COMPACT POWER TWIN RELAY

1 POLE x 2—30A (Dual relay)

(FOR AUTOMOTIVE APPLICATIONS)

FBR512, 522 SERIES

■ FEATURES

- Two independent relays mounted in a single package
- Miniature size
  (54% of the volume of the FBR160 relays)
- High current contact capacity
  (carrying current: 35 A/10 minutes, 25 A/1 hour)
- High resistance to vibration and shock
- Improved heat resistance and extended operating range
- Two contact gap options
  (FBR510: 0.3 mm, FBR520: 0.6 mm)
- Two types of contact materials

■ ORDERING INFORMATION

FBR512 N D12 – W1 **

[Example] ~~(a)~~ ~~(b)~~ ~~(c)~~ ~~(d)~~ ~~(e)~~

(a)	Series Name	FBR512: Standard type (contact gap 0.3 mm) FBR522: Wider contact gap type (contact gap 0.6 mm)
(b)	Enclosure	N : Plastic sealed type
(c)	Nominal Voltage	D06 : 6 VDC D09 : 9 VDC D10 : 10 VDC D12 : 12 VDC
(d)	Contact Material	W1 : Silver-tin oxide indium (high power type)
(e)	Custom Designation	To be assigned custom specification

■ SPECIFICATIONS

Item			Specifications
			W1 contact
Contact	Arrangement		1 form C × 2 (SPDT × 2)
	Material		Silver-tin oxide indium (high power type)
	Voltage Drop (Resistance)		Maximum 100 mV (at 1 A 12 VDC)
	Rating		14 VDC 25 A (locked motor load)
	Maximum Carrying Current*1		35 A/10 minutes, 30 A/1 hour (25°C, 100% rated coil voltage)
	Max. Inrush Current (Reference)		60 A
	Max. Switching Current (Reference)		35 A 16 VDC
	Min. Switching Load*2 (Reference)		1 A 6 VDC
Coil	Operating Temperature		–40°C to + 85°C (no frost)
	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 $\times 10^7$ operations minimum
	Electrical		2 $\times 10^5$ operations minimum 14 VDC 25 A (locked motor 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 13 g

*1 Need to consider the head from PCB when max. current is more than 10A.
*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 operating environment.

■ COIL DATA CHART

1. FBR512 SERIES

MODEL	Nominal voltage	Coil resistance (±10%) (at 20°C)	Must operate voltage*	Thermal resistance
W1 contact				
FBR512ND06-W1	6 VDC	60 Ω	3.6 VDC (at 20°C) 4.5 VDC (at 85°C)	73°C/W
FBR512ND09-W1	9 VDC	135 Ω	5.4 VDC (at 20°C) 6.8 VDC (at 85°C)	
FBR512ND10-W1	10 VDC	180 Ω	6.3 VDC (at 20°C) 7.9 VDC (at 85°C)	
FBR512ND12-W1	12 VDC	240 Ω	7.3 VDC (at 20°C) 9.2 VDC (at 85°C)	

* Pulse drive

2. FBR522 SERIES

MODEL W1 contact	Nominal voltage	Coil resistance (±10%) (at 20°C)	Must operate voltage*	Thermal resistance
FBR522ND06-W1	6 VDC	45 Ω	3.6 VDC (at 20°C) 4.5 VDC (at 85°C)	65°C/W
FBR522ND09-W1	9 VDC	100 Ω	5.4 VDC (at 20°C) 6.8 VDC (at 85°C)	
FBR522ND10-W1	10 VDC	135 Ω	6.3 VDC (at 20°C) 7.9 VDC (at 85°C)	
FBR522ND12-W1	12 VDC	180 Ω	7.3 VDC (at 20°C) 9.2 VDC (at 85°C)	

