Nominal Voltage	D24 : 24 VDC
(d)	Contact Material	W1: Silver-tin oxide indium Y: Silver-tin oxide
(e)	Custom Designation	To be assigned custom specification

FBR57 SERIES

■ SPECIFICATIONS

Item		Specifications	
Contact	Arrangement	1 form C	
	Material	Silver-tin oxide indium (-W1 type) Silver-tin oxide (-Y type)	
	Voltage Drop (resistance)	Maximum 100 mV (at 1 A 12 VDC)	
	Ratings	28 VDC 12 A (locked motor load) 28 VDC inrush 15 A, break 2.5 A (motor free load)	
	Maximum Carrying Current	40 A/10 minutes, 30 A/1 hour (25°C, 100% rated coil voltage)	
	Maximum Inrush Current	70 A (reference)	
	Maximum Switching Current	12 A 28 VDC (reference)	
	Minimum Switching Load*1	6 VDC, 1 A	
Coil	Operating Temperature	-40°C to +85°C (no frost) (refer to the CHARACTERISTIC DATA)	
	Storage Temperature	-40°C to +100°C (no frost)	
Time Value	Operate (at nominal voltage)	Maximum 10 ms	
	Release (at nominal voltage)	Maximum 5 ms	
Life	Mechanical	1 × 10 ⁶ operations minimum	
	Electrical	1 × 10 ⁵ operations minimum (locked motor load) 5 × 10 ⁵ operations minimum (motor free load)	
Other	Vibration Resistance		10 to 55 Hz (double amplitude of 1.5 mm)
	Shock Resistance	Misoperation	100 m/s ²
		Endurance	1,000 m/s ²
	Weight		Approximately 9.4 g

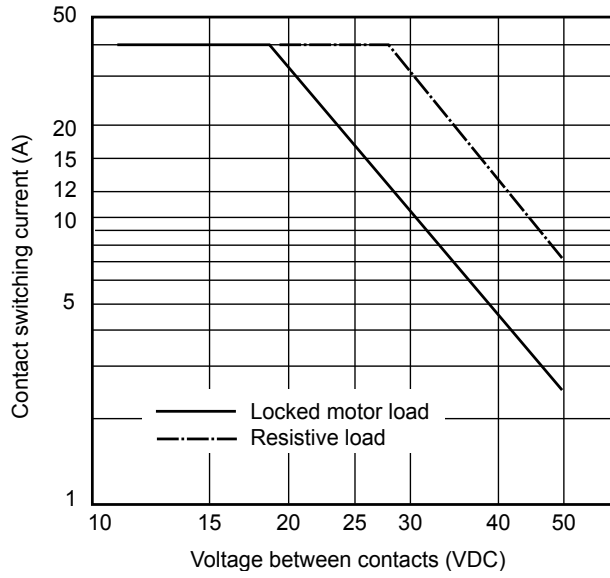
*1 Values when switching a resistive load at normal room temperature and humidity, and in a clean environment.
The minimum switching load varies with the switching frequency and operating environment.

■ COIL DATA CHART

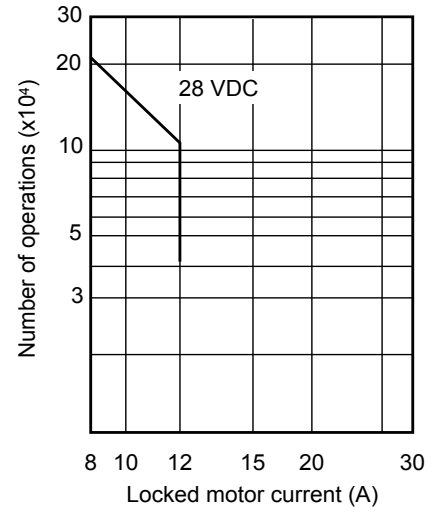
MODEL		Nominal voltage	Coil resistance (±10%) (at 20°C)	Must operate voltage	Thermal resistance
W1 contact	Y contact				
FBR57ND24-W1	FBR57ND24-Y	24 VDC	384 Ω	14.4 VDC (at 20°C) 18.0 VDC (at 85°C)	67°C/W

