Green Innovators of Innovation

www.lsis.biz

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

LS IS

Metasol

Meta solution

MCCB = ELCB

Upgrade of Meta-MEC series

··· Metasol Low voltage circuit breaker

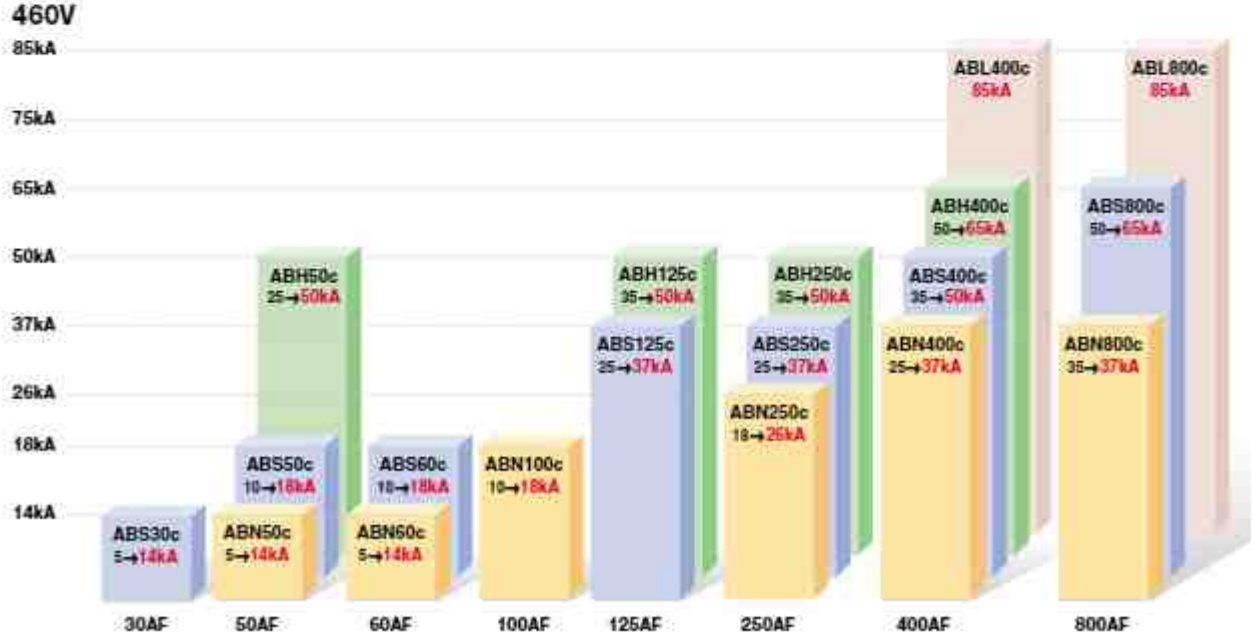
- Ics = 100% × Icu
- Ui = 750V
- Uimp = 8kV

- *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
- *Ics = 100% Icu*

Metasol MCCB/ELCB

Metasol MCCB

Upgrade breaking capacity



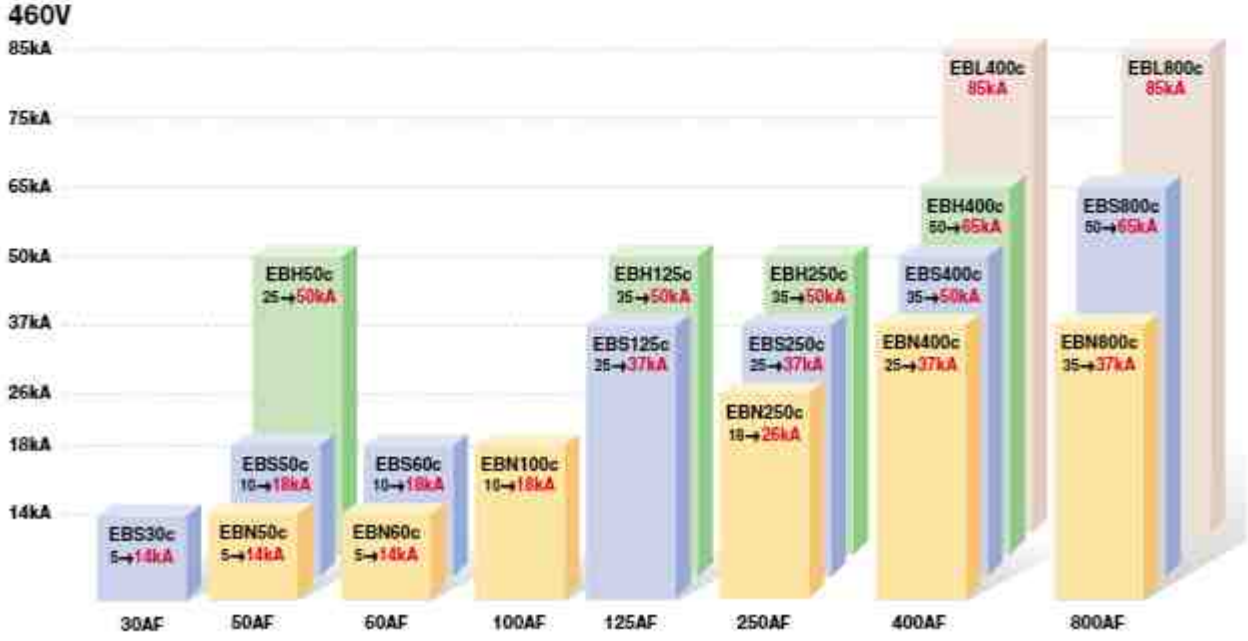
Short-circuit breaking capacity

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)

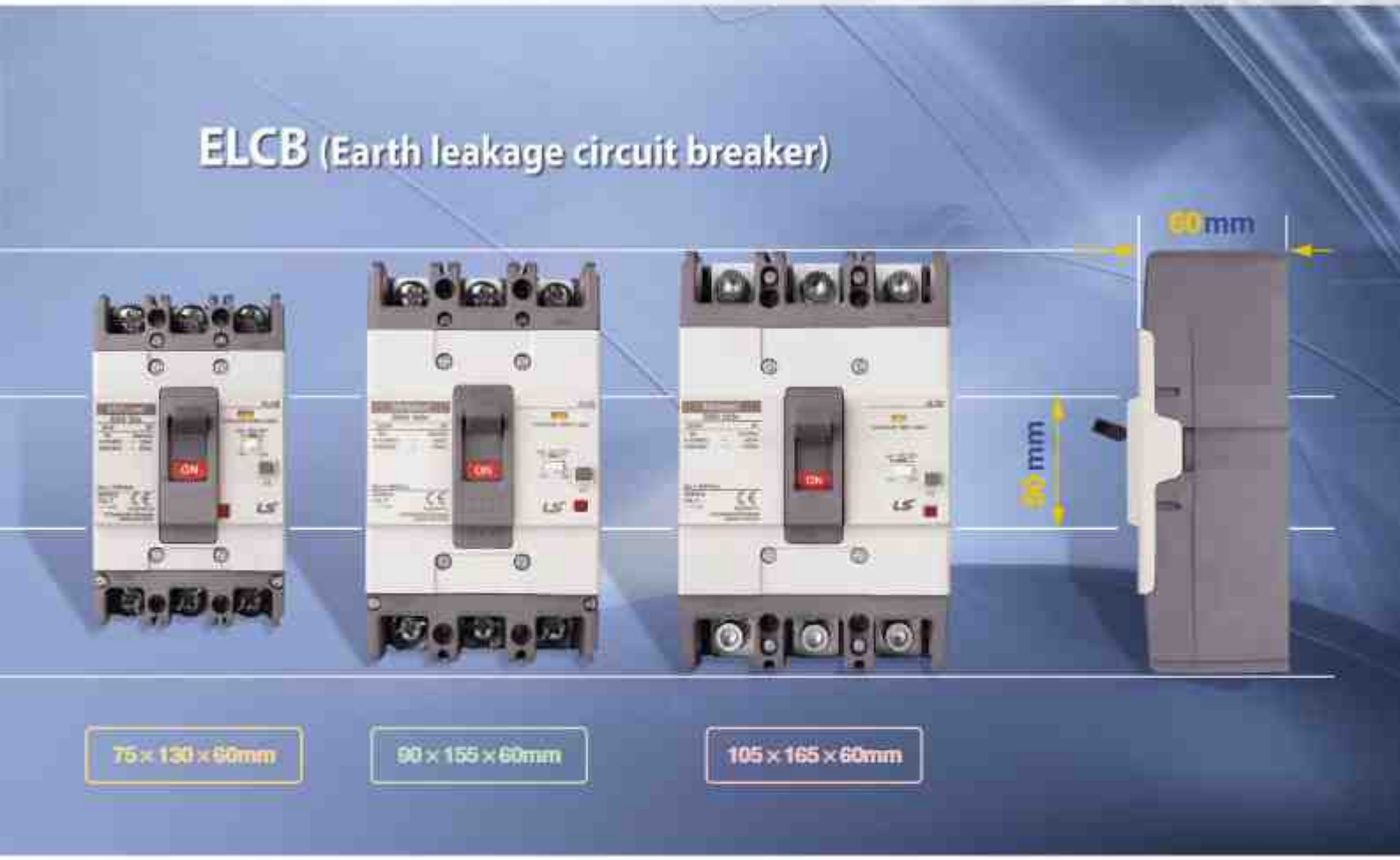
105×165×60mm | 90×155×60mm | 75×130×60mm

Metasol MCCB

Type \ AF	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.



Metasol ELCB

Type \ AF	30AF	50AF	60AF	100AF	125AF	250AF	400AF	800AF
EBN		EBN50c 14kA	EBN60c 14kA	EBN100c 18kA		EBN250c 26kA	EBN400c 27kA	EBN800c 27kA
EBS	EBS30c 14kA	EBS50c 18kA	EBS60c 18kA		EBS125c 37kA	EBS250c 37kA	EBS400c 50kA	EBS800c 65kA
EBH		EBH50c 50kA			EBH125c 50kA	EBH250c 50kA	EBH400c 65kA	
EBL							EBL400c 85kA	EBL800c 85kA

Note) Dimension is for 3 pole and breaking capacity is for AC400V.

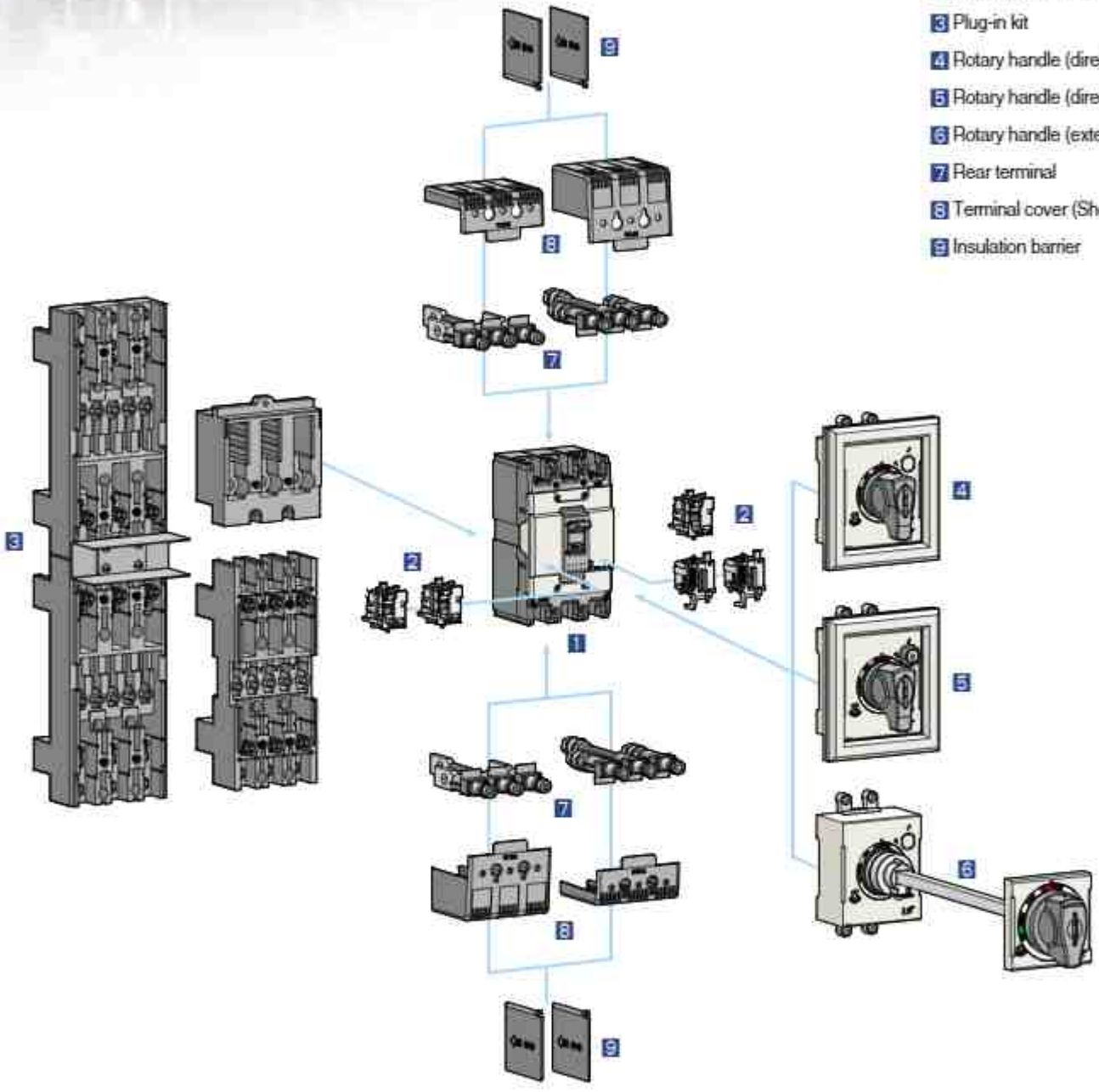
Metasol MCCB/ELCB System overview

Various installable Accessories

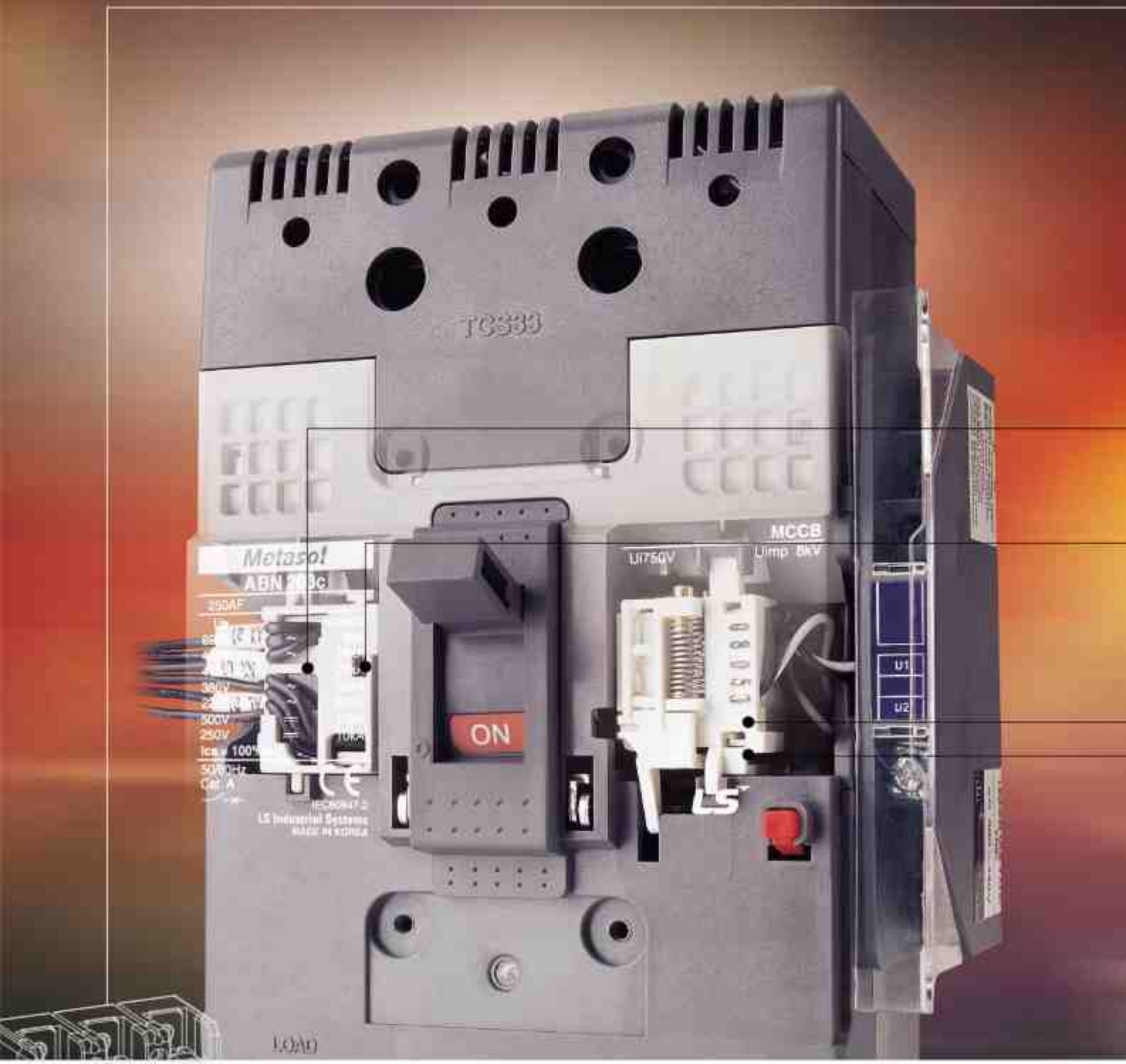
- Wider range of installable accessories compared to Meta MEC series.
- Composed of User Friendly Method.

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.

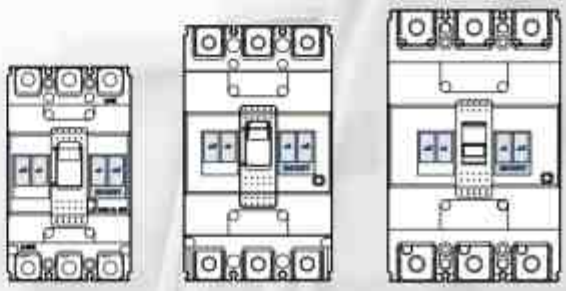
Undervoltage trip (UVT)

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 be fore 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

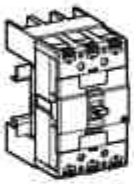
Designed for various mount and user safety.

External accessories

Front and rear connection

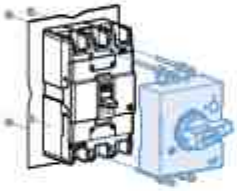
Several kinds of terminals can be equipped with ELCBs as well as MCCBs.

- Terminals for front connection
- Rear connection terminals



Plug-in base

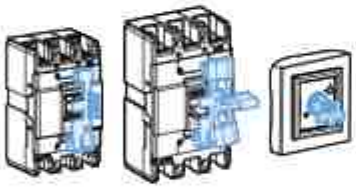
It makes to extract and/or rapidly replace the circuit breaker without having to touch connections.(Easy replacement and maintenance)



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.

Marking and configuration

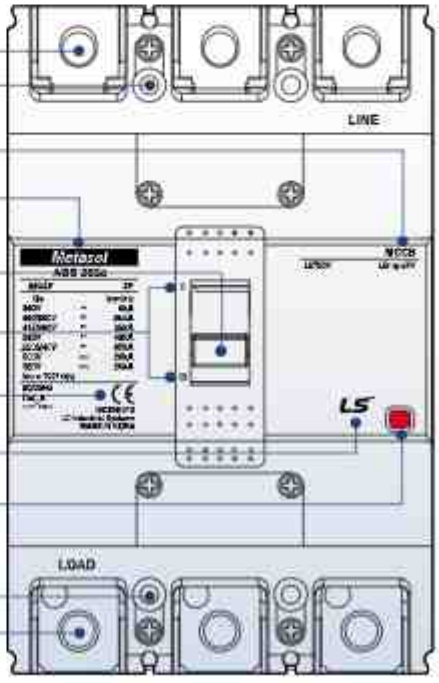
MCCB

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



Upstream connections
Fixing hole
Product name
Brand name
Operating handle
Indication of closed (I/ON) position
Indication of open (O/OFF) position
Certification mark
Company logo
"push to trip" button
Fixing hole
Downstream connections

ELCB

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

Rated frequency

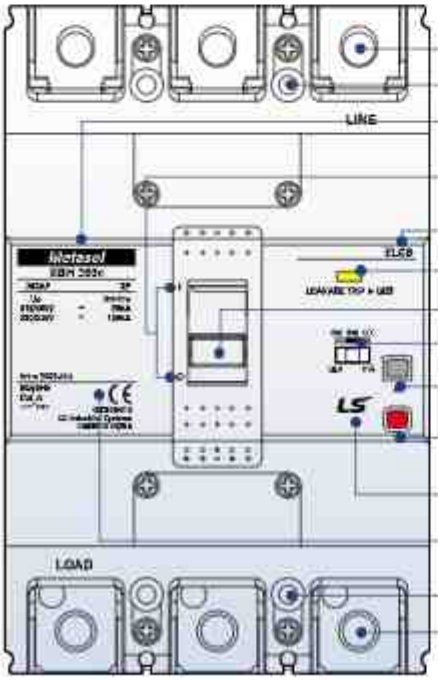
Symbol indicating suitability for isolation as defined by IEC 947-2

Standard

Manufacturer

Utilization category

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∆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

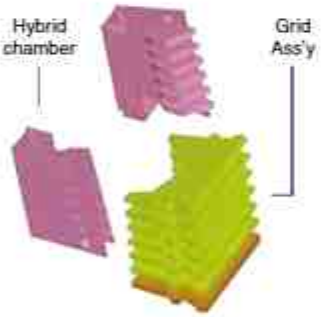
When the handle indicates "tripped" position it must first be reset by moving the handle to the "OFF" position and then closing is possible

- 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

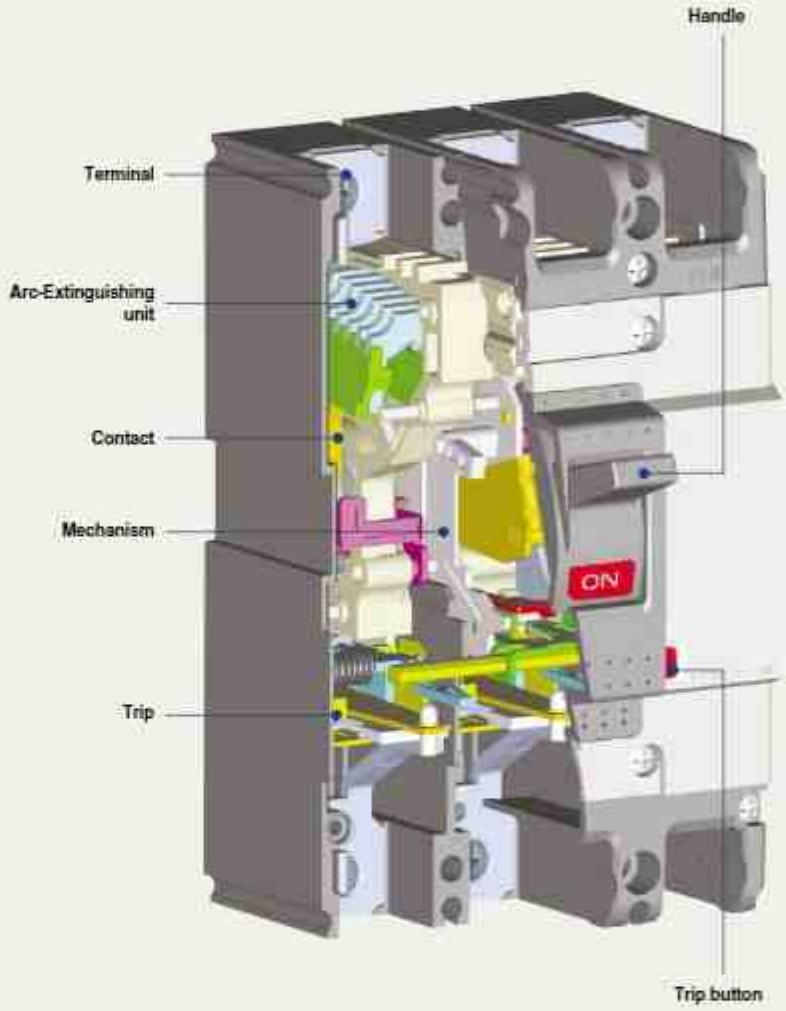
LS patent technique PASQ
Arc-Extinguishing unit
PASQ : Puffer Assisted Self-Quenching

- Reduction of arc voltage for a short time

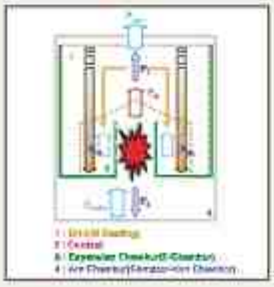


③ Trip button (push to trip)

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



A Application of PASQ Arc Extinguishing

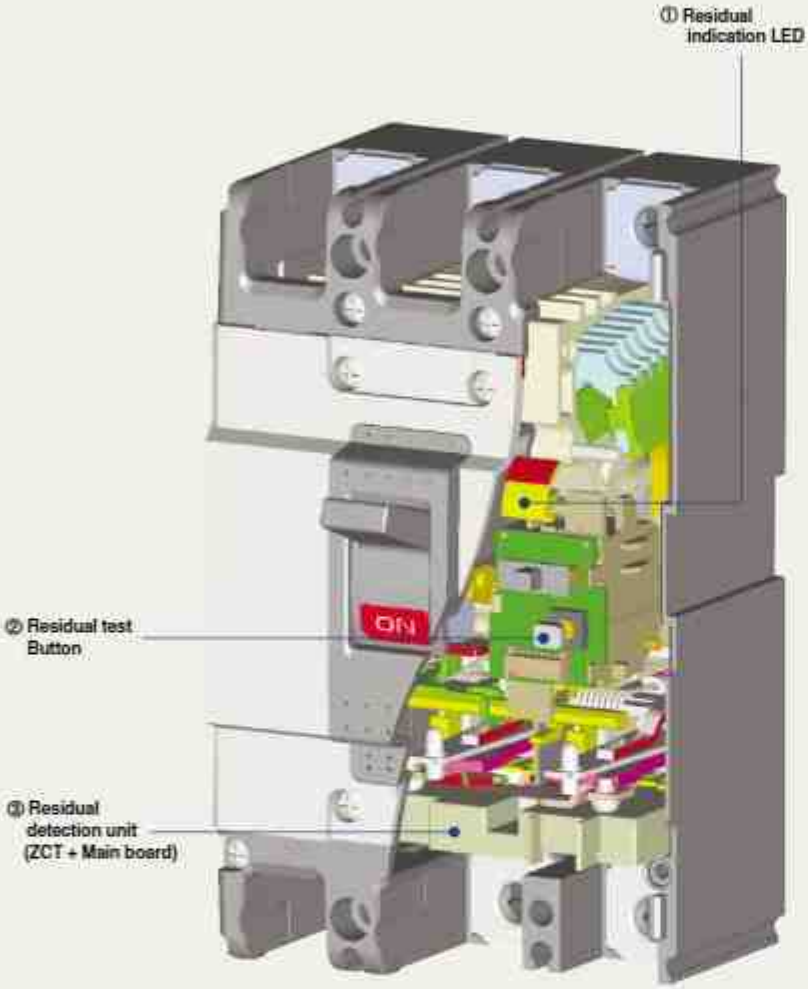


- The reduction of breaking time by applying PASQ arc extinguishing for inhibition of arc voltage for a short time.

