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Innovator  
for 10 years

**Metasol** *Meta Solution*

# MCCB/ELCB

Molded Case Circuit Breakers  
Earth Leakage Circuit Breakers



**LS** *ELECTRIC*

# **Meta***sol* **MCCB/ELCB**

Molded Case Circuit Breakers / Earth Leakage Circuit Breakers





**Metasol** Meta Solution

## **MOLDED CASE CIRCUIT BREAKERS/ EARTH LEAKAGE CIRCUIT BREAKERS**

# Upgraded for the Global Best Worth!

LS will become a global leader in electric power solutions.

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# Metasol

Meta solution



| Metasol<br>ABS 203c |         |
|---------------------|---------|
| 250AF               | 3P      |
| Ue                  |         |
| 690V                |         |
| 480/500V            |         |
| 415/460V            |         |
| 380V                |         |
| 220/240V            |         |
| 500V                |         |
| 250V                |         |
| Ics = 100%Icu       |         |
| 50/60Hz             |         |
| Cat. A              |         |
|                     | Ics/Icu |
|                     | 8kA     |
|                     | 26kA    |
|                     | 37kA    |
|                     | 42kA    |
|                     | 85kA    |
|                     | 20kA    |
|                     | 20kA    |

CE  
IEC60947-2  
MADE IN KOREA

**MCCB = ELCB**

# Metasol

Molded Case Circuit Breaker / Earth Leakage Circuit Breaker

Upgrade of Meta-MEC series

## ... **Metasol** Low Voltage Circuit Breaker

- $U_i = 1000V$
- $U_{imp} = 8kV$



- **Compatible and differentiated design**

- Compatible with the Meta-MEC
- Outlook differentiated design

- **Same external dimension with MCCB and ELCB**

- **Upgrade the coordination**

- Upgrade the coordination with Susol / Meta-MEC mass capacity

- **Upgrade breaking capacity**

- N100AF : 10 ➡ 18kA
- S125AF : 25 ➡ 37kA
- S250AF : 25 ➡ 37kA
- H250AF : 35 ➡ 50kA
- N400AF : 25 ➡ 37kA
- S400AF : 35 ➡ 50kA
- S800AF : 50 ➡ 65kA

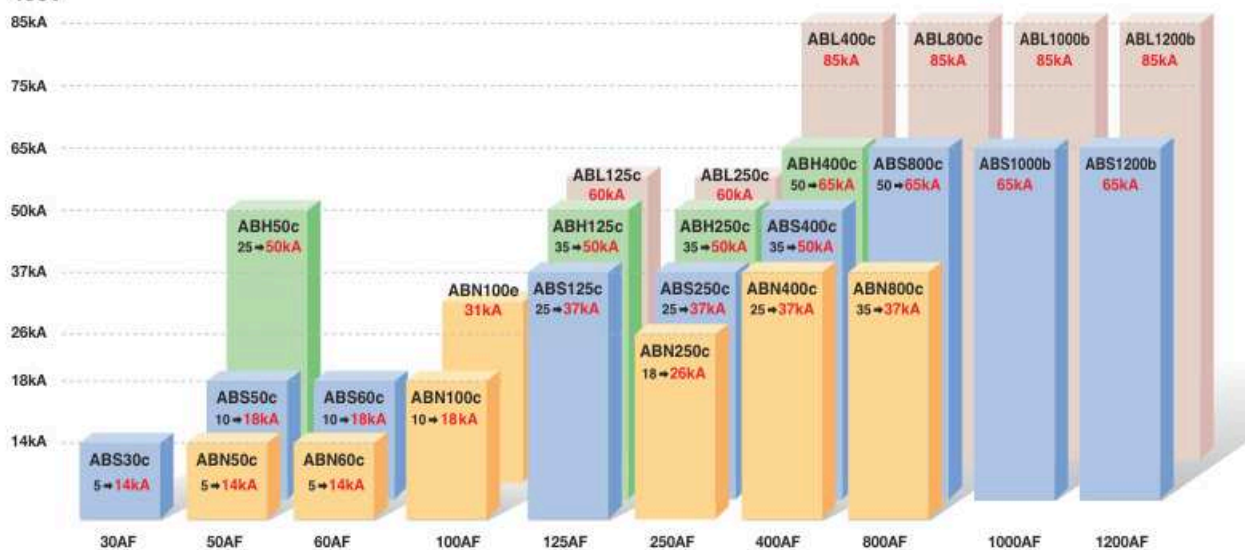
# Metasol MCCB/ELCB



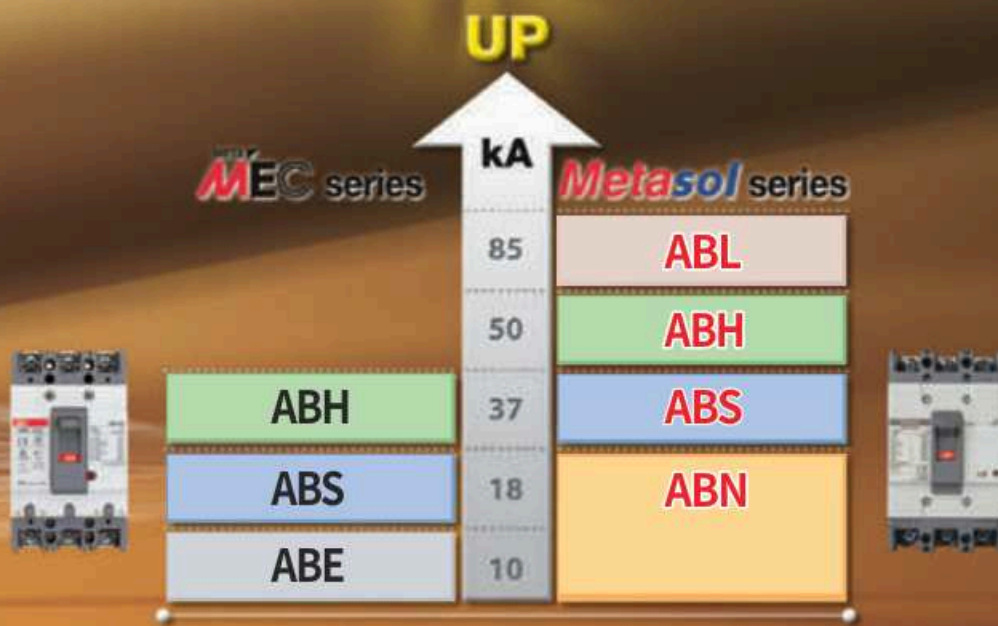
## Metasol MCCB

Upgrade breaking capacity

460V



## Short-circuit breaking capacity

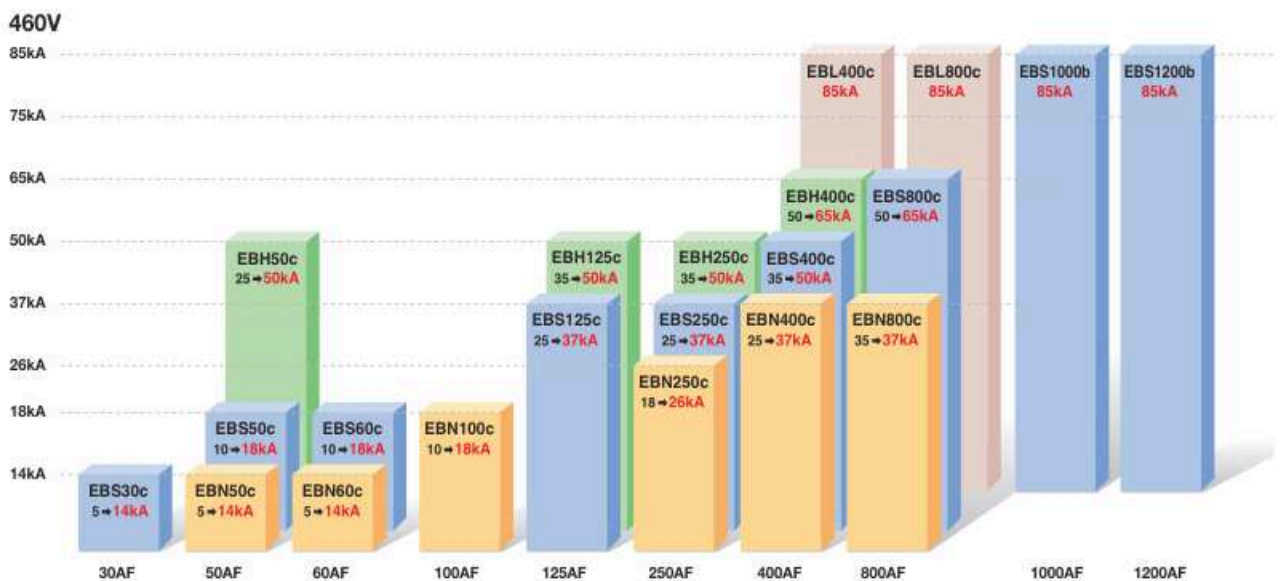


### Upgrade breaking capacity

- N100AF : 10 ➔ **18kA**
- S125AF : 25 ➔ **37kA**
- S250AF : 25 ➔ **37kA**
- H250AF : 35 ➔ **50kA**
- N400AF : 25 ➔ **37kA**
- S400AF : 35 ➔ **50kA**
- S630AF : 50 ➔ **65kA**
- S800AF : 50 ➔ **65kA**

### Metasol ELCB

#### Upgrade breaking capacity



# Metasol MCCB/ELCB Compatible and standard

- 100% compatible with Meta-MEC series.
- Standardized dimension (Depth, cutout) when the panel is made.

## MCCB (Molded Case Circuit Breaker)



105 × 165 × 60mm



90 × 155 × 60mm



75 × 130 × 60mm

### Metasol MCCB

| AF Type | 30AF           | 50AF           | 60AF           | 100AF                                                 | 125AF           | 250AF           | 400AF           | 800AF           | 1000AF           | 1200AF           |
|---------|----------------|----------------|----------------|-------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|
| ABN     |                | ABN50c<br>14kA | ABN60c<br>14kA | ABN100c<br>18kA<br>ABN100d<br>26kA<br>ABN100e<br>31kA |                 | ABN250c<br>26kA | ABN400c<br>37kA | ABN800c<br>37kA |                  |                  |
| ABS     | ABS30c<br>14kA | ABS50c<br>18kA | ABS60c<br>18kA |                                                       | ABS125c<br>37kA | ABS250c<br>37kA | ABS400c<br>50kA | ABS800c<br>65kA | ABS1000b<br>65kA | ABS1200b<br>65kA |
| ABH     |                | ABH50c<br>50kA |                |                                                       | ABH125c<br>50kA | ABH250c<br>50kA | ABH400c<br>65kA |                 |                  |                  |
| ABL     |                |                |                |                                                       | ABL125c<br>60kA | ABL250c<br>60kA | ABL400c<br>85kA | ABL800c<br>85kA | ABL1000b<br>85kA | ABL1200b<br>85kA |

Note) Dimension is for 3 pole and breaking capacity is for AC450V.

- Same external dimension with MCCB and ELCB.

## ELCB (Earth Leakage Circuit Breaker)

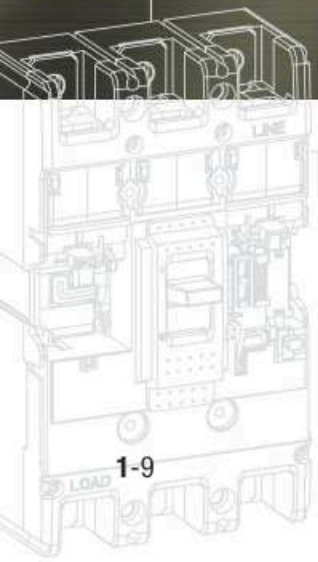


### Metasol ELCB

| AF Type | 30AF           | 50AF           | 60AF           | 100AF           | 125AF           | 250AF           | 400AF           | 800AF           | 1000AF           | 1200AF           |
|---------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|
| EBN     |                | EBN50c<br>14kA | EBN60c<br>14kA | EBN100c<br>18kA |                 | EBN250c<br>26kA | EBN400c<br>37kA | EBN800c<br>37kA |                  |                  |
| EBS     | EBS30c<br>14kA | EBS50c<br>18kA | EBS60c<br>18kA |                 | EBS125c<br>37kA | EBS250c<br>37kA | EBS400c<br>50kA | EBS800c<br>65kA | EBS1000b<br>85kA | EBS1200b<br>85kA |
| EBH     |                | EBH50c<br>50kA |                |                 | EBH125c<br>50kA | EBH250c<br>50kA | EBH400c<br>65kA |                 |                  |                  |
| EBL     |                |                |                |                 |                 |                 | EBL400c<br>85kA | EBL800c<br>85kA |                  |                  |

Note) Dimension is for 3 pole and breaking capacity is for AC460V.

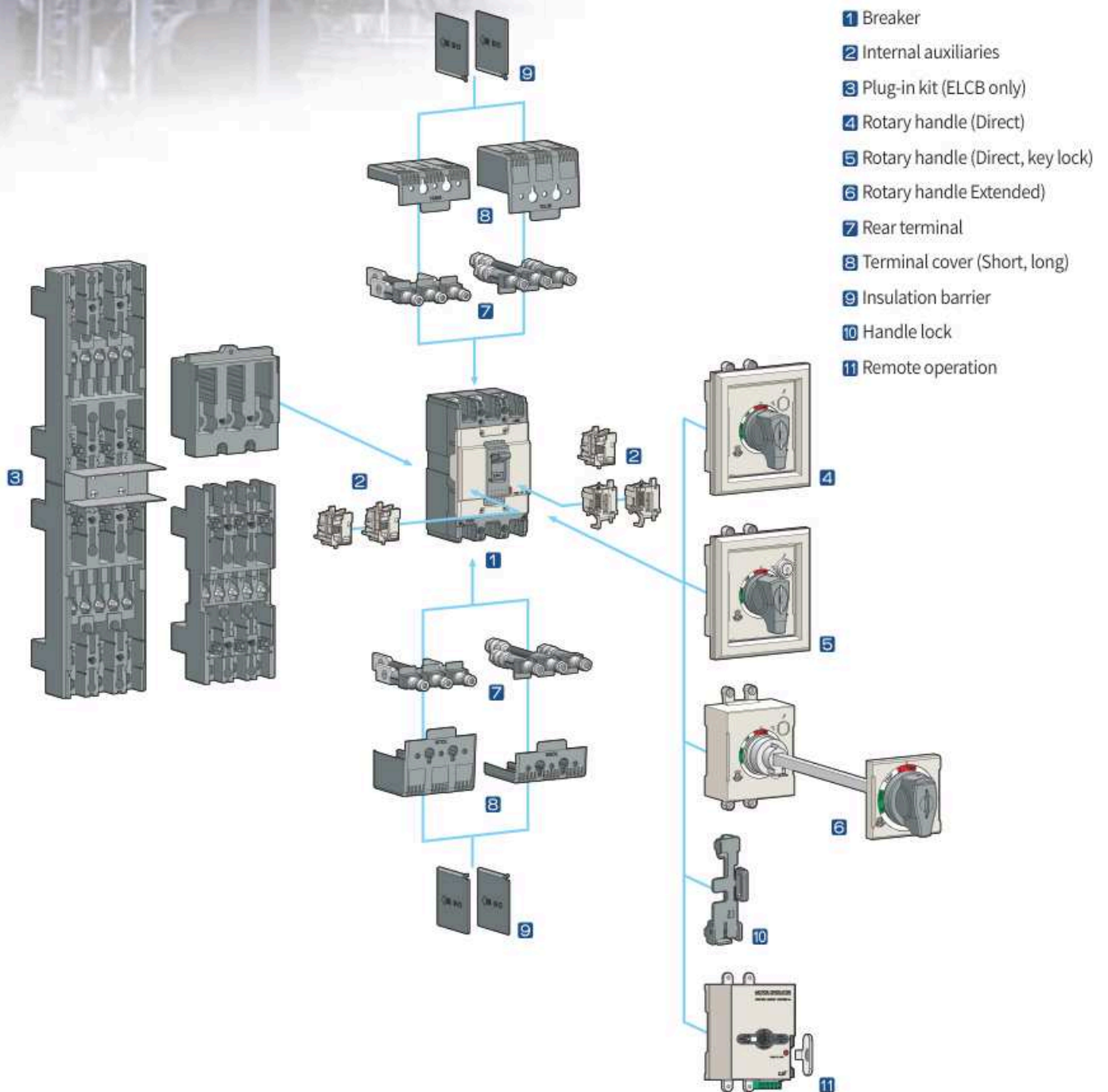
# Metasol MCCB/ELCB System overview



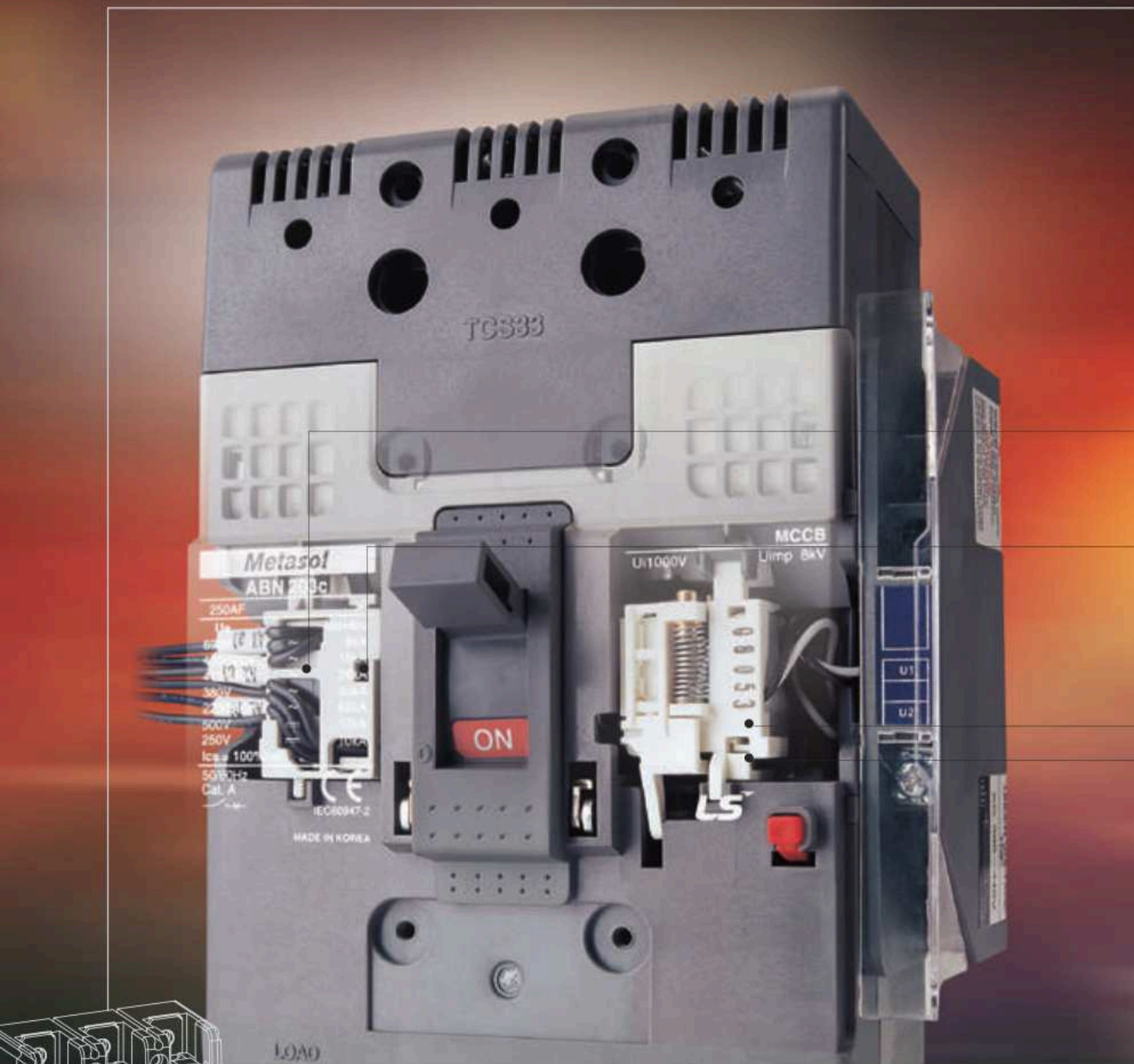
## ■ Various installable accessories

- Wider range of installable accessories compared to Meta MEC series.
- Composed of user friendly method.

# System overview

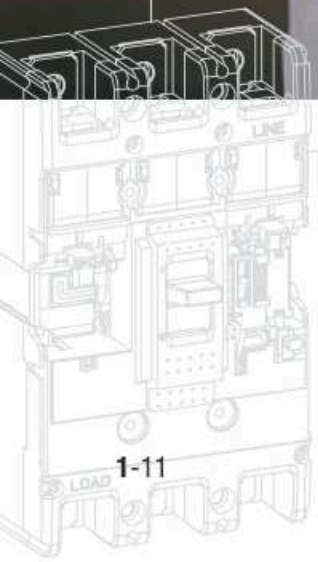


# Metasol MCCB/ELCB Internal accessories



## ■ Internal accessories

Internal accessories can be commonly used in all Metasol MCCB and ELCB  
(Notice: Exception of SHT, UVT in ELCB)





## Internal accessories

### Common use to all Metasol MCCBs and ELCBs



#### Alarm switch (AL)

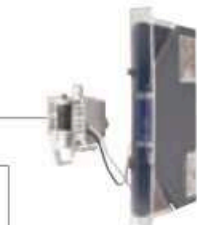
Alarm switches offer provisions for immediate audio or visual indication of a tripped breaker due to overload, short-circuit, operation of shunt trip, or undervoltage trip conditions, operation of push button.

They are particularly useful in automated plants where operators must be signaled about changes in the electrical distribution system. This switch features a closed contact when the circuit breaker is tripped automatically. In other words, this switch does not function when the breaker is operated manually. Its contact is open when the circuit breaker is reset.



#### Auxiliary switch (AX)

Auxiliary switch is for applications requiring remote "On" and "Off" indication. Each switch contains two contacts having a common connection. One is open and the other closed when the circuit breaker is open, and vice-versa.



#### Undervoltage trip (UVT)

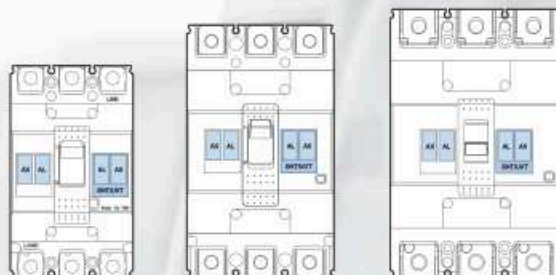
The undervoltage trip automatically opens a circuit breaker when voltage drops to a value ranging between 35% to 70% of the line voltage. The operation is instantaneous, and the circuit breaker cannot be reclosed until the voltage returns to 85% of line voltage.

Continuously energized, the undervoltage trip must be operating before the circuit breaker can be closed.

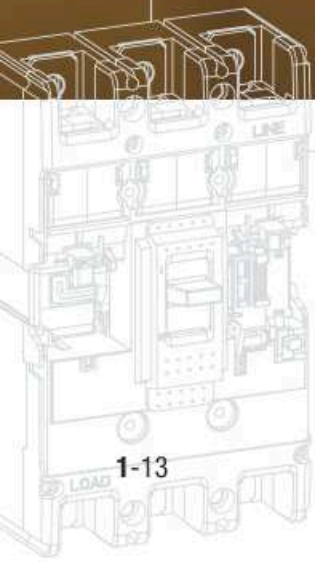


#### Shunt trip (SHT)

The shunt trip opens the mechanism in response to an externally applied voltage signal. LS shunt trips include coil clearing contacts that automatically clear the signal circuit when the mechanism has tripped. contact with live parts and thereby guarantee protection against direct contacts.



# *Metasol MCCB/ELCB* External accessories



## ■ External accessories

Designed for various mount and user safety.

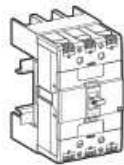
## External accessories



### Front and rear connection

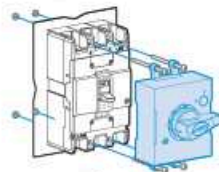
Several kinds of terminals can be equipped with ELCBs as well as MCCBs.

- Terminals for front connection
- Rear connection terminals



### Plug-in base

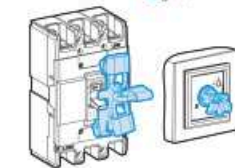
It makes to extract and/or rapidly replace the circuit breaker without having to touch connections. (Easy replacement and maintenance)



### Direct & extended rotary handle

There are two types of rotary handles.

- Direct rotary handle (with or w/o key lock device)
- Extended rotary handle



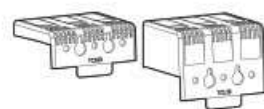
### Locking device

- Fixed padlock
- Removable padlock
- Key lock device on direct handle



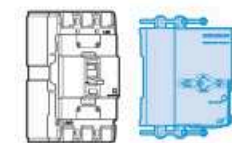
### Insulation barrier

These allow the insulation characteristics between the phases at the connections to be increased.



### Insulation terminal cover

The terminal covers are applied to the circuit-breaker to prevent accidental contact with live parts and thereby guarantee protection against direct contacts.



### Remote operation

It is a device that makes it possible to turn On / Off the breaker even in the remote place. It is safe because it does not have to operate the handle of the circuit breaker by hand, and it is suitable for automation.

## Marking and configuration

## MCCB

### MCCB model

- ABN: Economic type
- ABS: Standard type
- ABH: High capacity type

### Standardized characteristics

$U_i$ : Rated insulation voltage  
 $U_{imp}$ : Impulse withstand voltage  
 $U_e$ : Rated operational voltage  
 $I_{cu}$ : Ultimate breaking capacity  
 $I_{cs}$ : Service breaking capacity



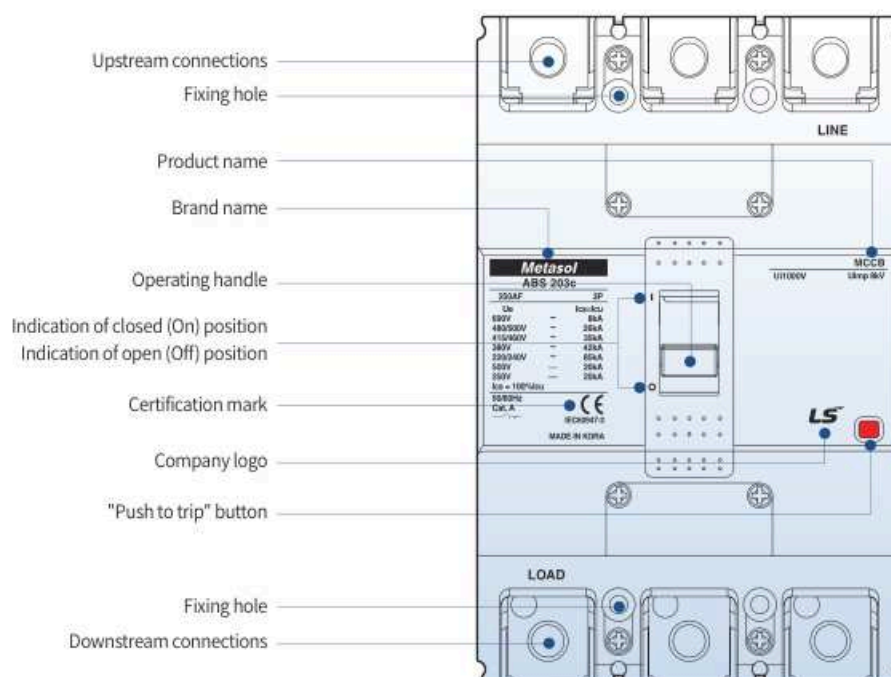
Rated frequency

Utilization category

Standard

Symbol indicating suitability for isolation as defined by IEC 947-2

## MCCB



ELCB



- ELCB model**
- EBN: Economic type
  - EBS: Standard type
  - EBH: High capacity type

1

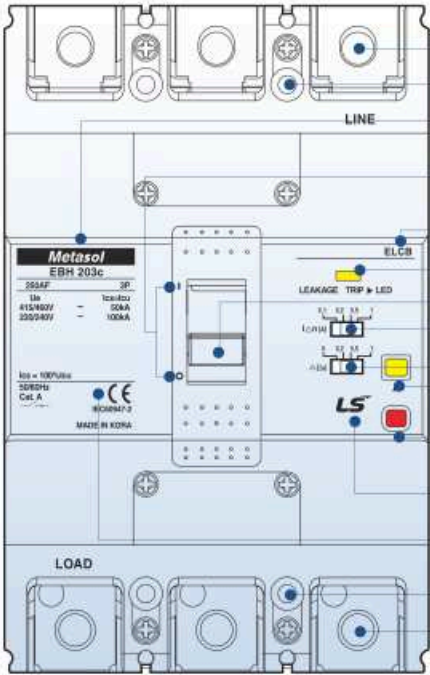
Rated frequency

Utilization category

Standard

Symbol indicating suitability for isolation as defined by IEC 947-2

ELCB



- Upstream connections
- Fixing hole
- Brand name
- Indication of closed (On) position
- Indication of open (Off) position
- Product name
- Trip indication by earth fault
- Operating handle
- Residual current (IΔn) setting
- Non-operating current setting
- "Push to trip" button for earth fault
- "Push to trip" button for overcurrent trip
- Company logo
- Certification mark
- Fixing hole
- Downstream connections

# Internal structure

## MCCB

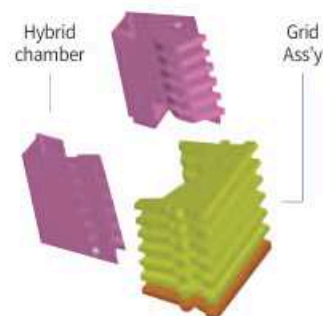
### ① Handle

- Function of indications
  - "On" "Off" "Trip"
- Resetting
 

When the handle indicates "Tripped" position it must first be reset by moving the handle to the "Off" position and then closing is possible
- Trip-free even if the handle is held at "On", the Breaker will trip if an over current flows
- Suitable for verification of the main contact position under abnormal conditions because the handle doesn't indicate open position

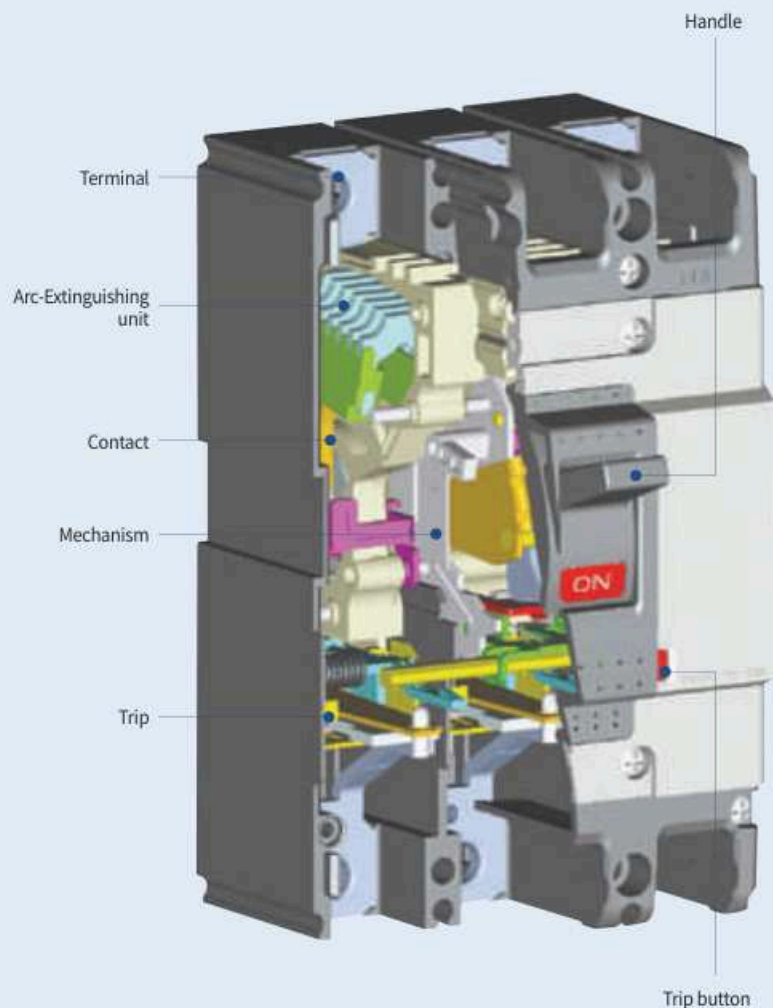
### ② Arc-Extinguishing unit

- LS patent technique PASQ
- Arc-extinguishing unit
- PASQ : Puffer assisted self-quenching
- Reduction of arc voltage for a short time

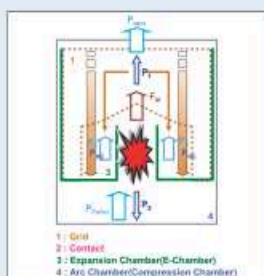


### ③ Trip button (Push to trip)

- Enables tripping mechanically from outside, for confirming the operation of the accessory switches and the manual resetting function.



## A application of PASQ arc extinguishing



- The reduction of breaking time by applying PASQ arc extinguishing for inhibition of arc voltage for a short time.

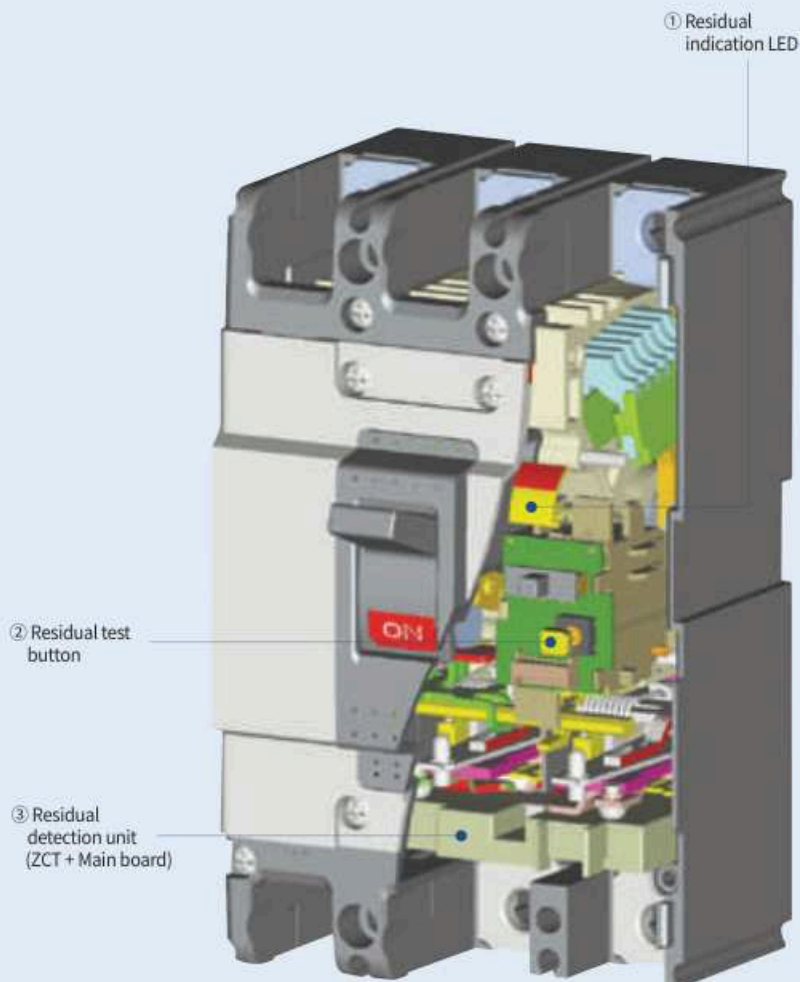
## A application of current limiting structure

- Current limiting repulsion structure (U fixed structure)
- Toggle structure
  - When the operating unit repulses by short circuit current, repulsion structure at bigger angle.



## ELCB

1



## ① Residual indication LED

- Normal situation is yellow, trip situation is red

## ② Residual test button

- Special design for upgrade to prohibit resistance accident

## ③ Residual detection unit (ZCT + Main board)

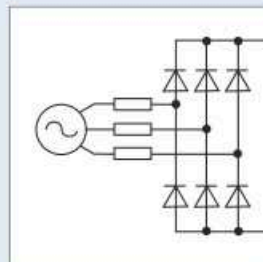
- For upgrade the design is selected the 3 phase input power method and in case of voltage problem, it can break residual current safely.

## Upgrade coil operation by special design



- Sliding structure application of trip lever
- Trip special design by applying design button method.
- Upgrade the testing unit

## 3 phase power supply method



- In case of 1 phase loss residual operation upgrade
- New IEC standard

# Quick selection table

## Molded Case Circuit Breakers

### MCCBs



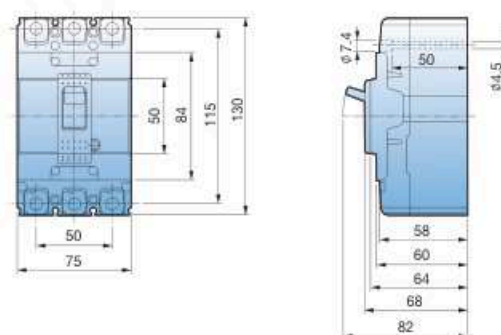
| AF                                                                 |           | 30AF                                      |           | 50AF               |        |           | 60AF                   |        |  |
|--------------------------------------------------------------------|-----------|-------------------------------------------|-----------|--------------------|--------|-----------|------------------------|--------|--|
| Type                                                               |           | E-type                                    | S-type    | N-type             | S-type | H-type    | N-type                 | S-type |  |
| Type and pole                                                      | 2-pole    | ABE32b                                    | ABS32c    | ABN52c             | ABS52c | ABH52c    | ABN62c                 | ABS62c |  |
|                                                                    | 3-pole    | ABE33b                                    | ABS33c    | ABN53c             | ABS53c | ABH53c    | ABN63c                 | ABS63c |  |
|                                                                    | 4-pole    | -                                         | ABS34c    | ABN54c             | ABS54c | ABH54c    | ABN64c                 | ABS64c |  |
| Rated current, In                                                  | A         | (3, 5, 10) <sup>Note 1</sup> , 15, 20, 30 |           | 15, 20, 30, 40, 50 |        |           | 15, 20, 30, 40, 50, 60 |        |  |
| Rated operational voltage, Ue                                      | AC (V)    | 460                                       | 690       | 690                | 690    | 690       | 690                    | 690    |  |
|                                                                    | DC (V)    | -                                         | 500       | 500                | 500    | 500       | 500                    | 500    |  |
| Rated insulation voltage, Ui                                       | V         | 460                                       | 1000      | 1000               | 1000   | 1000      | 1000                   | 1000   |  |
| Rated impulse withstand voltage, Uimp                              | kV        | 6                                         | 8         | 8                  | 8      | 8         | 8                      | 8      |  |
| Rated short-circuit breaking capacity (Icu) kA (Sym) , IEC 60947-2 |           |                                           |           |                    |        |           |                        |        |  |
| AC                                                                 | 690V      | -                                         | 2.5       | 2.5                | 5      | 10        | 2.5                    | 5      |  |
|                                                                    | 480/500V  | -                                         | 7.5 (5)   | 7.5                | 10     | 35        | 7.5                    | 10     |  |
|                                                                    | 415/460V  | 2.5                                       | 14 (10)   | 14                 | 18     | 50        | 14                     | 18     |  |
|                                                                    | 380V      | 2.5                                       | 18 (14)   | 18                 | 22     | 50        | 18                     | 22     |  |
|                                                                    | 220/250V  | 5                                         | 30 (25)   | 30                 | 35     | 100       | 30                     | 35     |  |
| DC                                                                 | 500V (3P) | -                                         | 5         | 5                  | 10     | 30        | 5                      | 10     |  |
|                                                                    | 250V (2P) | -                                         | 5         | 5                  | 10     | 30        | 5                      | 10     |  |
| Ics=% × Icu                                                        |           | 50                                        | 100       | 100                | 100    | 100       | 100                    | 100    |  |
| Dimensions (mm)                                                    | W×H×D     | 75×96×60                                  | 75×130×60 | 75×130×60          |        | 90×155×60 | 75×130×60              |        |  |
|                                                                    | (3-pole)  |                                           | (Fig. 1)  | (Fig. 1)           |        | (Fig. 2)  | (Fig. 1)               |        |  |

\* For more detail see the page. Ratings 5-1page – 5-14page, Curves 8-1page – 8-3page, and Drawings 9-1page – 9-4page

Note) 1. The short-circuit breaking capacities of ABS30AF type in ( ) are applied to the rated current in (3, 5, 10A)  
2. MCCBs can be applied to both 50 and 60Hz.

3. Standard type is designed on the basis of 40°C of ambient temperature.  
4. There are certain products for hot areas. (30–250AF on the basis of 55°C)  
5. The Ics(service breaking capacity) of ABN100e, ABL125/250AF are in ( )

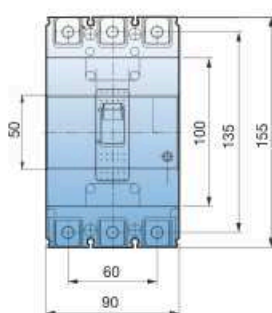
| AF Type | 30AF           | 50AF           | 60AF           | 100AF                              | 125AF           | 250AF           |
|---------|----------------|----------------|----------------|------------------------------------|-----------------|-----------------|
| ABN     |                | ABN50c<br>14kA | ABN60c<br>14kA | ABN100c<br>18kA<br>ABN100e<br>31kA |                 | ABN250c<br>26kA |
| ABS     | ABS30c<br>14kA | ABS50c<br>18kA | ABS60c<br>18kA |                                    | ABS125c<br>37kA | ABS250c<br>37kA |
| ABH     |                | ABH50c<br>50kA |                |                                    | ABH125c<br>50kA | ABH250c<br>50kA |
| ABL     |                |                |                |                                    | ABL125c<br>60kA | ABL250c<br>60kA |



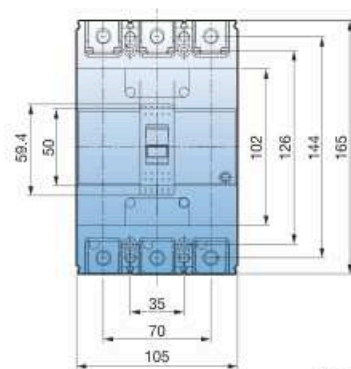
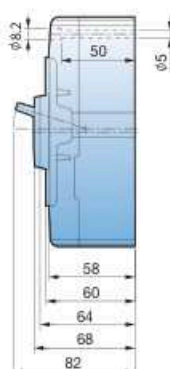
(Fig. 1)



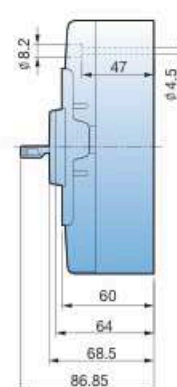
| 100AF                           |         | 125AF                                |         |           | 250AF                             |         |         |           |
|---------------------------------|---------|--------------------------------------|---------|-----------|-----------------------------------|---------|---------|-----------|
| N-type                          |         | S-type                               | H-type  | L-type    | N-type                            | S-type  | H-type  | L-type    |
| ABN102c                         | ABN102e | ABS102c                              | ABH102c | ABL102c   | ABN202c                           | ABS202c | ABH202c | ABL202c   |
| ABN103c                         | ABN103e | ABS103c                              | ABH103c | ABL103c   | ABN203c                           | ABS203c | ABH203c | ABL203c   |
| ABN104c                         | ABN104e | ABS104c                              | ABH104c | ABL104c   | ABN204c                           | ABS204c | ABH204c | ABL204c   |
| 15, 20, 30, 40, 50, 60, 75, 100 |         | 15, 20, 30, 40, 50, 60, 75, 100, 125 |         |           | 100, 125, 150, 175, 200, 225, 250 |         |         |           |
| 690                             | 690     | 690                                  | 690     | 690       | 690                               | 690     | 690     | 690       |
| 500                             | 500     | 500                                  | 500     | 500       | 500                               | 500     | 500     | 500       |
| 1000                            | 1000    | 1000                                 | 1000    | 1000      | 1000                              | 1000    | 1000    | 1000      |
| 8                               | 8       | 8                                    | 8       | 8         | 8                                 | 8       | 8       | 8         |
| 5                               | 7.5 (5) | 8                                    | 10      | 10 (10)   | 8                                 | 8       | 10      | 10 (10)   |
| 10                              | 14 (10) | 26                                   | 35      | 35 (35)   | 18                                | 26      | 35      | 35 (35)   |
| 18                              | 31 (18) | 37                                   | 50      | 60 (50)   | 26                                | 37      | 50      | 60 (50)   |
| 22                              | 31 (22) | 42                                   | 50      | 60 (50)   | 30                                | 42      | 50      | 60 (50)   |
| 35                              | 65 (35) | 85                                   | 100     | 125 (100) | 65                                | 85      | 100     | 125 (100) |
| 10                              | 15 (10) | 20                                   | 30      | 30 (30)   | 10                                | 20      | 30      | 30 (30)   |
| 10                              | 15 (10) | 20                                   | 30      | 30 (30)   | 10                                | 20      | 30      | 30 (30)   |
| 100                             | ( )     | 100                                  | 100     | ( )       | 100                               | 100     | 100     | ( )       |
| 75×130×60<br>(Fig. 1)           |         | 90×155×60<br>(Fig. 2)                |         |           | 105×165×60<br>(Fig. 3)            |         |         |           |



(Fig. 2)



(Fig. 3)



# Quick selection table

## Molded Case Circuit Breakers



### MCCBs

| AF                                                                 |           | 400AF              |         |         |         |
|--------------------------------------------------------------------|-----------|--------------------|---------|---------|---------|
| Type                                                               |           | N-type             | S-type  | H-type  | L-type  |
| Type and pole                                                      | 2-pole    | ABN402c            | ABS402c | ABH402c | ABL402c |
|                                                                    | 3-pole    | ABN403c            | ABS403c | ABH403c | ABL403c |
|                                                                    | 4-pole    | ABN404c            | ABS404c | ABH404c | ABL404c |
| Rated current, In                                                  | A         | 250, 300, 350, 400 |         |         |         |
| Rated operational voltage, Ue                                      | AC (V)    | 690                | 690     | 690     | 690     |
|                                                                    | DC (V)    | 500                | 500     | 500     | 500     |
| Rated insulation voltage, Ui                                       | V         | 1000               | 1000    | 1000    | 1000    |
| Rated impulse withstand voltage, Uimp                              | kV        | 8                  | 8       | 8       | 8       |
| Rated short-circuit breaking capacity (Icu) kA (Sym) , IEC 60947-2 |           |                    |         |         |         |
| AC                                                                 | 690V      | 5                  | 8       | 10      | 14      |
|                                                                    | 480/500V  | 18                 | 35      | 50      | 65      |
|                                                                    | 415/460V  | 37                 | 50      | 65      | 85      |
|                                                                    | 380V      | 42                 | 65      | 70      | 100     |
|                                                                    | 220/250V  | 50                 | 75      | 85      | 125     |
| DC                                                                 | 500V (3P) | 10                 | 20      | 40      | 40      |
|                                                                    | 250V (2P) | 10                 | 20      | 40      | 40      |
| Ics=% × Icu                                                        |           | 100                | 100     | 100     | 75      |
| Dimensions (mm)                                                    | W×H×D     | 140×257×109        |         |         |         |
|                                                                    | (3-pole)  | (Fig. 4)           |         |         |         |

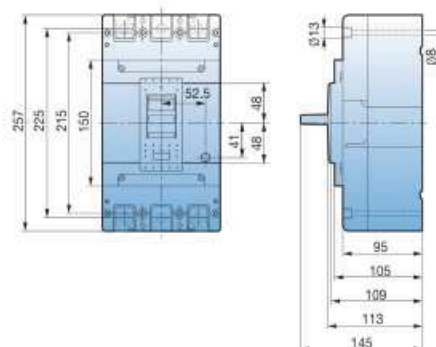
\* For more detail see the page, Ratings 5-15page - 5-22page, Curves 8-4page - 8-5page, and Drawings 9-5page - 9-8page

Note) 1. MCCBs can be applied to both 50 and 60Hz.

2. Standard type is designed on the basis of 40°C of ambient temperature.

3. There are certain products for hot areas. (400-800AF on the basis of 50°C)

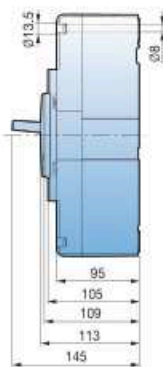
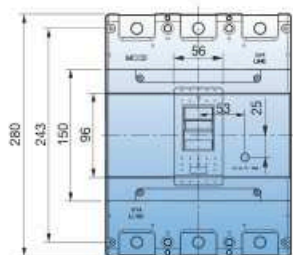
| AF   | 400AF           | 800AF           | 1000AF           | 1200AF           |
|------|-----------------|-----------------|------------------|------------------|
| Type |                 |                 |                  |                  |
| ABN  | ABN400c<br>37kA | ABN800c<br>37kA |                  |                  |
| ABS  | ABS400c<br>50kA | ABS800c<br>65kA | ABS1000b<br>85kA | ABS1200b<br>85kA |
| ABH  | ABH400c<br>65kA |                 |                  |                  |
| ABL  | ABL400c<br>85kA | ABL800c<br>85kA | ABL1000b<br>85kA | ABL1200b<br>85kA |



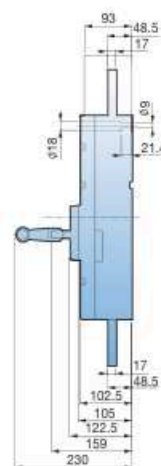
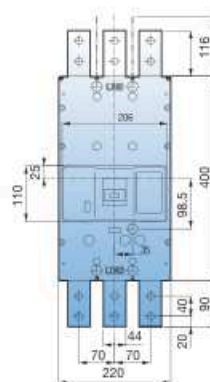
(Fig. 4)



| 800AF                   |         |         | 1000AF                  |          | 1200AF                  |           |          |
|-------------------------|---------|---------|-------------------------|----------|-------------------------|-----------|----------|
| N-type                  | S-type  | L-type  | S-type                  | L-type   | S-type                  |           | L-type   |
| ABN802c                 | ABS802c | ABL802c | -                       | -        | -                       | -         | -        |
| ABN803c                 | ABS803c | ABL803c | ABS1003b                | ABL1003b | ABS1203b                | ABS1203bE | ABL1203b |
| ABN804c                 | ABS804c | ABL804c | ABS1004b                | ABL1004b | ABS1204b                | -         | ABL1204b |
| 500, 630, 700, 800      |         |         | 1000                    |          | 1200                    |           |          |
| 690                     | 690     | 690     | 600                     | 600      | 600                     | 600       | 600      |
| 500                     | 500     | 500     | -                       | -        | -                       | -         | -        |
| 1000                    | 1000    | 1000    | 690                     | 690      | 690                     | 690       | 690      |
| 8                       | 8       | 8       | 6                       | 6        | 6                       | 6         | 6        |
| 8                       | 10      | 14      | -                       | -        | -                       | -         | -        |
| 25                      | 45      | 65      | 50                      | 75       | 50                      | 50        | 75       |
| 37                      | 65      | 85      | 65                      | 85       | 65                      | 65        | 85       |
| 45                      | 75      | 100     | 65                      | 85       | 65                      | 65        | 85       |
| 50                      | 85      | 125     | 100                     | 125      | 100                     | 100       | 125      |
| 10                      | 20      | 40      | -                       | -        | -                       | -         | -        |
| 10                      | 20      | 40      | -                       | -        | -                       | -         | -        |
| 100                     | 100     | 75      | 50                      | 50       | 50                      | 50        | 50       |
| 210×280×109<br>(Fig. 5) |         |         | 220×400×105<br>(Fig. 6) |          | 220×400×105<br>(Fig. 6) |           |          |



(Fig. 5)



(Fig. 6)

# Quick selection table

## Motor protection Molded Case Circuit Breakers

### MCCBs



| AF                                                                 |                       | 30AF                      | 50AF                      |         |                           | 60AF                      |         |
|--------------------------------------------------------------------|-----------------------|---------------------------|---------------------------|---------|---------------------------|---------------------------|---------|
| Type                                                               |                       | S-type                    | N-type                    | S-type  | H-type                    | N-type                    | S-type  |
| Type and pole                                                      | 3-pole                | ABS33cM                   | ABN53cM                   | ABS53cM | ABH53cM                   | ABN63cM                   | ABS63cM |
| Rated current, In                                                  | A                     | 16, 24                    | 16, 24, 32, 45            |         |                           | 60                        |         |
| Rated operational voltage, Ue                                      | AC (V)                | 690                       | 690                       | 690     | 690                       | 690                       | 690     |
|                                                                    | DC (V)                | 500                       | 500                       | 500     | 500                       | 500                       | 500     |
| Rated insulation voltage, Ui                                       | V                     | 1000                      | 1000                      | 1000    | 1000                      | 1000                      | 1000    |
| Rated impulse withstand voltage, Uimp                              | kV                    | 8                         | 8                         | 8       | 8                         | 8                         | 8       |
| Rated short-circuit breaking capacity (Icu) kA (Sym) , IEC 60947-2 |                       |                           |                           |         |                           |                           |         |
| AC                                                                 | 690V                  | 2.5                       | 2.5                       | 5       | 10                        | 2.5                       | 5       |
|                                                                    | 480/500V              | 7.5                       | 7.5                       | 10      | 35                        | 7.5                       | 10      |
|                                                                    | 415/460V              | 14                        | 14                        | 18      | 50                        | 14                        | 18      |
|                                                                    | 380V                  | 18                        | 18                        | 22      | 50                        | 18                        | 22      |
|                                                                    | 220/250V              | 30                        | 30                        | 35      | 100                       | 30                        | 35      |
| DC                                                                 | 500V (3P)             | 5                         | 5                         | 10      | 30                        | 5                         | 10      |
| Ics=% × Icu                                                        |                       | 100                       | 100                       | 100     | 100                       | 100                       | 100     |
| Dimensions (mm)                                                    | W × H × D<br>(3-pole) | 75 × 130 × 60<br>(Fig. 1) | 75 × 130 × 60<br>(Fig. 1) |         | 90 × 155 × 60<br>(Fig. 2) | 75 × 130 × 60<br>(Fig. 1) |         |

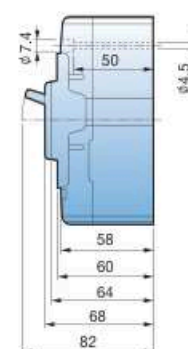
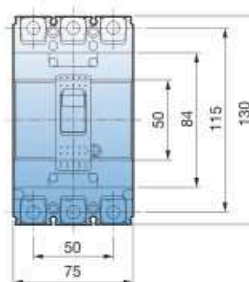
\* For more detail see the page. Ratings 5-3page ~ 5-14page, Curves 8-7page ~ 8-8page, and Drawings 9-2page ~ 9-4page

Note) 1. Same electrical and physical specification with MCCB.

2. Accessory: same application with MCCB

3. MCCBs can be applied to both 50 and 60Hz.

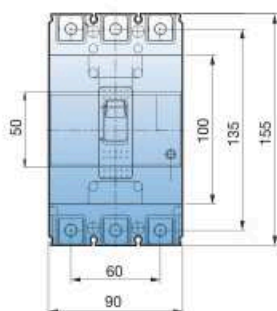
| AF Type | 30AF            | 50AF            | 60AF            | 100AF            | 125AF            | 250AF            |
|---------|-----------------|-----------------|-----------------|------------------|------------------|------------------|
| ABN     |                 | ABN50cM<br>14kA | ABN60cM<br>14kA | ABN100cM<br>18kA |                  |                  |
| ABS     | ABS30cM<br>14kA | ABS50cM<br>18kA | ABS60cM<br>18kA |                  | ABS125cM<br>37kA | ABS250cM<br>37kA |
| ABH     |                 | ABH50cM<br>50kA |                 |                  | ABH125cM<br>50kA | ABH250cM<br>50kA |



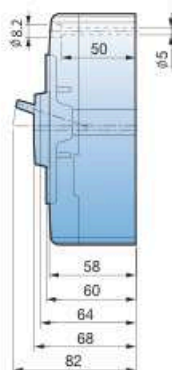
(Fig. 1)



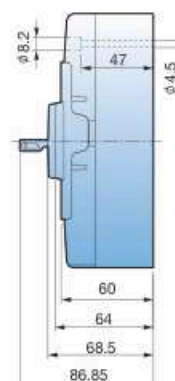
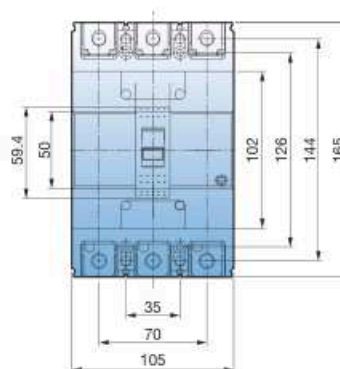
| 100AF                 |  | 125AF                 |          | 250AF                  |          |          |
|-----------------------|--|-----------------------|----------|------------------------|----------|----------|
| N-type                |  | S-type                | H-type   | N-type                 | S-type   | H-type   |
| ABN103cM              |  | ABS103cM              | ABH103cM | ABN203cM               | ABS203cM | ABH203cM |
| 60, 75, 90            |  | 60, 75, 90            |          | 125, 150, 175, 225     |          |          |
| 690                   |  | 690                   | 690      | 690                    | 690      | 690      |
| 500                   |  | 500                   | 500      | 500                    | 500      | 500      |
| 1000                  |  | 1000                  | 1000     | 1000                   | 1000     | 1000     |
| 8                     |  | 8                     | 8        | 8                      | 8        | 8        |
| 5                     |  | 8                     | 10       | 8                      | 8        | 10       |
| 10                    |  | 26                    | 35       | 18                     | 26       | 35       |
| 18                    |  | 37                    | 50       | 26                     | 37       | 50       |
| 22                    |  | 42                    | 50       | 30                     | 42       | 50       |
| 35                    |  | 85                    | 100      | 65                     | 85       | 100      |
| 10                    |  | 20                    | 30       | 10                     | 20       | 30       |
| 100                   |  | 100                   | 100      | 100                    | 100      | 100      |
| 75×130×60<br>(Fig. 1) |  | 90×155×60<br>(Fig. 2) |          | 105×165×60<br>(Fig. 3) |          |          |



(Fig. 2)



(Fig. 3)



# Quick selection table

## ZCT Molded Case Circuit Breakers

### MCCBs

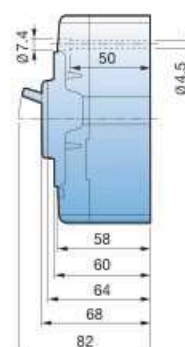
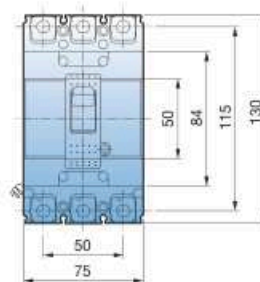


| AF                                                                 |          | 30AF       | 50AF               |         |         | 60AF                   |         |
|--------------------------------------------------------------------|----------|------------|--------------------|---------|---------|------------------------|---------|
| Type                                                               |          | S-type     | N-type             | S-type  | H-type  | N-type                 | S-type  |
| Type and pole                                                      | 2-pole   | -          | -                  | -       | ABH52cZ | -                      | -       |
|                                                                    | 3-pole   | ABS33cZ    | ABN53cZ            | ABS53cZ | ABH53cZ | ABN63cZ                | ABS63cZ |
|                                                                    | 4-pole   | ABS34cZ    | ABN54cZ            | ABS54cZ | ABH54cZ | ABN64cZ                | ABS64cZ |
| Rated current, In                                                  | A        | 15, 20, 30 | 15, 20, 30, 40, 50 |         |         | 15, 20, 30, 40, 50, 60 |         |
| Rated operational voltage, Ue                                      | AC (V)   | 690        | 690                | 690     | 690     | 690                    | 690     |
| Rated insulation voltage, Ui                                       | V        | 1000       | 1000               | 1000    | 1000    | 1000                   | 1000    |
| Rated impulse withstand voltage, Uimp                              | kV       | 8          | 8                  | 8       | 8       | 8                      | 8       |
| Rated short-circuit breaking capacity (Icu) kA (Sym) , IEC 60947-2 |          |            |                    |         |         |                        |         |
| AC                                                                 | 690V     | 2.5        | 2.5                | 5       | 10      | 2.5                    | 5       |
|                                                                    | 480/500V | 7.5        | 7.5                | 10      | 35      | 7.5                    | 10      |
|                                                                    | 415/460V | 14         | 14                 | 18      | 50      | 14                     | 18      |
|                                                                    | 380V     | 18         | 18                 | 22      | 50      | 18                     | 22      |
|                                                                    | 220/250V | 30         | 30                 | 35      | 100     | 30                     | 35      |
| Ics=% × Icu                                                        |          | 100        | 100                | 100     | 100     | 100                    | 100     |
| Dimensions (mm)                                                    | W×H×D    | 75×130×60  | 75×130×60          |         |         | 75×130×60              |         |
|                                                                    | (3-pole) | (Fig. 1)   | (Fig. 1)           |         |         | (Fig. 1)               |         |

\* For more detail see the page. Ratings 5-3page - 5-14page, Curves 8-1page - 8-3page, and Drawings 9-2page - 9-4page

- Note) 1. Same electrical and physical specification with MCCB.  
2. Accessory: Same application with MCCB.  
3. MCCBs can be applied to both 50 and 60Hz.  
4. Marking ZCT on the Aux. cover right side  
5. Dimension of ABH52c, ABS102c and ABH102, which have a built-in ZCT, is 60 (W) X 155 (H) X 60 (D) mm  
6. 4-pole product's ampacity on neutral conductor is equal to or less than 50% of the rated current.

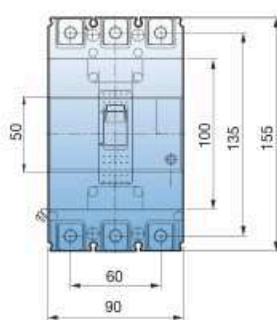
| AF Type | 30AF            | 50AF            | 60AF            | 100AF            | 125AF            | 250AF            |
|---------|-----------------|-----------------|-----------------|------------------|------------------|------------------|
| ABN     |                 | ABN50cZ<br>14kA | ABN60cZ<br>14kA | ABN100cZ<br>18kA |                  | ABN250cZ<br>26kA |
| ABS     | ABS30cZ<br>14kA | ABS50cZ<br>18kA | ABS60cZ<br>18kA |                  | ABS125cZ<br>37kA | ABS250cZ<br>37kA |
| ABH     |                 | ABH50cZ<br>50kA |                 |                  | ABH125cZ<br>50kA | ABH250cZ<br>50kA |



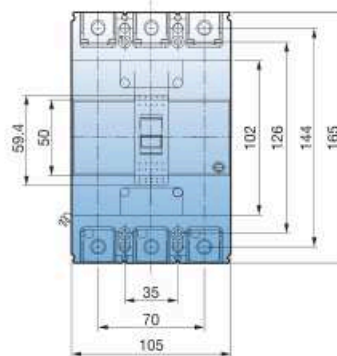
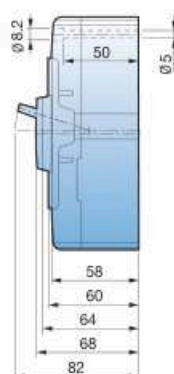
(Fig. 1)



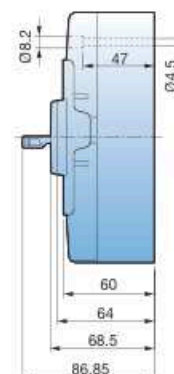
| 100AF                             | 125AF                                |          | 250AF                             |          |          |
|-----------------------------------|--------------------------------------|----------|-----------------------------------|----------|----------|
| N-type                            | S-type                               | H-type   | N-type                            | S-type   | H-type   |
| -                                 | ABS102cZ                             | ABH102cZ | -                                 | -        | -        |
| ABN103cZ                          | ABS103cZ                             | ABH103cZ | ABN203cZ                          | ABS203cZ | ABH203cZ |
| ABN104cZ                          | ABS104cZ                             | ABH104cZ | ABN204cZ                          | ABS204cZ | ABH204cZ |
| 15, 20, 30, 40, 50<br>60, 75, 100 | 15, 20, 30, 40, 50, 60, 75, 100, 125 |          | 100, 125, 150, 175, 200, 225, 250 |          |          |
| 690                               | 690                                  | 690      | 690                               | 690      | 690      |
| 1000                              | 1000                                 | 1000     | 1000                              | 1000     | 1000     |
| 8                                 | 8                                    | 8        | 8                                 | 8        | 8        |
| 5                                 | 8                                    | 10       | 8                                 | 8        | 10       |
| 10                                | 26                                   | 35       | 18                                | 26       | 35       |
| 18                                | 37                                   | 50       | 26                                | 37       | 50       |
| 22                                | 42                                   | 50       | 30                                | 42       | 50       |
| 35                                | 85                                   | 100      | 65                                | 85       | 100      |
| 100                               | 100                                  | 100      | 100                               | 100      | 100      |
| 75×130×60<br>(Fig. 1)             | 90×155×60<br>(Fig. 2)                |          | 105×165×60<br>(Fig. 3)            |          |          |



(Fig. 2)



(Fig. 3)



# Quick selection table

## ZCT Molded Case Circuit Breakers



### MCCBs

| AF                                                                              |          | 400AF              |          |          |          |
|---------------------------------------------------------------------------------|----------|--------------------|----------|----------|----------|
| Type                                                                            |          | N-type             | S-type   | H-type   | L-type   |
| Type and pole                                                                   | 2-pole   | -                  | -        | -        | -        |
|                                                                                 | 3-pole   | ABN403cZ           | ABS403cZ | ABH403cZ | ABL403cZ |
|                                                                                 | 4-pole   | ABN404cZ           | ABS404cZ | ABH404cZ | ABL404cZ |
| Rated current, I <sub>n</sub>                                                   | A        | 250, 300, 350, 400 |          |          |          |
| Rated operational voltage, U <sub>e</sub>                                       | AC (V)   | 690                | 690      | 690      | 690      |
| Rated insulation voltage, U <sub>i</sub>                                        | V        | 1000               | 1000     | 1000     | 1000     |
| Rated impulse withstand voltage, U <sub>imp</sub>                               | kV       | 8                  | 8        | 8        | 8        |
| Rated short-circuit breaking capacity (I <sub>cu</sub> ) kA (Sym) , IEC 60947-2 |          |                    |          |          |          |
| AC                                                                              | 690V     | 5                  | 8        | 10       | 14       |
|                                                                                 | 480/500V | 18                 | 35       | 50       | 65       |
|                                                                                 | 415/460V | 37                 | 50       | 65       | 85       |
|                                                                                 | 380V     | 42                 | 65       | 70       | 100      |
|                                                                                 | 220/250V | 50                 | 75       | 85       | 125      |
| I <sub>cs</sub> =% × I <sub>cu</sub>                                            |          | 100                | 100      | 100      | 75       |
| Dimensions (mm)                                                                 | W×H×D    | 140×257×109        |          |          |          |
|                                                                                 | (3-pole) | (Fig. 4)           |          |          |          |

\* For more detail see the page. Ratings 5-15page – 5-18page, Curves 8-4page and Drawings 9-5page – 9-6page

Note) 1. Same electrical and physical specification with MCCB.

