



# Metasol

Meta Solution

Low voltage circuit breakers





Leader in Electrics & Automation

***Upgraded for the global  
best worth!***

## ***Metasol***

**Molded case circuit breaker / Earth leakage circuit breaker**

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**Metasol**  
**ABS 203c**

250AF	3P
Ue	Ics=Icu
690V	8kA
480/500V	26kA
415/460V	37kA
380V	42kA
220/240V	85kA
500V	20kA
250V	20kA
Ics = 100%Icu	
50/60Hz	
Cat. A	



# Metasol

Meta solution



**MCCB = ELCB**



# Metasol

Molded case circuit breaker / Earth leakage circuit breaker

## Upgrade of Meta-MEC series

# ... **Metasol** Low voltage circuit breaker

- $I_{cs} = 100\% \times I_{cu}$
- $U_i = 750V$
- $U_{imp} = 8kV$



- *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

- *$I_{cs} = 100\% I_{cu}$*

# Metasol MCCB/ELCB

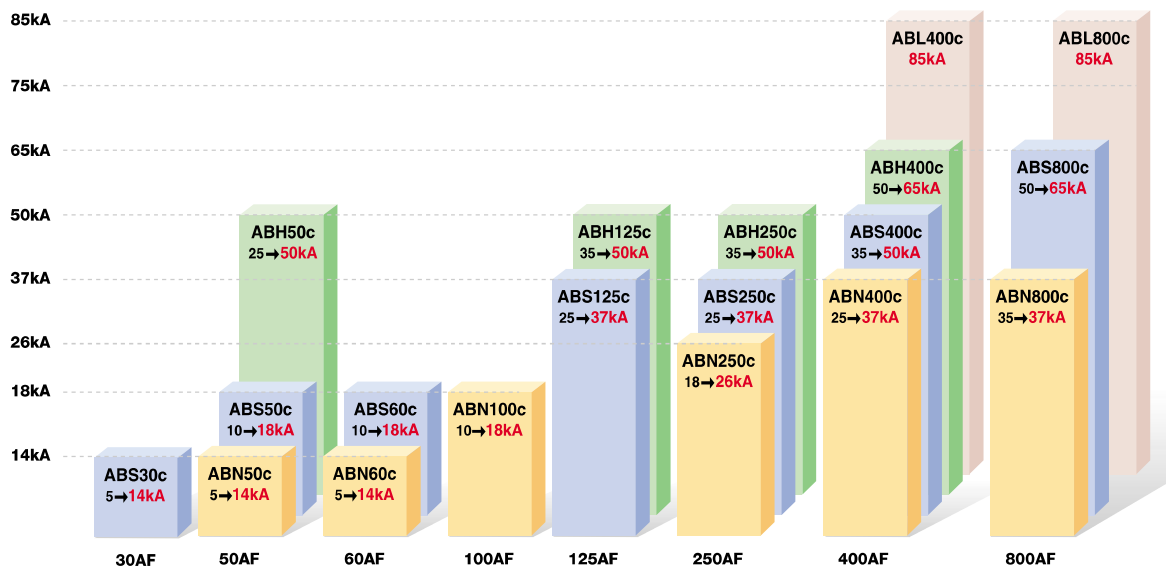


**Ics = 100% Icu**

## Metasol MCCB

Upgrade breaking capacity

460V



# Short-circuit breaking capacity

UP



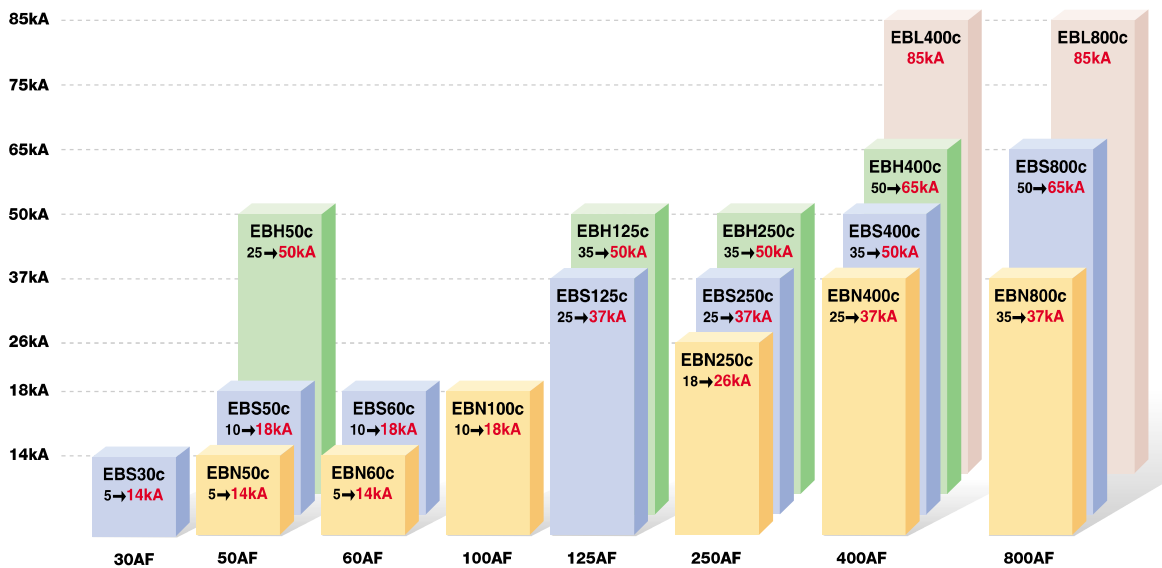
## Upgrade breaking capacity

- 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

460V



# 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
ABN		ABN50c 14kA	ABN60c 14kA	ABN100c 18kA		ABN250c 26kA	ABN400c 37kA	ABN800c 37kA
ABS	ABS30c 14kA	ABS50c 18kA	ABS60c 18kA		ABS125c 37kA	ABS250c 37kA	ABS400c 50kA	ABS800c 65kA
ABH		ABH50c 50kA			ABH125c 50kA	ABH250c 50kA	ABH400c 65kA	
ABL							ABL400c 85kA	ABL800c 85kA

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



- Same external dimension with MCCB and ELCB.