* Pulse drive

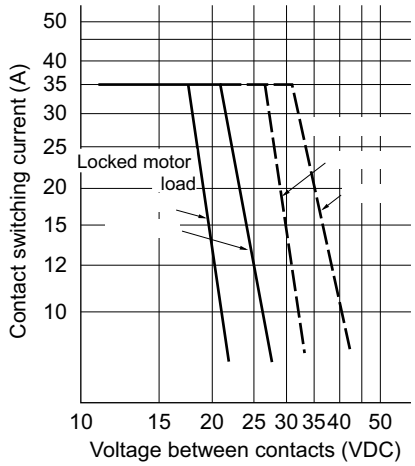
■ SUITABLE APPLICATIONS

Application	Normal load current (12 VDC system)	Description	Recommended model (example)	
			For 16 V or less motor load voltage	For instantaneous 20 V or more load voltage
Power Windows	20 to 25 A (switching at motor locking)	forward and reverse motor control	FBR512N□ -W1	FBR522N□ -W1
Automatic Door Lock	18 to 25 A (switching at motor locking)	forward and reverse motor control	FBR512N□ -W1	FBR522N□ -W1
Automatic Antenna	8 to 12 A (INRUSH) break 2 A maximum (motor-free)	forward and reverse motor control	FBR512N□ -W1	
Intermittent Wipers (Front and Rear)	15 to 30 A break 2 to 8 A (motor-free)	forward only	FBR512N□ -W1	FBR522N□ -W1
Tilt-Lock Wheel	20 A (switching at motor locking)	forward and reverse motor control	FBR512N□ -W1	FBR522N□ -W1
Power Seat	20 to 30 A (switching at motor locking)	forward and reverse motor control	FBR512N□ -W1	FBR522N□ -W1
Sunroof	20 to 30 A (switching at motor locking)	forward and reverse motor control	FBR512N□ -W1	FBR522N□ -W1

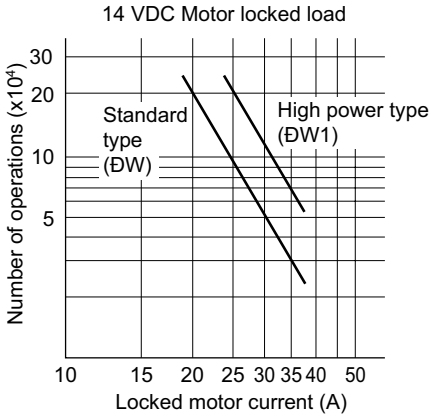
• For the load condition where higher voltage would be encountered during contact break, FBR522 series with wider contact gap is recommended.

■ CHARACTERISTIC DATA

1. MAXIMUM BREAK CAPACITY



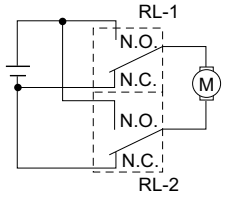
2. LIFE



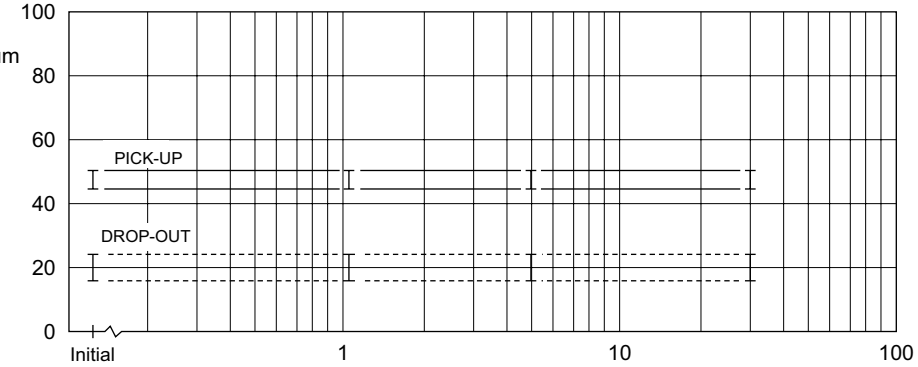
3. LIFE TEST (EXAMPLE)

• Test item
14 V DC-20 A
Motor lock
200,000 operations minimum
(FBR512 □-W type)