2. Accessory: Same application with MCCB.

3. MCCBs can be applied to both 50 and 60Hz.

4. Marking ZCT on the Aux. cover right side

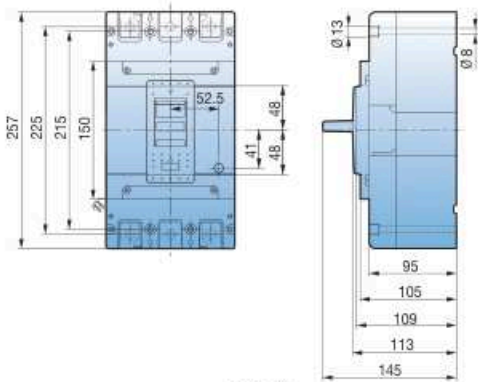
5. 4-pole product's ampacity on neutral conductor is equal to or less than 50% of the rated current.

| Type | AF | 400AF           | 800AF           |
|------|----|-----------------|-----------------|
| ABN  |    | ABN400c<br>37kA | ABN800c<br>37kA |
| ABS  |    | ABS400c<br>50kA | ABS800c<br>65kA |
| ABH  |    | ABH400c<br>65kA |                 |
| ABL  |    | ABL400c<br>85kA | ABL800c<br>85kA |

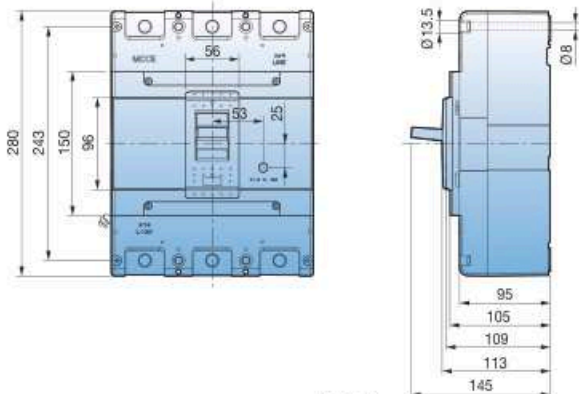


| 800AF              |          |          |
|--------------------|----------|----------|
| N-type             | S-type   | L-type   |
| -                  | -        | -        |
| ABN803cZ           | ABS803cZ | ABL803cZ |
| -                  | -        | -        |
| 500, 630, 700, 800 |          |          |
| 690                | 690      | 690      |
| 1000               | 1000     | 1000     |
| 8                  | 8        | 8        |
|                    |          |          |
| 8                  | 10       | 14       |
| 25                 | 45       | 65       |
| 37                 | 65       | 85       |
| 45                 | 75       | 100      |
| 50                 | 85       | 125      |
| 100                | 100      | 75       |
| 210×280×109        |          |          |
| (Fig. 5)           |          |          |

2



(Fig. 4)



(Fig. 5)

# Quick selection table

## Earth Leakage Circuit Breakers



### ELCBs

| AF                                                                              |                                              |          | 30AF                                     | 50AF                                     |        |           | 60AF                                     |        |  |
|---------------------------------------------------------------------------------|----------------------------------------------|----------|------------------------------------------|------------------------------------------|--------|-----------|------------------------------------------|--------|--|
| Type                                                                            |                                              |          | S-type                                   | N-type                                   | S-type | H-type    | N-type                                   | S-type |  |
| Type and pole                                                                   |                                              | 2-pole   | EBS32c                                   | EBN52c                                   | -      | -         | -                                        | -      |  |
|                                                                                 |                                              | 3-pole   | EBS33c                                   | EBN53c                                   | EBS53c | EBH53c    | EBN63c                                   | EBS63c |  |
|                                                                                 |                                              | 4-pole   | EBS34c                                   | -                                        | EBS54c | EBH54c    | -                                        | EBS64c |  |
| Protective function                                                             |                                              |          | Overload, short-circuit and ground fault | Overload, short-circuit and ground fault |        |           | Overload, short-circuit and ground fault |        |  |
| Rated current, I <sub>n</sub>                                                   |                                              | A        | (5, 10) <sup>Note</sup> 3, 15, 20, 30    | 15, 20, 30, 40, 50                       |        |           | 60                                       |        |  |
| Rated impulse withstand voltage, U <sub>imp</sub>                               |                                              | kV       | 6                                        | 6                                        |        |           | 6                                        |        |  |
| Instantaneous type                                                              | Rated residual current, I <sub>Δn</sub>      | mA       | 30, 100, 100/200/500, 100/300/500        | 30, 100, 100/200/500, 100/300/500        |        |           | 30, 100, 100/200/500, 100/300/500        |        |  |
|                                                                                 | Residual current off-time at I <sub>Δn</sub> | sec      | ≤0.1                                     | ≤0.1                                     |        |           | ≤0.1                                     |        |  |
|                                                                                 | Rated operational voltage, U <sub>e</sub>    | AC (V)   | 220/460                                  | 220/460                                  |        |           | 220/460                                  |        |  |
| Time delay type                                                                 | Rated residual current                       | 1A       | 0.1/0.2/0.5/1                            | 0.1/0.2/0.5/1                            |        |           | 0.1/0.2/0.5/1                            |        |  |
|                                                                                 | Intentional time delay                       | 1s       | 0/0.2/0.5/1                              | 0/0.2/0.5/1                              |        |           | 0/0.2/0.5/1                              |        |  |
|                                                                                 | Rated residual current                       | 2A       | 0.1/0.4/1/2                              | 0.1/0.4/1/2                              |        |           | 0.1/0.4/1/2                              |        |  |
|                                                                                 | Intentional time delay                       | 2s       | 0.5/1/1.5/2                              | 0.5/1/1.5/2                              |        |           | 0.5/1/1.5/2                              |        |  |
| Rated short-circuit breaking capacity (I <sub>cu</sub> ) kA (Sym) , IEC 60947-2 |                                              |          |                                          |                                          |        |           |                                          |        |  |
| AC                                                                              |                                              | 415/460V | 14 (10)                                  | 14                                       | 18     | 50        | 14                                       | 18     |  |
|                                                                                 |                                              | 220/250V | 30 (25)                                  | 30                                       | 35     | 100       | 30                                       | 35     |  |
| I <sub>cs</sub> =%×I <sub>cu</sub>                                              |                                              |          | 100                                      | 100                                      | 100    | 100       | 100                                      | 100    |  |
| Dimensions (mm)                                                                 |                                              | W×H×D    | 75×130×60                                | 75×130×60                                |        | 90×155×60 | 75×130×60                                |        |  |
|                                                                                 |                                              | (3-pole) | (Fig. 1)                                 | (Fig. 1)                                 |        | (Fig. 2)  | (Fig. 1)                                 |        |  |

\* For more detail see the page. Ratings 6-1page - 6-12page, Curves 8-1 - 8-3page and Drawings 9-9page - 9-11page

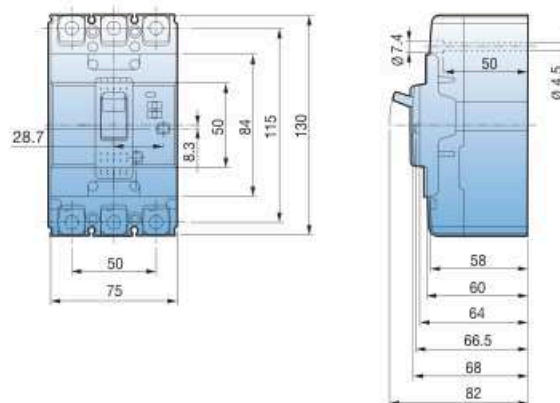
Note) 1. MCCBs can be applied to both 50 and 60Hz.

2. Do not test withstand voltage or insulation resistance test between poles to avoid the damage of the PCB.

3. The short-circuit breaking capacities ( ) are applied to the rated current in (5, 10A)

4. Below 250AF Some ELCBs have a test lead type for remote testing.

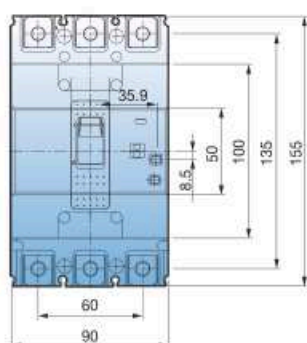
| AF Type | 30AF           | 50AF           | 60AF           | 100AF           | 125AF           | 250AF           |
|---------|----------------|----------------|----------------|-----------------|-----------------|-----------------|
| EBN     |                | EBN50c<br>14kA | EBN60c<br>14kA | EBN100c<br>18kA |                 | EBN250c<br>26kA |
| EBS     | EBS30c<br>14kA | EBS50c<br>18kA | EBS60c<br>18kA |                 | EBS125c<br>37kA | EBS250c<br>37kA |
| EBH     |                | EBH50c<br>50kA |                |                 | EBH125c<br>50kA | EBH250c<br>50kA |



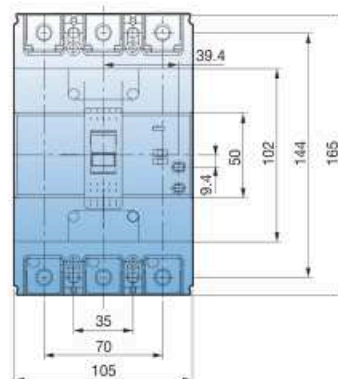
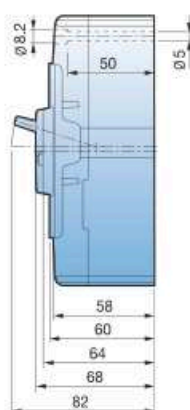
(Fig. 1)



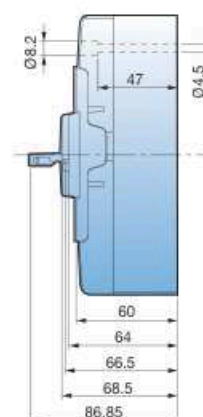
| 100AF                                    | 125AF                                    |         | 250AF                                    |         |         |
|------------------------------------------|------------------------------------------|---------|------------------------------------------|---------|---------|
| N-type                                   | S-type                                   | H-type  | N-type                                   | S-type  | H-type  |
| EBN102c                                  | -                                        | -       | EBN202c                                  | -       | -       |
| EBN103c                                  | EBS103c                                  | EBH103c | EBN203c                                  | EBS203c | EBH203c |
| EBN104c                                  | EBS104c                                  | EBH104c | -                                        | EBS204c | EBH204c |
| Overload, short-circuit and ground fault | Overload, short-circuit and ground fault |         | Overload, short-circuit and ground fault |         |         |
| 60, 75, 100                              | 15, 20, 30, 40, 50, 60, 75, 100, 125     |         | 100, 125, 150, 175, 200, 225, 250        |         |         |
| 6                                        | 6                                        |         | 6                                        |         |         |
| 30, 100, 100/200/500, 100/300/500        | 30, 100, 100/200/500, 100/300/500        |         | 30, 100, 100/200/500, 100/300/500        |         |         |
| ≤0.1                                     | ≤0.1                                     |         | ≤0.1                                     |         |         |
| 220/460                                  | 220/460                                  |         | 220/460                                  |         |         |
| 0.1/0.2/0.5/1                            | 0.1/0.2/0.5/1                            |         | 0.1/0.2/0.5/1                            |         |         |
| 0/0.2/0.5/1                              | 0/0.2/0.5/1                              |         | 0/0.2/0.5/1                              |         |         |
| 0.1/0.4/1/2                              | 0.1/0.4/1/2                              |         | 0.1/0.4/1/2                              |         |         |
| 0.5/1/1.5/2                              | 0.5/1/1.5/2                              |         | 0.5/1/1.5/2                              |         |         |
| 18                                       | 37                                       | 50      | 26                                       | 37      | 50      |
| 35                                       | 85                                       | 100     | 65                                       | 85      | 100     |
| 100                                      | 100                                      | 100     | 100                                      | 100     | 100     |
| 75×130×60<br>(Fig. 1)                    | 90×155×60<br>(Fig. 2)                    |         | 105×165×60<br>(Fig. 3)                   |         |         |



(Fig. 2)



(Fig. 3)



# Quick selection table

## Earth Leakage Circuit Breakers



### ELCBs

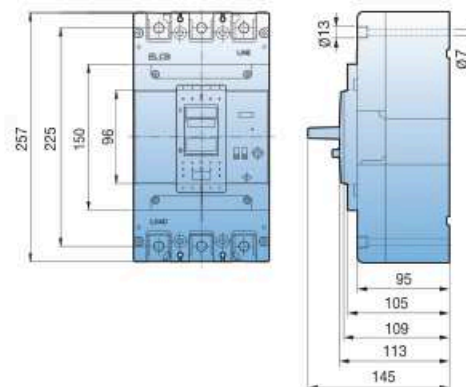
| AF                                                                              |                                              |          | 400AF                                    |         |         |         |         |
|---------------------------------------------------------------------------------|----------------------------------------------|----------|------------------------------------------|---------|---------|---------|---------|
| Type                                                                            |                                              |          | N-type                                   | S-type  | H-type  | L-type  |         |
|                                                                                 |                                              |          | 3-pole                                   | EBN403c | EBS403c | EBH403c | EBL403c |
|                                                                                 |                                              |          | 4-pole                                   | EBN404c | EBS404c | EBH404c | EBL404c |
| Protective function                                                             |                                              |          | Overload, short-circuit and ground fault |         |         |         |         |
| Rated current, I <sub>n</sub>                                                   |                                              | A        | 250, 300, 350, 400                       |         |         |         |         |
| Rated impulse withstand voltage, U <sub>imp</sub>                               |                                              | kV       | 6                                        | 6       | 6       | 6       |         |
| Rated operational voltage, U <sub>e</sub>                                       |                                              | AC (V)   | 220/460                                  | 220/460 | 220/460 | 220/460 |         |
| Instantaneous type                                                              | Rated residual current, I <sub>Δn</sub>      | mA       | 30, 100/200/500                          |         |         |         |         |
|                                                                                 | Residual current off-time at I <sub>Δn</sub> | sec      | ≤0.1                                     | ≤0.1    | ≤0.1    | ≤0.1    |         |
| Time delay type                                                                 | Rated residual current                       | A        | 0.1/0.4/1/2                              |         |         |         |         |
|                                                                                 | Intentional time delay                       | s        | 0.5/1/1.5/2                              |         |         |         |         |
| Rated short-circuit breaking capacity (I <sub>cu</sub> ) kA (Sym) , IEC 60947-2 |                                              |          |                                          |         |         |         |         |
| AC                                                                              | 415/460V                                     |          | 37                                       | 50      | 65      | 85      |         |
|                                                                                 | 220/250V                                     |          | 50                                       | 75      | 85      | 125     |         |
|                                                                                 | I <sub>cs</sub> =%×I <sub>cu</sub>           |          | 100                                      | 100     | 100     | 75      |         |
| Dimensions (mm)                                                                 |                                              | W×H×D    | 140×257×109                              |         |         |         |         |
|                                                                                 |                                              | (3-pole) | (Fig. 4)                                 |         |         |         |         |

\* For more detail see the page. Ratings 6-13page ~ 6-18page, Curves 8-4~ 8-5page and Drawings 9-12page ~ 9-14page

Note) 1. MCCBs other than 1,000/1200AF can be applied to both 50 and 60Hz.

2. Do not test withstand voltage or insulation resistance test between poles to avoid the damage of the PCB.

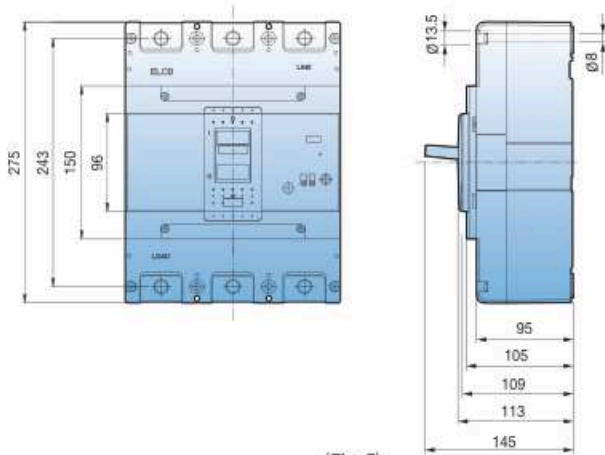
| Type | AF | 400AF           | 800AF           | 1000AF           | 1200AF           |
|------|----|-----------------|-----------------|------------------|------------------|
| EBN  |    | EBN400c<br>37kA | EBN800c<br>37kA |                  |                  |
| EBS  |    | EBS400c<br>50kA | EBS800c<br>65kA | EBS1000b<br>65kA | EBS1200b<br>65kA |
| EBH  |    | EBH400c<br>65kA |                 |                  |                  |
| EBL  |    | EBL400c<br>65kA | EBL800c<br>65kA |                  |                  |



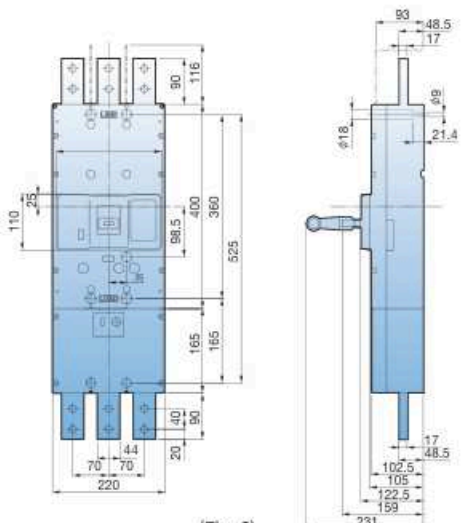
(Fig. 4)



| 800AF                                    |         |         | 1000AF                                   | 1200AF      |
|------------------------------------------|---------|---------|------------------------------------------|-------------|
| N-type                                   | S-type  | L-type  | S-type                                   | S-type      |
| EBN803c                                  | EBS803c | EBL803c | EBN1003b                                 | EBS1203b    |
| -                                        | -       | -       | -                                        | -           |
| Overload, short-circuit and ground fault |         |         | Overload, short-circuit and ground fault |             |
| 500, 630, 700, 800                       |         |         | 1000                                     | 1200        |
| 6                                        | 6       | 6       | -                                        | -           |
| 220/460                                  | 220/460 | 220/460 | 220/460                                  | 220/460     |
| 30, 100/200/500                          |         |         | 100/200/500                              | 100/200/500 |
| ≤0.1                                     | ≤0.1    | ≤0.1    | ≤0.1                                     | ≤0.1        |
| 0.1/0.4/1/2                              |         |         | -                                        | -           |
| 0.5/1/1.5/2                              |         |         | -                                        | -           |
| 37                                       | 65      | 85      | 85                                       | 85          |
| 50                                       | 85      | 125     | 125                                      | 125         |
| 100                                      | 100     | 75      | -                                        | -           |
| 210×280×109<br>(Fig. 5)                  |         |         | 220×565×105<br>(Fig. 6)                  |             |



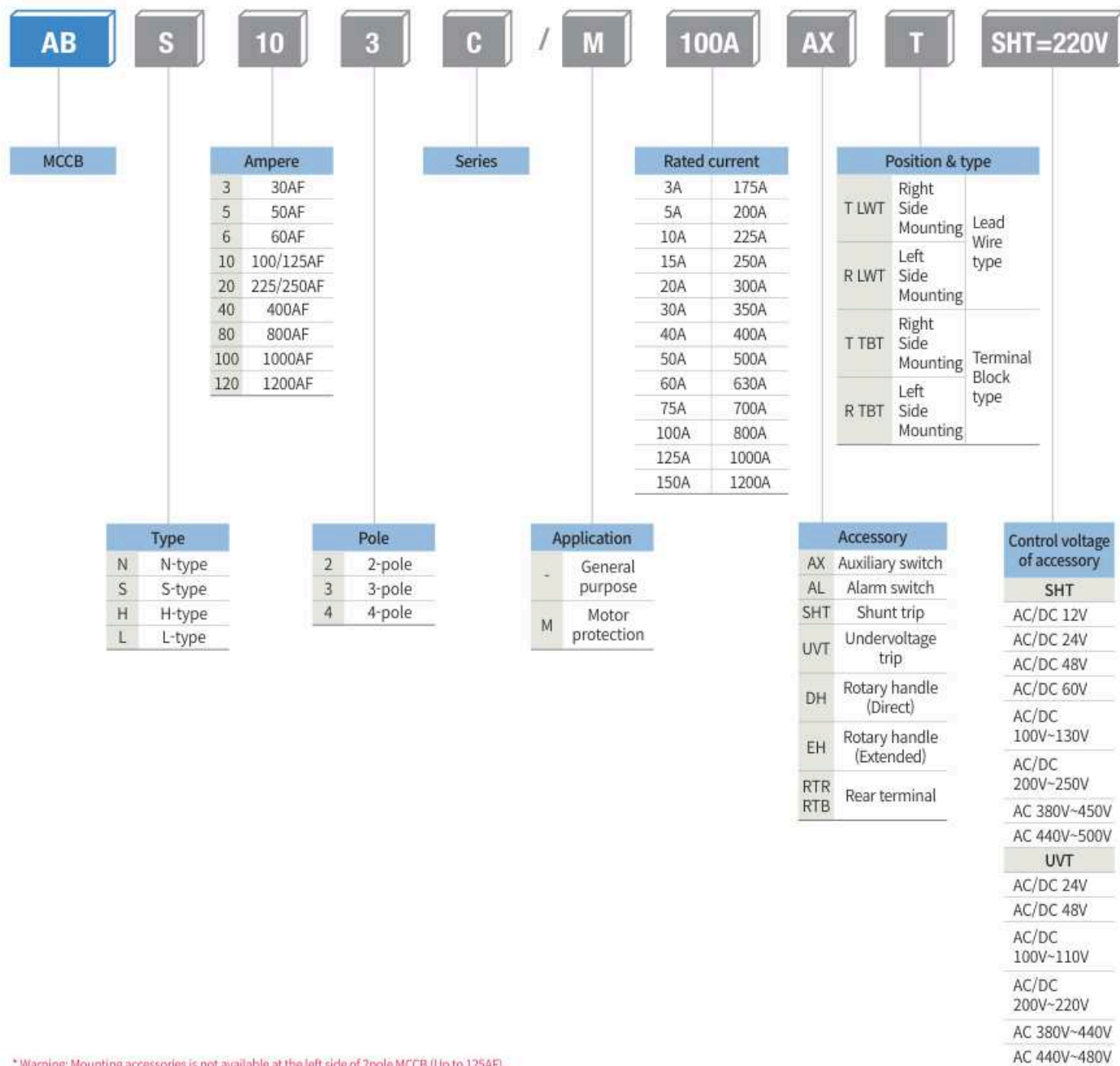
(Fig. 5)



(Fig. 6)

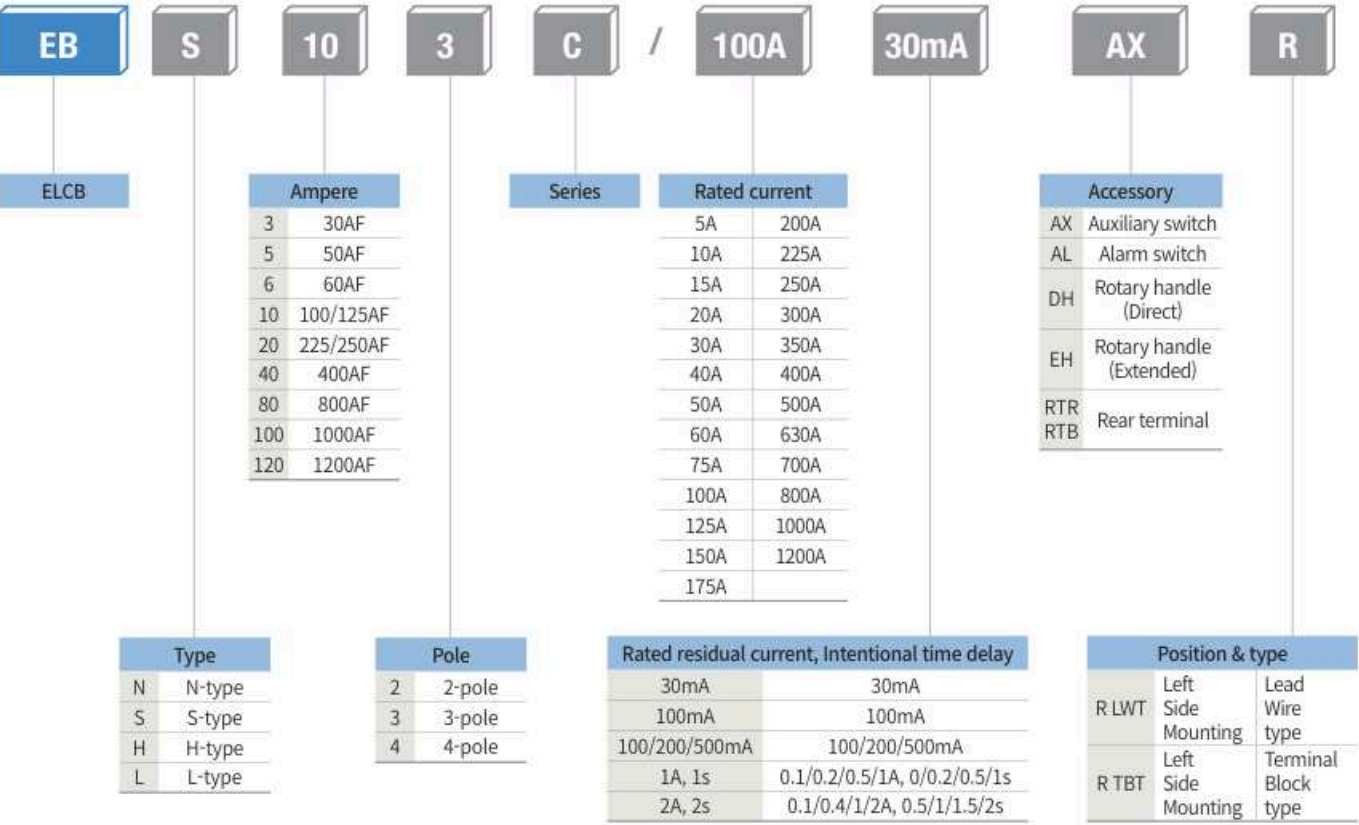
# Type numbering system

## MCCB



\* Warning: Mounting accessories is not available at the left side of 2pole MCCB (Up to 125AF)

ELCB



\* Warning: Mounting accessories is not available at the right side ELCB (Up to 250AF)

### Ratings



ABE32b



ABE33b

| Frame size                                                                          |                      |                  | 30AF                    |     |
|-------------------------------------------------------------------------------------|----------------------|------------------|-------------------------|-----|
| Type and pole                                                                       |                      |                  | E-type                  |     |
|                                                                                     | 2-pole               |                  | ABE32b                  |     |
|                                                                                     | 3-pole               |                  | ABE33b                  |     |
|                                                                                     | 4-pole               |                  | -                       |     |
| Rated current, I <sub>n</sub>                                                       |                      |                  | 3-5-10-15-20-30A        |     |
| Rated operational voltage, U <sub>e</sub>                                           |                      |                  | AC: 460V                |     |
|                                                                                     |                      |                  | -                       |     |
| Rated insulation voltage, U <sub>i</sub>                                            |                      |                  | AC: 460V                |     |
| Rated impulse withstand voltage, U <sub>imp</sub>                                   |                      |                  | 6kV                     |     |
| Rated short-circuit breaking                                                        |                      |                  | E-type                  |     |
| capacity, I <sub>cu</sub><br>IEC 60947-2 (I <sub>cu</sub> )                         | AC                   | 690V             | -                       |     |
|                                                                                     |                      | 480/500V         | -                       |     |
|                                                                                     |                      | 460V             | 2.5kA                   |     |
|                                                                                     |                      | 415V             | 2.5kA                   |     |
|                                                                                     |                      | 380V             | 2.5kA                   |     |
|                                                                                     |                      | 220/250V         | 5kA                     |     |
|                                                                                     | DC                   | 500V (3P)        | -                       |     |
|                                                                                     |                      | 250V (2P)        | -                       |     |
| I <sub>cs</sub> =%×I <sub>cu</sub>                                                  |                      |                  | 50%                     |     |
| Protective function                                                                 |                      |                  | Overload, short-circuit |     |
| Type of trip unit                                                                   |                      |                  | Hydraulic-magnetic      |     |
| Magnetic trip range                                                                 |                      |                  | 12I <sub>n</sub>        |     |
| Life cycle <sup>Note2)</sup>                                                        | Mechanical           | 8,500 operations |                         |     |
|                                                                                     | Electrical           | 1,500 operations |                         |     |
| Connection                                                                          | Standard             | Front connection |                         |     |
|                                                                                     | Optional             | -                |                         |     |
|                                                                                     |                      | -                |                         |     |
| Mounting                                                                            |                      | Standard         | Screw fixing            |     |
| Dimensions (mm)                                                                     |                      | Pole             | 2p                      | 3p  |
|  | a                    |                  | 50                      | 75  |
|                                                                                     | b                    |                  | 96                      | 96  |
|                                                                                     | c1 <sup>Note1)</sup> |                  | 60                      | 60  |
|                                                                                     | c2 <sup>Note1)</sup> |                  | -                       | -   |
|                                                                                     | d                    |                  | 80                      | 80  |
|                                                                                     | Weight, kg           | Standard         | 0.5                     | 0.7 |
| Certification                                                                       |                      | Pole             | 2p                      | 3p  |
| CE marking                                                                          | CE                   |                  | ○                       | ○   |

Note) 1. Depth by door cut size: c1 for large cut, c2 for small cut

2. Life cycle means not guarantee but limitation

(Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

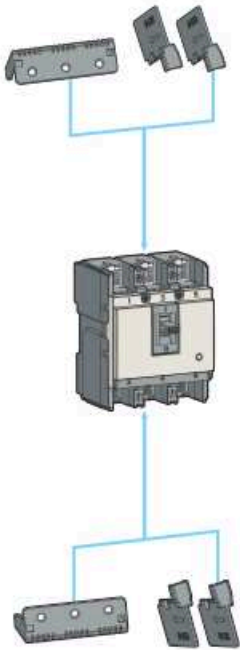
#### For more information

- Accessories ▶ 7-1 page
- Trip curves ▶ 8-1 page
- Drawings ▶ 9-1 page
- Connection and mounting ▶ 10-2 page

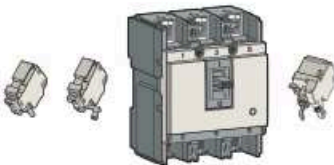
# Ordering types

## Breaker types

| ABE type (2.5kA/460V) |           |           |
|-----------------------|-----------|-----------|
| Rated current, In     | 2-pole    | 3-pole    |
| 3 A                   | ABE32b/3  | ABE33b/3  |
| 5 A                   | ABE32b/5  | ABE33b/5  |
| 10 A                  | ABE32b/10 | ABE33b/10 |
| 15 A                  | ABE32b/15 | ABE33b/15 |
| 20 A                  | ABE32b/20 | ABE33b/20 |
| 30 A                  | ABE32b/30 | ABE33b/30 |

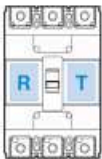


## Breaker types



## Electrical auxiliaries

|     |                  |
|-----|------------------|
| AX  | Auxiliary switch |
| AL  | Alarm switch     |
| SHT | Shunt trip       |



## Maximum possibilities

|            |                          |
|------------|--------------------------|
| T-position | One of above auxiliaries |
| R-position | Option of AX or AL       |

Note) For more detail see 7-1 page



## External accessories

| ABE30b | Name               |
|--------|--------------------|
| B-03B  | Insulation barrier |
| TBS23  | Short type         |

Note) For more detail see 7-9 ~ 7-26 page

### Ratings



ABS32c



ABS33c



ABS34c

#### For more information

- Accessories ▶ 7-1 page
- Trip curves ▶ 8-1 page
- Drawings ▶ 9-2 page
- Connection and mounting ▶ 10-2 page

| Frame size                                                                          |                     |           | 30AF                                  |         |     |
|-------------------------------------------------------------------------------------|---------------------|-----------|---------------------------------------|---------|-----|
| Type and pole                                                                       |                     |           | S-type                                |         |     |
|                                                                                     | 2-pole              |           | ABS32c                                |         |     |
|                                                                                     | 3-pole              |           | ABS33c                                |         |     |
|                                                                                     | 4-pole              |           | ABS34c                                |         |     |
| Rated current, I <sub>n</sub>                                                       |                     |           | (3-5-10) <sup>Note1</sup> , 15-20-30A |         |     |
| Rated operational voltage, U <sub>e</sub>                                           |                     |           | AC: 690V                              |         |     |
|                                                                                     |                     |           | DC: 500V                              |         |     |
| Rated insulation voltage, U <sub>i</sub>                                            |                     |           | AC: 1000V                             |         |     |
| Rated impulse withstand voltage, U <sub>imp</sub>                                   |                     |           | 8kV                                   |         |     |
| Rated short-circuit breaking                                                        |                     |           | S-type                                |         |     |
| capacity, I <sub>cu</sub>                                                           | AC                  | 690V      | 2.5kA                                 |         |     |
| IEC 60947-2 (I <sub>cu</sub> )                                                      |                     | 480/500V  | 7.5 (5)kA                             |         |     |
|                                                                                     |                     | 460V      | 14 (10)kA                             |         |     |
|                                                                                     |                     | 415V      | 14 (10)kA                             |         |     |
|                                                                                     |                     | 380V      | 18 (14)kA                             |         |     |
|                                                                                     |                     | 220/250V  | 30 (25)kA                             |         |     |
|                                                                                     | DC                  | 500V (3P) | 5kA                                   |         |     |
|                                                                                     |                     | 250V (2P) | 5kA                                   |         |     |
| I <sub>cs</sub> =% × I <sub>cu</sub>                                                |                     |           | 100%                                  |         |     |
| Protective function                                                                 |                     |           | Overload, short-circuit               |         |     |
| Type of trip unit                                                                   |                     |           | Thermal-magnetic                      |         |     |
| Magnetic trip range                                                                 |                     |           | 400A                                  |         |     |
| Life cycle <sup>Note4</sup>                                                         | Mechanical          |           | 25,000 operations                     |         |     |
|                                                                                     | Electrical          |           | 10,000 operations                     |         |     |
| Connection                                                                          | Standard            |           | Front connection                      |         |     |
|                                                                                     | Optional            |           | Rear connection                       |         |     |
|                                                                                     |                     |           |                                       | Plug-in |     |
| Mounting                                                                            | Standard            |           | Screw fixing                          |         |     |
| Dimensions (mm)                                                                     |                     | Pole      | 2p                                    | 3p      | 4p  |
|  | a                   |           | 50                                    | 75      | 100 |
|                                                                                     | b                   |           | 130                                   | 130     | 130 |
|                                                                                     | c1 <sup>Note2</sup> |           | 60                                    | 60      | 60  |
|                                                                                     | c2 <sup>Note2</sup> |           | 64                                    | 64      | 64  |
|                                                                                     | d                   |           | 82                                    | 82      | 82  |
|                                                                                     | Weight, kg          | Standard  |                                       | 0.5     | 0.7 |
| Certification                                                                       |                     | Pole      | 2p                                    | 3p      | 4p  |
| CE marking                                                                          | CE                  |           | ○                                     | ○       | ○   |

Note) 1. The short-circuit breaking capacities in ( ) are applied to the rated current in (3, 5, 10A)

2. Depth by door cut size: c1 for large cut, c2 for small cut

3. 4-pole product's ampacity on neutral conductor is equal to or less than 50% of the rated current.

4. Life cycle means not guarantee but limitation

(Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

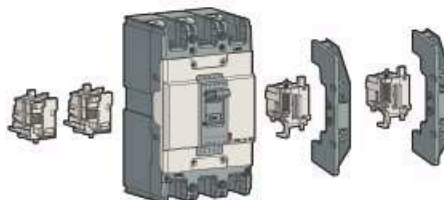
## Ordering types

### Breaker types

| ABS type (10kA/460V) |           |           |           |
|----------------------|-----------|-----------|-----------|
| Rated current, In    | 2-pole    | 3-pole    | 4-pole    |
| 3 A                  | ABS32c/3  | ABS33c/3  | ABS34c/3  |
| 5 A                  | ABS32c/5  | ABS33c/5  | ABS34c/5  |
| 10 A                 | ABS32c/10 | ABS33c/10 | ABS34c/10 |

| ABS type (14kA/460V) |           |           |           |
|----------------------|-----------|-----------|-----------|
| Rated current, In    | 2-pole    | 3-pole    | 4-pole    |
| 15 A                 | ABS32c/15 | ABS33c/15 | ABS34c/15 |
| 20 A                 | ABS32c/20 | ABS33c/20 | ABS34c/20 |
| 30 A                 | ABS32c/30 | ABS33c/30 | ABS34c/30 |

### Breaker types



### Electrical auxiliaries

|       |                    |
|-------|--------------------|
| AX    | Auxiliary switch   |
| AL    | Alarm switch       |
| AX+AL | Combination switch |
| SHT   | Shunt trip         |
| UVT   | Undervoltage trip  |



### Maximum possibilities

|            |                             |
|------------|-----------------------------|
| T-position | One of above auxiliaries    |
| R-position | Option of AX or AL or AX+AL |

Note) For more detail see 7-1 page

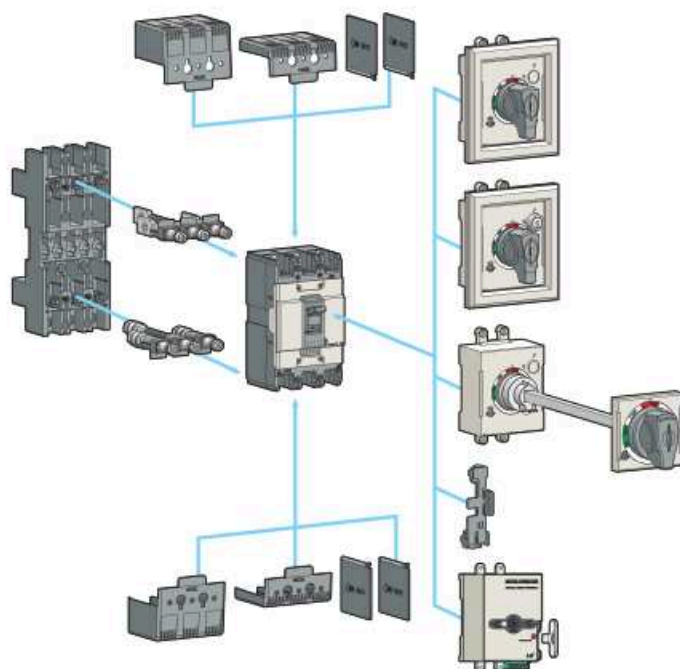


### External accessories

| ABS30c             | Name                                                                  |
|--------------------|-----------------------------------------------------------------------|
| IB13               | Insulation barrier                                                    |
| TCL13              | Terminal cover (Long)<br>- Single type, D-handle type, N-handle type  |
| TCS13              | Terminal cover (Short)<br>- Single type, D-handle type, N-handle type |
| N-30c              | Rotary handle (Direct)<br>- applicable for either 2, 3pole            |
| DH100              | Rotary handle (Direct)                                                |
| DHK100             | Rotary handle (Direct, key lock)                                      |
| EH100              | Rotary handle (Extended)                                              |
| RTR1               | Rear terminal (Round)                                                 |
| PB-A3              | Plug-in kit                                                           |
| <b>Handle lock</b> |                                                                       |
| MOP-M1             | Remote operation                                                      |

Note) For more detail see 7-9 ~ 7-26 page

- Single type: This cover is used without auxiliary handle.
- D-handle type: This cover is used with D-handle.
- N-handle type: This cover is used with N-handle.



# 50AF MCCB

## ABN50c, ABS50c, ABH50c

### Ratings



ABS52c



ABS53c



ABS54c

#### For more information

- Accessories ▶ 7-1 page
- Trip curves ▶ 8-1 page
- Drawings ▶ 9-2 page
- Connection and mounting ▶ 10-2 page

| Frame size                                        |                      |                                    | 50AF                                    |      |     |        |      |     |        |      |     |     |
|---------------------------------------------------|----------------------|------------------------------------|-----------------------------------------|------|-----|--------|------|-----|--------|------|-----|-----|
| Type and pole                                     |                      |                                    | N-type                                  |      |     | S-type |      |     | H-type |      |     |     |
|                                                   | 2-pole               |                                    | ABN52c                                  |      |     | ABS52c |      |     | ABH52c |      |     |     |
|                                                   | 3-pole               |                                    | ABN53c                                  |      |     | ABS53c |      |     | ABH53c |      |     |     |
|                                                   | 4-pole               |                                    | ABN54c                                  |      |     | ABS54c |      |     | ABH54c |      |     |     |
| Rated current, I <sub>n</sub>                     |                      |                                    | 15-20-30-40-50A                         |      |     |        |      |     |        |      |     |     |
| Rated operational voltage, U <sub>e</sub>         |                      |                                    | AC: 690V                                |      |     |        |      |     |        |      |     |     |
|                                                   |                      |                                    | DC: 500V                                |      |     |        |      |     |        |      |     |     |
| Rated insulation voltage, U <sub>i</sub>          |                      |                                    | AC: 1000V                               |      |     |        |      |     |        |      |     |     |
| Rated impulse withstand voltage, U <sub>imp</sub> |                      |                                    | 8kV                                     |      |     |        |      |     |        |      |     |     |
| Rated short-circuit breaking                      |                      |                                    | N-type                                  |      |     | S-type |      |     | H-type |      |     |     |
| capacity, I <sub>cu</sub>                         | AC                   | 690V                               | 2.5kA                                   |      |     | 5kA    |      |     | 10kA   |      |     |     |
|                                                   |                      | 480/500V                           | 7.5kA                                   |      |     | 10kA   |      |     | 35kA   |      |     |     |
|                                                   |                      | 460V                               | 14kA                                    |      |     | 18kA   |      |     | 50kA   |      |     |     |
|                                                   |                      | 415V                               | 14kA                                    |      |     | 18kA   |      |     | 50kA   |      |     |     |
|                                                   |                      | 380V                               | 18kA                                    |      |     | 22kA   |      |     | 50kA   |      |     |     |
|                                                   | DC                   | 220/250V                           | 30kA                                    |      |     | 35kA   |      |     | 100kA  |      |     |     |
|                                                   |                      | 500V (3P)                          | 5kA                                     |      |     | 10kA   |      |     | 30kA   |      |     |     |
|                                                   |                      | 250V (2P)                          | 5kA                                     |      |     | 10kA   |      |     | 30kA   |      |     |     |
|                                                   |                      | I <sub>cs</sub> =%×I <sub>cu</sub> |                                         | 100% |     |        | 100% |     |        | 100% |     |     |
| Protective function                               |                      |                                    | Overload, short-circuit                 |      |     |        |      |     |        |      |     |     |
| Type of trip unit                                 |                      |                                    | Thermal-magnetic                        |      |     |        |      |     |        |      |     |     |
| Magnetic trip range                               |                      |                                    | 12×I <sub>n</sub> (30A and under: 400A) |      |     |        |      |     |        |      |     |     |
| Life cycle <sup>Note1)</sup>                      | Mechanical           |                                    | 25,000 operations                       |      |     |        |      |     |        |      |     |     |
|                                                   | Electrical           |                                    | 10,000 operations                       |      |     |        |      |     |        |      |     |     |
| Connection                                        | Standard             |                                    | Front connection                        |      |     |        |      |     |        |      |     |     |
|                                                   | Optional             |                                    | Rear connection                         |      |     |        |      |     |        |      |     |     |
|                                                   |                      |                                    | Plug-in                                 |      |     |        |      |     |        |      |     |     |
| Mounting                                          | Standard             |                                    | Screw fixing                            |      |     |        |      |     |        |      |     |     |
| Dimensions (mm)                                   |                      |                                    | Pole                                    | 2p   | 3p  | 4p     | 2p   | 3p  | 4p     | 2p   | 3p  | 4p  |
|                                                   | a                    |                                    | 50                                      | 75   | 100 | 50     | 75   | 100 | 60     | 90   | 120 |     |
|                                                   | b                    |                                    |                                         | 130  |     |        | 130  |     |        | 155  |     |     |
|                                                   | c1 <sup>Note1)</sup> |                                    |                                         | 60   |     |        | 60   |     |        | 60   |     |     |
|                                                   | c2 <sup>Note1)</sup> |                                    |                                         | 64   |     |        | 64   |     |        | 64   |     |     |
|                                                   | d                    |                                    |                                         | 82   |     |        | 82   |     |        | 82   |     |     |
|                                                   |                      |                                    |                                         |      |     |        |      |     |        |      |     |     |
| Weight, kg                                        |                      |                                    | Standard                                | 0.5  | 0.7 | 0.9    | 0.5  | 0.7 | 0.9    | 0.7  | 1   | 1.2 |
| Certification                                     |                      |                                    | Pole                                    | 2p   | 3p  | 4p     | 2p   | 3p  | 4p     | 2p   | 3p  | 4p  |
| CE marking                                        |                      |                                    | CE                                      |      | ○   |        |      | ○   |        |      | ○   |     |

Note) 1. Depth by door cut size: c1 for large cut, c2 for small cut

2. 4-pole product's ampacity on neutral conductor is equal to or less than 50% of the rated current.

3. Life cycle means not guarantee but limitation

(Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

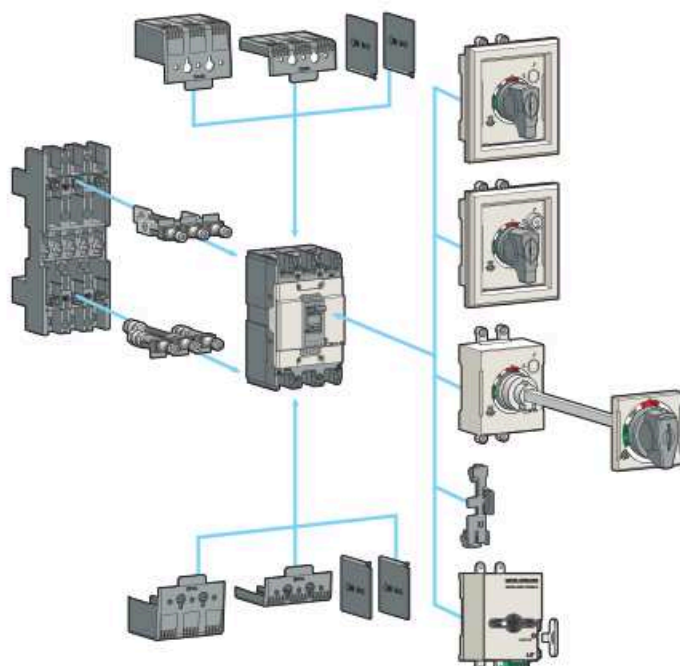
## Ordering types

### Breaker types

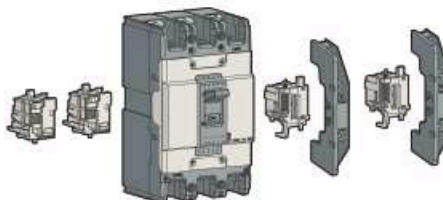
| ABN type (14kA/460V) |           |           |           |
|----------------------|-----------|-----------|-----------|
| Rated current, In    | 2-pole    | 3-pole    | 4-pole    |
| 15 A                 | ABN52c/15 | ABN53c/15 | ABN54c/15 |
| 20 A                 | ABN52c/20 | ABN53c/20 | ABN54c/20 |
| 30 A                 | ABN52c/30 | ABN53c/30 | ABN54c/30 |
| 40 A                 | ABN52c/40 | ABN53c/40 | ABN54c/40 |
| 50 A                 | ABN52c/50 | ABN53c/50 | ABN54c/50 |

| ABS type (18kA/460V) |           |           |           |
|----------------------|-----------|-----------|-----------|
| Rated current, In    | 2-pole    | 3-pole    | 4-pole    |
| 15 A                 | ABS52c/15 | ABS53c/15 | ABS54c/15 |
| 20 A                 | ABS52c/20 | ABS53c/20 | ABS54c/20 |
| 30 A                 | ABS52c/30 | ABS53c/30 | ABS54c/30 |
| 40 A                 | ABS52c/40 | ABS53c/40 | ABS54c/40 |
| 50 A                 | ABS52c/50 | ABS53c/50 | ABS54c/50 |

| ABH type (50kA/460V) |           |           |           |
|----------------------|-----------|-----------|-----------|
| Rated current, In    | 2-pole    | 3-pole    | 4-pole    |
| 15 A                 | ABH52c/15 | ABH53c/15 | ABH54c/15 |
| 20 A                 | ABH52c/20 | ABH53c/20 | ABH54c/20 |
| 30 A                 | ABH52c/30 | ABH53c/30 | ABH54c/30 |
| 40 A                 | ABH52c/40 | ABH53c/40 | ABH54c/40 |
| 50 A                 | ABH52c/50 | ABH53c/50 | ABH54c/50 |



### Accessories



### Electrical auxiliaries

|       |                    |
|-------|--------------------|
| AX    | Auxiliary switch   |
| AL    | Alarm switch       |
| AX+AL | Combination switch |
| SHT   | Shunt trip         |
| UVT   | Undervoltage trip  |



### Maximum possibilities

|            |                             |
|------------|-----------------------------|
| T-position | One of above auxiliaries    |
| R-position | Option of AX or AL or AX+AL |

Note) For more detail see 7-1 page



### External accessories

| ABN50c<br>ABS50c | ABH50c | Name                                                                  |
|------------------|--------|-----------------------------------------------------------------------|
| IB13             | IB23   | Insulation barrier                                                    |
| TCL13            | TCL23  | Terminal cover (Long)<br>- Single type, D-handle type, N-handle type  |
| TCS13            | TCS23  | Terminal cover (Short)<br>- Single type, D-handle type, N-handle type |
| N-30c            | N-40c  | Rotary handle (Direct)<br>- applicable for either 2, 3pole            |
| DH100            | DH125  | Rotary handle (Direct)                                                |
| DHK100           | DHK125 | Rotary handle (Direct, key lock)                                      |
| EH100            | EH125  | Rotary handle (Extended)                                              |
| -                | RTB2   | Rear terminal (Bar)                                                   |
| RTR1             | RTR2   | Rear terminal (Round)                                                 |
| PB-A3            | PB-C3  | Plug-in kit                                                           |
| Handle lock      |        |                                                                       |
| MOP-M1           | MOP-M2 | Remote operation                                                      |

Note) For more detail see 7-9 ~ 7-26 page

- Single type: This cover is used without auxiliary handle.
- D-handle type: This cover is used with D-handle.
- N-handle type: This cover is used with N-handle.

# 60AF MCCB

## ABN60c, ABS60c

### Ratings



ABS62c



ABS63c



ABS64c

#### For more information

- Accessories ▶ 7-1 page
- Trip curves ▶ 8-1 page
- Drawings ▶ 9-2 page
- Connection and mounting ▶ 10-2 page

| Frame size                                                                          |            |                      | 60AF                                      |      |        |     |     |     |
|-------------------------------------------------------------------------------------|------------|----------------------|-------------------------------------------|------|--------|-----|-----|-----|
| Type and pole                                                                       |            |                      | N-type                                    |      | S-type |     |     |     |
| 2-pole                                                                              |            |                      | ABN62c                                    |      | ABS62c |     |     |     |
| 3-pole                                                                              |            |                      | ABN63c                                    |      | ABS63c |     |     |     |
| 4-pole                                                                              |            |                      | ABN64c                                    |      | ABS64c |     |     |     |
| Rated current, I <sub>n</sub>                                                       |            |                      | 15-20-30-40-50-60A                        |      |        |     |     |     |
| Rated operational voltage, U <sub>e</sub>                                           |            |                      | AC: 690V                                  |      |        |     |     |     |
|                                                                                     |            |                      | DC: 500V                                  |      |        |     |     |     |
| Rated insulation voltage, U <sub>i</sub>                                            |            |                      | AC: 1000V                                 |      |        |     |     |     |
| Rated impulse withstand voltage, U <sub>imp</sub>                                   |            |                      | 8kV                                       |      |        |     |     |     |
| Rated short-circuit breaking                                                        |            |                      | N-type                                    |      | S-type |     |     |     |
| capacity, I <sub>cu</sub>                                                           | AC         | 690V                 | 2.5kA                                     |      | 5kA    |     |     |     |
| IEC 60947-2 (I <sub>cu</sub> )                                                      |            | 480/500V             | 7.5kA                                     |      | 10kA   |     |     |     |
|                                                                                     |            | 460V                 | 14kA                                      |      | 18kA   |     |     |     |
|                                                                                     |            | 415V                 | 14kA                                      |      | 18kA   |     |     |     |
|                                                                                     |            | 380V                 | 18kA                                      |      | 22kA   |     |     |     |
|                                                                                     |            | 220/250V             | 30kA                                      |      | 35kA   |     |     |     |
|                                                                                     | DC         | 500V (3P)            | 5kA                                       |      | 10kA   |     |     |     |
|                                                                                     | 250V (2P)  | 5kA                  |                                           | 10kA |        |     |     |     |
| I <sub>cs</sub> =% × I <sub>cu</sub>                                                |            |                      | 100%                                      |      | 100%   |     |     |     |
| Protective function                                                                 |            |                      | Overload, short-circuit                   |      |        |     |     |     |
| Type of trip unit                                                                   |            |                      | Thermal-magnetic                          |      |        |     |     |     |
| Magnetic trip range                                                                 |            |                      | 12 × I <sub>n</sub> (30A and under; 400A) |      |        |     |     |     |
| Life cycle <sup>Note3)</sup>                                                        | Mechanical | 25,000 operations    |                                           |      |        |     |     |     |
|                                                                                     | Electrical | 10,000 operations    |                                           |      |        |     |     |     |
| Connection                                                                          | Standard   | Front connection     |                                           |      |        |     |     |     |
|                                                                                     | Optional   | Rear connection      |                                           |      |        |     |     |     |
|                                                                                     |            | Plug-in              |                                           |      |        |     |     |     |
| Mounting                                                                            | Standard   | Screw fixing         |                                           |      |        |     |     |     |
| Dimensions (mm)                                                                     |            | Pole                 | 2p                                        | 3p   | 4p     | 2p  | 3p  | 4p  |
|  |            | a                    | 50                                        | 75   | 100    | 50  | 75  | 100 |
|                                                                                     |            | b                    | 130                                       |      |        | 130 |     |     |
|                                                                                     |            | c1 <sup>Note1)</sup> | 60                                        |      |        | 60  |     |     |
|                                                                                     |            | c2 <sup>Note1)</sup> | 64                                        |      |        | 64  |     |     |
|                                                                                     |            | d                    | 82                                        |      |        | 82  |     |     |
|                                                                                     |            |                      |                                           |      |        |     |     |     |
| Weight, kg                                                                          |            | Standard             | 0.5                                       | 0.7  | 0.9    | 0.5 | 0.7 | 0.9 |
| Certification                                                                       |            | Pole                 | 2p                                        |      |        | 3p  |     |     |
| CE marking                                                                          |            | CE                   | ○                                         |      |        | ○   |     |     |

Note) 1. Depth by door cut size: c1 for large cut, c2 for small cut  
 2. 4-pole product's ampacity on neutral conductor is equal to or less than 50% of the rated current.  
 3. Life cycle means not guarantee but limitation  
 (Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

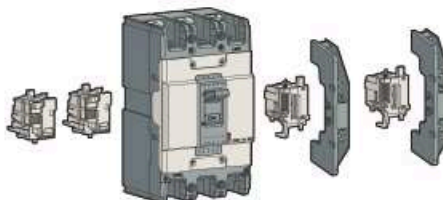
## Ordering types

### Breaker types

| ABN type (14kA/460V) |           |           |           |
|----------------------|-----------|-----------|-----------|
| Rated current, In    | 2-pole    | 3-pole    | 4-pole    |
| 15 A                 | ABN62c/15 | ABN63c/15 | ABN64c/15 |
| 20 A                 | ABN62c/20 | ABN63c/20 | ABN64c/20 |
| 30 A                 | ABN62c/30 | ABN63c/30 | ABN64c/30 |
| 40 A                 | ABN62c/40 | ABN63c/40 | ABN64c/40 |
| 50 A                 | ABN62c/50 | ABN63c/50 | ABN64c/50 |
| 60 A                 | ABN62c/60 | ABN63c/60 | ABN64c/60 |

| ABS type (18kA/460V) |           |           |           |
|----------------------|-----------|-----------|-----------|
| Rated current, In    | 2-pole    | 3-pole    | 4-pole    |
| 15 A                 | ABS62c/15 | ABS63c/15 | ABS64c/15 |
| 20 A                 | ABS62c/20 | ABS63c/20 | ABS64c/20 |
| 30 A                 | ABS62c/30 | ABS63c/30 | ABS64c/30 |
| 40 A                 | ABS62c/40 | ABS63c/40 | ABS64c/40 |
| 50 A                 | ABS62c/50 | ABS63c/50 | ABS64c/50 |
| 60 A                 | ABS62c/60 | ABS63c/60 | ABS64c/60 |

### Accessories



#### Electrical auxiliaries

|       |                    |
|-------|--------------------|
| AX    | Auxiliary switch   |
| AL    | Alarm switch       |
| AX+AL | Combination switch |
| SHT   | Shunt trip         |
| UVT   | Undervoltage trip  |



#### Maximum possibilities

|            |                             |
|------------|-----------------------------|
| T-position | One of above auxiliaries    |
| R-position | Option of AX or AL or AX+AL |

Note) For more detail see 7-1 page

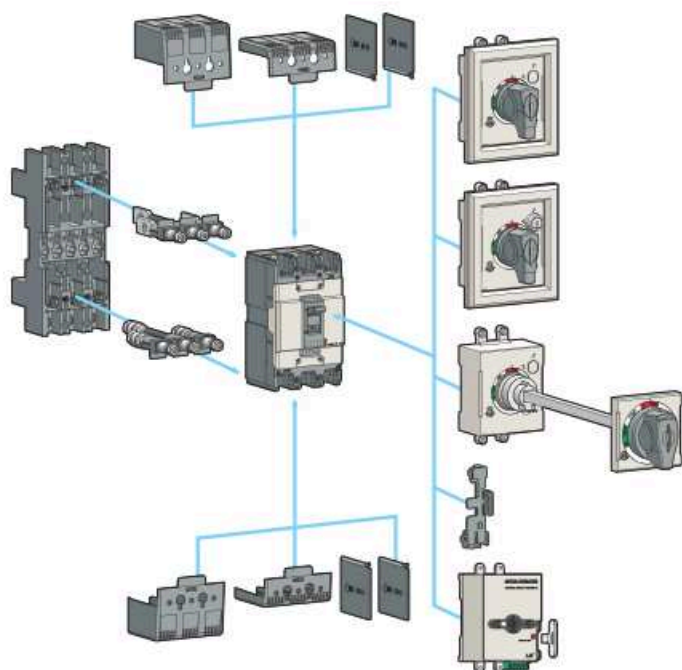


#### External accessories

| ABN50c<br>ABS50c   | Name                                                                  |
|--------------------|-----------------------------------------------------------------------|
| IB13               | Insulation barrier                                                    |
| TCL13              | Terminal cover (Long)<br>- Single type, D-handle type, N-handle type  |
| TCS13              | Terminal cover (Short)<br>- Single type, D-handle type, N-handle type |
| N-30c              | Rotary handle (Direct)<br>- applicable for either 2, 3pole            |
| DH100              | Rotary handle (Direct)                                                |
| DHK100             | Rotary handle (Direct, key lock)                                      |
| EH100              | Rotary handle (Extended)                                              |
| RTB1               | Rear terminal (Bar)                                                   |
| RTR1               | Rear terminal (Round)                                                 |
| PB-A3              | Plug-in kit                                                           |
| <b>handle lock</b> |                                                                       |
| MOP-M1             | Remote operation                                                      |

Note) For more detail see 7-9 ~ 7-26 page

- Single type: This cover is used without auxiliary handle.
- D-handle type: This cover is used with D-handle.
- N-handle type: This cover is used with N-handle.



# 100AF MCCB

## ABN100c, ABN100e

### Ratings



ABN102c



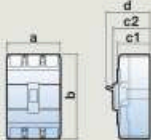
ABN103c



ABN104c

#### For more information

- Accessories ▶ 7-1 page
- Trip curves ▶ 8-1 page
- Drawings ▶ 9-2 page
- Connection and mounting ▶ 10-2 page

| Frame size                                                                          |                                    | 100AF                     |                         |           |     |
|-------------------------------------------------------------------------------------|------------------------------------|---------------------------|-------------------------|-----------|-----|
| Type and pole                                                                       |                                    | N-type                    |                         |           |     |
|                                                                                     | 2-pole                             | ABN102c                   |                         | ABN102e   |     |
|                                                                                     | 3-pole                             | ABN103c                   |                         | ABN103e   |     |
|                                                                                     | 4-pole                             | ABN104c                   |                         | ABN104e   |     |
| Rated current, I <sub>n</sub>                                                       |                                    | 15-20-30-40-50-60-75-100A |                         |           |     |
| Rated operational voltage, U <sub>e</sub>                                           |                                    | AC: 690V                  |                         |           |     |
|                                                                                     |                                    | DC: 500V                  |                         |           |     |
| Rated insulation voltage, U <sub>i</sub>                                            |                                    | AC: 1000V                 |                         |           |     |
| Rated impulse withstand voltage, U <sub>imp</sub>                                   |                                    | 8kV                       |                         |           |     |
| Rated short-circuit breaking                                                        |                                    | N-type                    |                         |           |     |
| capacity, I <sub>cu</sub><br>IEC 60947-2 (I <sub>cu</sub> )                         | AC                                 | 690V                      | 5kA                     | 7.5 (5)kA |     |
|                                                                                     |                                    | 480/500V                  | 10kA                    | 14 (10)kA |     |
|                                                                                     |                                    | 460V                      | 18kA                    | 31 (18)kA |     |
|                                                                                     |                                    | 415V                      | 18kA                    | 31 (18)kA |     |
|                                                                                     |                                    | 380V                      | 22kA                    | 31 (22)kA |     |
|                                                                                     |                                    | 220/250V                  | 35kA                    | 65 (35)kA |     |
|                                                                                     | DC                                 | 500V (3P)                 | 10kA                    | 15 (10)kA |     |
|                                                                                     |                                    | 250V (2P)                 | 10kA                    | 15 (10)kA |     |
|                                                                                     | I <sub>cs</sub> =%×I <sub>cu</sub> |                           | 100%                    | (    )    |     |
|                                                                                     | Protective function                |                           | Overload, short-circuit |           |     |
| Type of trip unit                                                                   |                                    | Thermal-magnetic          |                         |           |     |
| Magnetic trip range                                                                 |                                    | 400A                      |                         |           |     |
| Life cycle <sup>Note4)</sup>                                                        | Mechanical                         | 25,000 operations         |                         |           |     |
|                                                                                     | Electrical                         | 10,000 operations         |                         |           |     |
| Connection                                                                          | Standard                           | Front connection          |                         |           |     |
|                                                                                     | Optional                           | Rear connection           |                         |           |     |
|                                                                                     |                                    | Plug-in                   |                         |           |     |
| Mounting                                                                            | Standard                           | Screw fixing              |                         |           |     |
| Dimensions (mm)                                                                     |                                    | Pole                      | 2p                      | 3p        | 4p  |
|  | a                                  |                           | 50                      | 75        | 100 |
|                                                                                     | b                                  |                           | 130                     | 130       | 130 |
|                                                                                     | c1 <sup>Note1)</sup>               |                           | 60                      | 60        | 60  |
|                                                                                     | c2 <sup>Note1)</sup>               |                           | 64                      | 64        | 64  |
|                                                                                     | d                                  |                           | 82                      | 82        | 82  |
|                                                                                     | Weight, kg                         | Standard                  | 0.5                     | 0.7       | 0.9 |
| Certification                                                                       |                                    | Pole                      | 2p                      | 3p        | 4p  |
| CE marking                                                                          |                                    | CE                        | ○                       | ○         | ○   |

Note) 1. Depth by door cut size: c1 for large cut, c2 for small cut

2. 4-pole product's ampacity on neutral conductor is equal to or less than 50% of the rated current.

3. The I<sub>cs</sub>(Service breaking capacity) of ABN100e are in ( )

4. Life cycle means not guarantee but limitation

(Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

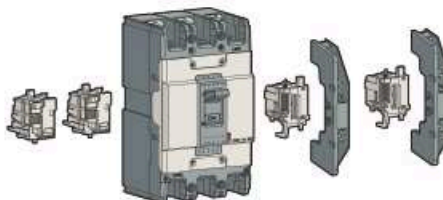
## Ordering types

### Breaker types

| ABN-c type (18kA/460V) |             |             |             |
|------------------------|-------------|-------------|-------------|
| Rated current, In      | 2-pole      | 3-pole      | 4-pole      |
| 15 A                   | ABN102c/15  | ABN103c/15  | ABN104c/15  |
| 20 A                   | ABN102c/20  | ABN103c/20  | ABN104c/20  |
| 30 A                   | ABN102c/30  | ABN103c/30  | ABN104c/30  |
| 40 A                   | ABN102c/40  | ABN103c/40  | ABN104c/40  |
| 50 A                   | ABN102c/50  | ABN103c/50  | ABN104c/50  |
| 60 A                   | ABN102c/60  | ABN103c/60  | ABN104c/60  |
| 75 A                   | ABN102c/75  | ABN103c/75  | ABN104c/75  |
| 100 A                  | ABN102c/100 | ABN103c/100 | ABN104c/100 |

| ABN-e type (31kA/460V) |             |             |             |
|------------------------|-------------|-------------|-------------|
| Rated current, In      | 2-pole      | 3-pole      | 4-pole      |
| 15 A                   | ABN102e/15  | ABN103e/15  | ABN104e/15  |
| 20 A                   | ABN102e/20  | ABN103e/20  | ABN104e/20  |
| 30 A                   | ABN102e/30  | ABN103e/30  | ABN104e/30  |
| 40 A                   | ABN102e/40  | ABN103e/40  | ABN104e/40  |
| 50 A                   | ABN102e/50  | ABN103e/50  | ABN104e/50  |
| 60 A                   | ABN102e/60  | ABN103e/60  | ABN104e/60  |
| 75 A                   | ABN102e/75  | ABN103e/75  | ABN104e/75  |
| 100 A                  | ABN102e/100 | ABN103e/100 | ABN104e/100 |

### Accessories



### Electrical auxiliaries

|       |                    |
|-------|--------------------|
| AX    | Auxiliary switch   |
| AL    | Alarm switch       |
| AX+AL | Combination switch |
| SHT   | Shunt trip         |
| UVT   | Undervoltage trip  |



### Maximum possibilities

|            |                             |
|------------|-----------------------------|
| T-position | One of above auxiliaries    |
| R-position | Option of AX or AL or AX+AL |

Note) For more detail see 7-1 page

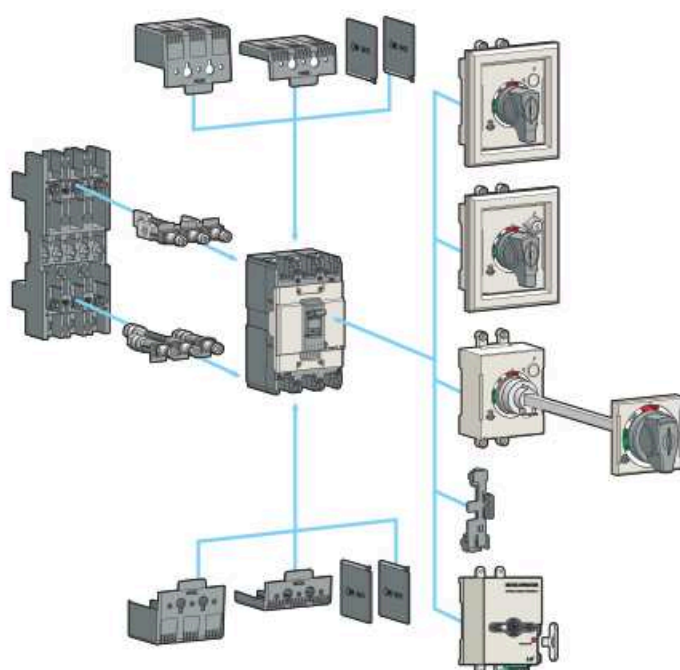


### External accessories

| ABN100c     | Name                                                                  |
|-------------|-----------------------------------------------------------------------|
| IB13        | Insulation barrier                                                    |
| TCL13       | Terminal cover (Long)<br>- Single type, D-handle type, N-handle type  |
| TCS13       | Terminal cover (Short)<br>- Single type, D-handle type, N-handle type |
| N-30c       | Rotary handle (Direct)<br>- applicable for either 2, 3pole            |
| DH100       | Rotary handle (Direct)                                                |
| DHK100      | Rotary handle (Direct, key lock)                                      |
| EH100       | Rotary handle (Extended)                                              |
| RTB1        | Rear terminal (Bar)                                                   |
| RTR1        | Rear terminal (Round)                                                 |
| PB-A3       | Plug-in kit                                                           |
| Handle lock |                                                                       |
| MOP-M1      | Remote operation                                                      |

Note) For more detail see 7-9 ~ 7-26 page

- Single type: This cover is used without auxiliary handle.
- D-handle type: This cover is used with D-handle.
- N-handle type: This cover is used with N-handle.