## ELCB (Earth leakage circuit breaker)



### Metasol ELCB

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

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

# Metasol MCCB/ELCB System overview

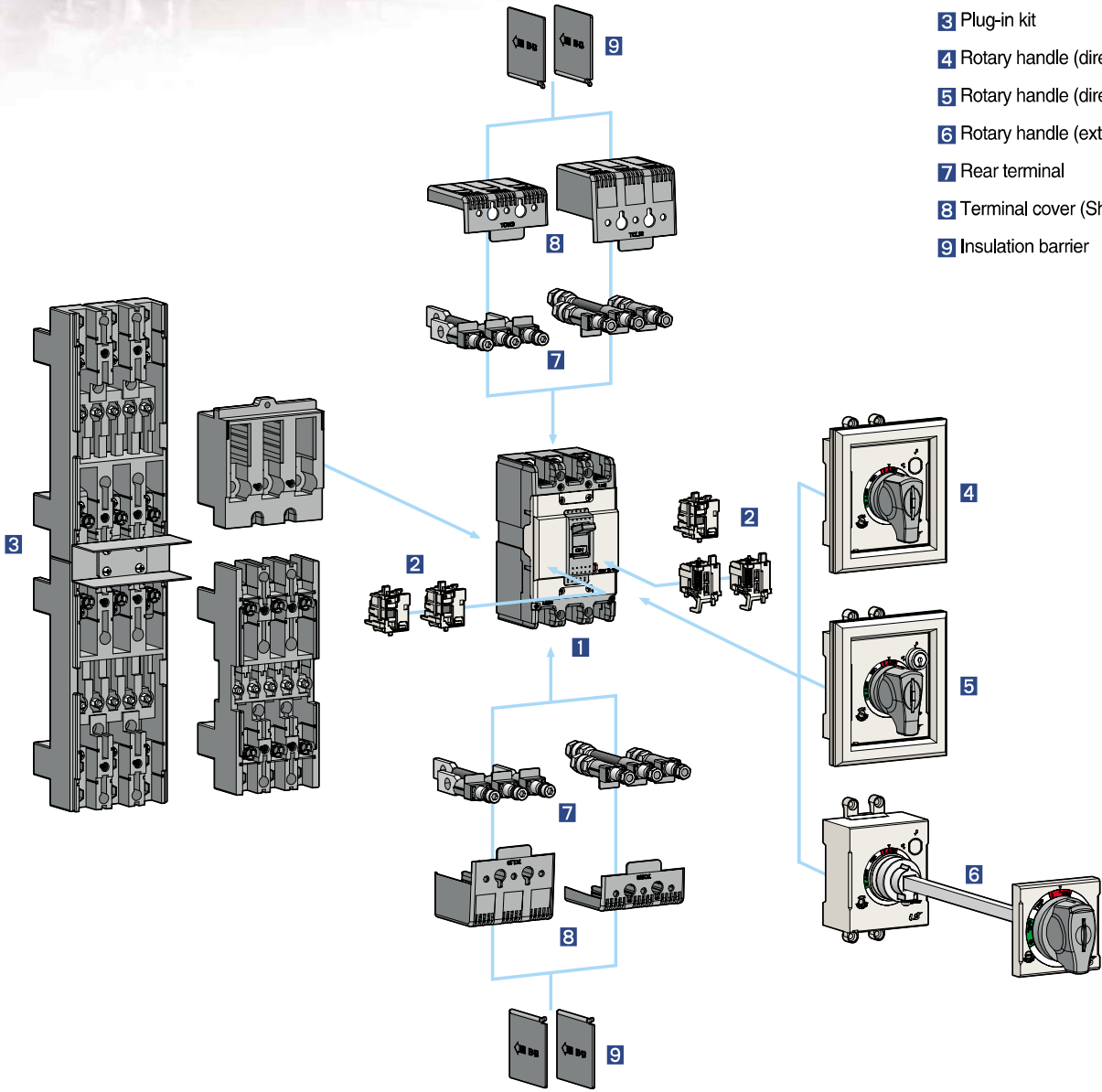


## ■ Various installable Accessories

- Wider range of installable accessories compared to Meta MEC series.
- Composed of User Friendly Method.

