

### Functions

- Overload protection
- Short circuit protection
- Controlling
- Protection for people and big length cables in TN and IT systems
- DC string protection: Protects the PV module from dangerous high DC back current
- Application in direct current circuit, like motors, auxiliary, circuits and photovoltaic.
- Used in industry and new energy

### Technical Specifications

- Standard: IEC 60947-2
- Rated current  $I_n$  (A): 2, 4, 6, 10, 16, 20, 25, 32, 40, 50, 63
- Number of poles: 1, 2, 3, 4
- Rated voltage  $U_e$  (V DC):
  - 1P: 250
  - 2P: 500
  - 3P: 750
  - 4P: 1000
- Operational voltage  $U_b$  (V DC):
  - Min.: 12
  - Max.: 1P: 250; 2P: 500; 3P: 750; 4P: 1000
- Rated insulation voltage (V DC): 1500
- Rated impulse withstand voltage (kV): 5
- Tripping characteristic: B, C
  - Characteristic B ( $I_n$ ): 4~7
  - Characteristic C ( $I_n$ ): 7~15
- Thermal operating limit ( $I_n$ ): 1.05~1.30
- Rated breaking capacity:

| Model  | Rated voltage |           | Acc. to IEC 60947-2     |
|--------|---------------|-----------|-------------------------|
|        | (V)           |           | $I_{cn}=I_{cs}$<br>(kA) |
| VBD510 | 1P            | 250 V DC  | 6                       |
|        | 2P            | 500 V DC  | 6                       |
|        | 3P            | 750 V DC  | 6                       |
|        | 4P            | 1000 V DC | 6                       |

- Mounting position: Any
- Conductor cross-sections
  - Solid and standard (mm<sup>2</sup>): 0.75-25
  - Finely stranded with end sleeve (mm<sup>2</sup>): 0.75-25
- Terminal tightening torque (N · m): 2.5
- Ambient temperature (°C): -25 ~ +45, max. 95 % humidity
- Storage temperature (°C): -40 ~ +75
- Altitude (meters): Max. 2,000

### Features

- The handle being sealable or equipped with padlock bracket avoids dangerous operation changes (ON / OFF)
- Clear indication of the contact position
- The emission of ionized gases is limited to the severest restrictions: 45 mm grid distance
- Suitable for household or similar applications in accordance with: IEC 60947-2



### Magnetic Release

An electromagnet with plunger ensures instantaneous tripping in case of short circuit.

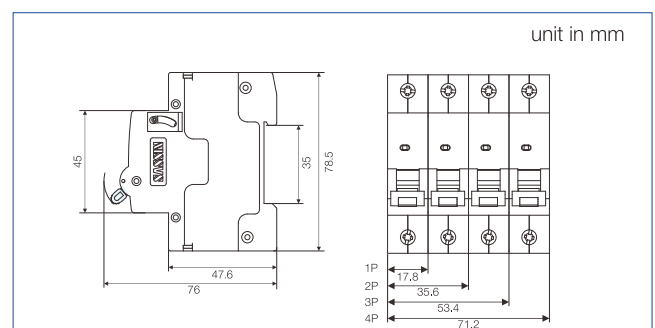
| Test | DC test current | Initial state | Time limit    | Expected result | Remark                                                      |
|------|-----------------|---------------|---------------|-----------------|-------------------------------------------------------------|
| B    | 4 $I_n$         | Cold state    | $t \leq 0.1s$ | No tripping     | The current rises steadily to the specified value within 5S |
|      | 7 $I_n$         |               | $t < 0.1s$    | Tripping        |                                                             |
| C    | 7 $I_n$         | Cold state    | $t \leq 0.1s$ | No tripping     | Close the auxiliary switch to turn on the power             |
|      | 15 $I_n$        |               | $t < 0.1s$    | Tripping        |                                                             |

### Thermal Release

- The release is initiated by a bimetal strip in case of overload.
- The standard defines the range of release for specific overload values.
- Reference ambient temperature is 30 °C

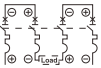
| Test current | Tripping time                                                |
|--------------|--------------------------------------------------------------|
| 1.05 $I_n$   | $t \leq 1h (I_n \leq 63A)$ , $t \leq 2h (I_n > 63A)$         |
| 1.30 $I_n$   | $t < 1h (I_n \leq 63A)$ , $t < 2h (I_n > 63A)$               |
| 2.55 $I_n$   | $1s < t < 60s (I_n \leq 32A)$<br>$1s < t < 120s (I_n > 32A)$ |