# 125AF MCCB

## ABS125c, ABH125c, ABL125c

### Ratings



ABS102c



ABS103c



ABS104c

#### For more information

- Accessories ▶ 7-1 page
- Trip curves ▶ 8-2 page
- Drawings ▶ 9-3 page
- Connection and mounting ▶ 10-2 page

| Frame size                                                                          |                      |           | 125AF                                   |     |     |         |     |     |             |     |     |
|-------------------------------------------------------------------------------------|----------------------|-----------|-----------------------------------------|-----|-----|---------|-----|-----|-------------|-----|-----|
| Type and pole                                                                       |                      |           | N-type                                  |     |     | H-type  |     |     | L-type      |     |     |
|                                                                                     | 2-pole               |           | ABS102c                                 |     |     | ABH102c |     |     | ABL102c     |     |     |
|                                                                                     | 3-pole               |           | ABS103c                                 |     |     | ABH103c |     |     | ABL103c     |     |     |
|                                                                                     | 4-pole               |           | ABS104c                                 |     |     | ABH104c |     |     | ABL104c     |     |     |
| Rated current, I <sub>n</sub>                                                       |                      |           | 15-20-30-40-50-60-75-100-125A           |     |     |         |     |     |             |     |     |
| Rated operational voltage, U <sub>e</sub>                                           |                      |           | AC: 690V                                |     |     |         |     |     |             |     |     |
|                                                                                     |                      |           | DC: 500V                                |     |     |         |     |     |             |     |     |
| Rated insulation voltage, U <sub>i</sub>                                            |                      |           | AC: 1000V                               |     |     |         |     |     |             |     |     |
| Rated impulse withstand voltage, U <sub>imp</sub>                                   |                      |           | 8kV                                     |     |     |         |     |     |             |     |     |
| Rated short-circuit breaking                                                        |                      |           | N-type                                  |     |     | H-type  |     |     | L-type      |     |     |
| capacity, I <sub>cu</sub>                                                           | AC                   | 690V      | 8kA                                     |     |     | 10kA    |     |     | 10 (10)kA   |     |     |
|                                                                                     |                      | 480/500V  | 26kA                                    |     |     | 35kA    |     |     | 35 (35)kA   |     |     |
|                                                                                     |                      | 460V      | 37kA                                    |     |     | 50kA    |     |     | 60 (50)kA   |     |     |
|                                                                                     |                      | 415V      | 37kA                                    |     |     | 50kA    |     |     | 60 (50)kA   |     |     |
|                                                                                     |                      | 380V      | 42kA                                    |     |     | 50kA    |     |     | 60 (50)kA   |     |     |
|                                                                                     |                      | 220/250V  | 85kA                                    |     |     | 100kA   |     |     | 125 (100)kA |     |     |
|                                                                                     | DC                   | 500V (3P) | 20kA                                    |     |     | 30kA    |     |     | 30 (30)kA   |     |     |
|                                                                                     |                      | 250V (2P) | 20kA                                    |     |     | 30kA    |     |     | 30 (30)kA   |     |     |
| I <sub>cs</sub> =%×I <sub>cu</sub>                                                  |                      |           | 100%                                    |     |     | 100%    |     |     | ( )         |     |     |
| Protective function                                                                 |                      |           | Overload, short-circuit                 |     |     |         |     |     |             |     |     |
| Type of trip unit                                                                   |                      |           | Thermal-magnetic                        |     |     |         |     |     |             |     |     |
| Magnetic trip range                                                                 |                      |           | 12×I <sub>n</sub> (30A and under: 400A) |     |     |         |     |     |             |     |     |
| Life cycle <sup>Note4)</sup>                                                        | Mechanical           |           | 25,000 operations                       |     |     |         |     |     |             |     |     |
|                                                                                     | Electrical           |           | 10,000 operations                       |     |     |         |     |     |             |     |     |
| Connection                                                                          | Standard             |           | Front connection                        |     |     |         |     |     |             |     |     |
|                                                                                     | Optional             |           | Rear connection                         |     |     |         |     |     |             |     |     |
|                                                                                     |                      |           | Plug-in                                 |     |     |         |     |     |             |     |     |
| Mounting                                                                            | Standard             |           | Screw fixing                            |     |     |         |     |     |             |     |     |
| Dimensions (mm)                                                                     |                      | Pole      | 2p                                      | 3p  | 4p  | 2p      | 3p  | 4p  | 2p          | 3p  | 4p  |
|  | a                    |           | 60                                      | 90  | 120 | 60      | 90  | 120 | 60          | 90  | 120 |
|                                                                                     | b                    |           |                                         | 155 |     |         | 155 |     |             | 155 |     |
|                                                                                     | c1 <sup>Note1)</sup> |           |                                         | 60  |     |         | 60  |     |             | 60  |     |
|                                                                                     | c2 <sup>Note1)</sup> |           |                                         | 64  |     |         | 64  |     |             | 64  |     |
|                                                                                     | d                    |           |                                         | 82  |     |         | 82  |     |             | 82  |     |
|                                                                                     |                      |           |                                         |     |     |         |     |     |             |     |     |
| Weight, kg                                                                          |                      | Standard  | 0.7                                     | 1   | 1.2 | 0.7     | 1   | 1.2 | 0.7         | 1   | 1.2 |
| Certification                                                                       |                      | Pole      | 2p                                      | 3p  | 4p  | 2p      | 3p  | 4p  | 2p          | 3p  | 4p  |
| CE marking                                                                          |                      | CE        |                                         | ○   |     |         | ○   |     |             | ○   |     |

- Note) 1. Depth by door cut size: c1 for large cut, c2 for small cut  
2. 4-pole product's ampacity on neutral conductor is equal to or less than 50% of the rated current.  
3. The I<sub>cs</sub>(Service breaking capacity) of ABL125AF are in ( )  
4. Life cycle means not guarantee but limitation  
(Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

## Ordering types

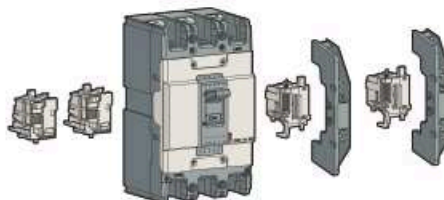
### Breaker types

| ABS type (37kA/460V) |             |             |             |
|----------------------|-------------|-------------|-------------|
| Rated current, In    | 2-pole      | 3-pole      | 4-pole      |
| 15 A                 | ABS102c/15  | ABS103c/15  | ABS104c/15  |
| 20 A                 | ABS102c/20  | ABS103c/20  | ABS104c/20  |
| 30 A                 | ABS102c/30  | ABS103c/30  | ABS104c/30  |
| 40 A                 | ABS102c/40  | ABS103c/40  | ABS104c/40  |
| 50 A                 | ABS102c/50  | ABS103c/50  | ABS104c/50  |
| 60 A                 | ABS102c/60  | ABS103c/60  | ABS104c/60  |
| 75 A                 | ABS102c/75  | ABS103c/75  | ABS104c/75  |
| 100 A                | ABS102c/100 | ABS103c/100 | ABS104c/100 |
| 125 A                | ABS102c/125 | ABS103c/125 | ABS104c/125 |

| ABH type (50kA/460V) |             |             |             |
|----------------------|-------------|-------------|-------------|
| Rated current, In    | 2-pole      | 3-pole      | 4-pole      |
| 15 A                 | ABH102c/15  | ABH103c/15  | ABH104c/15  |
| 20 A                 | ABH102c/20  | ABH103c/20  | ABH104c/20  |
| 30 A                 | ABH102c/30  | ABH103c/30  | ABH104c/30  |
| 40 A                 | ABH102c/40  | ABH103c/40  | ABH104c/40  |
| 50 A                 | ABH102c/50  | ABH103c/50  | ABH104c/50  |
| 60 A                 | ABH102c/60  | ABH103c/60  | ABH104c/60  |
| 75 A                 | ABH102c/75  | ABH103c/75  | ABH104c/75  |
| 100 A                | ABH102c/100 | ABH103c/100 | ABH104c/100 |
| 125 A                | ABH102c/125 | ABH103c/125 | ABH104c/125 |

| ABL type (60kA/460V) |             |             |             |
|----------------------|-------------|-------------|-------------|
| Rated current, In    | 2-pole      | 3-pole      | 4-pole      |
| 15 A                 | ABL102c/15  | ABL103c/15  | ABL104c/15  |
| 20 A                 | ABL102c/20  | ABL103c/20  | ABL104c/20  |
| 30 A                 | ABL102c/30  | ABL103c/30  | ABL104c/30  |
| 40 A                 | ABL102c/40  | ABL103c/40  | ABL104c/40  |
| 50 A                 | ABL102c/50  | ABL103c/50  | ABL104c/50  |
| 60 A                 | ABL102c/60  | ABL103c/60  | ABL104c/60  |
| 75 A                 | ABL102c/75  | ABL103c/75  | ABL104c/75  |
| 100 A                | ABL102c/100 | ABL103c/100 | ABL104c/100 |
| 125 A                | ABL102c/125 | ABL103c/125 | ABL104c/125 |

### Accessories



#### Electrical auxiliaries

|       |                    |
|-------|--------------------|
| AX    | Auxiliary switch   |
| AL    | Alarm switch       |
| AX+AL | Combination switch |
| SHT   | Shunt trip         |
| UVT   | Undervoltage trip  |



#### Maximum possibilities

|            |                             |
|------------|-----------------------------|
| T-position | One of above auxiliaries    |
| R-position | Option of AX or AL or AX+AL |

Note) For more detail see 7-1 page



#### External accessories

| ABS125c<br>ABH125c | Name                                                                  |
|--------------------|-----------------------------------------------------------------------|
| IB13               | Insulation barrier                                                    |
| TCL23              | Terminal cover (Long)<br>- Single type, D-handle type, N-handle type  |
| TCS23              | Terminal cover (Short)<br>- Single type, D-handle type, N-handle type |
| N-40c              | Rotary handle (Direct)<br>- applicable for either 2, 3pole            |
| DH125              | Rotary handle (Direct)                                                |
| DHK125             | Rotary handle (Direct, key lock)                                      |
| EH125              | Rotary handle (Extended)                                              |
| RTB2               | Rear terminal (Bar)                                                   |
| RTR2               | Rear terminal (Round)                                                 |
| PB-C3              | Plug-in kit                                                           |
| <b>Handle lock</b> |                                                                       |
| MOP-M2             | Remote operation                                                      |

Note) For more detail see 7-9 ~ 7-26 page

- Single type: This cover is used without auxiliary handle.
- D-handle type: This cover is used with D-handle.
- N-handle type: This cover is used with N-handle.

# 250AF MCCB

ABN250c, ABS250c, ABH250c, ABL250c

## Ratings



ABS202c



ABS203c



ABS204c

### For more information

- Accessories ▶ 7-1 page
- Trip curves ▶ 8-3 page
- Drawings ▶ 9-4 page
- Connection and mounting ▶ 10-2 page

| Frame size                                        |                      |           | 250AF                        |     |      |         |     |      |         |     |     |             |     |     |
|---------------------------------------------------|----------------------|-----------|------------------------------|-----|------|---------|-----|------|---------|-----|-----|-------------|-----|-----|
| Type and pole                                     |                      |           | N-type                       |     |      | S-type  |     |      | H-type  |     |     | L-type      |     |     |
|                                                   | 2-pole               |           | ABN202c                      |     |      | ABS202c |     |      | ABH202c |     |     | ABL202c     |     |     |
|                                                   | 3-pole               |           | ABN203c                      |     |      | ABS203c |     |      | ABH203c |     |     | ABL203c     |     |     |
|                                                   | 4-pole               |           | ABN204c                      |     |      | ABS204c |     |      | ABH204c |     |     | ABL204c     |     |     |
| Rated current, I <sub>n</sub>                     |                      |           | 100-125-150-175-200-225-250A |     |      |         |     |      |         |     |     |             |     |     |
| Rated operational voltage, U <sub>e</sub>         |                      |           | AC: 690V                     |     |      |         |     |      |         |     |     |             |     |     |
|                                                   |                      |           | DC: 500V                     |     |      |         |     |      |         |     |     |             |     |     |
| Rated insulation voltage, U <sub>i</sub>          |                      |           | AC: 1000V                    |     |      |         |     |      |         |     |     |             |     |     |
| Rated impulse withstand voltage, U <sub>imp</sub> |                      |           | 8kV                          |     |      |         |     |      |         |     |     |             |     |     |
| Rated short-circuit breaking                      |                      |           | N-type                       |     |      | S-type  |     |      | H-type  |     |     | L-type      |     |     |
| capacity, I <sub>cu</sub>                         | AC                   | 690V      | 8kA                          |     |      | 8kA     |     |      | 10kA    |     |     | 10 (10)kA   |     |     |
|                                                   |                      | 480/500V  | 18kA                         |     |      | 26kA    |     |      | 35kA    |     |     | 35 (35)kA   |     |     |
|                                                   |                      | 460V      | 26kA                         |     |      | 37kA    |     |      | 50kA    |     |     | 60 (50)kA   |     |     |
|                                                   |                      | 415V      | 26kA                         |     |      | 37kA    |     |      | 50kA    |     |     | 60 (50)     |     |     |
|                                                   | DC                   | 380V      | 30kA                         |     |      | 42kA    |     |      | 50kA    |     |     | 60 (50)     |     |     |
|                                                   |                      | 220/250V  | 65kA                         |     |      | 85kA    |     |      | 100kA   |     |     | 125 (100)kA |     |     |
|                                                   |                      | 500V (3P) | 10kA                         |     |      | 20kA    |     |      | 30kA    |     |     | 30 (30)kA   |     |     |
|                                                   |                      | 250V (2P) | 10kA                         |     |      | 20kA    |     |      | 30kA    |     |     | 30 (30)kA   |     |     |
| I <sub>cs</sub> =%×I <sub>cu</sub>                |                      | 100%      |                              |     | 100% |         |     | 100% |         |     | ( ) |             |     |     |
| Protective function                               |                      |           | Overload, short-circuit      |     |      |         |     |      |         |     |     |             |     |     |
| Type of trip unit                                 |                      |           | Thermal-magnetic             |     |      |         |     |      |         |     |     |             |     |     |
| Magnetic trip range                               |                      |           | 12×I <sub>n</sub>            |     |      |         |     |      |         |     |     |             |     |     |
| Life cycle <sup>Note4)</sup>                      | Mechanical           |           | 25,000 operations            |     |      |         |     |      |         |     |     |             |     |     |
|                                                   | Electrical           |           | 10,000 operations            |     |      |         |     |      |         |     |     |             |     |     |
| Connection                                        | Standard             |           | Front connection             |     |      |         |     |      |         |     |     |             |     |     |
|                                                   | Optional             |           | Rear connection              |     |      |         |     |      |         |     |     |             |     |     |
|                                                   |                      |           | Plug-in                      |     |      |         |     |      |         |     |     |             |     |     |
| Mounting                                          | Standard             |           | Screw fixing                 |     |      |         |     |      |         |     |     |             |     |     |
| Dimensions (mm)                                   |                      | Pole      | 2p                           | 3p  | 4p   | 2p      | 3p  | 4p   | 2p      | 3p  | 4p  | 2p          | 3p  | 4p  |
|                                                   | a                    |           | 105                          | 105 | 140  | 105     | 105 | 140  | 105     | 105 | 140 | 105         | 105 | 140 |
|                                                   | b                    |           | 165                          |     |      | 165     |     |      | 165     |     |     | 165         |     |     |
|                                                   | c1 <sup>Note1)</sup> |           | 60                           |     |      | 60      |     |      | 60      |     |     | 60          |     |     |
|                                                   | c2 <sup>Note1)</sup> |           | 64                           |     |      | 64      |     |      | 64      |     |     | 64          |     |     |
|                                                   | d                    |           | 87                           |     |      | 87      |     |      | 87      |     |     | 87          |     |     |
|                                                   | Weight, kg           | Standard  | 1.1                          | 1.2 | 1.6  | 1.1     | 1.2 | 1.6  | 1.1     | 1.2 | 1.6 | 1.1         | 1.2 | 1.6 |
| Certification                                     |                      | Pole      | 2p                           | 3p  | 4p   | 2p      | 3p  | 4p   | 2p      | 3p  | 4p  | 2p          | 3p  | 4p  |
| CE marking                                        |                      | CE        | ○                            |     |      | ○       |     |      | ○       |     |     | ○           |     |     |

Note) 1. Depth by door cut size: c1 for large cut, c2 for small cut

2. 4-pole product's ampacity on neutral conductor is equal to or less than 50% of the rated current.

3. The I<sub>cs</sub>(Service breaking capacity) of ABL250AF are in ( )

4. Life cycle means not guarantee but limitation

(Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

## Ordering types

### Breaker types

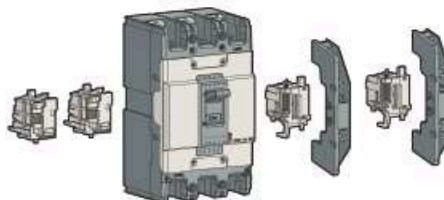
| ABN type (26kA/460V) |             |             |             |
|----------------------|-------------|-------------|-------------|
| Rated current, In    | 2-pole      | 3-pole      | 4-pole      |
| 100 A                | ABN202c/100 | ABN203c/100 | ABN204c/100 |
| 125 A                | ABN202c/125 | ABN203c/125 | ABN204c/125 |
| 150 A                | ABN202c/150 | ABN203c/150 | ABN204c/150 |
| 175 A                | ABN202c/175 | ABN203c/175 | ABN204c/175 |
| 200 A                | ABN202c/200 | ABN203c/200 | ABN204c/200 |
| 225 A                | ABN202c/225 | ABN203c/225 | ABN204c/225 |
| 250 A                | ABN202c/250 | ABN203c/250 | ABN204c/250 |

| ABS type (37kA/460V) |             |             |             |
|----------------------|-------------|-------------|-------------|
| Rated current, In    | 2-pole      | 3-pole      | 4-pole      |
| 100 A                | ABS202c/100 | ABS203c/100 | ABS204c/100 |
| 125 A                | ABS202c/125 | ABS203c/125 | ABS204c/125 |
| 150 A                | ABS202c/150 | ABS203c/150 | ABS204c/150 |
| 175 A                | ABS202c/175 | ABS203c/175 | ABS204c/175 |
| 200 A                | ABS202c/200 | ABS203c/200 | ABS204c/200 |
| 225 A                | ABS202c/225 | ABS203c/225 | ABS204c/225 |
| 250 A                | ABS202c/250 | ABS203c/250 | ABS204c/250 |

| ABH type (50kA/460V) |             |             |             |
|----------------------|-------------|-------------|-------------|
| Rated current, In    | 2-pole      | 3-pole      | 4-pole      |
| 100 A                | ABH202c/100 | ABH203c/100 | ABH204c/100 |
| 125 A                | ABH202c/125 | ABH203c/125 | ABH204c/125 |
| 150 A                | ABH202c/150 | ABH203c/150 | ABH204c/150 |
| 175 A                | ABH202c/175 | ABH203c/175 | ABH204c/175 |
| 200 A                | ABH202c/200 | ABH203c/200 | ABH204c/200 |
| 225 A                | ABH202c/225 | ABH203c/225 | ABH204c/225 |
| 250 A                | ABH202c/250 | ABH203c/250 | ABH204c/250 |

| ABL type (60kA/460V) |             |             |             |
|----------------------|-------------|-------------|-------------|
| Rated current, In    | 2-pole      | 3-pole      | 4-pole      |
| 100 A                | ABL202c/100 | ABL203c/100 | ABL204c/100 |
| 125 A                | ABL202c/125 | ABL203c/125 | ABL204c/125 |
| 150 A                | ABL202c/150 | ABL203c/150 | ABL204c/150 |
| 175 A                | ABL202c/175 | ABL203c/175 | ABL204c/175 |
| 200 A                | ABL202c/200 | ABL203c/200 | ABL204c/200 |
| 225 A                | ABL202c/225 | ABL203c/225 | ABL204c/225 |
| 250 A                | ABL202c/250 | ABL203c/250 | ABL204c/250 |

### Accessories



#### Electrical auxiliaries

|       |                    |
|-------|--------------------|
| AX    | Auxiliary switch   |
| AL    | Alarm switch       |
| AX+AL | Combination switch |
| SHT   | Shunt trip         |
| UVT   | Undervoltage trip  |



#### Maximum possibilities

|            |                             |
|------------|-----------------------------|
| T-position | One of above auxiliaries    |
| R-position | Option of AX or AL or AX+AL |

Note) For more detail see 7-1 page



#### External accessories

| ABH250c     | Name                                                                  |
|-------------|-----------------------------------------------------------------------|
| B33         | Insulation barrier                                                    |
| TCL33       | Terminal cover (Long)<br>- Single type, D-handle type, N-handle type  |
| TCS33       | Terminal cover (Short)<br>- Single type, D-handle type, N-handle type |
| N-50c       | Rotary handle (Direct)                                                |
| DH250       | Rotary handle (Direct)                                                |
| DHK250      | Rotary handle (Direct, key lock)                                      |
| EH250       | Rotary handle (Extended)                                              |
| RTB3        | Rear terminal (Bar)                                                   |
| RTR3        | Rear terminal (Round)                                                 |
| PBA250C     | Plug-in kit                                                           |
| Handle lock |                                                                       |
| MOP-M3      | Remote operation                                                      |

Note) For more detail see 7-9 ~ 7-26 page

- Single type: This cover is used without auxiliary handle.
- D-handle type: This cover is used with D-handle.
- N-handle type: This cover is used with N-handle.

# 400AF MCCB

ABN400c, ABS400c, ABH400c, ABL400c

## Ratings



ABS403c



ABL404c

| Frame size                                                                          |                     |           |      | 400AF                   |      |       |         |     |     |         |     |     |         |     |  |
|-------------------------------------------------------------------------------------|---------------------|-----------|------|-------------------------|------|-------|---------|-----|-----|---------|-----|-----|---------|-----|--|
| Type and pole                                                                       |                     |           |      | N-type                  |      |       | S-type  |     |     | H-type  |     |     | L-type  |     |  |
| 2-pole                                                                              |                     |           |      | ABN402c                 |      |       | ABS402c |     |     | ABH402c |     |     | ABL402c |     |  |
| 3-pole                                                                              |                     |           |      | ABN403c                 |      |       | ABS403c |     |     | ABH403c |     |     | ABL403c |     |  |
| 4-pole                                                                              |                     |           |      | ABN404c                 |      |       | ABS404c |     |     | ABH404c |     |     | ABL404c |     |  |
| Rated current, I <sub>n</sub>                                                       |                     |           |      | 250-300-350-400A        |      |       |         |     |     |         |     |     |         |     |  |
| Rated operational voltage, U <sub>e</sub>                                           |                     |           |      | AC: 690V                |      |       |         |     |     |         |     |     |         |     |  |
|                                                                                     |                     |           |      | DC: 500V                |      |       |         |     |     |         |     |     |         |     |  |
| Rated insulation voltage, U <sub>i</sub>                                            |                     |           |      | AC: 1000V               |      |       |         |     |     |         |     |     |         |     |  |
| Rated impulse withstand voltage, U <sub>imp</sub>                                   |                     |           |      | 8kV                     |      |       |         |     |     |         |     |     |         |     |  |
| Rated short-circuit breaking                                                        |                     |           |      | N-type                  |      |       | S-type  |     |     | H-type  |     |     | L-type  |     |  |
| capacity, I <sub>cu</sub>                                                           | AC                  | 690V      | 5kA  | 8kA                     | 10kA | 14kA  |         |     |     |         |     |     |         |     |  |
|                                                                                     |                     | 480/500V  | 18kA | 35kA                    | 50kA | 65kA  |         |     |     |         |     |     |         |     |  |
|                                                                                     |                     | 415/460V  | 37kA | 50kA                    | 65kA | 85kA  |         |     |     |         |     |     |         |     |  |
|                                                                                     |                     | 380V      | 42kA | 65kA                    | 70kA | 100kA |         |     |     |         |     |     |         |     |  |
|                                                                                     | DC                  | 500V (3P) | 10kA | 20kA                    | 40kA | 40kA  |         |     |     |         |     |     |         |     |  |
|                                                                                     |                     | 250V (2P) | 10kA | 20kA                    | 40kA | 40kA  |         |     |     |         |     |     |         |     |  |
| I <sub>cs</sub> =%×I <sub>cu</sub>                                                  |                     |           | 100% | 100%                    | 100% | 75    |         |     |     |         |     |     |         |     |  |
| Protective function                                                                 |                     |           |      | Overload, short-circuit |      |       |         |     |     |         |     |     |         |     |  |
| Type of trip unit                                                                   |                     |           |      | Thermal-magnetic        |      |       |         |     |     |         |     |     |         |     |  |
| Magnetic trip range                                                                 |                     |           |      | 8~12I <sub>n</sub>      |      |       |         |     |     |         |     |     |         |     |  |
| Life cycle <sup>Note3)</sup>                                                        | Mechanical          |           |      | 4,000 operations        |      |       |         |     |     |         |     |     |         |     |  |
|                                                                                     | Electrical          |           |      | 1,000 operations        |      |       |         |     |     |         |     |     |         |     |  |
| Connection                                                                          | Standard            |           |      | Front connection        |      |       |         |     |     |         |     |     |         |     |  |
|                                                                                     | Optional            |           |      | Plug-in                 |      |       |         |     |     |         |     |     |         |     |  |
| Mounting                                                                            | Standard            |           |      | Screw fixing            |      |       |         |     |     |         |     |     |         |     |  |
| Dimensions (mm)                                                                     |                     | Pole      | 2p   | 3p                      | 4p   | 2p    | 3p      | 4p  | 2p  | 3p      | 4p  | 2p  | 3p      | 4p  |  |
|  | a                   | 140       | 140  | 184                     | 140  | 140   | 184     | 140 | 140 | 184     | 140 | 140 | 184     |     |  |
|                                                                                     | b                   | 257       | 257  | 257                     | 257  |       |         |     |     |         |     |     |         |     |  |
|                                                                                     | c1 <sup>Note)</sup> | 109       | 109  | 109                     | 109  |       |         |     |     |         |     |     |         |     |  |
|                                                                                     | c2 <sup>Note)</sup> | 113       | 113  | 113                     | 113  |       |         |     |     |         |     |     |         |     |  |
|                                                                                     | d                   | 145       | 145  | 145                     | 145  |       |         |     |     |         |     |     |         |     |  |
|                                                                                     | e1                  | 140       | 140  | 140                     | 140  |       |         |     |     |         |     |     |         |     |  |
| Weight, kg                                                                          |                     | Standard  | 5.2  | 6.2                     | 7.8  | 5.2   | 6.2     | 7.8 | 5.2 | 6.2     | 7.8 | 5.2 | 6.2     | 7.8 |  |
| Certification                                                                       |                     | Pole      | 2p   | 3p                      | 4p   | 2p    | 3p      | 4p  | 2p  | 3p      | 4p  | 2p  | 3p      | 4p  |  |
| CE marking                                                                          |                     | CE        | ○    | ○                       | ○    | ○     | ○       | ○   | ○   | ○       | ○   | ○   | ○       | ○   |  |

Note) 1. Depth by door cut size: c1 for large cut, c2 for small cut  
 2. 4-pole product's ampacity on neutral conductor is equal to or less than 50% of the rated current.  
 3. Life cycle means not guarantee but limitation  
 (Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

### For more information

- Accessories ▶ 7-2 page
- Trip curves ▶ 8-4 page
- Drawings ▶ 9-5 page
- Connection and mounting ▶ 10-3 page

## Ordering types

### Breaker types

| ABN type (37kA/460V) |             |             |             |
|----------------------|-------------|-------------|-------------|
| Rated current, In    | 2-pole      | 3-pole      | 4-pole      |
| 250 A                | ABN402c/250 | ABN403c/250 | ABN404c/250 |
| 300 A                | ABN402c/300 | ABN403c/300 | ABN404c/300 |
| 350 A                | ABN402c/350 | ABN403c/350 | ABN404c/350 |
| 400 A                | ABN402c/400 | ABN403c/400 | ABN404c/400 |

| ABS type (50kA/460V) |             |             |             |
|----------------------|-------------|-------------|-------------|
| Rated current, In    | 2-pole      | 3-pole      | 4-pole      |
| 250 A                | ABS402c/250 | ABS403c/250 | ABS404c/250 |
| 300 A                | ABS402c/300 | ABS403c/300 | ABS404c/300 |
| 350 A                | ABS402c/350 | ABS403c/350 | ABS404c/350 |
| 400 A                | ABS402c/400 | ABS403c/400 | ABS404c/400 |

| ABH type (65kA/460V) |             |             |             |
|----------------------|-------------|-------------|-------------|
| Rated current, In    | 2-pole      | 3-pole      | 4-pole      |
| 250 A                | ABH402c/250 | ABH403c/250 | ABH404c/250 |
| 300 A                | ABH402c/300 | ABH403c/300 | ABH404c/300 |
| 350 A                | ABH402c/350 | ABH403c/350 | ABH404c/350 |
| 400 A                | ABH402c/400 | ABH403c/400 | ABH404c/400 |

| ABL type (85kA/460V) |             |             |             |
|----------------------|-------------|-------------|-------------|
| Rated current, In    | 2-pole      | 3-pole      | 4-pole      |
| 250 A                | ABL402c/250 | ABL403c/250 | ABL404c/250 |
| 300 A                | ABL402c/300 | ABL403c/300 | ABL404c/300 |
| 350 A                | ABL402c/350 | ABL403c/350 | ABL404c/350 |
| 400 A                | ABL402c/400 | ABL403c/400 | ABL404c/400 |

### Accessories



### Electrical auxiliaries

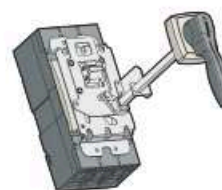
|     |                   |
|-----|-------------------|
| AX  | Auxiliary switch  |
| AL  | Alarm switch      |
| SHT | Shunt trip        |
| UVT | Undervoltage trip |



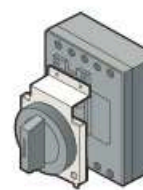
### Maximum possibilities

|            |                                   |
|------------|-----------------------------------|
| T-position | Option of 2AX, 2AL and SHT or UVT |
| R-position | Option of 2AX, 2AL and SHT or UVT |

Note) For more detail see 7-2 page



E-70U



N-70



MOP-M4

### External accessories

|          |                                                                  |
|----------|------------------------------------------------------------------|
| B-43B    | Insulation barrier                                               |
| T1-43A   | Terminal cover (Long) - 2, 3pole<br>- Single type, N-handle type |
| T1-44A   | Terminal cover (Long) - 4pole                                    |
| N-70     | Rotary handle (Direct)                                           |
| E-70U    | Rotary handle (Extended)                                         |
| MI-43    | Mechanical interlock - 2, 3pole                                  |
| MI-44    | Mechanical interlock - 4pole                                     |
| PB-I3-FR | Plug-in kit                                                      |
| MOP-M4   | Remote operation                                                 |

Note) For more detail see 7-9 ~ 7-26 page

# 800AF MCCB

## ABN800c, ABS800c, ABL800c

### Ratings



ABS803c



ABL804c

| Frame size                                                                          |                      |                                    | 800AF                   |      |      |         |      |      |         |     |      |
|-------------------------------------------------------------------------------------|----------------------|------------------------------------|-------------------------|------|------|---------|------|------|---------|-----|------|
| Type and pole                                                                       |                      |                                    | N-type                  |      |      | S-type  |      |      | L-type  |     |      |
|                                                                                     | 2-pole               |                                    | ABN802c                 |      |      | ABS802c |      |      | ABL802c |     |      |
|                                                                                     | 3-pole               |                                    | ABN803c                 |      |      | ABS803c |      |      | ABL803c |     |      |
|                                                                                     | 4-pole               |                                    | ABN804c                 |      |      | ABS804c |      |      | ABL804c |     |      |
| Rated current, I <sub>n</sub>                                                       |                      |                                    | 500-630-700-800A        |      |      |         |      |      |         |     |      |
| Rated operational voltage, U <sub>e</sub>                                           |                      |                                    | AC: 690V                |      |      |         |      |      |         |     |      |
|                                                                                     |                      |                                    | DC: 500V                |      |      |         |      |      |         |     |      |
| Rated insulation voltage, U <sub>i</sub>                                            |                      |                                    | AC: 1000V               |      |      |         |      |      |         |     |      |
| Rated impulse withstand voltage, U <sub>imp</sub>                                   |                      |                                    | 8kV                     |      |      |         |      |      |         |     |      |
| Rated short-circuit breaking                                                        |                      |                                    | N-type                  |      |      | S-type  |      |      | L-type  |     |      |
| capacity, I <sub>cu</sub>                                                           | AC                   | 690V                               | 8kA                     |      |      | 10kA    |      |      | 14kA    |     |      |
|                                                                                     |                      | 480/500V                           | 25kA                    |      |      | 45kA    |      |      | 65kA    |     |      |
|                                                                                     |                      | 415/460V                           | 37kA                    |      |      | 65kA    |      |      | 85kA    |     |      |
|                                                                                     |                      | 380V                               | 45kA                    |      |      | 75kA    |      |      | 100kA   |     |      |
|                                                                                     | DC                   | 500V (3P)                          | 10kA                    |      |      | 20kA    |      |      | 40kA    |     |      |
|                                                                                     |                      | 250V (2P)                          | 10kA                    |      |      | 20kA    |      |      | 40kA    |     |      |
|                                                                                     |                      | I <sub>cs</sub> =%×I <sub>cu</sub> |                         | 100% |      |         | 100% |      |         | 75% |      |
| Protective function                                                                 |                      |                                    | Overload, short-circuit |      |      |         |      |      |         |     |      |
| Type of trip unit                                                                   |                      |                                    | Thermal-magnetic        |      |      |         |      |      |         |     |      |
| Magnetic trip range                                                                 |                      |                                    | 8~12I <sub>n</sub>      |      |      |         |      |      |         |     |      |
| Life cycle <sup>Note1)</sup>                                                        | Mechanical           |                                    | 2,500 operations        |      |      |         |      |      |         |     |      |
|                                                                                     | Electrical           |                                    | 500 operations          |      |      |         |      |      |         |     |      |
| Connection                                                                          | Standard             |                                    | Front connection        |      |      |         |      |      |         |     |      |
|                                                                                     | Optional             |                                    | Plug-in                 |      |      |         |      |      |         |     |      |
| Mounting                                                                            |                      |                                    | Screw fixing            |      |      |         |      |      |         |     |      |
| Dimensions (mm)                                                                     |                      | Pole                               | 2p                      | 3p   | 4p   | 2p      | 3p   | 4p   | 2p      | 3p  | 4p   |
|  | a                    |                                    | 210                     | 210  | 280  | 210     | 210  | 280  | 210     | 210 | 280  |
|                                                                                     | b                    |                                    |                         | 280  |      |         | 280  |      |         | 280 |      |
|                                                                                     | c1 <sup>Note1)</sup> |                                    |                         | 109  |      |         | 109  |      |         | 109 |      |
|                                                                                     | c2 <sup>Note1)</sup> |                                    |                         | 113  |      |         | 113  |      |         | 113 |      |
|                                                                                     | d                    |                                    |                         | 145  |      |         | 145  |      |         | 145 |      |
|                                                                                     |                      |                                    |                         |      |      |         |      |      |         |     |      |
| Weight, kg                                                                          |                      | Standard                           | 7.7                     | 8.8  | 11.4 | 7.7     | 8.8  | 11.4 | 7.7     | 8.8 | 11.4 |
| Certification                                                                       |                      | Pole                               | 2p                      | 3p   | 4p   | 2p      | 3p   | 4p   | 2p      | 3p  | 4p   |
| CE marking                                                                          |                      | CE                                 |                         | ○    |      |         | ○    |      |         | ○   |      |

Note) 1. Depth by door cut size: c1 for large cut, c2 for small cut  
 2. 4-pole product's ampacity on neutral conductor is equal to or less than 50% of the rated current.  
 3. Life cycle means not guarantee but limitation  
 (Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

#### For more information

- Accessories ▶ 7-2 page
- Trip curves ▶ 8-4 page
- Drawings ▶ 9-6 page
- Connection and mounting ▶ 10-3 page

## Ordering types

### Breaker types

| ABN type (37kA/460V) |             |             |             |
|----------------------|-------------|-------------|-------------|
| Rated current, In    | 2-pole      | 3-pole      | 4-pole      |
| 500 A                | ABN802c/500 | ABN803c/500 | ABN804c/500 |
| 630 A                | ABN802c/630 | ABN803c/630 | ABN804c/630 |
| 700 A                | ABN802c/700 | ABN803c/700 | ABN804c/700 |
| 800 A                | ABN802c/800 | ABN803c/800 | ABN804c/800 |

| ABS type (65kA/460V) |             |             |             |
|----------------------|-------------|-------------|-------------|
| Rated current, In    | 2-pole      | 3-pole      | 4-pole      |
| 500 A                | ABS802c/500 | ABS803c/500 | ABS804c/500 |
| 630 A                | ABS802c/630 | ABS803c/630 | ABS804c/630 |
| 700 A                | ABS802c/700 | ABS803c/700 | ABS804c/700 |
| 800 A                | ABS802c/800 | ABS803c/800 | ABS804c/800 |

| ABL type (85kA/460V) |             |             |             |
|----------------------|-------------|-------------|-------------|
| Rated current, In    | 2-pole      | 3-pole      | 4-pole      |
| 500 A                | ABL802c/500 | ABL803c/500 | ABL804c/500 |
| 630 A                | ABL802c/630 | ABL803c/630 | ABL804c/630 |
| 700 A                | ABL802c/700 | ABL803c/700 | ABL804c/700 |
| 800 A                | ABL802c/800 | ABL803c/800 | ABL804c/800 |

### Accessories



#### Electrical auxiliaries

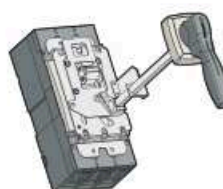
|            |                   |
|------------|-------------------|
| <b>AX</b>  | Auxiliary switch  |
| <b>AL</b>  | Alarm switch      |
| <b>SHT</b> | Shunt trip        |
| <b>UVT</b> | Undervoltage trip |



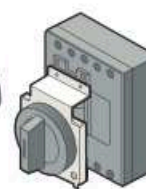
#### Maximum possibilities

|                   |                                   |
|-------------------|-----------------------------------|
| <b>T-position</b> | Option of 2AX, 2AL and SHT or UVT |
| <b>R-position</b> | Option of 2AX, 2AL and SHT or UVT |

Note) For more detail see 7-2 page



E-80U



N-80



MOP-M5

#### External accessories

|                 |                                                                  |
|-----------------|------------------------------------------------------------------|
| <b>B-33C</b>    | Insulation barrier                                               |
| <b>T1-63A</b>   | Terminal cover (Long) - 2, 3pole<br>- Single type, N-handle type |
| <b>T1-64A</b>   | Terminal cover (Long) - 4pole                                    |
| <b>N-80</b>     | Rotary handle (Direct)                                           |
| <b>E-80U</b>    | Rotary handle (Extended)                                         |
| <b>MI-83S</b>   | Mechanical interlock - 2, 3pole                                  |
| <b>MI-84S</b>   | Mechanical interlock - 4pole                                     |
| <b>PB-J3-FR</b> | Plug-in kit                                                      |
| <b>MOP-M5</b>   | Remote operation                                                 |

Note) For more detail see 7-9 - 7-26 page

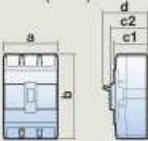
# 1000/1200AF MCCB

## ABS1000b/1200b, ABL1000b/1200b

### Ratings



① Adjustable instantaneous for each phase

| Frame size                                                                          |            |          | 1000AF                    |          | 1200AF   |          |      |
|-------------------------------------------------------------------------------------|------------|----------|---------------------------|----------|----------|----------|------|
| Type and pole                                                                       |            |          | S-type                    | L-type   | S-type   | L-type   |      |
|                                                                                     | 2-pole     |          | -                         | -        | -        | -        |      |
|                                                                                     | 3-pole     |          | ABS1003b                  | ABL1003b | ABS1203b | ABL1203b |      |
|                                                                                     | 4-pole     |          | ABS1004b                  | ABL1004b | ABS1204b | ABL1204b |      |
| Rated current, I <sub>n</sub>                                                       |            |          | 1000A                     |          | 1200A    |          |      |
| Rated operational voltage, U <sub>e</sub>                                           |            |          | AC: 600V                  |          |          |          |      |
| Rated insulation voltage, U <sub>i</sub>                                            |            |          | 690V                      |          |          |          |      |
| Rated impulse withstand voltage, U <sub>imp</sub>                                   |            |          | 6kV                       |          |          |          |      |
| Rated short-circuit breaking capacity, I <sub>cu</sub>                              |            |          | S-type                    | L-type   | S-type   | L-type   |      |
| IEC 60947-2 (I <sub>cu</sub> )                                                      | AC 690V    |          | 45kA                      | 65kA     | 45kA     | 65kA     |      |
|                                                                                     | 480/500V   |          | 50kA                      | 75kA     | 50kA     | 75kA     |      |
|                                                                                     | 460V/415V  |          | 65kA                      | 85kA     | 65kA     | 85kA     |      |
|                                                                                     | 380V       |          | 65kA                      | 85kA     | 65kA     | 85kA     |      |
|                                                                                     | 220/250V   |          | 100kA                     | 125kA    | 100kA    | 125kA    |      |
| I <sub>cs</sub> =% × I <sub>cu</sub>                                                |            |          | 50%                       | 50%      | 50%      | 50%      |      |
| Protective function                                                                 |            |          | Overload, short-circuit   |          |          |          |      |
| Type of trip unit                                                                   |            |          | Thermal-magnetic          |          |          |          |      |
| Magnetic trip range                                                                 |            |          | 3~6 × I <sub>n</sub> ...① |          |          |          |      |
| Life cycle <small>Note3)</small>                                                    | Mechanical |          | 2,500 operations          |          |          |          |      |
|                                                                                     | Electrical |          | 500 operations            |          |          |          |      |
| Connection                                                                          |            |          | Standard                  |          |          |          |      |
| Mounting                                                                            |            |          | Standard                  |          |          |          |      |
| Dimensions (mm)                                                                     |            |          | Pole                      | 3p       | 4p       | 3p       | 4p   |
|  | a          |          | 220                       | 290      | 220      | 290      |      |
|                                                                                     | b          |          | 400                       | 400      | 400      | 400      |      |
|                                                                                     | c          |          | 105                       | 105      | 105      | 105      |      |
|                                                                                     | d          |          | 159                       | 159      | 159      | 159      |      |
|                                                                                     |            |          |                           |          |          |          |      |
| Weight, kg                                                                          |            |          | Standard                  | 19.6     | 25.7     | 19.6     | 25.7 |
| Certification                                                                       |            |          | Pole                      | 3p       | 4p       | 3p       | 4p   |
| CE marking                                                                          | ☪☪         | ABS1003b | ABS1004b                  | ABS1203b | ABS1204b |          |      |
|                                                                                     |            | ○        | ×                         | ○        | ×        |          |      |
|                                                                                     |            | ABL1003b | ABL1004b                  | ABL1203b | ABL1204b |          |      |
|                                                                                     |            | ×        | ×                         | ×        | ×        |          |      |

Note) 1. Please specify the frequency when ordering.  
 2. 4-pole product's ampacity on neutral conductor is equal to or less than 50% of the rated current.  
 3. Life cycle means not guarantee but limitation  
 (Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

#### For more information

- Trip curves ▶ 8-5 page
- Drawings ▶ 9-7 page

## Ordering types

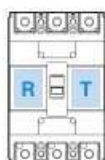
### Breaker types

| ABS type (65kA/460V) |               |               |
|----------------------|---------------|---------------|
| Rated current, In    | 3-pole        | 4-pole        |
| 1000 A               | ABS1003b/1000 | ABS1004b/1000 |
| 1200 A               | ABS1203b/1200 | ABS1204b/1200 |

| ABL type (85kA/460V) |               |               |
|----------------------|---------------|---------------|
| Rated current, In    | 3-pole        | 4-pole        |
| 1000 A               | ABL1003b/1000 | ABL1004b/1000 |
| 1200 A               | ABL1203b/1200 | ABL1204b/1200 |

### Option of below items for T-position

|               |                                    |
|---------------|------------------------------------|
| <b>AX1</b>    | Auxiliary switch (1c)              |
| <b>AX2</b>    | Auxiliary switch (2c)              |
| <b>AL1</b>    | Alarm switch (1c)                  |
| <b>AL2</b>    | Alarm switch (2c)                  |
| <b>AX1+AL</b> | Auxiliary (1c) + Alarm (1c) switch |
| <b>AX2+AL</b> | Auxiliary (2c) + Alarm (1c) switch |



### Option of below items for R-position

|            |                   |
|------------|-------------------|
| <b>SHT</b> | Shunt trip        |
| <b>UVT</b> | Undervoltage trip |



MOP-M6

### External accessories

|               |                  |
|---------------|------------------|
| <b>MOP-M6</b> | Remote operation |
|---------------|------------------|

Note) For more detail see 7-25 page

### Contact operation for auxiliary and alarm switches

| MCCB      | On | Off | Trip |
|-----------|----|-----|------|
| <b>AX</b> |    |     |      |
| <b>AL</b> |    |     |      |

### Contact rating for auxiliary and alarm switches

| AC          |                |                | DC          |                |                |
|-------------|----------------|----------------|-------------|----------------|----------------|
| Voltage (V) | Current (A)    |                | Voltage (V) | Current (A)    |                |
|             | Resistive load | Inductive load |             | Resistive load | Inductive load |
| 125         | 20             | 20             | 30          | 6              | 5              |
| 250         | 20             | 20             | 125         | 0.4            | 0.05           |
| 500         | 10             | 5              | 250         | 0.2            | 0.03           |

### Rating for shunt trip (SHT)

| Control voltage |                  | Time rating | Operational voltage        |
|-----------------|------------------|-------------|----------------------------|
| AC              | 100~110V<br>125V | Continuous  | 85~110% of control voltage |
|                 | 200~220V         |             |                            |
|                 | 380~440V         |             |                            |
|                 | 480~550V         |             |                            |
| DC              | 24V<br>48V       |             | 75~125% of control voltage |
|                 | 100~110V         |             |                            |
|                 | 125V             |             |                            |
|                 | 200~220V         |             |                            |

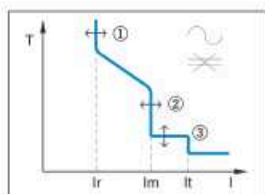
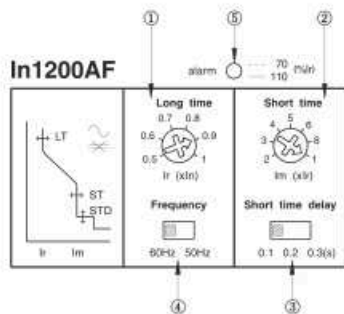
### Rating for undervoltage release (UVT)

| Control voltage |                  | Time rating | Operational voltage        | Trip voltage              |
|-----------------|------------------|-------------|----------------------------|---------------------------|
| AC              | 100~110V<br>125V | Continuous  | 85~110% of control voltage | 20~70% of control voltage |
|                 | 200~220V         |             |                            |                           |
|                 | 380~440V         |             |                            |                           |
|                 |                  |             |                            |                           |

# 1200AF Electronic MCCB

## ABS1203bE

### Ratings



#### For more information

- Trip curves ▶ 8-5 page
- Drawings ▶ 9-8 page

| Frame size                                      |                 | 1200AF                                                              |
|-------------------------------------------------|-----------------|---------------------------------------------------------------------|
| Type and pole                                   |                 | S-type                                                              |
|                                                 | 2-pole          | -                                                                   |
|                                                 | 3-pole          | ABS1203bE                                                           |
|                                                 | 4-pole          | -                                                                   |
| Rated current, $I_n$                            |                 | 1200A                                                               |
| Rated operational voltage, $U_e$                |                 | AC: 600V                                                            |
| Rated insulation voltage, $U_i$                 |                 | AC: 690V                                                            |
| Rated impulse withstand voltage, $U_{imp}$      |                 | 6kV                                                                 |
| Type                                            |                 |                                                                     |
| Long time                                       | Current, $I_R$  | $(0.5-0.6-0.7-0.8-0.9-1.0) \times I_n$ , adjustable... <sup>①</sup> |
| Pick-up                                         | Time            | 5sec $\pm$ 20% at $6 \times I_R$ , fixed                            |
| Short time                                      | Current, $I_m$  | $(2-3-4-5-6-8-10) \times I_n$ , adjustable... <sup>②</sup>          |
| Pick-up                                         | Time            | 0.1-0.2-0.3 sec, adjustable... <sup>③</sup>                         |
| Instantaneous                                   | Current, $I_t$  | $11 \times I_n$ , fixed                                             |
| Pick-up                                         | Time            | within 0.03 sec, fixed                                              |
| ⑤ LED                                           | Pre-alarm       | Between 70 to 110% of set current $I_R$ : LED flickering            |
|                                                 |                 | Over 110% of set current $I_R$ : stays on                           |
| ④ Rated frequency                               |                 | 50-60Hz selectable by the switch of the trip unit                   |
| Rated short-circuit breaking capacity, $I_{cu}$ |                 | S-type                                                              |
|                                                 | AC 690V         | 45kA                                                                |
|                                                 | 480/500V        | 50kA                                                                |
|                                                 | <b>415/460V</b> | <b>65kA</b>                                                         |
|                                                 | 380V            | 65kA                                                                |
|                                                 | <b>220/250V</b> | <b>100kA</b>                                                        |
| $I_{cs} = \% \times I_{cu}$                     |                 | 50%                                                                 |
| Protective function                             |                 | Overload, short-circuit                                             |
| Type of trip unit                               |                 | Electronic type                                                     |
| Life cycle <sup>Note1)</sup>                    | Mechanical      | 2,500 operations                                                    |
|                                                 | Electrical      | 500 operations                                                      |
| Connection                                      |                 | Front connection                                                    |
| Mounting                                        |                 | Screw fixing                                                        |
| Dimensions (mm)                                 |                 |                                                                     |
|                                                 | Pole            | 3p                                                                  |
|                                                 | a               | 220                                                                 |
|                                                 | b               | 400                                                                 |
|                                                 | c               | 105                                                                 |
|                                                 | d               | 159                                                                 |
| Weight, kg                                      |                 | 21                                                                  |

Note) 1. Life cycle means not guarantee but limitation  
(Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

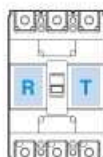
## Ordering types

### Breaker types

| ABS type (65kA/460V)          |           |
|-------------------------------|-----------|
| Rated current, I <sub>n</sub> | 3-pole    |
| 1200 A                        | ABS1203bE |

### Option of below items for T-position

|               |                                    |
|---------------|------------------------------------|
| <b>AX1</b>    | Auxiliary switch (1c)              |
| <b>AX2</b>    | Auxiliary switch (2c)              |
| <b>AL1</b>    | Alarm switch (1c)                  |
| <b>AL2</b>    | Alarm switch (2c)                  |
| <b>AX1+AL</b> | Auxiliary (1c) + Alarm (1c) switch |
| <b>AX2+AL</b> | Auxiliary (2c) + Alarm (1c) switch |



### Option of below items for R-position

|            |                   |
|------------|-------------------|
| <b>SHT</b> | Shunt trip        |
| <b>UVT</b> | Undervoltage trip |

### Contact operation for auxiliary and alarm switches

| MCCB      | On | Off | Trip |
|-----------|----|-----|------|
| <b>AX</b> |    |     |      |
| <b>AL</b> |    |     |      |

### Contact rating for auxiliary and alarm switches

| AC          |                |                | DC          |                |                |
|-------------|----------------|----------------|-------------|----------------|----------------|
| Voltage (V) | Current (A)    |                | Voltage (V) | Current (A)    |                |
|             | Resistive load | Inductive load |             | Resistive load | Inductive load |
| 125         | 20             | 20             | 30          | 6              | 5              |
| 250         | 20             | 20             | 125         | 0.4            | 0.05           |
| 500         | 10             | 5              | 250         | 0.2            | 0.03           |

### Rating for shunt trip (SHT)

|    | Control voltage      | Time rating | Operational voltage        |
|----|----------------------|-------------|----------------------------|
| AC | 100~110V             | Continuous  | 85~110% of control voltage |
|    | 125V                 |             |                            |
|    | 200~220V             |             |                            |
|    | 380~440V<br>480~550V |             |                            |
| DC | 24V                  |             | 75~125% of control voltage |
|    | 48V                  |             |                            |
|    | 100~110V             |             |                            |
|    | 125V                 |             |                            |
|    | 200~220V             |             |                            |

### Rating for undervoltage release (UVT)

|    | Control voltage | Time rating | Operational voltage        | trip voltage              |
|----|-----------------|-------------|----------------------------|---------------------------|
| AC | 100~110V        | Continuous  | 85~110% of control voltage | 20~70% of control voltage |
|    | 125V            |             |                            |                           |
|    | 200~220V        |             |                            |                           |
|    | 380~440V        |             |                            |                           |



EBS33c

## Ratings

| Frame size                                                                          |                                              | 30AF                                             |     |     |     |
|-------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------|-----|-----|-----|
| Type and pole                                                                       |                                              | S-type                                           |     |     |     |
|                                                                                     | 2-pole (2-sensor)                            | EBS32c                                           |     |     |     |
|                                                                                     | 3-pole (3-sensor)                            | EBS33c                                           |     |     |     |
|                                                                                     | 4-pole (3-sensor)                            | EBS34c                                           |     |     |     |
| Rated current, I <sub>n</sub>                                                       |                                              | (5-10) <sup>Note3)</sup> 15-20-30A               |     |     |     |
| Rated impulse withstand voltage, U <sub>imp</sub>                                   |                                              | 6kV                                              |     |     |     |
| Instantaneous type                                                                  | Rated residual current, I <sub>Δn</sub>      | 30, 100, 100/200/500, 100/300/500mA (Adjustable) |     |     |     |
|                                                                                     | Residual current off-time at I <sub>Δn</sub> | ≤0.1 sec                                         |     |     |     |
|                                                                                     | Rated operational voltage, U <sub>e</sub>    | AC: 220/460V                                     |     |     |     |
| Time delay type                                                                     | Rated residual current                       | 0.1/0.2/0.5/1A, 0.1/0.4/1/2A (Adjustable)        |     |     |     |
|                                                                                     | Intentional time delay                       | 0/0.2/0.5/1s, 0.5/1/1.5/2s (Adjustable)          |     |     |     |
| Wiring system                                                                       | 2-pole (2-sensor)                            | 1Ø2W                                             |     |     |     |
|                                                                                     | 3-pole (3-sensor)                            | 1Ø2W, 1Ø3W, 3Ø3W                                 |     |     |     |
|                                                                                     | 4-pole (3-sensor)                            | 1Ø2W, 1Ø3W, 3Ø3W, 3Ø4W                           |     |     |     |
| Rated short-circuit breaking capacity, I <sub>cu</sub>                              |                                              | S-type                                           |     |     |     |
| AC                                                                                  | 460V                                         | 14 (10)kA                                        |     |     |     |
|                                                                                     | 415V                                         | 14 (10)kA                                        |     |     |     |
|                                                                                     | 220/250V                                     | 30 (25)kA                                        |     |     |     |
| I <sub>cs</sub> =% × I <sub>cu</sub>                                                |                                              | 100%                                             |     |     |     |
| Protective function                                                                 |                                              | Overload, short-circuit and ground fault         |     |     |     |
| Type of trip unit                                                                   |                                              | Thermal-magnetic                                 |     |     |     |
| Magnetic trip range                                                                 |                                              | 400A                                             |     |     |     |
| Life cycle <sup>Note6)</sup>                                                        | Mechanical                                   | 25,000 operations                                |     |     |     |
|                                                                                     | Electrical                                   | 10,000 operations                                |     |     |     |
| Connection                                                                          | Standard                                     | Front connection                                 |     |     |     |
|                                                                                     | Optional                                     | Rear connection                                  |     |     |     |
| Mounting                                                                            | Standard                                     | Screw fixing                                     |     |     |     |
| Dimensions (mm)                                                                     |                                              | Pole                                             | 2p  | 3p  | 4p  |
|  | a                                            |                                                  | 75  |     | 100 |
|                                                                                     | b                                            |                                                  | 130 |     | 130 |
|                                                                                     | c1 <sup>Note1)</sup>                         |                                                  | 60  |     | 60  |
|                                                                                     | c2 <sup>Note1)</sup>                         |                                                  | 64  |     | 64  |
|                                                                                     | d                                            |                                                  | 82  |     | 82  |
|                                                                                     |                                              |                                                  |     |     |     |
| Weight, kg                                                                          | Standard                                     | 0.5                                              | 0.7 | 0.9 |     |
| Certification                                                                       |                                              | Pole                                             | 3p  | 4p  |     |
| CE marking                                                                          | CE                                           | ○                                                | ○   |     |     |

Note) 1. Depth by door cut size: c1 for large cut, c2 for small cut  
2. Do not test withstand voltage or insulation resistance test between poles to avoid the damage of the PCB.  
3. The short-circuit breaking capacities in ( ) are applied to the rated current in (5, 10A)  
4. 4-pole product's ampacity on neutral conductor is equal to or less than 50% of the rated current.  
5. Rated non-trip current sensitivity is equal to or less than 50% of the rated current sensitivity.  
6. Life cycle means not guarantee but limitation  
(Quantity guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

### For more information

- Accessories ▶ 7-1 page
- Trip curves ▶ 8-1 page
- Drawings ▶ 9-9 page
- Connection and mounting ▶ 10-2 page

## Ordering types

### Breaker types

#### Instantaneous type

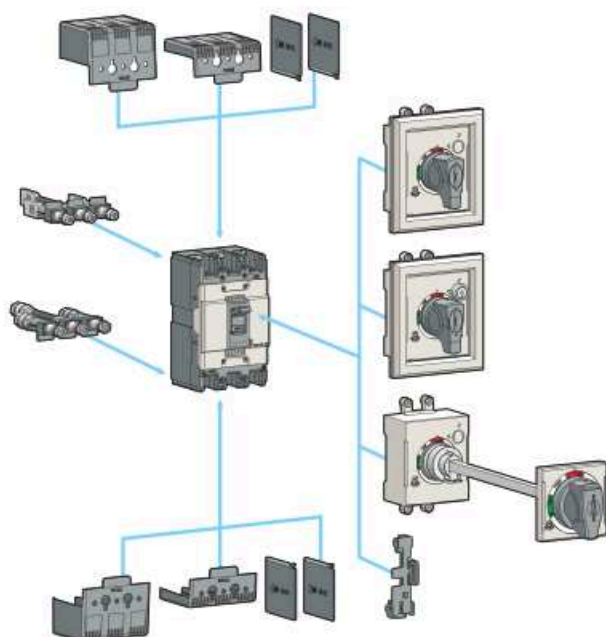
| EBS33c |                     | 5    |                  | 30          |                           |
|--------|---------------------|------|------------------|-------------|---------------------------|
| Code   | Frame size/<br>Pole | Code | Rated<br>current | Code        | Rated residual<br>current |
| EBS32c | EBS 30AF 2P         | 5    | 5A               | 30          | 30mA                      |
| EBS33c | EBS 30AF 3P         | 10   | 10A              | 100         | 100mA                     |
| EBS34c | EBS 30AF 4P         | 15   | 15A              | 100/200/500 | 100/200/500mA             |
|        |                     | 20   | 20A              | 100/300/500 | 100/300/500mA             |
|        |                     | 25   | 25A              |             |                           |
|        |                     | 30   | 30A              |             |                           |

Note) EBS32c/5/30: EBS32c, Rated current 5A, Rated residual current 30mA

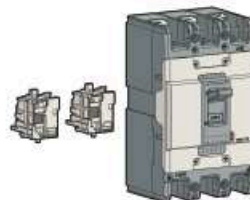
#### Time delay type

| EBS33c |                     | 5    |                  | 1A1s |                           |                           |
|--------|---------------------|------|------------------|------|---------------------------|---------------------------|
| Code   | Frame size/<br>Pole | Code | Rated<br>current | Code | Rated residual<br>current | Intentional<br>time delay |
| EBS32c | EBS 30AF 2P         | 5    | 5A               | 1A1s | 1A                        | 1s                        |
| EBS33c | EBS 30AF 3P         | 10   | 10A              | 2A2s | 2A                        | 2s                        |
| EBS34c | EBS 30AF 4P         | 15   | 15A              |      |                           |                           |
|        |                     | 20   | 20A              |      |                           |                           |
|        |                     | 25   | 25A              |      |                           |                           |
|        |                     | 30   | 30A              |      |                           |                           |

Note) EBS32c/5/30: EBS32c, Rated current 5A, Time delay type 1A1s



### Accessories



#### Electrical auxiliaries

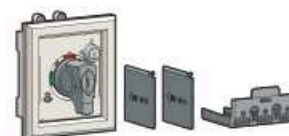
|       |                    |
|-------|--------------------|
| AX    | Auxiliary switch   |
| AL    | Alarm switch       |
| AX+AL | Combination switch |



#### Maximum possibilities

|            |                             |
|------------|-----------------------------|
| T-position | Not available               |
| R-position | Option of AX or AL or AX+AL |

Note) For more detail see 7-1 page



#### External accessories

| EBS30c             | Name                                                                  |
|--------------------|-----------------------------------------------------------------------|
| IB13               | Insulation barrier                                                    |
| TCL13              | Terminal cover (Long)<br>- Single type, D-handle type, N-handle type  |
| TCS13              | Terminal cover (Short)<br>- Single type, D-handle type, N-handle type |
| N-30c              | Rotary handle (Direct)                                                |
| DH100              | Rotary handle (Direct)                                                |
| DHK100             | Rotary handle (Direct, key lock)                                      |
| EH100              | Rotary handle (Extended)                                              |
| RTR1               | Rear terminal (Bar)                                                   |
| <b>Handle lock</b> |                                                                       |

Note) For more detail see 7-9 ~ 7-23 page

- Single type: This cover is used without auxiliary handle.
- D-handle type: This cover is used with D-handle.
- N-handle type: This cover is used with N-handle.