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

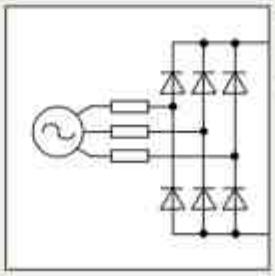
③ Residual detection unit (ZCT + Main board)

- 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

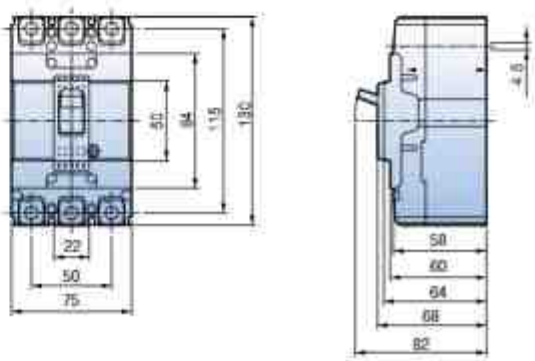
Quick selection table
Molded Case Circuit Breakers

MCCBs



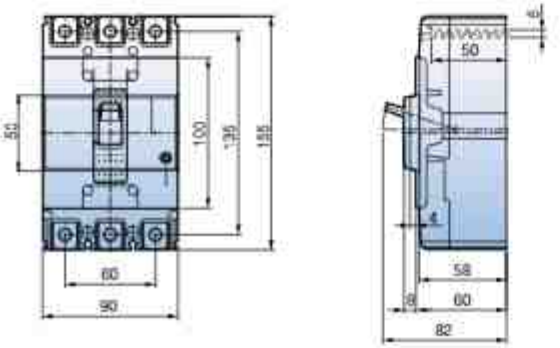
AF		30AF		50AF			60AF	
Type		E-Type	S-Type	N-Type	S-Type	H-Type	N-Type	S-Type
Type and Pole	2-pole	ABE32b	ABS32c	ABN52c	ABS52c	ABH52c	ABN62c	ABS62c
	3-pole	ABE33b	ABS33c	ABN53c	ABS53c	ABH53c	ABN63c	ABS63c
	4-pole	-	ABS34c	ABN54c	ABS54c	ABH54c	ABN64c	ABS64c
Rated current, In	A	(3, 5, 10), 15, 20, 30		15, 20, 30, 40, 50		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	750	750	750	750	750	750
Rated impulse withstand voltage, Uimp	kV	6	8	8	8	8	8	8
Rated short-circuit breaking capacity(Icu) kA (Sym), KSC8321, 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	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 (3-pole)	75 × 96 × 60mm	75 × 130 × 60mm (Fig. 1)	75 × 130 × 60mm (Fig. 1)		90 × 155 × 60mm (Fig. 2)	75 × 130 × 60mm (Fig. 1)	
More info.	Ratings	32 page	34 page	36 page		36 page	38 page	
	Curves	87 page	87 page	87 page		88 page	87 page	
	Drawings	92 page	93 page	93 page		94 page	93 page	

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

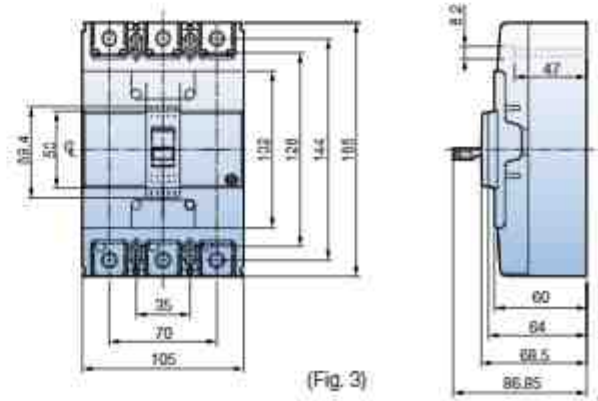


(Fig. 1)

	100AF	125AF		250AF		
	N-Type	S-Type	H-Type	N-Type	S-Type	H-Type
	ABN102c	ABS102c	ABH102c	ABN202c	ABS202c	ABH202c
	ABN103c	ABS103c	ABH103c	ABN203c	ABS203c	ABH203c
	ABN104c	ABS104c	ABH104c	ABN204c	ABS204c	ABH204c
	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
	500	500	500	500	500	500
	750	750	750	750	750	750
	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
	10	20	30	10	20	30
	100	100	100	100	100	100
	75 × 130 × 60mm (Fig. 1)	90 × 155 × 60mm (Fig. 2)		105 × 165 × 60mm (Fig. 3)		
	40 page	42 page		44 page		
	87 page	88 page		89 page		
	93 page	94 page		95 page		



(Fig. 2)



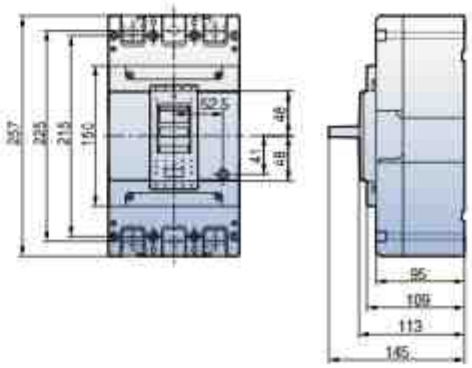
(Fig. 3)

Quick selection table
Molded Case Circuit Breakers

MCCBs

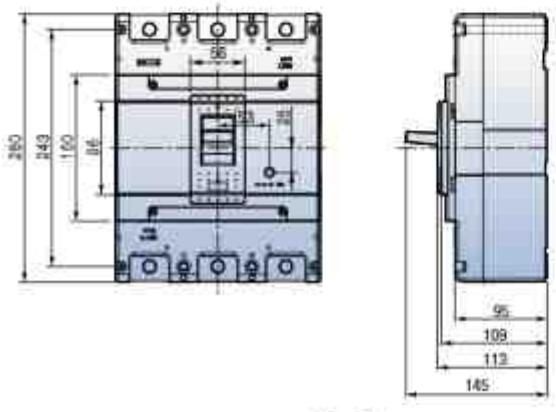
AF		400AF			
Type		N-Type	S-Type	H-Type	L-Type
Type and Pole	2-pole	ABN402c	ABS402c	ABH402c	ABL402c
	3-pole	ABN403c	ABS403c	ABH403c	ABL403c
	4-pole	ABN404c	ABS404c	ABH404c	ABL404c
Rated current, In	A	250, 300, 350, 400			
Rated operational	AC(V)	690	690	690	690
voltage, Ue	DC(V)	500	500	500	500
Rated insulation voltage, Ui	V	750	750	750	750
Rated impulse withstand voltage, Uimp	kV	8	8	8	8
Rated short-circuit breaking capacity(Icu) kA (Sym), KSC8321, 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=% x Icu		100	100	100	75
Dimensions (mm)	W x H x D	140 x 257 x 109mm			
	(3-pole)	(Fig. 4)			
More info.	Ratings	46 page			
	Curves	90 page			
	Drawings	96 page			

Note) MCCBs other than 1000/1200AF can be applied to both 50 and 60Hz.

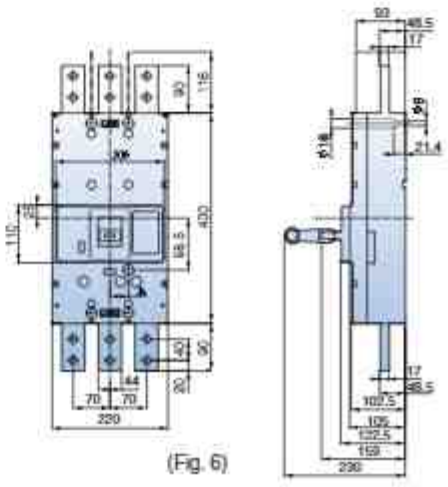


(Fig. 4)

	800 AF			1000 AF		1200 AF		
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	-	-	-	-	-
750	750	750	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 × 109mm		220 × 400 × 105mm		220 × 400 × 105mm		
	(Fig. 5)		(Fig. 6)		(Fig. 6)		
	48 page		50 page		50 page	51 page	50 page
	90 page		91 page		91 page	92 page	91 page
	97 page		98 page		98 page	99 page	98 page



(Fig. 5)



(Fig. 6)

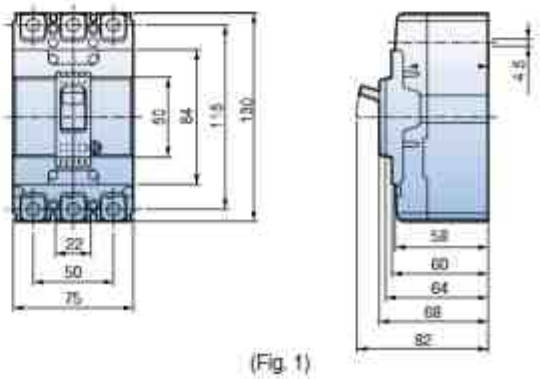
Quick selection table

Motor protection Molded Case Circuit Breakers

MCCBs

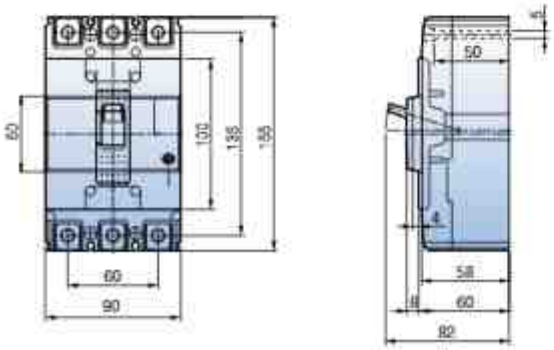


AF		30AF	50AF			60AF	
Type		S-Type	N-Type	S-Type	H-Type	N-Type	S-Type
Type and Pole	3-pole	ABS33cM	ABN53cM	ABS53cM	ABH53cM	ABN63cM	ABS63cM
Rated current, In	A	16, 24	16, 24, 32, 45			60	
Rated operational	AC(V)	690	690	690	690	690	690
voltage, Ue	DC(V)	500	500	500	500	500	500
Rated insulation voltage, Ui)	V	750	750	750	750	750	750
Rated impulse withstand voltage, Uimp	kV	8	8	8	8	8	8
Rated short-circuit breaking capacity(Icu) kA (Sym), KSC8321, 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	75 × 130 × 60mm	75 × 130 × 60mm		90 × 155 × 60mm	75 × 130 × 60mm	
	(3-pole)	(Fig. 1)	(Fig. 1)		(Fig. 2)	(Fig. 1)	
More info.	Ratings	38 Page	40 Page		40 Page	42 Page	
	Curves	104 Page	104 Page		105 Page	104 Page	
	Drawings	112 Page	112 Page		113 Page	112 Page	

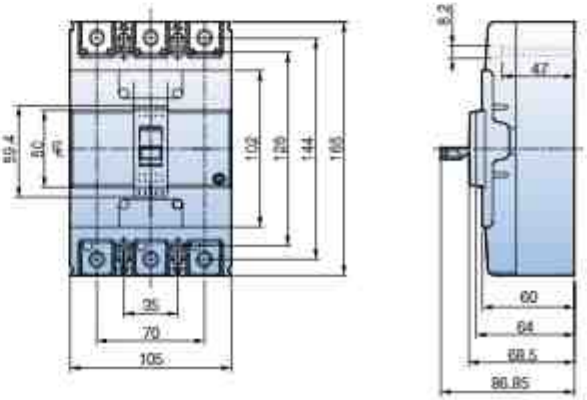


(Fig. 1)

	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
	750	750	750	750	750	750
	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
	75×130×60mm	90×155×60mm		105×165×60mm		
	(Fig. 1)	(Fig. 2)		(Fig. 3)		
	44 Page	46 Page		48 Page		
	104 Page	105 Page		106 Page		
	112 Page	113 Page		114 Page		



(Fig. 2)



(Fig. 3)

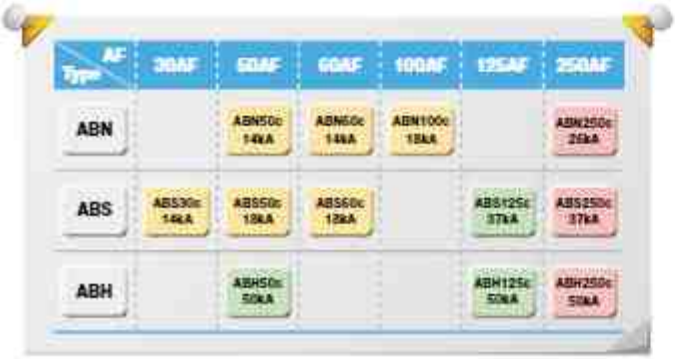
Quick selection table
ZCT Molded Case Circuit Breakers

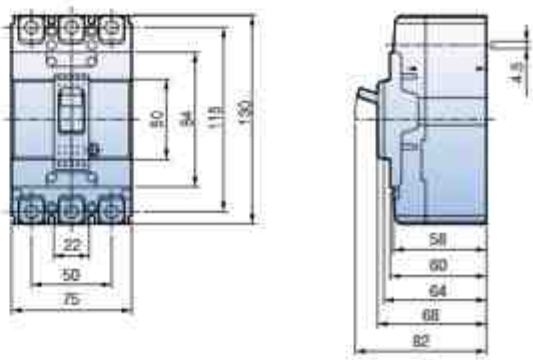


MCCBs

AF		30AF	50AF			60AF	
Type		S-Type	N-Type	S-Type	H-Type	N-Type	S-Type
Type and Pole	2-pole	-	-	-	ABH52c	-	-
	3-pole	ABS33c	ABN53c	ABS53c	ABH53c	ABN63c	ABS63c
	4-pole	ABS34c	ABN54c	ABS54c	ABH54c	ABN64c	ABS64c
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	750	750	750	750	750	750
Rated impulse withstand voltage, Uimp	kV	8	8	8	8	8	8
Rated short-circuit breaking capacity(Icu) kA (Sym), KSC8321, 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 × 60mm	75 × 130 × 60mm		90 × 155 × 60mm	75 × 130 × 60mm	
	(3-pole)	(Fig. 1)	(Fig. 1)		(Fig. 2)	(Fig. 1)	
More info.	Ratings	32 page	36 page		36 page	38 page	
	Curves	87 page	87 page		88 page	87 page	
	Drawings	92 page	92 page		94 page	92 page	

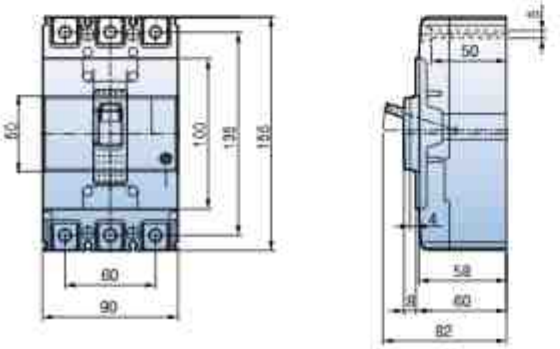
Note) 1. Same electrical and physical specification with MCCB.
2. Accessory : Same application with MCCB
3. MCCBs can be applied to both 50 and 60Hz.
4. Marking ZCT on the Aux. cover right side



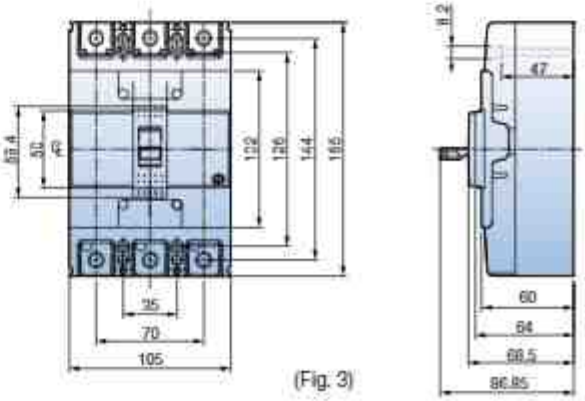


(Fig. 1)

	100AF	125AF		250AF		
	N-Type	S-Type	H-Type	N-Type	S-Type	H-Type
	-	ABS102c	ABH102c	-	-	-
	ABN103c	ABS103c	ABH103c	ABN203c	ABS203c	ABH203c
	ABN104c	ABS104c	ABH104c	ABN204c	ABS204c	ABH204c
	15, 20, 30, 40, 50 60, 75, 100, 125	15, 20, 30, 40, 50, 60, 75, 100, 125		100, 125, 150, 175, 200, 225, 250		
	690	690	690	690	690	690
	750	750	750	750	750	750
	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
	75×130×60mm (Fig. 1)	90×155×60mm (Fig. 2)		105×165×60mm (Fig. 3)		
	40 page	42 page		44 page		
	87 page	88 page		89 page		
	92 page	94 page		95 page		



(Fig. 2)



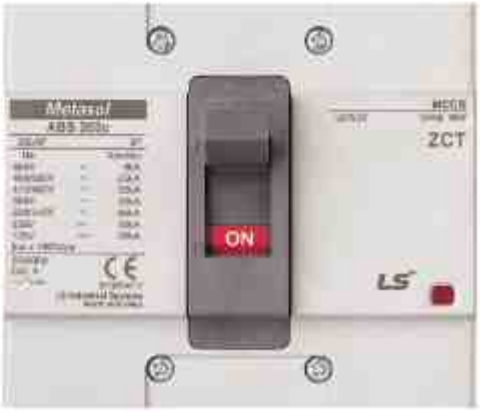
(Fig. 3)

Quick selection table
ZCT Molded Case Circuit Breakers

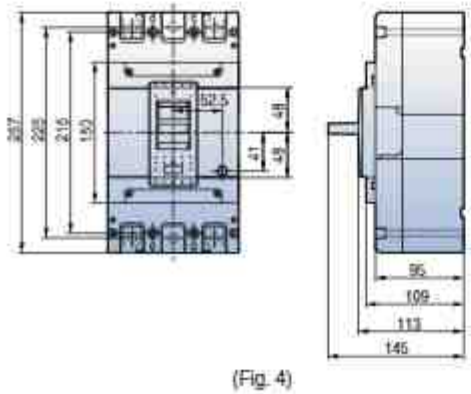
MCCBs

AF		400AF			
Type		N-Type	S-Type	H-Type	L-Type
Type and Pole	2-pole	-	-		
	3-pole	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
Rated insulation voltage, Ui	V	750	750	750	750
Rated impulse withstand voltage, Uimp	kV	8	8	8	8
Rated short-circuit breaking capacity(Icu) kA (Sym), KSC8321, 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
Ics=% x Icu		100	100	100	75
Dimensions (mm)	W x H x D	140 x 257 x 109mm			
	(3-pole)	(Fig. 4)			
More info.	Ratings	46 page			
	Curves	90 page			
	Drawings	96 page			

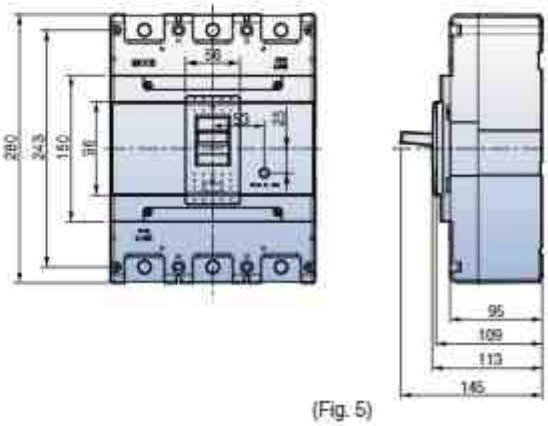
Note) 1. Same electrical and physical specification with MCCB.
2. Accessory : Same application with MCCB
3. MCCBs can be applied to both 50 and 60Hz.
4. Marking ZCT on the Aux. cover right side



	800 AF		
	N-Type	S-Type	L-Type
	-	-	-
	ABN803c	ABS803c	ABL803c
	-	-	-
	500, 630, 700, 800		
	690	690	690
	750	750	750
	8	8	8
	8	10	14
	25	45	65
	37	65	85
	45	75	100
	50	85	125
	100	100	75
	210 × 280 × 109mm		
	(Fig. 5)		
	48 page		
	90 page		
	97 page		



(Fig. 4)



(Fig. 5)

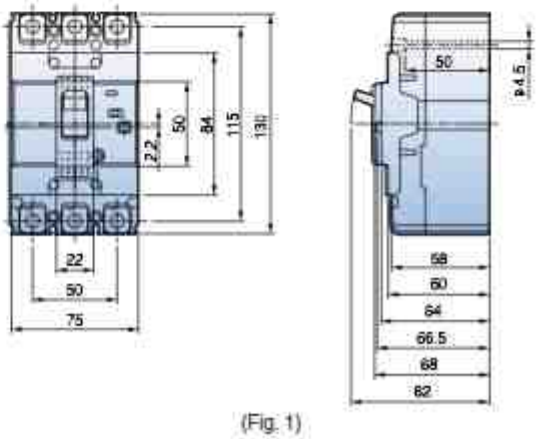
Quick selection table
Earth Leakage Circuit Breakers



ELCBs

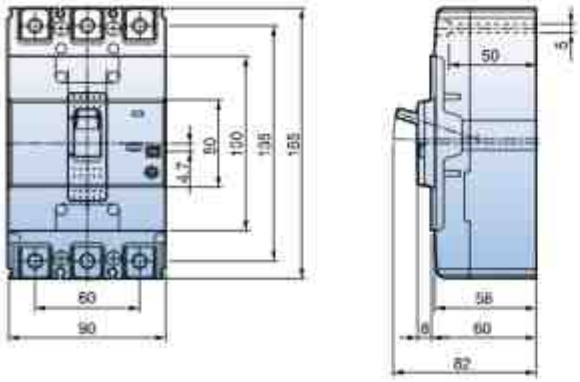
AF		30AF	50AF			60AF	
Type		S-Type	N-Type	S-Type	H-Type	N-Type	S-Type
Type and Pole	2-pole	-	EBN52c	-	-	-	-
	3-pole	EBS33c	EBN53c	EBS53c	EBH53c	EBN63c	EBS63c
	4-pole	EBS34c	-	EBS54c	EBH54c	-	EBS64c
Protective function		Overload, Short-circuit and Ground fault	Overload, Short-circuit and Ground fault		Overload, Short-circuit and Ground fault	Overload, Short-circuit and Ground fault	
Rated current, In	A	5, 10, 15, 20, 30	15, 20, 30, 40, 50		15, 20, 30, 40, 50	60	
Rated residual current, I∆n	mA	30, 100/200/500mA	30, 100/200/500mA		30, 100/200/500mA	30,100/200/500mA	
Rated operational voltage, Ue	AC(V)	220/460	220/460		220/460	220/460	
Rated impulse withstand voltage, Uimp	kV	6	6		6	6	
Residual current off-time at I∆n	sec	≤0.1 sec	≤0.1 sec		≤0.1 sec	≤0.1 sec	
Rated short-circuit breaking capacity (Icu) kA (Sym), KSC8321, IEC 60947-2							
AC	415/460V	14	14	18	50	14	18
	220/250V	30	30	35	100	30	35
Dimensions (mm)	W×H×D	75×130×60mm	75×130×60mm		90×155×60mm	75×130×60mm	
	(3-pole)	(Fig. 1)	(Fig. 1)		(Fig. 2)	(Fig. 1)	
More info.	Ratings	54 page	56 page		56 page	58 page	
	Curves	87 page	87 page		88 page	87 page	
	Drawings	100 page	100 page		101 page	100 page	

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

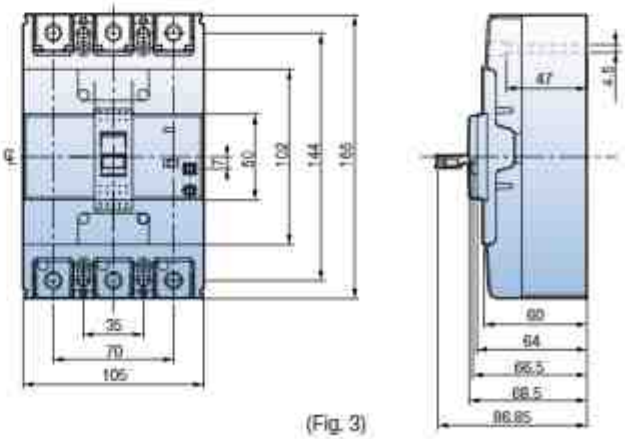


(Fig. 1)

	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		
	30, 100/200/500mA	30,100/200/500mA		30,100/200/500mA		
	220/460	220/460		220/460		
	6	6		6		
	≤0.1 sec	≤0.1 sec		≤0.1 sec		
	18	37	50	26	37	50
	35	85	100	65	85	100
	75×130×60mm (Fig. 1)	90×155×60mm (Fig. 2)		105×165×60mm (Fig. 3)		
	60 page	62 page		64 page		
	87 page	88 page		89 page		
	100 page	101 page		102 page		



(Fig. 2)



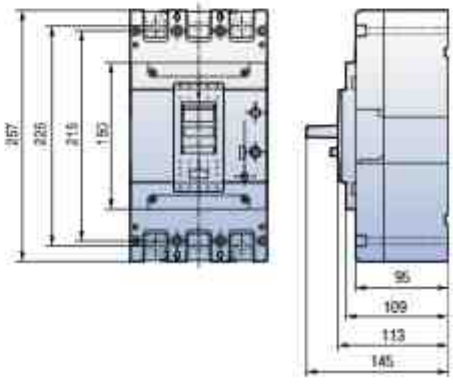
(Fig. 3)

Quick selection table
Earth Leakage Circuit Breakers

ELCBs

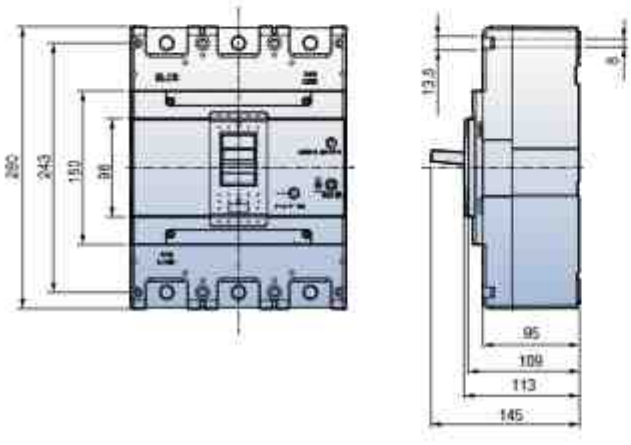
AF		400AF			
Type		N-Type	S-Type	H-Type	L-Type
Type and Pole	3-pole	EBN403c	EBS403c	EBH403c	EBL403c
	4-pole	EBN404c	EBS404c	EBH404c	EBL404c
Protective function		Overload, Short-circuit and Ground fault			
Rated current, In	A	250, 300, 350, 400			
Rated residual current, I∆n	mA	30, 100/200/500mA			
Rated operational voltage,Ue	AC(V)	220/460	220/460	220/460	220/460
Rated impulse withstand voltage, Uimp	kV	6	6	6	6
Residual current off-time at I∆n	sec	0.1 sec	0.1 sec	0.1 sec	0.1 sec
Rated short-circuit breaking capacity (Icu) kA (Sym), KSC8321, IEC 60947-2					
AC	415/460V	37	50	65	85
	220/250V	50	75	85	125
Ics=% x Icu		100	100	100	75
Dimensions (mm)	W x H x D	140 x 257 x 109mm			
	(3-pole)	(Fig. 4)			
More info.	Ratings	66 page			
	Curves	90 page			
	Drawings	103 page			

Note) MCCBs other than 1000/1200AF can be applied to both 50 and 60Hz

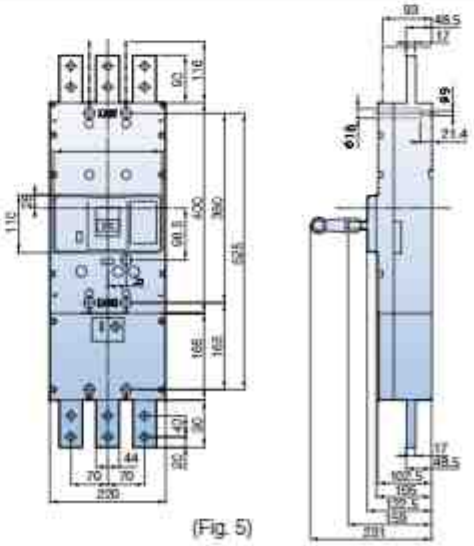


(Fig. 4)

	800 AF			1000 AF	1200 AF
	N-Type	S-Type	L-Type	S-Type	S-Type
	EBN803c	EBS803c	EBL803c	EBS1003b	EBS1203b
	-	-	-	-	-
	Overload, Short-circuit and Ground fault			Overload, Short-circuit and Ground fault	
	500, 630, 700, 800			1000	1200
	30, 100/200/500mA			100/200/500mA	100/200/500mA
	220/460	220/460	220/460	220/460	220/460
	6	6	6	-	-
	0.1 sec	0.1 sec	0.1 sec	0.1 sec	0.1 sec
	37	65	85	85	85
	50	85	125	125	125
	100	100	75	-	-
	210 × 280 × 109mm			220 × 565 × 105mm	
	(Fig. 5)			(Fig. 6)	
	68 page			70 page	
	90 page			91 page	
	104 page			105 page	



(Fig. 5)



(Fig. 5)

30AF MCCB
ABE30b

ABE32b

ABE33b

Ratings

Frame size			30AF	
Type and Pole			E-Type	
	2-pole		ABE32b	
	3-pole		ABE33b	
	4-pole		-	
Rated current, In			3-5-10-15-20-30A	
Rated operational voltage, Ue			AC : 460V	
			-	
Rated insulation voltage, Ui			AC : 460V	
Rated impulse withstand voltage, Uimp			6kV	
Rated short-circuit breaking			E-Type	
capacity, Icu	AC	690V	-	
IEC 60947-2 (Icu)		480/500V	-	
		460V	2.5kA	
		415V	2.5kA	
		380V	2.5kA	
		220/250V	5kA	
	DC	500V (3P)	-	
		250V (2P)	-	
Protective function			Overload, Short-circuit	
Type of trip unit			Hydraulic-Magnetic	
Magnetic trip range			12In	
Endurance	Mechanical		8500 operations	
	Electrical		1500 operations	
Connection	Standard		Front connection	
	Optional		-	
			-	
Mounting	Standard		Screw fixing	
Dimensions (mm)		Pole	2p	3p
		a	50	75
		b	96	96
		c1 Note)	60	60
		c2 Note)	-	-
		d	80	80
Weight, kg		Standard	0.5	0.7
Certification		Pole	2p	3p
CE marking		CE	O	O

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

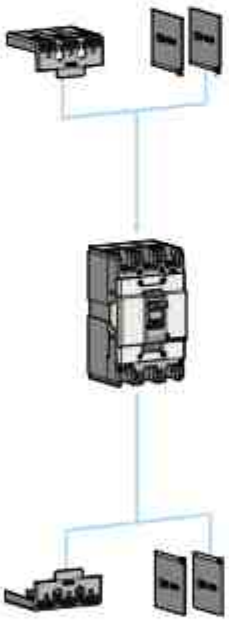
For more information

- Drawings ▶ 92 page
- Trip curves ▶ 87 page
- Accessories ▶ 72 page
- Connection and mounting ▶ 100 page

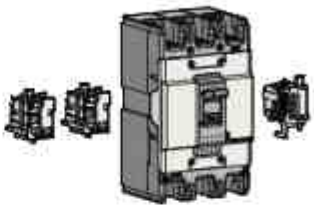
Ordering types

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

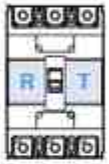


Accessories



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 72 page

External accessories

ABE30b	Name
IB13	Insulation barrier
TBS23	Short type

Note) For more detail see 80 page

30AF MCCB
ABS30c


ABS52c


ABS53c


ABS54c

Ratings

Frame size			30AF		
Type and Pole			S-Type		
	2-pole		ABS32c		
	3-pole		ABS33c		
	4-pole		ABS34c		
Rated current, In			(3-5-10)-15-20-30A		
Rated operational voltage, Ue			AC: 690V		
			DC: 500V		
Rated insulation voltage, Ui			AC: 750V		
Rated impulse withstand voltage, Uimp			8kV		
Rated short-circuit breaking			S-Type		
capacity, Icu	AC	690V	2.5 kA		
		480/500V	7.5 kA		
IEC 60947-2 (Icu)		460V	14 (10)kA		
		415V	14 (10)kA		
		380V	18 (14)kA		
		220/250V	30 (25)kA		
	DC	500V(3P)	5 kA		
		250V(2P)	5 kA		
Protective function			Overload, Short-circuit		
Type of trip unit			Thermal-Magnetic		
Magnetic trip range			400A		
Endurance	Mechanical		25000 operations		
	Electrical		10000 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 Note)	60	60	60
		c2 Note)	64	64	64
		d	82	82	82
Weight, kg		Standard	0.5	0.7	0.9
Certification		Pole	2p	3p	4p
CE marking		CE	O	O	O