■ CHARACTERISTIC DATA

1. MAXIMUM BREAK CAPACITY



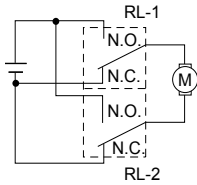
2. LIFE



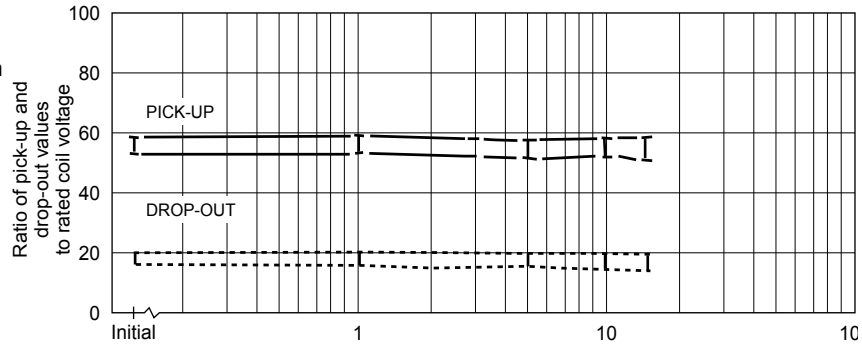
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3. LIFE TEST (EXAMPLE)

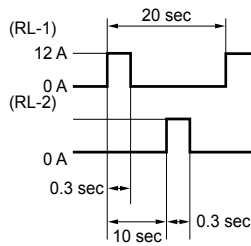
- Test item
28 V DC-12 A INRUSH
Motor lock
100,000 operations minimum
(FBR57 □-W type)
- Test circuit