# 50AF ELCB

## EBN50c, EBS50c, EBH50c

### Ratings



EBN53c



EBS53c

| Frame size                                                                          |                                              | 50AF                                             |        |     |        |     |     |     |
|-------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------|--------|-----|--------|-----|-----|-----|
| Type and pole                                                                       |                                              | N-type                                           | S-type |     | H-type |     |     |     |
|                                                                                     | 2-pole (2-sensor)                            | EBN52c                                           | -      |     | -      |     |     |     |
|                                                                                     | 3-pole (3-sensor)                            | EBN53c                                           | EBS53c |     | EBH53c |     |     |     |
|                                                                                     | 4-pole (3-sensor)                            | -                                                | EBS54c |     | EBH54c |     |     |     |
| Rated current, I <sub>n</sub>                                                       |                                              | 15-20-30-40-50A                                  |        |     |        |     |     |     |
| Rated impulse withstand voltage, U <sub>imp</sub>                                   |                                              | 6kV                                              |        |     |        |     |     |     |
| Instantaneous type                                                                  | Rated residual current, I <sub>Δn</sub>      | 30, 100, 100/200/500, 100/300/500mA (Adjustable) |        |     |        |     |     |     |
|                                                                                     | Residual current off-time at I <sub>Δn</sub> | ≤0.1 sec                                         |        |     |        |     |     |     |
|                                                                                     | Rated operational voltage, U <sub>e</sub>    | AC: 220/460V                                     |        |     |        |     |     |     |
| Time delay type                                                                     | Rated residual current                       | 0.1/0.2/0.5/1A, 0.1/0.4/1/2A (Adjustable)        |        |     |        |     |     |     |
|                                                                                     | Intentional time delay                       | 0/0.2/0.5/1s, 0.5/1/1.5/2s (Adjustable)          |        |     |        |     |     |     |
| Wiring system                                                                       | 2-pole (2-sensor)                            | 1Ø2W                                             |        |     |        |     |     |     |
|                                                                                     | 3-pole (3-sensor)                            | 1Ø2W, 1Ø3W, 3Ø3W                                 |        |     |        |     |     |     |
|                                                                                     | 4-pole (3-sensor)                            | 1Ø2W, 1Ø3W, 3Ø3W, 3Ø4W                           |        |     |        |     |     |     |
| Rated short-circuit breaking capacity, I <sub>cu</sub>                              |                                              | N-type                                           | S-type |     | H-type |     |     |     |
| AC                                                                                  | 460V                                         | 14kA                                             | 18kA   |     | 50kA   |     |     |     |
|                                                                                     | 415V                                         | 14kA                                             | 18kA   |     | 50kA   |     |     |     |
|                                                                                     | 220/250V                                     | 30kA                                             | 35kA   |     | 100kA  |     |     |     |
| I <sub>cs</sub> =%×I <sub>cu</sub>                                                  |                                              | 100%                                             | 100%   |     | 100%   |     |     |     |
| Protective function                                                                 |                                              | Overload, short-circuit and ground fault         |        |     |        |     |     |     |
| Type of trip unit                                                                   |                                              | Thermal-magnetic                                 |        |     |        |     |     |     |
| Magnetic trip range                                                                 |                                              | 12×I <sub>n</sub> (30A and under: 400A)          |        |     |        |     |     |     |
| Life cycle <sup>Note5)</sup>                                                        | Mechanical                                   | 25,000 operations                                |        |     |        |     |     |     |
|                                                                                     | Electrical                                   | 10,000 operations                                |        |     |        |     |     |     |
| Connection                                                                          | Standard                                     | Front connection                                 |        |     |        |     |     |     |
|                                                                                     | Optional                                     | Rear connection                                  |        |     |        |     |     |     |
| Mounting                                                                            |                                              | Screw fixing                                     |        |     |        |     |     |     |
| Dimensions (mm)                                                                     |                                              | Pole                                             | 2p     | 3p  | 3p     | 4p  | 3p  | 4p  |
|  | a                                            |                                                  | 75     | 75  | 75     | 100 | 90  | 120 |
|                                                                                     | b                                            |                                                  | 130    |     | 130    |     | 155 |     |
|                                                                                     | c1 <sup>Note1)</sup>                         |                                                  | 60     |     | 60     |     | 60  |     |
|                                                                                     | c2 <sup>Note1)</sup>                         |                                                  | 64     |     | 64     |     | 64  |     |
|                                                                                     | d                                            |                                                  | 82     |     | 82     |     | 82  |     |
|                                                                                     |                                              |                                                  |        |     |        |     |     |     |
| Weight, kg                                                                          |                                              | Standard                                         | 0.5    | 0.7 | 0.7    | 0.9 | 1   | 1.2 |
| Certification                                                                       |                                              | Pole                                             | 2p     | 3p  | 3p     | 4p  | 3p  | 4p  |
| CE marking                                                                          |                                              | CE                                               | ○      |     | ○      |     | ○   |     |

Note) 1. Depth by door cut size: c1 for large cut, c2 for small cut  
 2. Do not test withstand voltage or insulation resistance test between poles to avoid the damage of the PCB.  
 3. 4-pole product's ampacity on neutral conductor is equal to or less than 50% of the rated current.  
 4. Rated non-trip current sensitivity is equal to or less than 50% of the rated current sensitivity.  
 5. Life cycle means not guarantee but limitation  
 (Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

#### For more information

- Accessories ▶ 7-1 page
- Trip curves ▶ 8-1 ~ 8-2 page
- Drawings ▶ 9-9 ~ 9-10 page
- Connection and mounting ▶ 10-2 page

## Ordering types

### Breaker types

#### Instantaneous type

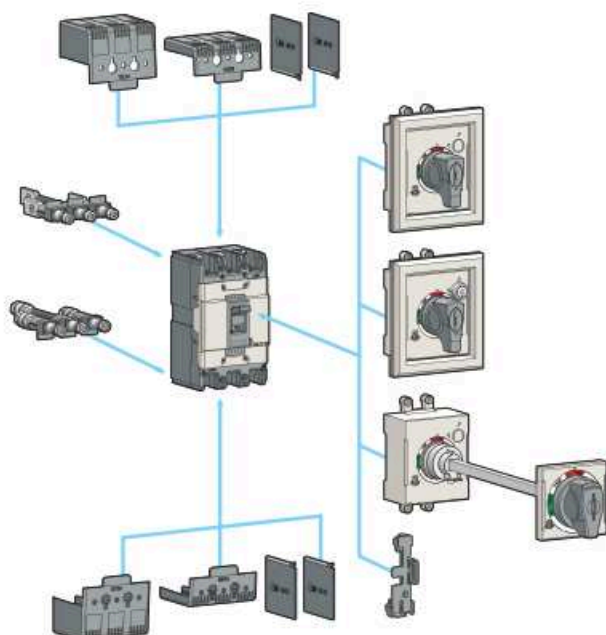
| EBN53c |                     | 20   |                  | 30          |                           |
|--------|---------------------|------|------------------|-------------|---------------------------|
| Code   | Frame size/<br>Pole | Code | Rated<br>current | Code        | Rated residual<br>current |
| EBN52c | EBN 50AF 2P         | 15   | 15A              | 30          | 30mA                      |
| EBN53c | EBN 50AF 3P         | 20   | 20A              | 100         | 100mA                     |
| EBS53c | EBS 50AF 3P         | 30   | 30A              | 100/200/500 | 100/200/500mA             |
| EBS54c | EBS 50AF 4P         | 40   | 40A              | 100/300/500 | 100/300/500mA             |
| EBH53c | EBH 50AF 3P         | 50   | 50A              |             |                           |
| EBH54c | EBH 50AF 4P         |      |                  |             |                           |

Note) EBS53c/20/30: EBS53c, Rated current 20A, Rated residual current 30mA

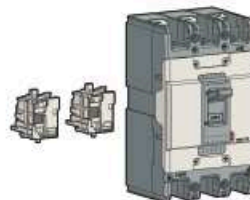
#### Time delay type

| EBN53c |                     | 20   |                  | 1A1s |                           |                           |
|--------|---------------------|------|------------------|------|---------------------------|---------------------------|
| Code   | Frame size/<br>Pole | Code | Rated<br>current | Code | Rated residual<br>current | Intentional<br>time delay |
| EBN52c | EBN 50AF 2P         | 15   | 15A              | 1A1s | 1A                        | 1s                        |
| EBN53c | EBN 50AF 3P         | 20   | 20A              | 2A2s | 2A                        | 2s                        |
| EBS53c | EBS 50AF 3P         | 30   | 30A              |      |                           |                           |
| EBS54c | EBS 50AF 4P         | 40   | 40A              |      |                           |                           |
| EBH53c | EBH 50AF 3P         | 50   | 50A              |      |                           |                           |
| EBH54c | EBH 50AF 4P         |      |                  |      |                           |                           |

Note) EBS53c/20/30: EBS53c, Rated current 20A, Time delay type 1A1s



### Accessories



#### Electrical auxiliaries

|       |                    |
|-------|--------------------|
| AX    | Auxiliary switch   |
| AL    | Alarm switch       |
| AX+AL | Combination switch |



#### Maximum possibilities

|            |                             |
|------------|-----------------------------|
| T-position | Not available               |
| R-position | Option of AX or AL or AX+AL |

Note) For more detail see 7-1 page



#### External accessories

| EBN50c<br>EBS50c | EBH50c | Name                                                                  |
|------------------|--------|-----------------------------------------------------------------------|
| IB13             | IB23   | Insulation barrier                                                    |
| TCL13            | TCL23  | Terminal cover (Long)<br>- Single type, D-handle type, N-handle type  |
| TCS13            | TCS23  | Terminal cover (Short)<br>- Single type, D-handle type, N-handle type |
| N-30c            | N-40c  | Rotary handle (Direct)                                                |
| DH100            | DH125  | Rotary handle (Direct)                                                |
| DHK100           | DHK125 | Rotary handle (Direct, key lock)                                      |
| EH100            | EH125  | Rotary handle (Extended)                                              |
| -                | RTB2   | Rear terminal (Bar)                                                   |
| RTR1             | RTR2   | Rear terminal (Round)                                                 |
| Handle lock      |        |                                                                       |

Note) For more detail see 7-9 ~ 7-23 page

- Single type: This cover is used without auxiliary handle.
- D-handle type: This cover is used with D-handle.
- N-handle type: This cover is used with N-handle.

# 60AF ELCB

## EBN60c, EBS60c



EBN63c

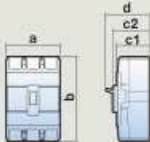


EBS63c

### For more information

- Accessories ▶ 7-1 page
- Trip curves ▶ 8-1 page
- Drawings ▶ 9-9 page
- Connection and mounting ▶ 10-2 page

## Ratings

| Frame size                                                                          |                                              | 60AF                                             |     |        |     |
|-------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------|-----|--------|-----|
| Type and pole                                                                       |                                              | N-type                                           |     | S-type |     |
|                                                                                     | 2-pole (2-sensor)                            | -                                                |     | -      |     |
|                                                                                     | 3-pole (3-sensor)                            | EBN63c                                           |     | EBS63c |     |
|                                                                                     | 4-pole (3-sensor)                            | -                                                |     | EBS64c |     |
| Rated current, I <sub>n</sub>                                                       |                                              | 60A                                              |     |        |     |
| Rated impulse withstand voltage, U <sub>imp</sub>                                   |                                              | 6kV                                              |     |        |     |
| Instantaneous type                                                                  | Rated residual current, I <sub>Δn</sub>      | 30, 100, 100/200/500, 100/300/500mA (Adjustable) |     |        |     |
|                                                                                     | Residual current off-time at I <sub>Δn</sub> | ≤0.1 sec                                         |     |        |     |
|                                                                                     | Rated operational voltage, U <sub>e</sub>    | AC: 220/460V                                     |     |        |     |
| Time delay type                                                                     | Rated residual current                       | 0.1/0.2/0.5/1A, 0.1/0.4/1/2A (Adjustable)        |     |        |     |
|                                                                                     | Intentional time delay                       | 0/0.2/0.5/1s, 0.5/1/1.5/2s (Adjustable)          |     |        |     |
| Wiring system                                                                       | 2-pole (2-sensor)                            | -                                                |     |        |     |
|                                                                                     | 3-pole (3-sensor)                            | 1Ø2W, 1Ø3W, 3Ø3W                                 |     |        |     |
|                                                                                     | 4-pole (3-sensor)                            | 1Ø2W, 1Ø3W, 3Ø3W, 3Ø4W                           |     |        |     |
| Rated short-circuit breaking capacity, I <sub>cu</sub>                              |                                              | N-type                                           |     | S-type |     |
| AC                                                                                  | 460V                                         | 14kA                                             |     | 18kA   |     |
|                                                                                     | 415V                                         | 14kA                                             |     | 18kA   |     |
|                                                                                     | 220/250V                                     | 30kA                                             |     | 35kA   |     |
| I <sub>cs</sub> =% × I <sub>cu</sub>                                                |                                              | 100%                                             |     | 100%   |     |
| Protective function                                                                 |                                              | Overload, short-circuit and ground fault         |     |        |     |
| Type of trip unit                                                                   |                                              | Thermal-magnetic                                 |     |        |     |
| Magnetic trip range                                                                 |                                              | 12 × I <sub>n</sub>                              |     |        |     |
| Life cycle <sup>Note5)</sup>                                                        | Mechanical                                   | 25,000 operations                                |     |        |     |
|                                                                                     | Electrical                                   | 10,000 operations                                |     |        |     |
| Connection                                                                          | Standard                                     | Front connection                                 |     |        |     |
|                                                                                     | Optional                                     | Rear connection                                  |     |        |     |
| Mounting                                                                            |                                              | Screw fixing                                     |     |        |     |
| Dimensions (mm)                                                                     |                                              | Pole                                             | 3p  | 3p     | 4p  |
|  | a                                            |                                                  | 75  | 75     | 100 |
|                                                                                     | b                                            |                                                  | 130 | 130    | 130 |
|                                                                                     | c1 <sup>Note1)</sup>                         |                                                  | 60  | 60     | 60  |
|                                                                                     | c2 <sup>Note1)</sup>                         |                                                  | 64  | 64     | 64  |
|                                                                                     | d                                            |                                                  | 82  | 82     | 82  |
| Weight, kg                                                                          |                                              | Standard                                         | 0.7 | 0.7    | 0.9 |
| Certification                                                                       |                                              | Pole                                             | 3p  | 3p     | 4p  |
| CE marking                                                                          |                                              | CE                                               | ○   |        | ○   |

- Note) 1. Depth by door cut size: c1 for large cut, c2 for small cut  
 2. Do not test withstand voltage or insulation resistance test between poles to avoid the damage of the PCB.  
 3. 4-pole product's ampacity on neutral conductor is equal to or less than 50% of the rated current.  
 4. Rated non-trip current sensitivity is equal to or less than 50% of the rated current sensitivity.  
 5. Life cycle means not guarantee but limitation  
 (Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

## Ordering types

### Breaker types

#### Instantaneous type

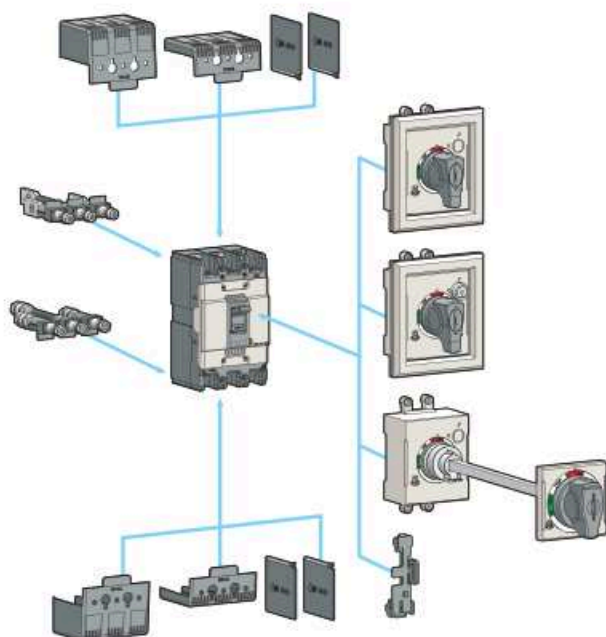
| EBN63c |                     | 60   |                  | 30          |                           |
|--------|---------------------|------|------------------|-------------|---------------------------|
| Code   | Frame size/<br>Pole | Code | Rated<br>current | Code        | Rated residual<br>current |
| EBN63c | EBN 60AF 3P         | 60   | 60A              | 30          | 30mA                      |
| EBS63c | EBS 60AF 3P         |      |                  | 100         | 100mA                     |
| EBS64c | EBS 60AF 4P         |      |                  | 100/200/500 | 100/200/500mA             |
|        |                     |      |                  | 100/300/500 | 100/300/500mA             |

Note) EBS63c/60/30: EBS63c, Rated current 60A, Rated residual current 30mA

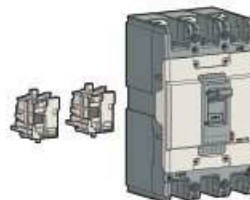
#### Time delay type

| EBN63c |                     | 60   |                  | 1A1s |                           |                           |
|--------|---------------------|------|------------------|------|---------------------------|---------------------------|
| Code   | Frame size/<br>Pole | Code | Rated<br>current | Code | Rated residual<br>current | Intentional<br>time delay |
| EBN63c | EBN 60AF 3P         | 60   | 60A              | 1A1s | 1A                        | 1s                        |
| EBS63c | EBS 60AF 3P         |      |                  | 2A2s | 2A                        | 2s                        |
| EBS64c | EBS 60AF 4P         |      |                  |      |                           |                           |

Note) EBS63c/60/30: EBS63c, Rated current 60A, Time delay type 1A1s



### Accessories



#### Electrical auxiliaries

|       |                    |
|-------|--------------------|
| AX    | Auxiliary switch   |
| AL    | Alarm switch       |
| AX+AL | Combination switch |



#### Maximum possibilities

|            |                             |
|------------|-----------------------------|
| T-position | Not available               |
| R-position | Option of AX or AL or AX+AL |

Note) For more detail see 7-1 page



#### External accessories

| EBS60c<br>EBN60c   | Name                                                                  |
|--------------------|-----------------------------------------------------------------------|
| IB13               | Insulation barrier                                                    |
| TCL13              | Terminal cover (Long)<br>- Single type, D-handle type, N-handle type  |
| TCS13              | Terminal cover (Short)<br>- Single type, D-handle type, N-handle type |
| N-30c              | Rotary handle (Direct)                                                |
| DH100              | Rotary handle (Direct)                                                |
| DHK100             | Rotary handle (Direct, key lock)                                      |
| EH100              | Rotary handle (Extended)                                              |
| RTB1               | Rear terminal (Bar)                                                   |
| RTR1               | Rear terminal (Round)                                                 |
| <b>Handle lock</b> |                                                                       |

Note) For more detail see 7-9 ~ 7-23 page

- Single type: This cover is used without auxiliary handle.
- D-handle type: This cover is used with D-handle.
- N-handle type: This cover is used with N-handle.



EBN103c

## Ratings

| Frame size                                                                          |                                              | 100AF                                            |     |     |     |
|-------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------|-----|-----|-----|
| Type and pole                                                                       |                                              | N-type                                           |     |     |     |
|                                                                                     | 2-pole (2-sensor)                            | EBN102c                                          |     |     |     |
|                                                                                     | 3-pole (3-sensor)                            | EBN103c                                          |     |     |     |
|                                                                                     | 4-pole (3-sensor)                            | EBN104c                                          |     |     |     |
| Rated current, I <sub>n</sub>                                                       |                                              | 60-75-100A                                       |     |     |     |
| Rated impulse withstand voltage, U <sub>imp</sub>                                   |                                              | 6kV                                              |     |     |     |
| Instantaneous type                                                                  | Rated residual current, I <sub>Δn</sub>      | 30, 100, 100/200/500, 100/300/500mA (Adjustable) |     |     |     |
|                                                                                     | Residual current off-time at I <sub>Δn</sub> | ≤0.1 sec                                         |     |     |     |
|                                                                                     | Rated operational voltage, U <sub>e</sub>    | AC: 220/460V                                     |     |     |     |
| Time delay type                                                                     | Rated residual current                       | 0.1/0.2/0.5/1A, 0.1/0.4/1/2A (Adjustable)        |     |     |     |
|                                                                                     | Intentional time delay                       | 0/0.2/0.5/1s, 0.5/1/1.5/2s (Adjustable)          |     |     |     |
| Wiring system                                                                       | 2-pole (2-sensor)                            | 1Ø2W                                             |     |     |     |
|                                                                                     | 3-pole (3-sensor)                            | 1Ø2W, 1Ø3W, 3Ø3W                                 |     |     |     |
|                                                                                     | 4-pole (3-sensor)                            | 1Ø2W, 1Ø3W, 3Ø3W, 3Ø4W                           |     |     |     |
| Rated short-circuit breaking capacity, I <sub>cu</sub>                              |                                              | N-type                                           |     |     |     |
| AC                                                                                  | 460V                                         | 18kA                                             |     |     |     |
|                                                                                     | 415V                                         | 18kA                                             |     |     |     |
|                                                                                     | 220/250V                                     | 35kA                                             |     |     |     |
| I <sub>cs</sub> =%×I <sub>cu</sub>                                                  |                                              | 100%                                             |     |     |     |
| Protective function                                                                 |                                              | Overload, short-circuit and ground fault         |     |     |     |
| Type of trip unit                                                                   |                                              | Thermal-magnetic                                 |     |     |     |
| Magnetic trip range                                                                 |                                              | 12×I <sub>n</sub>                                |     |     |     |
| Life cycle <sup>Note5)</sup>                                                        | Mechanical                                   | 25,000 operations                                |     |     |     |
|                                                                                     | Electrical                                   | 10,000 operations                                |     |     |     |
| Connection                                                                          | Standard                                     | Front connection                                 |     |     |     |
|                                                                                     | Optional                                     | Rear connection                                  |     |     |     |
| Mounting                                                                            | Standard                                     | Screw fixing                                     |     |     |     |
| Dimensions (mm)                                                                     |                                              | Pole                                             | 2p  | 3p  | 4p  |
|  | a                                            |                                                  | 75  | 75  | 100 |
|                                                                                     | b                                            |                                                  | 130 | 130 | 130 |
|                                                                                     | c1 <sup>Note1)</sup>                         |                                                  | 60  | 60  | 60  |
|                                                                                     | c2 <sup>Note2)</sup>                         |                                                  | 64  | 64  | 64  |
|                                                                                     | d                                            |                                                  | 82  | 82  | 82  |
|                                                                                     |                                              |                                                  |     |     |     |
| Weight, kg                                                                          | Standard                                     |                                                  | 0.5 | 0.7 | 0.9 |
| Certification                                                                       |                                              | Pole                                             | 2p  | 3p  | 4p  |
| CE marking                                                                          | CE                                           |                                                  | ○   | ○   | ○   |

Note) 1. Depth by door cut size: c1 for large cut, c2 for small cut  
2. Do not test withstand voltage or insulation resistance test between poles to avoid the damage of the PCB.  
3. 4-pole product's ampacity on neutral conductor is equal to or less than 50% of the rated current.  
4. Rated non-trip current sensitivity is equal to or less than 50% of the rated current sensitivity.  
5. Life cycle means not guarantee but limitation  
(Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

### For more information

- Accessories ▶ 7-1 page
- Trip curves ▶ 8-1 page
- Drawings ▶ 9-9 page
- Connection and mounting ▶ 10-2 page

## Ordering types

### Breaker types

#### Instantaneous type

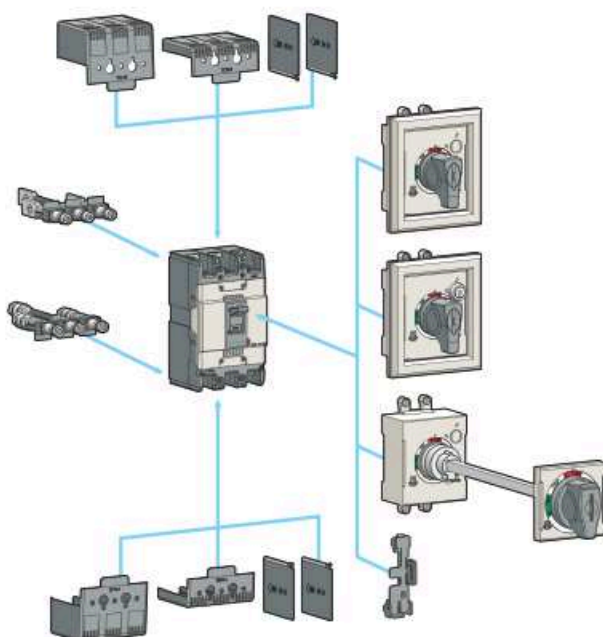
| EBN103c |                     | / | 100  |                  | / | 30          |                           |
|---------|---------------------|---|------|------------------|---|-------------|---------------------------|
| Code    | Frame size/<br>Pole |   | Code | Rated<br>current |   | Code        | Rated residual<br>current |
| EBN102c | EBN 100AF 2P        |   | 60   | 60A              |   | 30          | 30mA                      |
| EBN103c | EBN 100AF 3P        |   | 75   | 75A              |   | 100         | 100mA                     |
| EBN104c | EBN 100AF 4P        |   | 100  | 100A             |   | 100/200/500 | 100/200/500mA             |
|         |                     |   |      |                  |   | 100/300/500 | 100/300/500mA             |

Note) EBN103c/100/30: EBN103c, Rated current 100A, Rated residual current 30mA

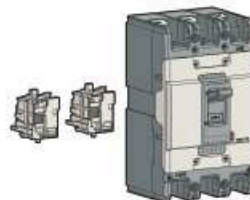
#### Time delay type

| EBN103c |                     | / | 100  |                  | / | 1A1s |                           |                           |
|---------|---------------------|---|------|------------------|---|------|---------------------------|---------------------------|
| Code    | Frame size/<br>Pole |   | Code | Rated<br>current |   | Code | Rated residual<br>current | Intentional<br>time delay |
| EBN102c | EBN 100AF 2P        |   | 60   | 60A              |   | 1A1s | 1A                        | 1s                        |
| EBN103c | EBN 100AF 3P        |   | 75   | 75A              |   | 2A2s | 2A                        | 2s                        |
| EBN104c | EBN 100AF 4P        |   | 100  | 100A             |   |      |                           |                           |

Note) EBN103c/100/30: EBN103c, Rated current 100A, Time delay type 1A1s



### Accessories



#### Electrical auxiliaries

|       |                    |
|-------|--------------------|
| AX    | Auxiliary switch   |
| AL    | Alarm switch       |
| AX+AL | Combination switch |



#### Maximum possibilities

|            |                             |
|------------|-----------------------------|
| T-position | Not available               |
| R-position | Option of AX or AL or AX+AL |

Note) For more detail see 7-1 page



#### External accessories

| EBN100c            | Name                                                                  |
|--------------------|-----------------------------------------------------------------------|
| IB13               | Insulation barrier                                                    |
| TCL13              | Terminal cover (Long)<br>- Single type, D-handle type, N-handle type  |
| TCS13              | Terminal cover (Short)<br>- Single type, D-handle type, N-handle type |
| N-30c              | Rotary handle (Direct)                                                |
| DH100              | Rotary handle (Direct)                                                |
| DHK100             | Rotary handle (Direct, key lock)                                      |
| EH100              | Rotary handle (Extended)                                              |
| RTB1               | Rear terminal (Bar)                                                   |
| RTR1               | Rear terminal (Round)                                                 |
| <b>Handle lock</b> |                                                                       |

Note) For more detail see 7-9~ 7-23 page

- Single type: This cover is used without auxiliary handle.
- D-handle type: This cover is used with D-handle.
- N-handle type: This cover is used with N-handle.

## Ratings



EBS103c



EBH103c

| Frame size                                                                          |                                              | 125AF                                            |     |         |     |     |
|-------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------|-----|---------|-----|-----|
| Type and pole                                                                       |                                              | S-type                                           |     | H-type  |     |     |
| 2-pole (2-sensor)                                                                   |                                              | -                                                |     | -       |     |     |
| 3-pole (3-sensor)                                                                   |                                              | EBS103c                                          |     | EBH103c |     |     |
| 4-pole (3-sensor)                                                                   |                                              | EBS104c                                          |     | EBH104c |     |     |
| Rated current, I <sub>n</sub>                                                       |                                              | 15-20-30-40-50-60-75-100-125A                    |     |         |     |     |
| Rated impulse withstand voltage, U <sub>imp</sub>                                   |                                              | 6kV                                              |     |         |     |     |
| Instantaneous type                                                                  | Rated residual current, I <sub>Δn</sub>      | 30, 100, 100/200/500, 100/300/500mA (Adjustable) |     |         |     |     |
|                                                                                     | Residual current off-time at I <sub>Δn</sub> | ≤0.1 sec                                         |     |         |     |     |
|                                                                                     | Rated operational voltage, U <sub>e</sub>    | AC: 220/460V                                     |     |         |     |     |
| Time delay type                                                                     | Rated residual current                       | 0.1/0.2/0.5/1A, 0.1/0.4/1/2A (Adjustable)        |     |         |     |     |
|                                                                                     | Intentional time delay                       | 0/0.2/0.5/1s, 0.5/1/1.5/2s (Adjustable)          |     |         |     |     |
| Wiring system                                                                       | 2-pole (2-sensor)                            | -                                                |     |         |     |     |
|                                                                                     | 3-pole (3-sensor)                            | 1Ø2W, 1Ø3W, 3Ø3W                                 |     |         |     |     |
|                                                                                     | 4-pole (3-sensor)                            | 1Ø2W, 1Ø3W, 3Ø3W, 3Ø4W                           |     |         |     |     |
| Rated short-circuit breaking capacity, I <sub>cu</sub>                              |                                              | N-type                                           |     | S-type  |     |     |
| AC                                                                                  | 460V                                         | 37kA                                             |     | 50kA    |     |     |
|                                                                                     | 415V                                         | 37kA                                             |     | 50kA    |     |     |
|                                                                                     | 220/250V                                     | 85kA                                             |     | 100kA   |     |     |
| I <sub>cs</sub> =% × I <sub>cu</sub>                                                |                                              | 100%                                             |     | 100%    |     |     |
| Protective function                                                                 |                                              | Overload, short-circuit and ground fault         |     |         |     |     |
| Type of trip unit                                                                   |                                              | Thermal-magnetic                                 |     |         |     |     |
| Magnetic trip range                                                                 |                                              | 12 × I <sub>n</sub> (30A and under: 400A)        |     |         |     |     |
| Life cycle <sup>Note5)</sup>                                                        | Mechanical                                   | 25,000 operations                                |     |         |     |     |
|                                                                                     | Electrical                                   | 10,000 operations                                |     |         |     |     |
| Connection                                                                          | Standard                                     | Front connection                                 |     |         |     |     |
|                                                                                     | Optional                                     | Rear connection                                  |     |         |     |     |
| Mounting                                                                            |                                              | Screw fixing                                     |     |         |     |     |
| Dimensions (mm)                                                                     |                                              | Pole                                             | 3p  | 4p      | 3p  | 4p  |
|  | a                                            |                                                  | 90  | 120     | 90  | 120 |
|                                                                                     | b                                            |                                                  | 155 | 155     | 155 | 155 |
|                                                                                     | c1 <sup>Note1)</sup>                         |                                                  | 60  | 60      | 60  | 60  |
|                                                                                     | c2 <sup>Note1)</sup>                         |                                                  | 64  | 64      | 64  | 64  |
|                                                                                     | d                                            |                                                  | 82  | 82      | 82  | 82  |
|                                                                                     |                                              |                                                  |     |         |     |     |
| Weight, kg                                                                          |                                              | Standard                                         | 1   | 1.2     | 1   | 1.2 |
| Certification                                                                       |                                              | Pole                                             | 3p  | 4p      | 3p  | 4p  |
| CE marking                                                                          |                                              | CE                                               | ○   | ○       | ○   | ○   |

Note) 1. Depth by door cut size: c1 for large cut, c2 for small cut  
2. Do not test withstand voltage or insulation resistance test between poles to avoid the damage of the PCB.  
3. 4-pole product's ampacity on neutral conductor is equal to or less than 50% of the rated current.  
4. Rated non-trip current sensitivity is equal to or less than 50% of the rated current sensitivity.  
5. Life cycle means not guarantee but limitation  
(Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

### For more information

- Accessories ▶ 7-1 page
- Trip curves ▶ 8-2 page
- Drawings ▶ 9-10 page
- Connection and mounting ▶ 10-2 page

## Ordering types

### Breaker types

#### Instantaneous type

| EBS103c |                     | / | 100  |                  | / | 30          |                           |
|---------|---------------------|---|------|------------------|---|-------------|---------------------------|
| Code    | Frame size/<br>Pole |   | Code | Rated<br>current |   | Code        | Rated residual<br>current |
| EBS103c | EBS 125AF 3P        |   | 15   | 15A              |   | 30          | 30mA                      |
| EBS104c | EBS 125AF 4P        |   | 20   | 20A              |   | 100         | 100mA                     |
| EBH103c | EBH 125AF 3P        |   | 30   | 30A              |   | 100/200/500 | 100/200/500mA             |
| EBH104c | EBH 125AF 4P        |   | 40   | 40A              |   | 100/300/500 | 100/300/500mA             |
|         |                     |   | 50   | 50A              |   |             |                           |
|         |                     |   | 60   | 60A              |   |             |                           |
|         |                     |   | 75   | 75A              |   |             |                           |
|         |                     |   | 100  | 100A             |   |             |                           |
|         |                     |   | 125  | 125A             |   |             |                           |

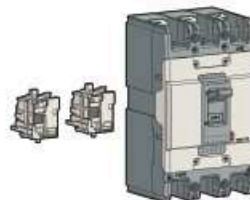
Note) EBS103c/100/30: EBS103c, Rated current 100A, Rated residual current 30mA

#### Time delay type

| EBS103c |                     | / | 100  |                  | / | 1A1s |                           |                           |
|---------|---------------------|---|------|------------------|---|------|---------------------------|---------------------------|
| Code    | Frame size/<br>Pole |   | Code | Rated<br>current |   | Code | Rated residual<br>current | Intentional<br>time delay |
| EBS103c | EBS 125AF 3P        |   | 15   | 15A              |   | 1A1s | 1A                        | 1s                        |
| EBS104c | EBS 125AF 4P        |   | 20   | 20A              |   | 2A2s | 2A                        | 2s                        |
| EBH103c | EBH 125AF 3P        |   | 30   | 30A              |   |      |                           |                           |
| EBH104c | EBH 125AF 4P        |   | 40   | 40A              |   |      |                           |                           |
|         |                     |   | 50   | 50A              |   |      |                           |                           |
|         |                     |   | 60   | 60A              |   |      |                           |                           |
|         |                     |   | 75   | 75A              |   |      |                           |                           |
|         |                     |   | 100  | 100A             |   |      |                           |                           |
|         |                     |   | 125  | 125A             |   |      |                           |                           |

Note) EBS103c/100/30: EBS103c, Rated current 100A, Time delay type 1A1s

### Accessories



#### Electrical auxiliaries

|       |                    |
|-------|--------------------|
| AX    | Auxiliary switch   |
| AL    | Alarm switch       |
| AX+AL | Combination switch |



#### Maximum possibilities

|            |                             |
|------------|-----------------------------|
| T-position | Not available               |
| R-position | Option of AX or AL or AX+AL |

Note) For more detail see 7-1 page



#### External accessories

| EBS125c<br>EBH125c | Name                                                                  |
|--------------------|-----------------------------------------------------------------------|
| IB23               | Insulation barrier                                                    |
| TCL23              | Terminal cover (Long)<br>- Single type, D-handle type, N-handle type  |
| TCS23              | Terminal cover (Short)<br>- Single type, D-handle type, N-handle type |
| N-40c              | Rotary handle (Direct)                                                |
| DH125              | Rotary handle (Direct)                                                |
| DHK125             | Rotary handle (Direct, key lock)                                      |
| EH125              | Rotary handle (Extended)                                              |
| RTB2               | Rear terminal (Bar)                                                   |
| RTR2               | Rear terminal (Round)                                                 |
| <b>Handle lock</b> |                                                                       |

Note) For more detail see 7-9 ~ 7-23 page  
 • Single type: This cover is used without auxiliary handle.  
 • D-handle type: This cover is used with D-handle.  
 • N-handle type: This cover is used with N-handle.

# 250AF ELCB

## EBN250c, EBS250c, EBH250c

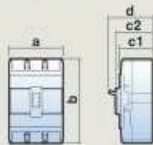
### Ratings



EBN203c



EBS203c

| Frame size                                                                          |                                           |          | 250AF                                            |     |         |     |         |     |     |
|-------------------------------------------------------------------------------------|-------------------------------------------|----------|--------------------------------------------------|-----|---------|-----|---------|-----|-----|
| Type and pole                                                                       |                                           |          | N-type                                           |     | S-type  |     | H-type  |     |     |
| 2-pole (2-sensor)                                                                   |                                           |          | EBN202c                                          |     | -       |     | -       |     |     |
| 3-pole (3-sensor)                                                                   |                                           |          | EBN203c                                          |     | EBS203c |     | EBH203c |     |     |
| 4-pole (3-sensor)                                                                   |                                           |          | -                                                |     | EBS204c |     | EBH204c |     |     |
| Rated current, I <sub>n</sub>                                                       |                                           |          | 100-125-150-175-200-225-250A                     |     |         |     |         |     |     |
| Rated impulse withstand voltage, U <sub>imp</sub>                                   |                                           |          | 6kV                                              |     |         |     |         |     |     |
| Instantaneous type                                                                  | Rated residual current, I $\Delta$ n      |          | 30, 100, 100/200/500, 100/300/500mA (Adjustable) |     |         |     |         |     |     |
|                                                                                     | Residual current off-time at I $\Delta$ n |          | $\leq 0.1$ sec                                   |     |         |     |         |     |     |
|                                                                                     | Rated operational voltage, U <sub>e</sub> |          | AC: 220/460V                                     |     |         |     |         |     |     |
| Time delay type                                                                     | Rated residual current                    |          | 0.1/0.2/0.5/1A, 0.1/0.4/1/2A (Adjustable)        |     |         |     |         |     |     |
|                                                                                     | Intentional time delay                    |          | 0/0.2/0.5/1s, 0.5/1/1.5/2s (Adjustable)          |     |         |     |         |     |     |
| Wiring system                                                                       | 2-pole (2-sensor)                         |          | 1Ø2W                                             |     |         |     |         |     |     |
|                                                                                     | 3-pole (3-sensor)                         |          | 1Ø2W, 1Ø3W, 3Ø3W                                 |     |         |     |         |     |     |
|                                                                                     | 4-pole (3-sensor)                         |          | 1Ø2W, 1Ø3W, 3Ø3W, 3Ø4W                           |     |         |     |         |     |     |
| Rated short-circuit breaking capacity, I <sub>cu</sub>                              |                                           |          | N-type                                           |     | S-type  |     | H-type  |     |     |
| AC                                                                                  | 460V                                      |          | 26kA                                             |     | 37kA    |     | 50kA    |     |     |
|                                                                                     | 415V                                      |          | 26kA                                             |     | 37kA    |     | 50kA    |     |     |
|                                                                                     | 220/250V                                  |          | 65kA                                             |     | 85kA    |     | 100kA   |     |     |
| I <sub>cs</sub> =% $\times$ I <sub>cu</sub>                                         |                                           |          | 100%                                             |     | 100%    |     | 100%    |     |     |
| Protective function                                                                 |                                           |          | Overload, short-circuit and ground fault         |     |         |     |         |     |     |
| Type of trip unit                                                                   |                                           |          | Thermal-magnetic                                 |     |         |     |         |     |     |
| Magnetic trip range                                                                 |                                           |          | 12 $\times$ I <sub>n</sub>                       |     |         |     |         |     |     |
| Life cycle <small>Note5)</small>                                                    | Mechanical                                |          | 20,000 operations                                |     |         |     |         |     |     |
|                                                                                     | Electrical                                |          | 5,000 operations                                 |     |         |     |         |     |     |
| Connection                                                                          | Standard                                  |          | Front connection                                 |     |         |     |         |     |     |
|                                                                                     | Optional                                  |          | Rear connection                                  |     |         |     |         |     |     |
| Mounting                                                                            |                                           | Standard | Screw fixing                                     |     |         |     |         |     |     |
| Dimensions (mm)                                                                     |                                           |          | Pole                                             | 2p  | 3p      | 3p  | 4p      | 3p  | 4p  |
|  | a                                         |          |                                                  | 105 | 105     | 105 | 140     | 105 | 140 |
|                                                                                     | b                                         |          |                                                  | 165 |         | 165 |         | 165 |     |
|                                                                                     | c1 <small>Note1)</small>                  |          |                                                  | 60  |         | 60  |         | 60  |     |
|                                                                                     | c2 <small>Note1)</small>                  |          |                                                  | 64  |         | 64  |         | 64  |     |
|                                                                                     | d                                         |          |                                                  | 87  |         | 87  |         | 87  |     |
|                                                                                     |                                           |          |                                                  | 1.1 |         | 1.2 |         | 1.5 |     |
| Weight, kg                                                                          |                                           |          | Standard                                         | 1.1 | 1.2     | 1.2 | 1.5     | 1.2 | 1.5 |
| Certification                                                                       |                                           |          | Pole                                             | 2p  | 3p      | 3p  | 4p      | 3p  | 4p  |
| CE marking                                                                          |                                           |          | CE                                               | ○   | ○       | ○   | ○       | ○   | ○   |

Note) 1. Depth by door-cut size: c1 for large cut, c2 for small cut  
2. Do not test withstand voltage or insulation resistance test between poles to avoid the damage of the PCB.  
3. 4-pole product's ampacity on neutral conductor is equal to or less than 50% of the rated current.  
4. Rated non-trip current sensitivity is equal to or less than 50% of the rated current sensitivity.  
5. Life cycle means not guarantee but limitation  
(Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

#### For more information

- Accessories ▶ 7-1 page
- Trip curves ▶ 8-3 page
- Drawings ▶ 9-11 page
- Connection and mounting ▶ 10-2 page

## Ordering types

### Breaker types

#### Instantaneous type

| EBS203c |                     | 250  |                  | 30          |                           |
|---------|---------------------|------|------------------|-------------|---------------------------|
| Code    | Frame size/<br>Pole | Code | Rated<br>current | Code        | Rated residual<br>current |
| EBN202c | EBN 250AF 2P        | 100  | 100A             | 30          | 30mA                      |
| EBN203c | EBN 250AF 3P        | 125  | 125A             | 100         | 100mA                     |
| EBS203c | EBS 250AF 3P        | 150  | 150A             | 100/200/500 | 100/200/500mA             |
| EBS204c | EBS 250AF 4P        | 175  | 175A             | 100/300/500 | 100/300/500mA             |
| EBH203c | EBH 250AF 3P        | 200  | 200A             |             |                           |
| EBH204c | EBH 250AF 4P        | 225  | 225A             |             |                           |
|         |                     | 250  | 250A             |             |                           |

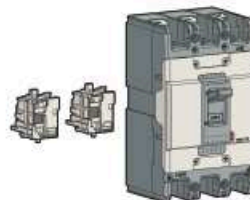
Note) EBS203c/250/30: EBS203c, Rated current 250A, Rated residual current 30mA

#### Time delay type

| EBS203c |                     | 250  |                  | 1A1s |                           |                           |
|---------|---------------------|------|------------------|------|---------------------------|---------------------------|
| Code    | Frame size/<br>Pole | Code | Rated<br>current | Code | Rated residual<br>current | Intentional<br>time delay |
| EBN202c | EBN 250AF 2P        | 100  | 100A             | 1A1s | 1A                        | 1s                        |
| EBN203c | EBN 250AF 3P        | 125  | 125A             | 2A2s | 2A                        | 2s                        |
| EBS203c | EBS 250AF 3P        | 150  | 150A             |      |                           |                           |
| EBS204c | EBS 250AF 4P        | 175  | 175A             |      |                           |                           |
| EBH203c | EBH 250AF 3P        | 200  | 200A             |      |                           |                           |
| EBH204c | EBH 250AF 4P        | 225  | 225A             |      |                           |                           |
|         |                     | 250  | 250A             |      |                           |                           |

Note) EBS203c/250/30: EBS203c, Rated current 250A, Time delay type 1A1s

### Accessories



#### Electrical auxiliaries

|       |                    |
|-------|--------------------|
| AX    | Auxiliary switch   |
| AL    | Alarm switch       |
| AX+AL | Combination switch |



#### Maximum possibilities

|            |                             |
|------------|-----------------------------|
| T-position | Not available               |
| R-position | Option of AX or AL or AX+AL |

Note) For more detail see 7-1 page



#### External accessories

| EBN250c<br>EBS250c<br>EBH250c | Name                                                                  |
|-------------------------------|-----------------------------------------------------------------------|
| IB23                          | Insulation barrier                                                    |
| TCL33                         | Terminal cover (Long)<br>- Single type, D-handle type, N-handle type  |
| TCS33                         | Terminal cover (Short)<br>- Single type, D-handle type, N-handle type |
| N-50c                         | Rotary handle (Direct)                                                |
| DH250                         | Rotary handle (Direct)                                                |
| DHK250                        | Rotary handle (Direct, key lock)                                      |
| EH250                         | Rotary handle (Extended)                                              |
| RTB3                          | Rear terminal (Bar)                                                   |
| RTR3                          | Rear terminal (Round)                                                 |
| Handle lock                   |                                                                       |

Note) For more detail see 7-9 ~ 7-23 page

- Single type: This cover is used without auxiliary handle.
- D-handle type: This cover is used with D-handle.
- N-handle type: This cover is used with N-handle.

# 400AF ELCB

EBN400c, EBS400c, EBH400c, EBL400c

## Ratings



EBS403c



EBL404c

| Frame size                                             |                                              | 400AF                                    |     |         |     |         |     |         |     |
|--------------------------------------------------------|----------------------------------------------|------------------------------------------|-----|---------|-----|---------|-----|---------|-----|
| Type and pole                                          |                                              | N-type                                   |     | S-type  |     | H-type  |     | L-type  |     |
|                                                        | 3-pole (3-sensor)                            | EBN403c                                  |     | EBS403c |     | EBH403c |     | EBL403c |     |
|                                                        | 4-pole (3-sensor)                            | EBN404c                                  |     | EBS404c |     | EBH404c |     | EBL404c |     |
| Rated current, I <sub>n</sub>                          |                                              | 250-300-350-400A                         |     |         |     |         |     |         |     |
| Rated impulse withstand voltage, U <sub>imp</sub>      |                                              | 6kV                                      |     |         |     |         |     |         |     |
| Rated operational voltage, U <sub>e</sub>              |                                              | 220/460V                                 |     |         |     |         |     |         |     |
| Instantaneous type                                     | Rated residual current, I <sub>Δn</sub>      | 30, 100/200/500mA (Adjustable)           |     |         |     |         |     |         |     |
|                                                        | Residual current off-time at I <sub>Δn</sub> | ≤0.1 sec                                 |     |         |     |         |     |         |     |
| Time delay type                                        | Rated residual current                       | 0.1/0.4/1/2A (Adjustable)                |     |         |     |         |     |         |     |
|                                                        | Intentional time delay                       | 0.5/1/1.5/2s (Adjustable)                |     |         |     |         |     |         |     |
| Wiring system                                          | 3-pole (3-sensor)                            | 1Ø2W, 1Ø3W, 3Ø3W                         |     |         |     |         |     |         |     |
|                                                        | 4-pole (3-sensor)                            | 1Ø2W, 1Ø3W, 3Ø3W, 3Ø4W                   |     |         |     |         |     |         |     |
| Rated short-circuit breaking capacity, I <sub>cu</sub> |                                              | N-type                                   |     | S-type  |     | H-type  |     | L-type  |     |
| AC                                                     | 415V/460V                                    | 37kA                                     |     | 50kA    |     | 65kA    |     | 85kA    |     |
|                                                        | 220/250V                                     | 50kA                                     |     | 75kA    |     | 85kA    |     | 125kA   |     |
| I <sub>cs</sub> =% × I <sub>cu</sub>                   |                                              | 100%                                     |     | 100%    |     | 100%    |     | 75%     |     |
| Protective function                                    |                                              | Overload, short-circuit and ground fault |     |         |     |         |     |         |     |
| Type of trip unit                                      |                                              | Thermal-magnetic                         |     |         |     |         |     |         |     |
| Magnetic trip range                                    |                                              | 8~12I <sub>n</sub>                       |     |         |     |         |     |         |     |
| Life cycle <sup>Note5)</sup>                           | Mechanical                                   | 4,000 operations                         |     |         |     |         |     |         |     |
|                                                        | Electrical                                   | 1,000 operations                         |     |         |     |         |     |         |     |
| Connection                                             |                                              | Front connection                         |     |         |     |         |     |         |     |
| Mounting                                               |                                              | Screw fixing                             |     |         |     |         |     |         |     |
| Dimensions (mm)                                        |                                              | 3p                                       |     | 4p      |     | 3p      |     | 4p      |     |
|                                                        | a                                            | 140                                      | 184 | 140     | 184 | 140     | 184 | 140     | 184 |
|                                                        | b                                            | 257                                      |     | 257     |     | 257     |     | 257     |     |
|                                                        | c1 <sup>Note1)</sup>                         | 109                                      |     | 109     |     | 109     |     | 109     |     |
|                                                        | c2 <sup>Note1)</sup>                         | 113                                      |     | 113     |     | 113     |     | 113     |     |
|                                                        | d                                            | 145                                      |     | 145     |     | 145     |     | 145     |     |
| Weight, kg                                             |                                              | Standard                                 | 7   | 8.4     | 7   | 8.4     | 7   | 8.4     | 7   |
| Certification                                          |                                              | Pole                                     | 3p  | 4p      | 3p  | 4p      | 3p  | 4p      | 3p  |
| CE marking                                             |                                              | CE                                       | ○   | ○       | ○   | ○       | ○   | ○       | ○   |

Note) 1. Depth by door cut size: c1 for large cut, c2 for small cut  
 2. Do not test withstand voltage or insulation resistance test between poles to avoid the damage of the PCB.  
 3. 4-pole product's ampacity on neutral conductor is equal to or less than 50% of the rated current.  
 4. Rated non-trip current sensitivity is equal to or less than 50% of the rated current sensitivity.  
 5. Life cycle means not guarantee but limitation  
 (Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

### For more information

- Accessories ▶ 7-2 page
- Trip curves ▶ 8-4 page
- Drawings ▶ 9-12 page
- Connection and mounting ▶ 10-3 page

## Ordering types

### Breaker types

#### Instantaneous type

| EBS403c |                     | 400  |                  | 30          |                           |
|---------|---------------------|------|------------------|-------------|---------------------------|
| Code    | Frame size/<br>Pole | Code | Rated<br>current | Code        | Rated residual<br>current |
| EBN403c | EBN 400AF 3P        | 250  | 250A             | 30          | 30mA                      |
| EBN404c | EBN 400AF 4P        | 300  | 300A             | 100/200/500 | 100/200/500mA             |
| EBS403c | EBS 400AF 3P        | 350  | 350A             |             |                           |
| EBS404c | EBS 400AF 4P        | 400  | 400A             |             |                           |
| EBH403c | EBH 400AF 3P        |      |                  |             |                           |
| EBH404c | EBH 400AF 4P        |      |                  |             |                           |
| EBL403c | EBH 400AF 3P        |      |                  |             |                           |
| EBL404c | EBH 400AF 4P        |      |                  |             |                           |

Note) EBS403c/400/30: EBS403c, Rated current 400A, Rated residual current 30mA

#### Time delay type

| EBS403c |                     | 400  |                  | 2A2s |                           |                           |
|---------|---------------------|------|------------------|------|---------------------------|---------------------------|
| Code    | Frame size/<br>Pole | Code | Rated<br>current | Code | Rated residual<br>current | Intentional<br>time delay |
| EBN403c | EBN 400AF 3P        | 250  | 250A             | 2A2s | 2A                        | 2s                        |
| EBN404c | EBN 400AF 4P        | 300  | 300A             |      |                           |                           |
| EBS403c | EBS 400AF 3P        | 350  | 350A             |      |                           |                           |
| EBS404c | EBS 400AF 4P        | 400  | 400A             |      |                           |                           |
| EBH403c | EBH 400AF 3P        |      |                  |      |                           |                           |
| EBH404c | EBH 400AF 4P        |      |                  |      |                           |                           |
| EBL403c | EBH 400AF 3P        |      |                  |      |                           |                           |
| EBL404c | EBH 400AF 4P        |      |                  |      |                           |                           |

Note) EBS403c/400/30: EBS403c, Rated current 400A, Time delay type 2A2s

### Accessories



#### Electrical auxiliaries

|     |                   |
|-----|-------------------|
| AX  | Auxiliary switch  |
| AL  | Alarm switch      |
| SHT | Shunt trip        |
| UVT | Undervoltage trip |



#### Maximum possibilities

|            |                                   |
|------------|-----------------------------------|
| T-position | Not available                     |
| R-position | Option of 2AX, 2AL and SHT or UVT |

Note) For more detail see 7-2 page

6



#### External accessories

|        |                                                                  |
|--------|------------------------------------------------------------------|
| B-43B  | Insulation barrier                                               |
| T1-43A | Terminal cover (Long) - 2, 3pole<br>- Single type, N-handle type |
| T1-44A | Terminal cover (Long) - 4pole                                    |
| N-70   | Rotary handle (Direct)                                           |
| E-70U  | Rotary handle (Extended)                                         |
| MI-43  | Mechanical interlock - 2, 3pole                                  |
| MI-44  | Mechanical interlock - 4pole                                     |

Note) For more detail see 7-9 ~ 7-23 page

# 800AF ELCB

## EBN803c, EBS803c, EBL803c



EBS803c

## Ratings

| Frame size                                             |                                              | 800AF                                    |         |         |
|--------------------------------------------------------|----------------------------------------------|------------------------------------------|---------|---------|
| Type and pole                                          |                                              | N-type                                   | S-type  | L-type  |
| 3-pole (3-sensor)                                      |                                              | EBN803c                                  | EBS803c | EBL803c |
| 4-pole (3-sensor)                                      |                                              | -                                        | -       | -       |
| Rated current, I <sub>n</sub>                          |                                              | 500-630-700-800A                         |         |         |
| Rated impulse withstand voltage, U <sub>imp</sub>      |                                              | 6 kV                                     |         |         |
| Rated operational voltage, U <sub>e</sub>              |                                              | 220/460V                                 |         |         |
| Instantaneous type                                     | Rated residual current, I <sub>Δn</sub>      | 30, 100/200/500mA (Adjustable)           |         |         |
|                                                        | Residual current off-time at I <sub>Δn</sub> | ≤0.1 sec                                 |         |         |
| Time delay type                                        | Rated residual current                       | 0.1/0.4/1/2A (Adjustable)                |         |         |
|                                                        | Intentional time delay                       | 0.5/1/1.5/2s (Adjustable)                |         |         |
| Wiring system                                          | 3-pole (3-sensor)                            | 1Ø2W, 1Ø3W, 3Ø3W                         |         |         |
|                                                        | 4-pole (3-sensor)                            | -                                        |         |         |
| Rated short-circuit breaking capacity, I <sub>cu</sub> |                                              | N-type                                   | S-type  | L-type  |
| AC                                                     | 415/460V                                     | 37kA                                     | 65kA    | 85kA    |
|                                                        | 220/250V                                     | 50kA                                     | 85kA    | 125kA   |
| I <sub>cs</sub> =% × I <sub>cu</sub>                   |                                              | 100%                                     | 100%    | 75%     |
| Protective function                                    |                                              | Overload, short-circuit and ground fault |         |         |
| Type of trip unit                                      |                                              | Thermal-magnetic                         |         |         |
| Magnetic trip range                                    |                                              | 8~12I <sub>n</sub>                       |         |         |
| Life cycle <sup>Note4)</sup>                           | Mechanical                                   | 2,500 operations                         |         |         |
|                                                        | Electrical                                   | 500 operations                           |         |         |
| Connection                                             |                                              | Front connection                         |         |         |
| Mounting                                               |                                              | Screw fixing                             |         |         |
| Dimensions (mm)                                        |                                              | Pole                                     | 3p      |         |
|                                                        | a                                            |                                          | 210     |         |
|                                                        | b                                            |                                          | 280     |         |
|                                                        | c1 <sup>Note1)</sup>                         |                                          | 109     |         |
|                                                        | c2 <sup>Note1)</sup>                         |                                          | 113     |         |
|                                                        | d                                            |                                          | 145     |         |
| Weight, kg                                             |                                              | Standard                                 | 11.5    |         |
| Certification                                          |                                              | Pole                                     | 3p      |         |
| CE marking                                             |                                              | CE                                       | O       |         |

Note) 1. Depth by door cut size: c1 for large cut, c2 for small cut  
 2. Do not test withstand voltage or insulation resistance test between poles to avoid the damage of the PCB.  
 3. Rated non-trip current sensitivity is equal to or less than 50% of the rated current sensitivity.  
 4. Life cycle means not guarantee but limitation  
 (Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

### For more information

- Accessories ▶ 7-2 page
- Trip curves ▶ 8-4 page
- Drawings ▶ 9-14 page
- Connection and mounting ▶ 10-3 page

## Ordering types

### Breaker types

#### Instantaneous type

| EBS803c |                     | 800  |                  | 30          |                           |
|---------|---------------------|------|------------------|-------------|---------------------------|
| Code    | Frame size/<br>Pole | Code | Rated<br>current | Code        | Rated residual<br>current |
| EBN803c | EBN 800AF 3P        | 500  | 500A             | 30          | 30mA                      |
| EBS803c | EBS 800AF 3P        | 630  | 630A             | 100/200/500 | 100/200/500mA             |
| EBL803c | EBH 800AF 3P        | 700  | 700A             |             |                           |
|         |                     | 800  | 800A             |             |                           |

Note) EBS803c/800/30: EBS803c, Rated current 800A, Rated residual current 30mA

#### Time delay type

| EBS803c |                     | / | 800  |                  | / | 2A2s |                           |                           |
|---------|---------------------|---|------|------------------|---|------|---------------------------|---------------------------|
| Code    | Frame size/<br>Pole |   | Code | Rated<br>current |   | Code | Rated residual<br>current | Intentional<br>time delay |
| EBN803c | EBN 800AF 3P        |   | 500  | 500A             |   | 2A2s | 2A                        | 2s                        |
| EBS803c | EBS 800AF 3P        |   | 630  | 630A             |   |      |                           |                           |
| EBL803c | EBH 800AF 3P        |   | 700  | 700A             |   |      |                           |                           |
|         |                     |   | 800  | 800A             |   |      |                           |                           |

Note) EBS803c/800/30: EBS803c, Rated current 800A, Time delay type 2A2s

### Accessories



#### Electrical auxiliaries

|     |                   |
|-----|-------------------|
| AX  | Auxiliary switch  |
| AL  | Alarm switch      |
| SHT | Shunt trip        |
| UVT | Undervoltage trip |



#### Maximum possibilities

|            |                                   |
|------------|-----------------------------------|
| T-position | Not available                     |
| R-position | Option of 2AX, 2AL and SHT or UVT |

Note) For more detail see 7-2 page



#### External accessories

|        |                                                                  |
|--------|------------------------------------------------------------------|
| B-33C  | Insulation barrier                                               |
| T1-63A | Terminal cover (Long) - 2, 3pole<br>- Single type, N-handle type |
| T1-64A | Terminal cover (Long) - 4pole                                    |
| N-80   | Rotary handle (Direct)                                           |
| E-80U  | Rotary handle (Extended)                                         |
| MI-83S | Mechanical interlock - 2, 3pole                                  |
| MI-84S | Mechanical interlock - 4pole                                     |

Note) For more detail see 7-9 ~ 7-23 page

# 1000/1200AF ELCB

## EBS1003b, EBS1203b

### Ratings



① Adjustable instantaneous for each phase

#### For more information

- Trip curves ▶ 8-5 page
- Drawings ▶ 9-14 page

| Frame size                                                        |                   | 1000AF                                   | 1200AF          |
|-------------------------------------------------------------------|-------------------|------------------------------------------|-----------------|
| <b>Type and pole</b>                                              |                   | <b>S-type</b>                            | <b>S-type</b>   |
|                                                                   | 3-pole (3-sensor) | <b>EBS1003b</b>                          | <b>EBS1203b</b> |
|                                                                   | 4-pole (3-sensor) | -                                        | -               |
| Rated current, $I_n$                                              |                   | 1000A                                    | 1200A           |
| Rated residual current, $I_{\Delta n}$                            |                   | 100/200/500mA (Adjustable)               |                 |
| Residual current off-time at $I_{\Delta n}$                       |                   | $\leq 0.1$ sec                           |                 |
| Rated operational voltage, $U_e$                                  |                   | AC: 460V                                 |                 |
| Wiring system 3-pole (3-sensor)                                   |                   | 1Ø2W, 1Ø3W, 3Ø3W                         |                 |
| <b>Rated short-circuit breaking capacity, <math>I_{cu}</math></b> |                   | <b>S-Type</b>                            | <b>S-Type</b>   |
| AC                                                                |                   | <b>415/460V</b>                          | <b>85kA</b>     |
|                                                                   |                   | <b>220/250V</b>                          | <b>125kA</b>    |
| <b>Protective function</b>                                        |                   | Overload, short-circuit and ground fault |                 |
| Type of trip unit                                                 |                   | Thermal-magnetic                         |                 |
| Magnetic trip range                                               |                   | $3-6 \times I_n \dots$ ①                 |                 |
| Life cycle <small>Note3</small>                                   | Mechanical        | 2,500 operations                         |                 |
|                                                                   | Electrical        | 500 operations                           |                 |
| Connection                                                        |                   | Front connection                         |                 |
| Mounting                                                          |                   | Screw fixing                             |                 |
| <b>Dimensions (mm)</b>                                            |                   | Pole                                     | 3p              |
|                                                                   | a                 |                                          | 220             |
|                                                                   | b                 |                                          | 565             |
|                                                                   | c                 |                                          | 105             |
|                                                                   | d                 |                                          | 159             |
|                                                                   |                   |                                          |                 |
| Weight, kg                                                        |                   | Standard                                 | 27.1            |

Note) 1. Do not test withstand voltage or insulation resistance test between poles to avoid the damage of the PCB.

2. Rated non-trip current sensitivity is equal to or less than 50% of the rated current sensitivity.

3. Life cycle means not guarantee but limitation

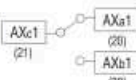
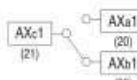
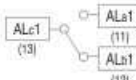
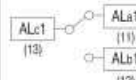
(Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee.)

## Ordering types

### Breaker types

| EBS type (85kA/460V) |                           |
|----------------------|---------------------------|
| Rated current, In    | 3-pole                    |
| 1000 A               | <b>EBS1003b/1,000/100</b> |
| 1200 A               | <b>EBS1203b/1200/100</b>  |

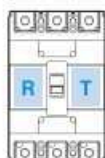
### Contact operation for auxiliary and alarm switches

| MCCB | On                                                                                  | Off                                                                                 | Trip |
|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|
| AX   |   |  |      |
| AL   |  |  |      |

### Option of below items for T-position

|                |                                    |
|----------------|------------------------------------|
| <b>AX1</b>     | Auxiliary switch (1c)              |
| <b>AL1</b>     | Alarm switch (1c)                  |
| <b>AX1+AL1</b> | Auxiliary (1c) + Alarm (1c) switch |

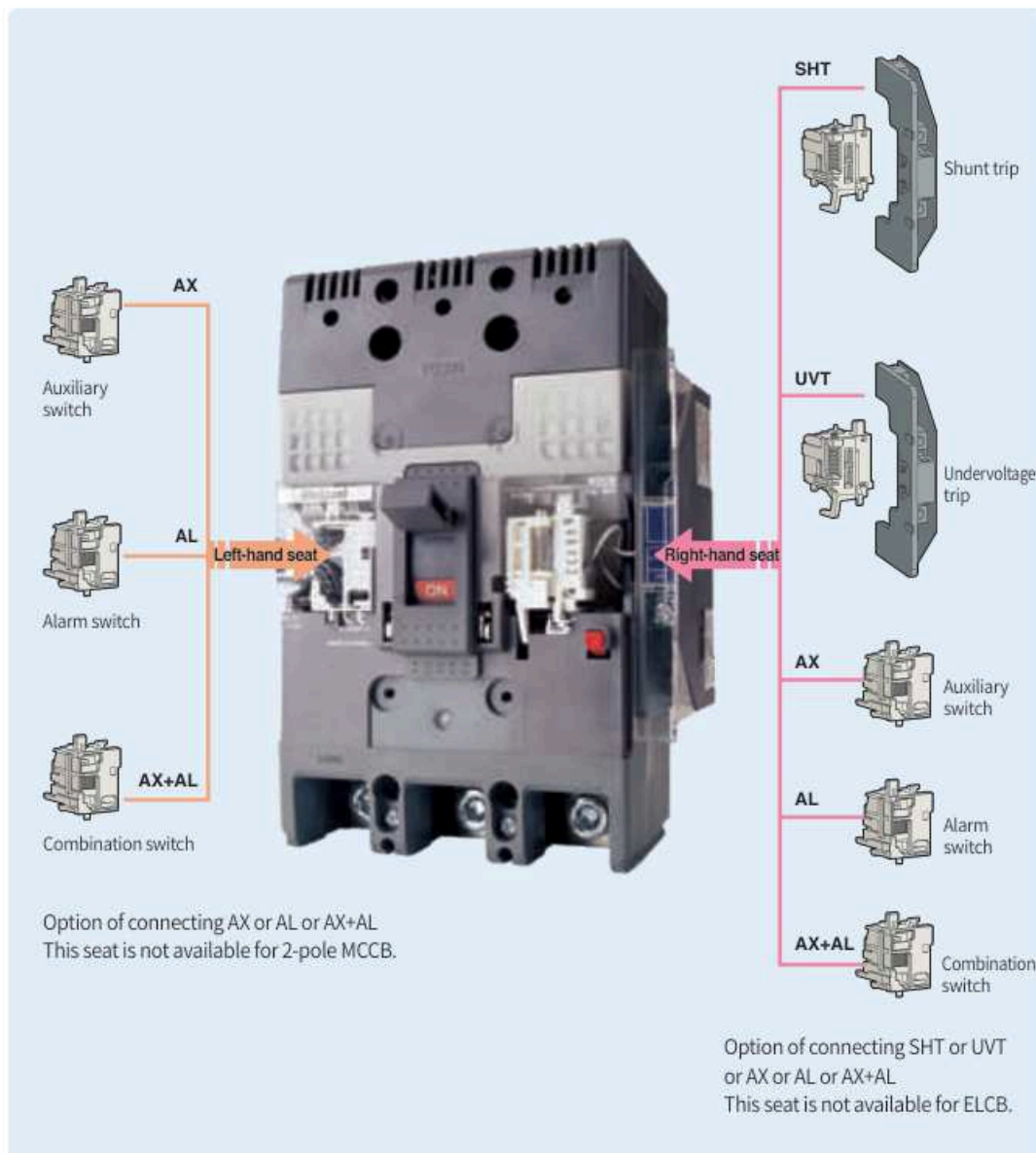
Note) R-position is not available.