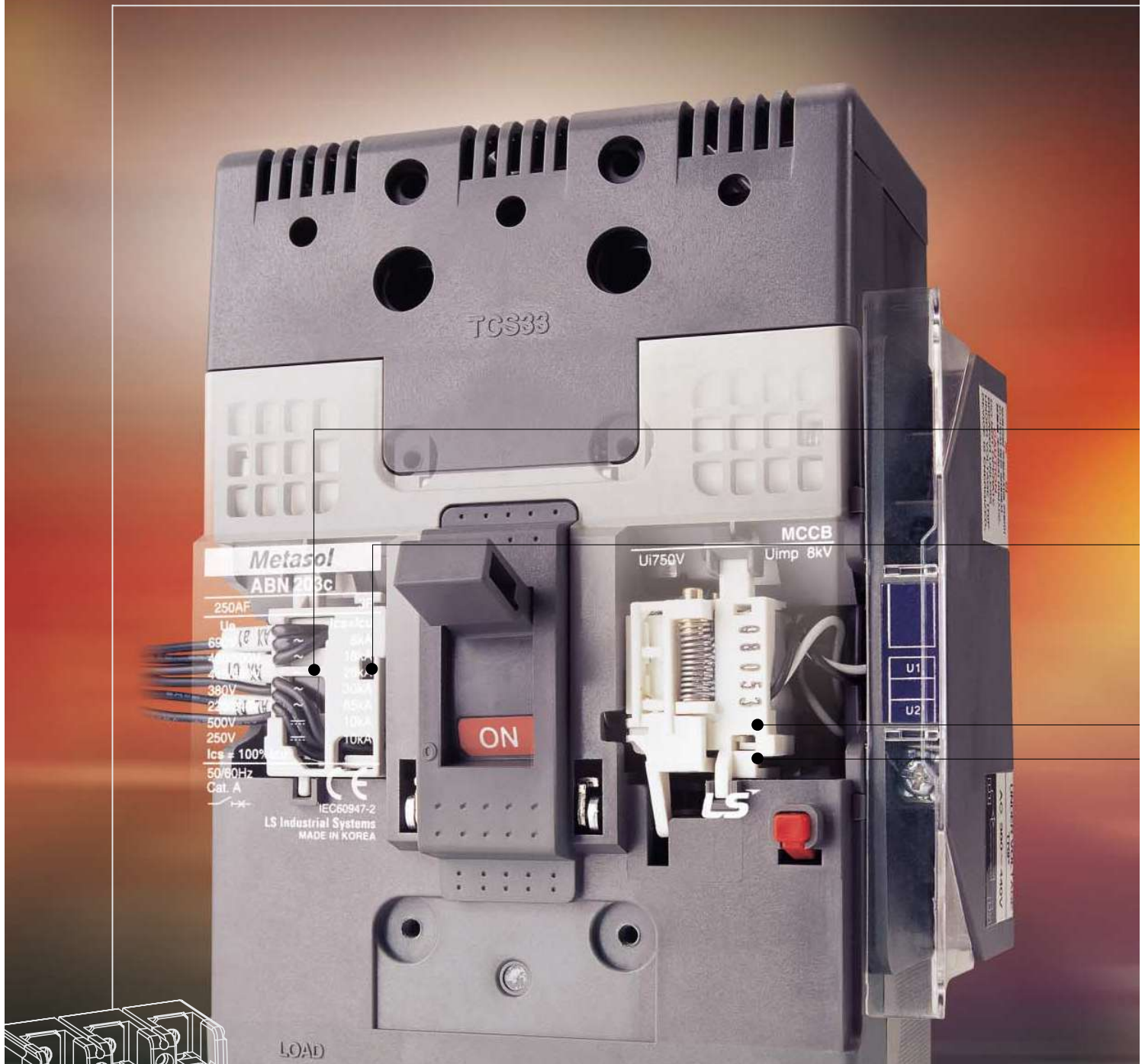
# System overview

- 1 Breaker
- 2 Internal auxiliaries
- 3 Plug-in kit
- 4 Rotary handle (direct)
- 5 Rotary handle (direct, key lock)
- 6 Rotary handle (extended)
- 7 Rear terminal
- 8 Terminal cover (Short, Long)
- 9 Insulation barrier



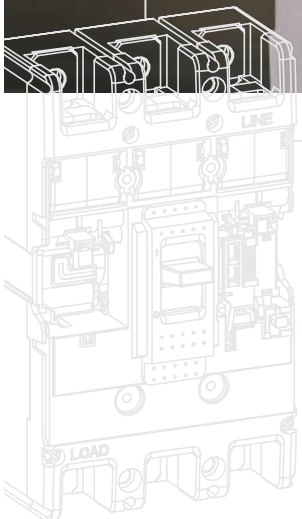


# Metasol MCCB/ELCB Internal accessories



## ■ Internal Accessories

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



## 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.



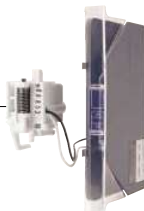
