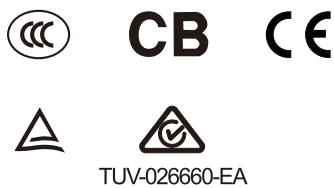


BB1-63 PV Miniature Circuit Breaker



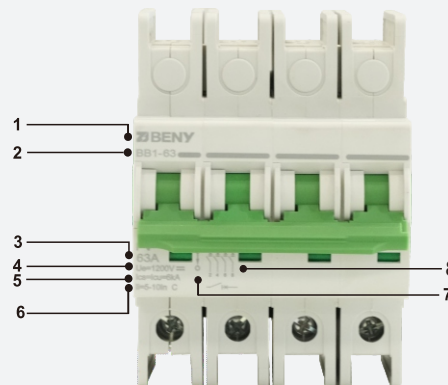
- 1 Brand
- 2 Type
- 3 Rated Current
- 4 Rated Voltage
- 5 Breaking Capacity
- 6 Current Setting
- 7 Wiring Diagram
- 8 Indicator

- Nonpolarity
- High short-circuit/breaking capacity
- Overload, Short circuit, Unfrequent operation and Anti-reflux protection
- Rated Voltage: 1200V DC
- Breaking Capacity: 6kA
- Body lengthening, Increase electrical clearance and creepage distance
- Rated Current: 63A
- Comply with: IEC60947-2/GB/T14048.2

Application

BENY BB1-63 series PV DC mini-circuit breaker is mainly used in PV power generation and distribution system, that is, photovoltaic bus box, inverter and other DC electrical equipment. Rated working voltage up to 1200V DC, rated working current up to 63A, scientific arc extinguishing and current limiting system, can quickly disconnect the DC distribution system fault current, and can achieve counter-current protection, to ensure the reliable operation of photovoltaic power generation system.

Appearance Introduction



Type Instruction

BB1	63	4P	63A	1200V	MF	4B
Product Code	Max Rated Current	Pole	Rated Current	Rated Voltage	Accessory	Wiring Method
PV Miniature Circuit Breaker	63A	1P 2P 3P 4P	6A, 10A, 13A 16A, 20A, 25A 32A, 40A, 50A 63A	300V 600V 900V 1200V	MX: Shunt Release OF: Auxiliary Contact MF: Shunt Release & Auxiliary Contact	customization

Parameter

Electrical Characteristics

		BB1-63			
Type		BB1-63			
Comply with		IEC 60947-2 /GB/T 14048.2			
Pole		1P	2P	3P	4P
Rated Working Voltage	Ue	300V	600V	900V	1200V
Max Rated Current	Ith	63A			
Rated Current	In	6A, 10A, 13A, 16A, 20A, 25A, 32A, 40A, 50A, 63A			
Rated Insulated Voltage	Ui	1200V DC			
Rated Impulsed Voltage	Uimp	6kV			
Ultimate Breaking Capacity	Icu	6kA			
Run Breaking Capacity	Ics	6kA			
Tripping Type		Thermal Magnetic Type			

Service Life & Cycle Operation


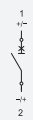
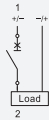

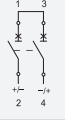
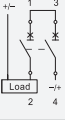
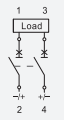
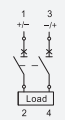
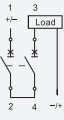
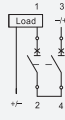

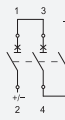
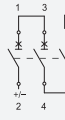

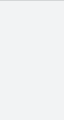
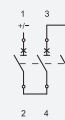
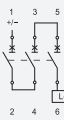
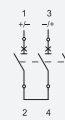
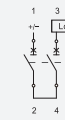


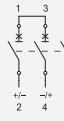
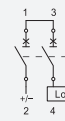
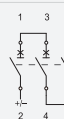
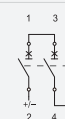
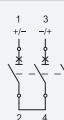
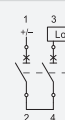
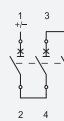
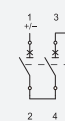

Mechanical	10000
Electrical	1500

Installation Environment

Ingress Protection	All Sides IP40, Connection Terminal IP20
Terminal Cross Section	2.5-25mm ²
Product wiring torque M5	2N·m-2.5N·m
Working Temperature	-40°C~+80°C
Storage Temperature	-40°C~+85°C
Resistance to Humidity and Heat	II (Humidity 55°C, relative humidity 95%)
Fixed installation	Fixed to the 35mm guide rail

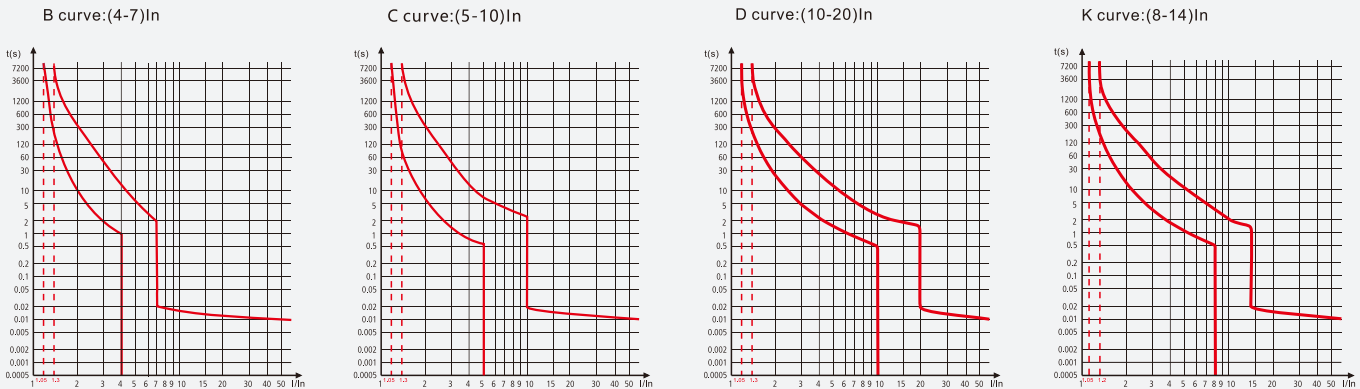


Wiring Diagram

Type	Pole	Wiring Diagram		
	1P	1A Default wiring method		
	2P	2A		
		2B Default wiring method		
		2C		
	3P	3A		
		3B Default wiring method		
		3C		
		3D		
		3E		User-defined wiring method
	4P	4A Default wiring method		
		4B		
		4C		
		4D		
		4E		User-defined wiring method