### Contact rating for auxiliary and alarm switches

| AC          |                |                | DC          |                |                |
|-------------|----------------|----------------|-------------|----------------|----------------|
| Voltage (V) | Current (A)    |                | Voltage (V) | Current (A)    |                |
|             | Resistive load | Inductive load |             | Resistive load | Inductive load |
| 125         | 20             | 20             | 30          | 6              | 5              |
| 250         | 20             | 20             | 125         | 0.4            | 0.05           |
| 500         | 10             | 5              | 250         | 0.2            | 0.03           |

## Electrical auxiliaries of 100~250AF



### Maximum possibilities

| Position        | Type    | ABN100c |      | ABH125c |      | ABH250c | EBN100c | EBH125c | EBH250c |
|-----------------|---------|---------|------|---------|------|---------|---------|---------|---------|
|                 |         | 2P      | 3/4P | 2P      | 3/4P | 2/3/4p  | 2/3/4p  | 3/4p    | 2/3/4p  |
| Left-hand seat  | AX      | -       | 1    | -       | 1    | 1       | 1       | 1       | 1       |
|                 | AL      | -       | 1    | -       | 1    | 1       | 1       | 1       | 1       |
|                 | AX+AL   | -       | 1    | -       | 1    | 1       | 1       | 1       | 1       |
| Right-hand seat | AX      | 1       | 1    | 1       | 1    | 1       | -       | -       | -       |
|                 | AL      | 1       | 1    | 1       | 1    | 1       | -       | -       | -       |
|                 | AX+AL   | 1       | 1    | 1       | 1    | 1       | -       | -       | -       |
|                 | SHT/UVT | 1       | 1    | 1       | 1    | 1       | -       | -       | -       |

Electrical auxiliaries of 400~800AF



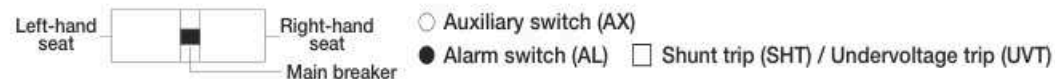
7

Maximum possibilities

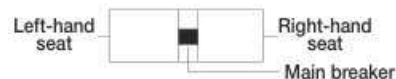
| Position           | Type    | MCCB<br>(400~800AF) | ELCB<br>(400~800AF) |
|--------------------|---------|---------------------|---------------------|
| Left-hand<br>seat  | AX      | 2                   | 2                   |
|                    | AL      | 2                   | 2                   |
|                    | SHT/UVT | 1                   | 1                   |
| Right-hand<br>seat | AX      | 2                   | -                   |
|                    | AL      | 2                   | -                   |
|                    | SHT/UVT | 1                   | -                   |

# Accessories

## Combinations of accessories



| Series           |        | MCCB (30~250AF) |         |                                           |                                                                                  | MCCB (400~800AF)                         | MCCB (1,000~1200AF)                                            |
|------------------|--------|-----------------|---------|-------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------|----------------------------------------------------------------|
| Type             | N-type | ABE 32b         | ABE 33b | ABN 52c<br>ABN 62c<br>ABN 102c/102e       | ABN 53c/54c<br>ABN 63c/64c<br>ABN 103c/104c, ABN 103e/104e<br>ABN 202c/203c/204c | ABN 402c/403c/404c<br>ABN 802c/803c/804c | -                                                              |
|                  | S-type | -               | -       | ABS 32c<br>ABS 52c<br>ABS 62c<br>ABS 102c | ABS 33c/34c<br>ABS 53c/54c<br>ABS 63c/64c<br>ABS 103c/104c<br>ABS 202c/203c/204c | ABS 402c/403c/404c<br>ABS 802c/803c/804c | ABS 1003b<br>ABS 1004b<br>ABS 1203b<br>ABS 1204b<br>ABS 1203bE |
|                  | H-type | -               | -       | ABH 52c<br>ABH 102c                       | ABH 53c/54c<br>ABH 103c/104c<br>ABH 202c/203c/204c                               | ABH 402c/403c/404c                       | -                                                              |
|                  | L-type | -               | -       | ABL 102c                                  | ABL 103c/104c<br>ABL 202c/203c/204c                                              | ABL 402c/403c/404c<br>ABL 802c/803c/804c | ABL 1003b<br>ABL 1004b<br>ABL 1203b<br>ABL 1204b               |
| Pole             |        | 2 pole          | 3 pole  | 2 pole                                    | 2, 3, 4 pole                                                                     | 2, 3, 4 pole                             | 3, 4 pole                                                      |
| AX               |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX2              |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX3 (4)          |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AL               |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AL2              |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AL3 (4)          |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| SHT (UVT)        |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| SHT (UVT) 2      |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX+AL            |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX+AL2           |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX+AL3 (4)       |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX2+AL           |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX2+AL2          |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX2+AL3 (4)      |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX3 (4) +AL      |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX3 (4) +AL2     |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX3 (4) +AL3 (4) |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX+SHT (UVT)     |        |                 |         |                                           |                                                                                  |                                          |                                                                |



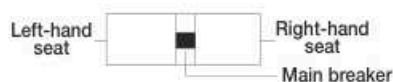
○ Auxiliary switch (AX)

● Alarm switch (AL)    □ Shunt trip (SHT) / Undervoltage trip (UVT)

| Series                      |        | MCCB (30~250AF) |         |                                           |                                                                                  | MCCB (400~800AF)                         | MCCB (1,000~1200AF)                                            |
|-----------------------------|--------|-----------------|---------|-------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------|----------------------------------------------------------------|
| Type                        | N-type | ABE 32b         | ABE 33b | ABN 52c<br>ABN 62c<br>ABN 102c/102d/102e  | ABN 53c/54c<br>ABN 63c/64c<br>ABN 103c/104c, ABN 103e/104e<br>ABN 202c/203c/204c | ABN 402c/403c/404c<br>ABN 802c/803c/804c | -                                                              |
|                             | S-type | -               | -       | ABS 32c<br>ABS 52c<br>ABS 62c<br>ABS 102c | ABS 33c/34c<br>ABS 53c/54c<br>ABS 63c/64c<br>ABS 103c/104c<br>ABS 202c/203c/204c | ABS 402c/403c/404c<br>ABS 802c/803c/804c | ABS 1003b<br>ABS 1004b<br>ABS 1203b<br>ABS 1204b<br>ABS 1203bE |
|                             | H-type | -               | -       | ABH 52c<br>ABH 102c                       | ABH 53c/54c<br>ABH 103c/104c<br>ABH 202c/203c/204c                               | ABH 402c/403c/404c                       | -                                                              |
|                             | L-type | -               | -       | ABL 102c                                  | ABL 103c/104c<br>ABL 202c/203c/204c                                              | ABL 402c/403c/404c<br>ABL 802c/803c/804c | ABL 1003b<br>ABL 1004b<br>ABL 1203b<br>ABL 1204b               |
| Pole                        |        | 2 pole          | 3 pole  | 2 pole                                    | 2, 3, 4 pole                                                                     | 2, 3, 4 pole                             | 3, 4 pole                                                      |
| AX+SHT (UVT) 2              |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX2+SHT (UVT)               |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX2+SHT (UVT) 2             |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX3 (4)+SHT (UVT)           |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX3 (4)+SHT (UVT) 2         |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AL+SHT (UVT)                |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AL+SHT (UVT) 2              |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AL2+SHT (UVT)               |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AL2+SHT (UVT) 2             |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AL3 (4) +SHT (UVT)          |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AL3 (4) +SHT (UVT) 2        |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX+AL+SHT (UVT)             |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX+AL+SHT (UVT) 2           |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX2+AL2+SHT (UVT)           |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX2+AL2+SHT (UVT) 2         |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX3 (4)+AL3 (4)+SHT (UVT)   |        |                 |         |                                           |                                                                                  |                                          |                                                                |
| AX3 (4)+AL3 (4)+SHT (UVT) 2 |        |                 |         |                                           |                                                                                  |                                          |                                                                |

# Accessories

## Combinations of accessories

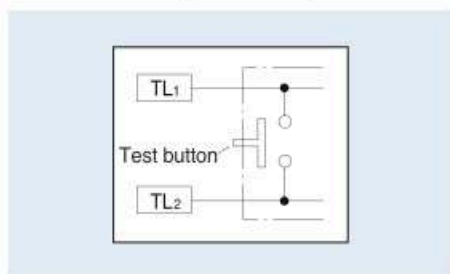


○ Auxiliary switch (AX)

● Alarm switch (AL)    □ Shunt trip (SHT) / Undervoltage trip (UVT)

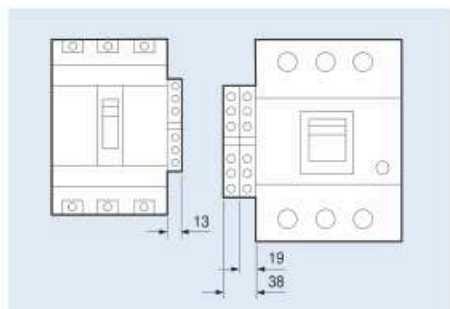
| Series            |        | ELCB (30~250AF)                                                                 | ELCB (400~800AF)          | ELCB (1,000~1200AF)    |
|-------------------|--------|---------------------------------------------------------------------------------|---------------------------|------------------------|
| Type              | N-type | EBN 52c/53c/54c<br>EBN 63c<br>EBN 102c/103c/104c<br>EBN 202c/203c               | EBN 403c/404c<br>EBN 803c | -                      |
|                   | S-type | EBS 32c/33c/34c<br>EBS 53c/54c<br>EBS 63c/64c<br>EBS 103c/104c<br>EBS 203c/204c | EBS 403c/404c<br>EBS 803c | EBS 1003b<br>EBS 1203b |
|                   | H-type | EBH 53c/54c<br>EBH 53c/54c<br>EBH 103c/104c                                     | EBH 403c/404c             | -                      |
|                   | L-type | -                                                                               | EBL 403c/404c<br>EBL 803c | -                      |
| Pole              |        | 3, 4 pole                                                                       | 3 pole                    | 3 pole                 |
| AX                |        |                                                                                 |                           |                        |
| AX2               |        |                                                                                 |                           |                        |
| AL                |        |                                                                                 |                           |                        |
| AL2               |        |                                                                                 |                           |                        |
| SHT (UVT)         |        |                                                                                 |                           |                        |
| AX+AL             |        |                                                                                 |                           |                        |
| AX+AL2            |        |                                                                                 |                           |                        |
| AX2+AL            |        |                                                                                 |                           |                        |
| AX2+AL2           |        |                                                                                 |                           |                        |
| AX+SHT (UVT)      |        |                                                                                 |                           |                        |
| AX2+SHT (UVT)     |        |                                                                                 |                           |                        |
| AL+SHT (UVT)      |        |                                                                                 |                           |                        |
| AL2+SHT (UVT)     |        |                                                                                 |                           |                        |
| AX+AL+SHT (UVT)   |        |                                                                                 |                           |                        |
| AX2+AL2+SHT (UVT) |        |                                                                                 |                           |                        |

### Test lead wire (30~250AF)



Note) 1. When you touch the lead wire under energized condition, you will be in danger of electric shock.  
2. Do not energize on both ends of lead wire.  
3. Do not pull out the lead wire excessively or impact on the product.

### Terminal block type



## Auxiliary and alarm switch

### Auxiliary switch (AX)



Auxiliary switch is for applications requiring remote "On" and "Off" indication. Each switch contains two contacts having a common connection. One is open and the other closed when the circuit breaker is open, and viceversa.

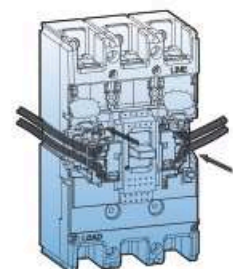
### Alarm switch (AL)



Alarm switches offer provisions for immediate audio or visual indication of a tripped breaker due to overload, short circuit, shunt trip, or undervoltage release conditions.

They are particularly useful in automated plants where operators must be signaled about changes in the electrical distribution system. This switch features a closed contact when the circuit breaker is tripped automatically. In other words, this switch does not function when the breaker is operated manually. Its contact is open when the circuit breaker is reset.

### Combination switch (AX+AL)



It consists of one auxiliary switch (AX) and one alarm switch (AL) in a body to connect into the same position of the breaker.

### Contact (AX+AL)

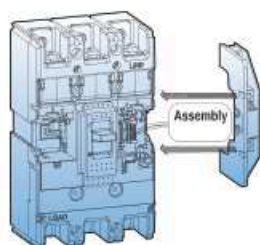
| MCCB | On | Off | Trip |
|------|----|-----|------|
| AX   |    |     |      |
| AL   |    |     |      |

### Rating (AX+AL)

| Conventional thermal current, I <sub>th</sub> |                         | 5A                      |                |                            |                                               |
|-----------------------------------------------|-------------------------|-------------------------|----------------|----------------------------|-----------------------------------------------|
| Rated operational current, I <sub>e</sub>     | Voltage, U <sub>e</sub> | Current, I <sub>e</sub> |                |                            |                                               |
|                                               |                         | Resistive load          | Inductive load | Minimum laod current       | Applicable MCCB/ELCB                          |
| AC 50/60Hz                                    | 125V                    | 5                       | 3              | 5V DC 160mA<br>30V DC 30mA | Metasol<br>MCCB/ELCB<br>30~250AF<br>400~800AF |
|                                               | 250V                    | 3                       | 2              |                            |                                               |
|                                               | 500V                    | -                       | -              |                            |                                               |
| DC                                            | 30V                     | 4                       | 3              | 5V DC 160mA<br>30V DC 30mA | Metasol<br>MCCB/ELCB<br>30~250AF<br>400~800AF |
|                                               | 125V                    | 0.4                     | 0.4            |                            |                                               |
|                                               | 250V                    | 0.2                     | 0.2            |                            |                                               |

# Accessories

## Shunt trip, SHT



The shunt trip opens the mechanism in response to an externally applied voltage signal. The releases include coil clearing contacts that automatically clear the signal circuit when the breaker has tripped. This is not available for ELCBs of 30~250AF.



### Rating for 30~250AF

| Control voltage, Ue                 |                | Power consumption |        | Applicable MCCB/ELCB                          |
|-------------------------------------|----------------|-------------------|--------|-----------------------------------------------|
|                                     |                | AC (VA)           | DC (W) |                                               |
| Voltage                             | DC 12V         | -                 | 1.5    | Metasol MCCB<br>ABN100c<br>ABH125c<br>ABH250c |
|                                     | AC/DC 24~30V   | 1.5               | 1.5    |                                               |
|                                     | AC/DC 48~60V   | 1.5               | 1.5    |                                               |
|                                     | AC/DC 100~130V | 1.5               | 1.5    |                                               |
|                                     | AC/DC 200~250V | 1.5               | 1.5    |                                               |
|                                     | AC 380~440V    | 1.5               | -      |                                               |
|                                     | AC 440~500V    | 1.5               | -      |                                               |
| Max.opening time                    |                | 50ms (max.)       |        |                                               |
| Tightening torque of terminal screw |                | 8.2 kgf·cm        |        |                                               |

Note: 1. Range of operational voltage: 0.7 ~ 1.1Vn  
Frequency (Only AC) : 45Hz ~ 65Hz



Terminal block type (TBT)



Lead wire type (LWT)

### Rating for 400~800AF

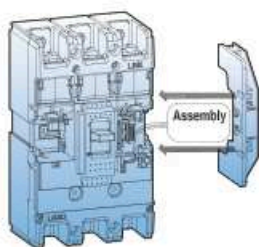
| Control voltage, Ue    | Power consumption |      |     |
|------------------------|-------------------|------|-----|
|                        | V                 | mA   | W   |
| AC/DC 24~48V           | AC 24             | 14   | 0.3 |
| AC 100~240/DC 100~220V | DC 24             | 15.4 | 0.4 |
|                        | AC 48             | 14   | 0.7 |
| AC 380~550V            | DC 48             | 16   | 0.8 |
|                        | AC 110            | 6    | 0.7 |
|                        | DC 110            | 6.6  | 0.7 |
|                        | AC 220            | 6.8  | 1.5 |
|                        | DC 200            | 7.6  | 1.5 |
|                        | AC 440            | 4.3  | 1.9 |
|                        | AC 480            | 4.4  | 3.3 |
|                        | AC 550            | 4.6  | 2.4 |

Note: Range of operational voltage  
AC: 0.85 ~ 1.1Vn  
DC: 0.75 ~ 1.25Vn



Lead wire type (LWT)

## Undervoltage release, UVT



The undervoltage release automatically opens a circuit breaker when voltage drops to a value ranging between 20% to 70% of the line voltage. The operation is instantaneous, and after tripping, the circuit breaker cannot be re-closed again until the voltage returns to 85% of line voltage.

Continuously energized, the undervoltage release must be operating before the circuit breaker can be closed. This is not available for ELCBs of 30~250AF.

- Range of tripping voltage:  $0.2 \sim 0.7V_n$
- Reset and closing of a breaker is possible when the control voltage is over  $0.85V_n$
- Frequency (Only AC: 45Hz ~ 65Hz)

### Rating for 30~250AF

| Control voltage, $U_e$              |                | Power consumption |        |     |
|-------------------------------------|----------------|-------------------|--------|-----|
|                                     |                | AC (VA)           | DC (W) | mA  |
| Voltage                             | AC/DC 24V      | 0.64              | 0.65   | 27  |
|                                     | AC/DC 48V      | 1.09              | 1.1    | 23  |
|                                     | AC/DC 100~110V | 0.73              | 0.75   | 5.8 |
|                                     | AC/DC 200~220V | 1.21              | 1.35   | 5.4 |
|                                     | AC 380~440V    | 1.67              | -      | 3.8 |
|                                     | AC 440~480V    | 1.68              | -      | 3.5 |
| Max. opening time                   |                | 50ms (max.)       |        |     |
| Tightening torque of terminal screw |                | 8.2 kgf·cm        |        |     |
| Operating voltage range             | Trip           | 20~70% $V_n$      |        |     |
|                                     | Reset/Closing  | $\geq 0.85V_n$    |        |     |



Terminal block type (TBT)

### Rating for 400~800AF

| Control voltage, $U_e$  | Trip voltage                                      | Reset/closing voltage                              | Time rating |
|-------------------------|---------------------------------------------------|----------------------------------------------------|-------------|
| AC/DC 48                | · AC: $85 \sim 1.1V_n$<br>· DC: $85 \sim 1.25V_n$ | · AC: $0.2 \sim 0.7V_n$<br>· DC: $0.2 \sim 0.7V_n$ | Continuous  |
| AC/DC 100~125           |                                                   |                                                    |             |
| AC 200~240 / DC 200~240 |                                                   |                                                    |             |
| AC 380~440              |                                                   |                                                    |             |
| AC 440~480              |                                                   |                                                    |             |



Lead wire type (LWT)

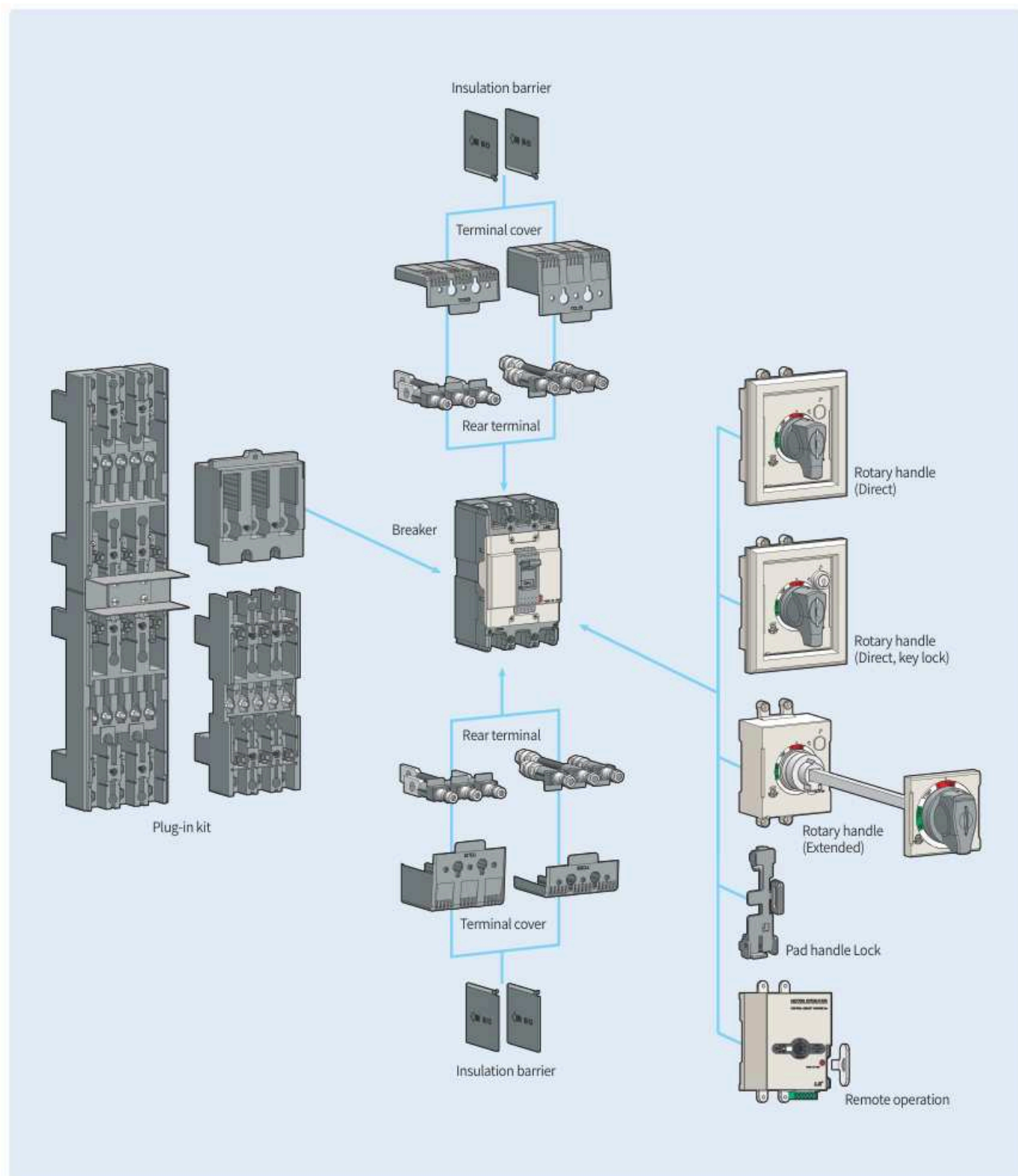
### Terminal numbering

| Auxiliary switch (AX) | Alarm switch (AL) | Shunt trip (SHT) | Undervoltage trip (UVT) |
|-----------------------|-------------------|------------------|-------------------------|
|                       |                   |                  |                         |

# Accessories

## External accessories

Wide range of external accessories provides user-friendly solution for mounting, cable connection, insulation, safety lock and remote control.



## Rotary handles

### Direct type



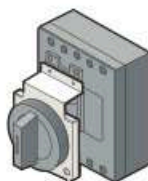
Direct type  
(DH 30~250AF)



Key lock  
(DH 30~250AF)



(N 30~250AF)

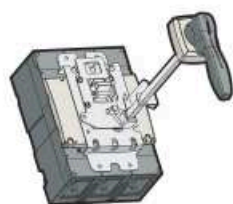


(N 400~800AF)

### Extended type



(30~250AF)



(400~800AF)

The rotary handle operating mechanism is available in either the direct version or in the extended version on the compartment door. It is always fitted with a compartment door lock and on a request it can be supplied with a key lock in the open position.

#### Direct type , D-handle and N-handle

- D-handle: Directly mountable to a circuit breaker. Trip button is built as standard. Key lock type is optional.
- N-handle: Directly mountable to a circuit breaker. Door is locked in the Off state. handle size is greater than D-handle.

#### Extended type, E-handle

It is used in case direct type handle can not be applied because of the longer distance between the breaker and the panel door.

### Type

| Direct type | Direct type<br>(Key lock) | Extended type | Breaker type             |                 |
|-------------|---------------------------|---------------|--------------------------|-----------------|
|             |                           |               | MCCB                     | ELCB            |
| N-30c       | -                         | -             | ABN50c/60c/100c/100e*    | EBN50c/60c/100c |
| DH100       | DHK100                    | EH100         | ABS30c/50c/60c*          | EBS30c/50c/60c  |
| N-40c       | -                         | -             | ABS125c*<br>ABH50c/125c* | EBS125c         |
| DH125       | DHK125                    | EH125         | ABL125c*                 | EBH50c/125c     |
| N-50c       | -                         | -             | ABN/S/H/L250c            | EBN/S/H250c     |
| DH250       | DHK250                    | EH250         |                          |                 |
| N-70        | -                         | E-70U         | ABN/S/H/L400c            | EBN/S/H/L400c   |
| N-80        | -                         | E-80U         | ABN/S/L800c              | EBN/S/L800c     |

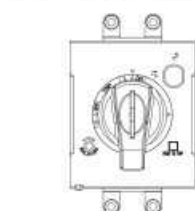
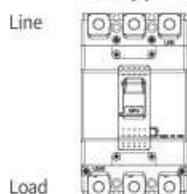
Note: Padlock type for N-handle

- On or Off state type - Only Off state type

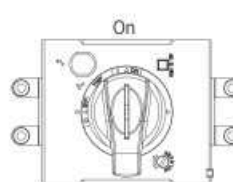
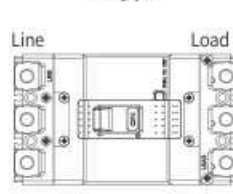
\* DH100 and DH125 cannot be mounted on 2-pole products.

### Type suffix according to the mounting position

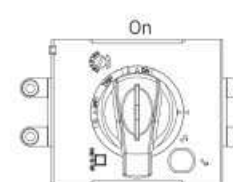
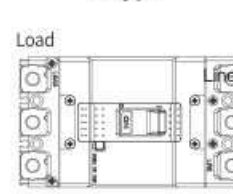
#### S-type



#### L-type



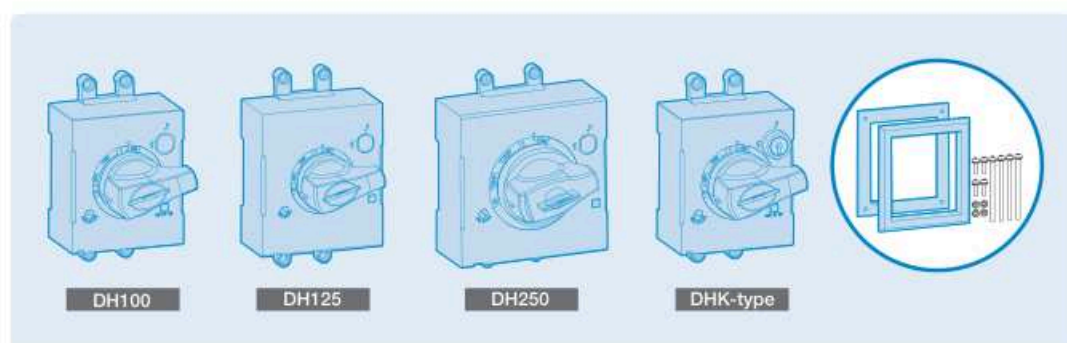
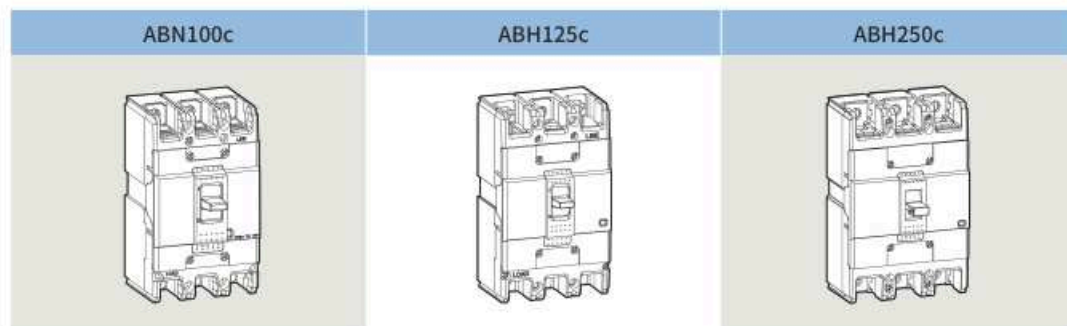
#### L-type



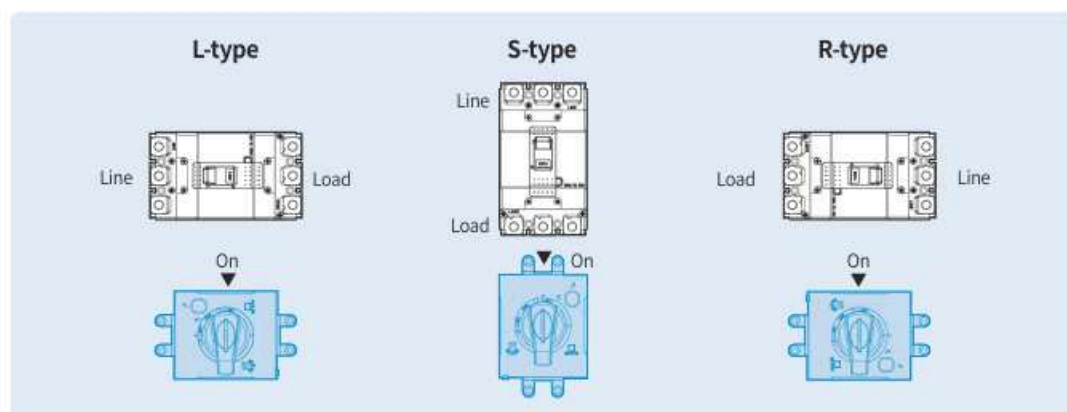
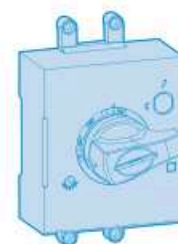
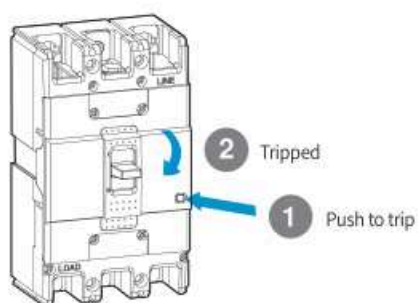
# Accessories

## D-handle

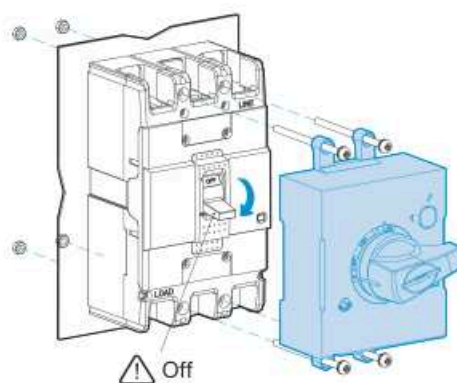
### MCCB and D-handle

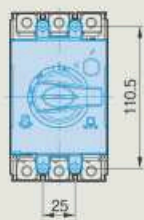


### Tripping MCCB & install type

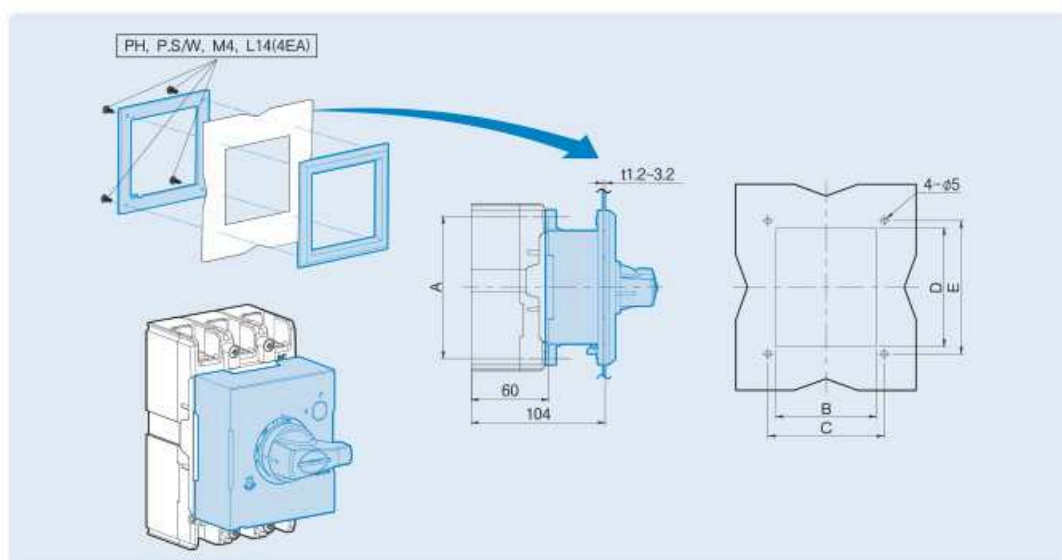


## Installing the D-handle



| ABN100c, EBN100c                                                                   | ABH125c, EBH125c                                                                    | ABH250c, EBH250c                                                                     |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  |  |  |

## Cutting panel



| Direct type | A (mm) | B (mm) | C (mm) | D (mm) | E (mm) | Breaker |
|-------------|--------|--------|--------|--------|--------|---------|
| DH100       | 110.5  | 78     | 90     | 92     | 103.4  | 100AF   |
| DH125       | 132    | 94     | 105    | 108    | 120    | 125AF   |
| DH250       | 126    | 108    | 121    | 110    | 122    | 250AF   |

# Accessories

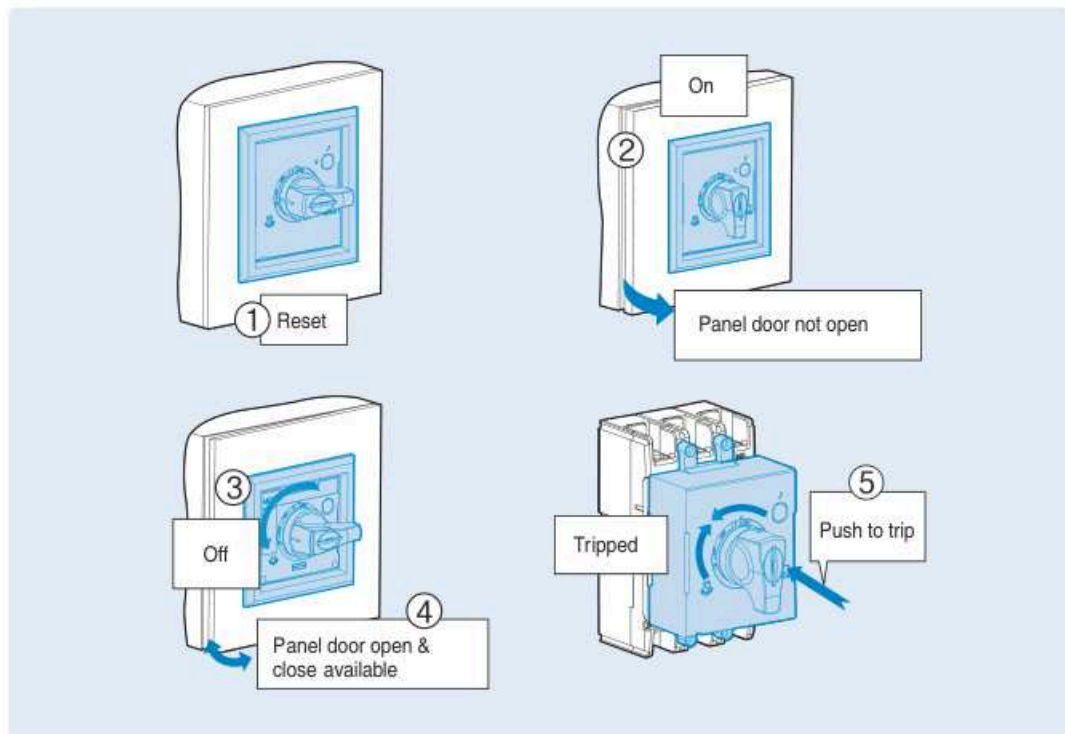
## D-handle

### Operating test

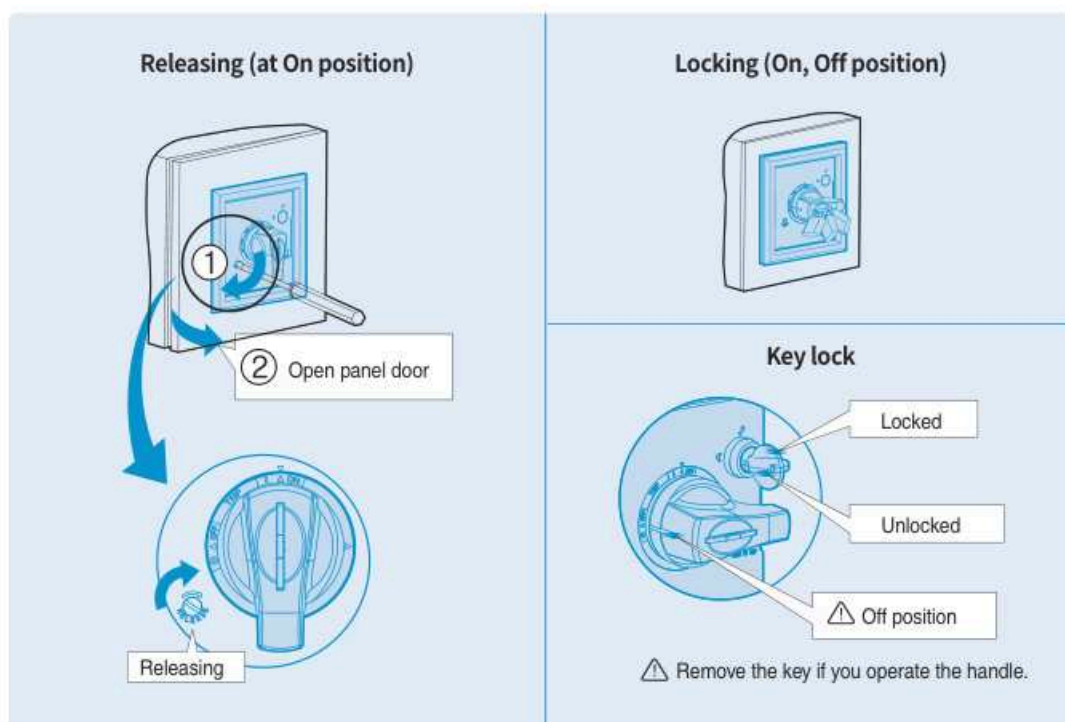
#### ⚠ CAUTION

If the door is opened with much pressure when the position of handle is On or trip, the handle lock lever will be damaged.

Trip position: Panel door can't be opened

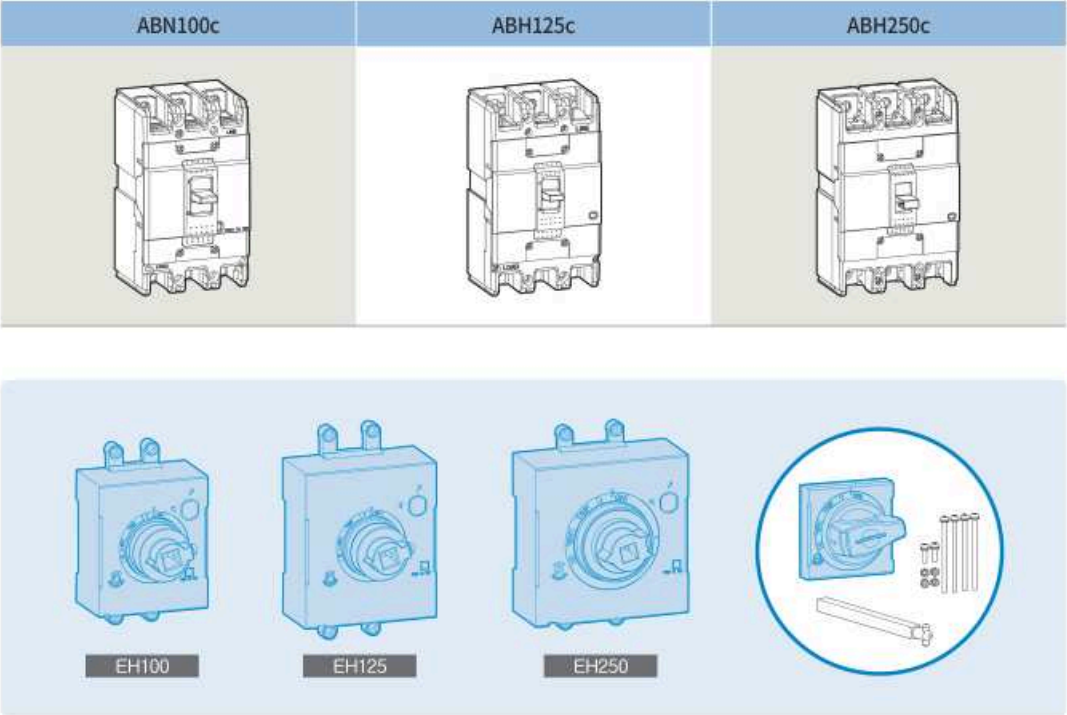


### Locking system

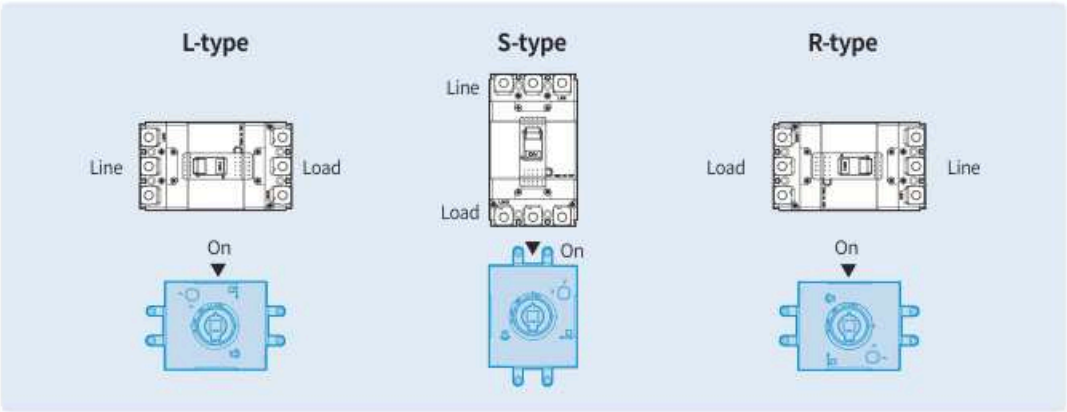
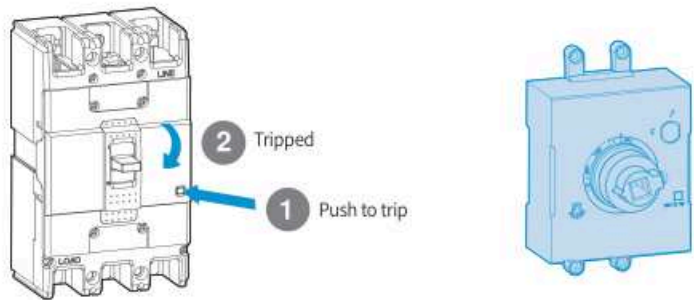


E-handle

MCCB and E-handle



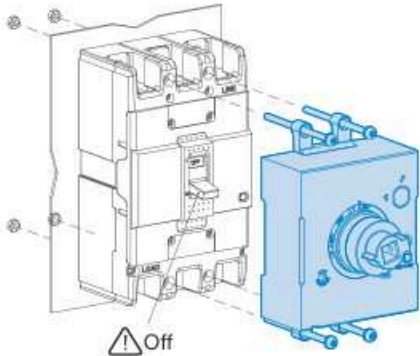
Tripping MCCB & install type



# Accessories

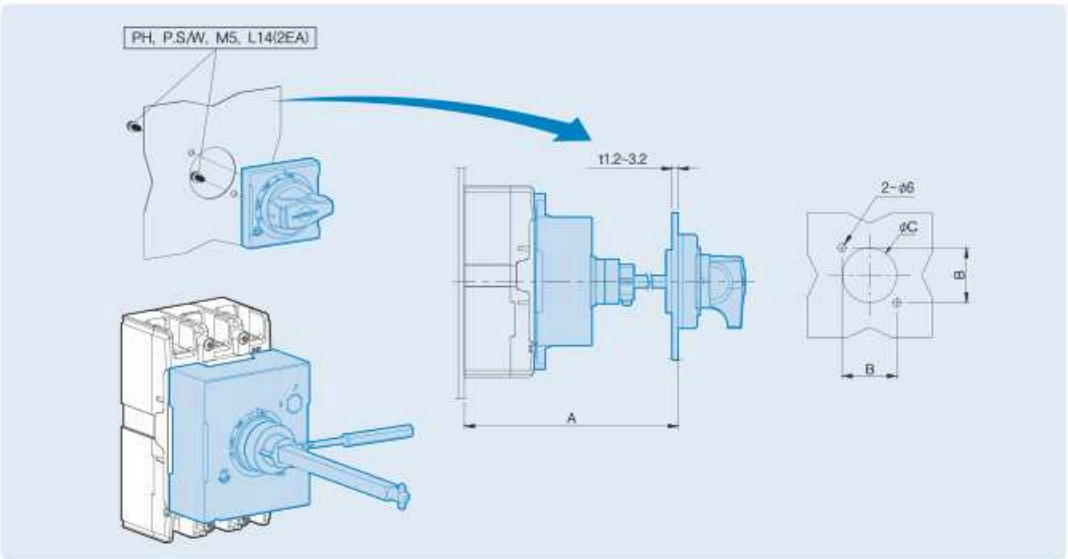
## E-handle

### Installing the E-handle



| ABN100c, EBN100c | ABH125c, EBH125c | ABH250c, EBH250c |
|------------------|------------------|------------------|
|                  |                  |                  |

### Cutting panel



| E-handle | A (mm)                          | B (mm) | C (mm) | Breaker |
|----------|---------------------------------|--------|--------|---------|
| EH100    | min 150, max 573.5 (Shaft469mm) | 47     | Ø53    | 100AF   |
| EH125    | min 150, max 573.5 (Shaft469mm) | 47     | Ø53    | 125AF   |
| EH250    | min 150, max 571.5 (Shaft469mm) | 47     | Ø53    | 250AF   |

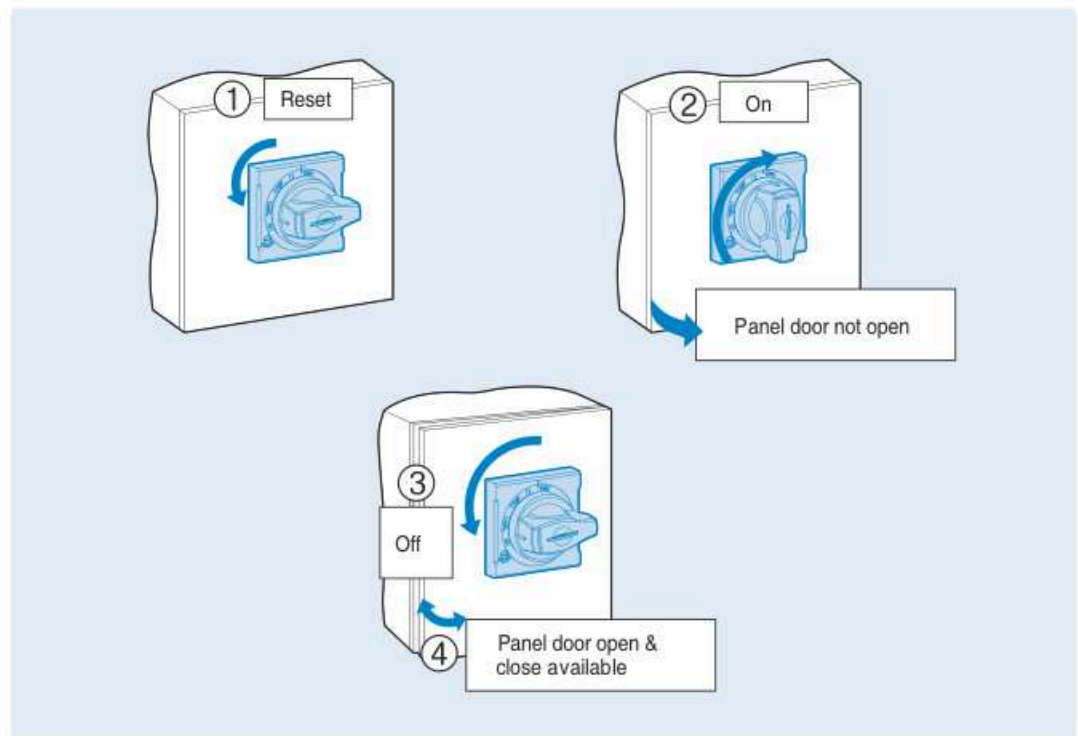
Note: An extension shaft that must be adjusted to the distance between back of circuit breaker and door

## Operating test

### ⚠ CAUTION

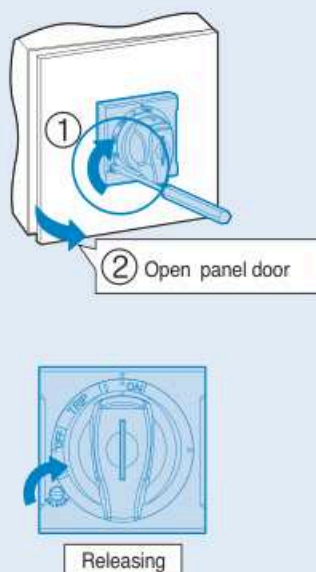
If the door is opened with much pressure when the position of handle is On or trip, the handle lock lever will be damaged.

Trip position: Panel door can't be opened

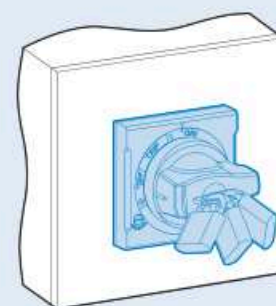


## Locking system

### Releasing (at On position)



### Locking (On, Off position)



⚠ Use lock with 6mm diameter.

Note: In case of EH100/125/250 Semi Type, it is possible to lock E-handle only in the condition of OFF.

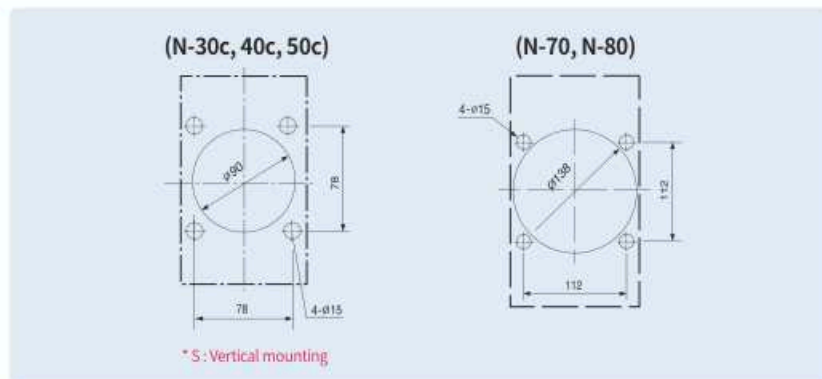
# Accessories

## N-handle

### How to mount

#### 1) Drilling on the panel door

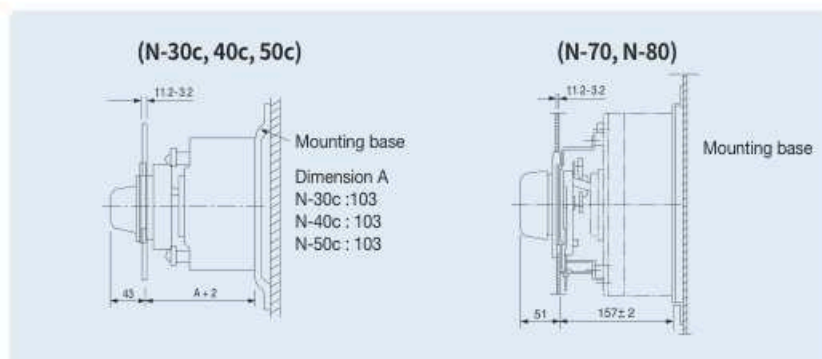
- ① All the N handles require the same size of mounting hole.
- ② Drill the holes according to the Fig. 1



<Fig 1>

#### (2) Mounting base

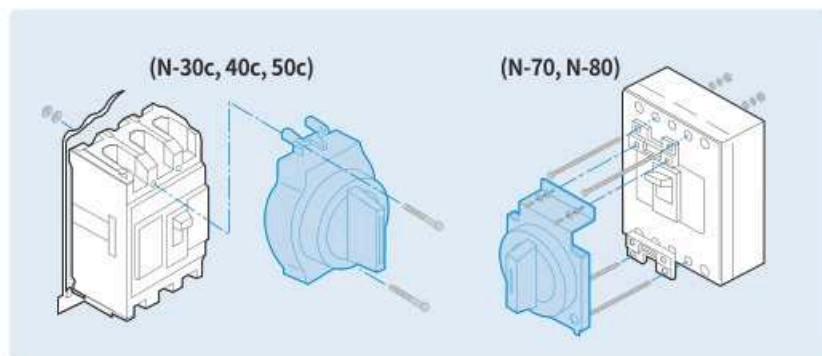
- ① Prepare a mounting base according to the Fig. 2. The distance between the door panel and the mounting base should be A+2. Dimension A is shown in the Fig.
- ② In the case of horizontal mounting turn the breaker mounting holes by 90 degrees



<Fig 2>

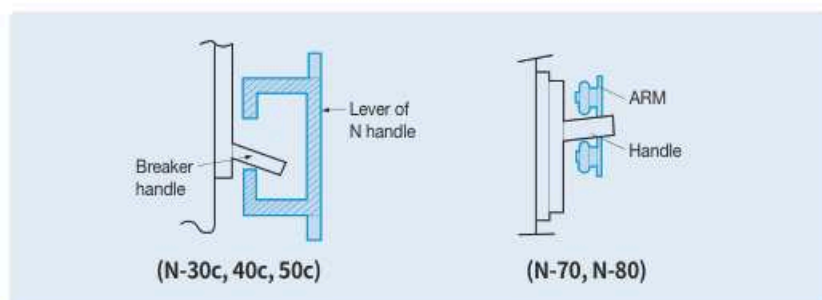
#### (3) Fixing

- ① Fixing a breaker and a handle at the same time.
  - a) As shown in the Fig. 3 a breaker and a handle can be fixed at the same time on a mounting base with the 4 (long) screws enclosed.



<Fig 3>

- b) Have the breaker handle and the lever of N handle be located in the position shown in Fig. 4.



<Fig 4>

- ② Fixing a handle and a breaker step by step
  - a) Check if there is any thin membrane in the mounting hole of the breaker cover and remove it, if exists.
  - b) Have the breaker handle and the lever of N handle be located in the position shown in Fig. 4.
  - c) Fix the N handle on the breaker with the 2 (Short) screws enclosed.
  - d) Fix the breaker on a mounting base with the 2 (Long) screws

#### (4) Fixing front plate and lock plate

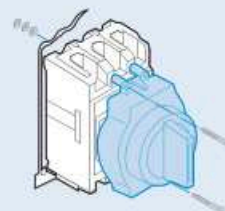
- ① Set the front plate and the locking plate on the door as shown in Fig. 6 fix them with screws.

- ② Adjust if front plate or handle is at tilt against the breaker .

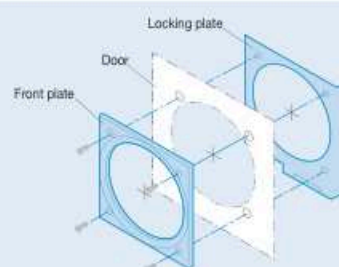
- ③ Verify that locking plate and locking lever interact on each other properly when the panel door is closed.  
If necessary adjust them by following instructions.

- a) In the event the panel door is not fully closed  
This happens if the distance between the door panel and the mounting base the panels of the door is short.  
Loosen the adjusting screw in the lock plate and move the plate in the direction of the arrow as shown in Fig. 9.

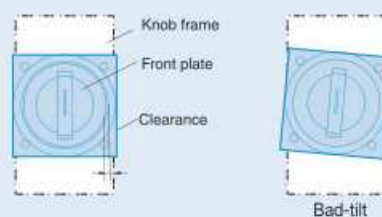
- b) In the event the door does not lock after closing the door  
This happens if the distance between the door panel and the mounting base the panels of the door is long.  
Loosen the adjusting screw in the lock plate and move the plate in the direction of the arrow as shown in Fig. 10.



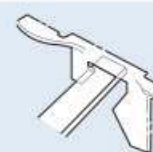
<Fig 5>



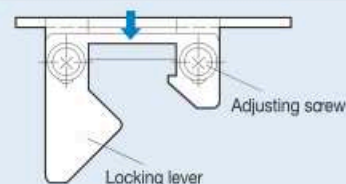
<Fig 6>



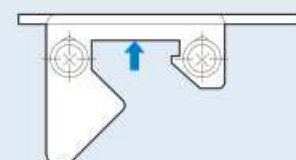
<Fig 7>



<Fig 8>

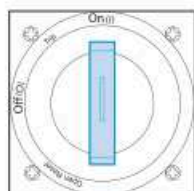


<Fig 9>

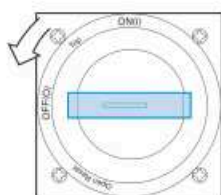


<Fig 10>

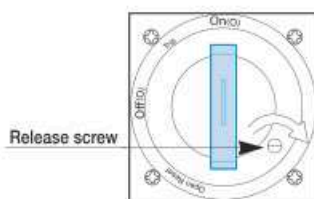
## N-handle



<Fig 11>



<Fig 12>



<Fig 13>

### (1) Operation in the door closed

- ① To have the breaker On turn the handle to be vertical. <Fig. 11>
- ② To have the breaker Off turn the handle to be horizontal. <Fig. 12>
- ③ If the breaker is tripped, the handle points to the Trip position.
- ④ To reset the breaker turn the handle to Reset position.

### (2) Unlocking the panel door

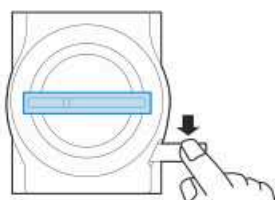
- ① The door is locked and will not open at On, Off and Trip status.
- ② To unlock the door from Off or Trip status turn the handle toward OPEN direction. (Unlocked after taking the hand off the handle.)
- ③ To unlock the door from on state turn the Release screw clockwise <Fig. 13>

### (3) Operation of the breaker in the door open

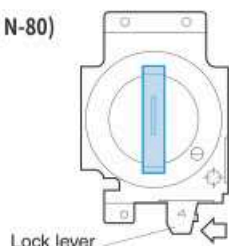
- ① When the door is open the breaker will not be on as the lock lever operates.
- ② To release the locking pull the lock lever to be nearly horizontal position. Then the breaker can be closed. <Fig. 14>
- ③ If the door is closed the lock lever will be reset automatically.

## Padlocking

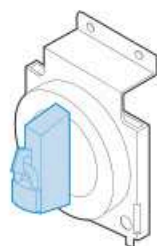
(N-30, 40, 50)



(N-70, N-80)



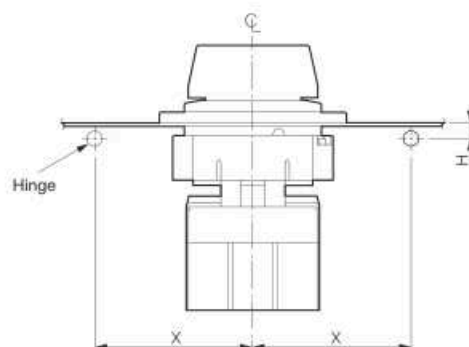
<Fig 14>



<Fig 15>

- ① Lockable at On or Off state with a padlock. (Padlock is not supplied)  
- Lockable at Off state with a padlock is an optional spec.
- ② Pull the lock plate on the front of the handle and fasten the lock. <Fig. 15>
- ③ If the breaker is tripped after padlocking at on state, the handle will point to the trip.
- ④ Padlock diameter should be 3.5 ~ 6mm

## Dimensions for N-handle hinges



Unit: mm

| Handle types            | Hinge dimensions |                  |
|-------------------------|------------------|------------------|
|                         | H                | X                |
| N-30c<br>N-40c<br>N-50c | 0 or more        | 5H + 110 or more |
| N-70<br>N-80            | 0 or more        | 5H + 100 or more |

## Locking device

It is a handle locking device which is used by being fixed on a breaker.  
You can use the padlock in the On or Off position of the breaker handle

### Fixed locking device

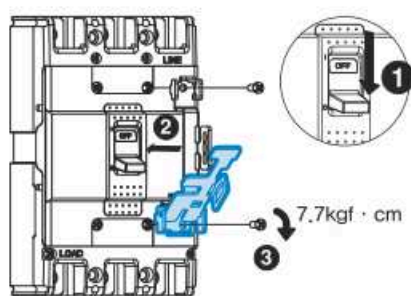
| Locking device types            | MCCB                                                                    | ELCB                                                             |
|---------------------------------|-------------------------------------------------------------------------|------------------------------------------------------------------|
| Handle Lock, ABN100c            | ABS30c, ABS50c, ABS60c,<br>ABN50c, ABN60c, ABN100c,<br>ABN100d, ABN100e | EBS30c, EBS50c, EBS60c,<br>EBN50c, EBN60c, EBN100c               |
| Handle Lock, ABH125c            | ABS125c, ABH50c, ABH125c, ABL125c                                       | EBS125c, EBH50c, EBH125c                                         |
| Handle Lock, ABH250c            | ABN250c, ABS250c, ABH250c, ABL250c                                      | EBN250c, EBS250c, EBH250c                                        |
| Handle Lock, ABE/S/H/L400b~800b | ABN400c, ABS400c, ABH400c, ABL400c,<br>ABN800c, ABS800c, ABL800c        | EBN400c, EBS400c, EBH400c, EBL400c,<br>EBN800c, EBS800c, EBL800c |

### How to use

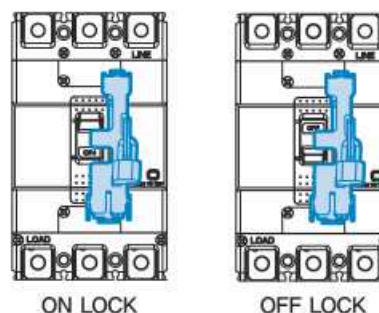
The handle lock is designed to be easily attached to the front of the breaker.

- (1) Set the breaker handle to the Off position. (Figures 1 and 2)
- (2) Secure the locking device on the cover of the circuit breaker. (Figures 1 and 2)
- (3) Use the padlock in the On or Off position. (Figures 3, 4 and 5)

#### •For 100AF/125AF/250AF MCCBs

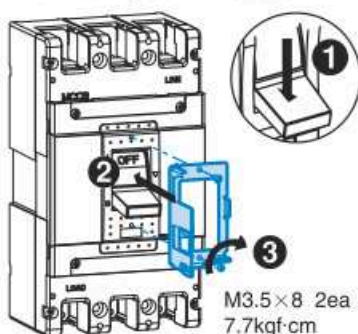


<Fig. 1>

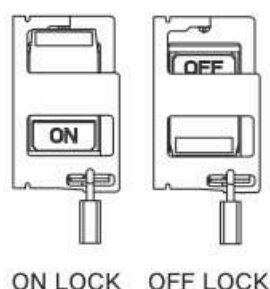


<Fig. 3>

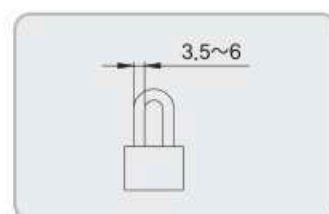
#### •For 400AF / 800AF MCCBs



<Fig. 2>



<Fig. 4>



<Fig. 5>

# Accessories

## Terminal covers

The terminal covers are applied to the circuit-breaker to prevent accidental contact with live parts and thereby guarantee protection against direct contacts.

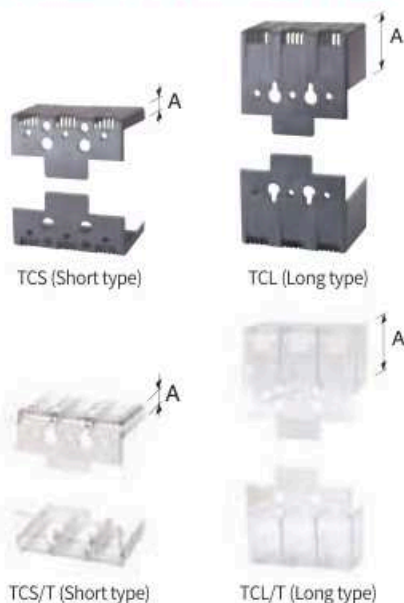
Two types by length are available and provide IP20 degree of protection.

Also, covers are classified in to 2 different type: Independent, Attachable and detachable with D or N handle

- Short type covers, TCS:  
For fixed circuit-breakers with rear terminals and for moving parts of plug-in.
- Long type covers, TCL:  
For fixed circuit-breakers with front, front extended, front for cables terminals.

| Terminal covers |          |          |           |          |          | Pole  | Applied breaker                        |                             | Size extended (A), mm |           |
|-----------------|----------|----------|-----------|----------|----------|-------|----------------------------------------|-----------------------------|-----------------------|-----------|
| Short type      |          |          | Long type |          |          |       | MCCB                                   | ELCB                        | Short type            | Long type |
| Inde            | D-handle | N-handle | Inde      | D-handle | N-handle |       |                                        |                             |                       |           |
| TBS22           | -        | -        | -         | -        | -        | 2P    | ABE30b                                 | -                           | 10                    | -         |
| TBS23           | -        | -        | -         | -        | -        | 3P    |                                        |                             |                       |           |
| TCS12           | -        | -        | TCL12     | -        | -        | 2P    | ABN50c/60c/100c/100e<br>ABS30c/50c/60c | -                           | 5.5                   | 30        |
| TCS/T-12        | -        | -        | TCL/T-12  | -        | -        |       |                                        |                             |                       |           |
| TCS13           | TCS13    | TCS13    | TCL13     | TCL13    | TCL13    | 3P    |                                        |                             |                       |           |
| TCS/T-13        | TCS/T-13 | TCS/T-13 | TCL/T-13  | TCL/T-13 | TCL/T-13 |       |                                        |                             |                       |           |
| TCS14           | TCS14    | TCS14    | TCL14     | TCS14    | TCS14    | 4P    |                                        |                             |                       |           |
| TCS/T-14        | TCS/T-14 | TCS/T-14 |           | TCL/T-14 | TCL/T-14 |       |                                        | EBS30c/50c/60c              |                       |           |
| TCS22           | -        | -        | TCL22     | -        | -        | 2P    | ABS125c<br>ABH50c/125c<br>ABL125c      | -                           | 5.5                   | 40        |
| TCS/T-22        | -        | -        | TCL/T-22  | -        | -        |       |                                        |                             |                       |           |
| TCS23           | TCS23    |          | TCL23     | TCL23    |          | 3P    |                                        |                             |                       |           |
| TCS/T-23        | TCS/T-23 |          | TCL/T-23  | TCL/T-23 |          |       |                                        |                             |                       |           |
| TCS24           | TCS24    |          | TCL24     | TCL24    |          | 4P    |                                        |                             |                       |           |
| TCS/T-24        | TCS/T-24 |          |           | TCL/T-24 |          |       |                                        | EBH50c/125c                 |                       |           |
| TCS33           | TCS33    |          | TCL33     | TCL33    |          | 2, 3P | ABN250c, ABS250c<br>ABH250c, ABL250c   | EBN250c, EBS250c<br>EBH250c | 5.5                   | 50        |
| TCS/T-33        | TCS/T-33 |          | TCL/T-33  | TCL/T-33 |          |       |                                        |                             |                       |           |
| TCS34           | TCS34    |          | TCL34     | TCL34    |          | 4P    |                                        |                             |                       |           |
| TCS/T-34        | TCS/T-34 |          |           | TCL/T-34 |          |       |                                        |                             |                       |           |
| -               | -        | -        | T1-43A    | -        | T1/T-43A | 2, 3P | ABN/S/H/L400c                          | EBN/S/H/L400c               | -                     | 120       |
| -               | -        | -        | T1-44A    | -        | -        | 4P    |                                        |                             |                       |           |
| -               | -        | -        | T1-63A    | -        | T1/T-63A | 2, 3P | ABN/S/L630c/800c                       | EBN/S/L630c/800c            | -                     | 141       |
| -               | -        | -        | T1-64A    | -        | -        | 4P    |                                        |                             |                       |           |

Note: Terminal covers for 400AF and 800AF MCCBs are in acrylic.



## Insulation barriers

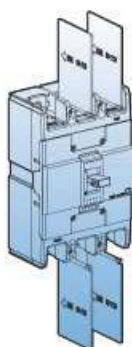


Insulation barrier allows the insulation characteristics between the phases at the connections to be increased.

They are mounted from the front, even with the circuit-breaker already installed, inserting them into the corresponding slots.

They are incompatible with both the insulating terminal covers.

It is possible to mount the phase separating partitions between two circuit-breakers side by side.



| Type         | Breaker                                                                   |                                                       |
|--------------|---------------------------------------------------------------------------|-------------------------------------------------------|
|              | MCCB                                                                      | ELCB                                                  |
| <b>IB-13</b> | ABN50c/60c/100c/100e<br>ABS30c/50c/60c                                    | EBN50c/60c/100c<br>EBS30c/50c/60c                     |
| <b>IB-23</b> | ABS125c<br>ABH50c/125c<br>ABN250c, ABS250c<br>ABH250c<br>ABL125c, ABL250c | EBS125c<br>EBH50c/125c<br>EBN250c, EBS250c<br>EBH250c |
| <b>B-43B</b> | ABN/S/H/L400c                                                             | EBN/S/H/L400c                                         |
| <b>B-33C</b> | ABN/S/L800c                                                               | EBN/S/L800c                                           |



Insulation barriers for line side are provided as standard.

## Rear connection terminals

Rear connection terminals are used to adapt the circuit breakers to switchboards or other applications that require rear connection.

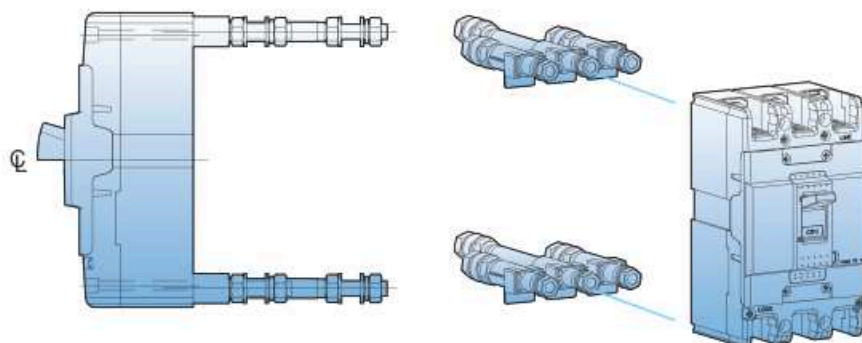
There are two kinds of rear connection terminals.