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

For more information

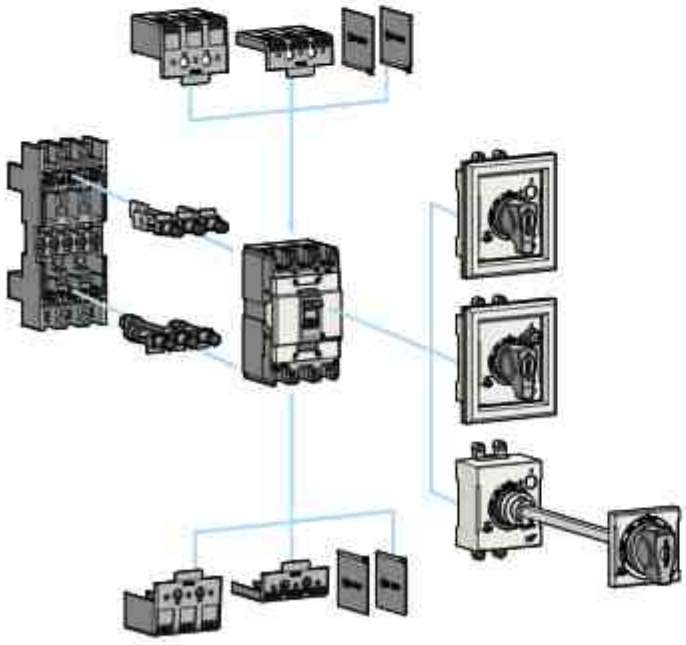
- Drawings ▶ 93 page
- Trip curves ▶ 87 page
- Accessories ▶ 72 page
- Connection and mounting ▶ 110 page

Ordering types

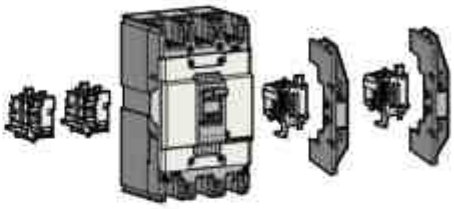
Breaker types

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

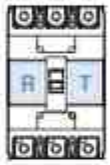


Accessories



Electrical auxiliaries

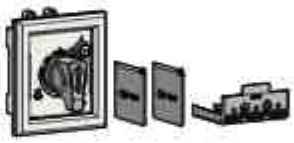
AX	Auxiliary Switch
AL	Alarm Switch
AX+AL	Combination switch
SHT	Shunt Trip
UVT	Undervoltage trip



Maximum possibilities

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

Note) For more detail see 72 page



External accessories

ABS30c	Name
IB13	Insulation barrier
TCL13	Terminal cover (Long)
TCS13	Terminal cover (Short)
DH100	Rotary handle (Direct)
DHK100	Rotary handle (Direct, Key lock)
EH100	Rotary handle (Extended)
RTR1	Rear terminal (Round)
PB-A3	Plug-in kit
PHL100C	Pad handle lock

Note) For more detail see 80 page

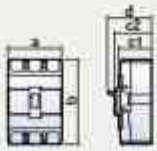
50AF MCCB
ABN50c, ABS50c, ABH50c


ABS52c


ABS53c

Ratings

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, In			15-20-30-40-50A		
Rated operational voltage, Ue			AC: 690V		
			DC: 500V		
Rated insulation voltage, Ui			AC: 750V		
Rated impulse withstand voltage, Uimp			8kV		
Rated short-circuit breaking			N-Type	S-Type	H-Type
capacity, Icu	AC	690V	2.5kA	5kA	10kA
		480/500V	7.5kA	10kA	35kA
IEC 60947-2 (Icu)		460V	14kA	18kA	50kA
Ics=100%Icu		415V	14kA	18kA	50kA
		380V	18kA	22kA	50kA
		220/250V	30kA	35kA	100kA
	DC	500V(3P)	5kA	10kA	30kA
		250V(2P)	5kA	10kA	30kA
Protective function			Overload, Short-circuit		
Type of trip unit			Thermal-Magnetic		
Magnetic trip range			12 × In (30A and under: 400A)		
Endurance	Mechanical		25000 operations		
	Electrical		10000 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 Note)	60			60			60		
	c2 Note)	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		O			O			O	

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

For more information

- Drawings ▶ 93 page
- Trip curves ▶ 87, 88 page
- Accessories ▶ 72 page
- Connection and mounting ▶ 110 page

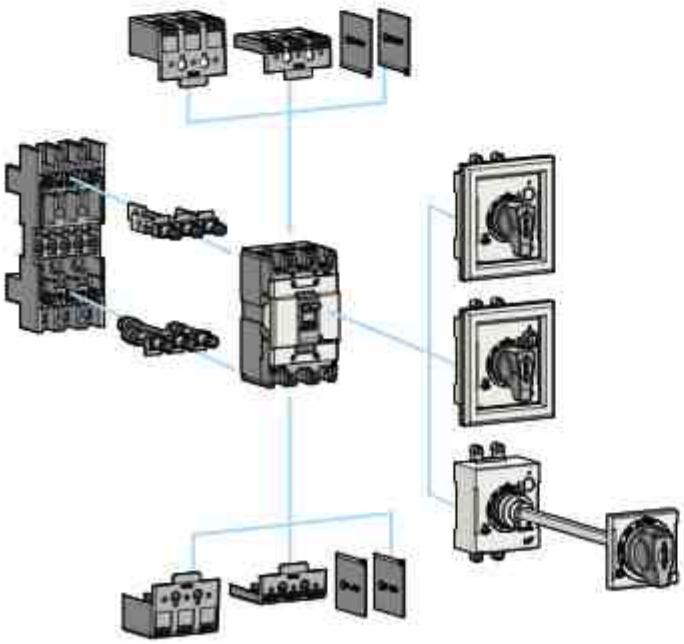
Ordering types

Breaker types

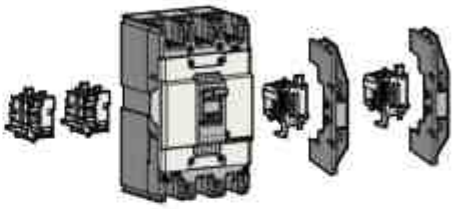
ABN type (14kA/460V)			
Rated current, In	2-pole	3-pole	4-pole
15 A	ABN52c/15	ABN53c/15	ABN54c/15
20 A	ABN52c/20	ABN53c/20	ABN54c/20
30 A	ABN52c/30	ABN53c/30	ABN54c/30
40 A	ABN52c/40	ABN53c/40	ABN54c/40
50 A	ABN52c/50	ABN53c/50	ABN54c/50

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

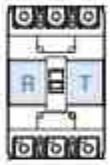


Accessories



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 72 page

External accessories

ABN50c ABS50c	ABH50c	Name
IB13	IB23	Insulation barrier
TCL13	TCL23	Terminal cover (Long)
TCS13	TCS23	Terminal cover (Short)
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
PHL100	PHL125	Pad handle lock

Note) For more detail see 80 page


ABS62c


ABS63c


ABS64c

Ratings

Frame size			60AF	
Type and Pole			N-Type	S-Type
	2-pole		ABN62c	ABS62c
	3-pole		ABN63c	ABS63c
	4-pole		ABN64c	ABS64c
Rated current, In			15-20-30-40-50-60A	
Rated operational voltage, Ue			AC: 690V	
			DC: 500V	
Rated insulation voltage, Ui			AC: 750V	
Rated impulse withstand voltage, Uimp			8kV	
Rated short-circuit breaking			N-Type	S-Type
capacity, Icu	AC	690V	2.5kA	5kA
		480/500V	7.5kA	10kA
IEC 60947-2 (Icu)		460V	14kA	18kA
Ics=100%Icu		415V	14kA	18kA
		380V	18kA	22kA
		220/250V	30kA	35kA
	DC	500V(3P)	5kA	10kA
		250V(2P)	5kA	10kA
Protective function			Overload, Short-circuit	
Type of trip unit			Thermal-Magnetic	
Magnetic trip range			12 × In (30A and under: 400A)	
Endurance	Mechanical		25000 operations	
	Electrical		10000 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 Note)		60			60	
	c2 Note)		64			64	
	d		82			82	
Weight, kg	Standard	0.5	0.7	0.9	0.5	0.7	0.9

Certification	Pole	2p	3p	4p	2p	3p	4p
CE marking	CE		O			O	

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

For more information

- Drawings ▶ 93 page
- Trip curves ▶ 87 page
- Accessories ▶ 72 page
- Connection and mounting ▶ 110 page

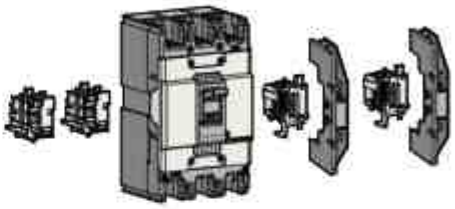
Ordering types

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

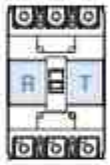
ABS type (18kA/460V)			
Rated current, In	2-pole	3-pole	4-pole
15 A	ABS62c/15	ABS63c/15	ABS64c/15
20 A	ABS62c/20	ABS63c/20	ABS64c/20
30 A	ABS62c/30	ABS63c/30	ABS64c/30
40 A	ABS62c/40	ABS63c/40	ABS64c/40
50 A	ABS62c/50	ABS63c/50	ABS64c/50
60 A	ABS62c/60	ABS63c/60	ABS64c/60

Accessories



Electrical auxiliaries

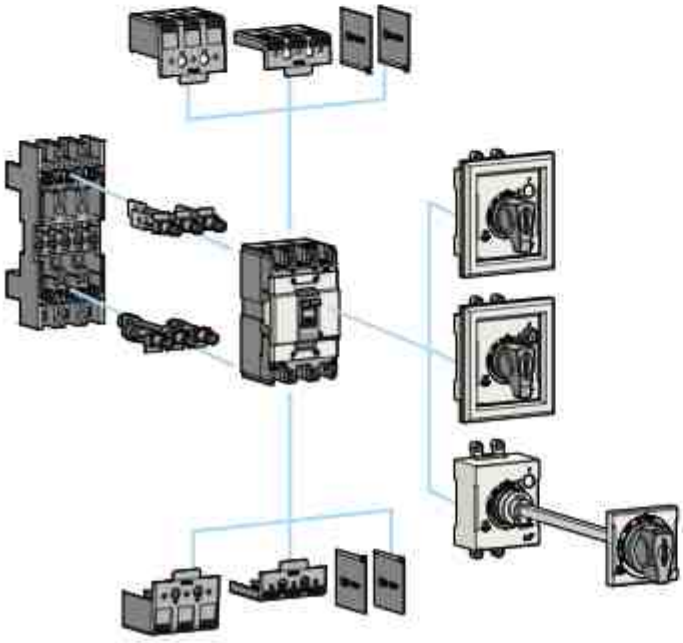
AX	Auxiliary Switch
AL	Alarm Switch
AX+AL	Combination switch
SHT	Shunt Trip
UVT	Undervoltage trip



Maximum possibilities

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

Note) For more detail see 72 page



External accessories

ABS60c ABN60c	Name
IB13	Insulation barrier
TCL13	Terminal cover (Long)
TCS13	Terminal cover (Short)
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
PHL100	Pad handle lock

Note) For more detail see 80 page

ABN102c

ABN103c

ABN104c

Ratings

Frame size			100AF		
Type and Pole			N-Type		
	2-pole		ABN102c		
	3-pole		ABN103c		
	4-pole		ABN104c		
Rated current, In			15-20-30-40-50-60-75-100A		
Rated operational voltage, Ue			AC: 690V		
			DC: 500V		
Rated insulation voltage, Ui			AC: 750V		
Rated impulse withstand voltage, Uimp			8kV		
Rated short-circuit breaking			N-Type		
capacity, Icu	AC	690V	5kA		
		480/500V	10kA		
IEC 60947-2 (Icu)		460V	18kA		
Ics=100%Icu		415V	18kA		
		380V	22kA		
		220/250V	35kA		
	DC	500V(3P)	10kA		
		250V(2P)	10kA		
Protective function			Overload, Short-circuit		
Type of trip unit			Thermal-Magnetic		
Magnetic trip range			400A		
Endurance	Mechanical		25000 operations		
	Electrical		10000 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 Note)	60	60	60
		c2 Note)	64	64	64
		d	82	82	82
Weight, kg		Standard	0.5	0.7	0.9
Certification		Pole	2p	3p	4p
CE marking		CE	O	O	O

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

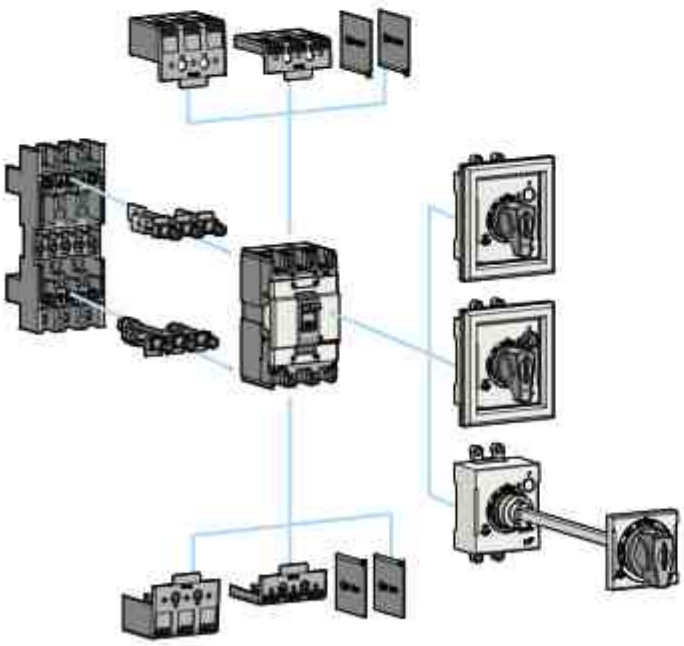
For more information

- Drawings ▶ 93 page
- Trip curves ▶ 87 page
- Accessories ▶ 72 page
- Connection and mounting ▶ 110 page

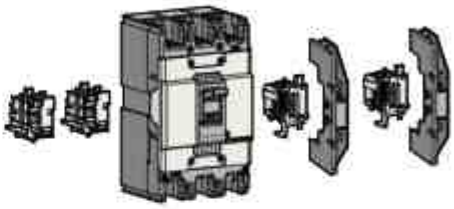
Ordering types

Breaker types

ABN type (14kA/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

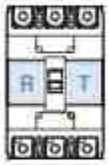


Accessories



Electrical auxiliaries

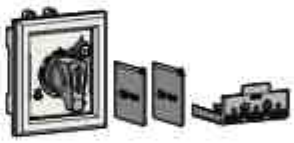
AX	Auxiliary Switch
AL	Alarm Switch
AX+AL	Combination switch
SHT	Shunt Trip
UVT	Undervoltage trip



Maximum possibilities

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

Note) For more detail see 72 page



External accessories

ABN100c	Name
IB13	Insulation barrier
TCL13	Terminal cover (Long)
TCS13	Terminal cover (Short)
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
PHL100	Pad handle lock

Note) For more detail see 80 page

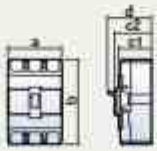
ABS102c

ABS103c

ABS104c

Ratings

Frame size			125AF	
Type and Pole			S-Type	H-Type
	2-pole		ABS102c	ABH102c
	3-pole		ABS103c	ABH103c
	4-pole		ABS104c	ABH104c
Rated current, In			15-20-30-40-50-60-75-100-125A	
Rated operational voltage, Ue			AC: 690V	
			DC: 500V	
Rated insulation voltage, Ui			AC: 750V	
Rated impulse withstand voltage, Uimp			8kV	
Rated short-circuit breaking			S-Type	H-Type
capacity, Icu	AC	690V	8kA	10kA
		480/500V	26kA	35kA
IEC 60947-2 (Icu)		460V	37kA	50kA
Ics=100%Icu		415V	37kA	50kA
		380V	42kA	50kA
		220/250V	85kA	100kA
	DC	500V(3P)	20kA	30kA
		250V(2P)	20kA	30kA
Protective function			Overload, Short-circuit	
Type of trip unit			Thermal-Magnetic	
Magnetic trip range			12 × In (30A and under: 400A)	
Endurance	Mechanical		25000 operations	
	Electrical		10000 operations	
Connection	Standard		Front connection	
	Optional		Rear connection	
			Plug-in	
Mounting	Standard		Screw fixing	

Dimensions (mm)	Pole	2p	3p	4p	2p	3p	4p
	a	60	90	120	60	90	120
	b		155			155	
	c1 Note)		60			60	
	c2 Note)		64			64	
	d		82			82	
Weight, kg	Standard	0.7	1	1.2	0.7	1	1.2
Certification	Pole	2p	3p	4p	2p	3p	4p
CE marking	CE		O			O	

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

For more information

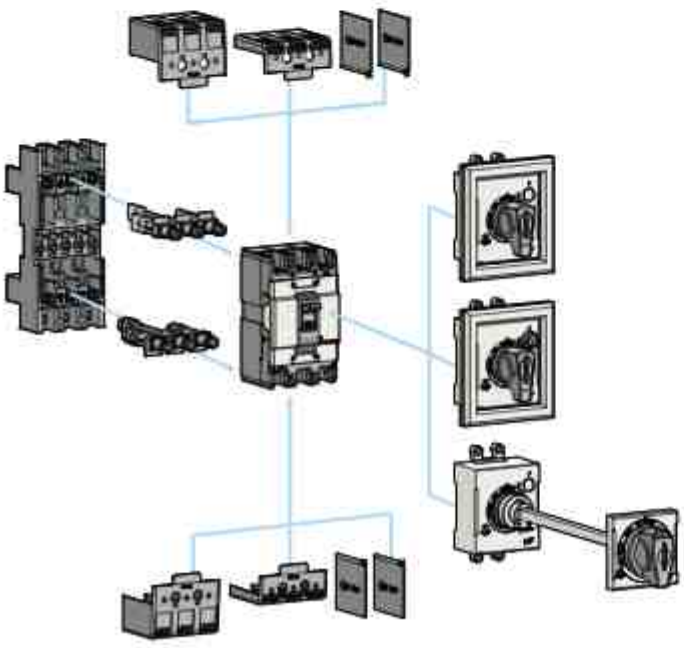
- Drawings ▶ 94 page
- Trip curves ▶ 88 page
- Accessories ▶ 72 page
- Connection and mounting ▶ 110 page

Ordering types

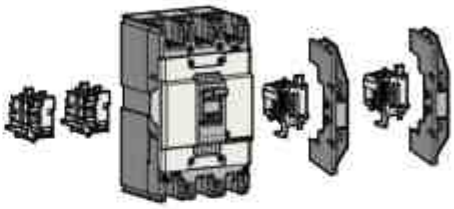
Breaker types

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

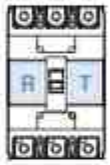


Accessories



Electrical auxiliaries

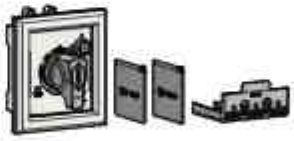
AX	Auxiliary Switch
AL	Alarm Switch
AX+AL	Combination switch
SHT	Shunt Trip
UVT	Undervoltage trip



Maximum possibilities

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

Note) For more detail see 72 page



External accessories

ABS125c ABH125c	Name
IB23	Insulation barrier
TCL23	Terminal cover (Long)
TCS23	Terminal cover (Short)
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
PHL125	Pad handle lock

Note) For more detail see 80 page

250AF MCCB
ABN250c, ABS250c, ABH250c

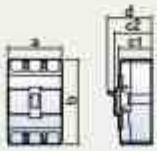

ABS202c


ABS203c


ABS204c

Ratings

Frame size			250AF		
Type and Pole			N-Type	S-Type	H-Type
	2-pole		ABN202c	ABS202c	ABH202c
	3-pole		ABN203c	ABS203c	ABH203c
	4-pole		ABN204c	ABS204c	ABH204c
Rated current, In			100-125-150-175-200-225-250A		
Rated operational voltage, Ue			AC: 690V		
			DC: 500V		
Rated insulation voltage, Ui			AC: 750V		
Rated impulse withstand voltage, Uimp			8kV		
Rated short-circuit breaking			N-Type	S-Type	H-Type
capacity, Icu	AC	690V	8kA	8kA	10kA
		480/500V	18kA	26kA	35kA
IEC 60947-2 (Icu)		460V	26kA	37kA	50kA
Ics=100%Icu		415V	26kA	37kA	50kA
		380V	30kA	42kA	50kA
		220/250V	65kA	85kA	100kA
	DC	500V(3P)	10kA	20kA	30kA
		250V(2P)	10kA	20kA	30kA
Protective function			Overload, Short-circuit		
Type of trip unit			Thermal-Magnetic		
Magnetic trip range			12 × In		
Endurance	Mechanical		25000 operations		
	Electrical		10000 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	105	105	140	105	105	140	105	105	140
	b		165			165			165	
	c1 Note)		60			60			60	
	c2 Note)		64			64			64	
	d		87			87			87	
Weight, kg	Standard	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
CE marking	CE		O			O			O	

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

For more information

- Drawings ▶ 95 page
- Trip curves ▶ 89 page
- Accessories ▶ 72 page
- Connection and mounting ▶ 110 page

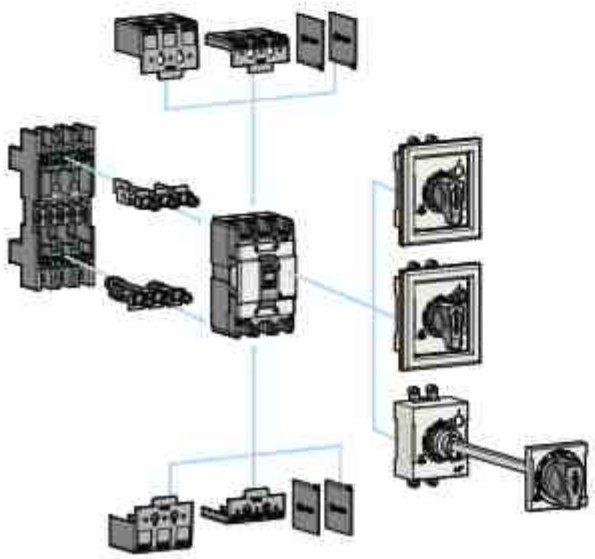
Ordering types

Breaker types

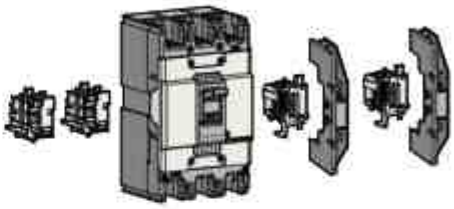
ABN type (25kA/460V)			
Rated current, In	2-pole	3-pole	4-pole
100 A	ABN202c/100	ABN203c/100	ABN204c/100
125 A	ABN202c/125	ABN203c/125	ABN204c/125
150 A	ABN202c/150	ABN203c/150	ABN204c/150
175 A	ABN202c/175	ABN203c/175	ABN204c/175
200 A	ABN202c/200	ABN203c/200	ABN204c/200
225 A	ABN202c/225	ABN203c/225	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

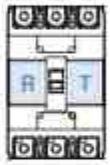


Accessories



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 72 page

External accessories

ABH250c	Name
B33	Insulation barrier
TCL33	Terminal cover (Long)
TCS33	Terminal cover (Short)
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
PHL250	Pad handle lock

Note) For more detail see 80 page

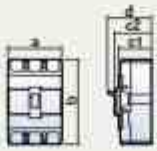
400AF MCCB
ABN400c, ABS400c, ABH400c, ABL400c


ABS403c


ABL404c

Ratings

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, In			250-300-350-400A			
Rated operational voltage, Ue			AC: 690V			
			DC: 500V			
Rated insulation voltage, Ui			AC: 750V			
Rated impulse withstand voltage, Uimp			8kV			
Rated short-circuit breaking			N-Type	S-Type	H-Type	L-Type
capacity, Icu	AC	690V	5kA	8kA	10kA	14kA
		480/500V	18kA	35kA	50kA	65kA
IEC 60947-2 (Icu)		415/460V	37kA	50kA	65kA	85kA
		380V	42kA	65kA	70kA	100kA
		220/250V	50kA	75kA	85kA	125kA
	DC	500V(3P)	10kA	20kA	40kA	40kA
		250V(3P)	10kA	20kA	40kA	40kA
Ics=100%Icu		125V	100%	100%	100%	75%
Protective function			Overload, Short-circuit			
Type of trip unit			Thermal-Magnetic			
Magnetic trip range			8~12In			
Endurance	Mechanical		4000 operations			
	Electrical		1000 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	140	140	184	140	140	184	140	140	184	140	140	184
	b		257			257			257			257	
	c1 Note)		109			109			109			109	
	c2 Note)		113			113			113			113	
	d		145			145			145			145	
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) Depth by door-cut size : c1 for large cut, c2 for small cut

For more information
- Drawings ▶ 96 page
- Trip curves ▶ 90 page
- Accessories ▶ 72 page
- Connection and mounting ▶ 111 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

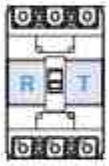
ABH type(65kA/460V)			
Rated current, In	2-pole	3-pole	4-pole
250 A	ABH402c/250	ABH403c/250	ABH404c/250
300 A	ABH402c/300	ABH403c/300	ABH404c/300
350 A	ABH402c/350	ABH403c/350	ABH404c/350
400 A	ABH402c/400	ABH403c/400	ABH404c/400

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

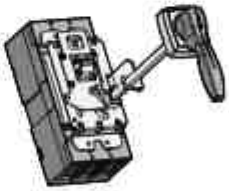
AX	Auxiliary Switch
AL	Alarm Switch
SHT	Shunt Trip
UVT	Undervoltage trip



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 73 page



E-70U

N-70

External accessories

IBL400	Insulation barrier
T1-43A	Terminal cover (Long) - 2, 3pole
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
X-402	Rear terminal - 2pole
X-403	Rear terminal - 3pole
X-404	Rear terminal - 4pole
PB-I3-FR	Plug-in kit

Note) For more detail see 80 page

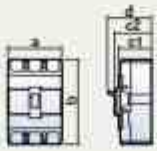
800AF MCCB
ABN800c, ABS800c, ABL800c


ABS803c


ABL804c

Ratings

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, In			500-630-700-800A		
Rated operational voltage, Ue			AC: 690V		
			DC: 500V		
Rated insulation voltage, Ui			AC: 750V		
Rated impulse withstand voltage, Uimp			8kV		
Rated short-circuit breaking			N-Type	S-Type	L-Type
capacity, Icu	AC	690V	8kA	10kA	14kA
		480/500V	25kA	45kA	65kA
IEC 60947-2 (Icu)		415/460V	37kA	65kA	85kA
		380V	45kA	75kA	100kA
		220/250V	50kA	85kA	125kA
	DC	500V(3P)	10kA	20kA	40kA
		250V(3P)	10kA	20kA	40kA
Ics=100%Icu		125V	100%	100%	75%
Protective function			Overload, Short-circuit		
Type of trip unit			Thermal-Magnetic		
Magnetic trip range			8~12In		
Endurance	Mechanical		2500 operations		
	Electrical		500 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	210	210	280	210	210	280	210	210	280
	b		280			280			280	
	c1 (Note)		109			109			109	
	c2 (Note)		113			113			113	
	d		145			145			145	
Weight, kg	Standard	11	11.5	18.2	11	11.5	18.2	11	11.5	18.2
Certification	Pole	2p	3p	4p	2p	3p	4p	2p	3p	4p
CE marking	CE		○			○			○	

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

For more information

- Drawings ▶ 97 page
- Trip curves ▶ 90 page
- Accessories ▶ 72 page
- Connection and mounting ▶ 111 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

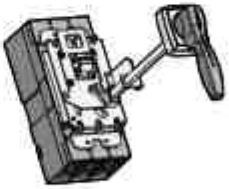
Electrical auxiliaries

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 73 page



E-80U

N-80

External accessories

IBL800	Insulation barrier
T1-63A	Terminal cover (Long) - 2, 3pole
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
X-802	Rear terminal - 2pole
X-803	Rear terminal - 3pole
X-804	Rear terminal - 4pole
PB-J3-FR	Plug-in kit

Note) For more detail see 80 page

1000/1200AF MCCB
ABS1000b/1200b, ABL1000b/1200b

Ratings

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, In			1000A		1200A	
Rated operational voltage, Ue			AC: 600V			
Rated insulation voltage, Ui			690V			
Rated impulse withstand voltage, Uimp			6kV			
Rated short-circuit breaking			S-Type		L-Type	
capacity, Icu	AC	690V	45kA		65kA	
		480/500V	50kA		75kA	
IEC 60947-2 (Icu)		415/460V	65kA		85kA	
		380V	65kA		85kA	
		220/250V	100kA		125kA	
Ics=100%Icu		125V	50kA		50kA	
Protective function			Overload, Short-circuit			
Type of trip unit			Thermal-Magnetic			
Magnetic trip range			3-6× In			
Endurance	Mechanical		2500 operations			
	Electrical		500 operations			
Connection	Standard		Front connection			
Mounting	Standard		Screw fixing			
Dimensions (mm)		Pole	3p		4p	
		a	220		290	
		b	400		400	
		c	105		105	
		d	159		159	
Weight, kg		Standard	19.6		25.7	
Certification		Pole	3p		4p	
CE marking		CE				

Note) Please specify the frequency when ordering.