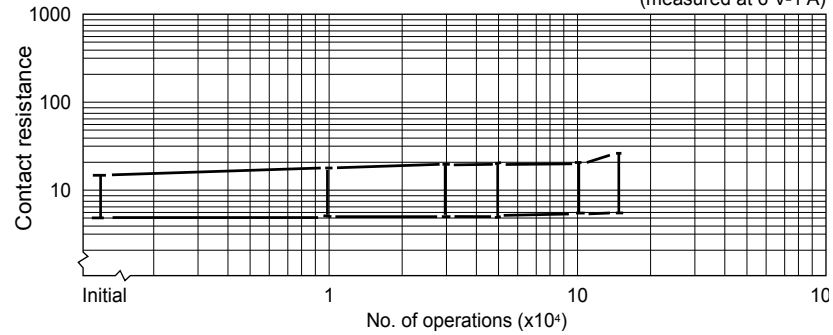
- Shift of pick-up and drop-out voltage



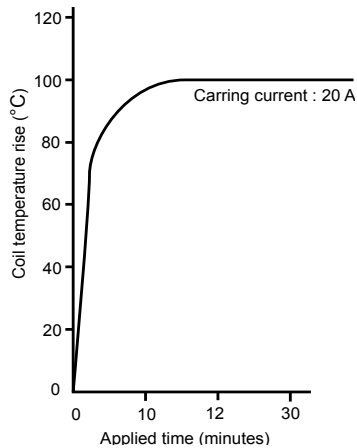
- Current wave form



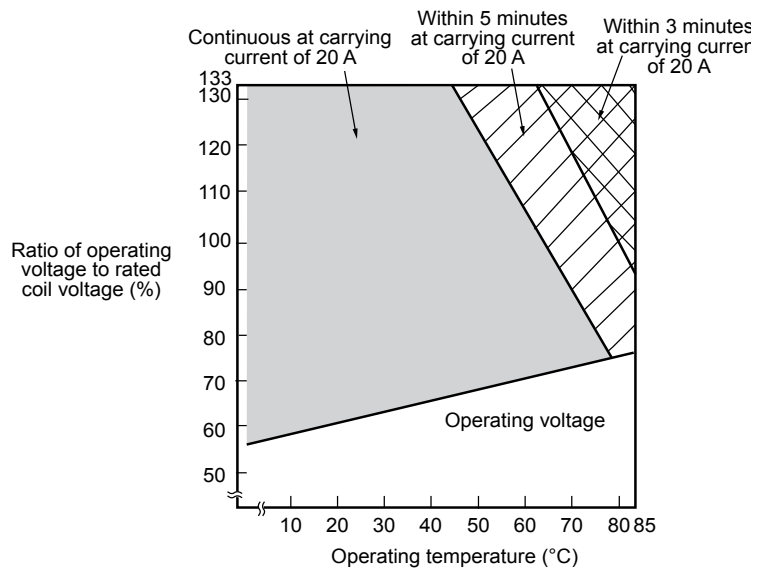
- Shift of contact resistance



4. COIL TEMPERATURE RISE

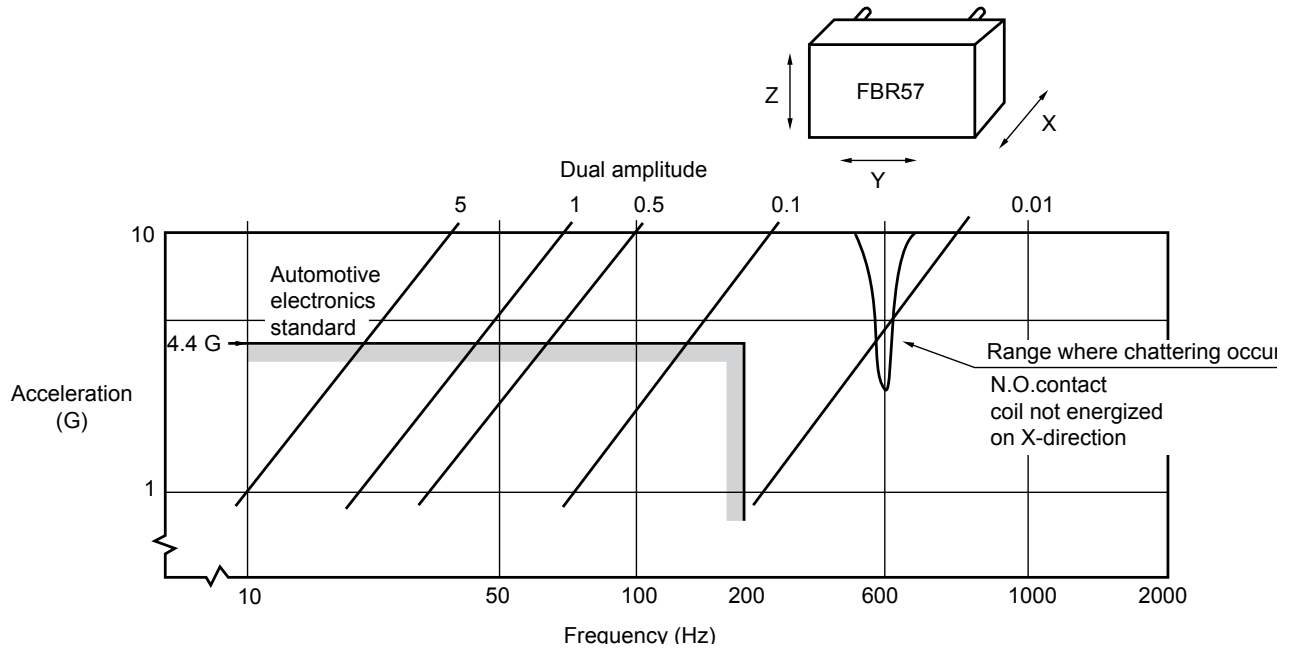


5. OPERATING COIL VOLTAGE RANGE (EXAMPLE)

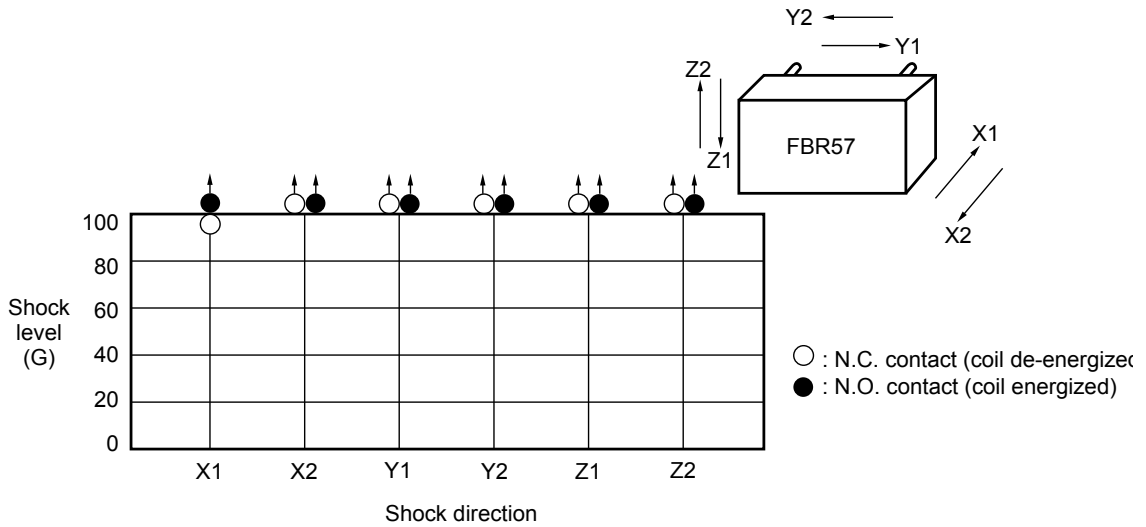