- Flat type
- Round type

### Round type terminals



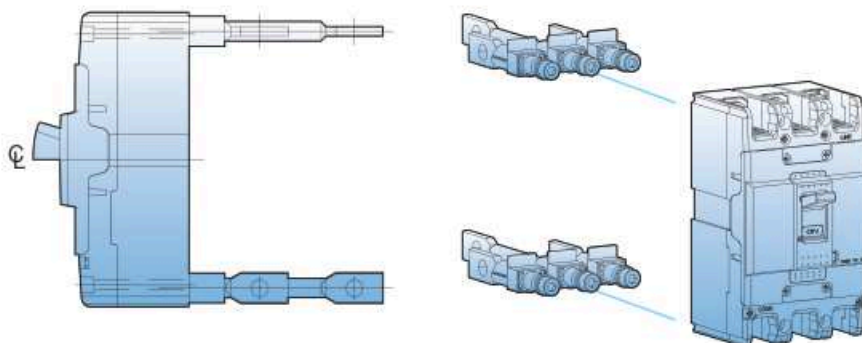
| Breaker              | For 2-pole | For 3-pole | For 4-pole |
|----------------------|------------|------------|------------|
| <b>ABN100c 50AF</b>  | RTR1-52    | RTR1-53    | -          |
| <b>ABN100c 100AF</b> | RTR1-102   | RTR1-103   | RTR1-104   |
| <b>ABH125c</b>       | RTR2-102   | RTR2-103   | RTR2-104   |
| <b>ABH250c</b>       | RTR3-202   | RTR3-203   | RTR3-204   |



### Flat type terminals



| Breaker        | For 2-pole | For 3-pole | For 4-pole |
|----------------|------------|------------|------------|
| <b>ABN100c</b> | RTB1-102   | RTB1-103   | RTB1-104   |
| <b>ABH125c</b> | RTB2-102   | RTB2-103   | RTB2-104   |
| <b>ABH250c</b> | RTB3-202   | RTB3-203   | RTB3-204   |



## Mechanical interlock

The mechanical interlock is installed on the front of two breakers mounted side by side, in either the 3-pole or 4-pole version and prevents simultaneous closing of the two breakers. So it is suitable for consisting of manual sourcechangeover system.

### Type numbering system

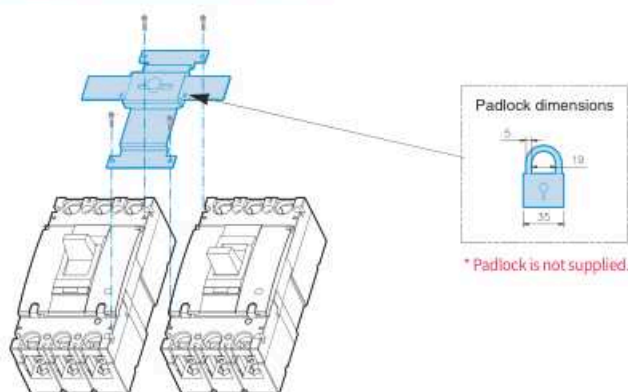
|                      |          |          |
|----------------------|----------|----------|
| <b>MI</b>            | <b>4</b> | <b>3</b> |
| Type                 | AF       | Pole     |
| Mechanical interlock |          |          |
|                      | 1 100AF  | 3 3P     |
|                      | 2 125AF  | 4 4P     |
|                      | 3 250AF  |          |
|                      | 4 400AF  |          |
|                      | 5 800AF  |          |

### Types and applicable breakers

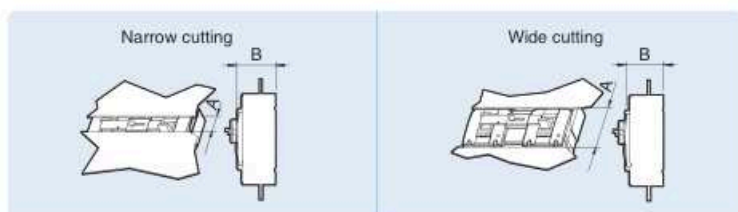
| Type      | MCCB                                                     | ELCB                                            |
|-----------|----------------------------------------------------------|-------------------------------------------------|
| MI-13, 14 | ABS30c, ABS50c, ABS60c, ABN50c, ABN60c, ABN100c, ABN100e | EBS30c, EBS50c, EBS60c, EBN50c, EBN60c, EBN100c |
| MI-23, 24 | ABS125c, ABH50c, ABH125c, ABL125c                        | EBS125c, EBH50c, EBH125c                        |
| MI-33, 34 | ABN/S/H/L250c                                            | EBN/S/H/L250c                                   |
| MI-43, 44 | ABN/S/H/L400c                                            | EBN/S/H/L400c                                   |
| MI-83, 84 | ABN/S/L800c                                              | EBN/S/L800c                                     |

Note) MI is not applicable to 2-pole version breakers of 100AF and 125AF.

### Layout



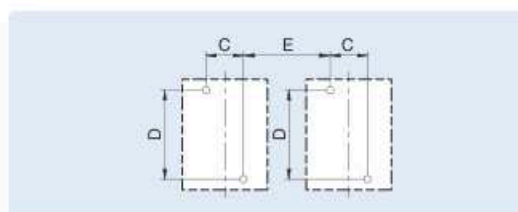
### MCCB panel cutting



(Unit in: mm)

| Cutting | MI-13, 14 |    | MI-23, 24 |    | MI-33, 34 |    | MI-43, 44 |     | MI-83, 84 |     |
|---------|-----------|----|-----------|----|-----------|----|-----------|-----|-----------|-----|
|         | A         | B  | A         | B  | A         | B  | A         | B   | A         | B   |
| Narrow  | 52        | 66 | 52        | 66 | 52        | 66 | 100       | 111 | 100       | 111 |
| Wide    | 86        | 62 | 102       | 62 | 104       | 62 | 152       | 97  | 152       | 97  |

### MCCB panel drilling



(Unit in: mm)

| Breaker | C  |    | D     |       | E   |     |
|---------|----|----|-------|-------|-----|-----|
|         | 3P | 4P | 3P    | 4P    | 3P  | 4P  |
| 100AF   | 25 | 25 | 110.5 | 110.5 | 70  | 95  |
| 125AF   | 30 | 30 | 132   | 132   | 84  | 114 |
| 250AF   | 35 | 35 | 126   | 126   | 99  | 134 |
| 400AF   | 44 | 44 | 215   | 215   | 166 | 210 |
| 800AF   | 70 | 70 | 243   | 243   | 210 | 280 |

## Plug-in devices



Plug-in base

Plug-in device makes it possible to extract and/or rapidly replace the circuit breaker without having to touch connections for ship and important installations.

The plug-in base is the fixed part of the plug-in version of the circuit-breaker.

It will be installed directly on the back plate of panel.

The circuit-breaker is racked out by unscrewing the top and bottom fixing screws.

### Normal type plug-in MCCB

- MCCB current rating upto 250A
- Generally used in switchgears

### Double-row type plug-in MCCB

- For 125AF MCCB
- Generally used in branch circuits

## Type names of blocks



Plug-in type MCCB  
(Plug-in terminal built)



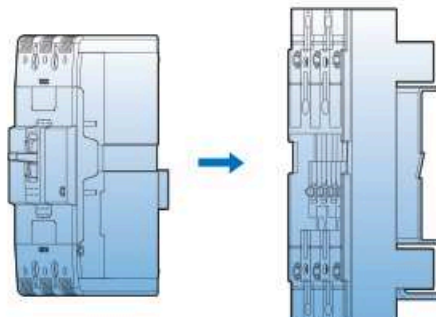
ABH103c plug-in type



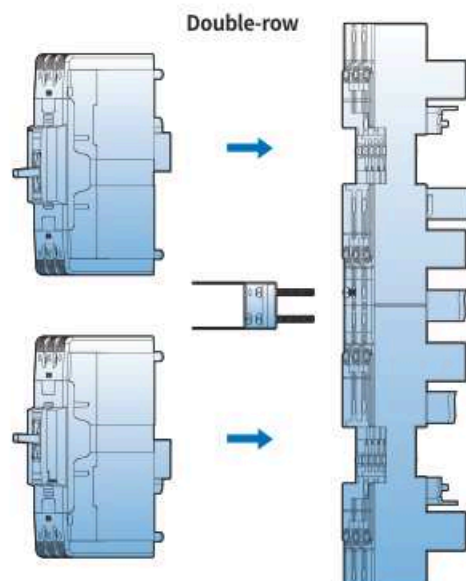
ABH203c plug-in type

| Breaker | Arrangement      | Plug-in block      | Remark |
|---------|------------------|--------------------|--------|
| ABN100c | Normal           | PB-A3-FR           |        |
|         | Single-row       | PB-A3-1DB          |        |
|         | Double-row       | PB-A3-2DB          |        |
|         | Line-only        | PB-A3-FRL          |        |
| ABH125c | Normal           | PB-C3-FR           |        |
|         | Single-row       | PB-C3-1DB          |        |
|         | Double-row       | PB-C3-2DB          |        |
|         | Line-only        | PB-C3-FRL          |        |
| ABH250c | Normal           | PB-D3-FR           |        |
| 400AF   | Normal/Line-only | PB-I3-FR/PB-I3-FRL |        |
| 800AF   | Normal           | PB-J3-FR           |        |

Normal



Double-row



## Remote operation

### Motor operator

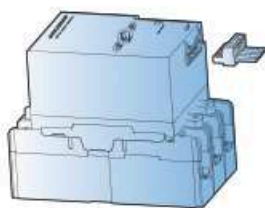


Motor operators can also be operated by manual. The motor drives a mechanism which switches Metasol toggle handle to the "On" and "Off/Reset" positions.

- The manual actuator handle is located on the front of the cover.
- Manual or Automatic operation can be selected.
- Applicable to 2, 3 and 4-pole breakers.

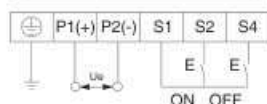
| MCCB                               |                                                          |                                                          | Type   | Control voltage                               | Actuation current (A)     | Response time (ms) |         | Mechanical service life (operations) | No. of operations per hour |
|------------------------------------|----------------------------------------------------------|----------------------------------------------------------|--------|-----------------------------------------------|---------------------------|--------------------|---------|--------------------------------------|----------------------------|
| 2P                                 | 3P                                                       | 4P                                                       |        |                                               |                           | Closing            | Opening |                                      |                            |
| -                                  | ABN53c, ABN63c, ABN103c, ABN103e, ABS33c, ABS53c, ABS63c | ABN54c, ABN64c, ABN104c, ABN104e, ABS34c, ABS54c, ABS64c | MOP-M1 | ① DC24V<br>② AC110V~DC110V<br>③ AC230V/DC220V | ≤3A (DC24V)<br>≤0.5A (AC) | 700                | 700     | 10,000                               | 120                        |
| -                                  | ABS103c, ABH53c, ABH103c, ABL103c                        | ABS104c, ABH54c, ABH104c, ABL104c                        | MOP-M2 | ① DC24V<br>② AC110V~DC110V<br>③ AC230V/DC220V | ≤3A (DC24V)<br>≤0.5A (AC) | 840                | 840     | 10,000                               | 120                        |
| ABN202c, ABS202c, ABH202c, ABL202c | ABN203c, ABS203c, ABH203c, ABL203c                       | ABN204c, ABS204c, ABH204c, ABL204c                       | MOP-M3 | ① DC24V<br>② AC110V~DC110V<br>③ AC230V/DC220V | ≤3A (DC24V)<br>≤0.5A (AC) | 840                | 840     | 10,000                               | 120                        |
| ABN402c, ABS402c, ABH402c, ABL402c | ABN403c, ABS403c, ABH403c, ABL403c                       | ABN404c, ABS404c, ABH404c, ABL404c                       | MOP-M4 | ① DC24V<br>② AC110~DC110V<br>③ AC230V/DC220V  | ≤6A (DC24V)<br>≤0.8A (AC) | 1,200              | 1,200   | 4,000                                | 60                         |
| ABN802c, ABS802c, ABL802c          | ABN803c, ABS803c, ABL803c                                | ABN804c, ABS804c, ABL804c                                | MOP-M5 | ① DC24V<br>② AC110~DC110V<br>③ AC230V/DC220V  | ≤6A (DC24V)<br>≤0.8A (AC) | 1,200              | 1,200   | 2,500                                | 60                         |
| -                                  | ABS1003b, ABS1203b, ABL1003b, ABL1203b                   | ABS1004b, ABS1204b, ABL1004b, ABL1204b                   | MOP-M6 | ① AC230V/DC220V                               | ≤6A (DC24V)<br>≤0.8A (AC) | 1,500              | 1,500   | 2,500                                | 20                         |

### Wiring connection



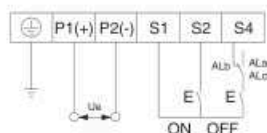
#### Standard connection

- 1) Remote On and Off of MCCB and manual operation
- 2) Be careful not to change the polarity at DC24V



#### Connection with alarm switch (AL)

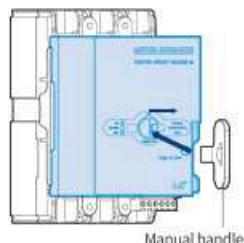
- 1) The connection diagram is the method of using a alarm switch (AL) without shunt or undervoltage trip. A trip due to a fault or trip button prevent a remote reset.
- 2) The fault must be cleared surely and reset it with manual operation.



# Accessories

## Remote operation

### Manual operation



- 1) Insert the manual handle into the slot of Motor operator surface and rotate it clockwise.
- 2) It must be rotated just 180° clockwise for safe operation of micro switch in the motor operator.
- 3) Return the manual handle after the manual operation
- 4) Turn the slide switch back to the position of Auto.

CAUTION: When the circuit breaker is tripped by trip button in the Off status, it is impossible to operate motor operator automatically. It must be reset by manual operation.

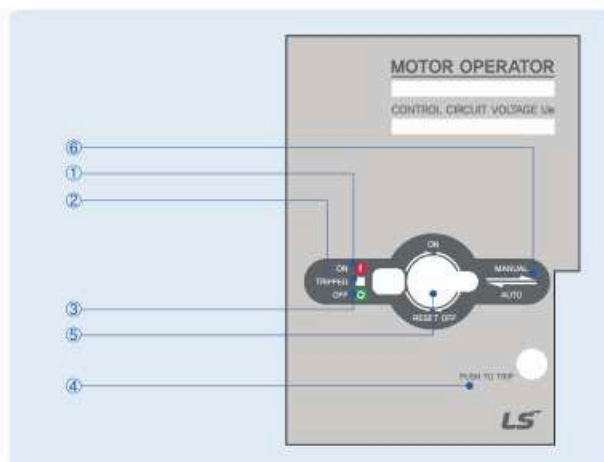
### Automatic operation

- 1) Set the slide switch to Auto, then internal power is closed automatically.
- 2) Operating frequency should be less than these below regulated values.  
MOP-M1~M3, M7 (120 operations per hour), MOP-M4 (60 operations per hour),  
MOP-M5, M6 (20 operations per hour)
- 3) Use the On/Off switch in the range of regulated values.
- 4) It may interfere near communication equipments because of internal switching power supply.  
It's recommended that a noise filter be installed to power supply.
- 5) Please do not input On/Off signals at the same time during the automatic operation.
- 6) If the circuit breaker has a UVT attached inside, charge a UVT on the rated voltage before performing Motor operator.

### Motor operator

#### Feature

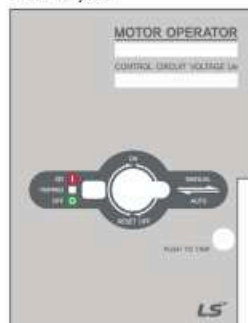
- ① On position indication (Red color)
- ② Trip position indication (White color)
- ③ Off position indication (Green color)
- ④ Button for push to trip
- ⑤ On/Off/Reset selection lever
- ⑥ Manual/Auto selection lever



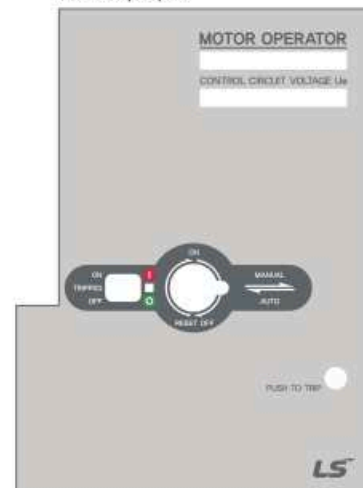
MOP-M1



MOP-M2, M3



MOP-M4/M5/M6



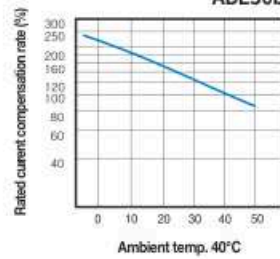
## Breaker types

MCCB

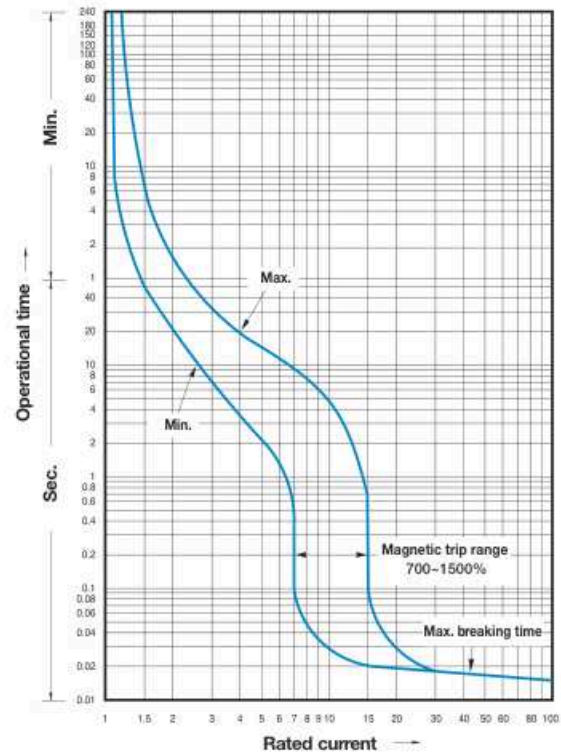
ABE30b

## Compensation curves

ABE30b



## Rated current: 3~30A (ABE)



## Breaker types

MCCB

ABN50c/60c/100c/100e

ABS30c/50c/60c

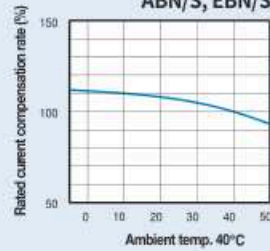
ELCB

EBN50c/60c/100c

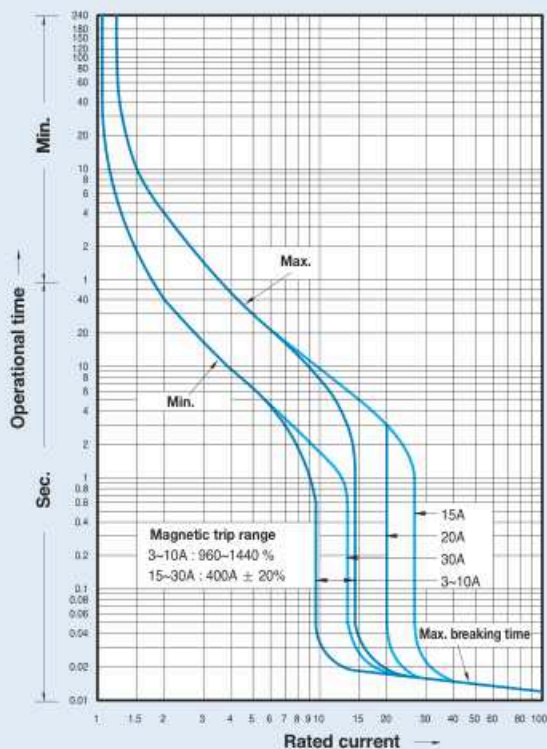
EBS30c/50c/60c

## Compensation curves

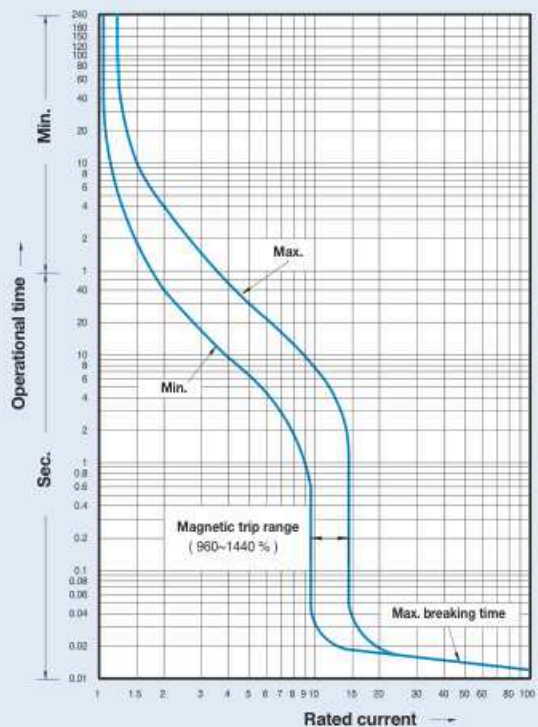
ABN/S, EBN/S



## Rated current: 3~30A (ABN/S,EBN/S)



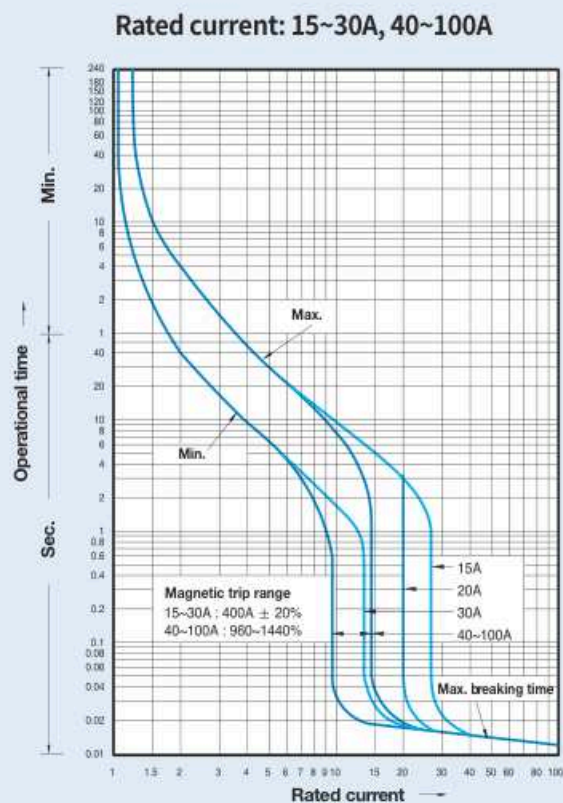
## Rated current: 40~100A (ABN/S,EBN/S)



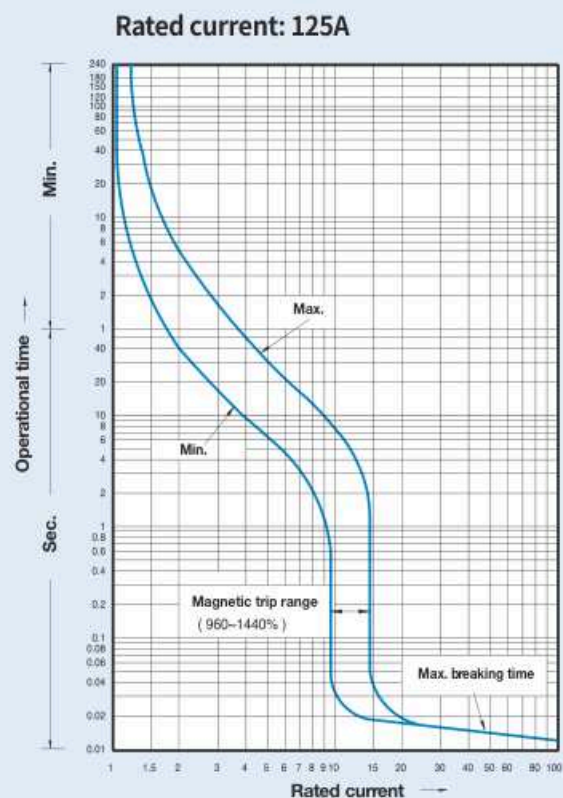
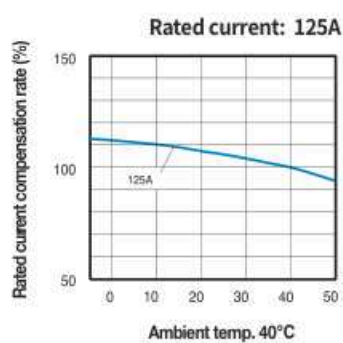
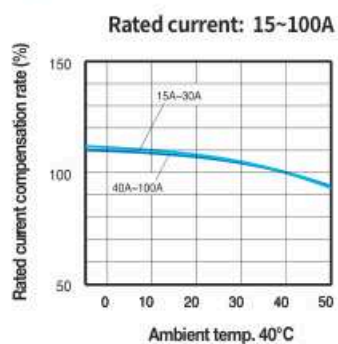
# Characteristics curves

## Breaker types

| MCCB        |
|-------------|
| ABS125c     |
| ABH50c/125c |
| ABL125c     |
| ELCB        |
| EBS125c     |
| EBH50c/125c |



## Compensation curves



## Breaker types

### MCCB

ABN250c, ABS250c

ABH250c, ABL250c

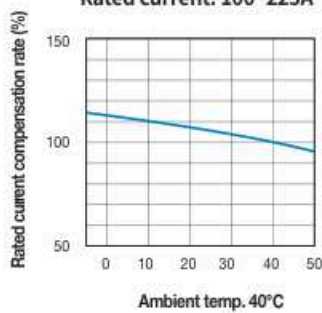
### ELCB

EBN250c, EBS250c

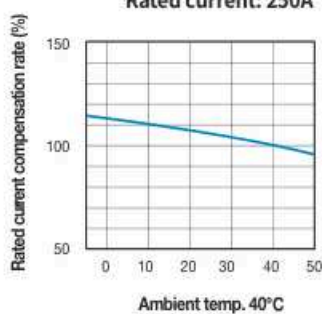
EBH250c

## Compensation curves

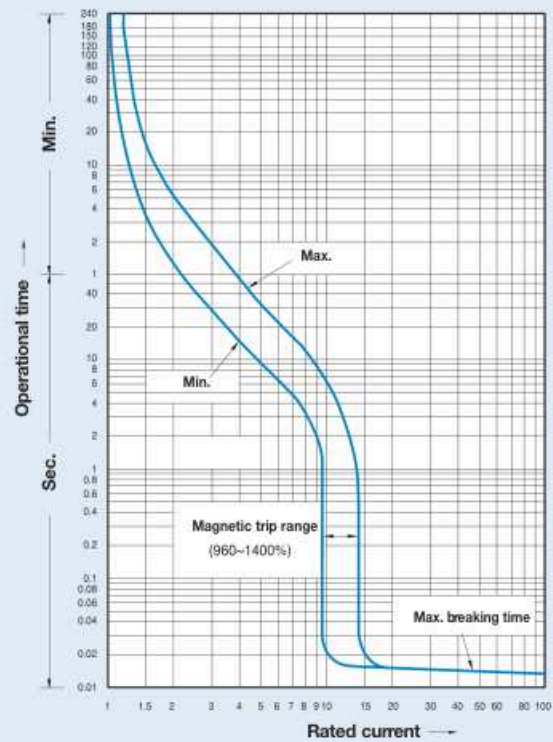
Rated current: 100~225A



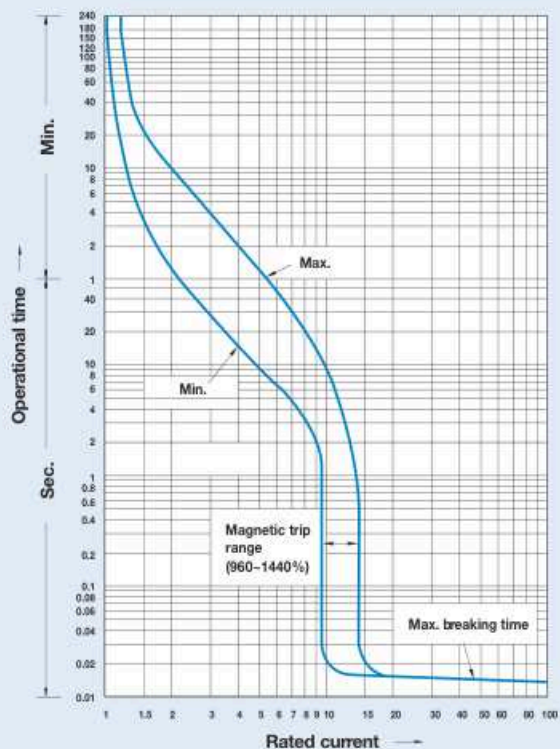
Rated current: 250A



Rated current: 100~225A



Rated current: 250A

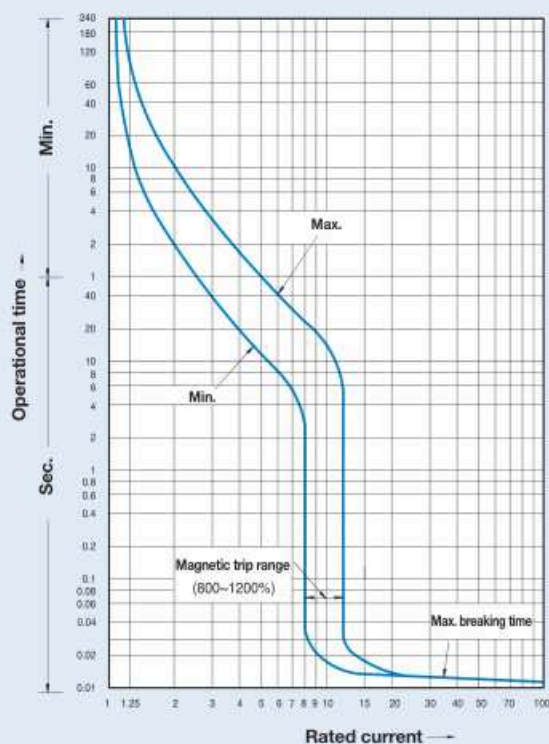


# Characteristics curves

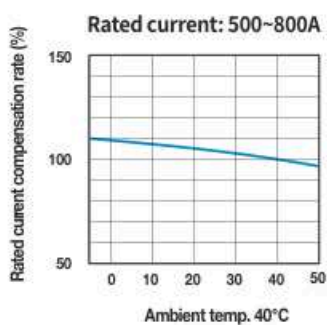
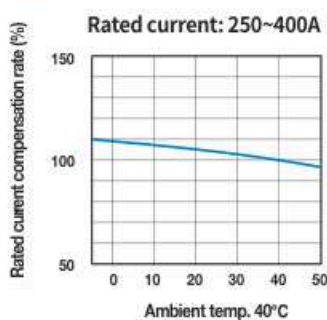
## Breaker types

| MCCB                               |
|------------------------------------|
| ABN400c, ABS400c, ABH400c, ABL400c |
| ABN800c, ABS800c, ABL800c          |
| ELCB                               |
| EBN400c, EBS400c, EBH400c, EBL400c |
| EBN800c, EBS800c, EBL800c          |

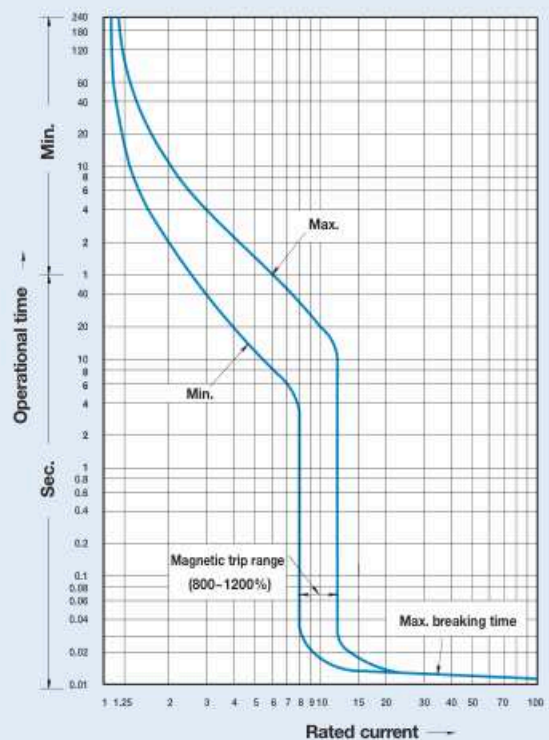
Rated current: 250~400A



## Compensation curves



Rated current: 500~800A



### Breaker types

#### MCCB

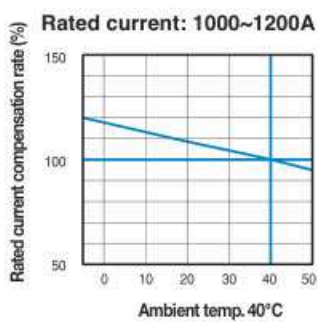
ABS1000b, ABL1000b

ABS1200b, ABL1200b

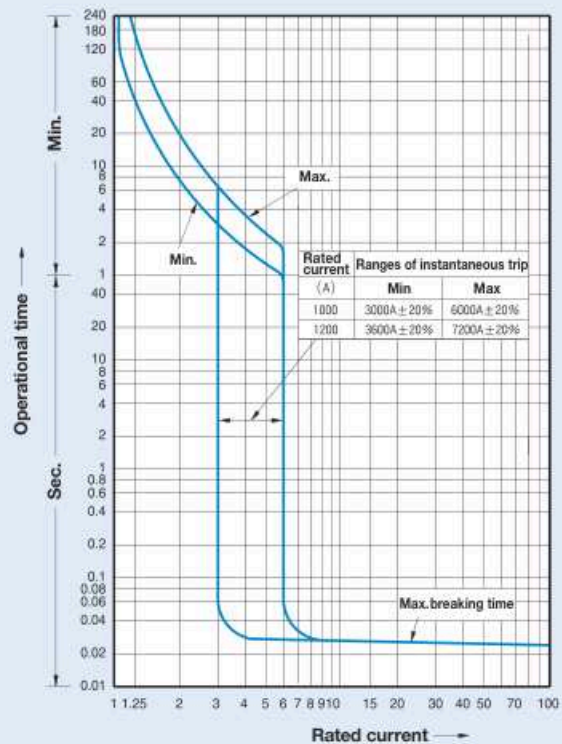
#### ELCB

EBS1003b, EBS1203b

### Compensation curves



### Rated current: 1000~1200A

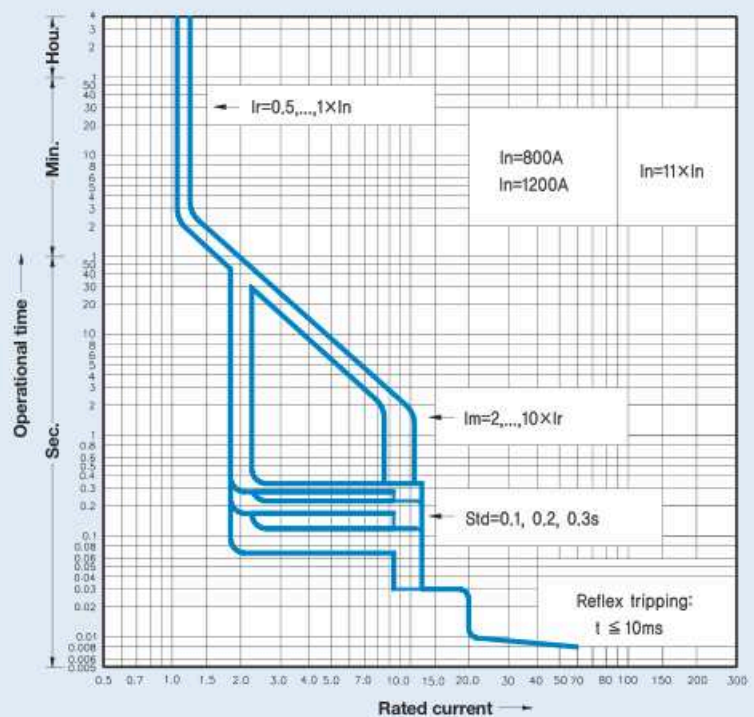


### Breaker types

#### MCCB

ABS1200bE

### Rated current: 1200A



# Characteristics curves (ELCB Adjustable)

## Breaker types

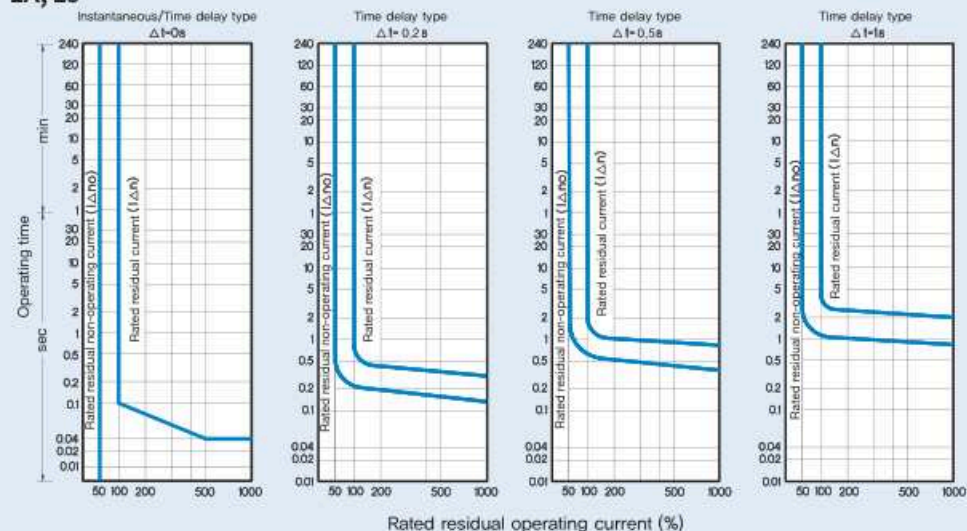
### ELCB

EBN 50c/60c/100c/250c

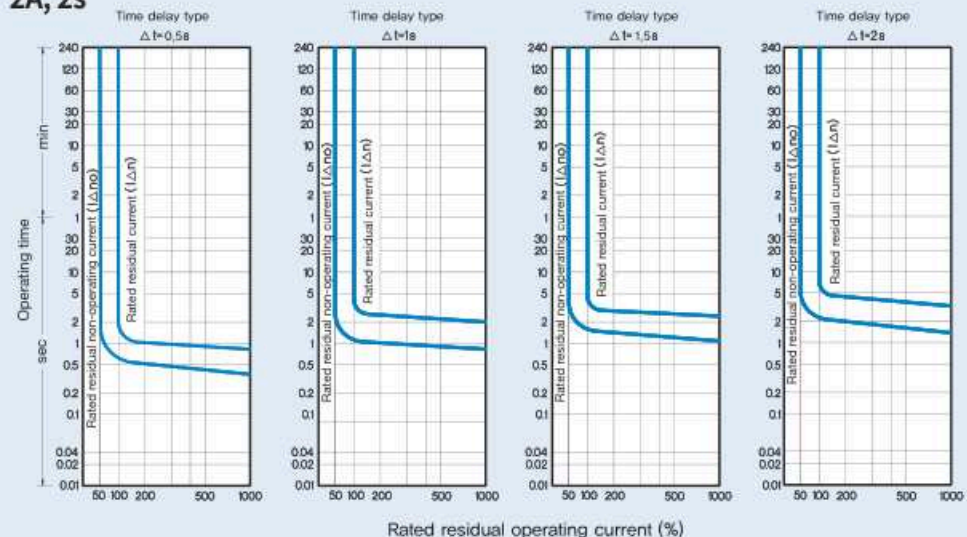
EBS 30c/50c/60c/125c/250c

EBH 50c/125c/250c

## 1A, 1s



## 2A, 2s



## Breaker types

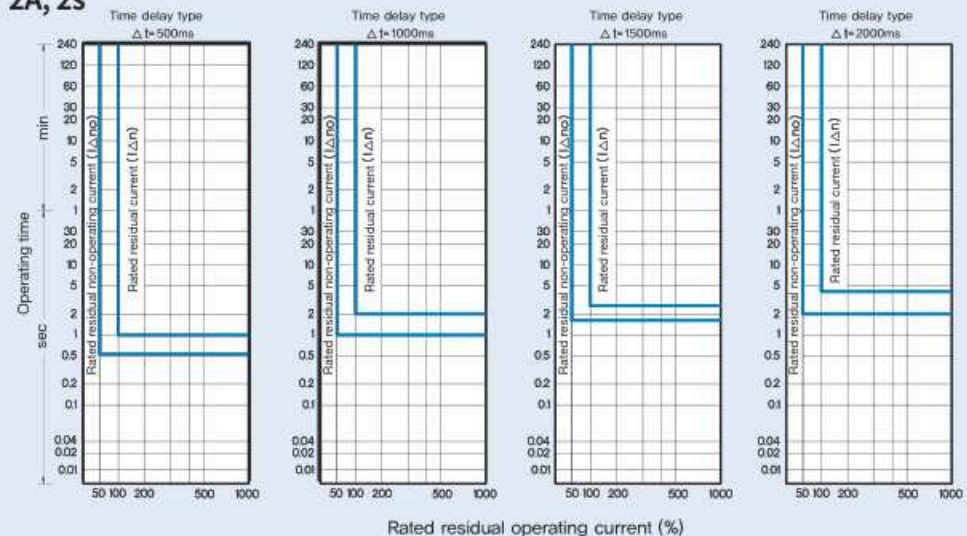
### ELCB

EBN400c, EBS400c

EBH400c, EBL400c

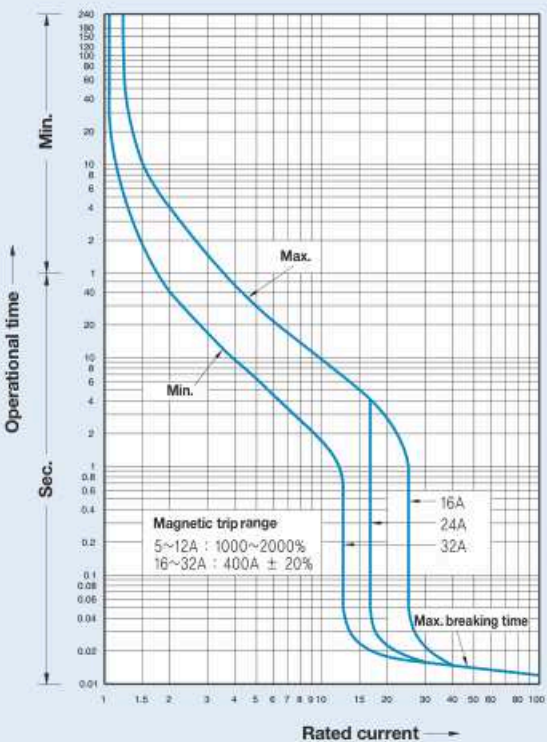
EBN800c, EBS800c, EBL800c

## 2A, 2s



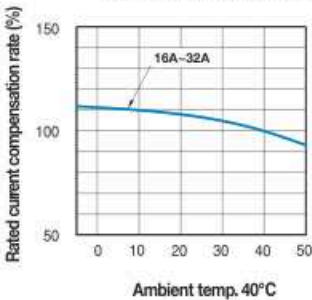
## Breaker types

Rated current: 16~32A

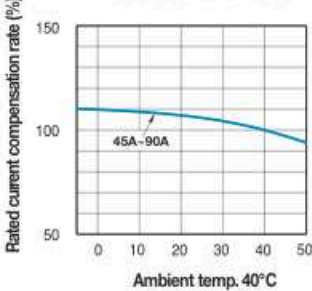


## Compensation curves

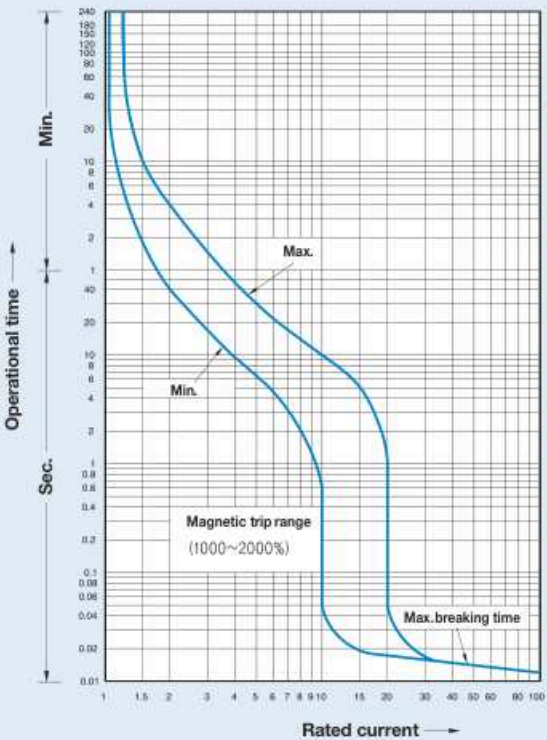
Rated current: 16~32A



Rated current: 45~90A



Rated current: 45~90A

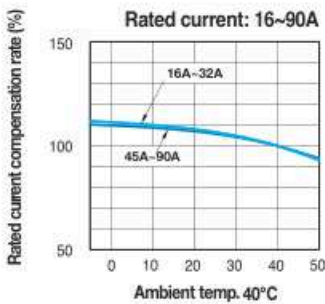


# Characteristics curves (Motor protection type)

## Breaker types

| MCCB          |
|---------------|
| ABS125cM      |
| ABH50cM/125cM |

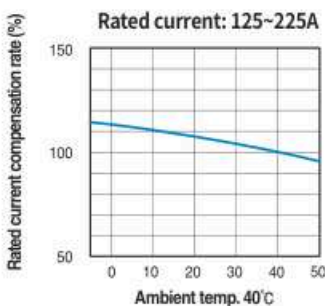
## Compensation curves



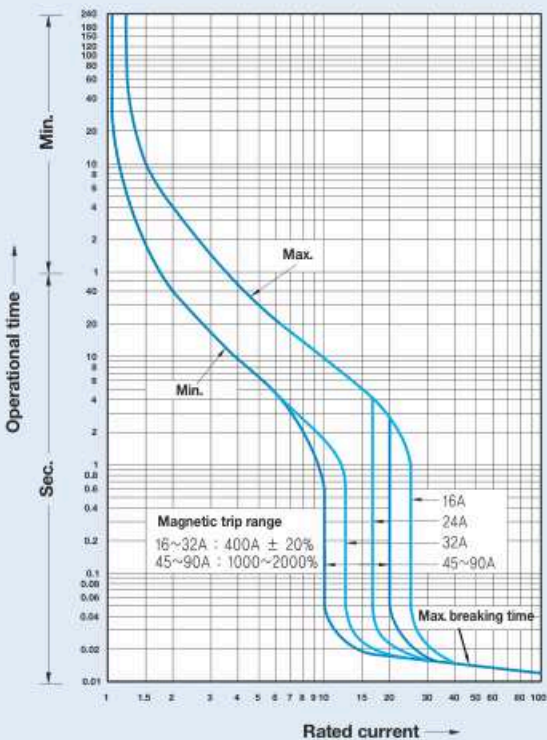
## Breaker types

| MCCB               |
|--------------------|
| ABN250cM, ABS250cM |
| ABH250cM           |

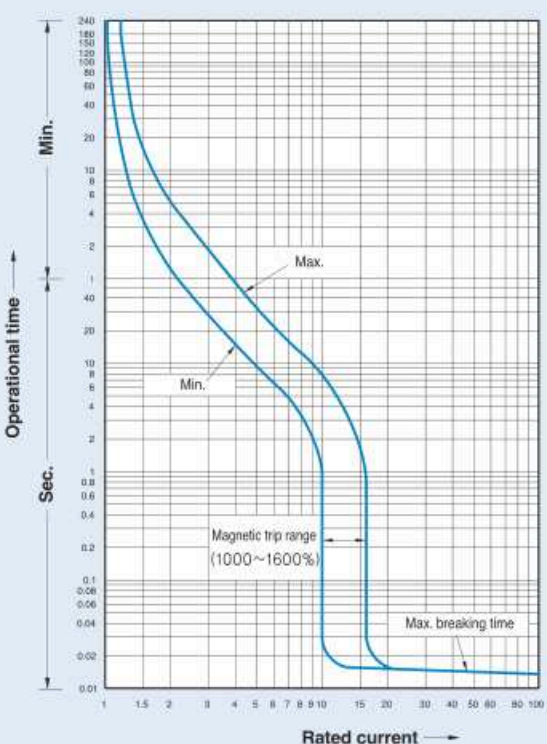
## Compensation curves



## Rated current: 16~90A



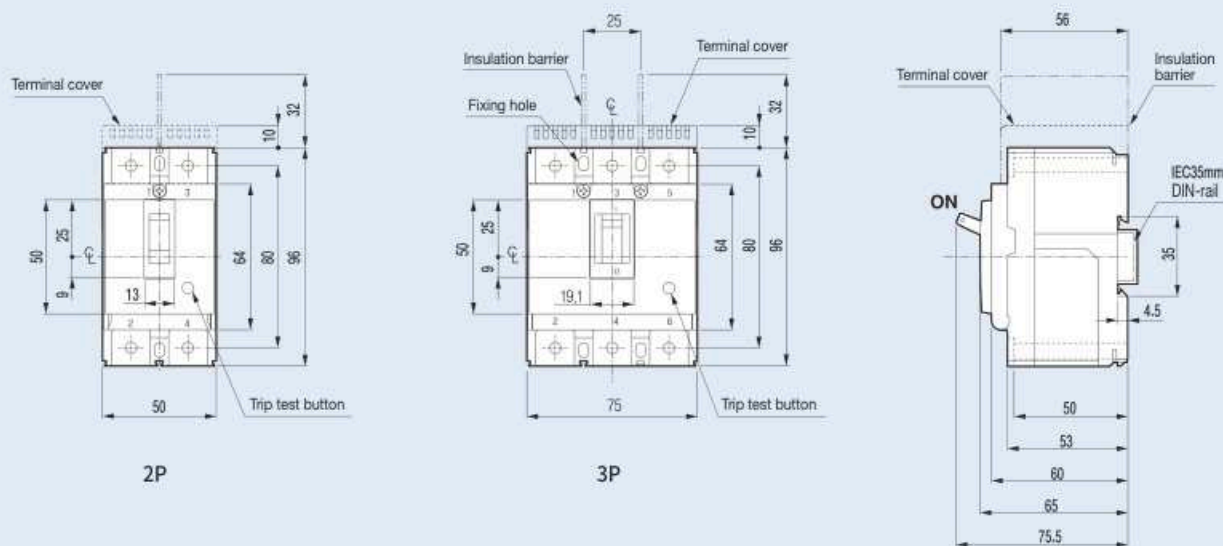
## Rated current: 125~225A



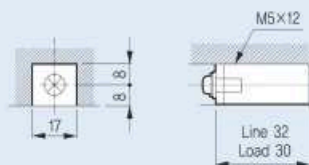
## MCCB

**ABE30b**

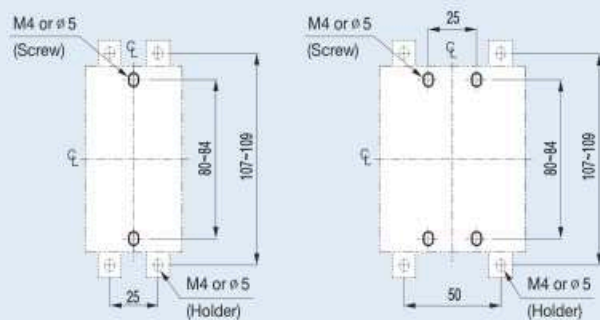
(Unit: mm)



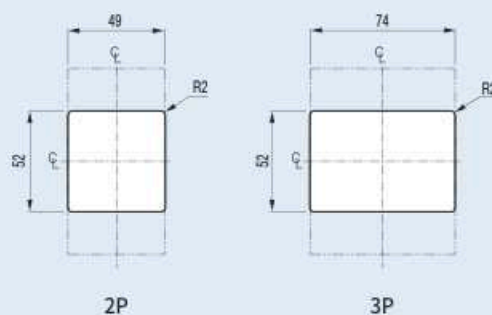
### Terminal details



### Panel drilling



### Front panel cutting

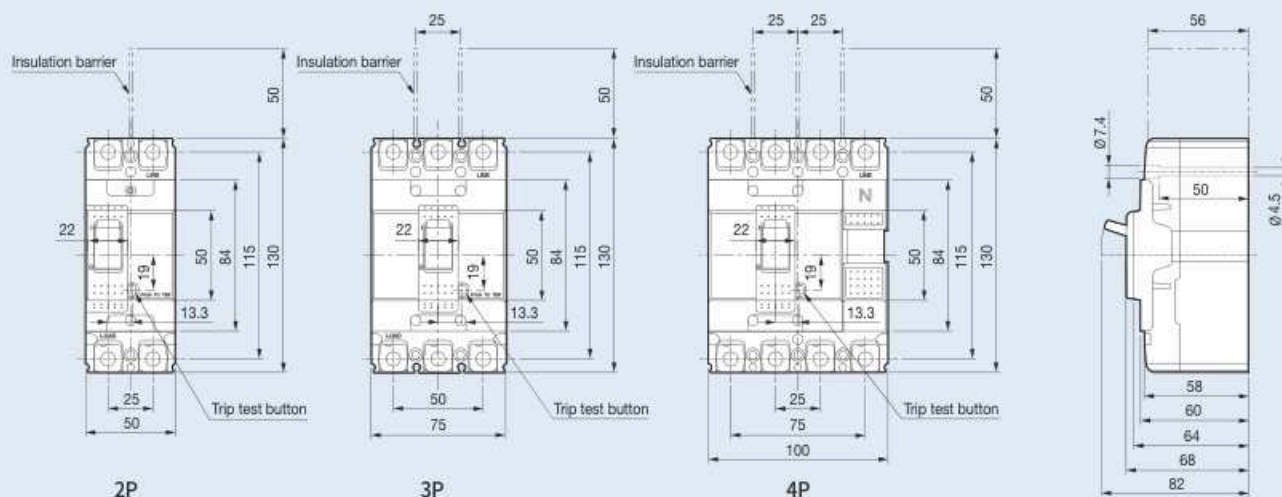


# Dimensions

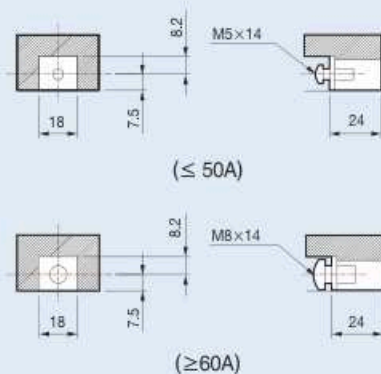
## MCCB

|              |        |
|--------------|--------|
| ABN50c       | ABS30c |
| ABN60c       | ABS50c |
| ABN100c/100e | ABS60c |

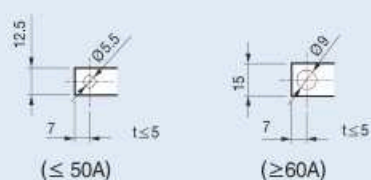
(Unit: mm)



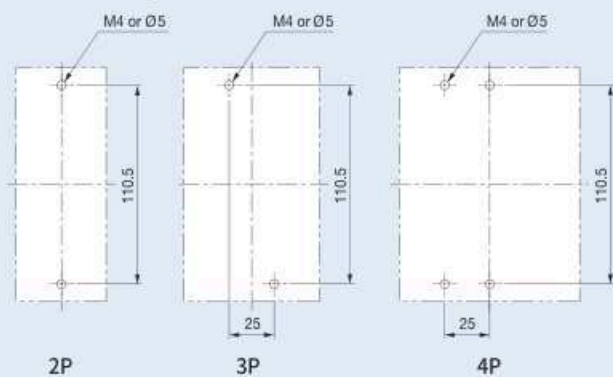
### Terminal details



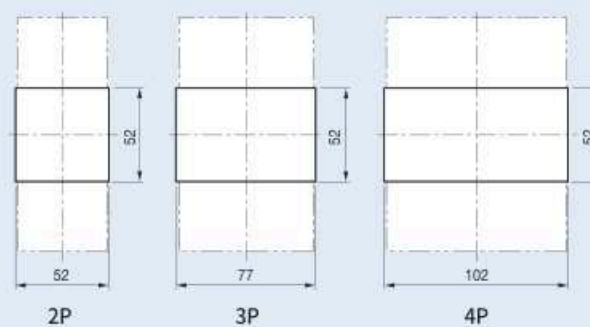
### Connecting



### Panel drilling



### Front panel cutting



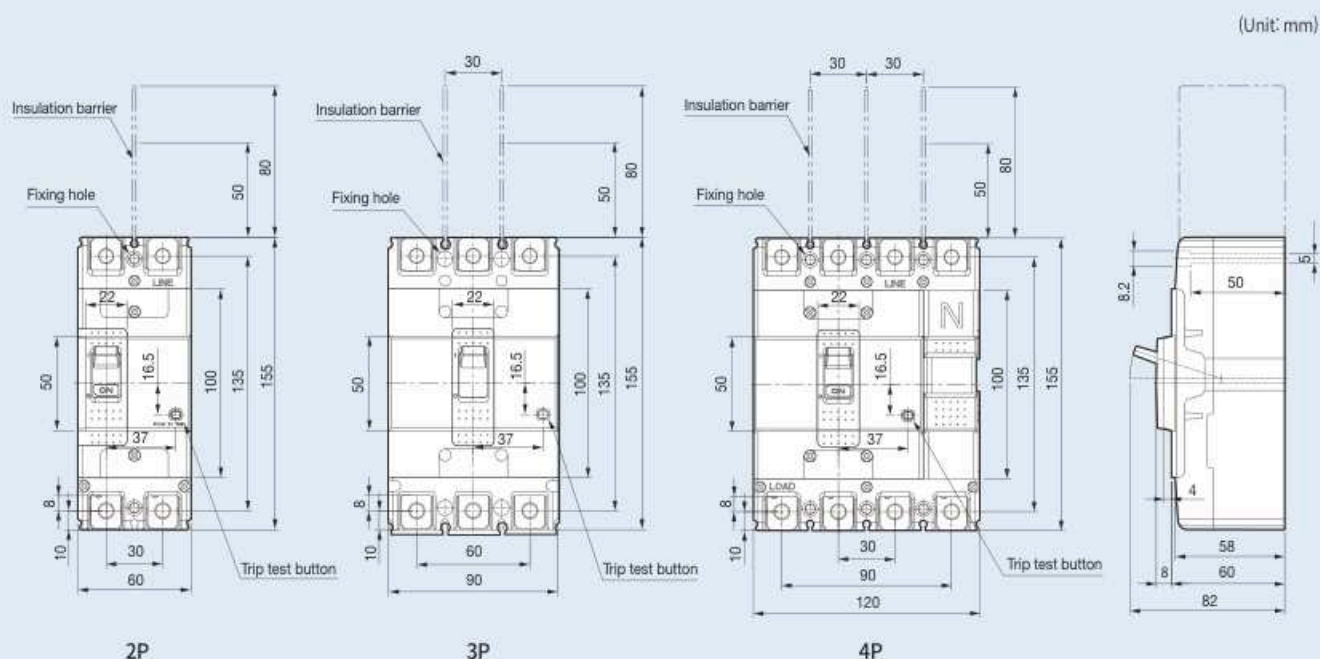
## MCCB

ABS125c

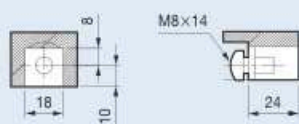
ABH50c

ABH125c

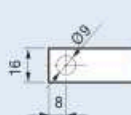
ABL125c



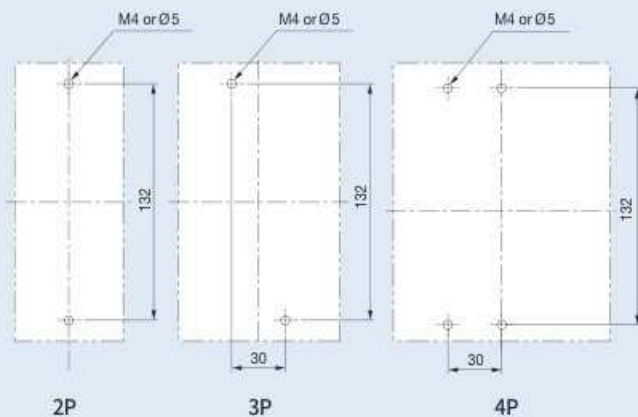
### Terminal details



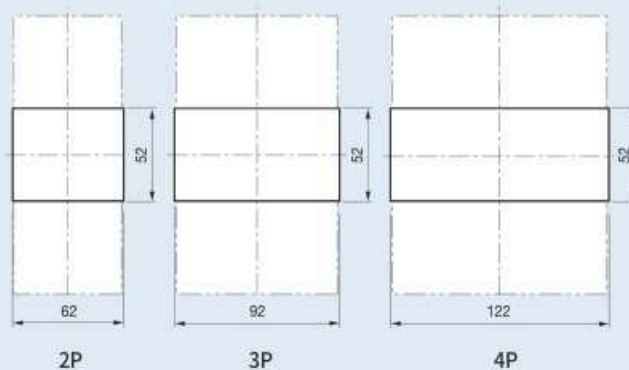
## Connecting



### Panel drilling



### Front panel cutting



# Dimensions

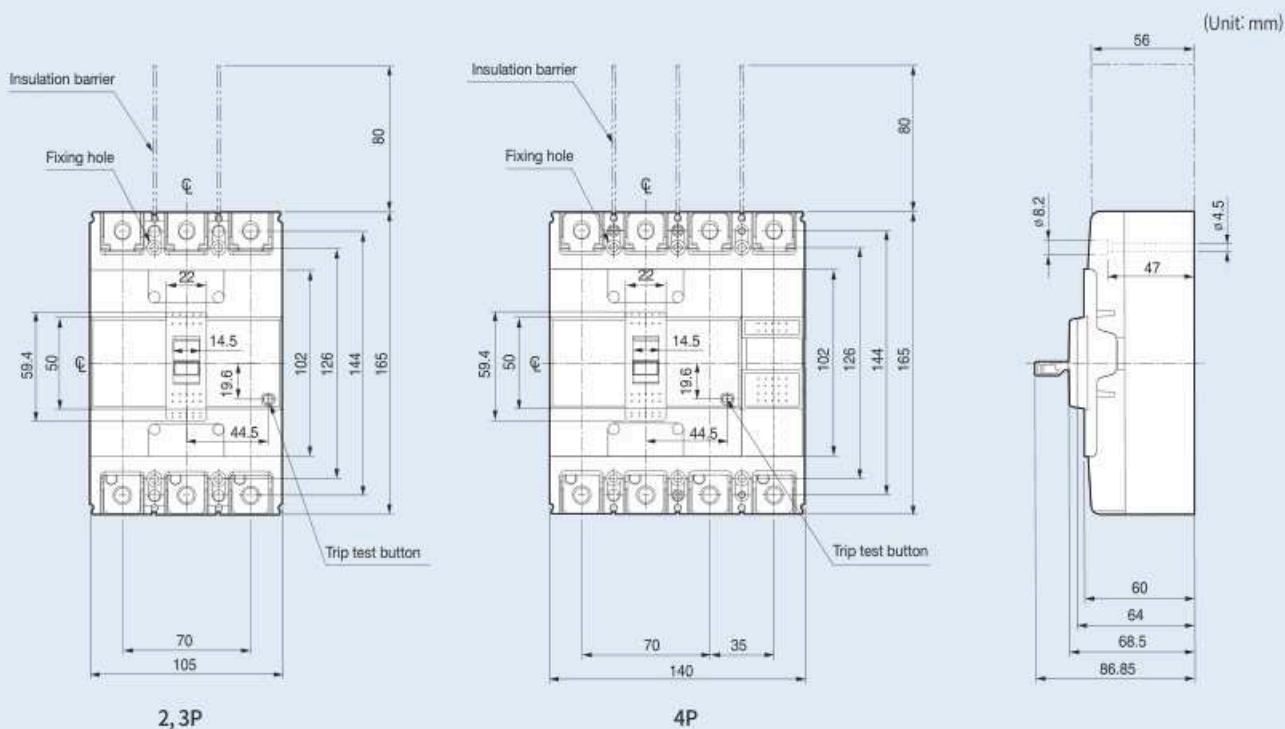
## MCCB

ABN250c

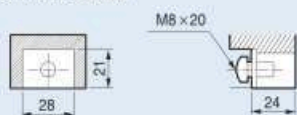
ABS250c

ABH250c

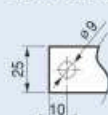
ABL250c



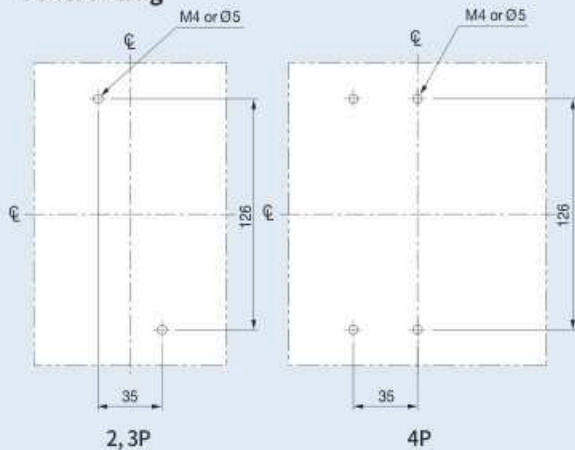
### Terminal details



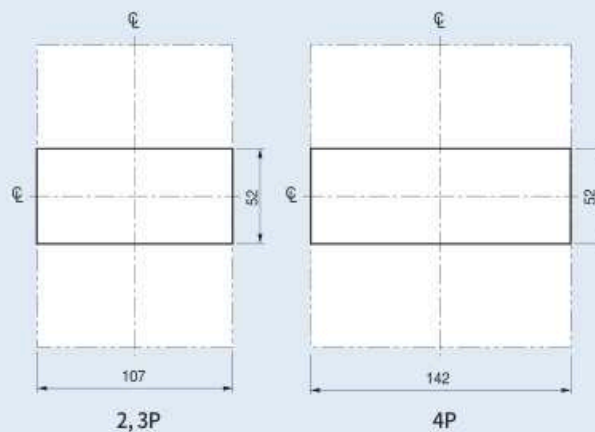
### Connecting



### Panel drilling



### Front panel cutting



## MCCB

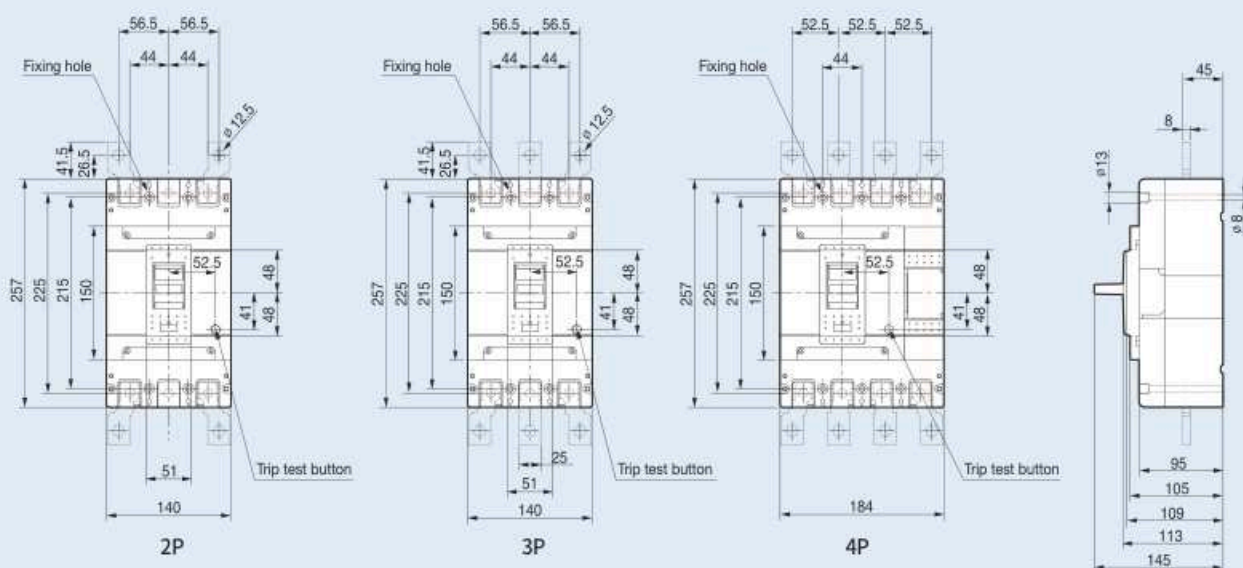
ABN400c

ABS400c

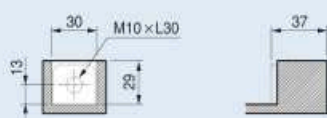
ABH400c

ABL400c

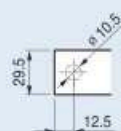
(Unit: mm)