Characteristic Curve

1. Default curve C curve.
2. Other curves need to be customized.



- | | | | |
|---|--|---|--|
| <ol style="list-style-type: none"> 1) $I=1.05I_n, t \geq 1h, \text{not trip};$ 2) $I=1.3I_n, t < 1h, \text{trip};$ 3) $I=2.55I_n, t \geq 1-120s (I_n=6-63A);$ 4) Instantaneous trip: $(4-7)I_n.$ | <ol style="list-style-type: none"> 1) $I=1.05I_n, t \geq 1h, \text{not trip};$ 2) $I=1.3I_n, t < 1h, \text{trip};$ 3) $I=2.55I_n, t \geq 1-120s (I_n=6-63A);$ 4) Instantaneous trip: $(5-10)I_n.$ | <ol style="list-style-type: none"> 1) $I=1.05I_n, t \geq 1h, \text{not trip};$ 2) $I=1.3I_n, t < 1h, \text{trip};$ 3) $I=2.55I_n, t \geq 1-120s (I_n=6-63A);$ 4) Instantaneous trip: $(10-20)I_n.$ | <ol style="list-style-type: none"> 1) $I=1.05I_n, t \geq 1h, \text{not trip};$ 2) $I=1.3I_n, t < 1h, \text{trip};$ 3) $I=2.55I_n, t \geq 1-120s (I_n=6-63A);$ 4) Instantaneous trip: $(8-14)I_n.$ |
|---|--|---|--|

Derating Date

Derating Temperature

Type	Tem				
	Proportion				
	-40°C-40°C	50°C	60°C	70°C	80°C
BB1-63	100%	95%	90%	85%	80%

Altitude of Derating

Altitude	2000m	3000m	4000m	5000m
Power frequency withstand voltage	100%	100%	100%	100%
Ui	100%	100%	100%	100%
In	100%	100%	90%	80%
Ue	N/A			

Installation Derating

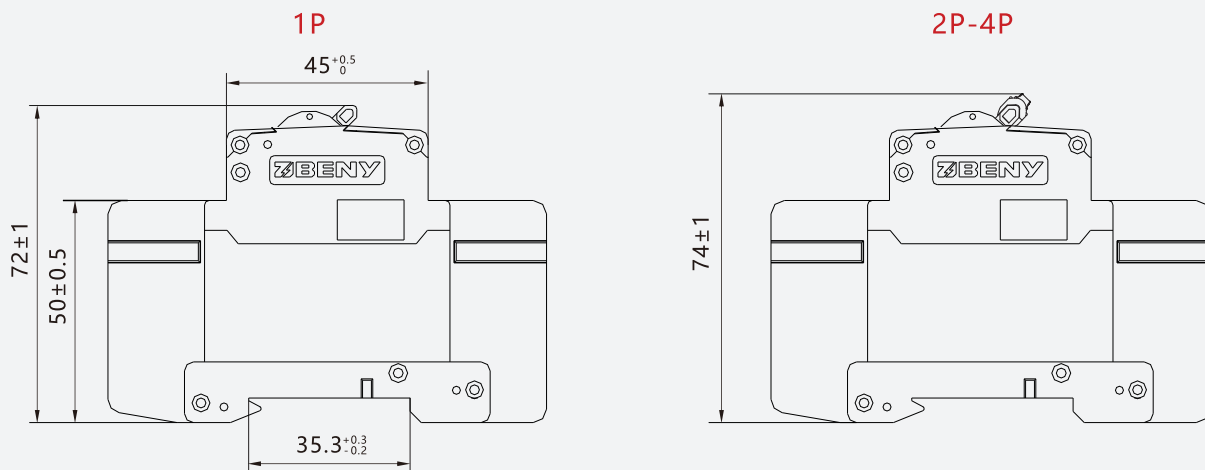
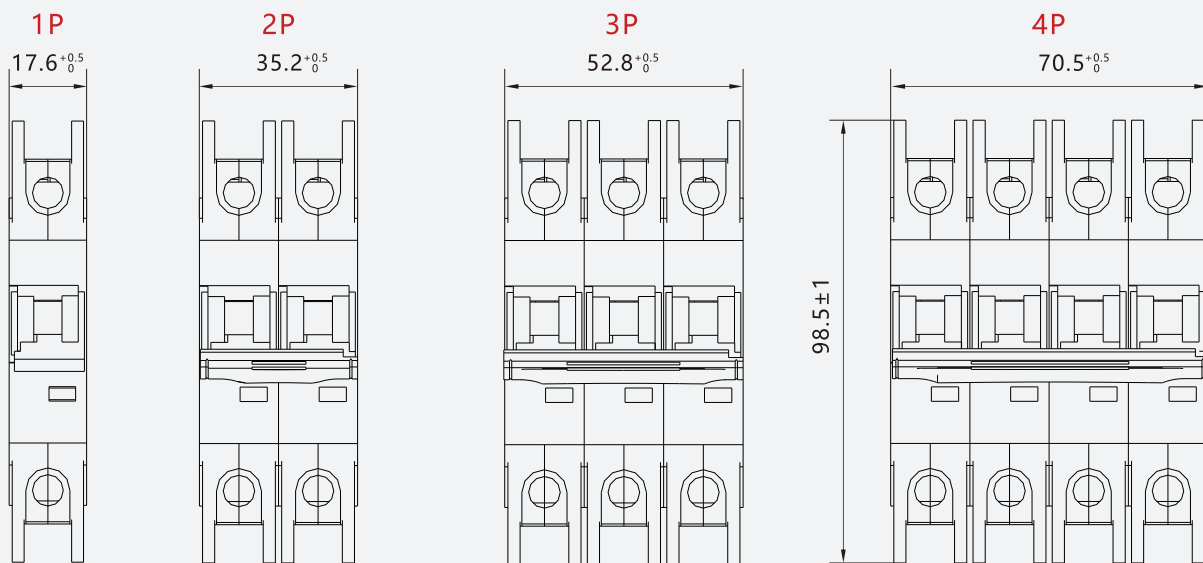
MCB side by side quantity	1	2-3	4-5	6-9	10 Above
Reduction coefficient	1	0.95	0.9	0.8	0.7