For more information

- Drawings ▶ 98 page
- Trip curves ▶ 91 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

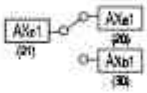
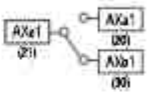
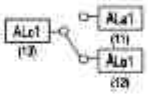
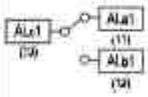
Option of below items for T-position

AX1	Auxiliary Switch (1c)
AX2	Auxiliary Switch (2c)
AL1	Alarm Switch (1c)
AL2	Alarm Switch (2c)
AX1+AL	Auxiliary (1c) + Alarm (1c) Switch
AX2+AL	Auxiliary (2c) + Alarm (1c) Switch

Option of below items for R-position

SHT	Shunt Trip
UVT	Undervoltage trip

Contact operation for Auxiliary and Alarm Switches

MCCB	ON	OFF	TRIP
AX			
AL			

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

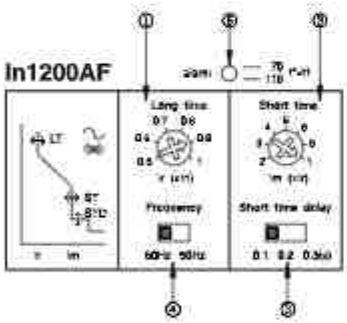
Rating for Shunt trip (SHT)

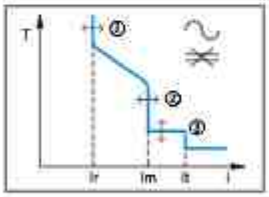
Control voltage		Time rating	Operational voltage
AC	100~110V 200~220V 380~440V	Continuous	85~110% of control voltage
DC	48V 100~110V 200~220V		75~125% of control voltage

Rating for Undervoltage release (UVT)

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

1200AF Electronic MCCB
ABS1203bE





For more information
• Drawings ▶ 99 page
• Trip curves ▶ 92 page

Ratings

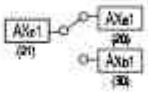
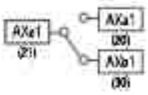
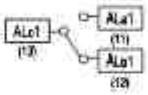
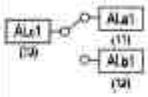
Frame size			1200AF
Type and Pole			S-Type
		2-pole	-
		3-pole	ABS1203bE
		4-pole)	-
Rated current, In			1200A
Rated operational voltage, Ue			AC: 600V
Rated insulation voltage, Ui			AC: 600V
Rated impulse withstand voltage, Uimp			6kV
Type	Long time pick-up	Current, IR	(0.5-0.6-0.7-0.8-0.9-1.0) × In, adjustable...①
		time	5sec ± 20% at 6 × Ir, fixed
	Short time pick-up	Current, Im	(2-3-4-5-6-8-10) × In, adjustable...②
		time	0.1-0.2-0.3 sec, adjustable...③
	Instantaneous pick-up	Current, It	11 × In, fixed
		time	within 0.03 sec, fixed
	⑤ LED	Pre-Alarm	between 70 to 110% of set current Ir: LED flickering
			over 110% of set current Ir: stays on
	④ Rated frequency		50-60Hz selectable by the switch of the trip unit
Rated short-circuit breaking capacity, Icu			S-Type
		AC 690V	45kA
		480/500V	50kA
		415/460V	65kA
		380V	65kA
		220/250V	100kA
Ics=100%Icu			50%
Protective function			Overload, Short-circuit
Type of trip unit			Electronic type
Endurance	Mechanical		2500 operations
	Electrical		500 operations
Connection	Standard		Front connection
Mounting	Standard		Screw fixing
Dimensions (mm)		Pole	3p
		a	220
		b	400
		c	105
		d	159
Weight, kg		Standard	21

Ordering types

Breaker types

ABS type (65kA/460V)	
Rated current, In	3P
1200 A	ABS1203bE

Contact operation for Auxiliary and Alarm Switches

MCCB	ON	OFF	TRIP
AX			
AL			

Option of below items for T-position

AX1	Auxiliary Switch (1c)
AX2	Auxiliary Switch (2c)
AL1	Alarm Switch (1c)
AL2	Alarm Switch (2c)
AX1+AL	Auxiliary (1c) + Alarm (1c) Switch
AX2+AL	Auxiliary (2c) + Alarm (1c) Switch

Option of below items for R-position

SHT	Shunt Trip
UVT	Undervoltage trip

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 200~220V 380~440V	Continuous	85~110% of control voltage
DC	48V 100~110V 200~220V		75~125% of control voltage

Rating for Undervoltage release (UVT)

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

30AF ELCB
EBS30c

EBS33c

Ratings

Frame size			30AF	
Type and Pole			S-Type	
	2-pole(2-sensor)		-	
	3-pole(3-sensor)		EBS33c	
	4-pole(3-sensor)		EBS34c	
Rated current, In			5-10-15-20-30A	
Rated residual current, I∧n			30, 100/200/500mA (Adjustable)	
Residual current off-time at I∧n			≤0.1 sec	
Rated operational voltage, Ue			AC: 220/460V	
Rated impulse withstand voltage, Uimp			6kV	
Wiring system	2-pole(2-sensor)		-	
	3-pole(3-sensor)		1 ø 2W, 1 ø 3W, 3 ø 3W	
	4-pole(3-sensor)		1 ø 2W, 1 ø 3W, 3 ø 3W, 3 ø 4W	
Rated short-circuit breaking			S-Type	
capacity, Icu	AC	460V	14 kA	
IEC 60947-2 (Icu)		415V	14 kA	
Ics=100%Icu		220/250V	30 kA	
Protective function			Overload, Short-circuit and Ground fault	
Type of trip unit			Thermal-Magnetic	
Magnetic trip range			400A	
Endurance	Mechanical		25000 operations	
	Electrical		10000 operations	
Connection	Standard		Front connection	
	Optional		Rear connection	
			Plug-in	
Mounting	Standard		Screw fixing	
Dimensions (mm)		Pole	3p	4p
		a	75	100
		b	130	130
		c1 Note)	60	60
		c2 Note)	64	64
		d	82	82
Weight, kg		Standard	0.7	0.9
Certification		Pole	3p	4p
CE marking		CE	o	o

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

For more information

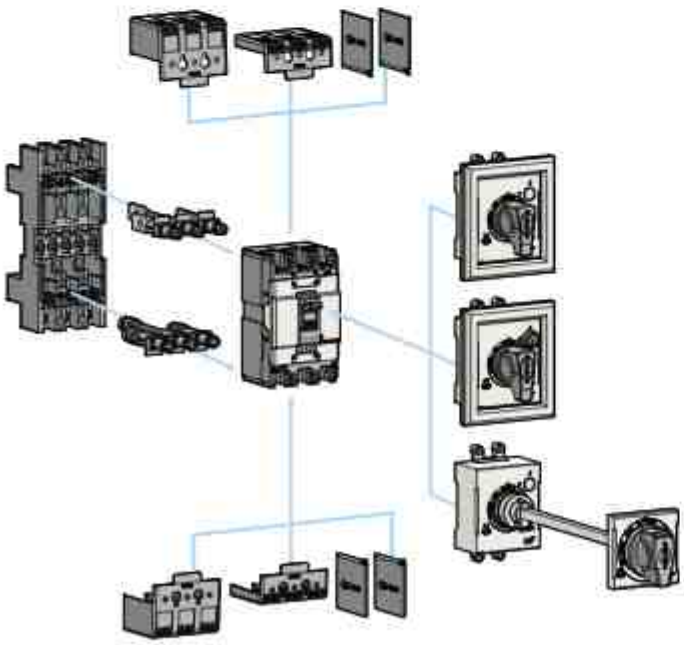
- Drawings ▶ 100 page
- Trip curves ▶ 87 page
- Accessories ▶ 72 page
- Connection and mounting ▶ 110 page

Ordering types

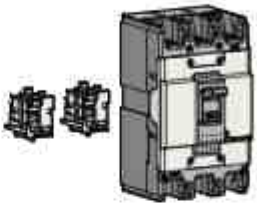
Breaker types

EBS type (14kA/460V)		
Rated current, In	Rated residual current, I△n: 30mA	
	3-pole	4-pole
5 A	EBS33c/5/30	EBS34c/5/30
10 A	EBS33c/10/30	EBS34c/10/30
15 A	EBS33c/15/30	EBS34c/15/30
20 A	EBS33c/20/30	EBS34c/20/30
30 A	EBS33c/30/30	EBS34c/30/30

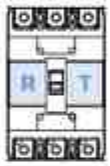
EBS type (14kA/460V)		
Rated current, In	Rated residual current, I△n: 100/200/500mA	
	3-pole	4-pole
5 A	EBS33c/5/100	EBS34c/5/100
10 A	EBS33c/10/100	EBS34c/10/100
15 A	EBS33c/15/100	EBS34c/15/100
20 A	EBS33c/20/100	EBS34c/20/100
30 A	EBS33c/30/100	EBS34c/30/100



Accessories



Electrical auxiliaries

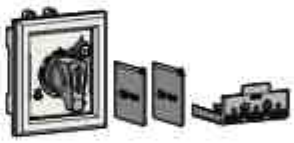


AX	Auxiliary Switch
AL	Alarm Switch
AX+AL	Combination switch

Maximum possibilities

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

Note) For more detail see 72 page



External accessories

EBS30c	Name
IB13	Insulation barrier
TCL13	Terminal cover (Long)
TCS13	Terminal cover (Short)
DH100	Rotary handle (Direct)
DHK100	Rotary handle (Direct, Key lock)
EH100	Rotary handle (Extended)
RTR1	Rear terminal (Round)
PB-A3	Plug-in kit
PHL100	Pad handle lock

Note) For more detail see 80 page

50AF ELCB
EBN50c, EBS50c, EBH50c

EBN53c

EBS53c

Ratings

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, In		15-20-30-40-50A		
Rated residual current, I∧n		30, 100/200/500mA (Adjustable)		
Residual current off-time at I∧n		≤0.1 sec		
Rated operational voltage, Ue		AC: 220/460V		
Rated impulse withstand voltage, Uimp		6kV		
Wiring system	2-pole(2-sensor)	1 ø 2W		
	3-pole(3-sensor)	1 ø 2W, 1 ø 3W, 3 ø 3W		
	4-pole(3-sensor)	1 ø 2W, 1 ø 3W, 3 ø 3W, 3 ø 4W		
Rated short-circuit breaking		N-Type	S-Type	H-Type
capacity, Icu	AC 460V	14kA	18kA	50kA
IEC 60947-2 (Icu)	415V	14kA	18kA	50kA
Ics=100%Icu	220/250V	30kA	35kA	100kA
Protective function		Overload, Short-circuit and Ground fault		
Type of trip unit		Thermal-Magnetic		
Magnetic trip range		12 × In (30A and under: 400A)		
Endurance	Mechanical	25000 operations		
	Electrical	10000 operations		
Connection	Standard	Front connection		
	Optional	Rear connection		
		Plug-in		
Mounting	Standard	Screw fixing		

Dimensions (mm)	Pole	2p	3p	3p	4p	3p	4p
	a	75	75	75	100	90	120
	b	130		130		155	
	c1 Note)	60		60		60	
	c2 Note)	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) Depth by door cut size : C1 for large cut, C2 for small cut

For more information

- Drawings ▶ 100 page
- Trip curves ▶ 87, 88 page
- Accessories ▶ 72 page
- Connection and mounting ▶ 110 page

Ordering types

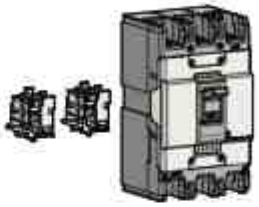
Breaker types

EBN type (14kA/460V)				
Rated current, In	Rated residual current, I△n: 30mA		Rated residual current, I△n: 100/200/500mA	
	2-pole	3-pole	2-pole	3-pole
15 A	EBN52c/15/30	EBN53c/15/30	EBN52c/15/100	EBN53c/15/100
20 A	EBN52c/20/30	EBN53c/20/30	EBN52c/20/100	EBN53c/20/100
30 A	EBN52c/30/30	EBN53c/30/30	EBN52c/30/100	EBN53c/30/100
40 A	EBN52c/40/30	EBN53c/40/30	EBN52c/40/100	EBN53c/40/100
50 A	EBN52c/50/30	EBN53c/50/30	EBN52c/50/100	EBN53c/50/100

EBS type (18kA/460V)				
Rated current, In	Rated residual current, I△n: 30mA		Rated residual current, I△n: 100/200/500mA	
	3-pole	4-pole	3-pole	4-pole
15 A	EBS53c/15/30	EBS54c/15/30	EBS53c/15/100	EBS54c/15/100
20 A	EBS53c/20/30	EBS54c/20/30	EBS53c/20/100	EBS54c/20/100
30 A	EBS53c/30/30	EBS54c/30/30	EBS53c/30/100	EBS54c/30/100
40 A	EBS53c/40/30	EBS54c/40/30	EBS53c/40/100	EBS54c/40/100
50 A	EBS53c/50/30	EBS54c/50/30	EBS53c/50/100	EBS54c/50/100

EBH type (37kA/460V)				
Rated current, In	Rated residual current, I△n: 30mA		Rated residual current, I△n: 100/200/500mA	
	3-pole	4-pole	3-pole	4-pole
15 A	EBH53c/15/30	EBH54c/15/30	EBH53c/15/100	EBH54c/15/100
20 A	EBH53c/20/30	EBH54c/20/30	EBH53c/20/100	EBH54c/20/100
30 A	EBH53c/30/30	EBH54c/30/30	EBH53c/30/100	EBH54c/30/100
40 A	EBH53c/40/30	EBH54c/40/30	EBH53c/40/100	EBH54c/40/100
50 A	EBH53c/50/30	EBH54c/50/30	EBH53c/50/100	EBH54c/50/100

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 72 page

External accessories

EBN50c EBS50c	EBH50c	Name
IB13	IB23	Insulation barrier
TCL13	TCL23	Terminal cover (Long)
TCS13	TCS23	Terminal cover (Short)
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
PHL100	PHL125	Pad handle lock

Note) For more detail see 80 page

60AF ELCB
EBN60c, EBS60c

EBN63c

EBS63c

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, In		60A	
Rated residual current, I∆n		30, 100/200/500mA (Adjustable)	
Residual current off-time at I∆n		≤0.1 sec	
Rated operational voltage, Ue		AC 220/460V	
Rated impulse withstand voltage, Uimp		6kV	
Wiring system	2-pole(2-sensor)	-	
	3-pole(3-sensor)	1 ø 2W, 1 ø 3W, 3 ø 3W	
	4-pole(3-sensor)	1 ø 2W, 1 ø 3W, 3 ø 3W, 3 ø 4W	

Rated short-circuit breaking			N-Type	S-Type
capacity, Icu	AC	460V	14kA	18kA
IEC 60947-2 (Icu)		415V	14kA	18kA
Ics=100%Icu		220/250V	30kA	35kA

Protective function	Overload, Short-circuit and Ground fault	
Type of trip unit	Thermal-Magnetic	
Magnetic trip range	12×In	
Endurance	Mechanical	25000 operations
	Electrical	10000 operations
Connection	Standard	Front connection
	Optional	Rear connection
		Plug-in
Mounting	Standard	Screw fixing

Dimensions (mm)	Pole	3p	3p	4p
	a	75	75	100
	b	130	130	130
	c1 Note)	60	60	60
	c2 Note)	64	64	64
	d	82	82	82
Weight, kg	Standard	0.7	0.7	0.9

Certification	Pole	3p	3p	4p
CE marking	CE	o	o	

Note) Depth by door cut size : C1 for large cut, C2 for small cut

For more information

- Drawings ▶ 100 page
- Trip curves ▶ 87 page
- Accessories ▶ 72 page
- Connection and mounting ▶ 110 page

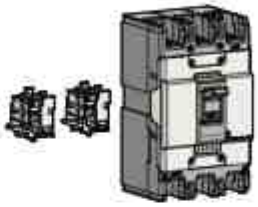
Ordering types

Breaker types

EBN type (14kA/460V)		
Rated current, In	Rated residual current, I△n: 30mA	Rated residual current, I△n: 100/200/500mA
	3-pole	3-pole
60 A	EBN63c/60/30	EBN63c/60/100

EBS type (18kA/460V)				
Rated current, In	Rated residual current, I△n: 30mA		Rated residual current, I△n: 100/200/500mA	
	3-pole	4-pole	3-pole	4-pole
60 A	EBS63c/60/30	EBS64c/60/30	EBS63c/60/100	EBS64c/60/100

Accessories



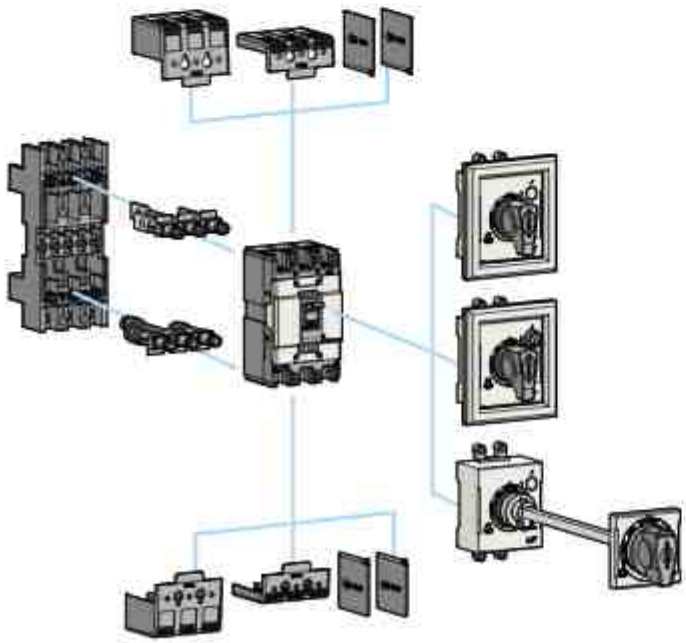
Electrical auxiliaries

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 72 page



External accessories

EBS60c EBN60c	Name
IB13	Insulation barrier
TCL13	Terminal cover (Long)
TCS13	Terminal cover (Short)
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
PHL100	Pad handle lock

Note) For more detail see 80 page

100AF ELCB
EBN100c

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, In			60-75-100A		
Rated residual current, I∆n			30, 100/200/500mA (Adjustable)		
Residual current off-time at I∆n			≤0.1 sec		
Rated operational voltage, Ue			AC: 220/460V		
Rated impulse withstand voltage, Uimp			6kV		
Wiring system	2-pole(2-sensor)		1 ø 2W		
	3-pole(3-sensor)		1 ø 2W, 1 ø 3W, 3 ø 3W		
	4-pole(3-sensor)		1 ø 2W, 1 ø 3W, 3 ø 3W, 3 ø 4W		
Rated short-circuit breaking			N-Type		
capacity, Icu	AC	460V	18kA		
IEC 60947-2 (Icu)		415V	18kA		
Ics=100%Icu		220/250V	35kA		
Protective function			Overload, Short-circuit and Ground fault		
Type of trip unit			Thermal-Magnetic		
Magnetic trip range			12×In		
Endurance	Mechanical		25000 operations		
	Electrical		10000 operations		
Connection	Standard		Front connection		
	Optional		Rear connection		
			Plug-in		
Mounting	Standard		Screw fixing		
Dimensions (mm)	Pole		2p	3p	4p
	a		75	75	100
	b		130	130	130
	c1 Note)		60	60	60
	c2 Note)		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) Depth by door cut size : c1 for large cut, c2 for small cut

For more information

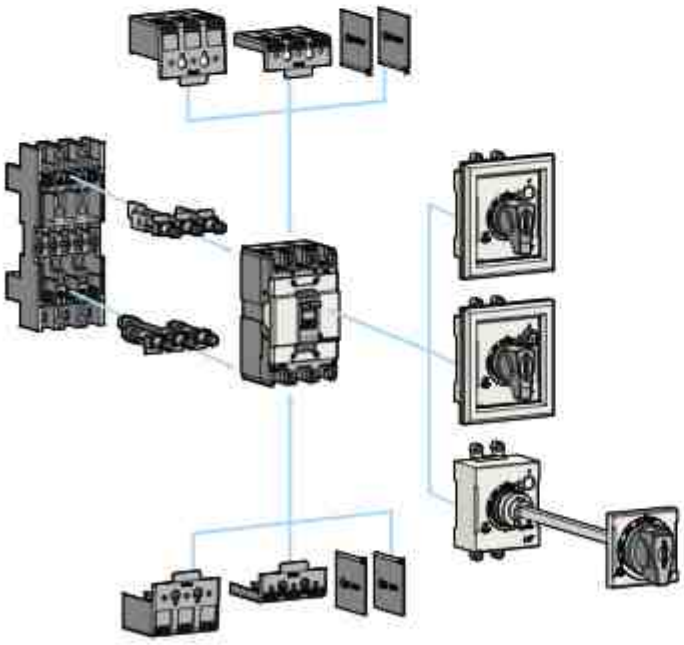
- Drawings ▶ 100 page
- Trip curves ▶ 87 page
- Accessories ▶ 72 page
- Connection and mounting ▶ 110 page

Ordering types

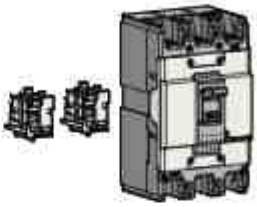
Breaker types

EBN type (18kA/460V)			
Rated current, In	Rated residual current, I△n: 30mA		
	2-pole	3-pole	4-pole
60 A	EBN102c/60/30	EBN103c/60/30	EBN104c/60/30
75 A	EBN102c/75/30	EBN103c/75/30	EBN104c/75/30
100 A	EBN102c/100/30	EBN103c/100/30	EBN104c/100/30

Rated current, In	Rated residual current, I△n: 100/200/500mA		
	2-pole	3-pole	4-pole
60 A	EBN102c/60/100	EBN103c/60/100	EBN104c/60/100
75 A	EBN102c/75/100	EBN103c/75/100	EBN104c/75/100
100 A	EBN102c/100/100	EBN103c/100/100	EBN104c/100/100

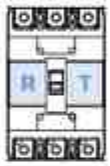


Accessories



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 72 page

External accessories

EBN100c	Name
IB13	Insulation barrier
TCL13	Terminal cover (Long)
TCS13	Terminal cover (Short)
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
PHL100	Pad handle lock

Note) For more detail see 80 page

125AF ELCB
EBS125c, EBH125c

EBS103c

EBH103c

Ratings

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, In			15-20-30-40-50-60-75-100-125A	
Rated residual current, I∧n			30, 100/200/500mA (Adjustable)	
Residual current off-time at I∧n			≤0.1 sec	
Rated operational voltage, Ue			AC: 220/460V	
Rated impulse withstand voltage, Uimp			6kV	
Wiring system	2-pole(2-sensor)		-	
	3-pole(3-sensor)		1 ø 2W, 1 ø 3W, 3 ø 3W	
	4-pole(3-sensor)		1 ø 2W, 1 ø 3W, 3 ø 3W, 3 ø 4W	
Rated short-circuit breaking capacity, Icu	AC	460V	37kA	50kA
IEC 60947-2 (Icu)		415V	37kA	50kA
Ics=100%Icu		220/250V	85kA	100kA
Protective function			Overload, Short-circuit and Ground fault	
Type of trip unit			Thermal-Magnetic	
Magnetic trip range			12 × In (30A and under: 400A)	
Endurance	Mechanical		25000 operations	
	Electrical		10000 operations	
Connection	Standard		Front connection	
	Optional		Rear connection	
			Plug-in	
Mounting	Standard		Screw fixing	

Dimensions (mm)	Pole	3p	4p	3p	4p
	a	90	120	90	120
	b	155	155	155	155
	c1 Note)	60	60	60	60
	c2 Note)	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	O	O	O	O

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

For more information

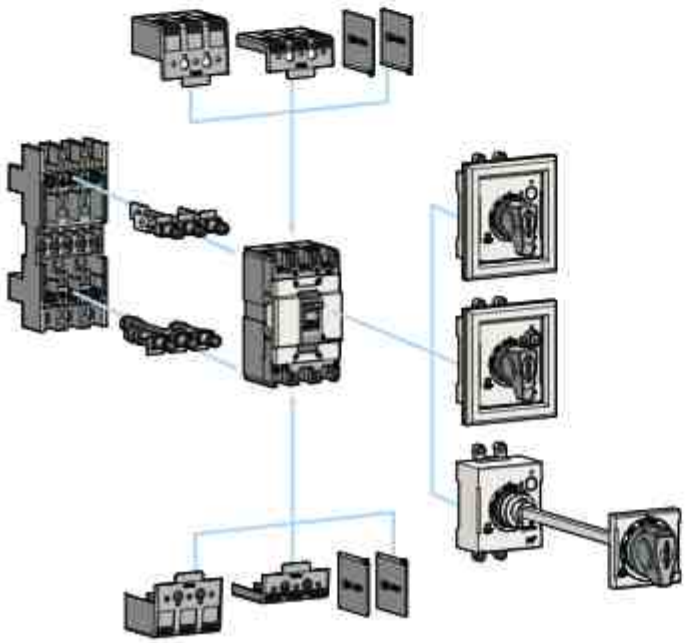
- Drawings ▶ 101 page
- Trip curves ▶ 88 page
- Accessories ▶ 72 page
- Connection and mounting ▶ 110 page

Ordering types

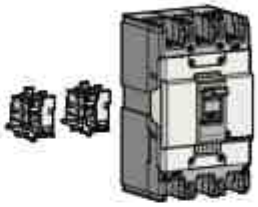
Breaker types

EBS type (37kA/460V)				
Rated current, In	Rated residual current, I△n: 30mA		Rated residual current, I△n: 100/200/500mA	
	3-pole	4-pole	3-pole	4-pole
15 A	EBS103c/15/30	EBS104c/15/30	EBS103c/15/100	EBS104c/15/100
20 A	EBS103c/20/30	EBS104c/20/30	EBS103c/20/100	EBS104c/20/100
30 A	EBS103c/30/30	EBS104c/30/30	EBS103c/30/100	EBS104c/30/100
40 A	EBS103c/40/30	EBS104c/40/30	EBS103c/40/100	EBS104c/40/100
50 A	EBS103c/50/30	EBS104c/50/30	EBS103c/50/100	EBS104c/50/100
60 A	EBS103c/60/30	EBS104c/60/30	EBS103c/60/100	EBS104c/60/100
75 A	EBS103c/75/30	EBS104c/75/30	EBS103c/75/100	EBS104c/75/100
100 A	EBS103c/100/30	EBS104c/100/30	EBS103c/100/100	EBS104c/100/100
125 A	EBS103c/125/30	EBS104c/125/30	EBS103c/125/100	EBS104c/125/100

EBH type (50kA/460V)				
Rated current, In	Rated residual current, I△n: 30mA		Rated residual current, I△n: 100/200/500mA	
	3-pole	4-pole	3-pole	4-pole
15 A	EBH103c/15/30	EBH104c/15/30	EBH103c/15/100	EBH104c/15/100
20 A	EBH103c/20/30	EBH104c/20/30	EBH103c/20/100	EBH104c/20/100
30 A	EBH103c/30/30	EBH104c/30/30	EBH103c/30/100	EBH104c/30/100
40 A	EBH103c/40/30	EBH104c/40/30	EBH103c/40/100	EBH104c/40/100
50 A	EBH103c/50/30	EBH104c/50/30	EBH103c/50/100	EBH104c/50/100
60 A	EBH103c/60/30	EBH104c/60/30	EBH103c/60/100	EBH104c/60/100
75 A	EBH103c/75/30	EBH104c/75/30	EBH103c/75/100	EBH104c/75/100
100 A	EBH103c/100/30	EBH104c/100/30	EBH103c/100/100	EBH104c/100/100
125 A	EBH103c/125/30	EBH104c/125/30	EBH103c/125/100	EBH104c/125/100



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 72 page

External accessories

EBS125c EBH125c	Name
IB23	Insulation barrier
TCL23	Terminal cover (Long)
TCS23	Terminal cover (Short)
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
PHL125	Pad handle lock

Note) For more detail see 80 page

250AF ELCB
EBN250c, EBS250c, EBH250c

EBN203c

EBS203c

Ratings

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, In		100-125-150-175-200-225-250A		
Rated residual current, I∧n		30, 100/200/500mA (Adjustable)		
Residual current off-time at I∧n		≤0.1 sec		
Rated operational voltage, Ue		AC: 220/460V		
Rated impulse withstand voltage, Uimp		6kV		
Wiring system	2-pole(2-sensor)	1 ø 2W		
	3-pole(3-sensor)	1 ø 2W, 1 ø 3W, 3 ø 3W		
	4-pole(3-sensor)	1 ø 2W, 1 ø 3W, 3 ø 3W, 3 ø 4W		
Rated short-circuit breaking		N-Type	S-Type	H-Type
capacity, Icu	AC 460V	25kA	37kA	50kA
IEC 60947-2 (Icu)	415V	25kA	37kA	50kA
Ics=100%Icu	220/250V	65kA	85kA	100kA
Protective function		Overload, Short-circuit and Ground fault		
Type of trip unit		Thermal-Magnetic		
Magnetic trip range		12 × In		
Endurance	Mechanical	20000 operations		
	Electrical	5000 operations		
Connection	Standard	Front connection		
	Optional	Rear connection		
		Plug-in		
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 Note)	60		60		60	
	c2 Note)	64		64		64	
	d	87		87		87	
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	o		o		o	

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

For more information

- Drawings ▶ 102 page
- Trip curves ▶ 89 page
- Accessories ▶ 72 page
- Connection and mounting ▶ 110 page

Ordering types

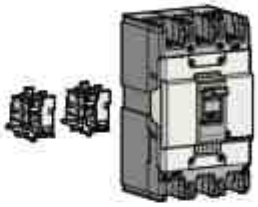
Breaker types

EBN type (25kA/460V)				
Rated current, In	Rated residual current, I△n: 30mA		Rated residual current, I△n: 100/200/500mA	
	2-pole	3-pole	2-pole	3-pole
100 A	EBN202c/100/30	EBN203c/100/30	EBN202c/100/100	EBN203c/100/100
125 A	EBN202c/125/30	EBN203c/125/30	EBN202c/125/100	EBN203c/125/100
150 A	EBN202c/150/30	EBN203c/150/30	EBN202c/150/100	EBN203c/150/100
175 A	EBN202c/175/30	EBN203c/175/30	EBN202c/175/100	EBN203c/175/100
200 A	EBN202c/200/30	EBN203c/200/30	EBN202c/200/100	EBN203c/200/100
225 A	EBN202c/225/30	EBN203c/225/30	EBN202c/225/100	EBN203c/225/100
250 A	EBN202c/250/30	EBN203c/250/30	EBN202c/250/100	EBN203c/250/100

EBS type (37kA/460V)				
Rated current, In	Rated residual current, I△n: 30mA		Rated residual current, I△n: 100/200/500mA	
	3-pole	4-pole	3-pole	4-pole
100 A	EBS203c/100/30	EBS204c/100/30	EBS203c/100/100	EBS204c/100/100
125 A	EBS203c/125/30	EBS204c/125/30	EBS203c/125/100	EBS204c/125/100
150 A	EBS203c/150/30	EBS204c/150/30	EBS203c/150/100	EBS204c/150/100
175 A	EBS203c/175/30	EBS204c/175/30	EBS203c/175/100	EBS204c/175/100
200 A	EBS203c/200/30	EBS204c/200/30	EBS203c/200/100	EBS204c/200/100
225 A	EBS203c/225/30	EBS204c/225/30	EBS203c/225/100	EBS204c/225/100
250 A	EBS203c/250/30	EBS204c/250/30	EBS203c/250/100	EBS204c/250/100

EBH type (50kA/460V)				
Rated current, In	Rated residual current, I△n: 30mA		Rated residual current, I△n: 100/200/500mA	
	3-pole	4-pole	3-pole	4-pole
100 A	EBH203c/100/30	EBH204c/100/30	EBH203c/100/100	EBH204c/100/100
125 A	EBH203c/125/30	EBH204c/125/30	EBH203c/125/100	EBH204c/125/100
150 A	EBH203c/150/30	EBH204c/150/30	EBH203c/150/100	EBH204c/150/100
175 A	EBH203c/175/30	EBH204c/175/30	EBH203c/175/100	EBH204c/175/100
200 A	EBH203c/200/30	EBH204c/200/30	EBH203c/200/100	EBH204c/200/100
225 A	EBH203c/225/30	EBH204c/225/30	EBH203c/225/100	EBH204c/225/100
250 A	EBH203c/250/30	EBH204c/250/30	EBH203c/250/100	EBH204c/250/100