### Auxiliary Switch (AX)

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.



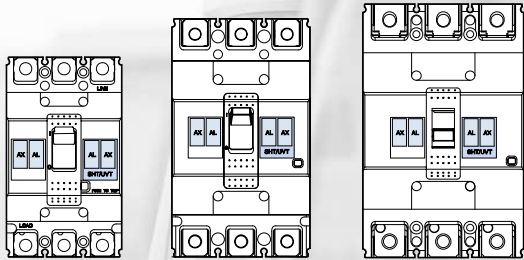
### Undervoltage trip (UVT)

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.

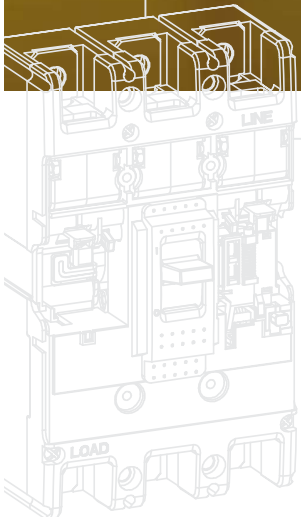


### Shunt Trip (SHT)

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.



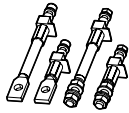
# Metasol MCCB/ELCB External accessories



## ■ External Accessories

Designed for various mount and user safety.