Installation and use

Recommended wiring section

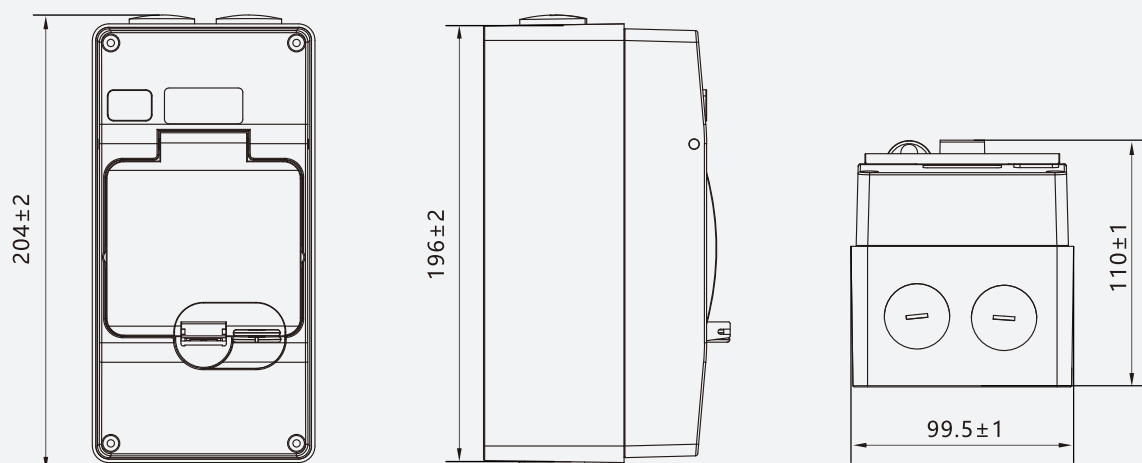
Current	6A	10A	13A	16A	20A	25A	32A	40A	50A	63A
Section mm ²	1	1.5	2.5	2.5	2.5	4	6	10	10	16

Dimensions(mm)



Dimensions with IP65 Waterproof Enclosure(mm)

Choose the waterproof box according to your needs, and the maximum installation width of the waterproof box is 72mm.



BY-OF

Type Instruction **BY-OF** – Auxiliary contact

- Auxiliary contact synchronous with main contacts of device
- According IEC 60947-5-1, GB/T14048.5

Parameter

Electrical Parametes

Product parameters	AC 12	le=3A Ue=415V
		le=6A Ue=240V
	DC 12	le=1A Ue=110V
		le=2A Ue=48V
		le=6A Ue=24V
Rated Insulated Voltage U_i		500V
Rated Impulsed Voltage U_{imp}		4kV
Min.op.current per contact I_{min}		10mA
Min.op.voltage per contact U_{min}		11V DC
Rated frequency		50/60Hz

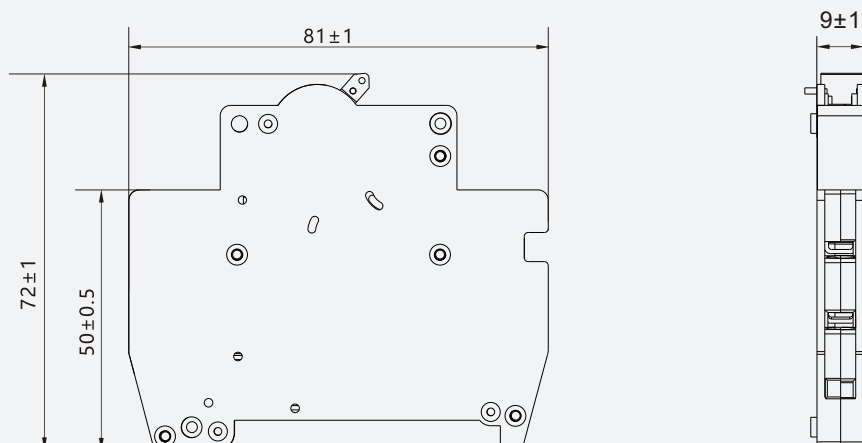
Mechanical parameters

Mounting		Fixed to the 35mm guide rail
Degree of protection		IP20
Terminals capacity		1mm ² -2.5mm ²
Fastening torque of terminals		0.5N·m-0.7N·m
Working temprature		-40~+80°C

Wiring Method

Show	Wiring Diagram
OFF	
ON	

Dimensions(mm)



BY-MX

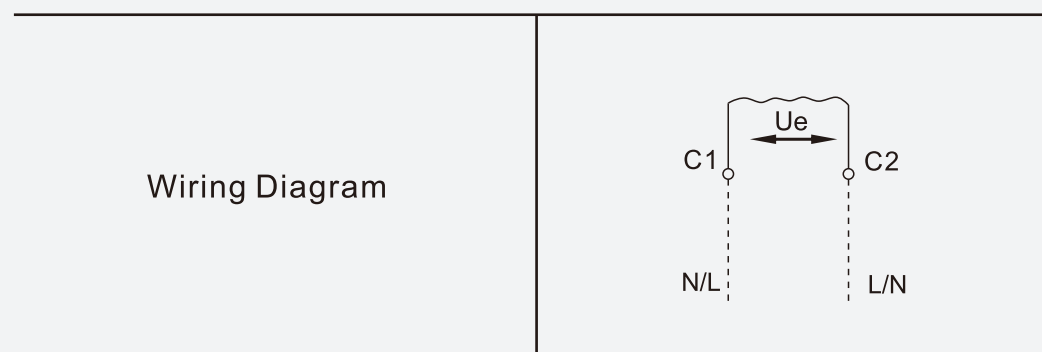
Type Instruction **BY-MX** – **Shunt trip**