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 72 page

External accessories

EBN250c EBS250c EBH250c	Name
IB23	Insulation barrier
TCL33	Terminal cover (Long)
TCS33	Terminal cover (Short)
DH250	Rotary handle (Direct)
DHK250	Rotary handle (Direct, Key lock)
EH250	Rotary handle (Extended)
RTB3	Rear terminal (Bar)
RTR3	Rear terminal (Round)
PB-D3	Plug-in kit
PHL250	Pad handle lock

Note) For more detail see 80 page

400AF ELCB
EBN400c, EBS400c, EBH400c, EBL400c


EBS403c


EBL404c

Ratings

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, In			250-300-350-400A			
Rated residual current, I∧n			30, 100/200/500mA (Adjustable)			
Residual current off-time at I∧n			≤0.1 sec			
Rated operational voltage, Ue			220/460V			
Rated impulse withstand voltage, Uimp			6kV			
Wiring system	3-pole(3-sensor)		1 ø 2W, 1 ø 3W, 3 ø 3W			
	4-pole(3-sensor)		1 ø 2W, 1 ø 3W, 3 ø 3W, 3 ø 4W			
Rated short-circuit breaking			N-Type	S-Type	H-Type	L-Type
capacity, Icu	AC	415/460V	37kA	50kA	65kA	85kA
IEC 60947-2 (Icu)		220/250V	50kA	75kA	85kA	125kA
Ics=%Icu			100%	100%	100%	75%
Protective function			Overload, Short-circuit and Ground fault			
Type of trip unit			Thermal-Magnetic			
Magnetic trip range			8~12In			
Endurance	Mechanical		4000 operations			
	Electrical		1000 operations			
Connection	Standard		Front connection			
	Optional		Rear connection			
			Plug-in			
Mounting	Standard		Screw fixing			

Dimensions (mm)	Pole	3p	4p	3p	4p	3p	4p	3p	4p
	a	140	184	140	184	140	184	140	184
	b	257		257		257		257	
	c1 (Note)	109		109		109		109	
	c2 (Note)	113		113		113		113	
	d	145		145		145		145	
Weight, kg	Standard	7	8.4	7	8.4	7		7	
Certification	Pole	3p	4p	3p	4p	3p		3p	
CE marking	CE	-		-		-		-	

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

For more information

- Drawings ▶ 103 page
- Trip curves ▶ 90 page
- Accessories ▶ 72 page
- Connection and mounting ▶ 110 page

Ordering types

Breaker types

EBN type (25kA/460V)				
Rated current, In	Rated residual current, I△n: 30mA		Rated residual current, I△n: 100/200/500mA	
	3-pole	4-pole	3-pole	4-pole
250 A	EBN403c/250/30	EBN404c/250/30	EBN403c/250/100	EBN404c/250/100
300 A	EBN403c/300/30	EBN404c/300/30	EBN403c/300/100	EBN404c/300/100
350 A	EBN403c/350/30	EBN404c/350/30	EBN403c/350/100	EBN404c/350/100
400 A	EBN403c/400/30	EBN404c/400/30	EBN403c/400/100	EBN404c/400/100

EBS type (50kA/460V)				
Rated current, In	Rated residual current, I△n: 30mA		Rated residual current, I△n: 100/200/500mA	
	3-pole	4-pole	3-pole	4-pole
250 A	EBS403c/250/30	EBS404c/250/30	EBS403c/250/100	EBS404c/250/100
300 A	EBS403c/300/30	EBS404c/300/30	EBS403c/300/100	EBS404c/300/100
350 A	EBS403c/350/30	EBS404c/350/30	EBS403c/350/100	EBS404c/350/100
400 A	EBS403c/400/30	EBS404c/400/30	EBS403c/400/100	EBS404c/400/100

EBH type(65kA/460V)				
Rated current, In	Rated residual current, I△n: 30mA		Rated residual current, I△n: 100/200/500mA	
	3-pole	4-pole	3-pole	4-pole
250 A	EBH403c/250/30	EBH404c/250/30	EBH403c/250/100	EBH404c/250/100
300 A	EBH403c/300/30	EBH404c/300/30	EBH403c/300/100	EBH404c/300/100
350 A	EBH403c/350/30	EBH404c/350/30	EBH403c/350/100	EBH404c/350/100
400 A	EBH403c/400/30	EBH404c/400/30	EBH403c/400/100	EBH404c/400/100

EBL type(85kA/460V)				
Rated current, In	Rated residual current, I△n: 30mA		Rated residual current, I△n: 100/200/500mA	
	3-pole	4-pole	3-pole	4-pole
250 A	EBL403c/250/30	EBL404c/250/30	EBL403c/250/100	EBL404c/250/100
300 A	EBL403c/300/30	EBL404c/300/30	EBL403c/300/100	EBL404c/300/100
350 A	EBL403c/350/30	EBL404c/350/30	EBL403c/350/100	EBL404c/350/100
400 A	EBL403c/400/30	EBL404c/400/30	EBL403c/400/100	EBL404c/400/100

Accessories

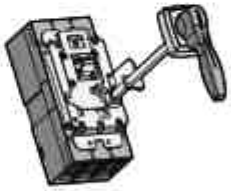
Electrical auxiliaries

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 73 page



E-70U

N-70

External accessories

IBL400	Insulation barrier
T1-43A	Terminal cover (Long) - 2, 3pole
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
X-402	Rear terminal - 2pole
X-403	Rear terminal - 3pole
X-404	Rear terminal - 4pole
PB-I3-FR	Plug-in kit

Note) For more detail see 80 page

800AF ELCB
EBN803c, EBS803c, EBL803c

EBS803c

Ratings

Frame size			800AF		
Type and Pole	3-pole(3-sensor)		N-Type	S-Type	L-Type
	4-pole(3-sensor)		EBN803c	EBS803c	EBL803c
			-	-	-
Rated current, In			500-630-700-800A		
Rated residual current, I∧n			30, 100/200/500mA (Adjustable)		
Residual current off-time at I∧n			≤0.1 sec		
Rated operational voltage, Ue			220/460V		
Rated impulse withstand voltage, Uimp			6 kV		
Wiring system	3-pole(3-sensor)		1 ø 2W, 1 ø 3W, 3 ø 3W		
	4-pole(3-sensor)		-		
Rated short-circuit breaking capacity, Icu IEC 60947-2 (Icu)	AC	415/460V	37kA	65kA	85kA
		220/250V	50kA	85kA	125kA
Ics=%Icu			100%	100%	75%
Protective function			Overload, Short-circuit and Ground fault		
Type of trip unit			Thermal-Magnetic		
Magnetic trip range			8~12In		
Endurance	Mechanical		2500 operations		
	Electrical		500 operations		
Connection	Standard		Front connection		
	Optional		Rear connection		
			Plug-in		
Mounting	Standard		Screw fixing		
Dimensions (mm)		Pole	3p		
		a	210		
		b	280		
		c1 Note)	109		
		c2 Note)	113		
		d	145		
Weight, kg		Standard	11.5		
Certification		Pole	3p		
CE marking		CE	-		

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

For more information

- Drawings ▶ 104 page
- Trip curves ▶ 90 page
- Accessories ▶ 72 page
- Connection and mounting ▶ 110 page

Ordering types

Breaker types

EBN type (37kA/460V)		
Rated current, In	Rated residual current, I△n: 30mA	Rated residual current, I△n: 100/200/500mA
	3p	3p
500 A	EBN803c/500/30	EBN803c/500/100
630 A	EBN803c/630/30	EBN803c/630/100
700 A	EBN803c/700/30	EBN803c/700/100
800 A	EBN803c/800/30	EBN803c/800/100

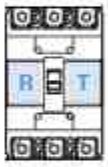
EBS type (65kA/460V)		
Rated current, In	Rated residual current, I△n: 30mA	Rated residual current, I△n: 100/200/500mA
	3p	3p
500 A	EBS803c/500/30	EBS803c/500/100
630 A	EBS803c/630/30	EBS803c/630/100
700 A	EBS803c/700/30	EBS803c/700/100
800 A	EBS803c/800/30	EBS803c/800/100

EBL type(85kA/460V)		
Rated current, In	Rated residual current, I△n: 30mA	Rated residual current, I△n: 100/200/500mA
	3p	3p
500 A	EBL803c/500/30	EBL803c/500/100
630 A	EBL803c/630/30	EBL803c/630/100
700 A	EBL803c/700/30	EBL803c/700/100
800 A	EBL803c/800/30	EBL803c/800/100

Accessories

Electrical auxiliaries

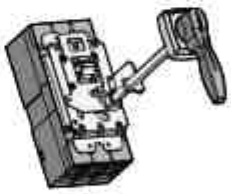
AX	Auxiliary Switch
AL	Alarm Switch
SHT	Shunt Trip
UVT	Undervoltage trip



Maximum possibilities

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

Note) For more detail see 73 page



E-80U

N-80

External accessories

IBL800	Insulation barrier
T1-63A	Terminal cover (Long) - 2, 3pole
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
X-802	Rear terminal - 2pole
X-803	Rear terminal - 3pole
X-804	Rear terminal - 4pole
PB-J3-FR	Plug-in kit

Note) For more detail see 90 page

1000/1200AF ELCB
EBS1003b, EBS1203b

Ratings

Frame size			1000AF	1200AF
Type and Pole			S-Type	S-Type
	3-pole(3-sensor)		EBS1003b	EBS1203b
	4-pole(4-sensor)		-	-
Rated current, In			1000A	1200A
Rated residual current, I∆n			100/200/500mA (Adjustable)	
Residual current off-time at I∆n			≤0.1 sec	
Rated operational voltage, Ue			AC: 460V	
Wiring system	3-pole(3-sensor)		1Ø2W, 1Ø3W, 3Ø3W	
Rated short-circuit breaking			S-Type	S-Type
capacity, Icu	AC	415/460V	85kA	
IEC 60947-2 (Icu)		220/250V	125kA	
Protective function			Overload, Short-circuit and Ground fault	
Type of trip unit			Thermal-Magnetic	
Magnetic trip range			3-6× In	
Endurance	Mechanical		2500operations	
	Electrical		500operations	
Connection	Standard		Front connection	
Mounting	Standard		Screw fixing	
Dimensions (mm)		Pole	3p	
		a	220	
		b	565	
		c	105	
		d	159	
Weight, kg		Standard	27.1	

For more information

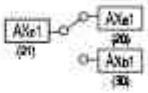
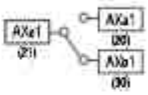
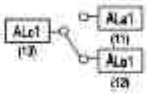
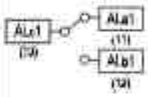
- Drawings ▶ 105 page
- Trip curves ▶ 91 page

Ordering types

Breaker types

EBS type (85kA/460V)	
Rated current, In	**3p**
1000 A	EBS1003b/1000/100
1200 A	EBS1203b/1200/100

Contact operation for Auxiliary and Alarm Switches

MCCB	ON	OFF	TRIP
AX			
AL			

Option of below items for T-position

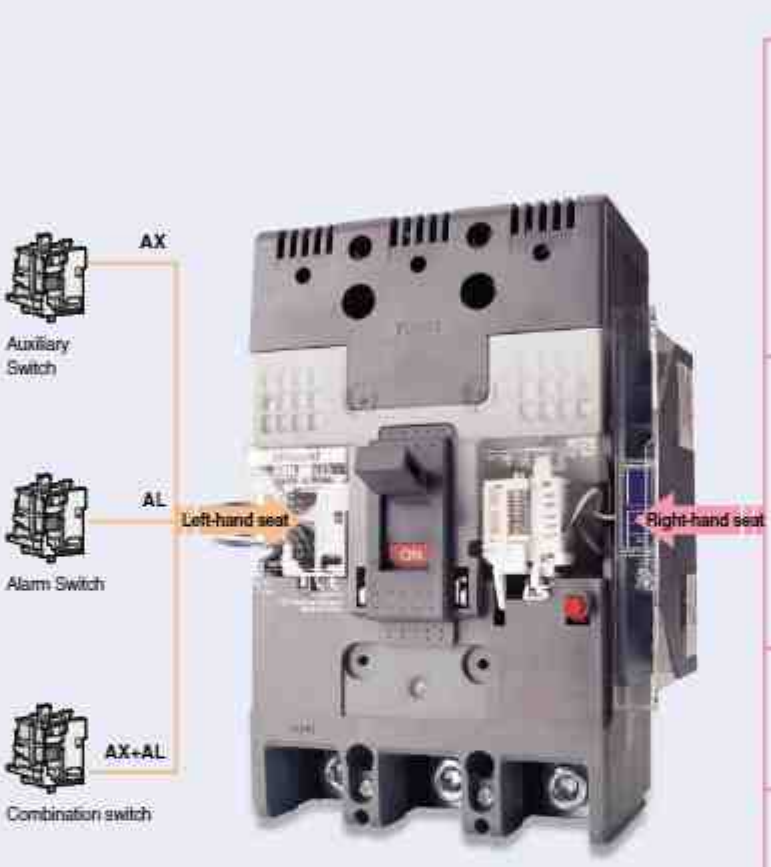
AX1	Auxiliary Switch (1c)
AL1	Alarm Switch (1c)
AX1+AL1	Auxiliary (1c) + Alarm (1c) Switch

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 30~250AF



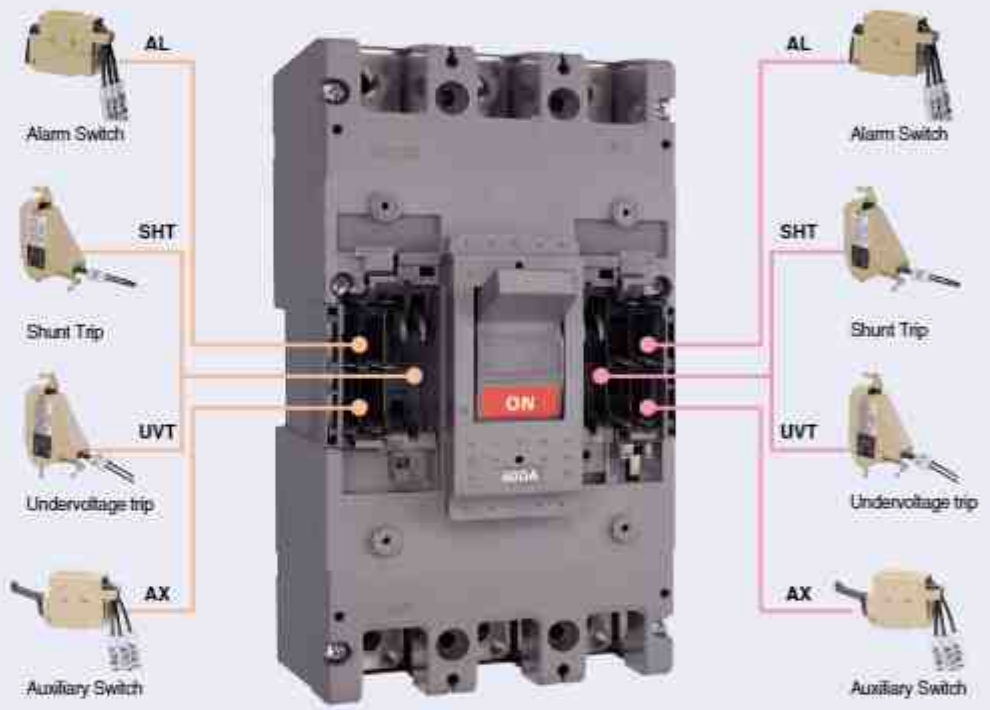
Option of connecting AX or AL or AX+AL
This seat is not available for 2-pole MCCB.

Option of connecting SHT or UVT
or AX or AL or AX+AL
This seat is not available for ELCB.

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



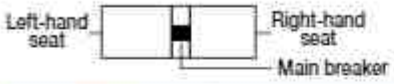
Option of connecting
AX or AL or AX+AL
This seat is not available for 2-pole breakers.

Option of connecting
SHT or UVT or AX or AL or AX+AL
This seat is not available for ELCB.

Maximum possibilities

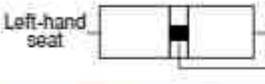
Position	Type	MCCB (400~800AF)	ELCB (400~800AF)
Left-hand seat	AX	2	2
	AL	2	2
	SHT/UVT	1	1
Right-hand seat	AX	2	-
	AL	2	-
	SHT/UVT	1	-

Combinations of accessories

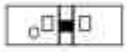
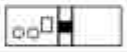
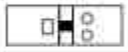
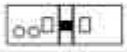
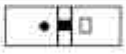
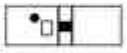
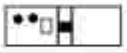
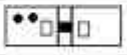
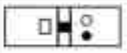
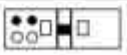
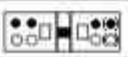


○ Auxiliary switch (AX)
● Alarm switch (AL) □ Shunt trip (SHT) / Undervoltage trip (UVT)

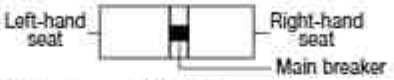
Series		MCCB (30~250AF)				MCCB (400~800AF)	MCCB (1000~1200AF)
Type	N-Type	ABE 32b	ABE 33b	ABN 52c ABN 62c ABN 102c/102d	ABN 53c/54c ABN 63c/64c ABN 103c/104c, ABN 103d/104d ABN 202c/203c/204c	ABN 402c/403c/404c ABN 802c/803c/804c	-
	S-Type	-	-	ABS 32c ABS 52c ABS 62c ABS 102c	ABS 33c/34c ABS 53c/54c ABS 63c/64c ABS 103c/104c ABS 202c/203c/204c	ABS 402c/403c/404c ABS 802c/803c/804c	ABS 1003b ABS 1004b ABS 1203b ABS 1204b ABS 1203bE
	H-Type	-	-	ABH 52c ABH 102c	ABH 53c/54c ABH 103c/104c ABH202c/203c/204c	ABH 402c/403c/404c	-
	L-Type	-	-	-	-	ABL 402c/403c/404c ABL 802c/803c/804c	ABL 1003b ABL 1004b ABL 1203b 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)							



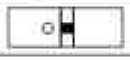
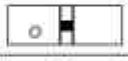
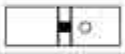
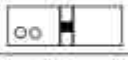
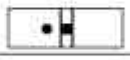
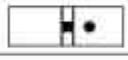
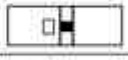
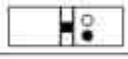
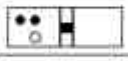
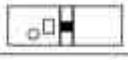
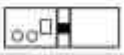
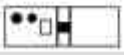
○ Auxiliary switch (AX)
● Alarm switch (AL) ☐ Shunt trip (SHT) / Undervoltage trip (UVT)

Series		MCCB (30-250AF)				MCCB (400-800AF)	MCCB (1000-1200AF)
Type	N-Type	ABE 32b	ABE 33b	ABN 52c ABN 62c ABN 102c	ABN 53c/54c ABN 63c/64c ABN 103c/104c ABN 202c/203c/204c	ABN 402c/403c/404c ABN 802c/803c/804c	-
	S-Type	-	-	ABS 32c ABS 52c ABS 62c ABS 102c	ABS 33c/34c ABS 53c/54c ABS 63c/64c ABS 103c/104c ABS 202c/203c/204c	ABS 402c/403c/404c ABS 802c/803c/804c	ABS 1003b ABS 1004b ABS 1203b ABS 1204b ABS 1203bE
	H-Type	-	-	ABH 52c ABH 102c	ABH 53c/54c ABH 103c/104c ABH202c/203c/204c	ABH 402c/403c/404c	-
	L-Type	-	-	-	-	ABL 402c/403c/404c ABL 802c/803c/804c	ABL 1003b ABL 1004b ABL 1203b 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							

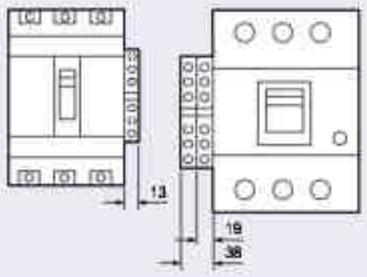
Combinations of accessories



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

Series		ELCB (30~250AF)	ELCB (400~800AF)	ELCB (1000~1200AF)
Type	N-Type	EBN 52c/53c/54c EBN 63c EBN 102c/103c/104c EBN 202c/203c	EBN 403c/404c EBN 803c	-
	S-Type	EBS 33c/34c EBS 53c/54c EBS 63c/64c EBS 103c/104c EBS 203c/204c	EBS 403c/404c EBS 803c	EBS 1003b EBS 1203b
	H-Type	EBH 53c/54c EBH 53c/54c EBH 103c/104c	EBH 403c/404c	-
	L-Type	-	EBL 403c/404c 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)				

Terminal block type



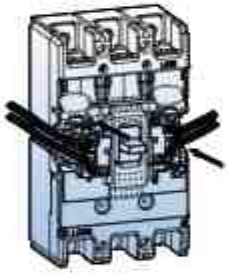
Auxiliary and Alarm switch

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)

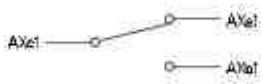
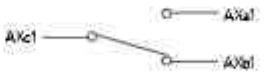
Alarm switches offer provisions for immediate audio or visual indication of a tripped breaker due to overload, short circuit, shunt trip, or undervoltage release conditions.
They are particularly useful in automated plants where operators must be signaled about changes in the electrical distribution 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.

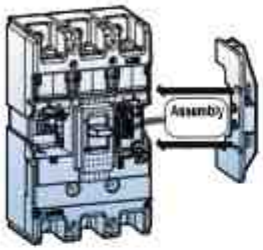
Contact (AX+AL)

MCCB	ON	OFF	TRIP
AX			
AL			

Rating (AX+AL)

Conventional thermal current, Ith		5A		
Rated operational current, Ie		Voltage, Ue	Current, Ie	
			Resistive load	Inductive load
	AC 50/60Hz	125V	5	3
		250V	3	2
		500V	-	-
	DC	30V	4	3
		125V	0.4	0.4
		250V	0.2	0.2

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

Terminal block type

Lead wire type

Control voltage, Ue		Power consumption		
		AC (VA)	DC (W)	mA
Voltage	AC/DC 12V	0.35	0.36	30
	AC/DC 24V	0.64	0.65	27
	AC/DC 48V	1.09	1.1	23
	AC/DC 60V	1.2	1.22	20
	AC/DC 100~130V	0.73	0.75	5.8
	AC/DC 200~250V	1.21	1.35	5.4
	AC 380~450V	1.67	-	3.8
	AC 440~500V	1.68	-	3.5
Max.opening time		50ms (max.)		
Tightening torque of terminal screw		12 kgf - cm		

Note. 1. Range of operational voltage: 0.7 ~ 1.1Vn
Frequency (Only AC): 45Hz ~ 65Hz
2. SHT is available in both type - Terminal block type and Lead wire type

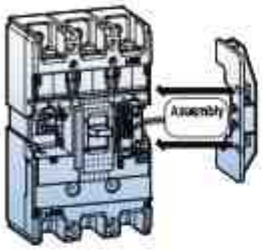
Rating for 400~800AF

Control voltage, Ue
AC/DC 24~48
AC 100~125/DC 100~110
AC 200~240/DC 200~220
AC 380~460
AC 480~550

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

Power consumption		
V	mA	W
AC 24	14	0.3
DC 24	15.4	0.4
AC 48	14	0.7
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

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 ~ 0.7Vn
- Reset and closing of a breaker is possible when the control voltage is over 0.85Vn
- Frequency (Only AC): 45Hz ~ 65Hz

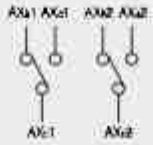
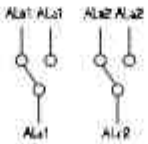
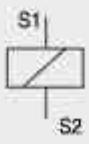
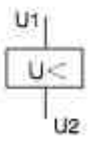
Rating for 30~250AF

Control voltage, Ue		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		12 kgf - cm		
Operating voltage range	Trip	20~70% Vn		
	Reset/Closing	≥ 0.85Vn		

Rating for 400~800AF

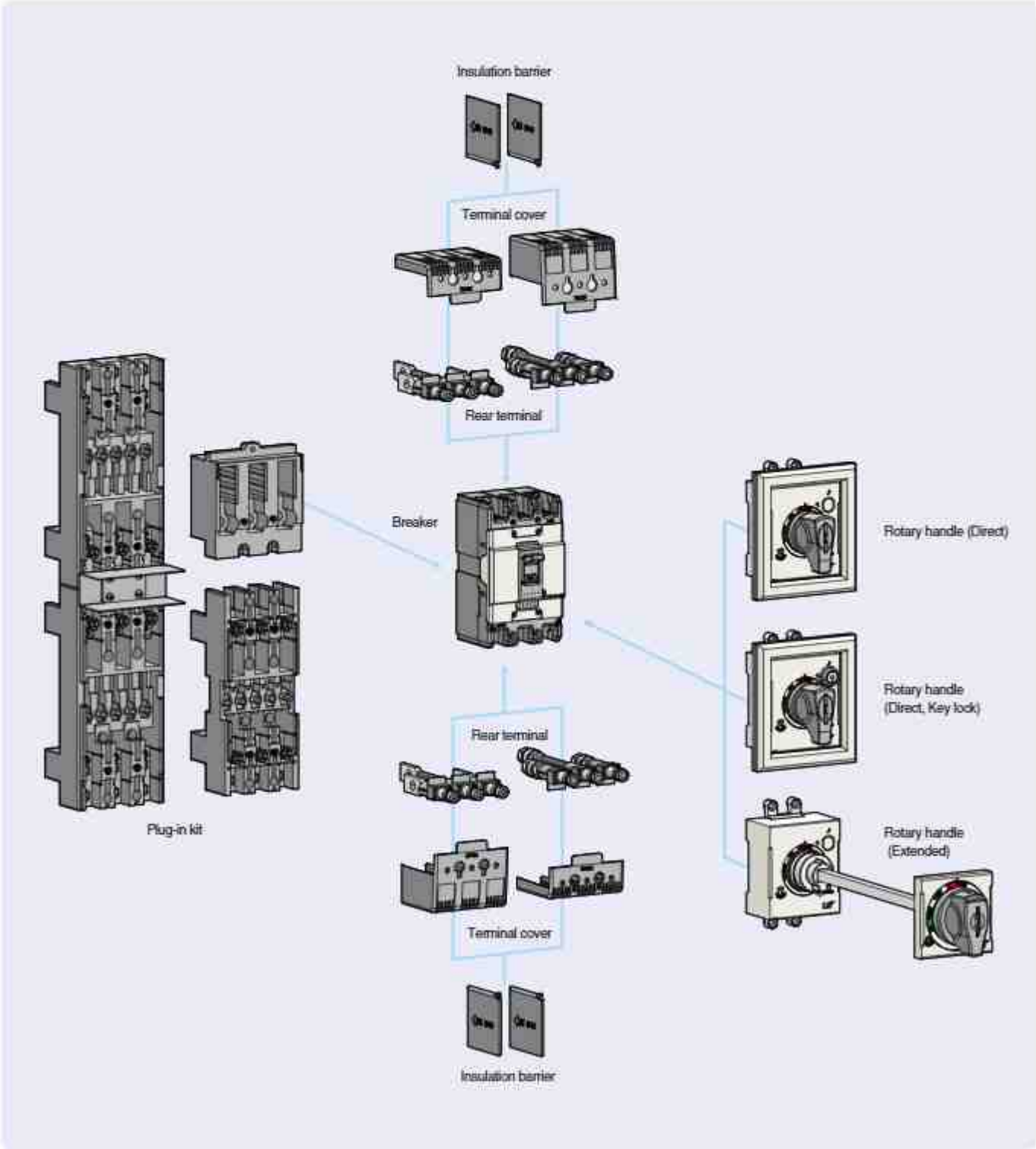
Control voltage, Ue	Trip voltage	Reset/closing voltage	Time rating
AC/DC 48	- AC: 85~1.1Vn - DC: 85~1.25Vn	- AC: 0.2~0.7Vn - DC: 0.2~0.7Vn	Continuous
AC/DC 100~125			
AC/DC 200~240			
AC 380~440			
AC 440~480			

Terminal numbering

Auxiliary Switch (AX)	Alarm Switch (AL)	Shunt Trip (SHT)	Undervoltage trip (UVT)
			

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)

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 (Key lock)	Extended type	Breaker type	
			MCCB	ELCB
N-30c	-	-	ABN50c/60c/100c	EBN50c/60c/100c
DH100	DHK100	EH100	ABS30c/50c/60c	EBS30c/50c/60c
N-40c	-	-	ABS125c	EBS125c
DH125	DHK125	EH125	ABH50c/125c	EBH50c/125c
N-50c	-	-	ABN/S/H250c	EBN/S/H250c
DH250	DHK250	EH250		
N-70	-	E-70U	ABN/S/H/L400c	EBN/S/H/L400c
N-90	-	E-90U	ABN/S/L630c/800c	EBN/S/L630c/800c

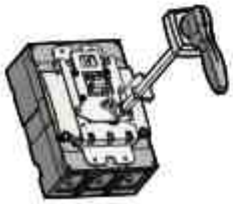
Degree of protections

Type		Degree of protection	IP degree
Circuit breaker with cover frame and rotary direct handle	D-handle N-handle	The access probe of 1.0mm diameter shall not penetrate.	IP40
Circuit breaker with cover frame and rotary extended handle	E-handle	Totally protected against ingress of dust and water jets from any direction	IP65

Note. IP30 for N-handle

Extended type

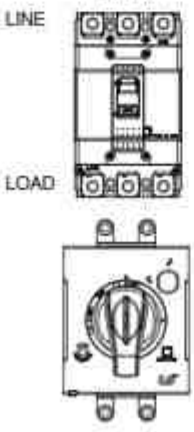
Extended type
(30~250AF)



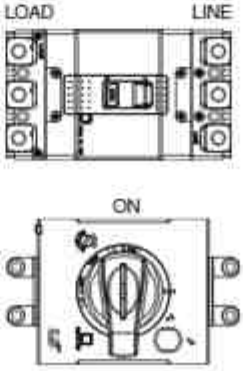
(400~800AF)

Type suffix according to the mounting position

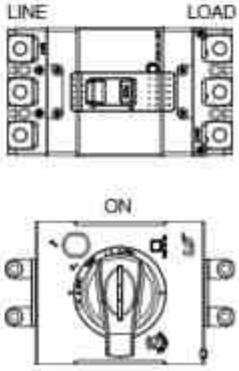
S-Type



L-Type

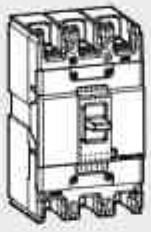
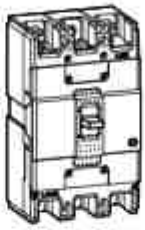
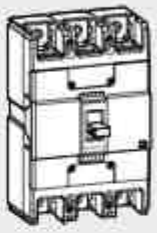