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6. VIBRATION RESISTANCE CHARACTERISTICS



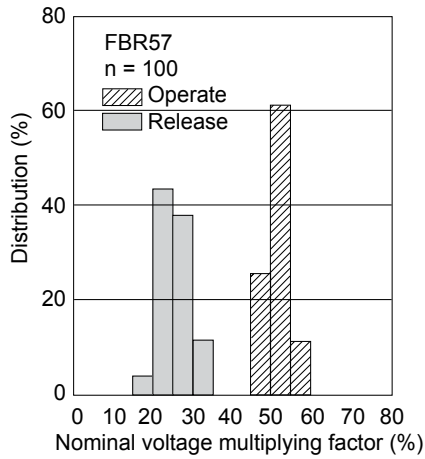
7. SHOCK RESISTANCE CHARACTERISTICS



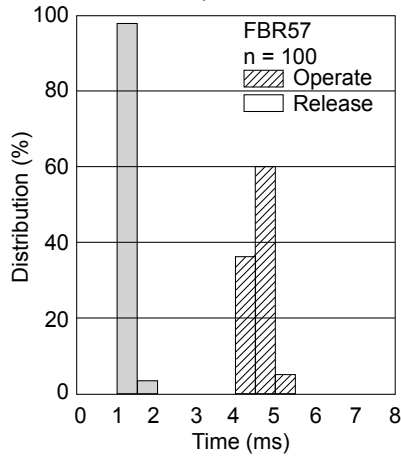
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REFERENCE DATA

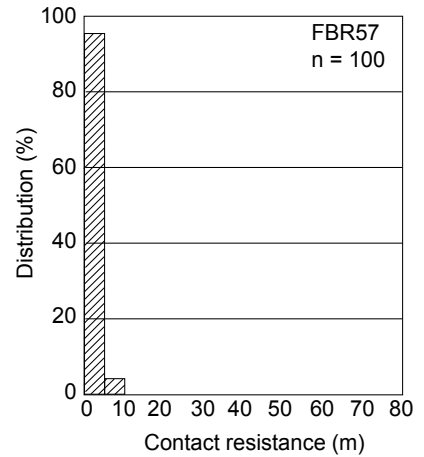
Distribution of operate and release voltage