- Shunt trip synchronous with main contacts of device
- According GB/T 14048.1

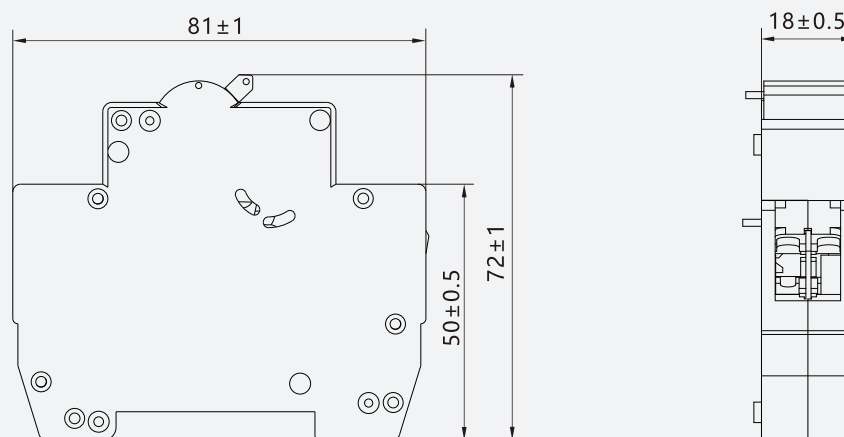
Parameter

Electrical Parameters		
Rated op. voltage	AC	Ue=110/415V
		Ue=24/48V
	DC	Ue=24/48V
Conduction time	< 1s	
Min.op.voltage	Ue*70%	
Max. op. voltage	Ue*110%	
Working current	0.5A-5A	
Operation frequency	6 times per minute	
Rated frequency	50/60Hz	
Mechanical parameters		
Mounting	Fixed to the 35mm guide rail	
Degree of protection	IP20	
Terminals capacity	1mm ² ~2.5mm ²	
Fastening torque of terminals	0. 8N. m-1N. m	
Working temperture	-40~+80°C	

Wiring Method



Dimensions(mm)



BY-MF

Type Instruction **BY-MF** – **Shunt trip&Auxiliary contact**

- Shunt assist one of the ports shared
- According GB/T 14048.1, GB/T14048.5, IEC 60947-5-1

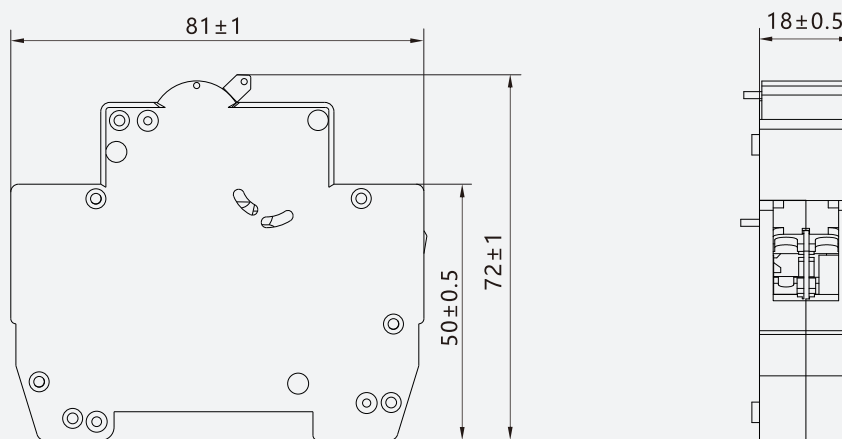
Parameter

Electrical Parametes			
Product parameters	Shunt trip	AC	Ue=110/415V
			Ue=24/48V
	Auxiliary contact	DC	Ue=24/48V
		AC	Ie=2 Ue=250V
		DC	Ie=5 Ue=12-125V
			Ie=5 Ue=12-36V
Rated frequency		50/60Hz	
Shunt trip parameters	Conduction time		< 1s
	Min.op.voltage		Ue*70%
	Max. op. voltage		Ue*110%
	Working current		0.5A-5A
	Operation frequency		6 times per minute
Mechanical parameters			
Mounting		Fixed to the 35mm guide rail	
Degree of protection		IP20	
Terminals capacity		1mm ² -2.5mm ²	
Fastening torque of terminals		0.5N·m-0.7N·m	
Working tempreture		-40~+80°C	

Wiring Method

Show	Auxiliary contact Wiring Diagram	Shunt Release Wiring Diagram
OFF		
ON		

Dimensions(mm)



BY-MF

Type Instruction **BY-MF** – **Shunt trip&Auxiliary contact**

- Shunt auxiliary independent port
- According GB/T 14048.1, GB/T14048.5, IEC 60947-5-1