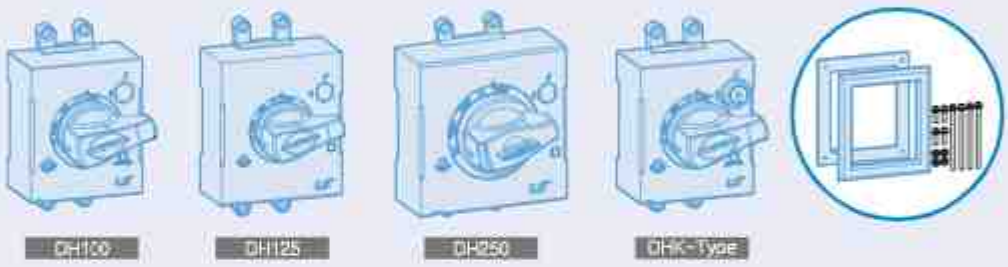
R-Type



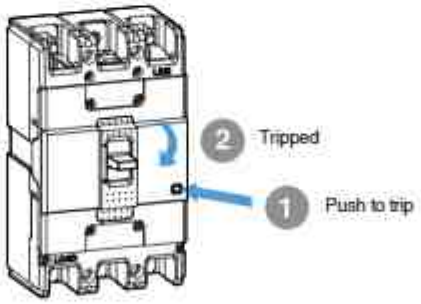
D-handle

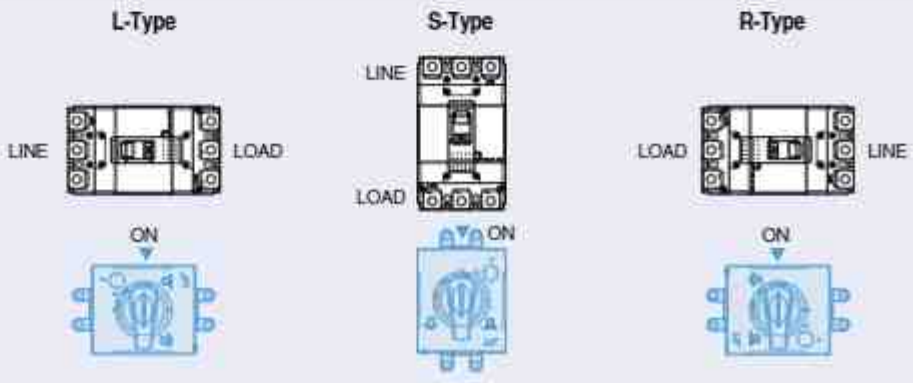
MCCB and D-handle

ABN100c	ABH125c	ABH250c
		

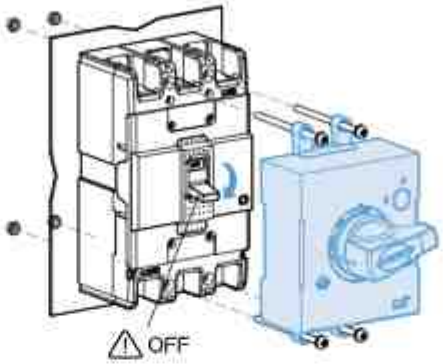


Tripping MCCB & Install type



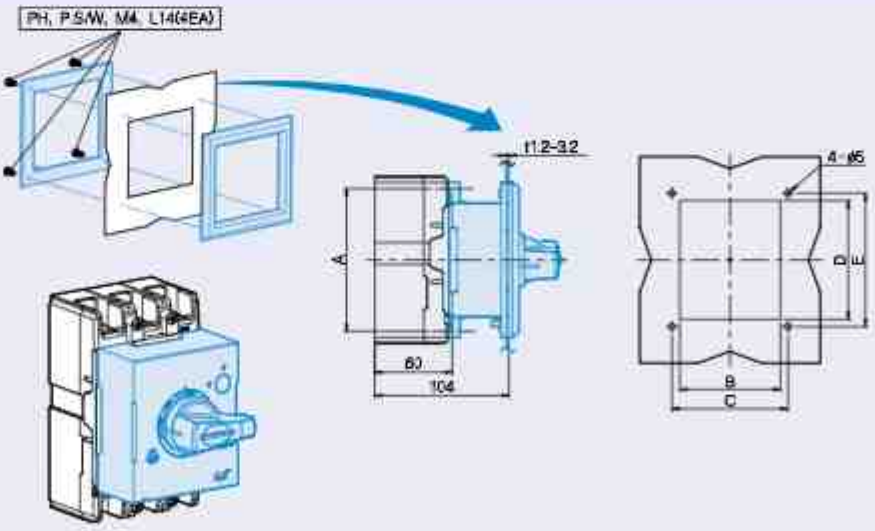


Installing the D-handle



ABN100c, EBN100c	ABH125c, EBH125c	ABH250c, EBH250c
		

Cutting Panel



D-Handle	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

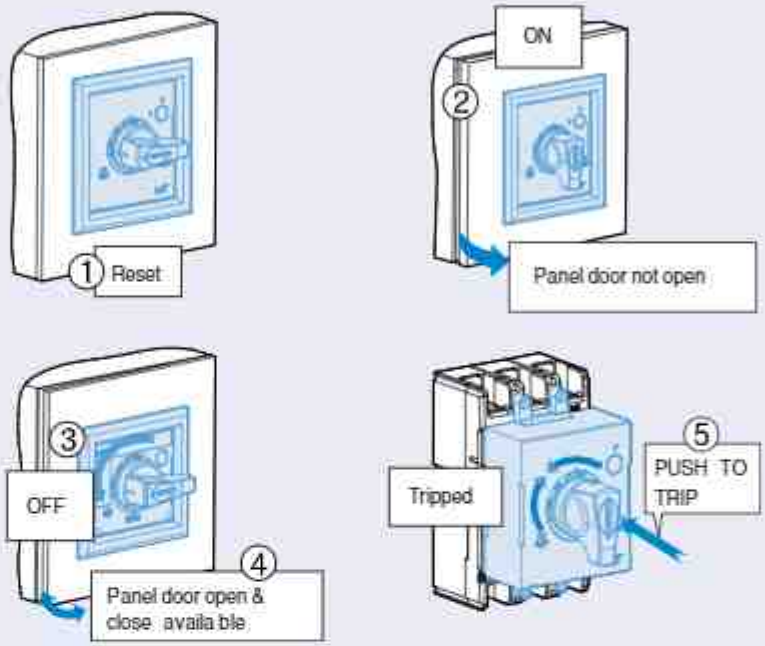
D-handle

Operating Test

⚠ CAUTION

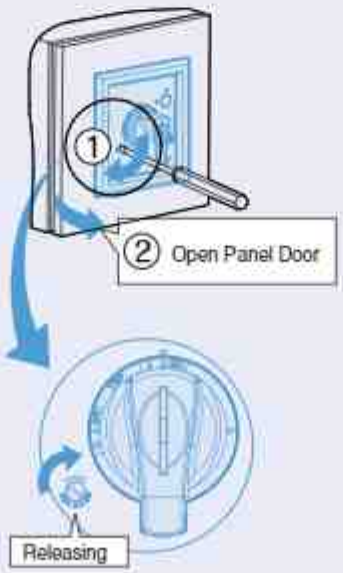
If the door is opened with much pressure when the position of handle is ON or TRIP, the handle lock lever will be demaged.

TRIP position : Panel door can't be opened



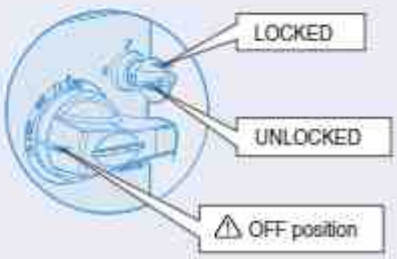
Locking System

Releasing (at ON position)



Locking (ON, OFF position)

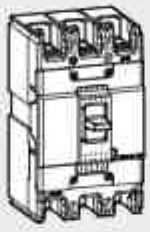
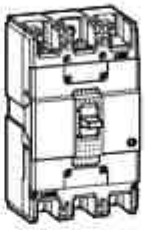
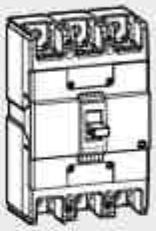
KEY LOCK



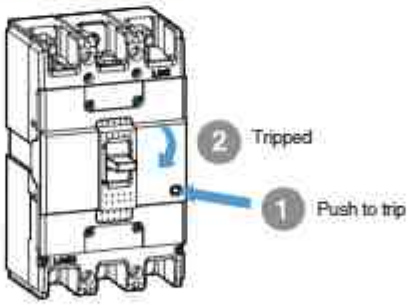
⚠ Remove the key if you operate the handle.

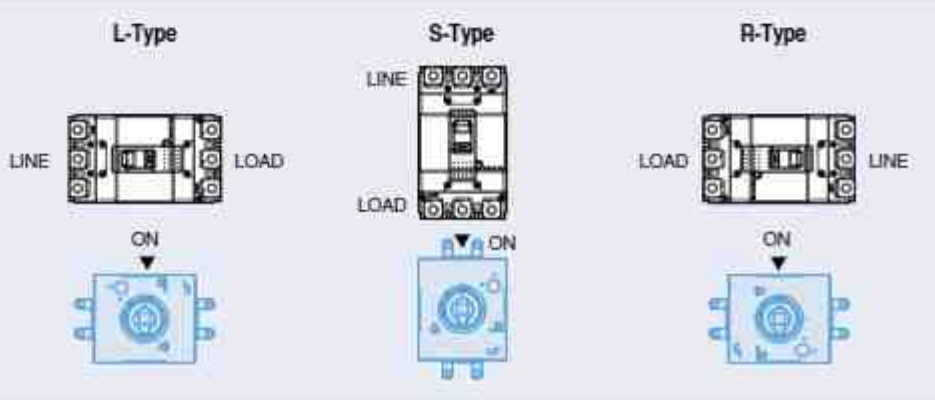
E-handle

MCCB and E-handle

ABN100c	ABH125c	ABH250c
		

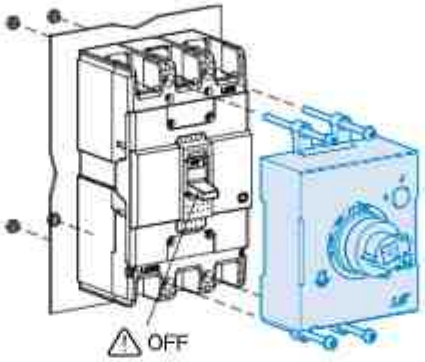
Tripping MCCB & Install type





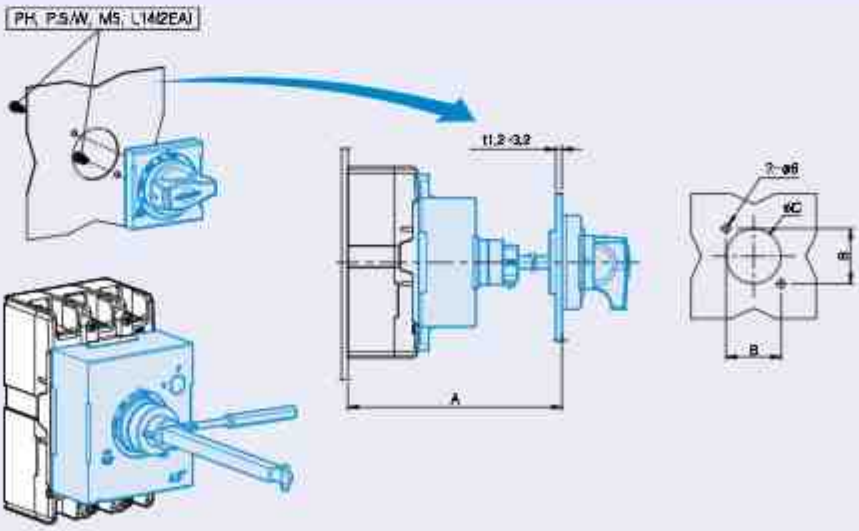
E-handle

Installing the E-handle



ABN100c, EBN100c	ABH125c, EBH125c	ABH250c, EBH250c
		

Cutting Panel



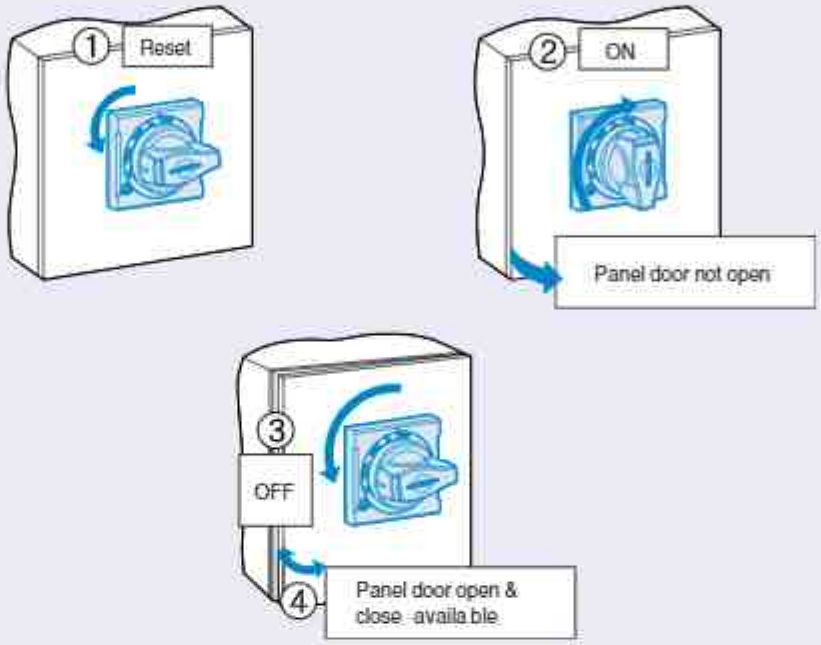
E-Handle	A (mm)	B (mm)	C (mm)	Breaker
EH100	min 150, max 573.5 (SHAFT469mm)	47	Ø53	100AF
EH125	min 150, max 573.5 (SHAFT469mm)	47	Ø53	125AF
EH250	min 150, max 571.5 (SHAFT469mm)	47	Ø53	250AF

Operating Test

⚠ CAUTION

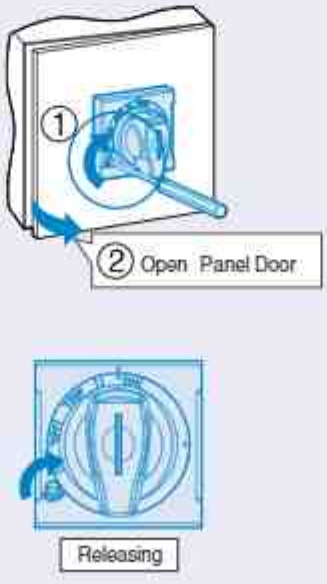
If the door is opened with much pressure when the position of handle is ON or TRIP, the handle lock lever will be damaged.

TRIP position : Panel door can't be opened



Locking System

Releasing (at ON position)



Locking (ON, OFF position)

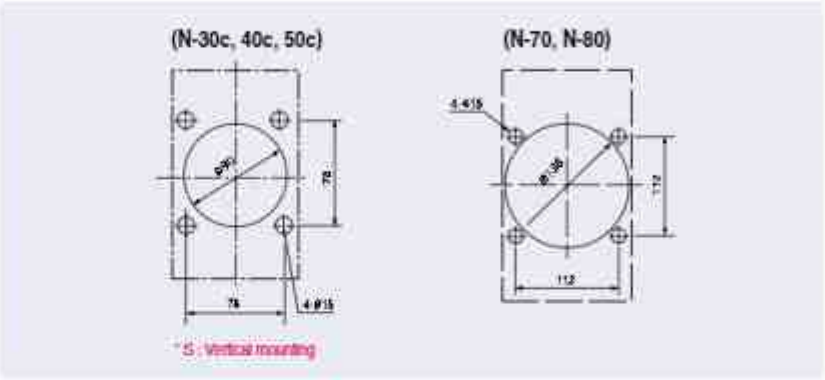
N-handle

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

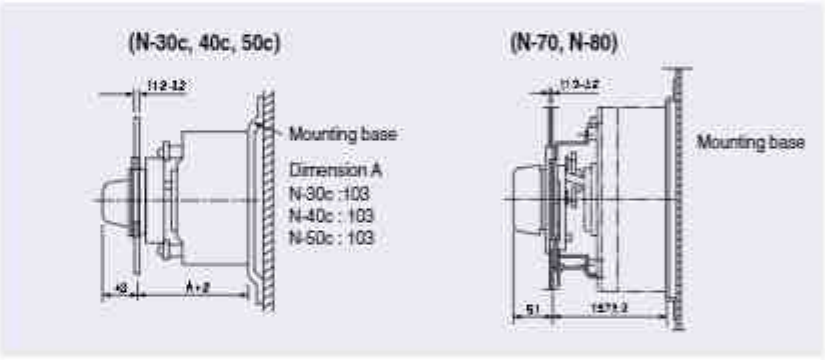


<Fig 1>

(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

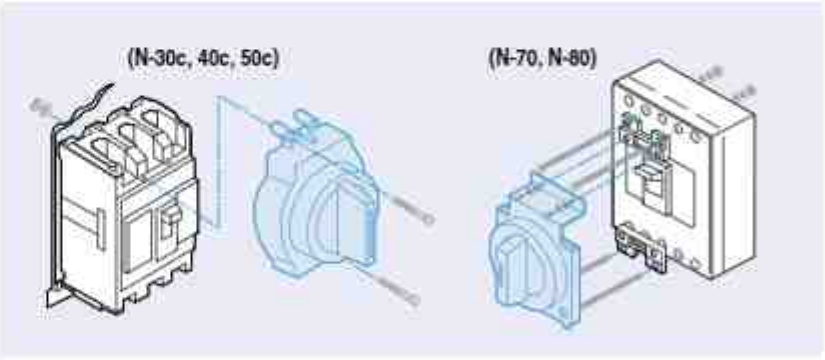


<Fig 2>

(3) Fixing

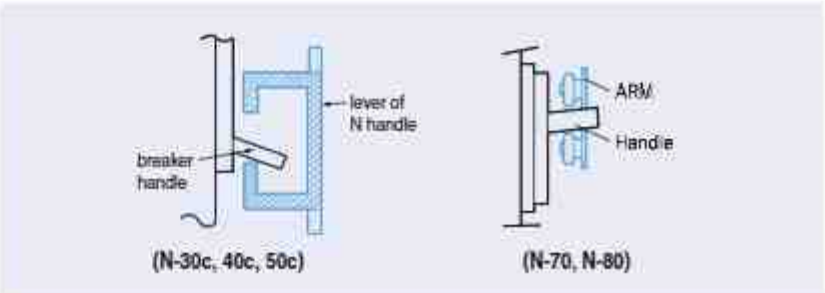
① Fixing a breaker and a handle at the same time.

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.

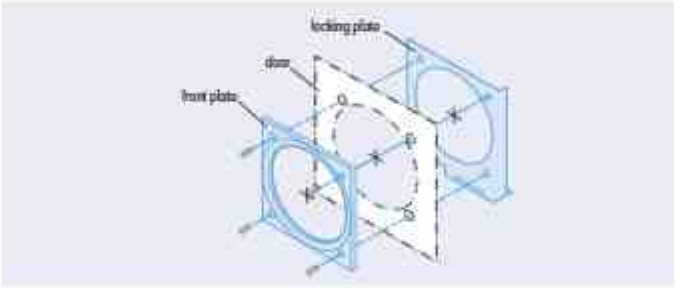
c) Fix the N handle on the breaker with the 2 (short) screws enclosed.

d) Fix the breaker on a mounting base with the 2 (long) screws

<Fig 5>

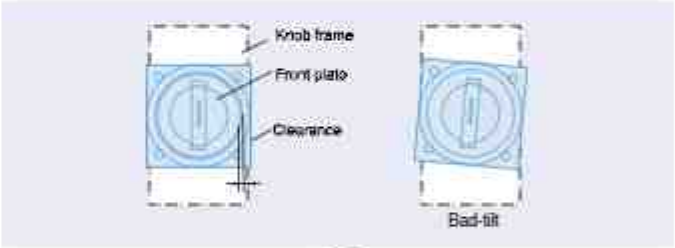
(4) Fixing front plate and lock plate

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



<Fig 6>

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

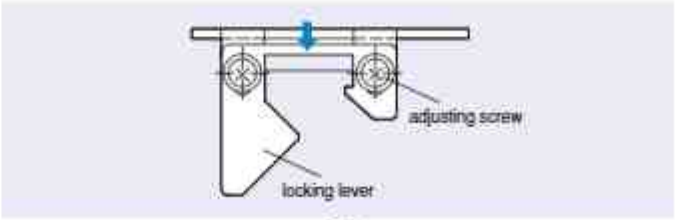


<Fig 7>

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.

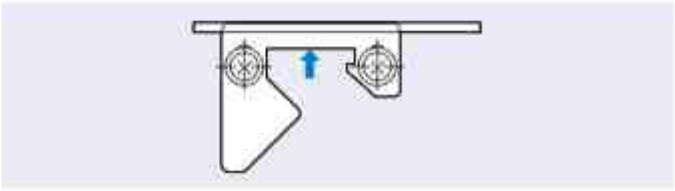
<Fig 8>

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 platein the direction of the arrow as shown in Fig. 9.



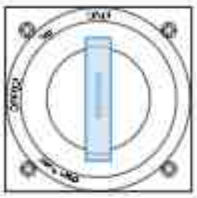
<Fig 9>

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 10>

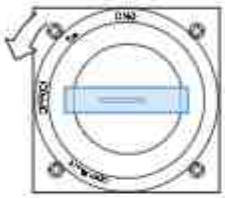
N-handle



<Fig 11>

(1) Operation in the door closed

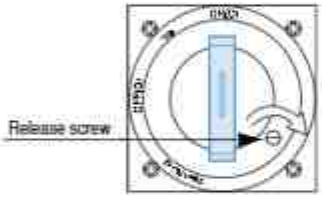
① To have the breaker ON turn the handle to be vertical. <Fig. 11>
② To have the breaker OFF turn the handle to be horizontal. <Fig. 12>
③ If the breaker is tripped, the handle points to the TRIP position.
④ To reset the breaker turn the handle to Reset position.



<Fig 12>

(2) Unlocking the panel door

① The door is locked and will not open at ON, OFF and TRIP status.
②To 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>



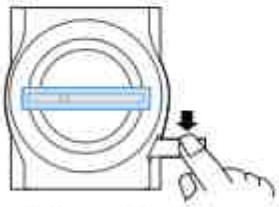
<Fig 13>

(3) Operation of the breaker in the door open

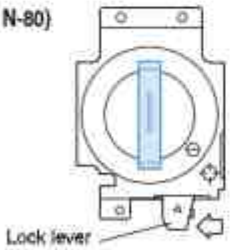
①When the door is open the breaker will not be ON as the lock lever operates.
②To release the locking pull the lock lever to be nearly horizontal position. Then the breaker can be closed. <Fig. 14>
③ If the door is closed the lock lever will be reset automatically.

Padlocking

(N-30, 40, 50)

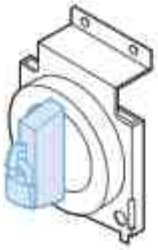


(N-70, N-80)



<Fig 14>

① Lockable at ON or OFF state with a padlock. (Padlock is not supplied)
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



<Fig 15>

Terminal covers

TCS (Short type)

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 IP40 degree of protection.

- **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.

TCL (Long type)

Type		Pole	Breaker		Size extended(A), mm	
Short Type	Long Type		MCCB	ELCB	Short Type	Long Type
TBS22	-	2P	ABE30b	-	10	-
TBS23	-	3P				
TCS12	TCL12	2P	ABN50c/60c/100c ABS30c/50c/60c	EBN50c/60c/100c EBS30c/50c/60c	5.5	30
TCS13	TCL13	3P				
TCS14	TCL14	4P				
TCS22	TCL22	2P	ABS125c ABH50c/125c	EBS125c EBH50c/125c	5.5	40
TCS23	TCL23	3P				
TCS24	TCL24	4P				
TCS33	TCL33	2/3P	ABN250c, ABS250c ABH250c	EBN250c, EBS250c EBH250c	5.5	50
TCS34	TCL34	4P				
-	T1-43A	2, 3P	ABN/S/H/L400c	EBN/S/H/L400c	-	120
-	T1-44A	4P				
-	T1-63A	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.


Short type construction


Long type construction

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
IB-13	ABN50c/60c/100c ABS30c/50c/60c	EBN50c/60c/100c EBS30c/50c/60c
IB-23	ABS125c ABH50c/125c ABN250c, ABS250c ABH250c	EBS125c EBH50c/125c EBN250c, EBS250c EBH250c
IBL400	ABN/S/H/L400c	EBN/S/H/L400c
IBL800	ABN/S/L800c	EBN/S/L800c

Insulation barriers for line side are provided as standard.

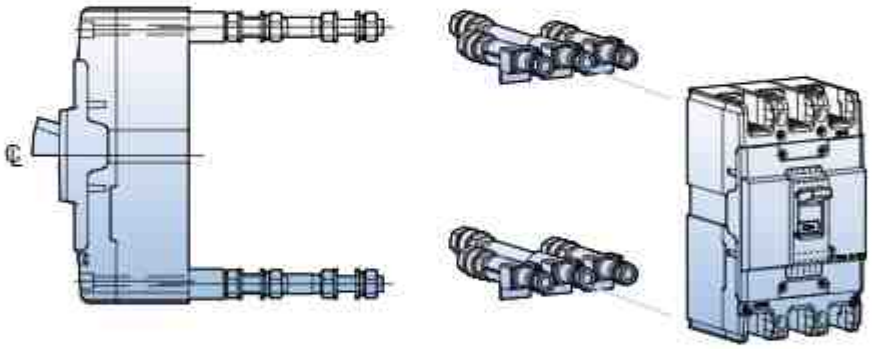
Rear connection terminals

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

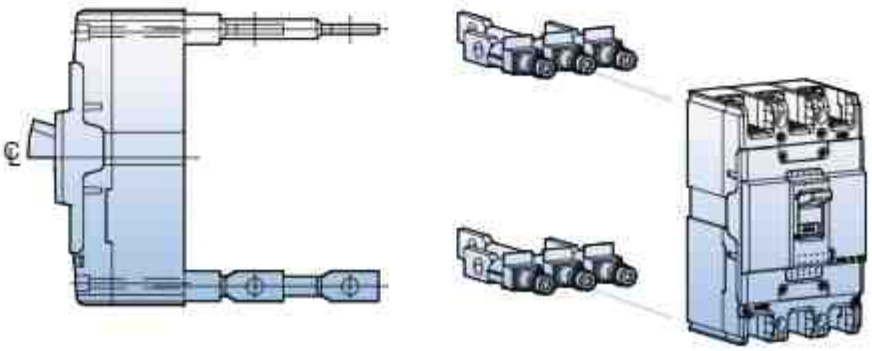
Round type terminals

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



Flat type terminals

Breaker	For 2-pole	For 3-pole	For 4-pole
ABN100c	RTB1-102	RTB1-103	RTB1-104
ABH125c	RTB2-102	RTB2-103	RTB2-104
ABH250c	RTB3-202	RTB3-203	RTB3-204
AB□400c	X-402	X-403	X-404
AB□800c	X-802	X-803	X-804



Plug-in base

Plug-in devices

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

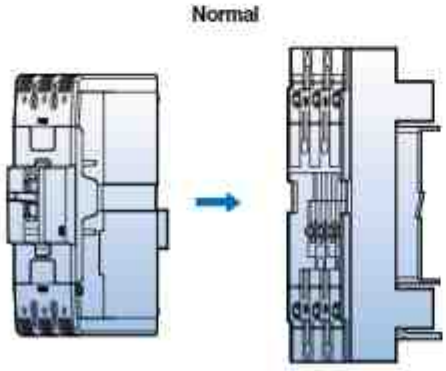
Plug-in type MCCB
(plug-in terminal built)

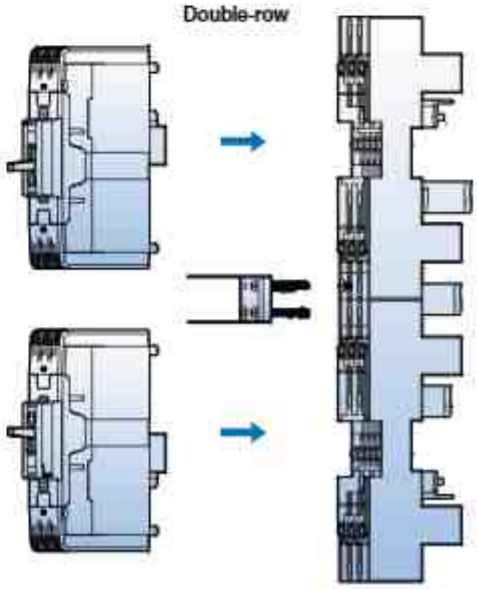
Type names of blocks

Breaker	Arrangement	P lug-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	

ABH103c plug-in type

ABH203c plug-in type





Type numbering system

MCCB

AB	S	10	3	C	M	/	100A	AX	SHT=220V

MCCB

Type

N	N-Type
S	S-Type
H	H-Type
L	L-Type

Ampere Frame

3	30AF
5	50AF
6	60AF
10	100/125AF
20	225/250AF
40	400AF
80	800AF
100	1000AF
120	1200AF

Pole

2	2-pole
3	3-pole
4	4-pole

Series

Application

-	General purpose
M	Motor protection

Rated current

3A	150A
5A	175A
10A	200A
15A	225A
20A	250A
30A	300A
40A	350A
50A	400A
60A	500A
75A	630A
100A	700A
125A	800A
150A	1200A

Rated current

Accessory

AX	Auxiliary Switch
AL	Alarm Switch
SHT	Shunt Trip
UVT	Undervoltage trip
DH	Rotary handle (Direct)
EH	Rotary handle (Extended)
RTR RTB	Rear terminal

Control voltage of accessory

SHT
AC/DC 12V
AC/DC 24V
AC/DC 48V
AC/DC 60V
AC/DC 100V~130V
AC/DC 200V~250V
AC 380V~450V
AC 440V~500V
UVT
AC/DC 24V
AC/DC 48V
AC/DC 100V~110V
AC/DC 200V~220V
AC 380V~440V
AC 440V~480V