Distribution of operate and release time

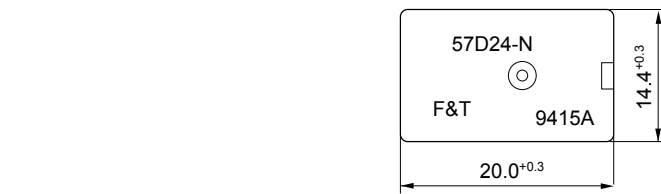


Distribution of contact resistance

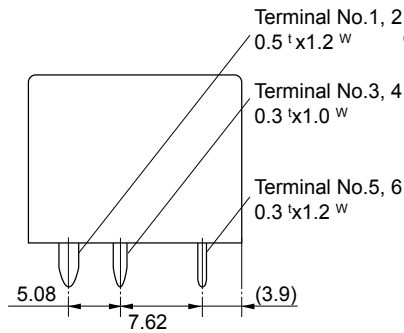
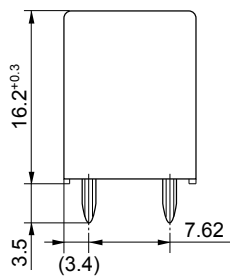
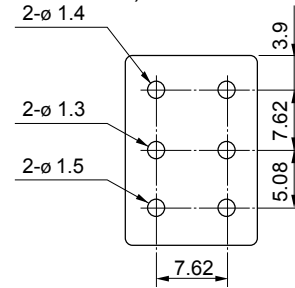


DIMENSIONS

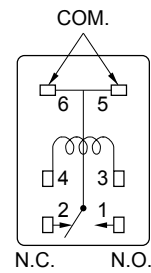
Dimensions



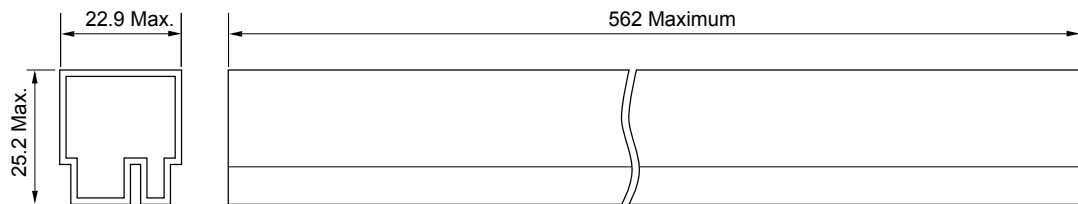
PC board mounting hole layout (BOTTOM VIEW)



Schematic (BOTTOM VIEW)



Tube carrier



35 pieces/tube

Unit : mm

RoHS Compliance and Lead Free Relay Information

1. General Information

- Relays produced after the specific date code that is indicated on each data sheet are lead-free now. Most of our signal and power relays are lead-free. Please refer to Lead-Free Status Info. (<http://www.fujitsu.com/us/downloads/MICRO/fcai/relays/lead-free-letter.pdf>)
- Lead free solder paste currently used in relays is Sn-3.0Ag-0.5Cu.
- All signal and most power relays also comply with RoHS. Please refer to individual data sheets. Relays that are RoHS compliant do not contain the 5 hazardous materials that are restricted by RoHS directive (lead, mercury, chromium IV, PBB, PBDE).
- It has been verified that using lead-free relays in leaded assembly process will not cause any problems (compatible).
- "LF" is marked on each outer and inner carton. (No marking on individual relays).
- To avoid leaded relays (for lead-free sample, etc.) please consult with area sales office.
- We will ship leaded relays as long as the leaded relay inventory exists.

Note: Cadmium was exempted from RoHS on October 21, 2005. (Amendment to Directive 2002/95/EC)

2. Recommended Lead Free Solder Profile

- Recommended solder paste Sn-3.0Ag-0.5Cu.

Reflow Solder condition

Flow Solder condition:

Pre-heating: maximum 120°C
Soldering: dip within 5 sec. at
260°C solder bath

Solder by Soldering Iron:

Soldering Iron
Temperature: maximum 360°C
Duration: maximum 3 sec.

We highly recommend that you confirm your actual solder conditions

3. Moisture Sensitivity

- Moisture Sensitivity Level standard is not applicable to electromechanical relays.

4. Tin Whisker

- Dipped SnAgCu solder is known as low risk tin whisker. No considerable length whisker was found by our in house test.

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