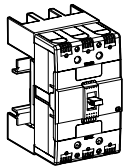




## Front and rear connection

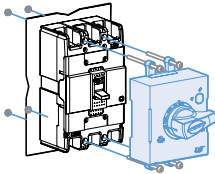
Several kinds of terminals can be equipped with ELCBs as well as MCCBs.

- Terminals for front connection
- Rear connection terminals



## Plug-in base

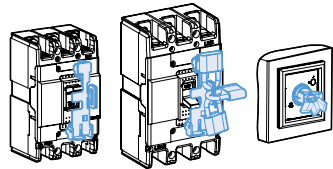
It makes to extract and/or rapidly replace the circuit breaker without having to touch connections.(Easy replacement and maintenance)



## Direct & Extended Rotary Handle

There are two types of rotary handles.

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



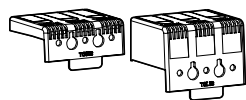
## Locking device

- 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.

# Marking and configuration

Metasol

## MCCB

### MCCB model

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

### Standardized characteristics

- Ui: Rated insulation voltage
- Uimp: Impulse withstand voltage
- Ue: Rated operational voltage
- Icu: Ultimate breaking capacity
- Ics: Service breaking capacity



Rated frequency

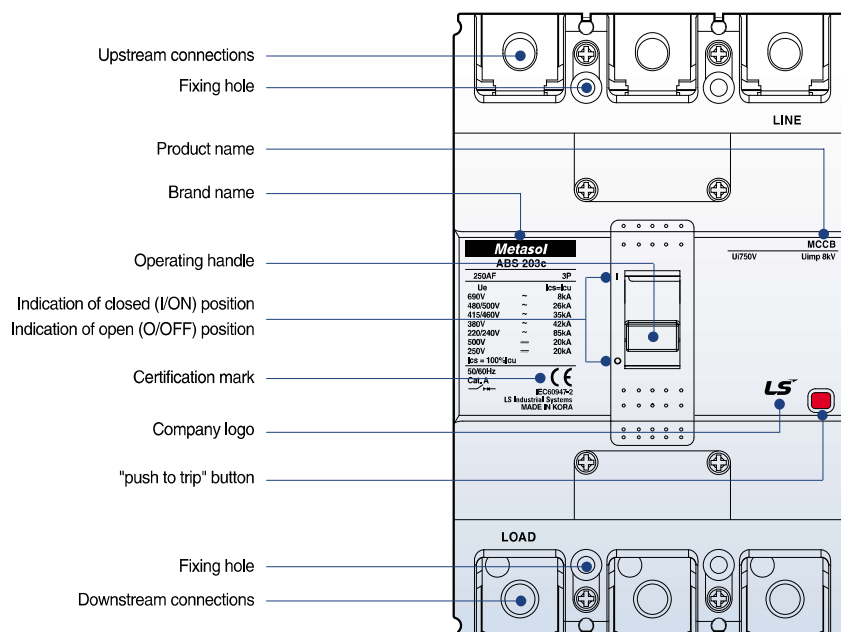
Utilization category

Manufacturer

Standard

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

## MCCB





## ELCB

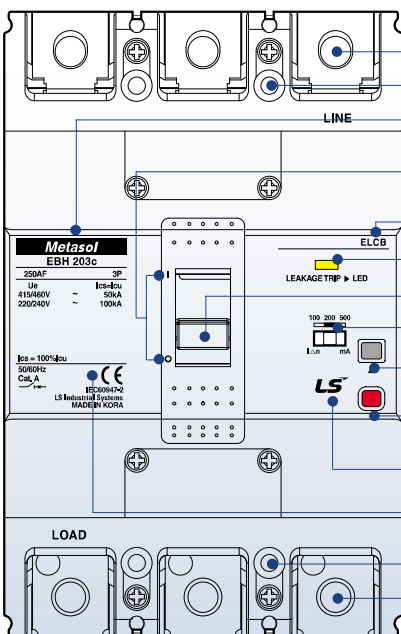


- ELCB model**
- EBN: Economic type
  - EBS: Standard type
  - EBH: High capacity type