ELCB

EB	S	10	3	C	/	100A	30mA	AX

ELCB

Type

N	N-Type
S	S-Type
H	H-Type
L	L-Type

Ampere Frame

3	30AF
5	50AF
6	60AF
10	100/125AF
20	225/250AF
40	400AF
80	800AF
100	1000AF
120	1200AF

Pole

2	2-pole
3	3-pole
4	4-pole

Series

Rated current

15A	225A
20A	250A
30A	300A
40A	350A
50A	400A
60A	500A
75A	630A
100A	700A
125A	800A
150A	1000A
175A	1200A
200A	

Rated residual current

30mA
100/200/500mA

Accessory

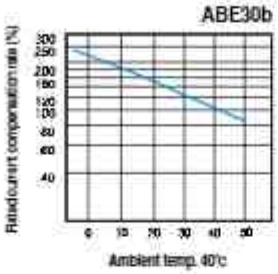
AX	Auxiliary Switch
AL	Alarm Switch
DH	Rotary handle (Direct)
EH	Rotary handle (Extended)
RTR RTB	Rear terminal

Characteristics curves

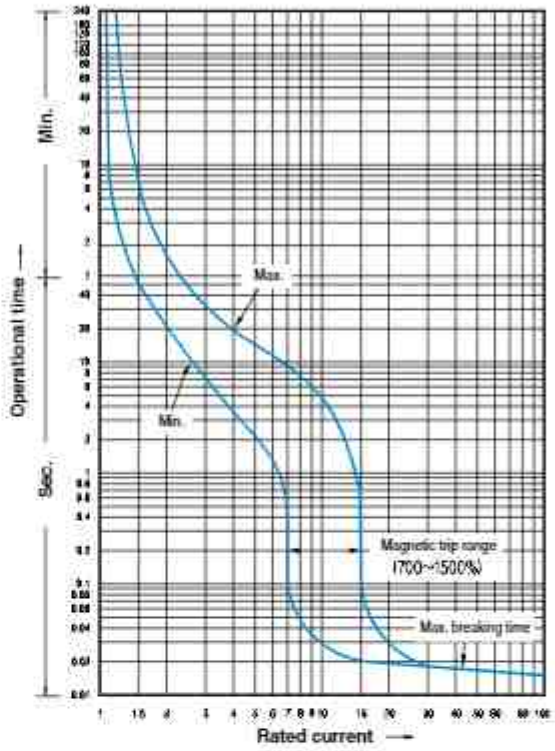
Breaker types

MCCB
ABE30b

Compensation curves



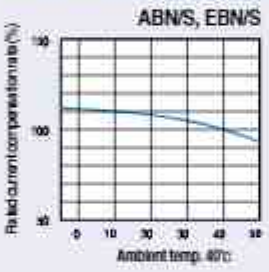
Rated current: 3~30A (ABE)



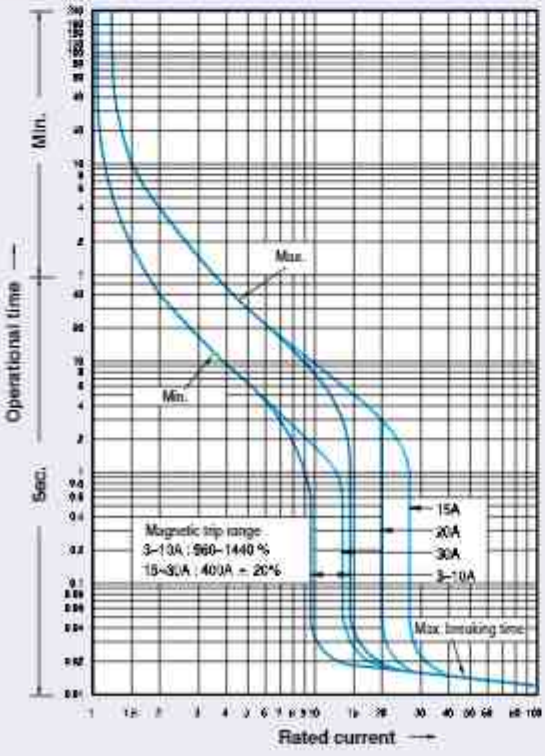
Breaker types

MCCB
ABN50c/60c/100c/100d
ABS30c/50c/60c
ELCB
EBN50c/60c/100c
EBS30c/50c/60c

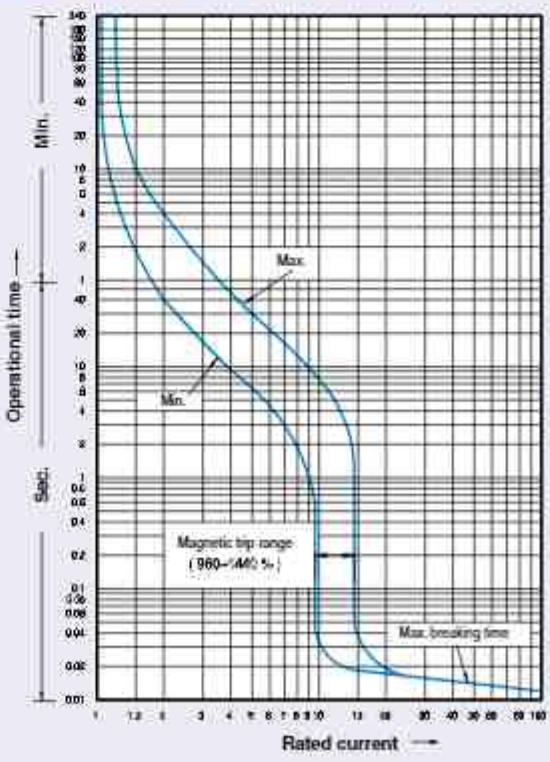
Compensation curves



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



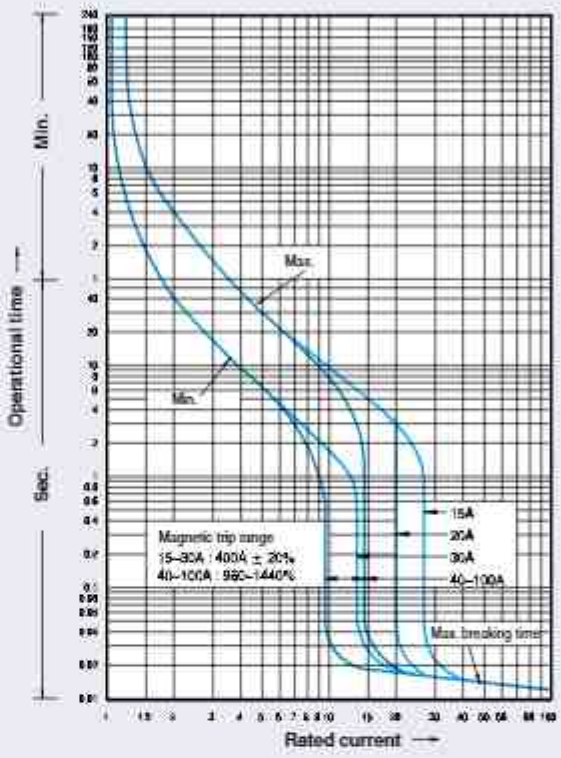
Rated current: 40~100A (ABN/S,EBN/S)



Breaker types

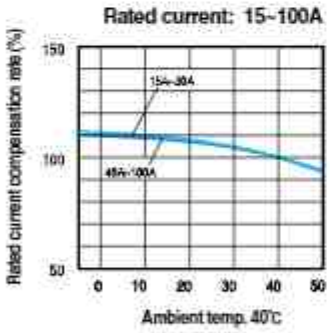
MCCB
ABS125c
ABH50c/125c
ELCB
EBS125c
EBH50c/125c

Rated current: 15~30A, 40~100A

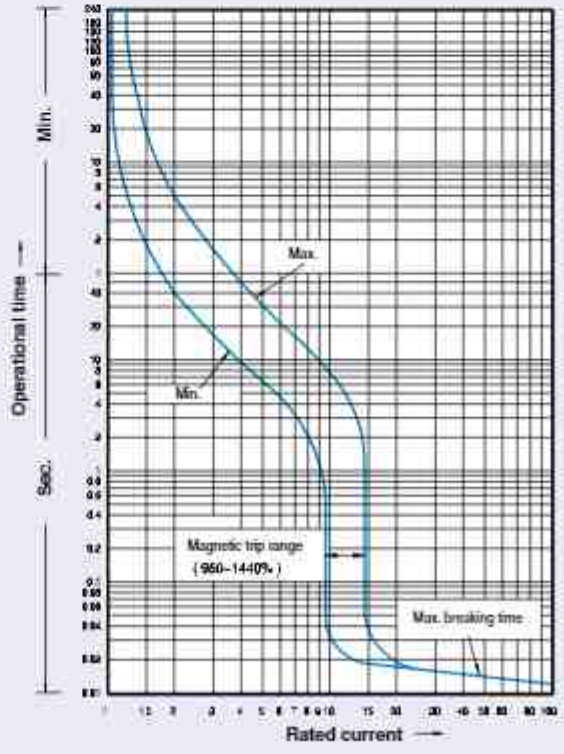


Compensation curves

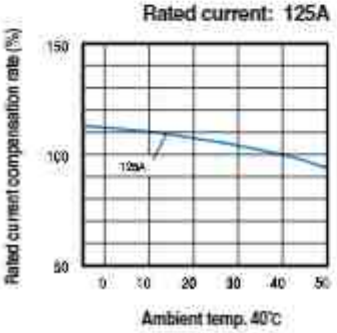
Rated current: 15~100A



Rated current: 125A



Rated current: 125A

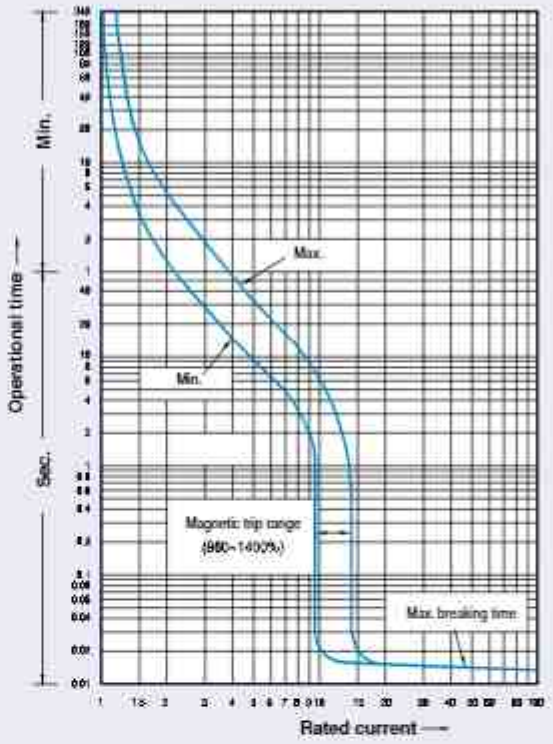


Characteristics curves

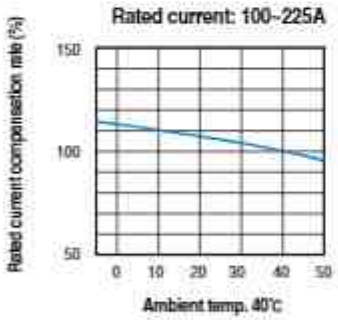
Breaker types

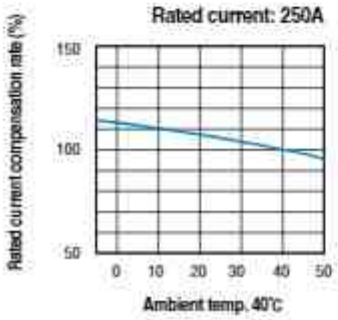
MCCB
ABN250c, ABS250c
ABH250c
ELCB
EBN250c, EBS250c
EBH250c

Rated current: 100~225A

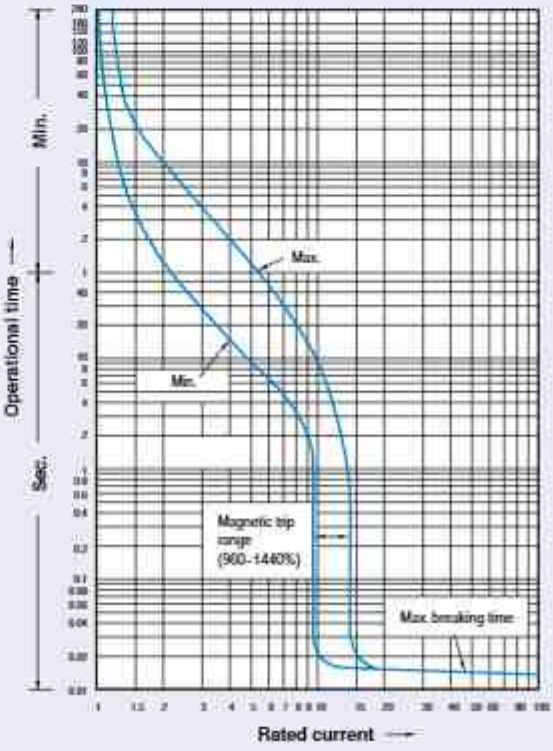


Compensation curves





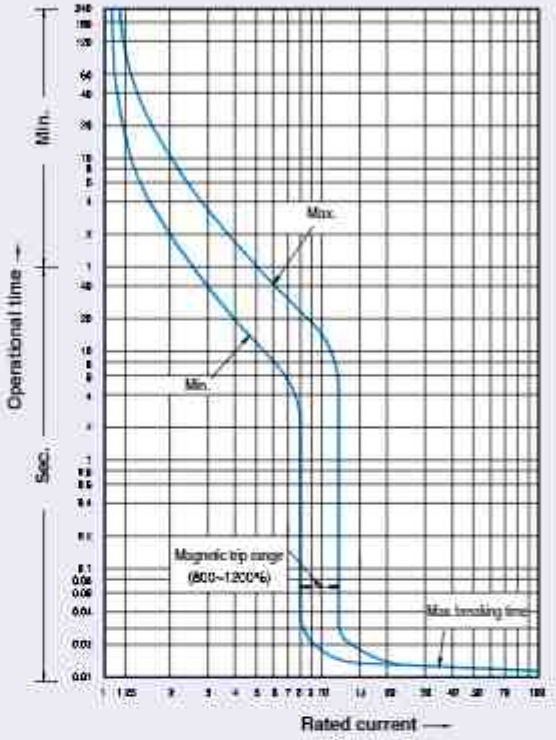
Rated current: 250A



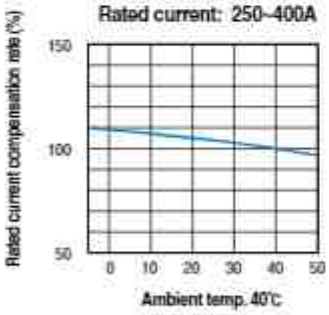
Breaker types

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

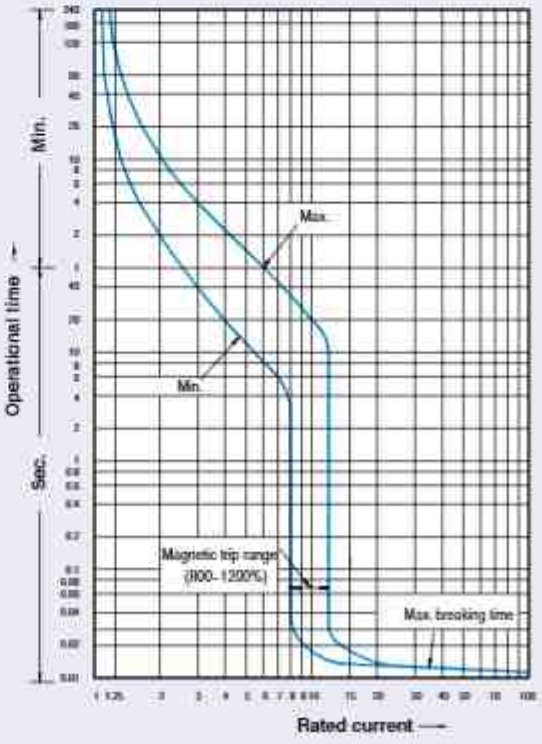
Rated current: 250~400A

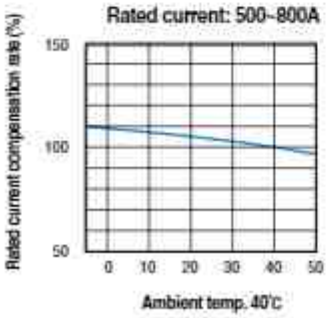


Compensation curves



Rated current: 500~800A



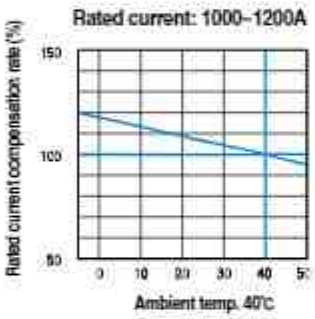


Characteristics curves

Breaker types

MCCB
ABS1000b, ABL1000b
ABS1200b, ABL1200b
ELCB
EBS1003b, EBS1203b

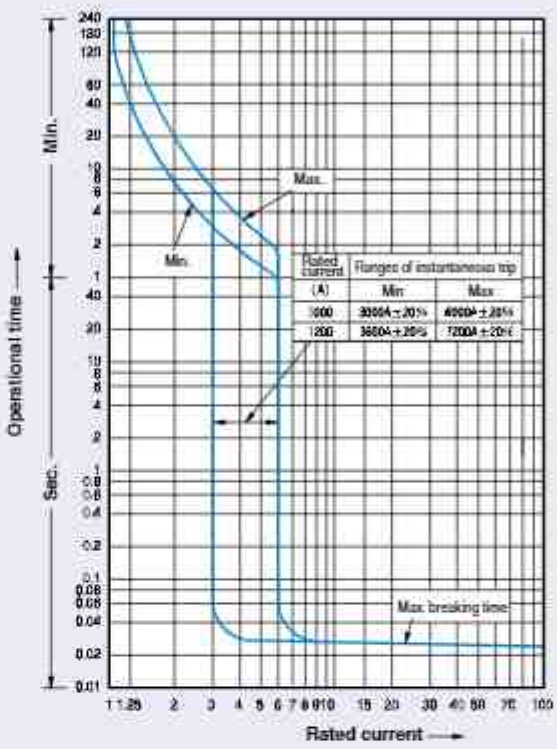
Compensation curves



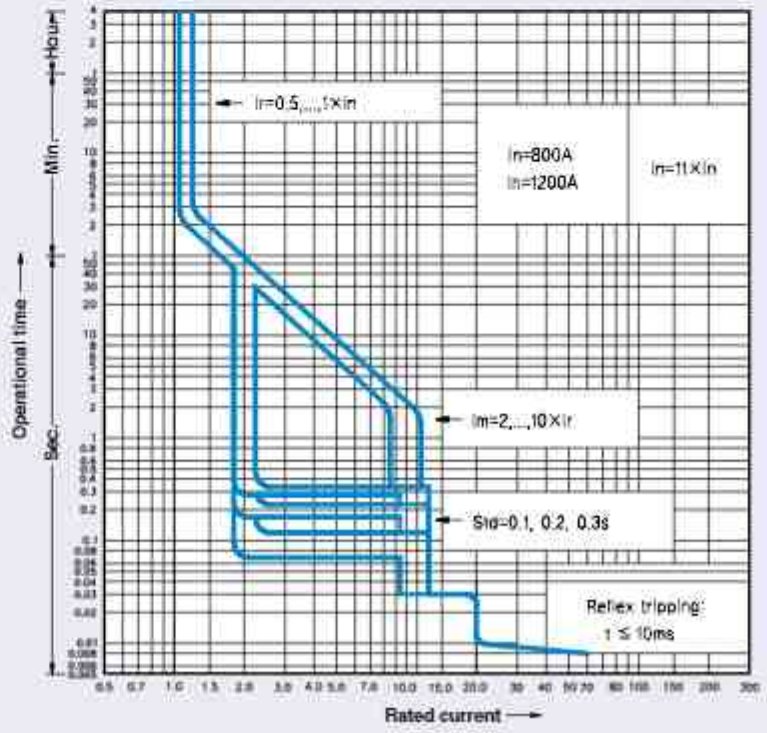
Breaker types

MCCB
ABS1200bE

Rated current: 1000~1200A



Rated current: 1200A

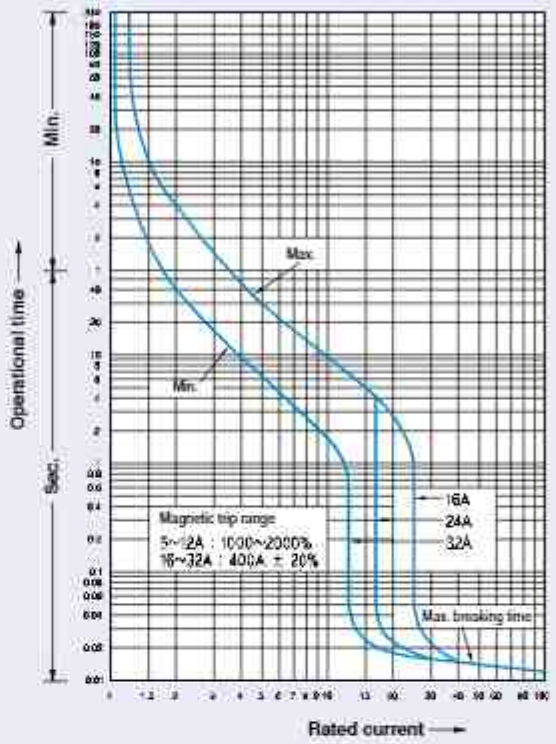


Characteristics curves
Motor Protection type

Breaker types

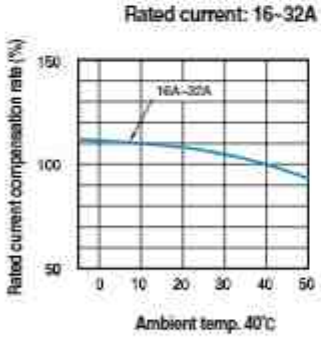
MCCB
ABN50cM/60cM/100cM/100dM
ABS30cM/50cM/60cM