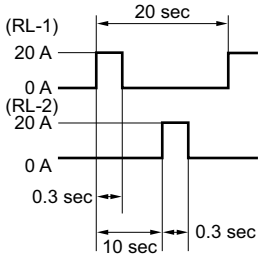
• Test circuit



• Shift of pick-up and drop-out voltage

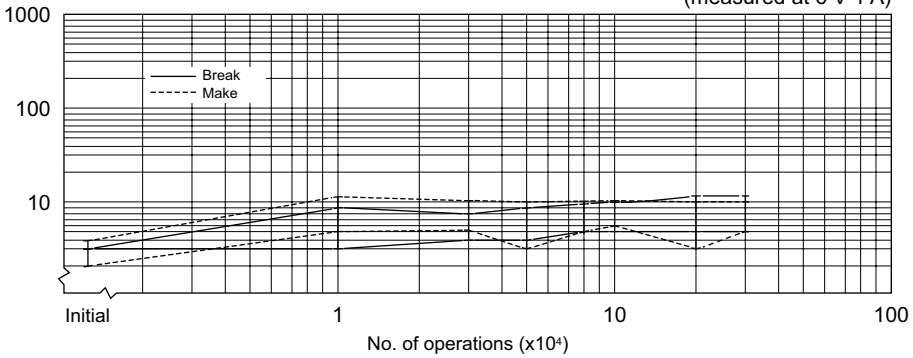


• Current wave form



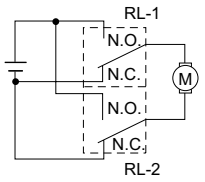
• Shift of contact resistance

(measured at 6 V-1 A)

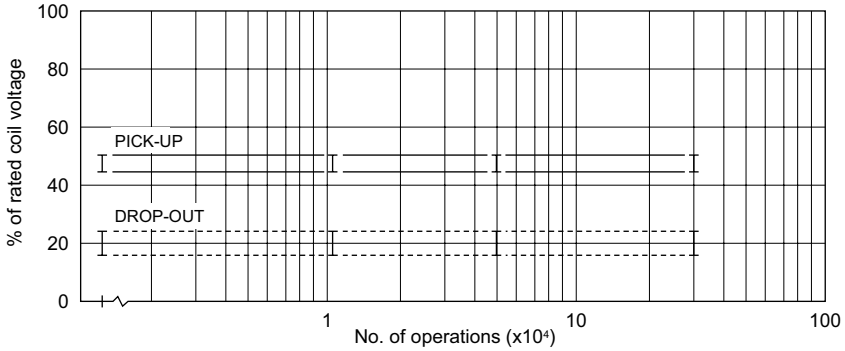


• Test item
14 V DC-25 A
Motor lock
200,000 operations minimum
(FBR512 □-W1 type)

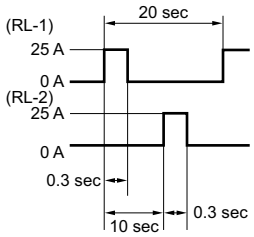
• Test circuit



• Shift of pick-up and drop-out voltage

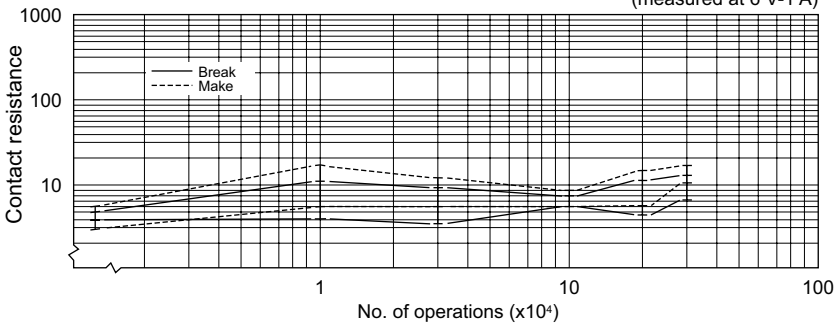


• Current wave form

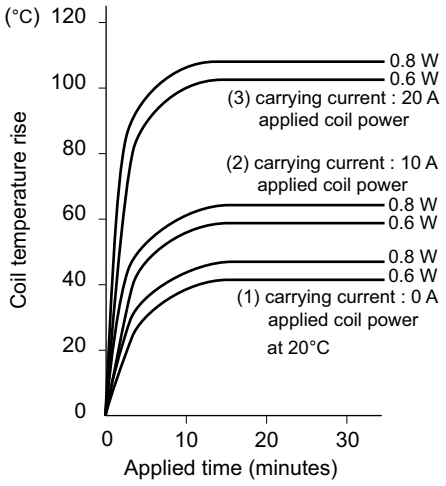


• Shift of contact resistance

(measured at 6 V-1 A)