Rated frequency      Standard      Manufacturer      Utilization category

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

## ELCB



- Upstream connections
- Fixing hole
- Brand name
- Indication of closed (I/ON) position
- Indication of open (O/OFF) position
- Product name
- Trip indication by earth fault
- Operating handle
- Residual current(I $\Delta$ n) setting
- "push to trip" button for earth fault
- "push to trip" button for overcurrent trip
- Company logo
- Certification mark
- Fixing hole
- Downstream connections



# External configuration

## MCCB

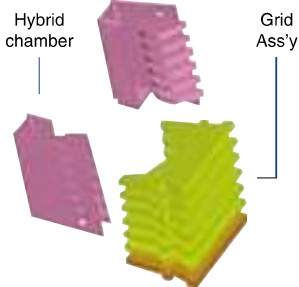
### ① Handle

- 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

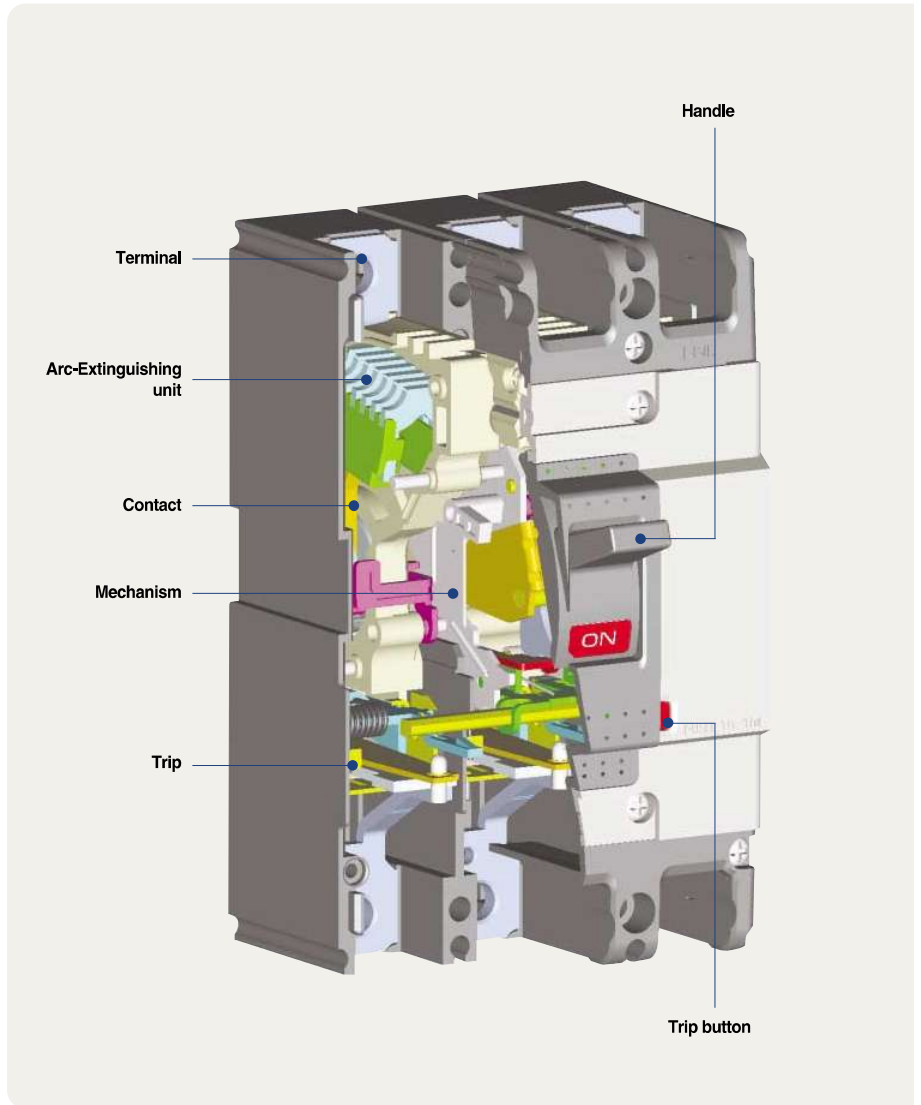
### ② Arc-Extinguishing unit

- LS patent technique PASQ
- Arc-Extinguishing unit
- PASQ : Puffer Assisted Self-Quenching
  - Reduction of arc voltage for a short time

