

# PCB Relays

## BR•BRS Series



### Fully automated assembly line

Automatic production machine



Inspection of foreign matter on the contact surface



Catalog No. C0305b

Ideal relay for inverter power supply circuits

# PCB Relays

High capacity BR·BRS Series  
BR-301L/BR-401L/BR-401LB/BRS-451LA

Save up to **50%** of your relay footprint on your PCB

**RoHS Compliant**



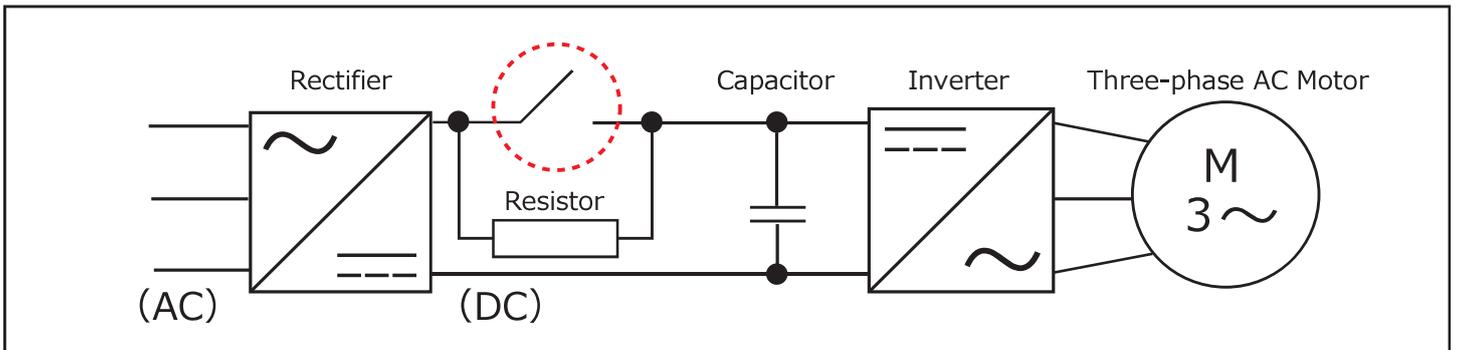
Specialized for inrush current prevention circuits