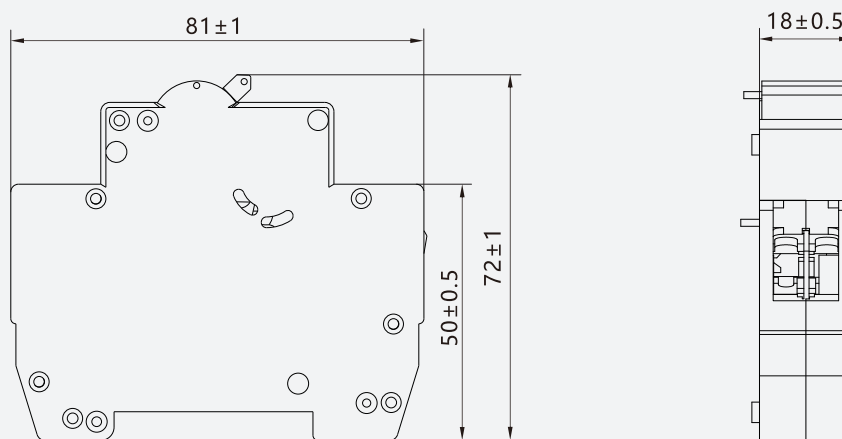
Parameter

Electrical Parametes			
Product parameters	Shunt trip	AC	Ue=110/415V
			Ue=24/48V
	Auxiliary contact	DC	Ue=24/48V
		AC	Ie=2 Ue=250V
		DC	Ie=5 Ue=12-125V
			Ie=5 Ue=12-36V
Rated frequency		50/60Hz	
Shunt trip parameters	Conduction time		< 1s
	Min.op.voltage		Ue*70%
	Max. op. voltage		Ue*110%
	Working current		0.5A-5A
	Operation frequency		6 times per minute
Mechanical parameters			
Mounting		Fixed to the 35mm guide rail	
Degree of protection		IP20	
Terminals capacity		1mm ² -2.5mm ²	
Fastening torque of terminals		0.5N·m-0.7N·m	
Working tempreture		-40~+80°C	

Wiring Method

Show	Auxiliary contact Wiring Diagram	Shunt Release Wiring Diagram
OFF		
ON		

Dimensions(mm)



BB1-63 PV Miniature Circuit Breaker



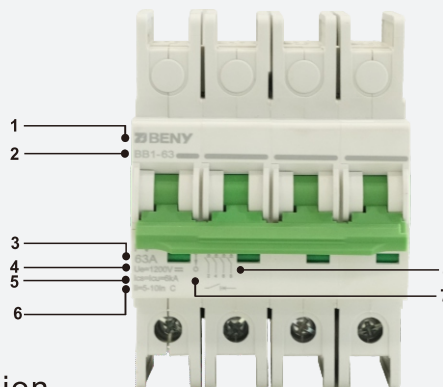
- 1 Brand
- 2 Type
- 3 Rated Current
- 4 Rated Voltage
- 5 Standard Code
- 6 Operational Breaking Capacity
- 7 Wiring Diagram
- 8 Indicator

- Nonpolarity
- High short-circuit/breaking capacity
Overload, Short circuit, Unfrequent operation and Anti-reflux protection
- Rated Voltage: 1200V DC
- Breaking Capacity: 5kA
- Body lengthening, Increase electrical clearance and creepage distance
- Rated Current: 50A
- Comply with: UL489B

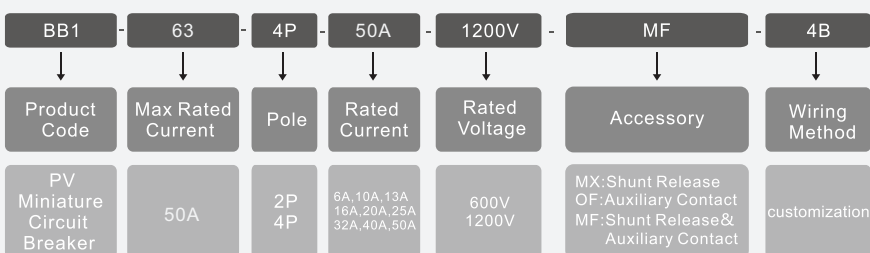
Application

ZBENY BB1-63 PV Miniature Circuit Breaker are designed for solar DC strings protection according to UL489B standard. Offer overload protection, anti-reflux function and short-circuit protection to solar PV systems, UPS and BESS. The new design brings safety and durable working life.

Appearance Introduction

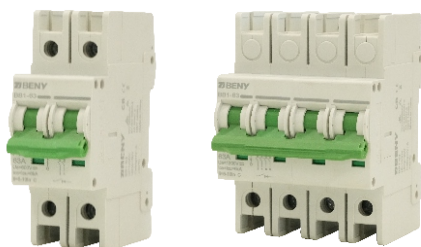


Type Instruction


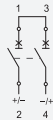
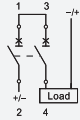
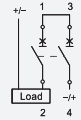
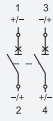
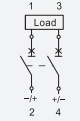
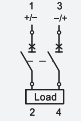
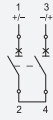
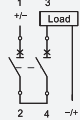
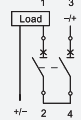

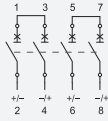
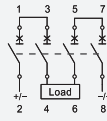
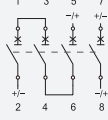
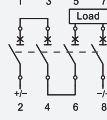
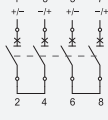
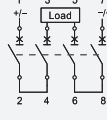

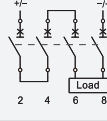



Parameter

Electrical Characteristics	
Type	BB1-63
Comply with	UL 489B
Pole	2P 4P
Rated Working Voltage	Ue 600V 1200V
Max Rated Current	Ith 50A
Rated Current	In 6A, 10A, 13A, 16A, 20A, 25A, 32A, 40A, 50A
Rated Insulated Voltage	Ui 1200V DC
Rated Impulsed Voltage	Uimp 6kV
Ultimate Breaking Capacity	Icu 5kA
Run Breaking Capacity	Ics 5kA
Tripping Type	Thermal Magnetic Type
Service Life & Cycle Operation	
Mechanical	10000
Electrical	1000
Installation Environment	
Ingress Protection	All Sides IP40, Connection Terminal IP20
Terminal Cross Section	AWG14-4mm ²
Working Temperature	-40°C ~ +80°C
Storage Temperature	-40°C ~ +85°C
Resistance to Humidity and Heat	II (Humidity 55°C, relative humidity 95%)
Fixed installation	Fixed to the 35mm guide rail