### Outline and Installation Dimensions



### Selection and Ordering Data

IEC 60947-2 6 kA

|                                                                                     | Number of poles | Rated current In (A) | Characteristic B                                                                    | Characteristic C |
|-------------------------------------------------------------------------------------|-----------------|----------------------|-------------------------------------------------------------------------------------|------------------|
|                                                                                     |                 |                      | Type code                                                                           | Type code        |
|    | 1               | 6                    | VBD511-B6                                                                           | VBD511-C6        |
|                                                                                     |                 | 10                   | VBD511-B10                                                                          | VBD511-C10       |
|                                                                                     |                 | 16                   | VBD511-B16                                                                          | VBD511-C16       |
|                                                                                     |                 | 20                   | VBD511-B20                                                                          | VBD511-C20       |
|                                                                                     |                 | 25                   | VBD511-B25                                                                          | VBD511-C25       |
|                                                                                     |                 | 32                   | VBD511-B32                                                                          | VBD511-C32       |
|                                                                                     |                 | 40                   | VBD511-B40                                                                          | VBD511-C40       |
|                                                                                     |                 | 50                   | VBD511-B50                                                                          | VBD511-C50       |
|                                                                                     |                 | 63                   | VBD511-B63                                                                          | VBD511-C63       |
|                                                                                     |                 |                      |    |                  |
|   | 2               | 6                    | VBD512-B6                                                                           | VBD512-C6        |
|                                                                                     |                 | 10                   | VBD512-B10                                                                          | VBD512-C10       |
|                                                                                     |                 | 16                   | VBD512-B16                                                                          | VBD512-C16       |
|                                                                                     |                 | 20                   | VBD512-B20                                                                          | VBD512-C20       |
|                                                                                     |                 | 25                   | VBD512-B25                                                                          | VBD512-C25       |
|                                                                                     |                 | 32                   | VBD512-B32                                                                          | VBD512-C32       |
|                                                                                     |                 | 40                   | VBD512-B40                                                                          | VBD512-C40       |
|                                                                                     |                 | 50                   | VBD512-B50                                                                          | VBD512-C50       |
|                                                                                     |                 | 63                   | VBD512-B63                                                                          | VBD512-C63       |
|                                                                                     |                 |                      |   |                  |
|  | 3               | 6                    | VBD513-B6                                                                           | VBD513-C6        |
|                                                                                     |                 | 10                   | VBD513-B10                                                                          | VBD513-C10       |
|                                                                                     |                 | 16                   | VBD513-B16                                                                          | VBD513-C16       |
|                                                                                     |                 | 20                   | VBD513-B20                                                                          | VBD513-C20       |
|                                                                                     |                 | 25                   | VBD513-B25                                                                          | VBD513-C25       |
|                                                                                     |                 | 32                   | VBD513-B32                                                                          | VBD513-C32       |
|                                                                                     |                 | 40                   | VBD513-B40                                                                          | VBD513-C40       |
|                                                                                     |                 | 50                   | VBD513-B50                                                                          | VBD513-C50       |
|                                                                                     |                 | 63                   | VBD513-B63                                                                          | VBD513-C63       |
|                                                                                     |                 |                      |  |                  |
|  | 4               | 6                    | VBD514-B6                                                                           | VBD514-C6        |
|                                                                                     |                 | 10                   | VBD514-B10                                                                          | VBD514-C10       |
|                                                                                     |                 | 16                   | VBD514-B16                                                                          | VBD514-C16       |
|                                                                                     |                 | 20                   | VBD514-B20                                                                          | VBD514-C20       |
|                                                                                     |                 | 25                   | VBD514-B25                                                                          | VBD514-C25       |
|                                                                                     |                 | 32                   | VBD514-B32                                                                          | VBD514-C32       |
|                                                                                     |                 | 40                   | VBD514-B40                                                                          | VBD514-C40       |
|                                                                                     |                 | 50                   | VBD514-B50                                                                          | VBD514-C50       |
|                                                                                     |                 | 63                   | VBD514-B63                                                                          | VBD514-C63       |
|                                                                                     |                 |                      |  |                  |