**Capable of up to 45A in a continuous current**  
in the size of a typical 20A relay

## Examples

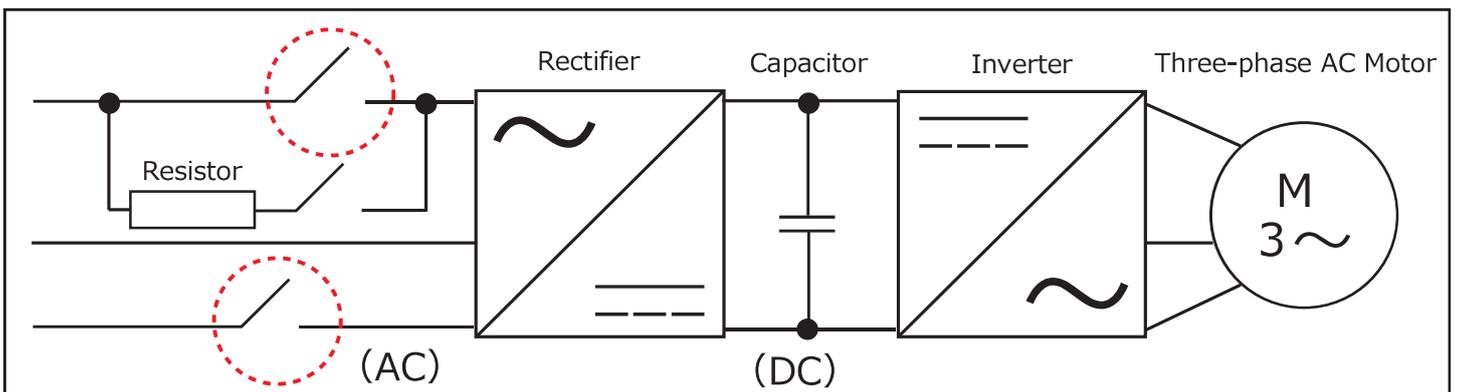
① PCB Relay is connected at the DC side

 PCB Relay is used here



② PCB Relay is connected at the AC side

 PCB Relay is used here



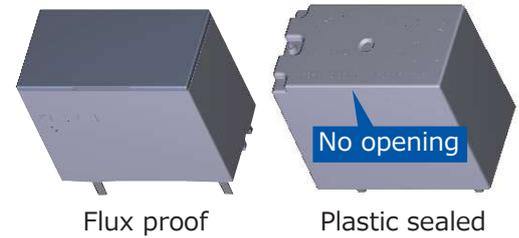
## Features

### 1 Compact Size and High Capacity

Delivers a 45A continuous carrying current within the case size of a standard 20A relay, reducing PCB mounting space (footprint) by approximately 50%. This contributes to greater PCB design flexibility and device miniaturization.

### 2 Dust-Proof Structure Ideal for Special Environments

The plastic sealed type features a gap-free, dust-tight structure, making it ideal for use in special atmospheres.



### 3 Wide Operating Temperature Range

Operates within an ambient temperature range of -40°C to +85°C.



### 4 Pinout Compatibility

The BR series and BRS series share an identical PCB pinout, ensuring mounting compatibility.

## Approved standards

UL · cUL	TUV	CQC
UL 60947-4-1 CSA C22.2 No.60947-4-1 No.E44273	EN 61810-1 No.R50299822	GB/T14536.1 GB/T21711.1 No.CQC19002216076

## Specifications

Model Number	BRS-451LA	BR-401LB	BR-401L	BR-301L
Overview	Plastic sealed	Expanded current and temperature	Standard	
Dimensions	32.8×18.9×29.2(h)mm	30.3×16.4×26.4(h)mm		
Protection	Plastic sealed	Flux proof		
Contact rating (Resistive load)	25A Make / 5A Break, 480VAC 45A Make / 10A Break, 250VAC	25A, 480VAC 28A, 440VAC 40A, 250VAC	19A, 480VAC 21A, 440VAC 30A, 250VAC	
Limiting continuous current	45A		40A	30A
Ambient temperature	-40°C~+85°C		-40°C~+65°C	
Safety standards	UL, TUV, CQC			
Electrical endurance	10,000 operations			
Mechanical endurance	3,000,000 operations			
Contact gap	Min. 0.75mm			

# BR Series

## Applications

- High capacity inverter
- Servo amplifier

## Features

- Small size, high capacity
- Size equivalent to a typical 20A relay for up to 45A in a continuous current



## Specifications

Model number	BR-401LB			BR-401L			BR-301L		
Contact configuration	1a(NO)								
Contact resistance (Initial)	MAX. 100mΩ (6VDC, 1A, Voltage drop method)								
Contact material	Silver alloy								
Rated operating voltage	480VAC								
Limiting continuous current	45A			40A			30A		
Contact rating (Resistive load)	250VAC 40A	440VAC 28A	480VAC 25A	250VAC 40A	440VAC 28A	480VAC 25A	250VAC 30A	440VAC 21A	480VAC 19A
Rated breaking capacity (50 operations)	60A	42A	37.5A	60A	42A	37.5A	45A	31.5A	28.5A
Min. switching load	100mA, 5VDC								
Electrical endurance	10×10 <sup>3</sup> operations (Resistive load)								
Mechanical endurance	3×10 <sup>6</sup> operations (No load)								
Frequency of opening and closing	1,800 operations / hour (No load) 120 operations / hour (Resistive load)								
Operate voltage(1)	Max. 95% of the rated coil voltage			Max. 85% of the rated coil voltage					
Release voltage	Min. 10% of the rated coil voltage								
Limiting voltage	110% of the rated coil voltage								
Operation time	Max. 20ms								
Release time	Max. 10ms								
Insulation resistance (Initial)	Min. 1,000MΩ								
Dielectric strength (Initial)	Between open contacts : 1,700VAC for 1 minute Between coil and contact : 4,500VAC for 1 minute								
Rated impulse withstand voltage (Initial)	Between open contacts : 2,500V (1.2×50μs) Between coil and contact : 6,000V (1.2×50μs)								
Protection	RT II Flux proof relay								
Insulation characteristics (IEC 61810-1)	Insulation distance : Clearance / Creepage distance 5.5mm / 8.0mm Type of disconnection : Micro disconnection Over voltage category : III Materials group : IIIa Rated insulation voltage : 500V Between coil and contact : Basic insulation Pollution degree : 2								
							Rated insulation voltage : 250V Between coil and contact : Reinforced insulation Pollution degree : 3		