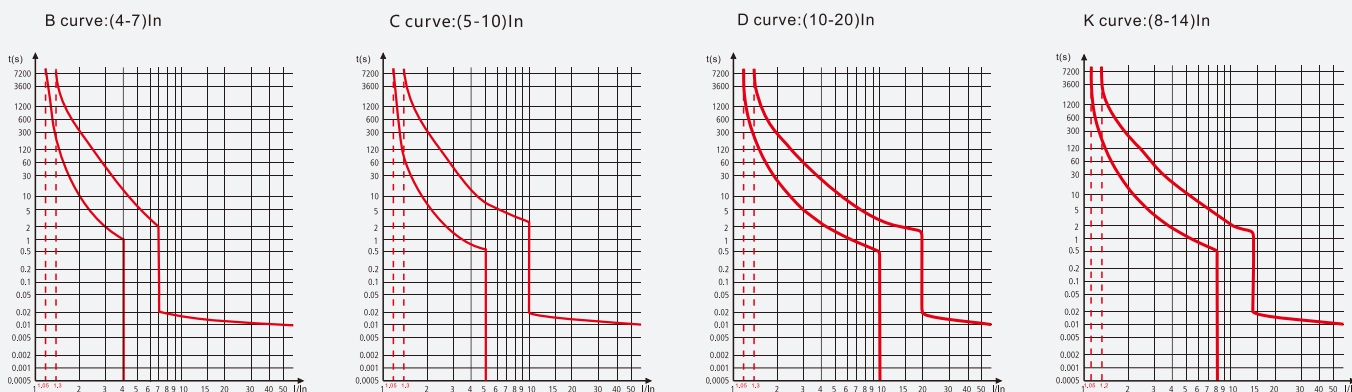


Wiring Diagram

Type	Pole	Wiring Diagram	
	2P	<p>2A</p> 	 
		<p>2B Default wiring method</p> 	 
		<p>2C</p> 	 
	4P	<p>4A Default wiring method</p> 	
		<p>4B</p> 	
		<p>4C</p> 	
		<p>4D</p> 	
		<p>4E</p> 	<p>User-defined wiring method</p>

Characteristic Curve

1. Default curve C curve.
2. Other curves need to be customized.



- | | | | |
|---|--|---|--|
| <ol style="list-style-type: none"> 1) $I=1.05I_n, t \geq 1h$, not trip; 2) $I=1.3I_n, t < 1h$, trip; 3) $I=2.55I_n, t \geq 1-120s (I_n=6-63A)$; 4) Instantaneous trip: (4-7)I_n. | <ol style="list-style-type: none"> 1) $I=1.05I_n, t \geq 1h$, not trip; 2) $I=1.3I_n, t < 1h$, trip; 3) $I=2.55I_n, t \geq 1-120s (I_n=6-63A)$; 4) Instantaneous trip: (5-10)I_n. | <ol style="list-style-type: none"> 1) $I=1.05I_n, t \geq 1h$, not trip; 2) $I=1.3I_n, t < 1h$, trip; 3) $I=2.55I_n, t \geq 1-120s (I_n=6-63A)$; 4) Instantaneous trip: (10-20)I_n. | <ol style="list-style-type: none"> 1) $I=1.05I_n, t \geq 1h$, not trip; 2) $I=1.3I_n, t < 1h$, trip; 3) $I=2.55I_n, t \geq 1-120s (I_n=6-63A)$; 4) Instantaneous trip: (8-14)I_n. |
|---|--|---|--|

Derating Date

Derating Temperature

Type	Tem Proportion				
	-40°C-40°C	50°C	60°C	70°C	80°C
BB1-63	100%	95%	90%	85%	80%

Altitude of Derating

Altitude	2000m	3000m	4000m	5000m
Power frequency withstand voltage	100%	100%	100%	100%
Ui	100%	100%	100%	100%
In	100%	100%	90%	80%
Ue	N/A			

Installation Derating

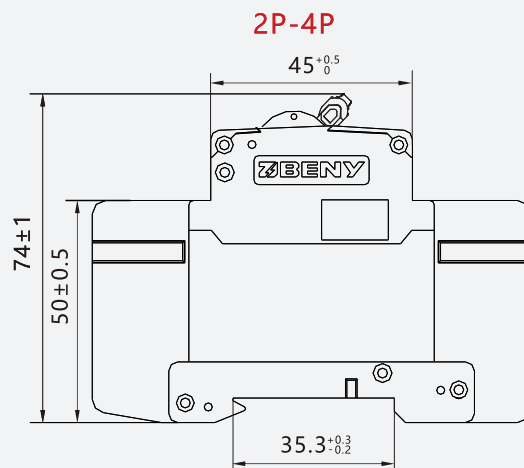
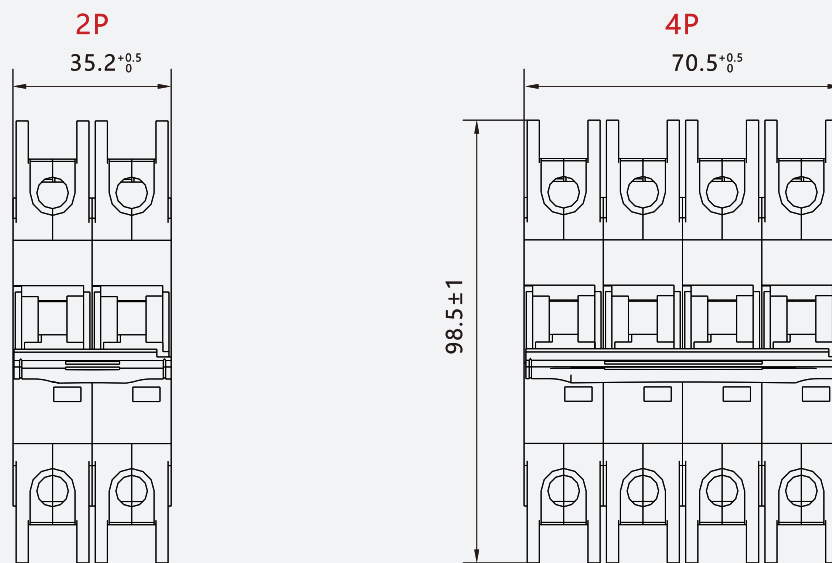
MCB side by side quantity	1	2-3	4-5	6-9	10 Above
Reduction coefficient	1	0.95	0.9	0.8	0.7