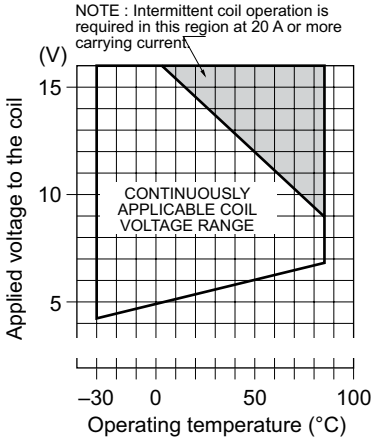


4. COIL TEMPERATURE RISE

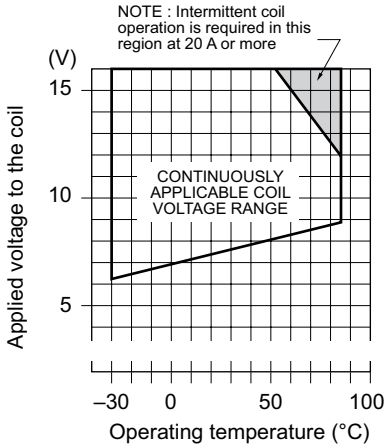


5. OPERATING COIL VOLTAGE RANGE (EXAMPLE)

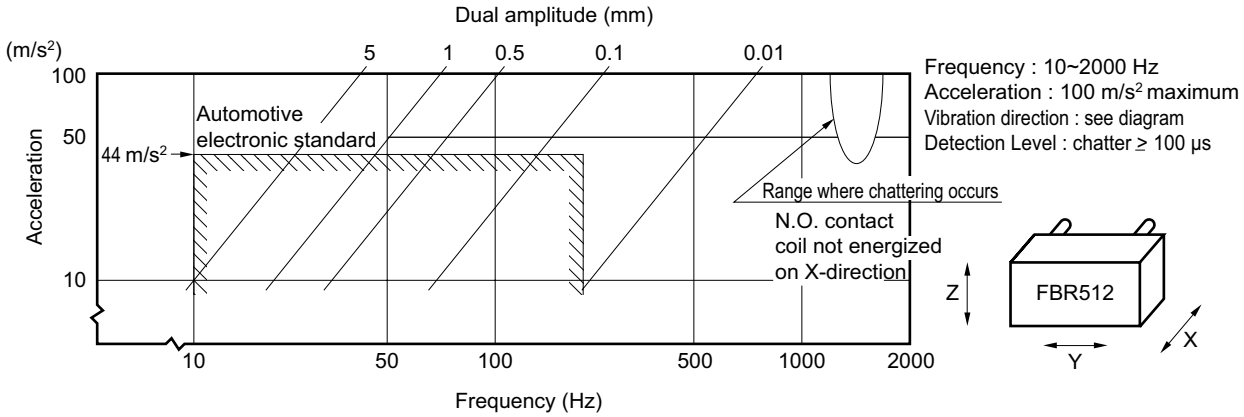
[FBR512ND09-W]



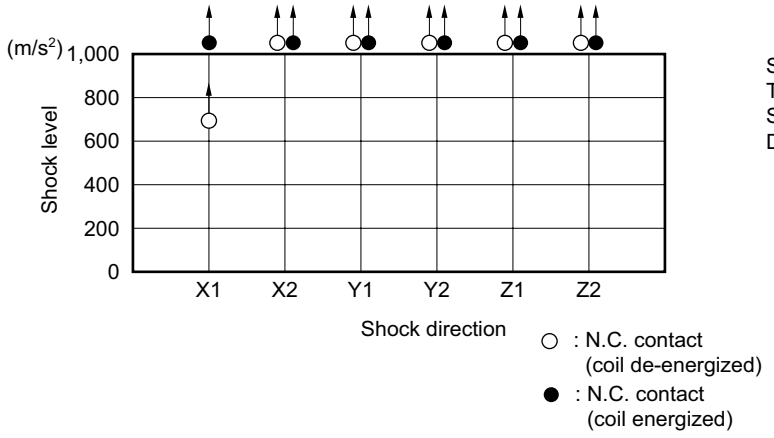
[FBR512ND12-W]