(NOTE) 1.BR-401LB Thermal equilibrium: at 85°C, Contact carrying current 45A  
BR-401L Thermal equilibrium: at 65°C, Contact carrying current 40A  
BR-301L Thermal equilibrium: at 65°C, Contact carrying current 30A

### <Coil data>

Rated coil voltage	6VDC	12VDC	24VDC
Rated current	150mA	75mA	46mA
Rated power consumption	0.9W	0.9W	1.1W
Coil resistance *±10%	40Ω	160Ω	525Ω

(NOTE) The rated current, the rated power consumption, and the coil resistance are measured at a coil temperature of 23°C.

Model number		BR-401LB	BR-401L	BR-301L
Shock resistance	Malfunction	Peak acceleration: 100m/s <sup>2</sup> Duration time: 11ms		
	Destruction	Peak acceleration: 1,000m/s <sup>2</sup> Duration time: 6ms		
Vibration resistance	Malfunction	Frequency range: 10 to 55 to 10Hz		
	Destruction	Double amplitude: 1.5mm		
Environmental conditions		Avoid icing and condensation. If left or used for a long period of time in a sulfide gas or organic gas atmosphere, the contact surface may corrode and contact resistance may increase. Do not use products containing silicon near relays. Silicon oxide may form on the contact surface and cause contact failure.		
Ambient temperature		-40~85°C		-40~65°C
Storage temperature		-40~85°C		-40~80°C
Ambient temperature and ambient humidity range Storage temperature and storage humidity range				
Altitude		Max.2,000m		
Solder heat resistance		Flow soldering Solder temperature 260±3°C Solder dipping 5±0.5s Hand soldering Soldering iron temperature Max. 350°C Solder dipping Max. 3s		
Mounting direction		No restriction		
Weight		Approx. 26g		
Packing		Inner carton : 100 pcs. Shipping unit : 300 or 500 pcs.		

## Contact ratings for safety standards

### ○BR-401LB

	Rating	Electrical life	Operating temperature
UL	40A 277VAC (Resistive load) 25A 480VAC (Resistive load)	10×10 <sup>3</sup> operations	at 85°C
TUV	40A 250VAC (Resistive load) 28A 440VAC (Resistive load) 25A 480VAC (Resistive load)		
CQC	40A 250VAC (Resistive load) 28A 440VAC (Resistive load) 25A 480VAC (Resistive load)		

### ○BR-401L

	Rating	Electrical life	Operating temperature
UL	40A 277VAC (Resistive load) 25A 480VAC (Resistive load)	10×10 <sup>3</sup> operations	at 65°C
TUV	40A 250VAC (Resistive load) 28A 440VAC (Resistive load) 25A 480VAC (Resistive load)		
CQC	40A 250VAC (Resistive load) 28A 440VAC (Resistive load) 25A 480VAC (Resistive load)		

### ○BR-301L

	Rating	Electrical life	Operating temperature
UL	30A 277VAC (Resistive load) 19A 480VAC (Resistive load)	10×10 <sup>3</sup> operations	at 65°C
TUV	30A 250VAC (Resistive load) 21A 440VAC (Resistive load) 19A 480VAC (Resistive load)		
CQC	30A 250VAC (Resistive load) 21A 440VAC (Resistive load) 19A 480VAC (Resistive load)		

# BRS Series



## Applications

- High capacity inverter
- Servo amplifier
- Plastic sealed type can be used in special atmospheres and is dustproof. This increases design freedom.