Installation and use

Recommended wiring section

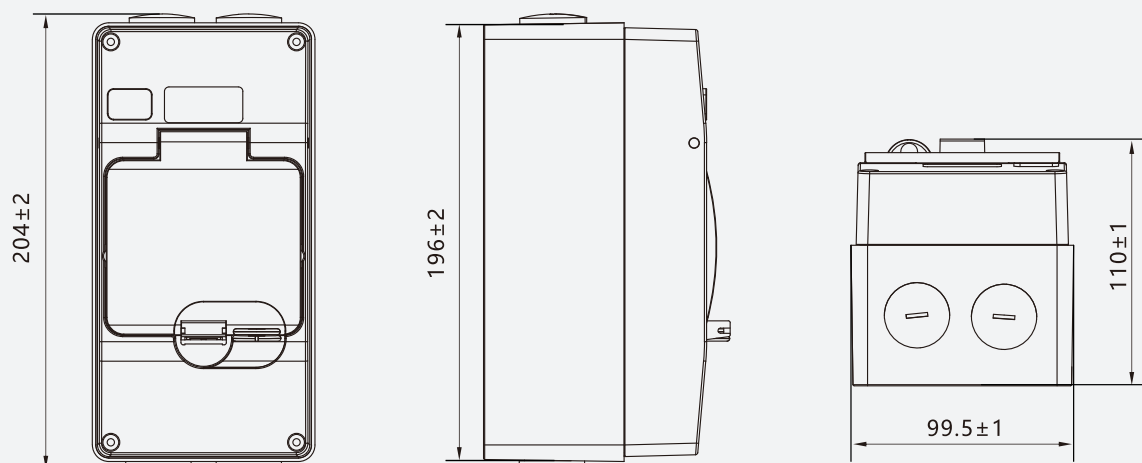
Current	6A	10A	13A	16A	20A	25A	32A	40A	50A	63A
Section mm ²	1	1.5	2.5	2.5	2.5	4	6	10	10	16

Dimensions(mm)



Dimensions with IP65 Waterproof Enclosure(mm)

Choose the waterproof box according to your needs, and the maximum installation width of the waterproof box is 72mm.



BY-MX

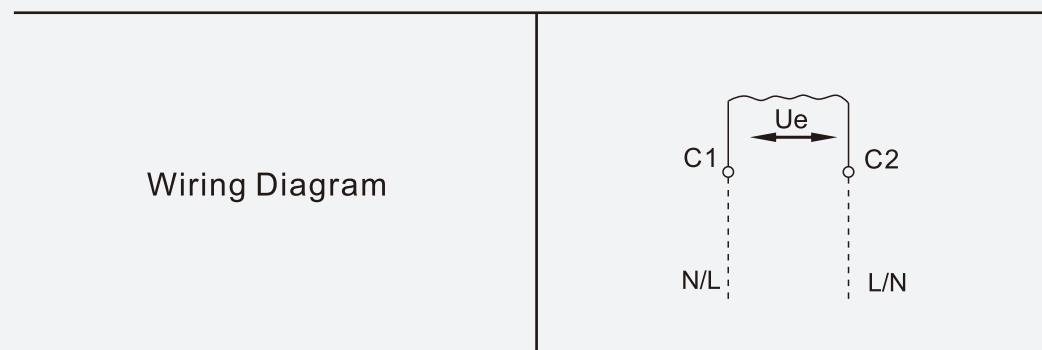
Type Instruction **BY-MX** – **Shunt trip**

- Shunt trip synchronous with main contacts of device
- According GB/T 14048.1

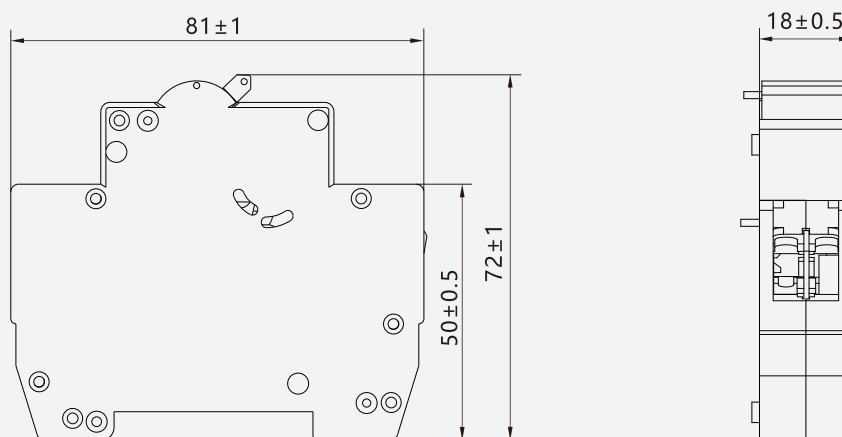
Parameter

Electrical Parameters		
Rated op. voltage	AC	Ue=110/415V
		Ue=24/48V
	DC	Ue=24/48V
Conduction time	< 1s	
Min.op.voltage	Ue*70%	
Max. op. voltage	Ue*110%	
Working current	0.5A-5A	
Operation frequency	6 times per minute	
Rated frequency	50/60Hz	
Mechanical parameters		
Mounting	Fixed to the 35mm guide rail	
Degree of protection	IP20	
Terminals capacity	1mm ² ~2.5mm ²	
Fastening torque of terminals	0. 8N. m-1N. m	
Working temprature	-40~+80°C	