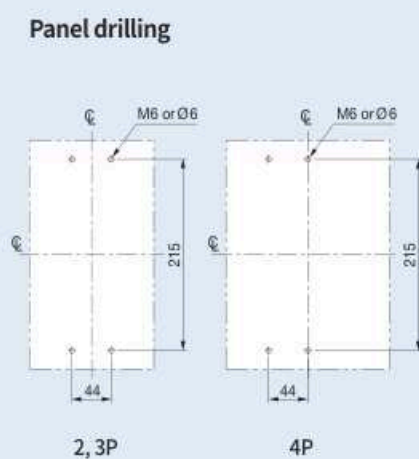
## Terminal details



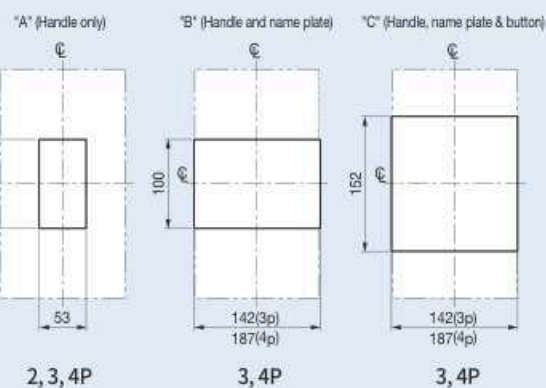
## Connecting



## Panel drilling



## Front panel cutting

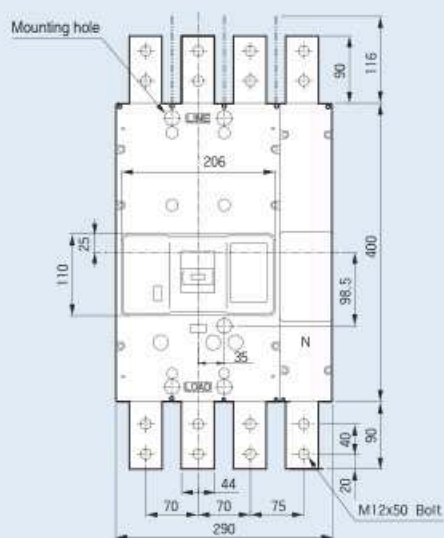




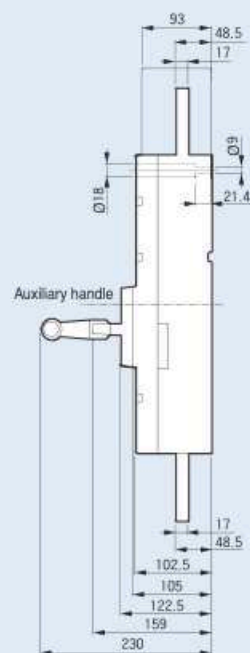
ABL1000b

ABL1200b

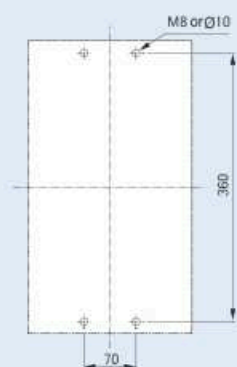
3P



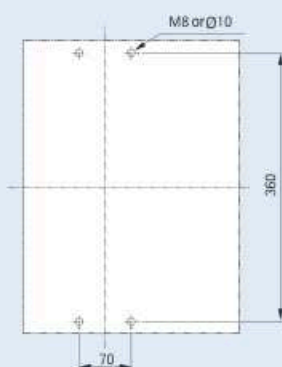
4P



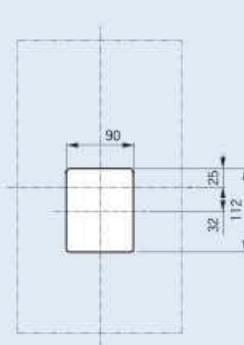
### Front panel cutting



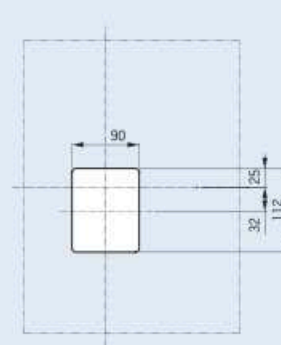
3P



4P



3P



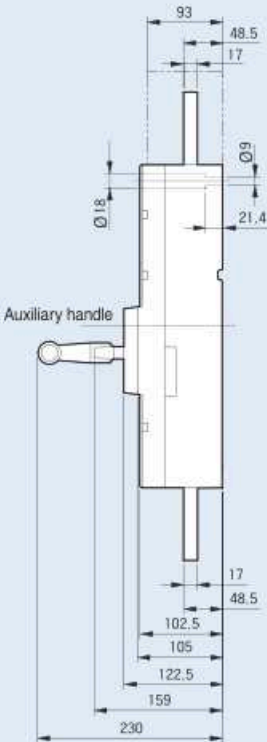
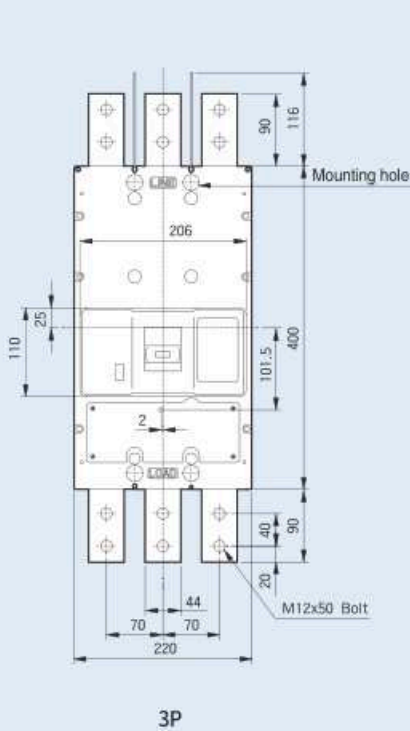
4P

# Dimensions

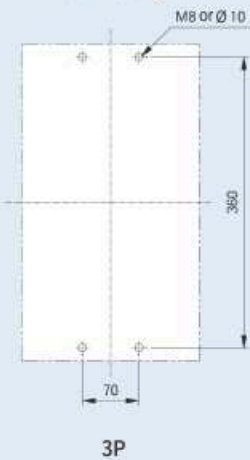
## MCCB

ABS1203bE

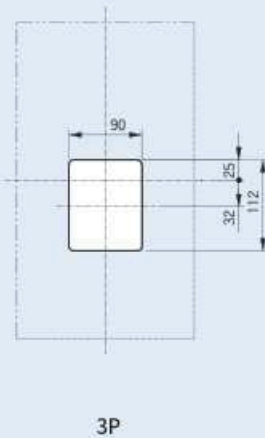
(Unit: mm)



### Panel drilling



### Front panel cutting



## ELCB

EBN50c

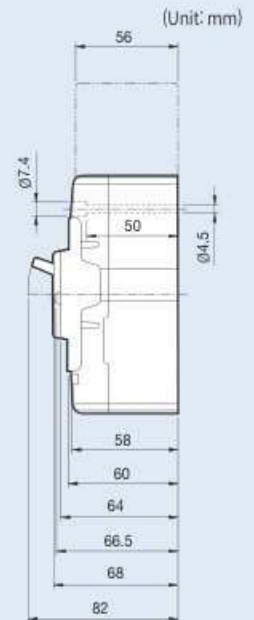
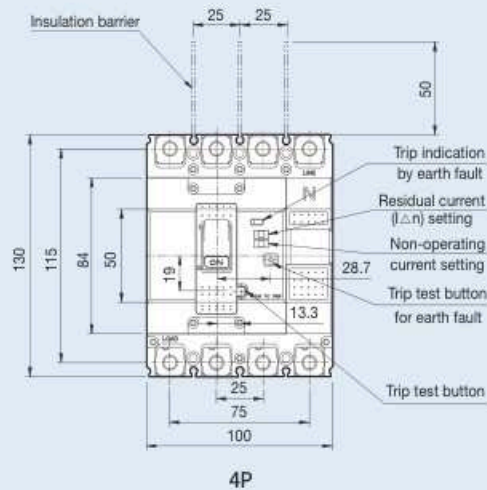
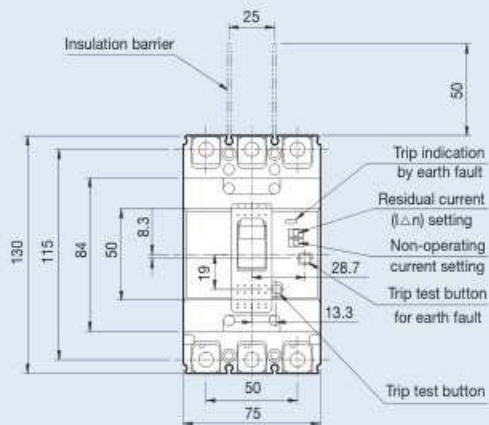
EBS30c

EBN60c

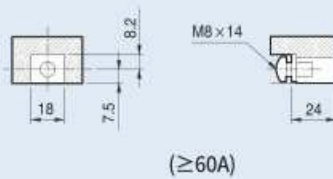
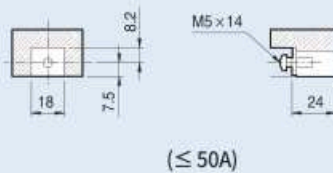
EBS50c

EBN100c

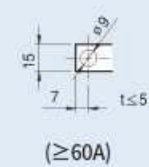
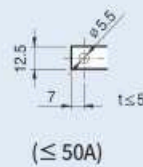
EBS60c



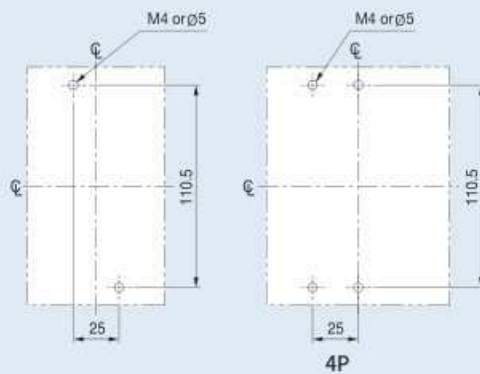
## Terminal details



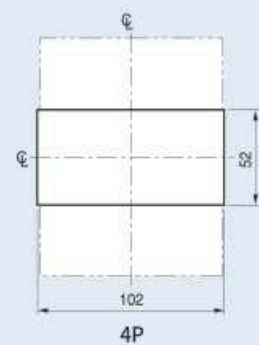
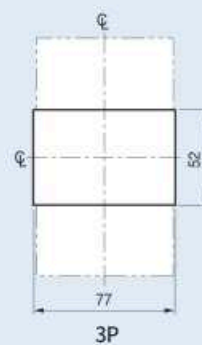
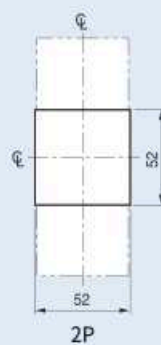
## Connecting



## Panel drilling



## Front panel cutting



# Dimensions

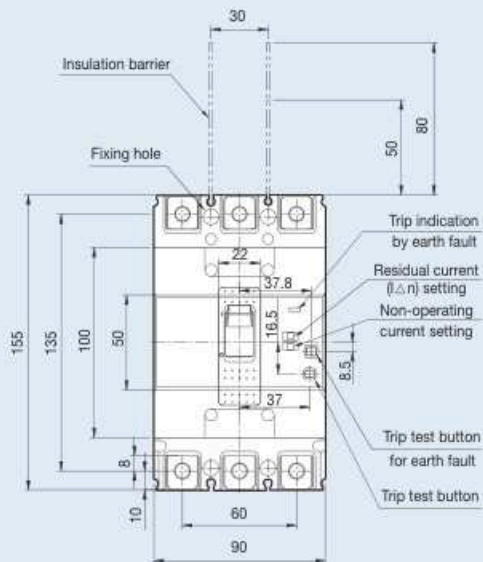
## ELCB

EBS125c

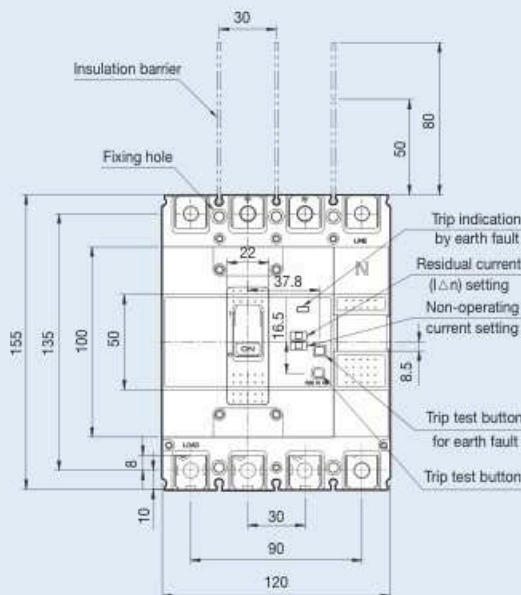
EBH50c

EBH125c

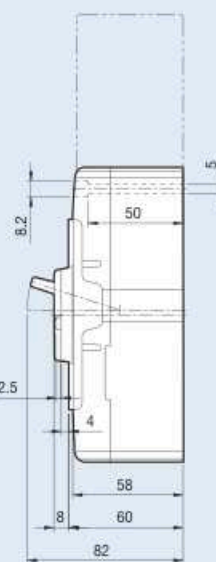
(Unit: mm)



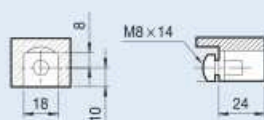
3P



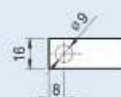
4P



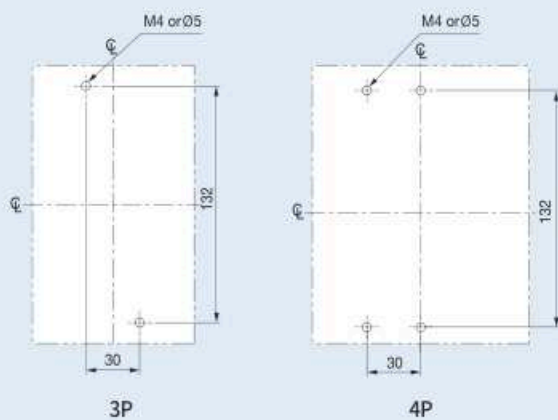
### Terminal details



### Connecting



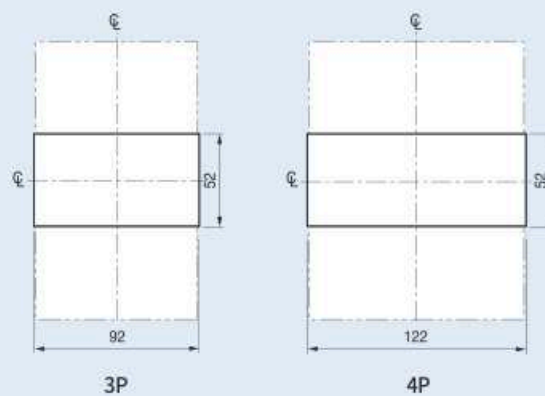
### Panel drilling



3P

4P

### Front panel cutting



3P

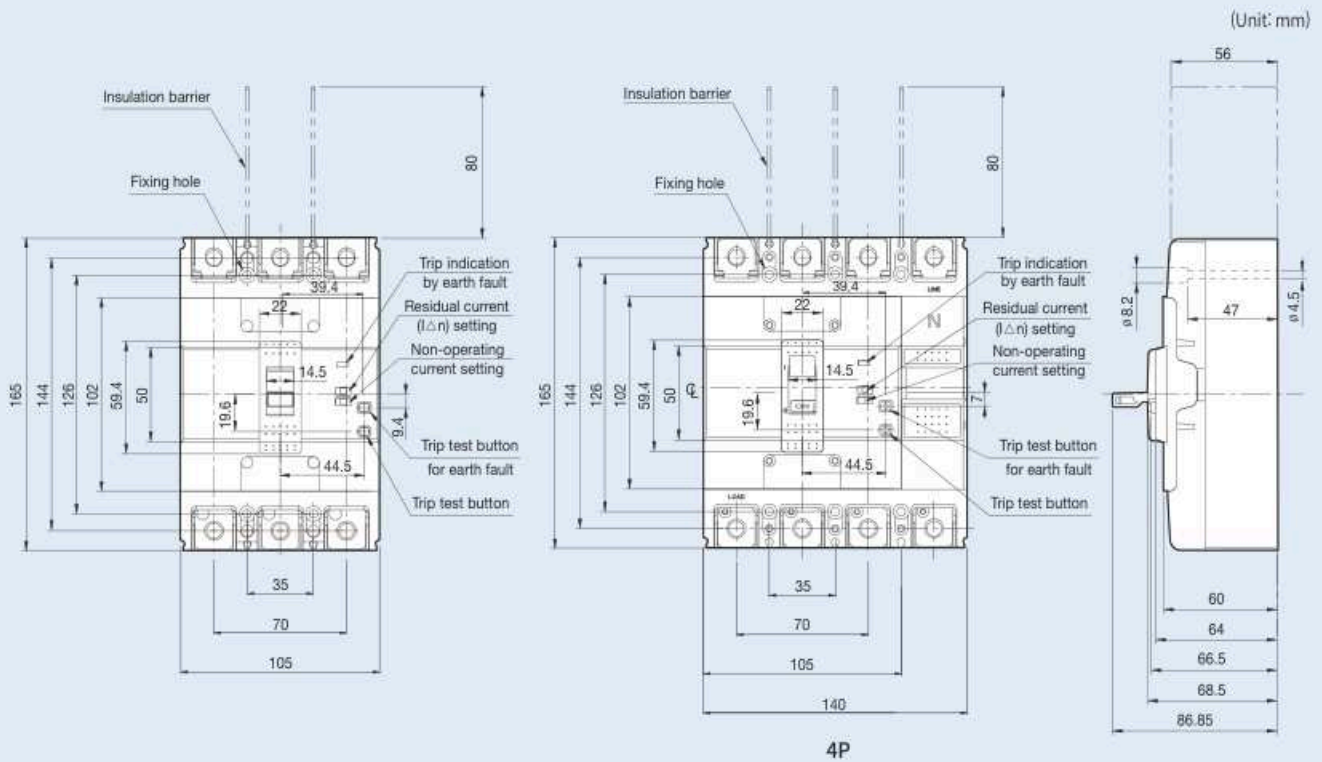
4P

## ELCB

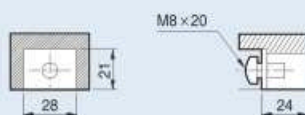
EBN250c

EBS250c

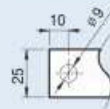
EBH250c



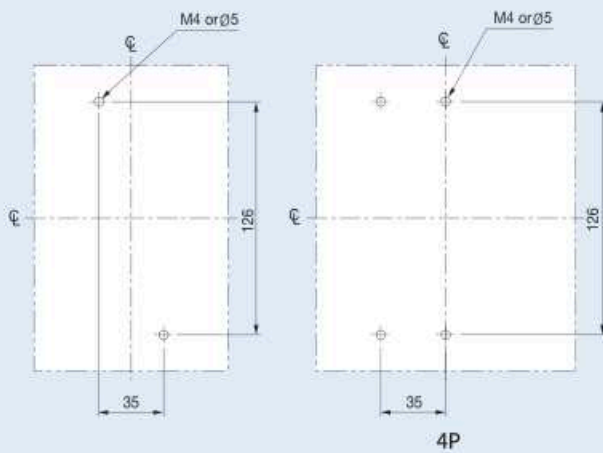
## Terminal details



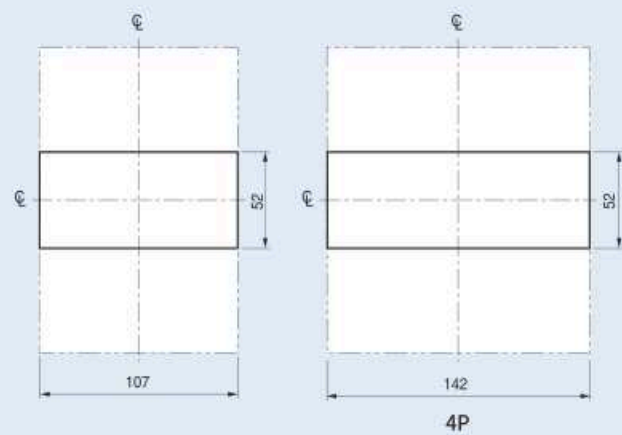
## Connecting



## Panel drilling



## Front panel cutting



# Dimensions

## ELCB (Instantaneous type)

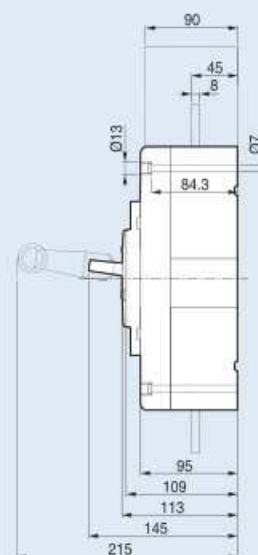
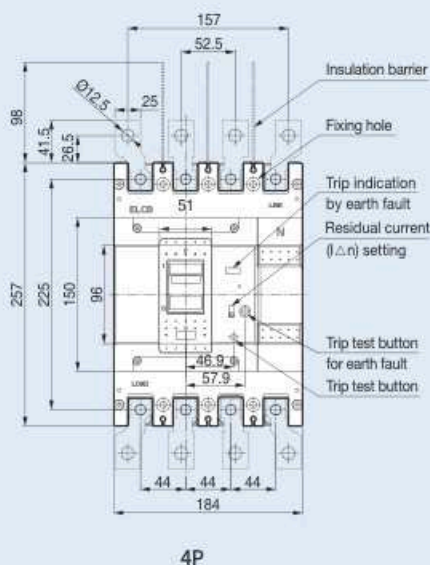
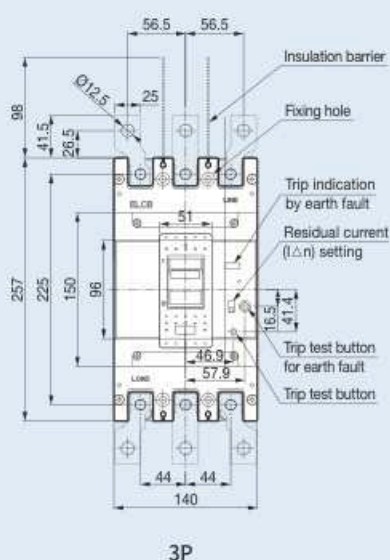
EBN400c

EBS400c

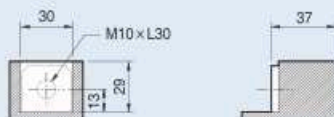
EBH400c

EBL400c

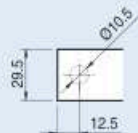
(Unit: mm)



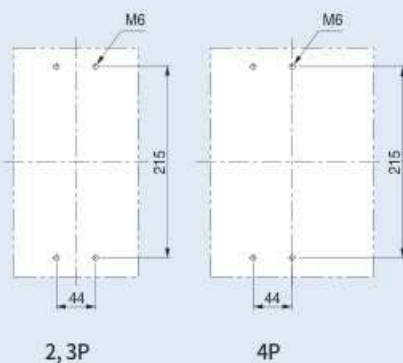
### Terminal details



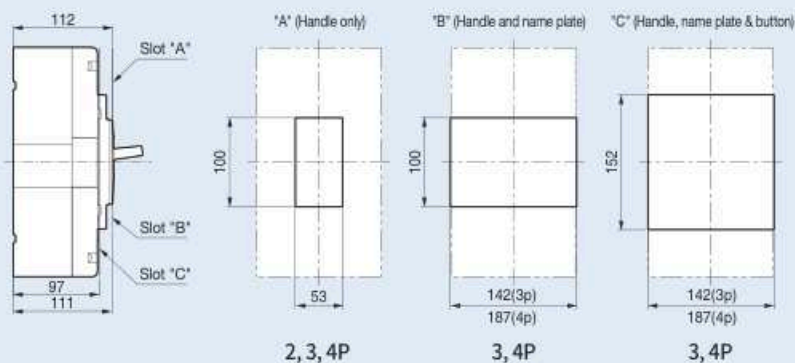
### Connecting



### Panel drilling



### Front panel cutting



# ELCB (Time delay type)

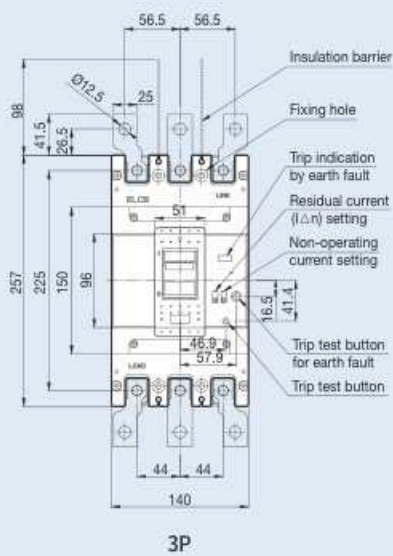
EBN400c

EBS400c

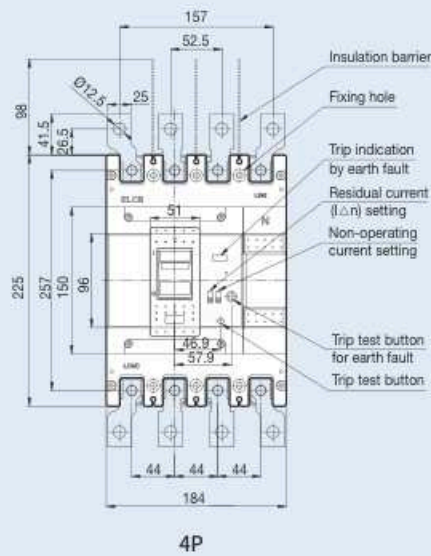
EBH400c

EBL400c

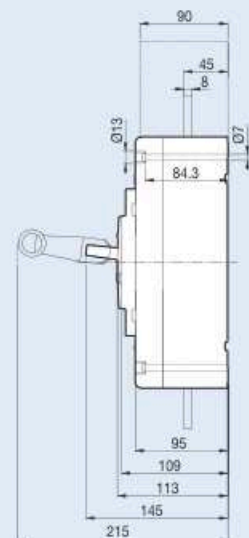
(Unit: mm)



3P



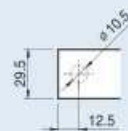
4P



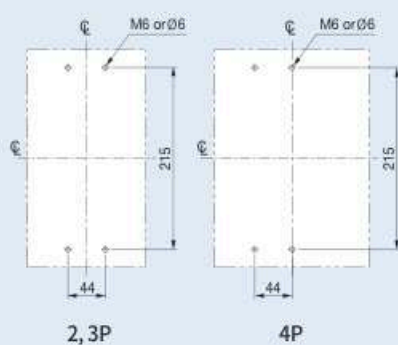
## Terminal details



## Connecting



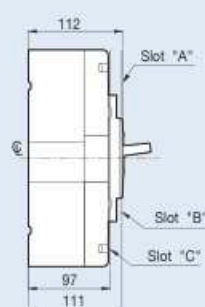
## Panel drilling



2, 3P

4P

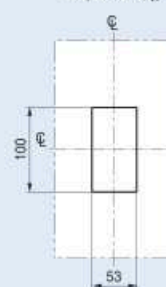
## Front panel cutting



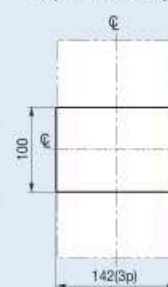
"A" (Handle only)

"B" (Handle and name plate)

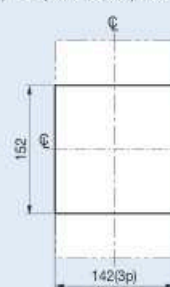
"C" (Handle, name plate &amp; button)



2, 3, 4P



3, 4P



3, 4P

## Dimensions

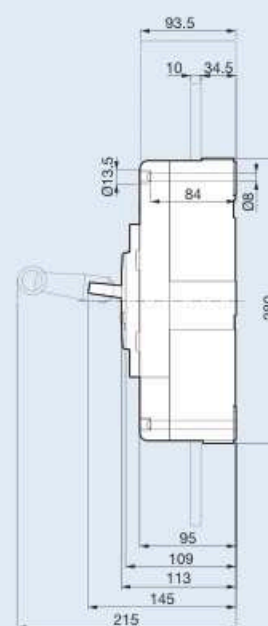
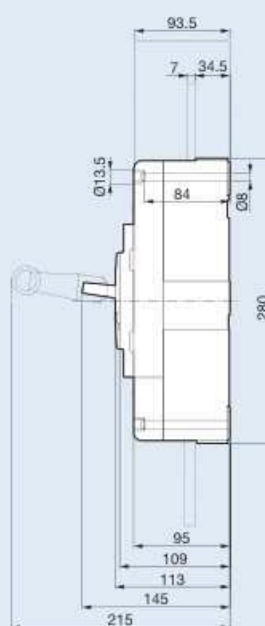
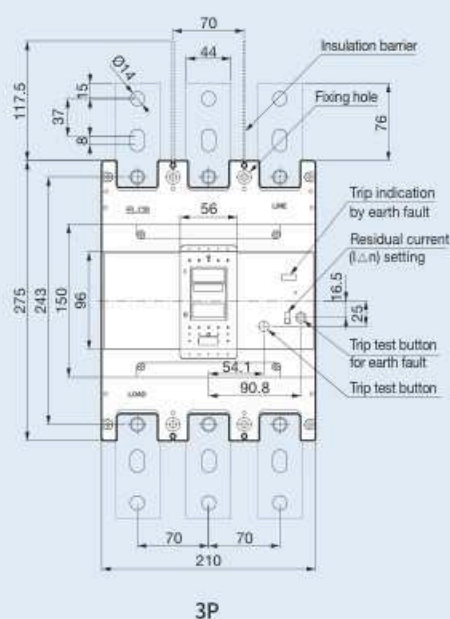
### ELCB (Instantaneous type)

EBN800c

EBS800c

EBL800c

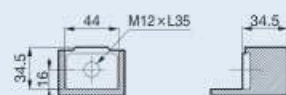
(Unit: mm)



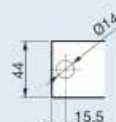
630AF

800AF

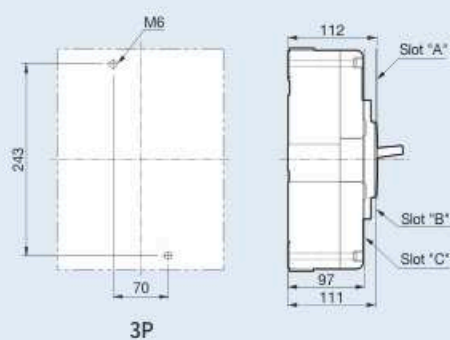
### Terminal details



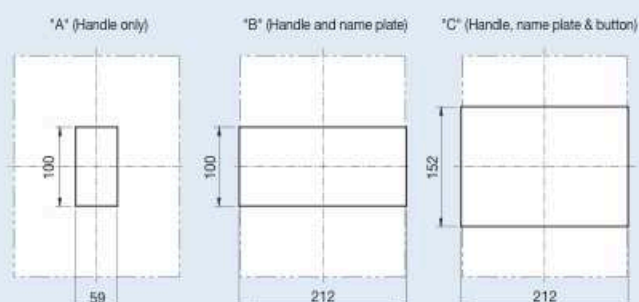
## Connecting



### Panel drilling



### Front panel cutting



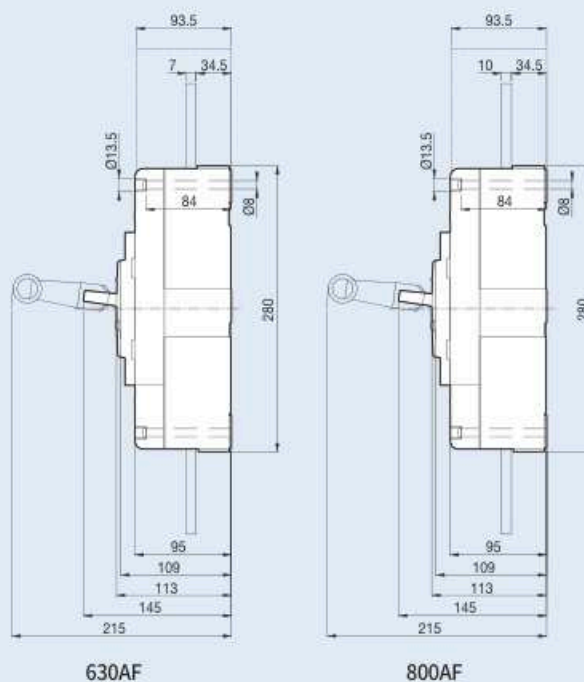
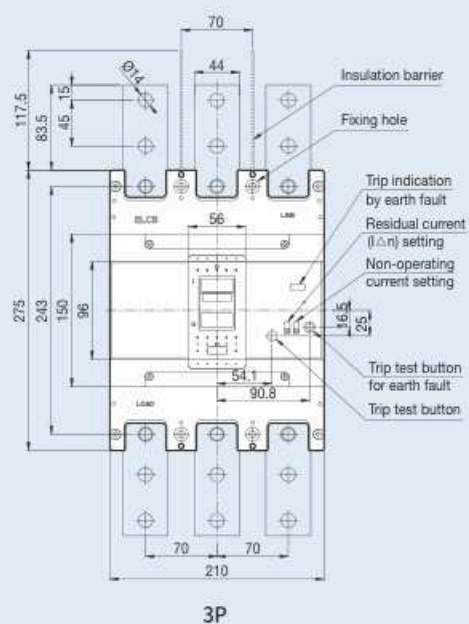
### ELCB (Time delay type)

EBN800c

EBS800c

EBL800c

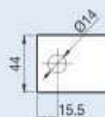
(Unit: mm)



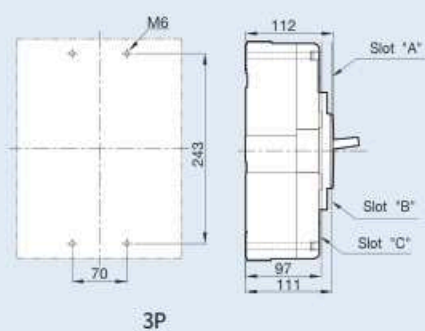
### Terminal details



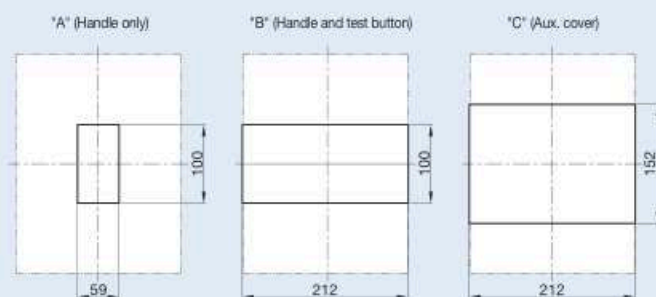
## Connecting



### Panel drilling



### Front panel cutting



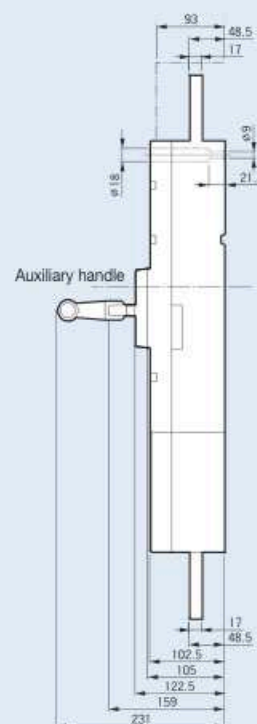
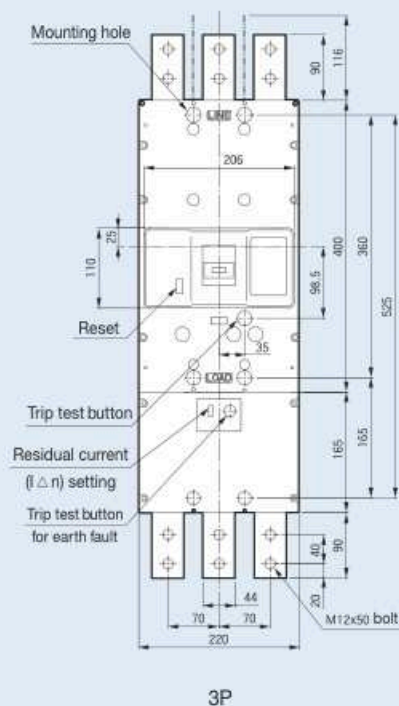
# Dimensions

## ELCB

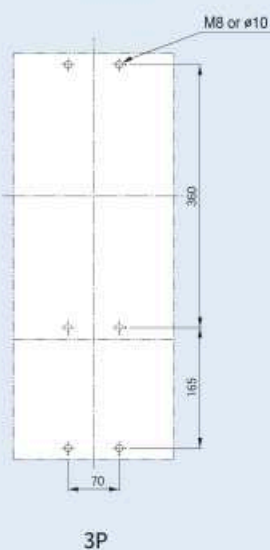
EBS1000b

EBS1200b

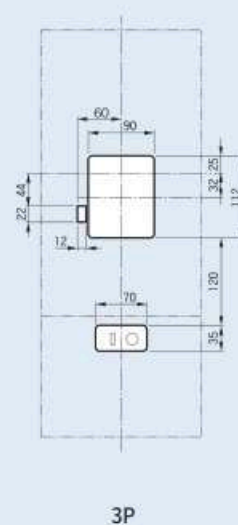
(Unit: mm)



Panel drilling

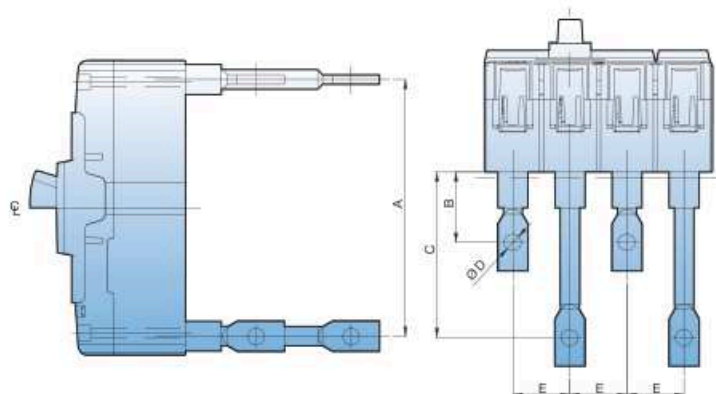


Front panel cutting



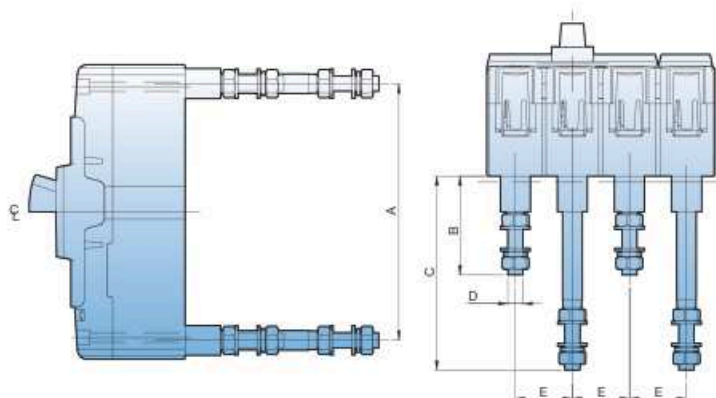
## Rear connection terminals

### Bar type



| MCCB    | A   | B    | C    | D    | E  |
|---------|-----|------|------|------|----|
| ABN100c | 115 | 37   | 87   | Ø8.5 | 25 |
| ABH125c | 135 | 37   | 87   | Ø8.5 | 30 |
| ABH250c | 144 | 57.5 | 93.5 | Ø8.5 | 35 |

### Round type

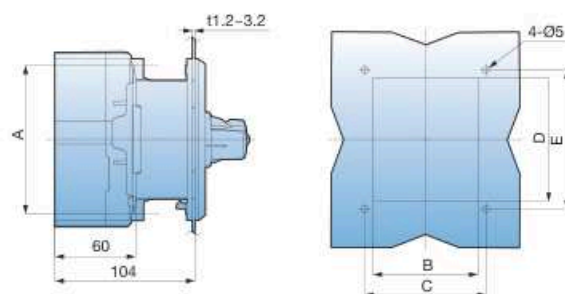


| MCCB          | A   | B  | C   | D  | E  |
|---------------|-----|----|-----|----|----|
| ABN100c 50AF  | 115 | 42 | 92  | M6 | 25 |
| ABN100c 100AF | 115 | 52 | 102 | M8 | 25 |
| ABH125c       | 135 | 52 | 102 | M8 | 30 |
| ABH250c       | 144 | 70 | 106 | M8 | 35 |

# Dimensions

## Rotary handles

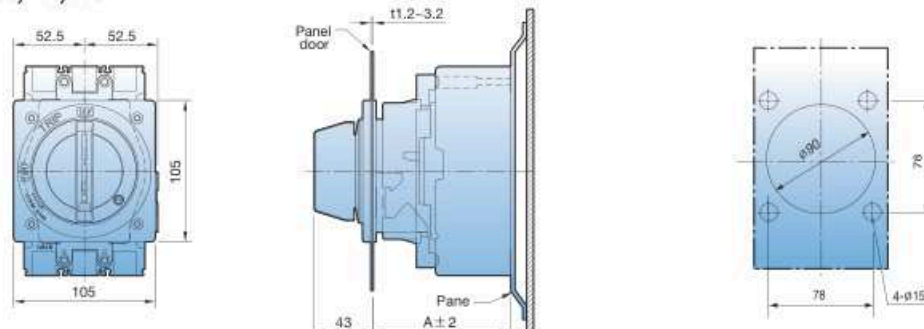
### Direct mounting type (D-handle, 30~250AF)



| Type  | A (mm) | B (mm) | C (mm) | D (mm) | E (mm) | Remarks |
|-------|--------|--------|--------|--------|--------|---------|
| DH100 | 110.5  | 78     | 90     | 92     | 103.4  | 100AF   |
| DH125 | 132    | 94     | 105    | 108    | 120    | 125AF   |
| DH250 | 126    | 108    | 121    | 110    | 122    | 250AF   |

### Direct mounting type (N-handle, 30~250AF)

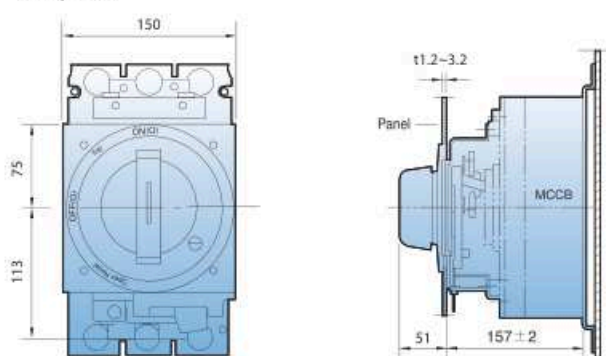
#### N-30c, 40c, 50c

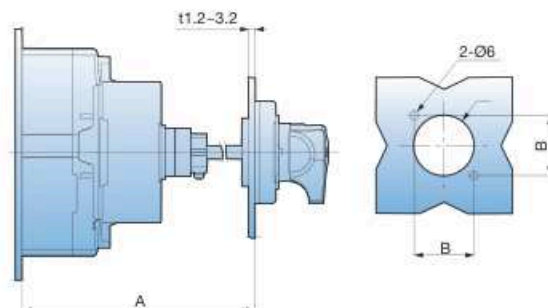


| N-handle | N-30c | N-40c | N-50c |
|----------|-------|-------|-------|
| Note     | 100AF | 125AF | 250AF |
| A (mm)   | 103   | 103   | 103   |

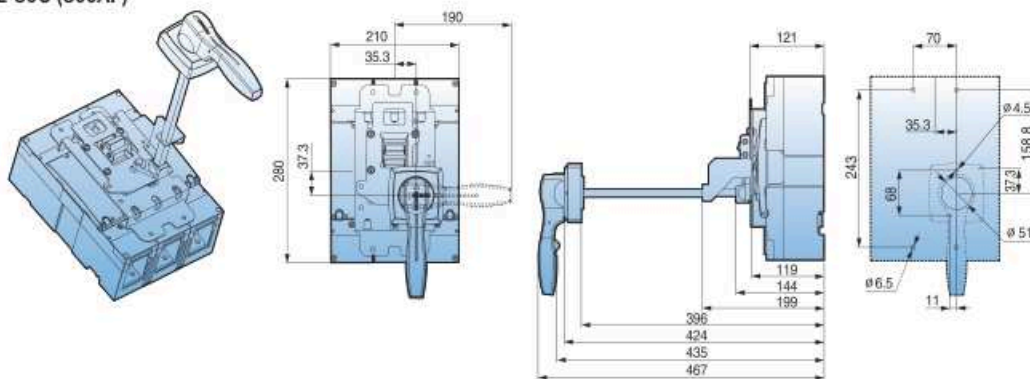
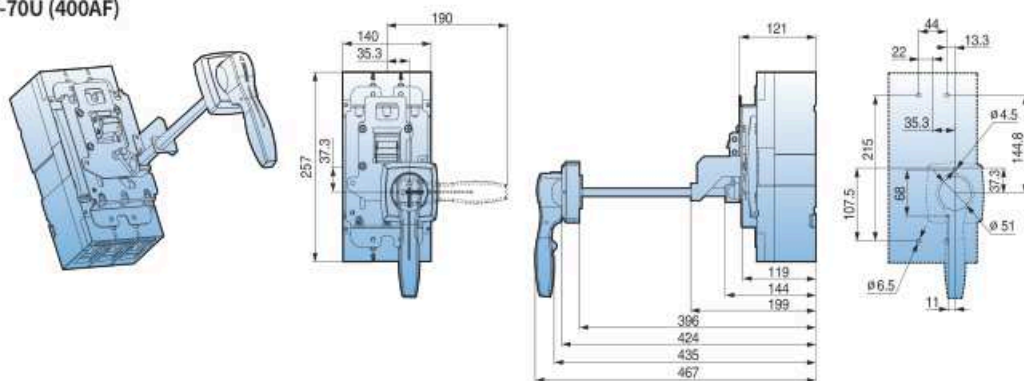
### Direct mounting type (N-handle, 400~800AF)

#### N-70, N-80





| Type         | A (mm)                           | B (mm) | C (mm) | Remarks |
|--------------|----------------------------------|--------|--------|---------|
| <b>EH100</b> | min 150, max 573.5 (Shaft 469mm) | 47     | Ø53    | 100AF   |
| <b>EH125</b> | min 150, max 573.5 (Shaft 469mm) | 47     | Ø53    | 125AF   |
| <b>EH250</b> | min 150, max 571.5 (Shaft 469mm) | 47     | Ø53    | 250AF   |

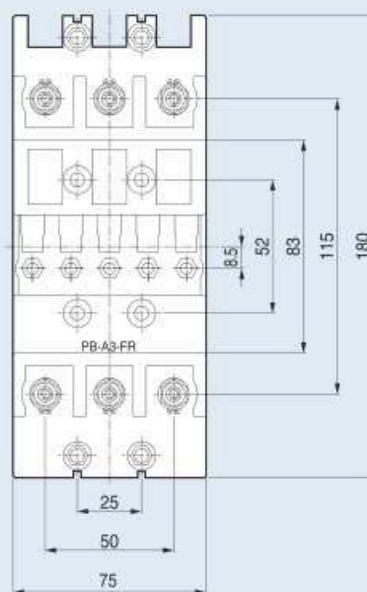
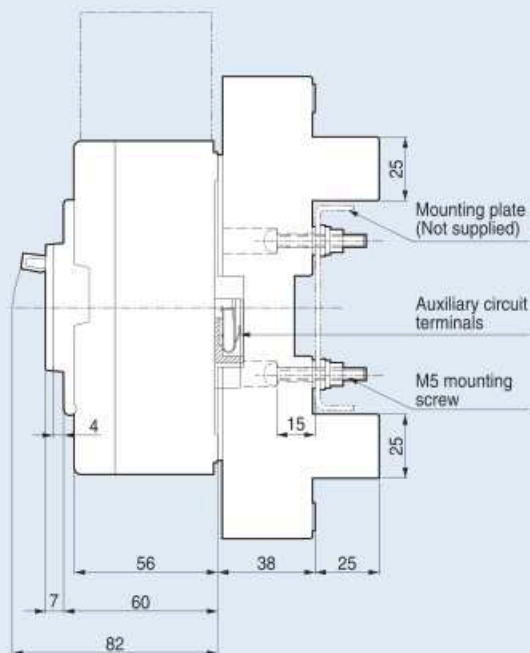


# Dimensions

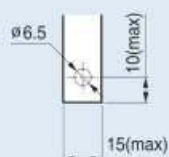
## Plug-in MCCB (ABN100c)

### Normal type (PB-A3-FR)

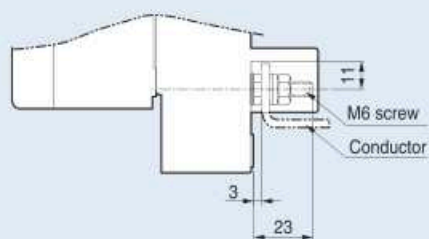
(Unit: mm)



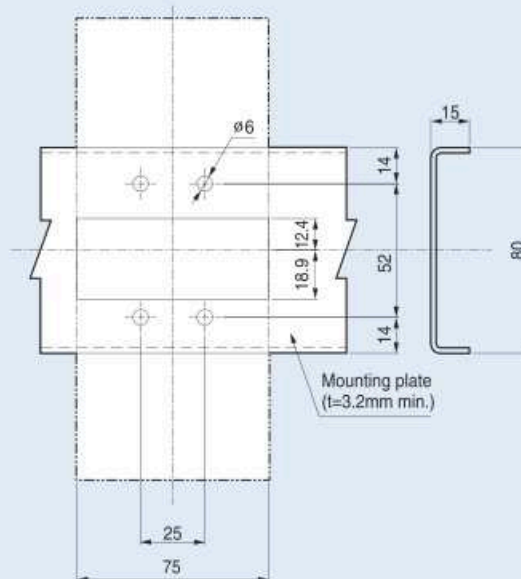
#### Detail for conductor



#### Detail for connection



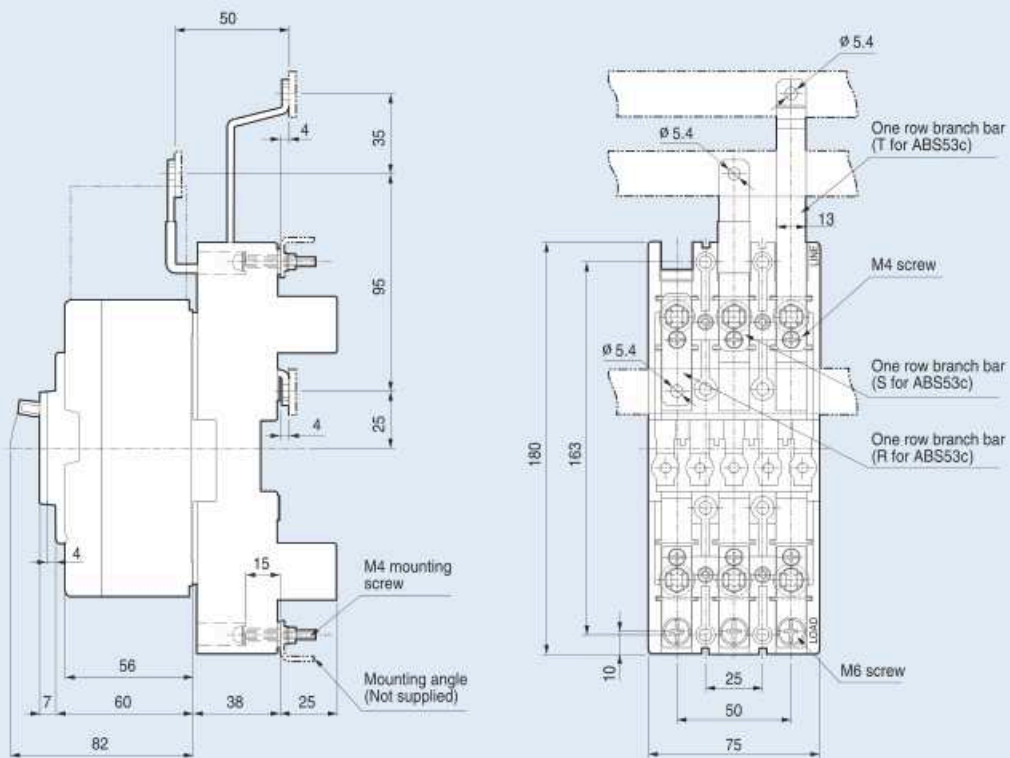
#### Mounting dimensions



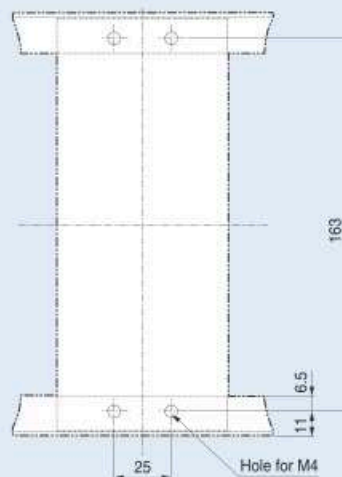
### Plug-in MCCB (ABN100c)

**Single-row type (PB-A3-1DB)**

(Unit: mm)



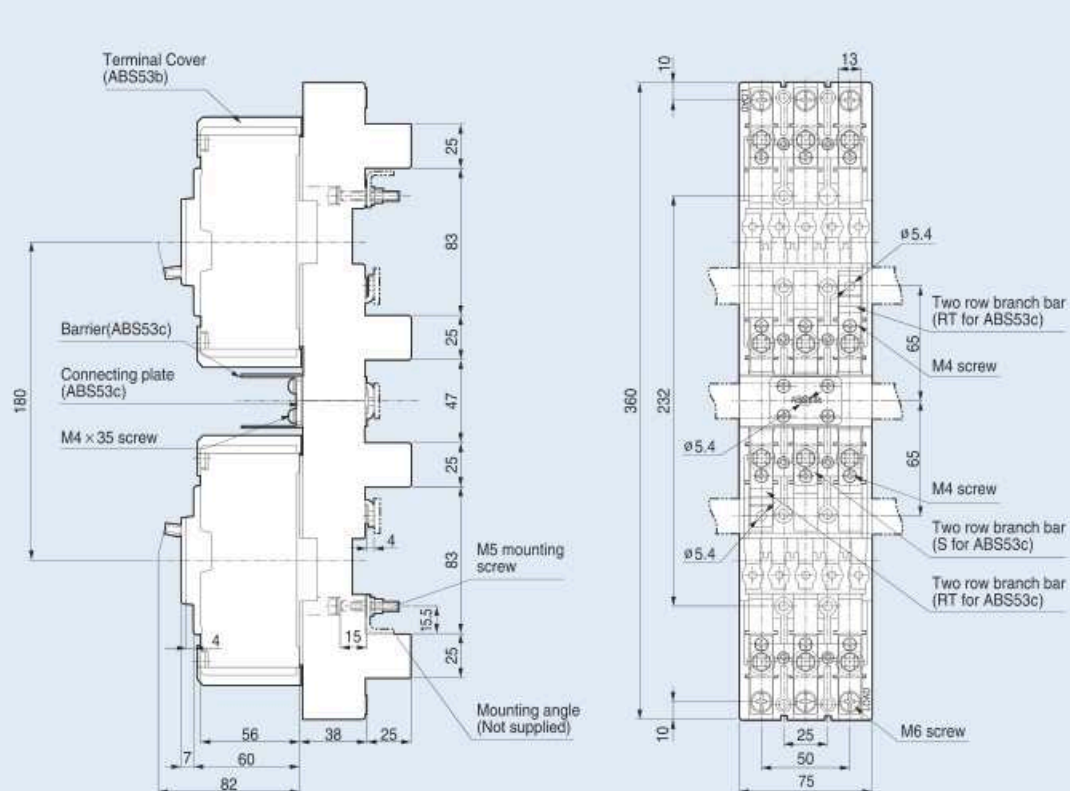
### Mounting dimensions



## Dimensions

### Plug-in MCCB (ABN100c)

### Double-row type (PB-A3-2DB)



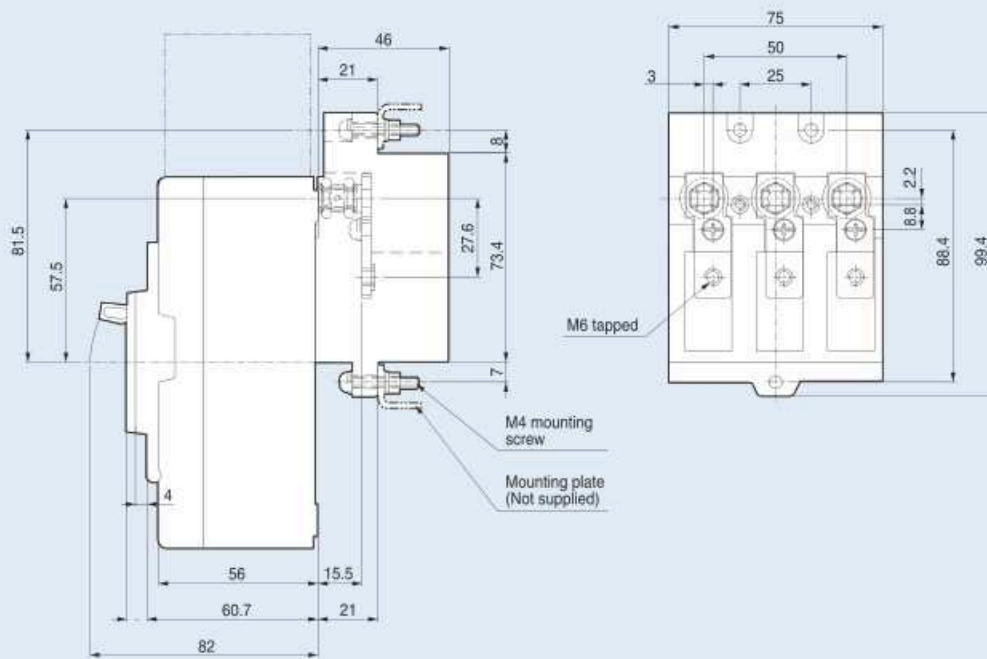
### Mounting dimensions



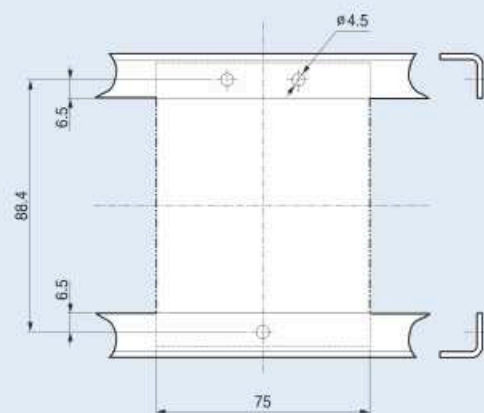
## Plug-in MCCB (ABN100c)

### Line-only type (PB-A3-FRL)

(Unit: mm)



#### Mounting dimensions

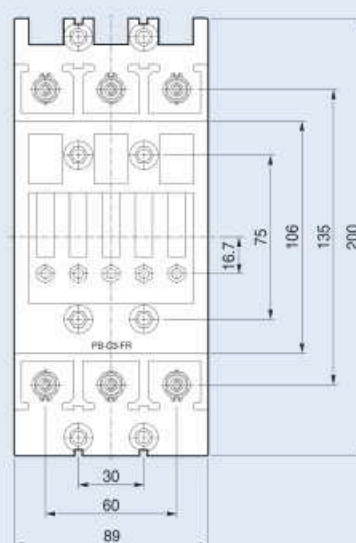
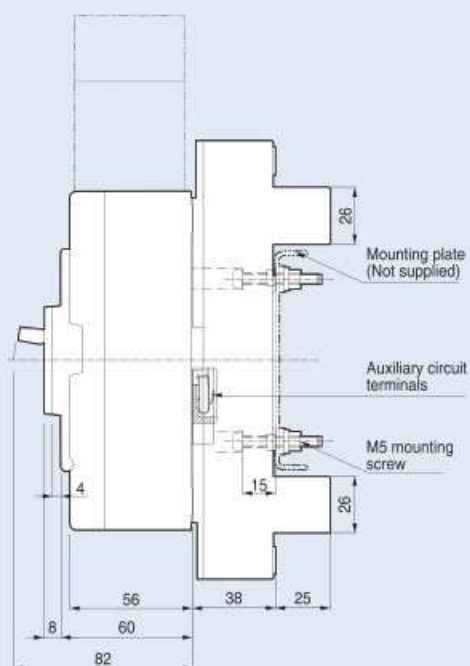


# Dimensions

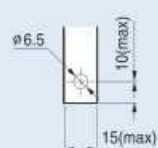
## Plug-in MCCB (ABH125c)

### Normal type (PB-C3-FR)

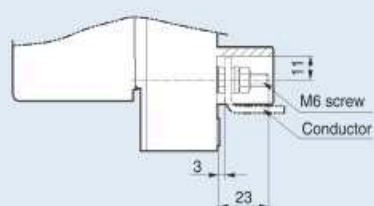
(Unit: mm)



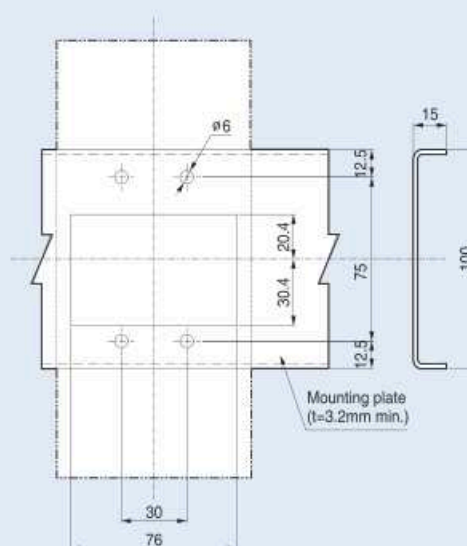
#### Detailed conductor



#### Detailed connection



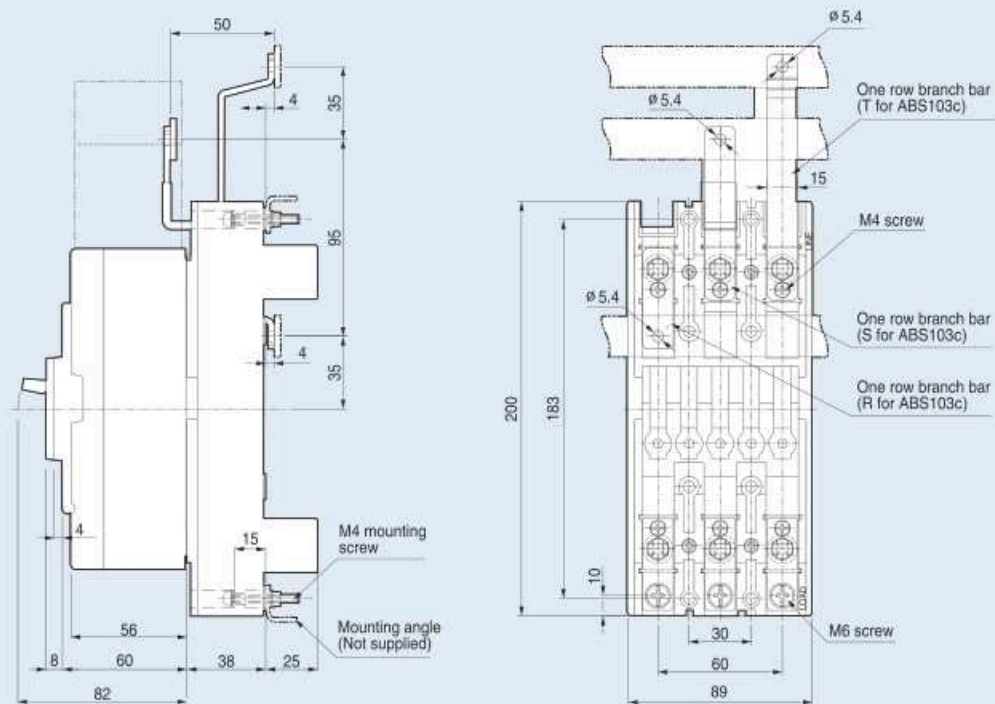
#### Mounting dimensions



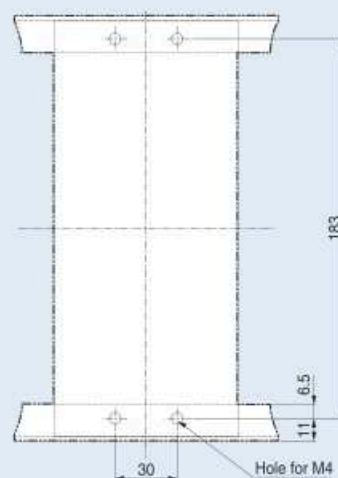
### Plug-in MCCB (ABH125c)

**Single-row type (PB-C3-1DB)**

(Unit: mm)