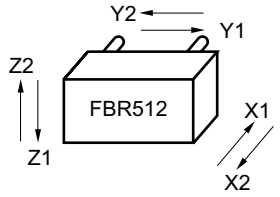
6. VIBRATION RESISTANCE CHARACTERISTICS



7. SHOCK RESISTANCE CHARACTERISTICS

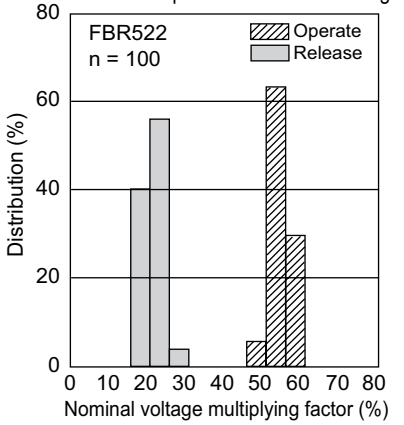


Shock application time : 11 ms, half-sine wave
Test material : coil, energized and de-energized
Shock direction: see diagram
Detection Level : chatter ≥ 100 µs

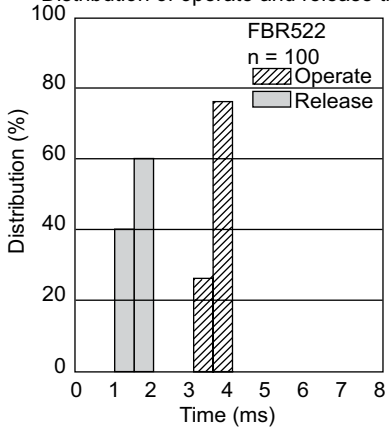


■ REFERENCE DATA

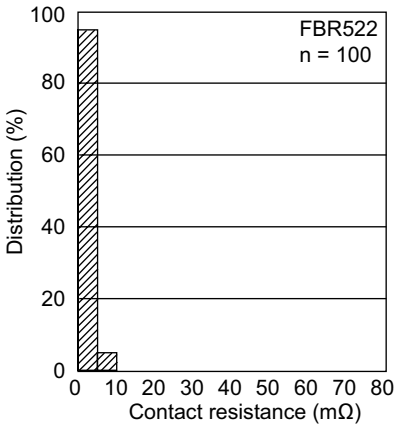
Distribution of operate and release voltage



Distribution of operate and release time

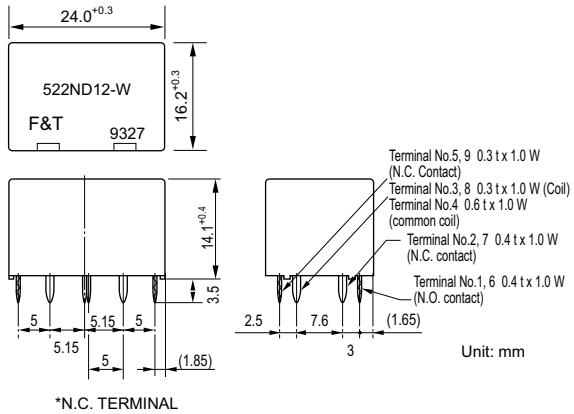


Distribution of contact resistance



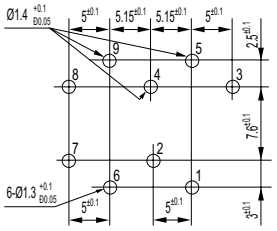
■ DIMENSIONS

● Dimensions

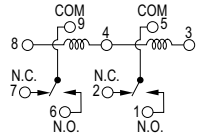


*N.C. TERMINAL

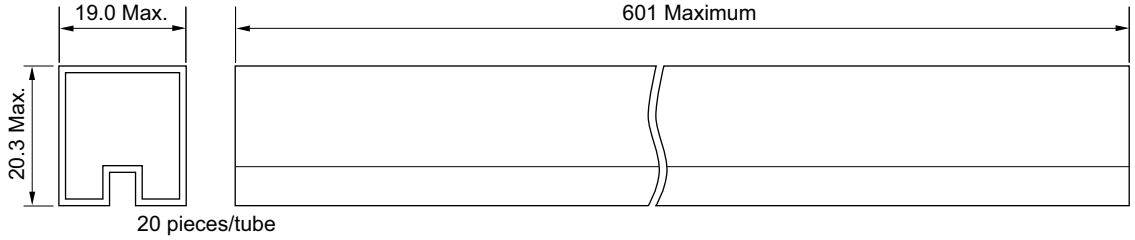
● PC board mounting hole layout (BOTTOM VIEW)



●Schematic (BOTTOM VIEW)



● Tube carrier



Unit: mm

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