## Features

- Plastic sealed, capable of up to 45A in a continuous current at 85°C

## Specifications

Model number	BRS-451LA	
Contact configuration	1a(NO)	
Contact resistance (Initial)	MAX. 100mΩ (6VDC, 1A, Voltage drop method)	
Contact material	Silver alloy	
Rated operating voltage	480VAC	
Limiting continuous current	45A	
Contact rating (Resistive load)	250VAC	480VAC
	45A Make / 10A break	25A Make / 5A break
Rated breaking capacity (50 operations)	45A (250VAC)	
Min. switching load	100mA, 5VDC	
Electrical endurance	10×10 <sup>3</sup> operations (Resistive load)	
Mechanical endurance	3×10 <sup>6</sup> operations (No load)	
Frequency of opening and closing	1,800 operations / hour (No load)	
	120 operations / hour (Resistive load)	
Operate voltage(1)	Max. 95% of the rated coil voltage	
Release voltage	Min. 10% of the rated coil voltage	
Limiting voltage	110% of the rated coil voltage	
Operation time	Max. 20ms	
Release time	Max. 10ms	
Insulation resistance (Initial)	Min. 1,000MΩ	
Dielectric strength (Initial)	Between open contacts : 1,700VAC for 1 minute	
	Between coil and contact : 4,500VAC for 1 minute	
Rated impulse withstand voltage (Initial)	Between open contacts : 2,500V(1.2×50μs)	
	Between coil and contact : 6,000V(1.2×50μs)	
Protection	RT III Wash tight relay (Plastic sealed)	
Insulation characteristics (IEC 61810-1)	Insulation distance : Clearance / Creepage distance 5.5mm / 8.0mm	
	Type of disconnection : Micro disconnection	
	Over voltage category : III	
	Materials group : IIIa	
	Rated insulation voltage : 500V	Rated insulation voltage : 250V
Between coil and contact : Basic insulation	Between coil and contact : Reinforced insulation	
Pollution degree : 2	Pollution degree : 3	

(NOTE) 1. Thermal equilibrium: at 85°C, Contact carrying current 45A

### <Coil data>

Rated voltage	6VDC	12VDC	24VDC
Rated current	150mA	75mA	46mA
Rated power consumption	0.9W	0.9W	1.1W
Coil resistance *±10%	40Ω	160Ω	525Ω

(NOTE) The rated current, the rated power consumption, and the coil resistance are measured at a coil temperature of 23°C.

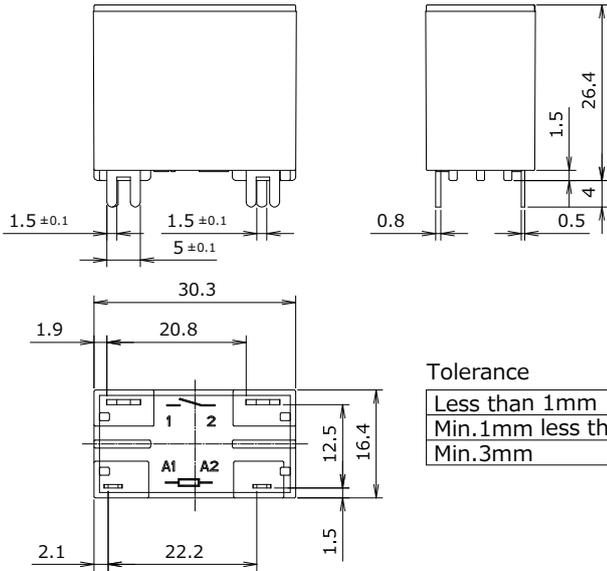
Model number		BRS-451LA
Shock resistance	Malfunction	Peak acceleration: 100m/s <sup>2</sup> Duration time: 11ms
	Destruction	Peak acceleration: 1,000m/s <sup>2</sup> Duration time: 6ms
Vibration resistance	Malfunction	Frequency range: 10 to 55 to 10Hz
	Destruction	Double amplitude: 1.5mm
Environmental conditions		Avoid icing and condensation. If left or used for a long period of time in a sulfide gas or organic gas atmosphere, the contact surface may corrode and contact resistance may increase. Do not use products containing silicon near relays. The permeability of the plastic allows silicone gas to penetrate inside the relay. Silicon oxide may form on the contact surface and cause contact failure.
Ambient temperature		-40~85°C
Storage temperature		
Ambient temperature and ambient humidity range Storage temperature and storage humidity range		
Altitude		Max. 2,000m
Solder heat resistance		Flow soldering Solder temperature 260±3°C Solder dipping 5±0.5s Hand soldering Soldering iron temperature Max. 350°C Solder dipping Max. 3s
Mounting direction		No restriction
Weight		Approx. 35g
Packing		Inner carton : 100 pcs. Shipping unit : 500 pcs.