### Mounting dimensions

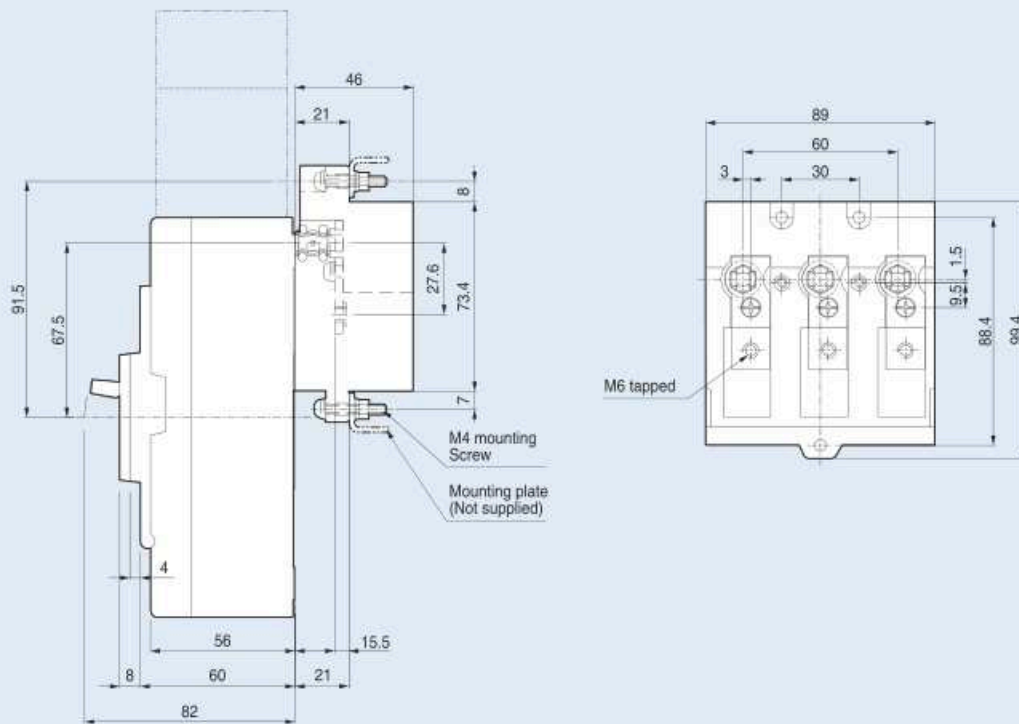




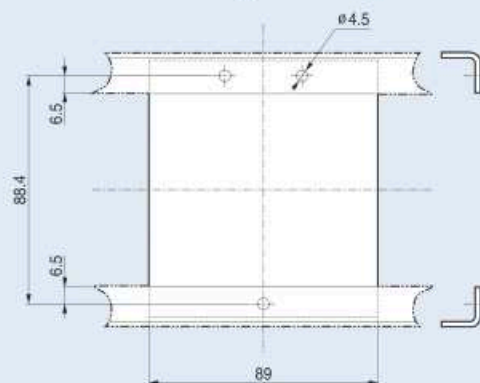
## Plug-in MCCB (ABH125c)

### Line-only type (PB-C3-FRL)

(Unit: mm)



#### Mounting dimensions

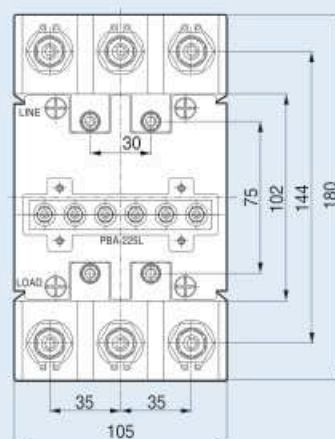
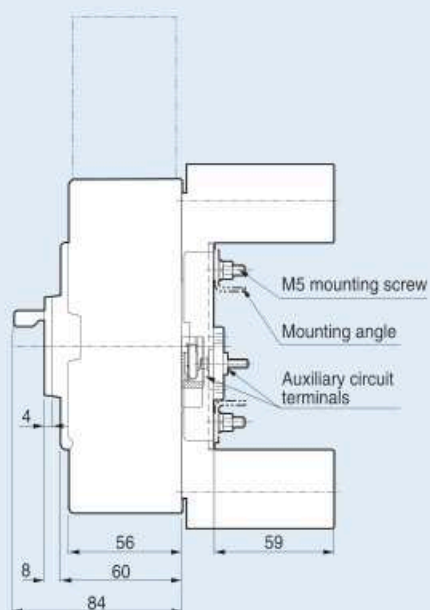


# Dimensions

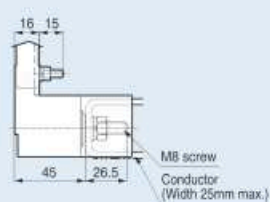
## Plug-in MCCB (ABH250c, 400AF)

### Normal type (PB-D3-FR/FRL)

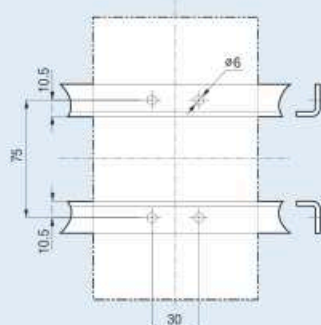
(Unit: mm)



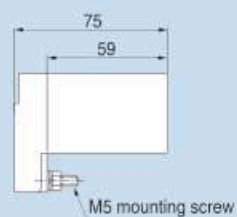
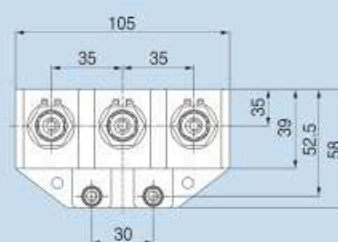
#### Detail for connection



#### Mounting dimensions



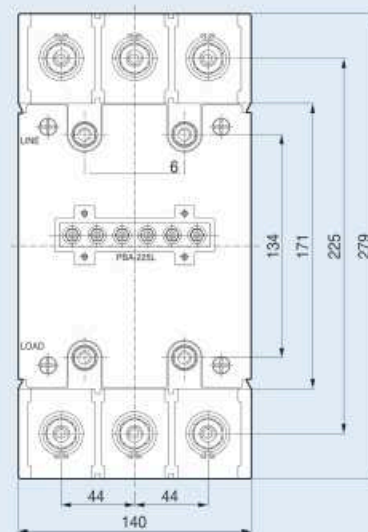
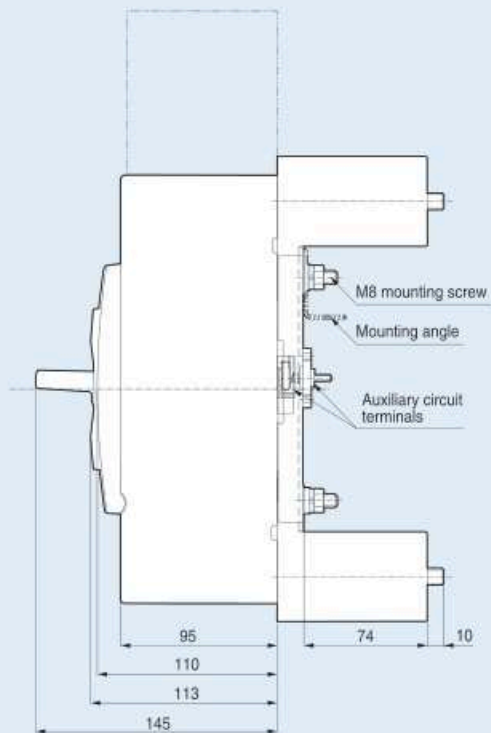
#### PB-D3-FRL



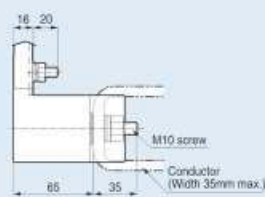
## Plug-in MCCB (400AF)

### Normal type (PB-I3-FR/FRL)

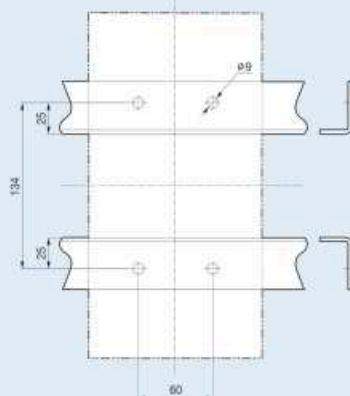
(Unit: mm)



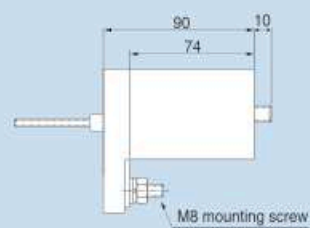
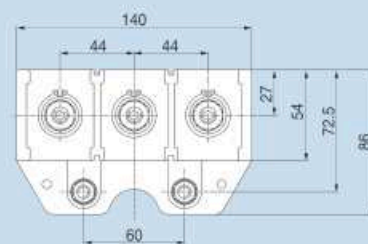
#### Detail for connection



#### Mounting dimensions



#### PB-I3-FRL

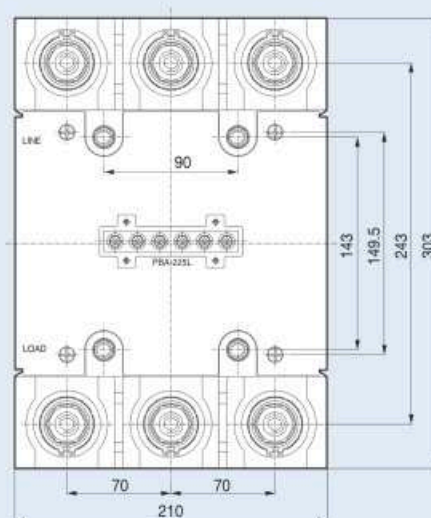
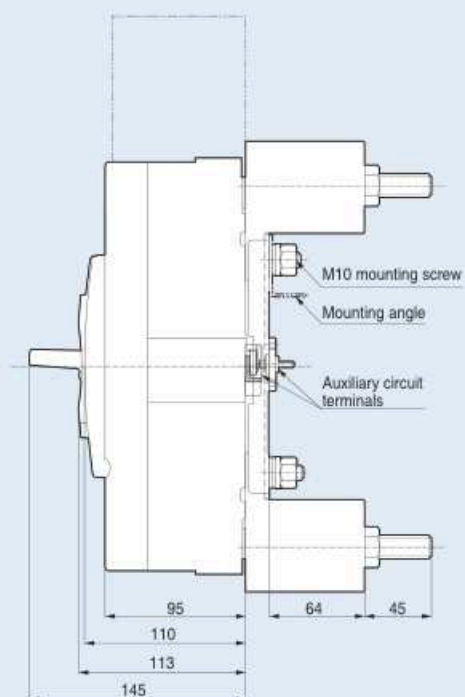


# Dimensions

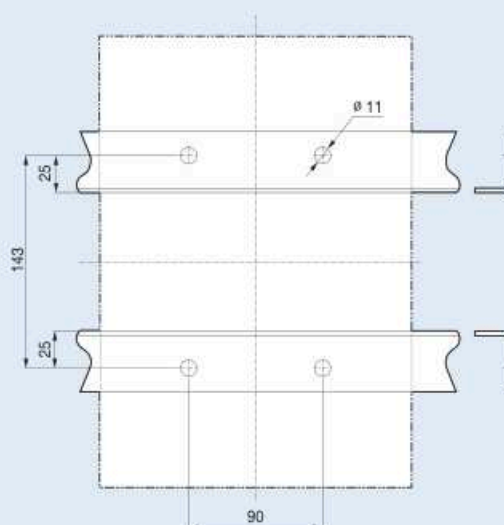
## Plug-in MCCB (800AF)

### Normal type (PB-J3-FR)

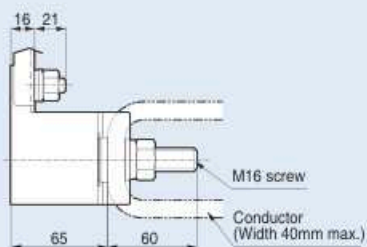
(Unit: mm)



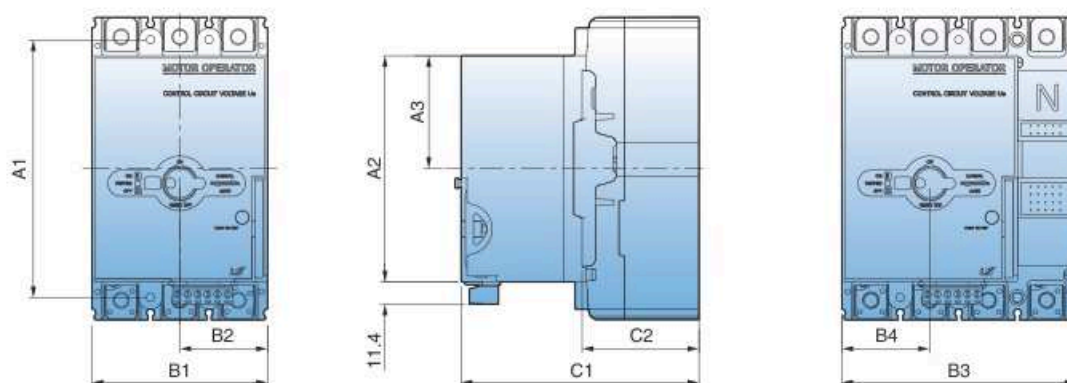
### Mounting dimensions



### Detail for connection



## Remote operation



|        | A1    | A2  | A3   | B1  | B2   | B3  | B4   | C1  | C2  |
|--------|-------|-----|------|-----|------|-----|------|-----|-----|
| MOP-M1 | 110.5 | 102 | 51   | 75  | 37.5 | 100 | 37.5 | 128 | 60  |
| MOP-M2 | 132   | 116 | 58   | 90  | 45   | 120 | 45   | 122 | 60  |
| MOP-M3 | 126   | 116 | 55   | 105 | 52.5 | 140 | 52.5 | 125 | 60  |
| MOP-M4 | 215   | 176 | 88   | 140 | 70   | 184 | 70   | 198 | 109 |
| MOP-M5 | 243   | 176 | 88   | 210 | 105  | 280 | 105  | 198 | 109 |
| MOP-M6 | 322.5 | 176 | 65.5 | 220 | 110  | 289 | 110  | 210 | 105 |

# Dimensions

## Standard accessories

The following accessories for mounting, connection and insulation are standard items and are packed with Metasol series circuit breakers.

| Item               | 100AF                                                                                                                                            | 125AF                                                                               | 250AF                                                                                | 400AF                                                                                 | 800AF                                                                                 |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Fixing screw       |                                                                 |    |    |    |    |
|                    | 2P: 2EA (M4×60)<br>3P: 2EA (M4×60)<br>4P: 4EA (M4×60)                                                                                            | 2P: 2EA (M4×60)<br>3P: 2EA (M4×60)<br>4P: 4EA (M4×60)                               | 2P: 2EA (M4×55)<br>3P: 2EA (M4×55)<br>4P: 4EA (M4×55)                                | 2P: 4EA (M6×100)<br>3P: 4EA (M6×100)<br>4P: 4EA (M6×100)                              | 2P: 4EA (M6×100)<br>3P: 4EA (M6×100)<br>4P: 4EA (M6×100)                              |
| Terminal bolt      |                                                                 |    |    |    |    |
|                    | <b>3~50A</b><br>2P: 4EA (M5×14)<br>3P: 6EA (M5×14)<br>4P: 8EA (M5×14)<br><b>60~100A</b><br>2P: 4EA (M8×14)<br>3P: 6EA (M8×14)<br>4P: 8EA (M8×14) | 2P: 4EA (M8×14)<br>3P: 6EA (M8×14)<br>4P: 8EA (M8×14)                               | 2P: 4EA (M8×20)<br>3P: 6EA (M8×20)<br>4P: 8EA (M8×20)                                | 2P: 4EA (M10×30)<br>3P: 6EA (M10×30)<br>4P: 8EA (M10×30)                              | 2P: 4EA (M12×35)<br>3P: 6EA (M12×35)<br>4P: 8EA (M12×35)                              |
| Insulation barrier |                                                               |  |  |  |  |
|                    | 2P: 1EA<br>3P: 2EA<br>4P: 3EA                                                                                                                    | 2P: 1EA<br>3P: 2EA<br>4P: 3EA                                                       | 2P: 1EA<br>3P: 2EA<br>4P: 3EA                                                        | 2P: 1EA<br>3P: 2EA<br>4P: 3EA                                                         | 2P: 1EA<br>3P: 2EA<br>4P: 3EA                                                         |

## Fixing screws for rotary handles

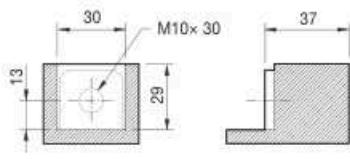
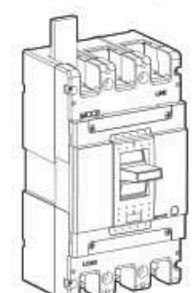
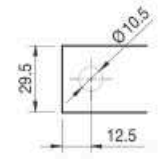
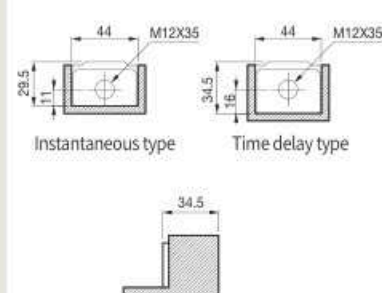
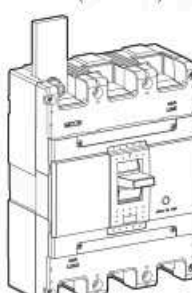
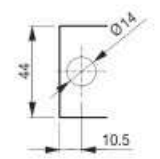
| Handle type          | N-30c                                          | N-40c                                       | N-50c                                        | N-70                                         | N-80                             |
|----------------------|------------------------------------------------|---------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------|
| Applied MCCB         | ABN 50c/60c/100c<br>ABS 30c/50c/60c<br>ABN100e | ABS 125c<br>ABH 50c<br>ABH 125c<br>ABL 125c | ABN 250c<br>ABS 250c<br>ABH 250c<br>ABL 250c | ABN 400c<br>ABS 400c<br>ABH 400c<br>ABL 400c | ABN 800c<br>ABS 800c<br>ABL 800c |
| Applied ELCB         | EBN 50c/60c/100c<br>EBS 30c/50c/60c            | EBS 125c<br>EBH 50c<br>EBH 125c             | EBN 250c<br>EBS 250c<br>EBH 250c             | EBN 400c<br>EBS 400c<br>EBH 400c<br>EBL 400c | EBN 800c<br>EBS 800c<br>EBL 800c |
| Fixing screw (short) | -                                              | -                                           | -                                            | M6×16                                        | M6×16                            |
| Fixing screw (long)  | M4×85                                          | M4×85                                       | M4×85                                        | M6×110                                       | M6×110                           |

| Handle type  | DH/EH100 | DH/EH125 | DH/EH250 |
|--------------|----------|----------|----------|
| Fixing screw | M4×70    | M4×70    | M4×70    |

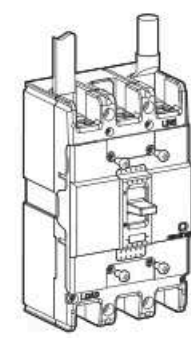
## Connection

| MCCB  | Terminal (mm)        | Tightening torque (kgf·cm)     | Conductor (mm)       |
|-------|----------------------|--------------------------------|----------------------|
| 100AF | <b>[3~50A]</b><br>   | <br>M5: 23 ~ 28<br>M8: 55 ~ 75 | <b>[3~50A]</b><br>   |
|       | <b>[60~100A]</b><br> |                                | <b>[60~100A]</b><br> |
| 125AF |                      | <br>M8: 55 ~ 75                |                      |
| 250AF |                      | <br>M8: 80 ~ 130               |                      |

## Connection

| MCCB  | Terminal (mm)                                                                                                                     | Tightening torque (kgf·cm)                                                                                                                  | Conductor (mm)                                                                        |
|-------|-----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 400AF |                                                  | <p>M10: 240~300 (Terminal)<br/>M12: 400~500 (Busbar)</p>  |    |
| 800AF |  <p>Instantaneous type      Time delay type</p> | <p>M12: 400~500 (Terminal, Busbar)</p>                   |  |

## Aux cover screw connection

| Model                                           | Tightening torque (kgf·cm) | Screw position                                                                        |
|-------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------|
| 30AF<br>50AF<br>60AF<br>100AF<br>125AF<br>250AF | 15                         |  |
| 400AF<br>630AF<br>800AF                         | 21                         |                                                                                       |

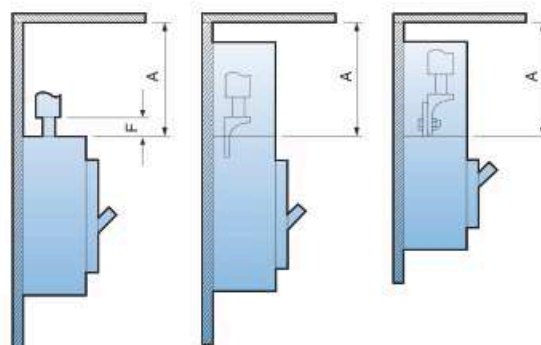
## Safety clearance

When installing a circuit breaker, safety clearances must be kept between the breaker and panels, bars and other protection devices installed nearby. These safety clearances are depend on the ultimate breaking capacity and are defined by tests carried out in accordance with standard IEC 60947-2.

When a short circuit interruption occur, high temperatures pressures are present in and above the arc chambers of the circuit-breaker. In order to allow the pressure to be distributed and to prevent fire and arcing or short-circuit currents, safety clearances are required.

### A: Minimum distance to metallic top panels

| Frame size | Description | A (mm) |      |
|------------|-------------|--------|------|
|            |             | 460V   | 250V |
| 100AF      | ABN50c      | 40     | 25   |
|            | ABN60c      | 40     | 25   |
|            | ABN100c     | 50     | 30   |
|            | ABN100e     | 50     | 30   |
|            | ABS30c      | 30     | 25   |
|            | ABS50c      | 40     | 30   |
|            | ABS60c      | 40     | 30   |
| 125AF      | ABS125c     | 50     | 40   |
|            | ABH50c      | 50     | 40   |
|            | ABH125c     | 100    | 80   |
|            | ABL125c     | 100    | 80   |
| 250AF      | ABN250c     | 100    | 80   |
|            | ABS250c     | 100    | 80   |
|            | ABH250c     | 100    | 80   |
|            | ABL250c     | 100    | 80   |
| 400AF      | ABN400c     | 100    | 80   |
|            | ABS400c     | 100    | 80   |
|            | ABH400c     | 100    | 80   |
|            | ABL400c     | 100    | 80   |
| 800AF      | ABN800c     | 120    | 80   |
|            | ABS800c     | 120    | 80   |
|            | ABL800c     | 120    | 80   |



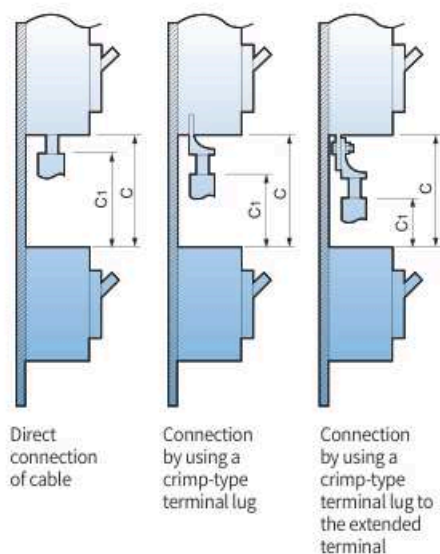
## Safety clearance

### B: Minimum distance between the lower and the upper breakers

- C1: Minimum distance between the lower breaker and the bare terminal of the upper breaker
- C: C1+ the dimension of bare part of conductor

| Frame size | Description | C1 (mm) |      | C (mm) |
|------------|-------------|---------|------|--------|
|            |             | 460V    | 250V |        |
| 100AF      | ABN50c      | 40      | 25   |        |
|            | ABN60c      | 40      | 25   |        |
|            | ABN100c     | 50      | 30   |        |
|            | ABN100e     | 50      | 30   |        |
|            | ABS30c      | 30      | 25   |        |
|            | ABS50c      | 40      | 30   |        |
|            | ABS60c      | 40      | 30   |        |
| 125AF      | ABS125c     | 50      | 40   |        |
|            | ABH50c      | 50      | 40   |        |
|            | ABH125c     | 100     | 80   |        |
|            | ABL125c     | 100     | 80   |        |
| 250AF      | ABN250c     | 100     | 80   |        |
|            | ABS250c     | 100     | 80   |        |
|            | ABH250c     | 100     | 80   |        |
|            | ABL250c     | 100     | 80   |        |
| 400AF      | ABN400c     | 100     | 80   |        |
|            | ABS400c     | 100     | 80   |        |
|            | ABH400c     | 100     | 80   |        |
|            | ABL400c     | 100     | 80   |        |
| 800AF      | ABN800c     | 100     | 80   |        |
|            | ABS800c     | 100     | 80   |        |
|            | ABL800c     | 100     | 80   |        |

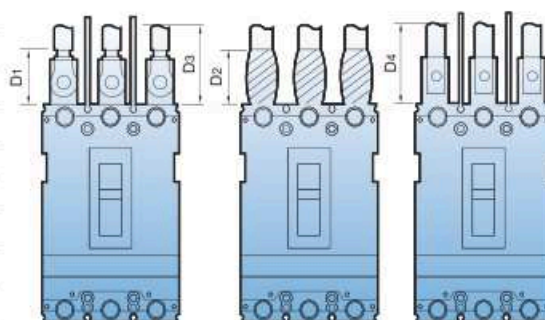
The dimension of bare conduct + C1



### Insulated length of main terminal of circuit breaker

- D1: Connection by solderless terminal with taping
- D2: Connection by busbar with taping
- D3: Connection by solderless terminal and using insulation barrier
- D4: Connection by busbar and using insulation barrier

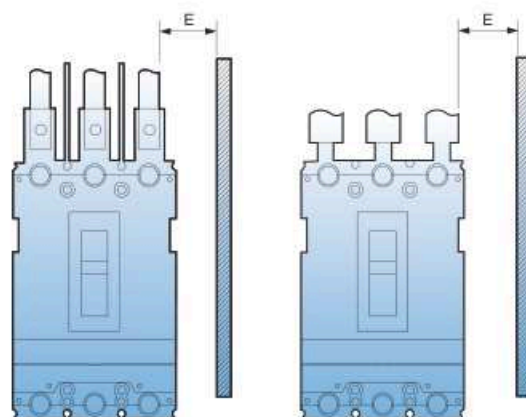
| Frame size | Description | D1 (mm)                            | D2 (mm) | D3 (mm)                            | D4 (mm) |
|------------|-------------|------------------------------------|---------|------------------------------------|---------|
| 100AF      | ABN50c      | The dimension of bare conduct + 20 | 40      | The dimension of bare conduct + 20 | 40      |
|            | ABN60c      |                                    | 40      |                                    | 40      |
|            | ABN100c     |                                    | 50      |                                    | 50      |
|            | ABN100e     |                                    | 50      |                                    | 50      |
|            | ABS30c      |                                    | 30      |                                    | 30      |
|            | ABS50c      |                                    | 40      |                                    | 40      |
|            | ABS60c      |                                    | 40      |                                    | 40      |
| 125AF      | ABS125c     |                                    | 50      |                                    | 50      |
|            | ABH50c      |                                    | 50      |                                    | 50      |
|            | ABH125c     |                                    | 50      |                                    | 50      |
|            | ABL125c     |                                    | 50      |                                    | 50      |
| 250AF      | ABN250c     |                                    | 50      |                                    | 50      |
|            | ABS250c     |                                    | 50      |                                    | 50      |
|            | ABH250c     |                                    | 50      |                                    | 50      |
|            | ABL250c     |                                    | 50      |                                    | 50      |
| 400AF      | ABN400c     |                                    | 100     |                                    | 100     |
|            | ABS400c     |                                    | 100     |                                    | 100     |
|            | ABH400c     |                                    | 100     |                                    | 100     |
|            | ABL400c     |                                    | 100     |                                    | 100     |
| 800AF      | ABN800c     |                                    | 150     |                                    | 150     |
|            | ABS800c     |                                    | 150     |                                    | 150     |
|            | ABL800c     |                                    | 150     |                                    | 150     |



## Safety clearance

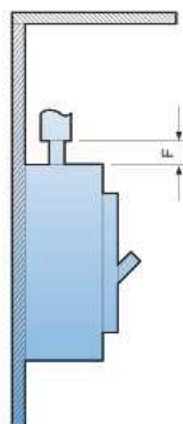
### Minimum distance to metallic side panels

| Frame size | Description | E (mm) |      |
|------------|-------------|--------|------|
|            |             | 460V   | 250V |
| 100AF      | ABN50c      | 25     | 15   |
|            | ABN60c      | 25     | 15   |
|            | ABN100c     | 25     | 15   |
|            | ABN100e     | 25     | 15   |
|            | ABS30c      | 20     | 15   |
|            | ABS50c      | 25     | 15   |
|            | ABS60c      | 25     | 15   |
| 125AF      | ABS125c     | 25     | 15   |
|            | ABH50c      | 25     | 15   |
|            | ABH125c     | 50     | 20   |
|            | ABL125c     | 50     | 20   |
| 250AF      | ABN250c     | 50     | 15   |
|            | ABS250c     | 50     | 15   |
|            | ABH250c     | 50     | 15   |
|            | ABL250c     | 50     | 15   |
| 400AF      | ABN400c     | 80     | 40   |
|            | ABS400c     | 80     | 40   |
|            | ABH400c     | 80     | 40   |
|            | ABL400c     | 80     | 40   |
| 800AF      | ABN800c     | 80     | 40   |
|            | ABS800c     | 80     | 40   |
|            | ABL800c     | 80     | 40   |



## Distance of bare cables or busbars

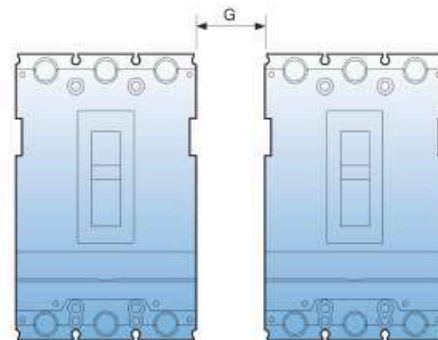
| Frame size | Description | F (mm) |
|------------|-------------|--------|
| 100AF      | ABN50c      | 10     |
|            | ABN60c      | 10     |
|            | ABN100c     | -      |
|            | ABN100e     | -      |
|            | ABS30c      | 5      |
|            | ABS50c      | 10     |
|            | ABS60c      | 10     |
| 125AF      | ABS125c     | -      |
|            | ABH50c      | 10     |
|            | ABH125c     | 20     |
|            | ABL125c     | -      |
|            | ABN250c     | -      |
| 250AF      | ABS250c     | -      |
|            | ABH250c     | -      |
|            | ABL250c     | -      |
|            | ABN400c     | 10     |
| 400AF      | ABS400c     | 10     |
|            | ABH400c     | 10     |
|            | ABL400c     | 10     |
|            | ABN800c     | 10     |
| 800AF      | ABS800c     | 10     |
|            | ABL800c     | 10     |



## Safety clearance

### Minimal distance between two adjacent breakers (With terminal covers)

| Frame size | Description | G (mm) |
|------------|-------------|--------|
| 100AF      | ABN50c      | 0      |
|            | ABN60c      | 0      |
|            | ABN100c     | 0      |
|            | ABN100e     | 0      |
|            | ABS30c      | 0      |
|            | ABS50c      | 0      |
|            | ABS60c      | 0      |
| 125AF      | ABS125c     | 0      |
|            | ABH50c      | 0      |
|            | ABH125c     | 0      |
|            | ABL125c     | 0      |
| 250AF      | ABN250c     | 0      |
|            | ABS250c     | 0      |
|            | ABH250c     | 0      |
|            | ABL250c     | 0      |
| 400AF      | ABN400c     | 0      |
|            | ABS400c     | 0      |
|            | ABH400c     | 0      |
|            | ABL400c     | 0      |
| 800AF      | ABN800c     | 0      |
|            | ABS800c     | 0      |
|            | ABL800c     | 0      |



## Insulation resistance (IR) testing & withstand voltage testing (For ELCB)

### Insulation resistance (IR) testing

Insulation resistance marked as  $\triangle$  in table1 is not destroyed when 500V is applied using insulation tester but when 1000V is applied. Conduct the testing when the indicator needle of insulation tester wavers greatly. Make sure ELCB is Off before testing.

### Withstand voltage testing

When conducting IR testing and withstand voltage testing, Do Not apply voltage for those marked as X in Table1.

**Table1. insulation resistance (IR) testing & withstand voltage testing**

| Application circuit breaker |      | Insulation resistance (IR) testing |             | Withstand voltage testing |     |
|-----------------------------|------|------------------------------------|-------------|---------------------------|-----|
| Application circuit breaker |      | On                                 | Off         | On                        | Off |
| handle status               |      | ○                                  | ○           | ○                         | ○   |
| Charge-earth                |      | ○                                  | ○           | ○                         | ○   |
| R-S, S-T, R-T               | Line | $\triangle$                        | $\triangle$ | ×                         | ○   |
|                             | Load | $\triangle$                        | $\triangle$ | ×                         | ×   |
| Line-load                   |      | —                                  | ○           | —                         | ○   |

## Standards & approval

Metasol series circuit breakers and auxiliaries comply with the following international standard:

- IEC 60947-1  
Low-voltage switchgear and controlgear - Part 1: General rules
- IEC 60947-2  
Low-voltage switchgear and controlgear - Part 2: Circuit-breakers

The following certificates are available on a request.

- CE Declaration of conformity
- Certificate of conformance test (CB) - IEC 60947

### CE conformity marking

The CE conformity marking shall indicate conformity to all the obligations imposed on the manufacturer, as regards his products, by virtue of the European community directives providing for the affixing of the CE marking.

When the CE marking is affixed on a product, it represents a declaration of the manufacturer or of his authorized representative that the product in question conforms to all the applicable provisions including the conformity assessment procedures.

| IEC                                                                                                      |                                                                                                                                                                                                                                                                            | IECEE                                                  |                    | CB TEST CERTIFICATE       |  | Ref. Certificate No. |
|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------|---------------------------|--|----------------------|
|                                                                                                          |                                                                                                                                                                                                                                                                            |                                                        |                    |                           |  | NE-141963/7          |
| <b>IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME</b> |                                                                                                                                                                                                                                                                            |                                                        |                    |                           |  |                      |
| Issued to:                                                                                               | KEMA Quality B.V.                                                                                                                                                                                                                                                          |                                                        |                    |                           |  |                      |
| Product:                                                                                                 | Moulded case circuit breaker                                                                                                                                                                                                                                               |                                                        |                    |                           |  |                      |
| Assessment:                                                                                              | IE Industrial Systems Co., Ltd.                                                                                                                                                                                                                                            | 1025-6, Hepingdong, Dongcheng-Anping-st, Guangzhou     | Korea, Republic of |                           |  |                      |
| Manufacturer:                                                                                            | IE Industrial Systems Co., Ltd.                                                                                                                                                                                                                                            | 1025-6, Hepingdong, Dongcheng-Anping-st, Guangzhou     | Korea, Republic of |                           |  |                      |
| Factory:                                                                                                 | IE Industrial Systems Co., Ltd. Changsha Plant                                                                                                                                                                                                                             | 1, Shengpingdong, Hengsheng-gu, Changsha, Changsha-shi | Korea, Republic of |                           |  |                      |
| Rating and approval characteristics:                                                                     | 3 pole MCCB (thermal-magnetic)<br>IN = 10, 25, 35, 40, 50, 63, 75, 100, 125 A<br>ICS = 225, 240, 250, 475, 480, 490 VAC<br>UIC = 725 Vdc<br>ICSM = 8 kA<br>ICS = 100 kA at 225, 240, 250 V and 90 kA at 475, 480, 490 V, for 100 kA<br>Rated frequency = 50/60 Hz<br>Cat A |                                                        |                    |                           |  |                      |
| Trade mark of origin:                                                                                    | IE                                                                                                                                                                                                                                                                         |                                                        |                    |                           |  |                      |
| Manufacturer reference:                                                                                  | 451010, 451020, 451030                                                                                                                                                                                                                                                     |                                                        |                    |                           |  |                      |
| Additional information:                                                                                  | WBT procedure                                                                                                                                                                                                                                                              |                                                        |                    |                           |  |                      |
| Series of products covered in test in conformity with IEC:                                               | 60947-2 and 4                                                                                                                                                                                                                                                              |                                                        |                    |                           |  |                      |
| Test Report Ref. No.:                                                                                    | 2108802-01 (198 pages)                                                                                                                                                                                                                                                     |                                                        |                    |                           |  |                      |
| This CB Test Certificate is issued by the National Certification Body                                    |                                                                                                                                                                                                                                                                            |                                                        |                    |                           |  |                      |
| KEMA Quality B.V.                                                                                        |                                                                                                                                                                                                                                                                            | KEMA Quality B.V.                                      |                    | KEMA Quality B.V.         |  | KEMA                 |
| Lindendreef 110                                                                                          |                                                                                                                                                                                                                                                                            | Lindendreef 110                                        |                    | Lindendreef 110           |  |                      |
| P.O. Box 8166                                                                                            |                                                                                                                                                                                                                                                                            | P.O. Box 8166                                          |                    | P.O. Box 8166             |  |                      |
| 3800 DD Arnhem                                                                                           |                                                                                                                                                                                                                                                                            | 3800 DD Arnhem                                         |                    | 3800 DD Arnhem            |  |                      |
| The Netherlands                                                                                          |                                                                                                                                                                                                                                                                            | The Netherlands                                        |                    | The Netherlands           |  |                      |
| Signed by: P.J. Schreuder                                                                                |                                                                                                                                                                                                                                                                            | Signed by: P.J. Schreuder                              |                    | Signed by: P.J. Schreuder |  |                      |
| Date of issue: 2008-05-21                                                                                |                                                                                                                                                                                                                                                                            | Date of issue: 2008-05-21                              |                    | Date of issue: 2008-05-21 |  |                      |

| IEC                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                       | IECEE                                                  |                    | CB TEST CERTIFICATE       |  | Ref. Certificate No. |
|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------|---------------------------|--|----------------------|
|                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                       |                                                        |                    |                           |  | NE-141963/2          |
| <b>IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME</b> |                                                                                                                                                                                                                                                                                                                                                                       |                                                        |                    |                           |  |                      |
| Issued to:                                                                                               | KEMA Quality B.V.                                                                                                                                                                                                                                                                                                                                                     |                                                        |                    |                           |  |                      |
| Product:                                                                                                 | Moulded case circuit breaker with leakage (moulded)                                                                                                                                                                                                                                                                                                                   |                                                        |                    |                           |  |                      |
| Assessment:                                                                                              | IE Industrial Systems Co., Ltd.                                                                                                                                                                                                                                                                                                                                       | 1025-6, Hepingdong, Dongcheng-Anping-st, Guangzhou     | Korea, Republic of |                           |  |                      |
| Manufacturer:                                                                                            | IE Industrial Systems Co., Ltd.                                                                                                                                                                                                                                                                                                                                       | 1025-6, Hepingdong, Dongcheng-Anping-st, Guangzhou     | Korea, Republic of |                           |  |                      |
| Factory:                                                                                                 | IE Industrial Systems Co., Ltd. Changsha Plant                                                                                                                                                                                                                                                                                                                        | 1, Shengpingdong, Hengsheng-gu, Changsha, Changsha-shi | Korea, Republic of |                           |  |                      |
| Rating and approval characteristics:                                                                     | 3 pole CB with leakage (moulded)<br>Thermal-magnetic with electronic ground fault protection (IG) and 4000/4500 Vdc<br>IN = 10, 25, 35, 40, 50, 63, 75, 100 and 125 A<br>ICS = 225, 240, 250 and 475, 480, 490 VAC<br>UIC = 725 Vdc<br>ICSM = 8 kA<br>ICS = 100 kA at 225, 240, 250 V and 90 kA at 475, 480, 490 V, for 100 kA<br>Rated frequency = 50/60 Hz<br>Cat B |                                                        |                    |                           |  |                      |
| Trade mark of origin:                                                                                    | IE                                                                                                                                                                                                                                                                                                                                                                    |                                                        |                    |                           |  |                      |
| Manufacturer reference:                                                                                  | 550 100, 550 150, 550 160                                                                                                                                                                                                                                                                                                                                             |                                                        |                    |                           |  |                      |
| Additional information:                                                                                  | WBT procedure                                                                                                                                                                                                                                                                                                                                                         |                                                        |                    |                           |  |                      |
| Series of products covered in test in conformity with IEC:                                               | 60947-2 and 4                                                                                                                                                                                                                                                                                                                                                         |                                                        |                    |                           |  |                      |
| Test Report Ref. No.:                                                                                    | 2108802-02                                                                                                                                                                                                                                                                                                                                                            |                                                        |                    |                           |  |                      |
| This CB Test Certificate is issued by the National Certification Body                                    |                                                                                                                                                                                                                                                                                                                                                                       |                                                        |                    |                           |  |                      |
| KEMA Quality B.V.                                                                                        |                                                                                                                                                                                                                                                                                                                                                                       | KEMA Quality B.V.                                      |                    | KEMA Quality B.V.         |  | KEMA                 |
| Lindendreef 110                                                                                          |                                                                                                                                                                                                                                                                                                                                                                       | Lindendreef 110                                        |                    | Lindendreef 110           |  |                      |
| P.O. Box 8166                                                                                            |                                                                                                                                                                                                                                                                                                                                                                       | P.O. Box 8166                                          |                    | P.O. Box 8166             |  |                      |
| 3800 DD Arnhem                                                                                           |                                                                                                                                                                                                                                                                                                                                                                       | 3800 DD Arnhem                                         |                    | 3800 DD Arnhem            |  |                      |
| The Netherlands                                                                                          |                                                                                                                                                                                                                                                                                                                                                                       | The Netherlands                                        |                    | The Netherlands           |  |                      |
| Signed by: P.J. Schreuder                                                                                |                                                                                                                                                                                                                                                                                                                                                                       | Signed by: P.J. Schreuder                              |                    | Signed by: P.J. Schreuder |  |                      |
| Date of issue: 2008-05-21                                                                                |                                                                                                                                                                                                                                                                                                                                                                       | Date of issue: 2008-05-21                              |                    | Date of issue: 2008-05-21 |  |                      |

## Standard use environment

### Standard use environment for molded case circuit breaker

The operation characteristic of Molded Case Circuit Breaker including short-circuit, overload, endurance and insulation is often influenced largely by external environment and thus should be applied appropriately with conditions of the place where it is used taken into consideration. In particular, the operation characteristic of the circuit breaker with a thermal magnetic trip element (FTU, FMU, ATU) applied changes a bit with the ambient temperature so you have to adjust the value of power rating accordingly when it is actually in use.

- 1) Ambient temperature: Within the range of  $-5^{\circ}\text{C}$ ~ $+40^{\circ}\text{C}$  (However, the average for the duration of 24 hours must not exceed  $35^{\circ}\text{C}$ .)
- 2) Relative humidity: Within the range of 45~85%
- 3) Altitude: 2,000m or less (However, if it exceeds 1,000m, atmosphere correction through humidity test and withstand voltage test can be considered.)
- 4) Atmosphere where excessive steam, oil steam, smoke, dust, salt, conductive powder and other corrosive materials do not exist



- If a standard circuit breaker is used in high temperature exceeding  $40^{\circ}\text{C}$ , you are advised to use it according to the current corrected for each level of ambient temperature in catalog.
- If used in conditions of highly humidity, the dielectric strength or electric performance may be degraded.



- There is no problem in conduction switch, trip or short circuit isolation in the temperature of  $-20^{\circ}\text{C}$ .
- Passing or storage in stone-cold area is allowed in the temperature of  $40^{\circ}\text{C}$ .
- The operating characteristic of the breaker with a thermal magnetic trip element changes as the base ambient temperature is adjusted to  $40^{\circ}\text{C}$ .



- It is highly recommended to use a dust cover or anti-humid agent if it is used in dusty and humid conditions.
- Excessive vibration may cause a trip break such as connection fault or flaw on mechanical parts.



- If it is left On or Off for a long time, it is recommended to switch load current on a regular basis.
- It is recommend to put it in the sealed protection if corrosive gas is prevalent.

## Special use environment

### Environment where ambient temperature exceeds 40°C

The temperature of each module of a Molded Case Circuit Breaker is the sum of temperature increase by conduction and ambient temperature and if the ambient temperature exceeds 40°C the passing current needs to be reduced so that the temperature of such element as internal insulator of MCCB exceed the maximum allowable temperature.

The base ambient temperature of Metasol breaker is set as 40°C so if it has to be used in conditions with higher temperature than this, the rated current is required to be reduced a little as described in the table below.

**Table of rated current for Metasol MCCB corrected according to ambient temperature**

| Ampere frame | Rated current | Model name of breaker              | Rated current | Table of rated current corrected according to ambient temperature (A) |      |      |      |      |      |      |
|--------------|---------------|------------------------------------|---------------|-----------------------------------------------------------------------|------|------|------|------|------|------|
|              |               |                                    |               | 10°C                                                                  | 20°C | 30°C | 40°C | 45°C | 50°C | 55°C |
| 30           | 3             | ABS30c                             | 3             | 3                                                                     | 3    | 3    | 3    | 3    | 3    | 3    |
|              | 5             |                                    | 5             | 5                                                                     | 5    | 5    | 5    | 5    | 5    | 4    |
|              | 10            |                                    | 10            | 10                                                                    | 10   | 10   | 10   | 10   | 9    | 9    |
|              | 15            |                                    | 15            | 15                                                                    | 15   | 15   | 15   | 15   | 14   | 13   |
|              | 20            |                                    | 20            | 20                                                                    | 20   | 20   | 20   | 19   | 19   | 18   |
|              | 30            |                                    | 30            | 30                                                                    | 30   | 30   | 30   | 29   | 28   | 27   |
|              | 40            | ABN50c, ABS50c                     | 40            | 40                                                                    | 40   | 40   | 40   | 39   | 38   | 36   |
|              | 50            |                                    | 50            | 50                                                                    | 50   | 50   | 50   | 49   | 47   | 45   |
|              | 60            | ABN60c, ABS60c                     | 60            | 60                                                                    | 60   | 60   | 60   | 58   | 56   | 55   |
|              | 75            | ABN100c, ABN100e                   | 75            | 75                                                                    | 75   | 75   | 75   | 73   | 71   | 68   |
|              | 100           |                                    | 100           | 100                                                                   | 100  | 100  | 100  | 97   | 94   | 91   |
| 125          | 125           | ABH50c, ABS125c, ABH125c, ABL125c  | 125           | 125                                                                   | 125  | 125  | 125  | 121  | 116  | 107  |
| 250          | 150           | ABN250c, ABS250c, ABH250c, ABL250c | 150           | 150                                                                   | 150  | 150  | 150  | 145  | 140  | 128  |
|              | 175           |                                    | 175           | 175                                                                   | 175  | 175  | 175  | 169  | 163  | 150  |
|              | 200           |                                    | 200           | 200                                                                   | 200  | 200  | 200  | 193  | 186  | 171  |
|              | 225           |                                    | 225           | 225                                                                   | 225  | 225  | 225  | 217  | 209  | 193  |
|              | 250           |                                    | 250           | 250                                                                   | 250  | 250  | 250  | 241  | 233  | 214  |
| 400          | 250           | ABN400c, ABS400c                   | 250           | 250                                                                   | 250  | 250  | 250  | 246  | 242  | 238  |
|              | 300           |                                    | 300           | 300                                                                   | 300  | 300  | 300  | 295  | 291  | 287  |
|              | 350           | ABH400c, ABL400c                   | 350           | 350                                                                   | 350  | 350  | 350  | 345  | 339  | 332  |
|              | 400           |                                    | 400           | 400                                                                   | 400  | 400  | 400  | 394  | 388  | 381  |
| 800          | 700           | ABN800c, ABS800c                   | 700           | 700                                                                   | 700  | 700  | 700  | 689  | 679  | 668  |
|              | 800           | ABL800c                            | 800           | 800                                                                   | 800  | 800  | 800  | 788  | 776  | 764  |

## Special use environment

**Table of rated current for Metasol ELCB corrected according to ambient temperature**

| Ampere frame | Rated current | Model name of breaker | Rated current                      | Table of rated current corrected according to ambient temperature (A) |      |      |      |      |      |      |
|--------------|---------------|-----------------------|------------------------------------|-----------------------------------------------------------------------|------|------|------|------|------|------|
|              |               |                       |                                    | 10°C                                                                  | 20°C | 30°C | 40°C | 45°C | 50°C | 55°C |
|              | 30            | 15                    | EBS30c                             | 15                                                                    | 15   | 15   | 15   | 15   | 15   | 15   |
|              |               | 20                    |                                    | 20                                                                    | 20   | 20   | 20   | 19   | 19   | 18   |
|              |               | 30                    |                                    | 30                                                                    | 30   | 30   | 30   | 29   | 28   | 27   |
|              | 50            | 40                    | EBN50c, EBS50c                     | 40                                                                    | 40   | 40   | 40   | 39   | 38   | 36   |
|              |               | 50                    |                                    | 50                                                                    | 50   | 50   | 50   | 49   | 47   | 45   |
|              | 60            | 60                    | EBN60c, EBS60c                     | 60                                                                    | 60   | 60   | 60   | 58   | 56   | 55   |
|              | 100           | 75                    | EBN100c                            | 75                                                                    | 75   | 75   | 75   | 73   | 71   | 68   |
|              |               | 100                   |                                    | 100                                                                   | 100  | 100  | 100  | 97   | 94   | 91   |
|              | 125           | 125                   | EBH50c, EBS125c, EBH125c           | 125                                                                   | 125  | 125  | 125  | 121  | 116  | 107  |
|              | 250           | 150                   | EBN250c, EBS250c, EBH250c          | 150                                                                   | 150  | 150  | 150  | 145  | 140  | 128  |
|              |               | 175                   |                                    | 175                                                                   | 175  | 175  | 175  | 169  | 163  | 150  |
|              |               | 200                   |                                    | 200                                                                   | 200  | 200  | 200  | 193  | 186  | 171  |
|              |               | 225                   |                                    | 225                                                                   | 225  | 225  | 225  | 217  | 209  | 193  |
|              |               | 250                   |                                    | 250                                                                   | 250  | 250  | 250  | 241  | 233  | 214  |
|              | 400           | 250                   | EBN400c, EBS400c, EBH400c, EBL400c | 250                                                                   | 250  | 250  | 250  | 246  | 242  | 238  |
|              |               | 300                   |                                    | 300                                                                   | 300  | 300  | 300  | 295  | 291  | 287  |
|              |               | 350                   |                                    | 350                                                                   | 350  | 350  | 350  | 345  | 339  | 332  |
|              |               | 400                   |                                    | 400                                                                   | 400  | 400  | 400  | 394  | 388  | 381  |
|              | 800           | 700                   | EBN800c, EBS800c                   | 700                                                                   | 700  | 700  | 700  | 689  | 679  | 668  |
|              |               | 800                   | EBL800c                            | 800                                                                   | 800  | 800  | 800  | 788  | 776  | 764  |

### Environment where ambient temperature is -5°C or less

Molded Case Circuit Breaker is subject to the effect of low temperature brittle of metal part inside and insulator, or changes in viscosity of lubricating oil in device, extra care should be taken not to have the temperature drop extremely with the use of such device as space heater. In addition, in case of using a thermal magnetic trip element (FTU, FMU, ATU), the operating characteristic changes toward the difficult direction, so you should identify the relationship of protection and correct accordingly.

Although MCCB is not affected by conduction switch, trip, or short circuit isolation in the temperature of -20°C, it is highly recommended to use a temperature maintaining device such as space heater. In addition, transportation and passing in stone-cold area in the temperature as low as -40°C is allowed but it is recommended to leave the status of MCCB off or tripped in order to minimize the effect of brittle due to a low temperature.

### High humidity condition (Relative humidity 85% or more)

Using Molded Case Circuit Breaker in a place of high humidity requires a rigorous maintenance including installation of anti-humidity agent within the structure in order to prevent the insulation sag of insulator or corrosion of mechanical parts as a result of high humidity. Also, in case of installing MCCB within the enclosed equipment, a space heater needs to be installed as well to prevent dew condensation that might occur due to a drastic temperature change.

### Environment where petrochemical gas exists

The contact material of Molded Case Circuit Breaker is silver or silver alloy which develops creation of petrochemical coat that might cause a poor connection if it gets in contact with petrochemical gas. However, it is easy for petrochemical coat to be mechanically taken off so it is no problem if make-and-break operation occurs frequently but it needs to be switched back and forth between make and break if the operation rarely occurs.

The lead wire of moving contact of Molded Case Circuit Breaker can be disconnected as it is corroded or hardened by petrochemical gas. The silver coating is effective to prevent this from occurring and there is a need to increase durability of MCCB with the use of silver coated lead wire if it is used in environment with thick petrochemical gas.

### Environment where potentially explosive gas exists

It is advised, in principle, not to install a Molded Case Circuit Breaker that switches and inhibits current in a dangerous place such as this one.

### Impact of altitude

If an MCCB is used in an elevated area higher than 2000m sea level, its operating performance is subject to dramatic drop in atmospheric pressure and temperature. For example, the air pressure is reduced to 80% of ordinary pressure at 2,200m and further 50% at 5,500m although the short-circuit performance is not affected. If

it is used in areas of high sea level, you can do correction based on the correction parameter table in high altitude environment, as described below

\* Refer to the correction parameter table in high altitude environment (ANSI C37. 29-1970)

1) How to correct voltage:

- If the rated voltage is AC 600V at 4,000m above sea level,  
 $600V \text{ (rated voltage)} \times 0.82 \text{ (correction parameter)} = 492V$ .

2) How to correct current:

- If the rated voltage is AC 800A at above 4,000m sea level,  
 $800A \text{ (rated current)} \times 0.96 \text{ (correction parameter)} = 768A$ .

[Correction parameter table for altitude]

| Altitude | Voltage correction parameter | Current correction parameter |
|----------|------------------------------|------------------------------|
| 2,000m   | 1.00                         | 1.00                         |
| 3,000m   | 0.91                         | 0.98                         |
| 4,000m   | 0.82                         | 0.96                         |
| 5,000m   | 0.73                         | 0.94                         |
| 6,000m   | 0.65                         | 0.92                         |

## Environment with vibration and impulse exercised

### Impact of vibration and impulse

An excessive vibration and impulse may cause damage on breaker or other security problems including dynamic strength. An appropriate consideration is required to select a right MCCB for an adverse environmental stress such as this one. Moreover, this stress may incur from vibration during transportation, magnetic impulse while manipulating a switch or may be affected by equipment in surrounding area. There is a standard call [Vibration testing method for small electric appliances] for vibration and impulse test for electric equipment and the seismic and endurance tests of Molded Case Circuit Breaker are conducted in accordance with this standard, considering the circumstance mentioned above.

### Vibration

The magnitude of vibration is measured by double amplitude and frequency with the following equation with accelerator.

$$\alpha g = 0.002 \times \text{frequency (Hz)} \times \text{double amplitude (mm)}$$

\*  $\alpha g$ : Multiple of gravitational acceleration ( $g = 9.8\text{m/sec}^2$ )

There are three types of vibration tests including resonance test, vibration endurance test, and malfunction test as described below.

#### 1) Resonant test

Alter the frequency of sinusoidal wave within the range of 0~55Hz gradually with 0.5~1mm of double amplitude applied to see if there is any occurrence of vibration on a specific part of MCCB.

#### 2) Vibration endurance test

A sinusoidal wave with double amplitude of 0.5~1mm and frequency of 55Hz (Resonant frequency obtained in previous clause if there is a resonant point) is manually created to check the operational status.

#### 3) Malfunction test

Apply vibration for 10 minutes for each condition of altering double amplitude and frequency to check if there is any malfunction in MCCB.

### Impulse

The magnitude of impulse is denoted by the multiple of gravitational acceleration imposed on the equipment and part. The test is conducted through a drop impulse test.

### Impact of high frequency

In case of high frequency current, you are required to reduce the rated current of the breaker with a thermal magnetic trip element embedded due to heat incurred by the skin effect of conductor and/or core loss of structure. The reduction rate varies according to the frame Size and rated current and decreases down to 70~80% at 400Hz. In addition, the core loss decreases attractive force, which leads to increase of instantaneous trip current.

\* Core loss: It refers to the electrical loss in a transformer caused by magnetization of the core that changes over time and is categorized into hysteresis loss and eddy current loss.

\* Hysteresis loss: It takes up the majority portion of no-load loss of electric equipment and is calculated like this.

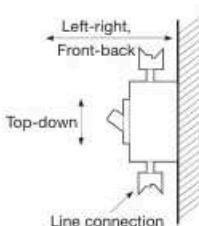
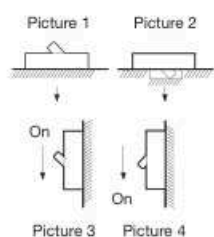
$$P_h = \sigma f B_m n$$

$B_m$ : Maximum value of magnetic flux density,  $n$ : constant (1.6~2.0),  $f$ : Frequency,  $\sigma$ : Hysteresis constant

\* Eddy current: It refers to an induced electric current formed within the body of a conductor when it moves through a non-uniform or changing magnetic field. The eddy current that incurs at winding of transformer or core is considered as one of the transformer losses as a part of exciting current. It is also called 'eddy current loss'.

## Use environment with vibration and impulse applied

[Table of seismic performance and internal impulse performance]

|                |                                          | Test                                                                                                                                                                                                                                                                                          | Internal impulse                                                                                                                                                                                  |
|----------------|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test condition | Mounting vibration, direction of impulse | <ul style="list-style-type: none"> <li>Vertical mounting</li> <li>Top-down, Left-right, Front-back</li> </ul>                                                                                                | <ul style="list-style-type: none"> <li>Picture 1, 2, 3, 4<br/>(→ Represents the direction of drop)</li> </ul>  |
|                | Status of MCCB                           | (1) Non-conduction (On or Off status)<br>(2) Status where rated current is conducted until the temperature of MCCB becomes constant and keeps being conducted                                                                                                                                 | Non-conduction (On or Off status)                                                                                                                                                                 |
| Test result    | Judgment condition                       | <ul style="list-style-type: none"> <li>If it is On, it should not be Off</li> <li>If it is Off, it should not be On</li> <li>No abnormal status such as damage, transformation, or annealing of nut part</li> <li>Characteristics of switch and trip after the test must be normal</li> </ul> |                                                                                                                                                                                                   |

# Certifications

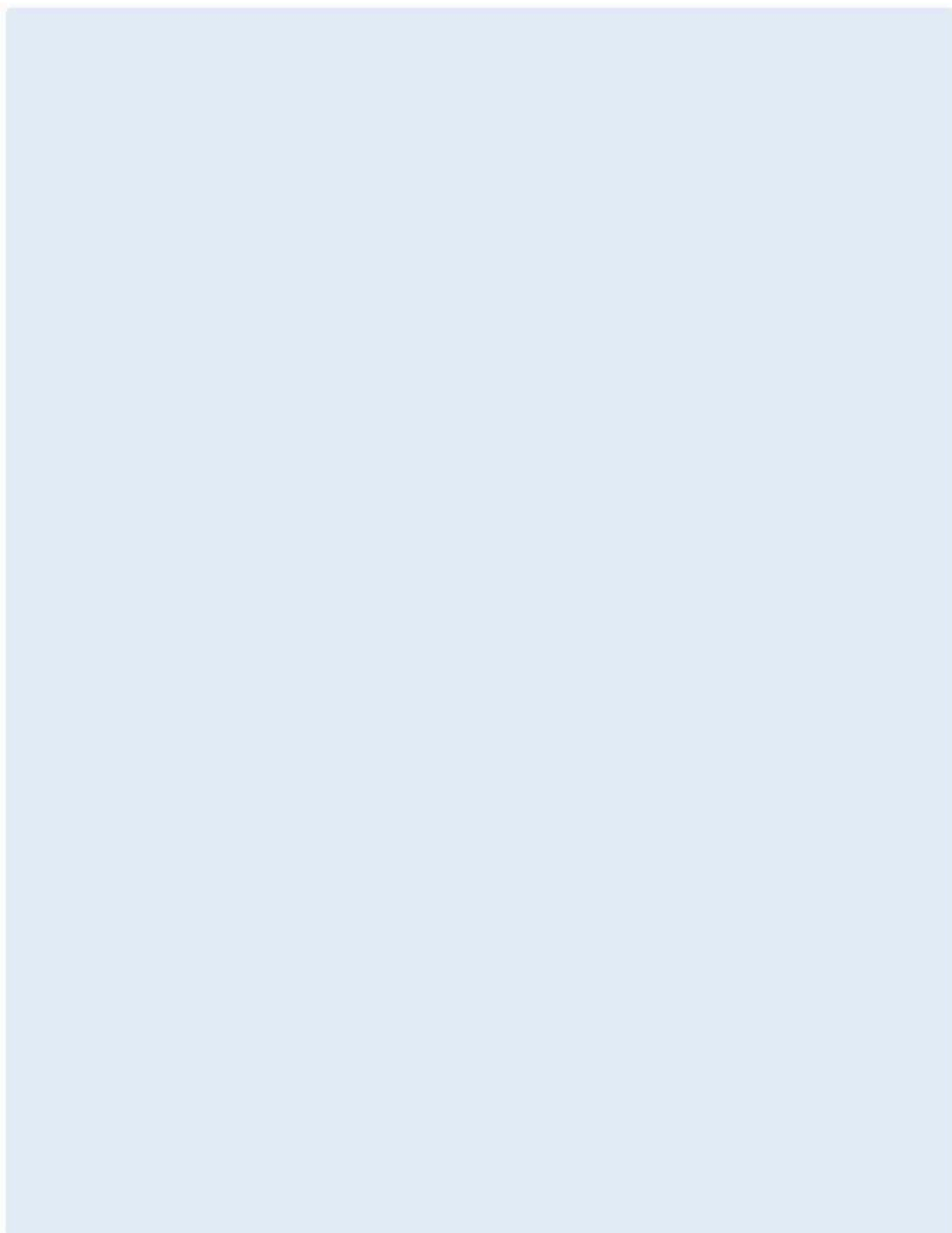
## MCCB

| Type<br>Certificate | Approvals     |        | Certificates |
|---------------------|---------------|--------|--------------|
|                     | Safet certi   | IEC    | KEMA         |
|                     | Mark and name | CE     | KEMA         |
| Type                | Korea         | Europe | Netherlands  |
| ABS32c              | ●             | ●      | ●            |
| ABS33c              | ●             | ●      | ●            |
| ABS34c              | ●             | ●      | ●            |
| ABN52c              | ●             | ●      | ●            |
| ABN53c              | ●             | ●      | ●            |
| ABN54c              | ●             | ●      | ●            |
| ABS52c              | ●             | ●      | ●            |
| ABS53c              | ●             | ●      | ●            |
| ABS54c              | ●             | ●      | ●            |
| ABN62c              | ●             | ●      | ●            |
| ABN63c              | ●             | ●      | ●            |
| ABN64c              | ●             | ●      | ●            |
| ABS62c              | ●             | ●      | ●            |
| ABS63c              | ●             | ●      | ●            |
| ABS64c              | ●             | ●      | ●            |
| ABN102c             | ●             | ●      | ●            |
| ABN103c             | ●             | ●      | ●            |
| ABN104c             | ●             | ●      | ●            |
| ABS32d              | ●             | ●      | ●            |
| ABS33d              | ●             | ●      | ●            |
| ABS34d              | ●             | ●      | ●            |
| ABN52d              | ●             | ●      | ●            |
| ABN53d              | ●             | ●      | ●            |
| ABN54d              | ●             | ●      | ●            |
| ABS52d              | ●             | ●      | ●            |
| ABS53d              | ●             | ●      | ●            |
| ABS54d              | ●             | ●      | ●            |
| ABN62d              | ●             | ●      | ●            |
| ABN63d              | ●             | ●      | ●            |
| ABN64d              | ●             | ●      | ●            |
| ABS62d              | ●             | ●      | ●            |
| ABS63d              | ●             | ●      | ●            |
| ABS64d              | ●             | ●      | ●            |
| ABN102d             | ●             | ●      | ●            |
| ABN103d             | ●             | ●      | ●            |
| ABN104d             | ●             | ●      | ●            |
| ABP52c              | ●             | ●      | ●            |
| ABP53c              | ●             | ●      | ●            |
| ABP54c              | ●             | ●      | ●            |
| ABH52c              | ●             | ●      | ●            |
| ABH53c              | ●             | ●      | ●            |
| ABH54c              | ●             | ●      | ●            |
| ABS102c             | ●             | ●      | ●            |
| ABS103c             | ●             | ●      | ●            |
| ABS104c             | ●             | ●      | ●            |
| ABP102c             | ●             | ●      | ●            |
| ABP103c             | ●             | ●      | ●            |

Note: ● (Completion)

## ELCB

| Type<br>Certificate | Approvals     |        | Certificates |
|---------------------|---------------|--------|--------------|
|                     | Safet certi   | IEC    | KEMA         |
|                     | Mark and name | CE     | KEMA         |
| Type                | Korea         | Europe | Netherlands  |
| EBS32c              | ●             | ●      | ●            |
| EBS33c              | ●             | ●      | ●            |
| EBS34c              | ●             | ●      | ●            |
| EBN52c              | ●             | ●      | ●            |
| EBN53c              | ●             | ●      | ●            |
| EBS53c              | ●             | ●      | ●            |
| EBS54c              | ●             | ●      | ●            |
| EBN63c              | ●             | ●      | ●            |
| EBS63c              | ●             | ●      | ●            |
| EBS64c              | ●             | ●      | ●            |
| EBN102c             | ●             | ●      | ●            |
| EBN103c             | ●             | ●      | ●            |
| EBN104c             | ●             | ●      | ●            |
| EBS33d              | ●             | ●      | ●            |
| EBS34d              | ●             | ●      | ●            |
| EBN52d              | ●             | ●      | ●            |
| EBN53d              | ●             | ●      | ●            |
| EBS53d              | ●             | ●      | ●            |
| EBS54d              | ●             | ●      | ●            |
| EBN63d              | ●             | ●      | ●            |
| EBS63d              | ●             | ●      | ●            |
| EBS64d              | ●             | ●      | ●            |
| EBN102d             | ●             | ●      | ●            |
| EBN103d             | ●             | ●      | ●            |
| EBN104d             | ●             | ●      | ●            |
| EBP53c              | ●             | ●      | ●            |
| EBP54c              | ●             | ●      | ●            |
| EBH53c              | ●             | ●      | ●            |
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| EBS103c             | ●             | ●      | ●            |
| EBS104c             | ●             | ●      | ●            |
| EBP103c             | ●             | ●      | ●            |
| EBP104c             | ●             | ●      | ●            |
| EBH103c             | ●             | ●      | ●            |
| EBH104c             | ●             | ●      | ●            |
| EBN202c             | ●             | ●      | ●            |
| EBN203c             | ●             | ●      | ●            |
| EBS203c             | ●             | ●      | ●            |
| EBS204c             | ●             | ●      | ●            |
| EBP203c             | ●             | ●      | ●            |
| EBP204c             | ●             | ●      | ●            |
| EBH203c             | ●             | ●      | ●            |
| EBH204c             | ●             | ●      | ●            |





## Safety Instructions

- For your safety, please read user's manual thoroughly before operating.
- Contact the nearest authorized service facility for examination, repair, or adjustment.
- Please contact qualified service technician when you need maintenance. Do not disassemble or repair by yourself!
- Any maintenance and inspection shall be performed by the personnel having expertise concerned.



- According to The WEEE Directive, please do not discard the device with your household waste.



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