Wiring Method



Dimensions(mm)



BY-OF

Type Instruction **BY-OF** – Auxiliary contact

- Auxiliary contact synchronous with main contacts of device
- According IEC 60947-5-1, GB/T14048.5

Parameter

Electrical Parametes

Product parameters	AC 12	le=3A Ue=415V
		le=6A Ue=240V
	DC 12	le=1A Ue=110V
		le=2A Ue=48V
		le=6A Ue=24V
Rated Insulated Voltage U_i		500V
Rated Impulsed Voltage U_{imp}		4kV
Min.op.current per contact I_{min}		10mA
Min.op.voltage per contact U_{min}		11V DC
Rated frequency		50/60Hz

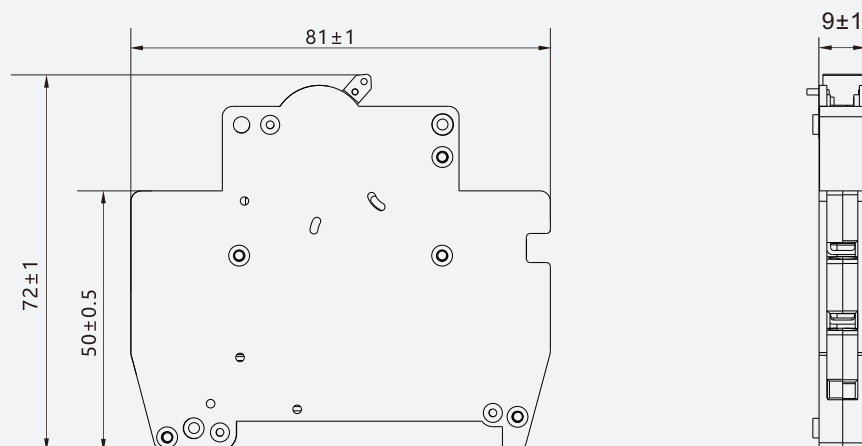
Mechanical parameters

Mounting		Fixed to the 35mm guide rail
Degree of protection		IP20
Terminals capacity		1mm ² -2.5mm ²
Fastening torque of terminals		0.5N·m-0.7N·m
Working temprature		-40~+80°C

Wiring Method

Show	Wiring Diagram
OFF	
ON	

Dimensions(mm)



BY-MF

Type Instruction **BY-MF** – **Shunt trip&Auxiliary contact**

- Shunt assist one of the ports shared
- According GB/T 14048.1, GB/T14048.5, IEC 60947-5-1

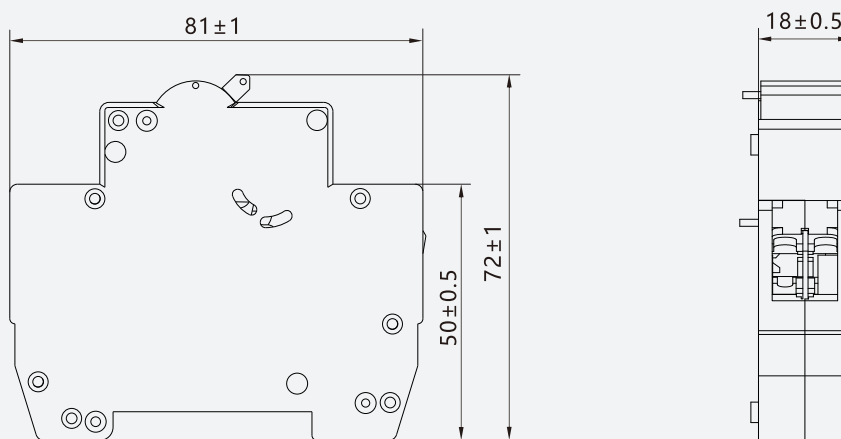
Parameter

Electrical Parametes			
Product parameters	Shunt trip	AC	Ue=110/415V
			Ue=24/48V
	Auxiliary contact	DC	Ue=24/48V
		AC	Ie=2 Ue=250V
		DC	Ie=5 Ue=12-125V
			Ie=5 Ue=12-36V
Rated frequency		50/60Hz	
Shunt trip parameters	Conduction time		< 1s
	Min.op.voltage		Ue*70%
	Max. op. voltage		Ue*110%
	Working current		0.5A-5A
	Operation frequency		6 times per minute
Mechanical parameters			
Mounting		Fixed to the 35mm guide rail	
Degree of protection		IP20	
Terminals capacity		1mm ² -2.5mm ²	
Fastening torque of terminals		0.5N·m-0.7N·m	
Working tempreture		-40~+80°C	

Wiring Method

Show	Auxiliary contact Wiring Diagram	Shunt Release Wiring Diagram
OFF		
ON		

Dimensions(mm)



BY-MF

Type Instruction **BY-MF** – **Shunt trip&Auxiliary contact**

- Shunt auxiliary independent port
- According GB/T 14048.1, GB/T14048.5, IEC 60947-5-1

Parameter

Electrical Parametes			
Product parameters	Shunt trip	AC	Ue=110/415V
			Ue=24/48V
	Auxiliary contact	DC	Ue=24/48V
		AC	Ie=2 Ue=250V
		DC	Ie=5 Ue=12-125V
			Ie=5 Ue=12-36V
Rated frequency		50/60Hz	
Shunt trip parameters	Conduction time		< 1s
	Min.op.voltage		Ue*70%
	Max. op. voltage		Ue*110%
	Working current		0.5A-5A
	Operation frequency		6 times per minute
Mechanical parameters			
Mounting		Fixed to the 35mm guide rail	
Degree of protection		IP20	
Terminals capacity		1mm ² -2.5mm ²	
Fastening torque of terminals		0.5N·m-0.7N·m	
Working tempreture		-40~+80°C	

Wiring Method

Show	Auxiliary contact Wiring Diagram	Shunt Release Wiring Diagram
OFF		
ON		

Dimensions(mm)