## Contact ratings for safety standards

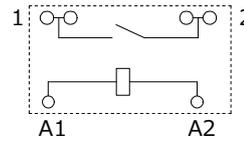
	Rating	Electrical life	Operating temperature
UL	45A Make / 10A Break, 277VAC (Resistive load) 25A Make / 5A Break, 480VAC (Resistive load) 10A, 277VAC (Resistive load) 5A, 480VAC (Resistive load)	10×10 <sup>3</sup> operations	at 85°C
TUV	45A Make / 10A Break 250VAC (Resistive load) 25A Make / 5A Break 480VAC (Resistive load)		
CQC	45A Make / 10A Break 250VAC (Resistive load) 25A Make / 5A Break 480VAC (Resistive load)		

# Dimensions

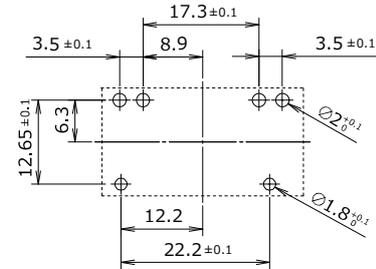
## BR-401LB , BR-401L , BR-301L



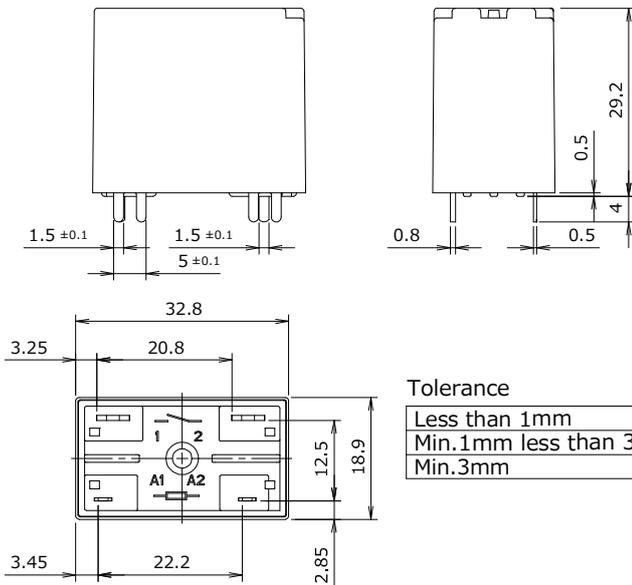
### Schematic (Bottom view)



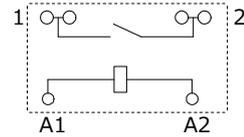
### Mounting hole (Bottom view)



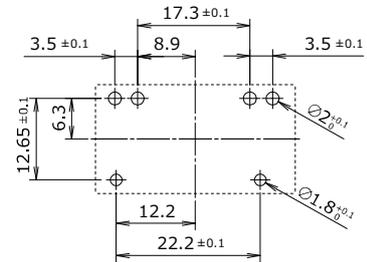
## BRS-451LA



### Schematic (Bottom view)



### Mounting hole (Bottom view)



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### Contact

If you have any questions about our products, please contact us below.

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 TEL +81-3-3465-0711  
 FAX +81-3-5738-3622

### Warranty period

The warranty period shall be valid for one year from the arrival date of the product.

### Warranty range

We will repair the product free of charge, provided that such degradation is determined to be due to defects in materials or workmanship under normal operation within the warranty period. This warranty is limited to coverage of only the delivered product itself and does not extend to the compensation for consequential damage that has occurred by the product supplied itself.

### Notice

Please note that the specification, design and other factors are subject to change.