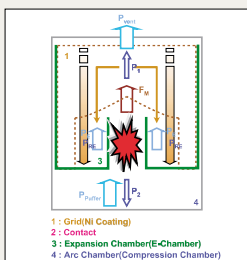


### ③ Trip button (push to trip)

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



### A Application of PASQ Arc Extinguishing



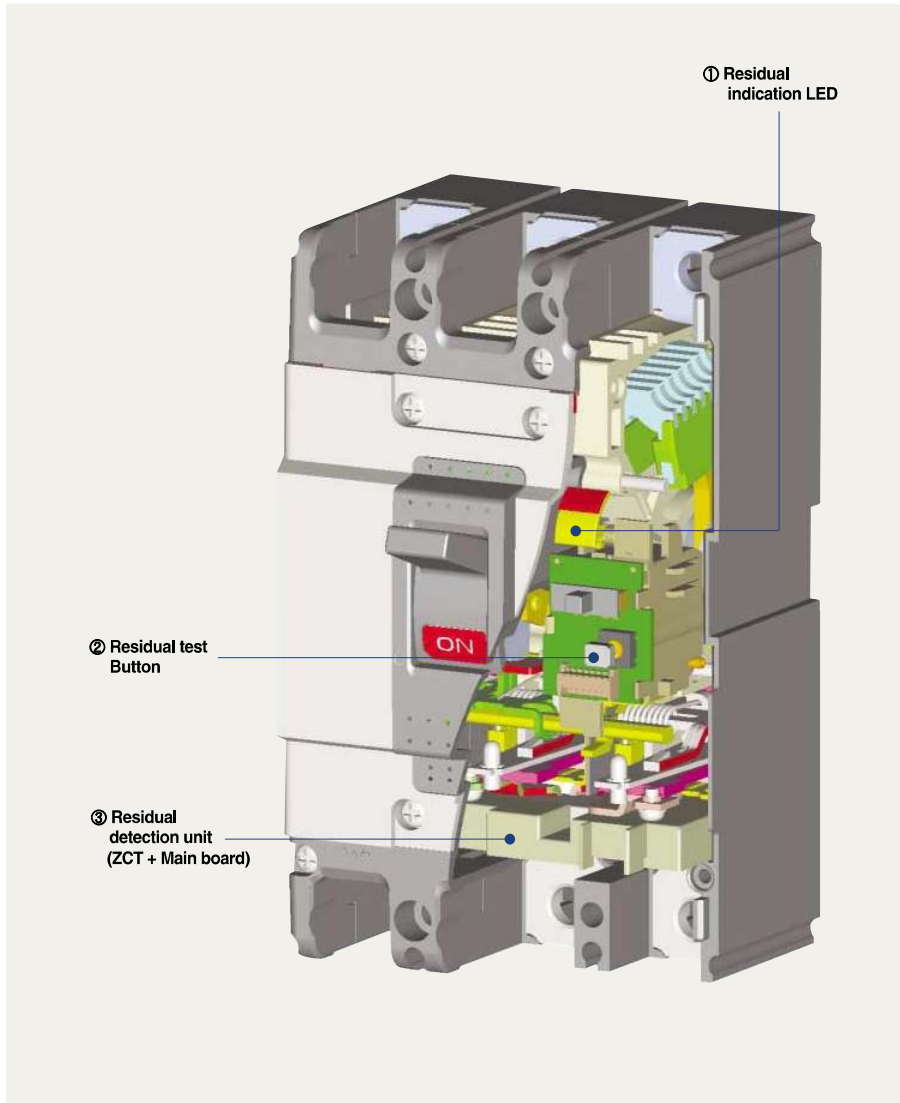
- The reduction of breaking time by applying PASQ arc extinguishing for inhibition of arc voltage for a short time.

### 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 Residual indication LED

- Normal situation is yellow , trio situation is red

### ② Residual test Button

- Special design for Upgrade to prohibit resistance accident

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

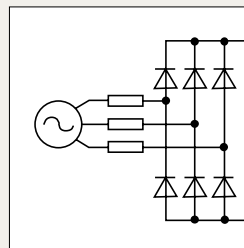
- For upgrade the design is selected the 3 phase input power method and in case of Voltage problem, it can break residual current safely.

### 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