Rated current: 16~32A

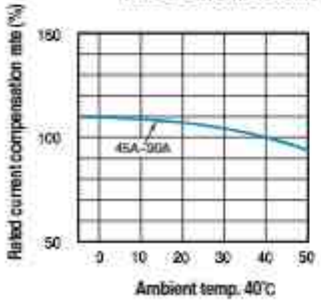


Compensation curves

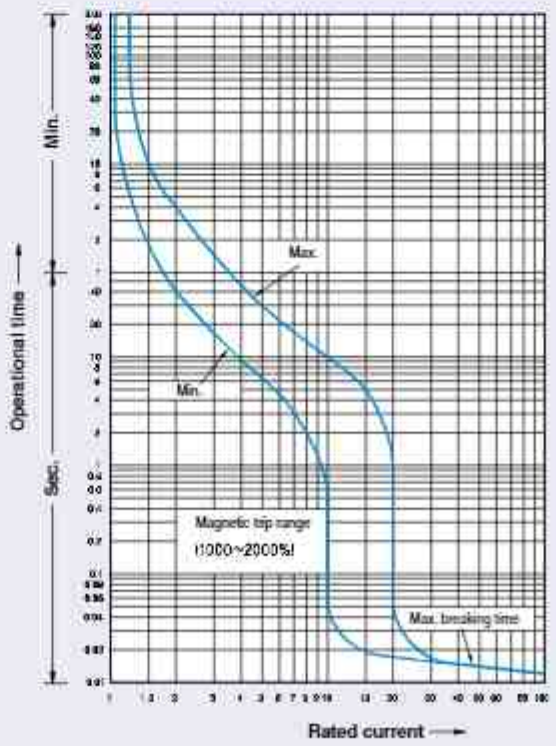
Rated current: 16~32A



Rated current: 45~90A



Rated current: 45~90A

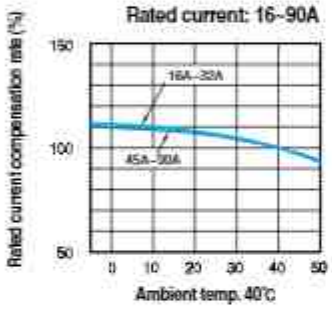


Characteristics curves
Motor Protection type

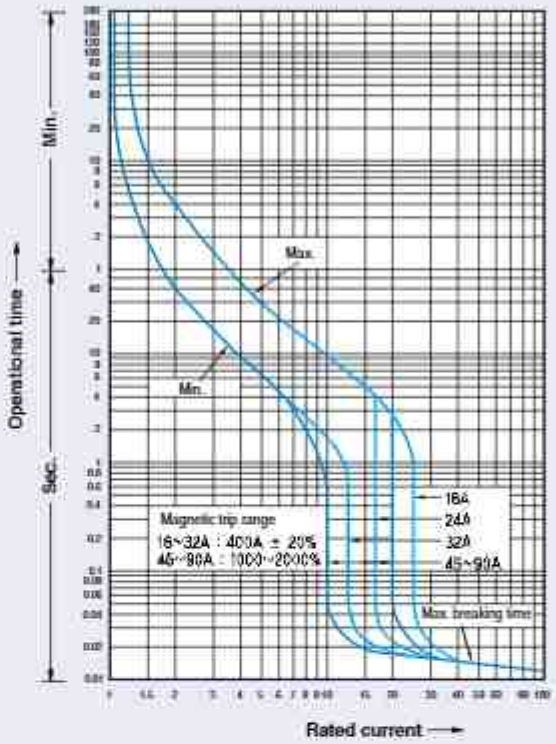
Breaker types

MCCB
ABS125cM
ABH50cM/125cM

Compensation curves



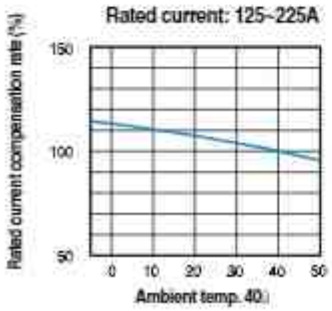
Rated current: 16~90A



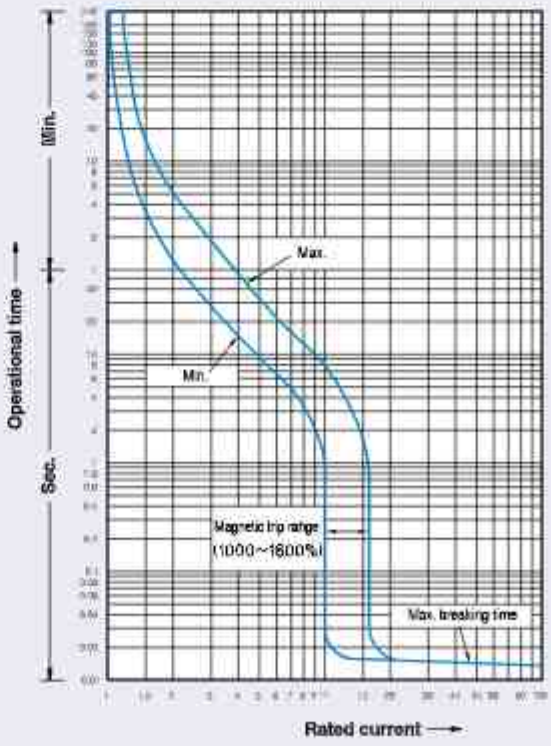
Breaker types

MCCB
ABN250cM, ABS250cM
ABH250cM

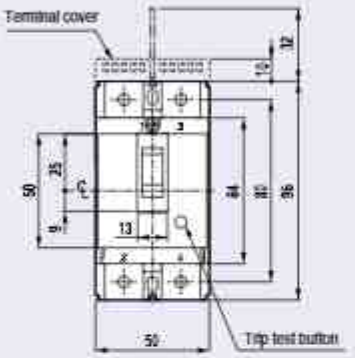
Compensation curves



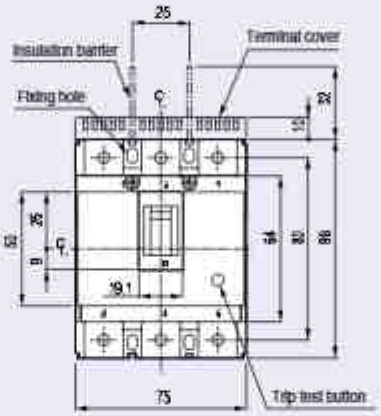
Rated current: 125~225A



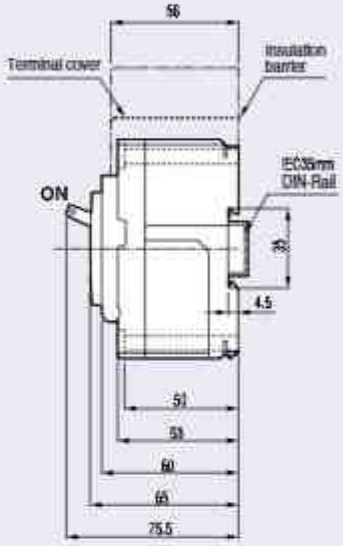
MCCB



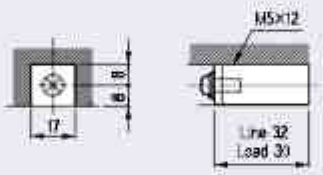
2P



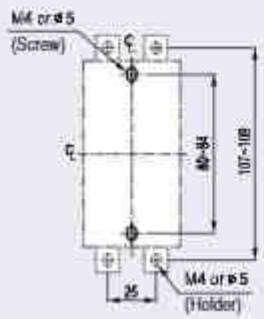
3P

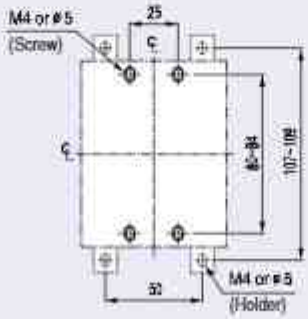


Terminal details

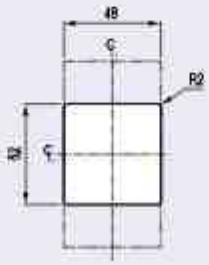


Panel drilling

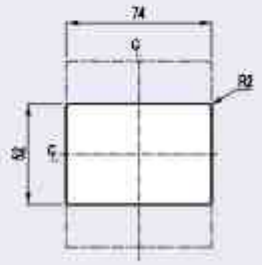




Front panel cutting

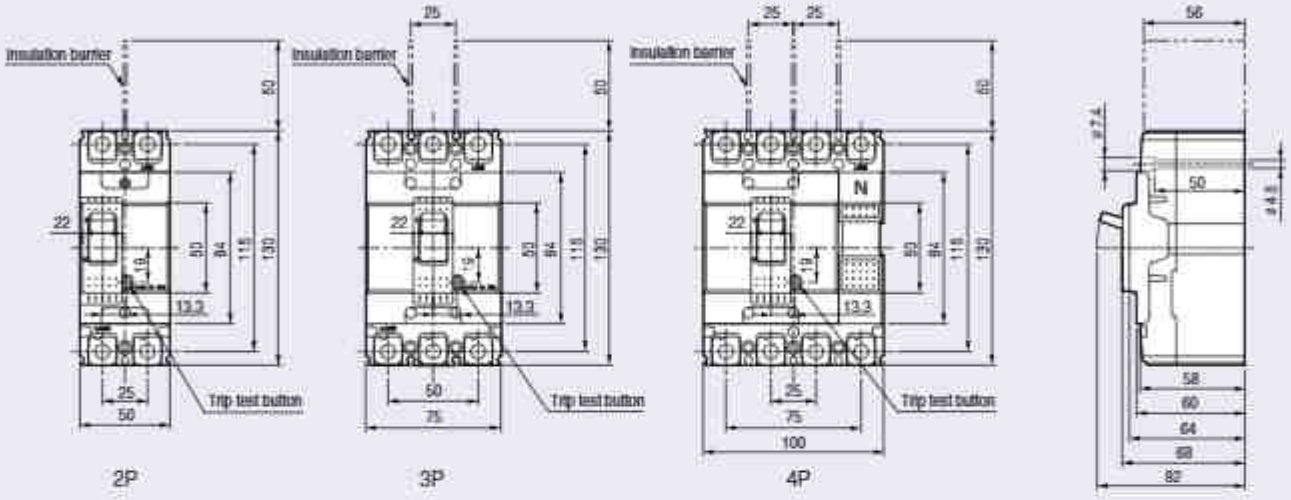


3P

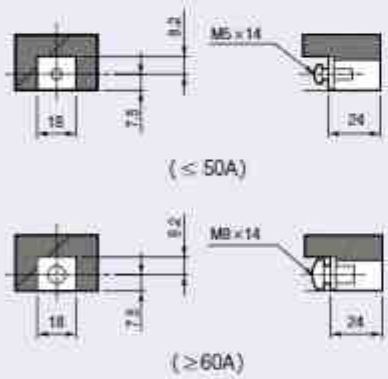


3P

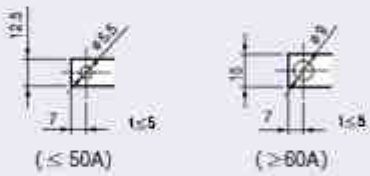
MCCB



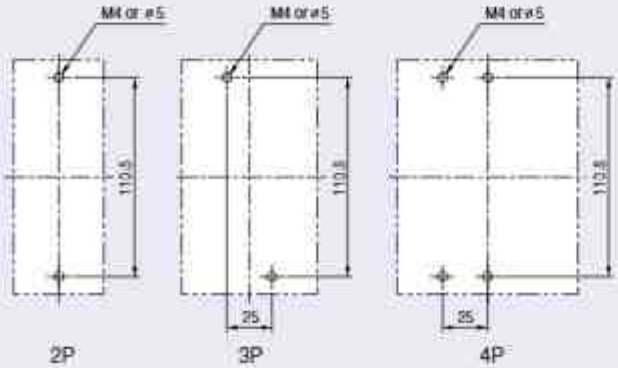
Terminal details



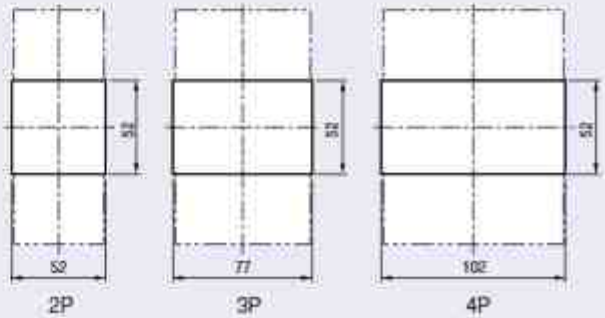
Connecting



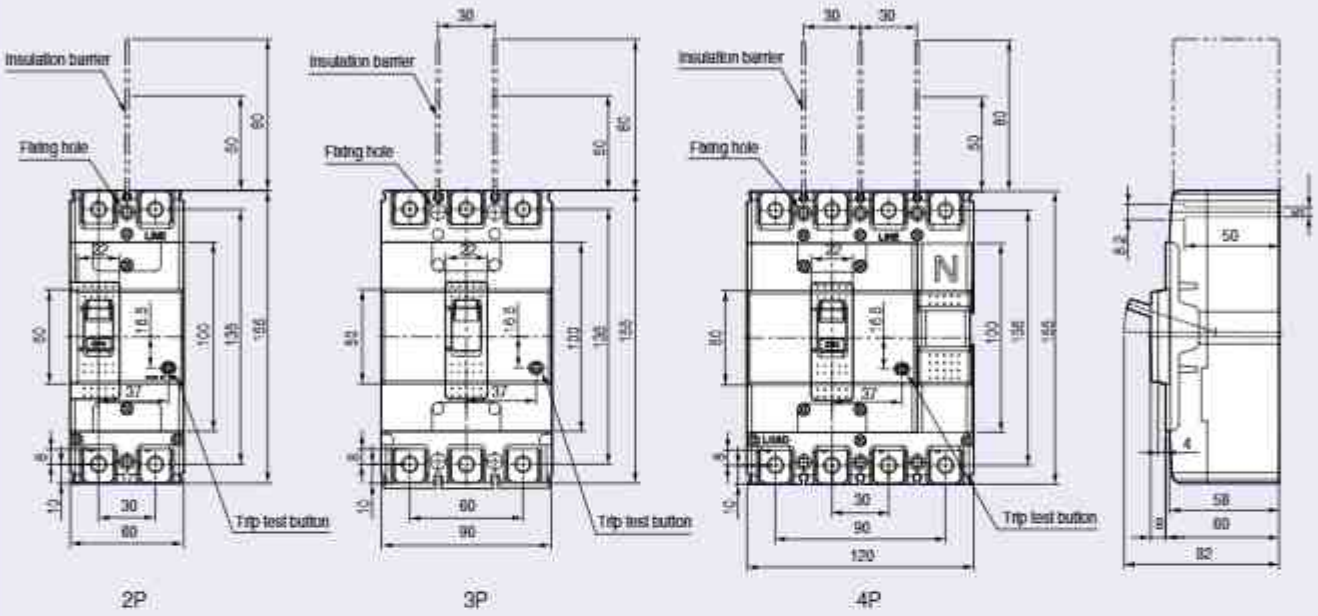
Panel drilling



Front panel cutting

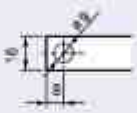


MCCB

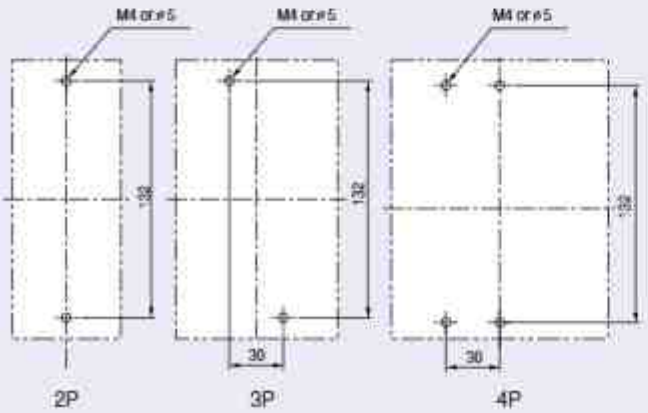


Terminal details

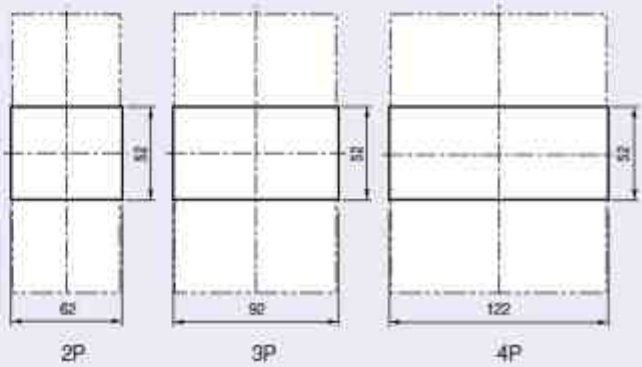
Connecting



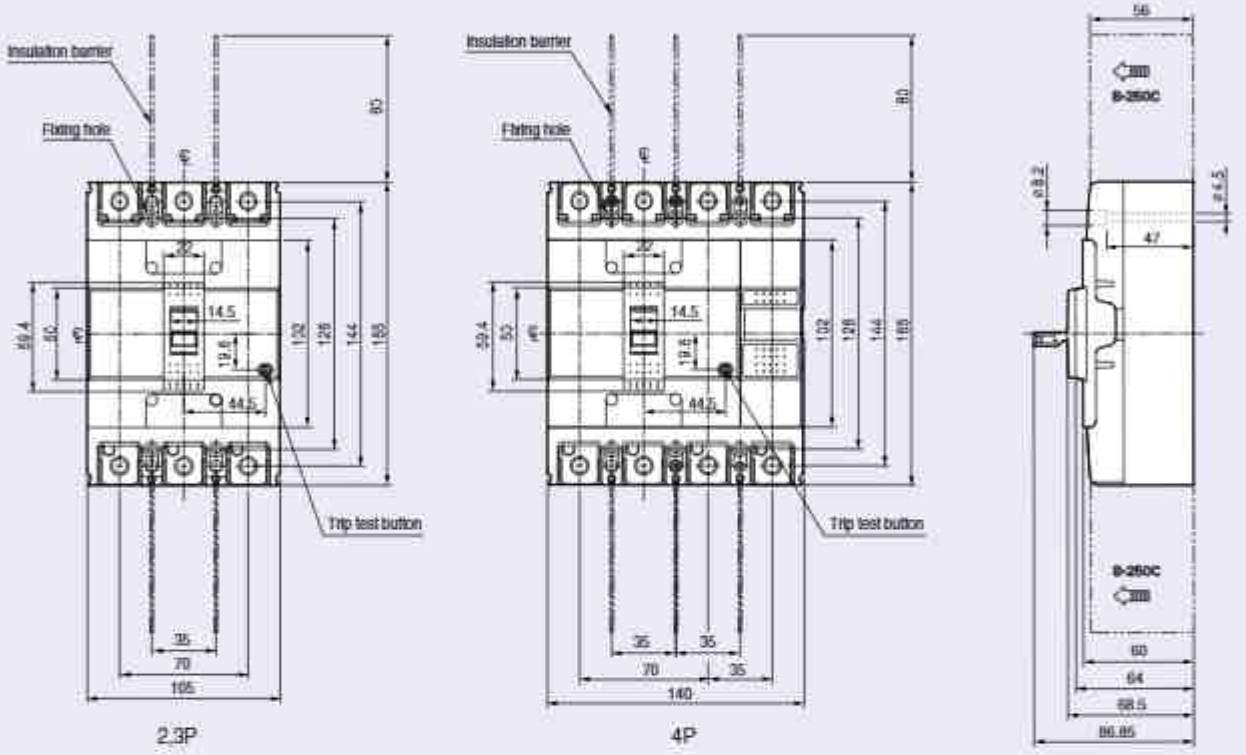
Panel drilling



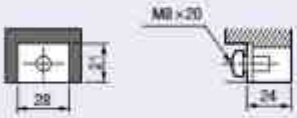
Front panel cutting



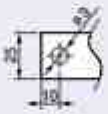
MCCB



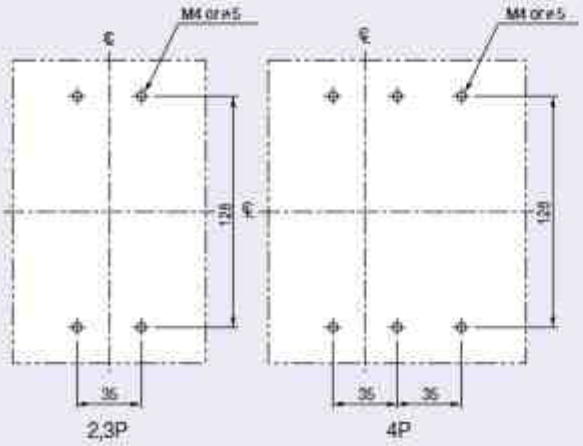
Terminal details



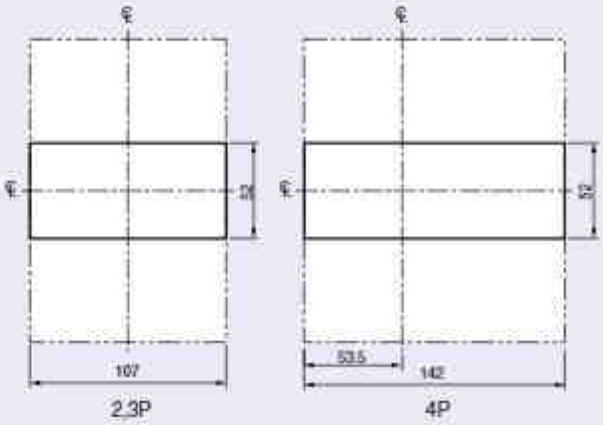
Connecting



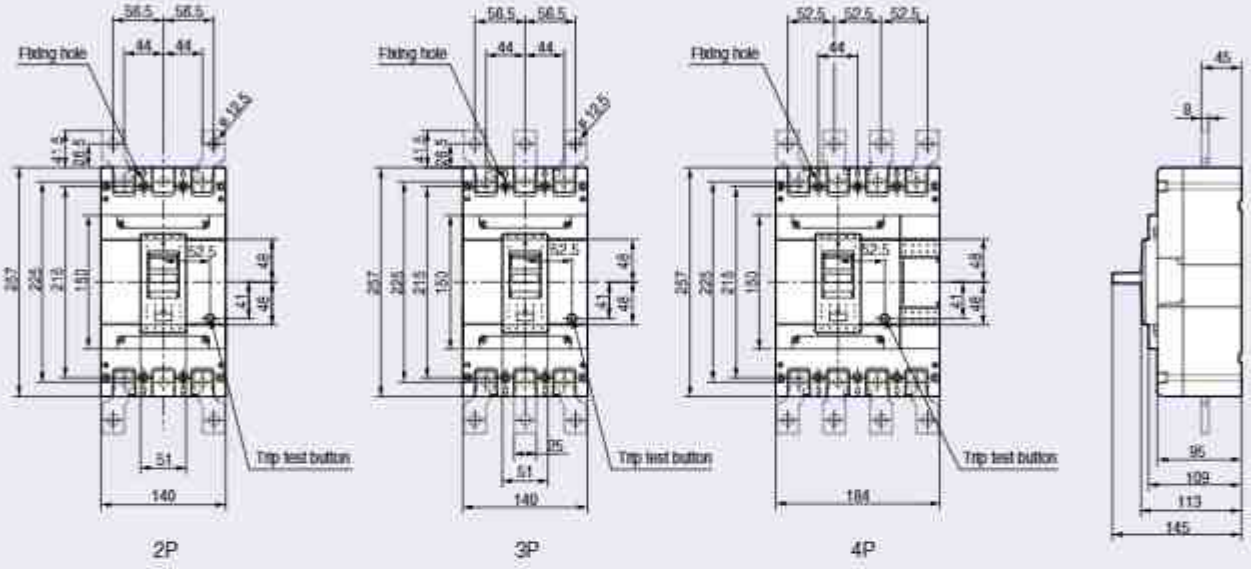
Panel drilling



Front panel cutting

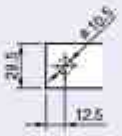


MCCB

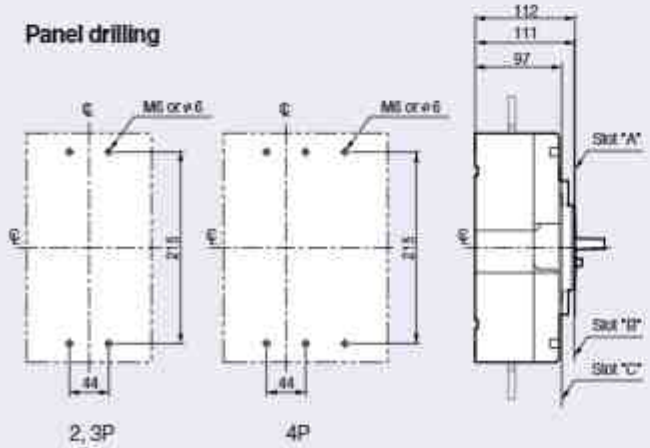


Terminal details

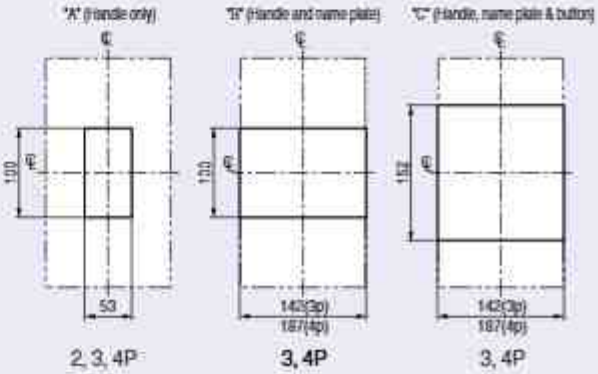
Connecting



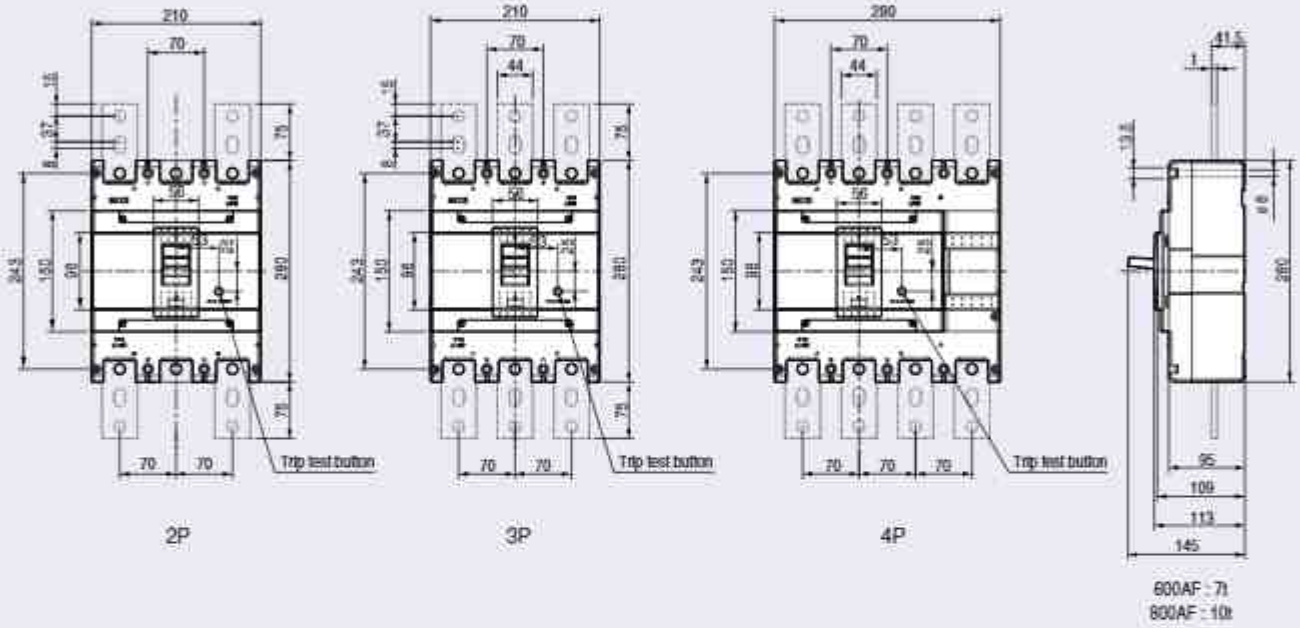
Panel drilling



Front panel cutting



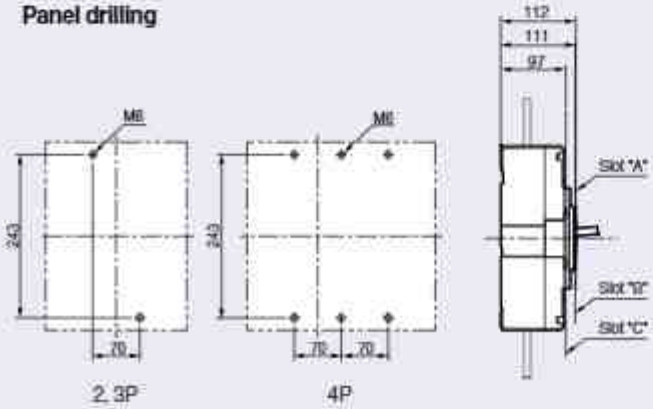
MCCB



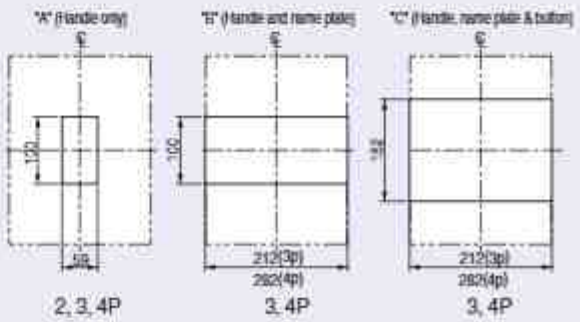
Terminal details

Connecting

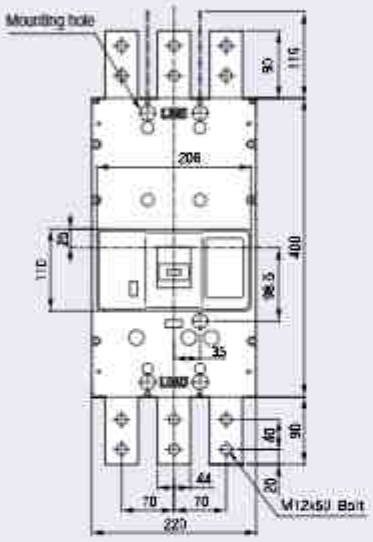
Panel drilling



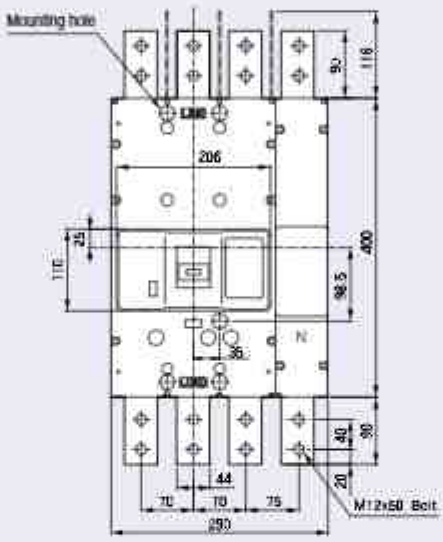
Front panel cutting



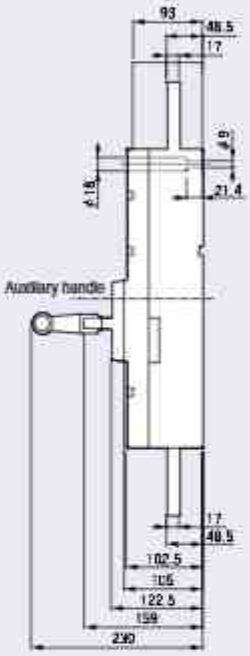
MCCB



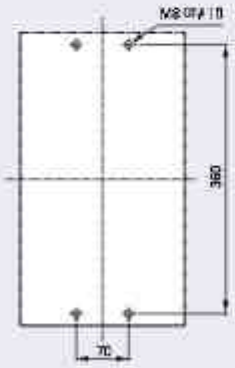
3P



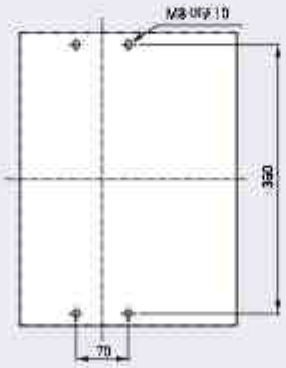
4P



Panel drilling

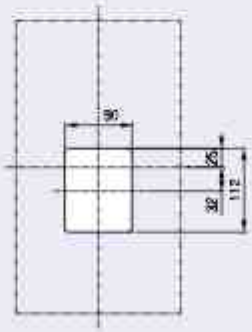


3P

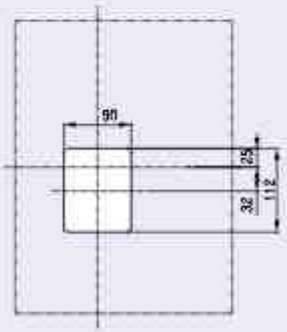


4P

Front panel cutting

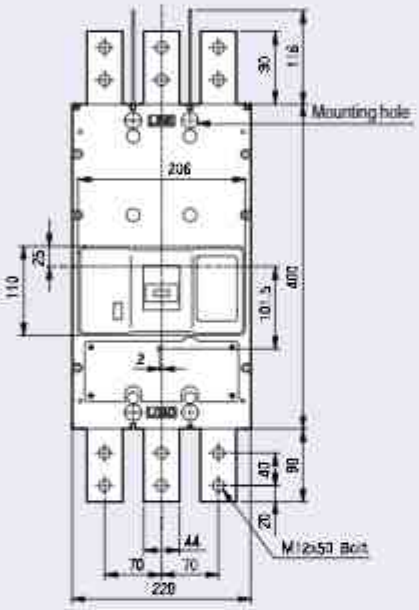


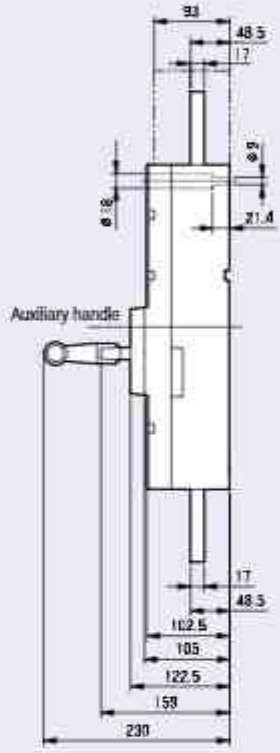
3P



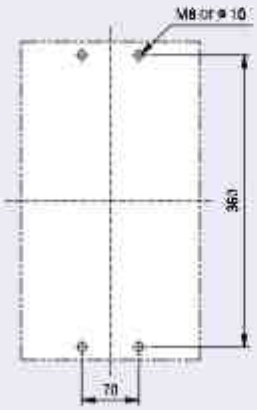
4P

MCCB

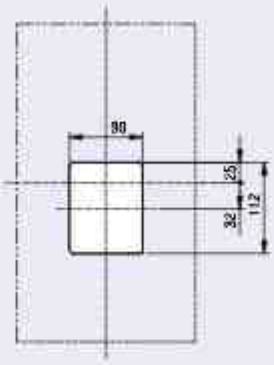




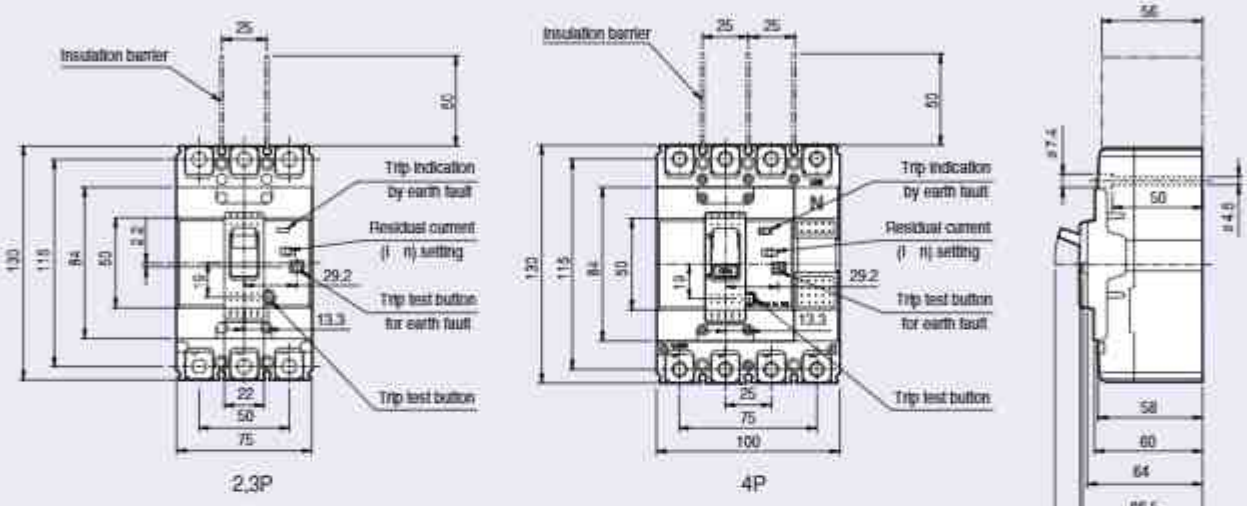
Panel drilling



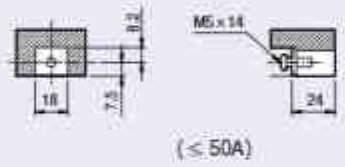
Front panel cutting



ELCB

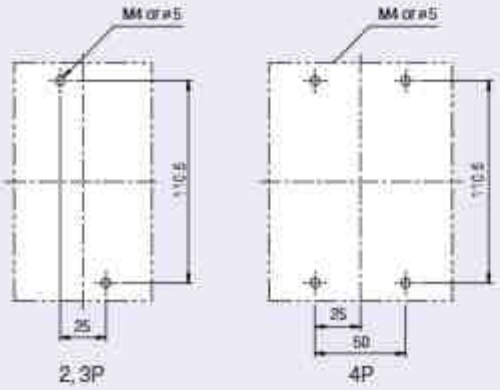


Terminal details

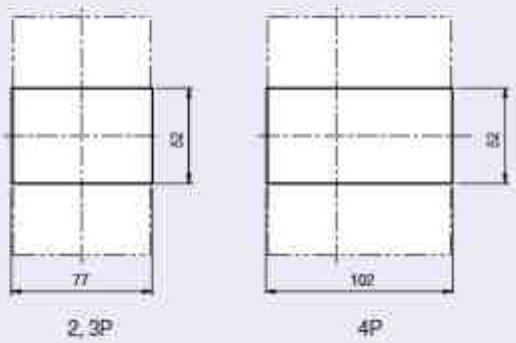


Connecting

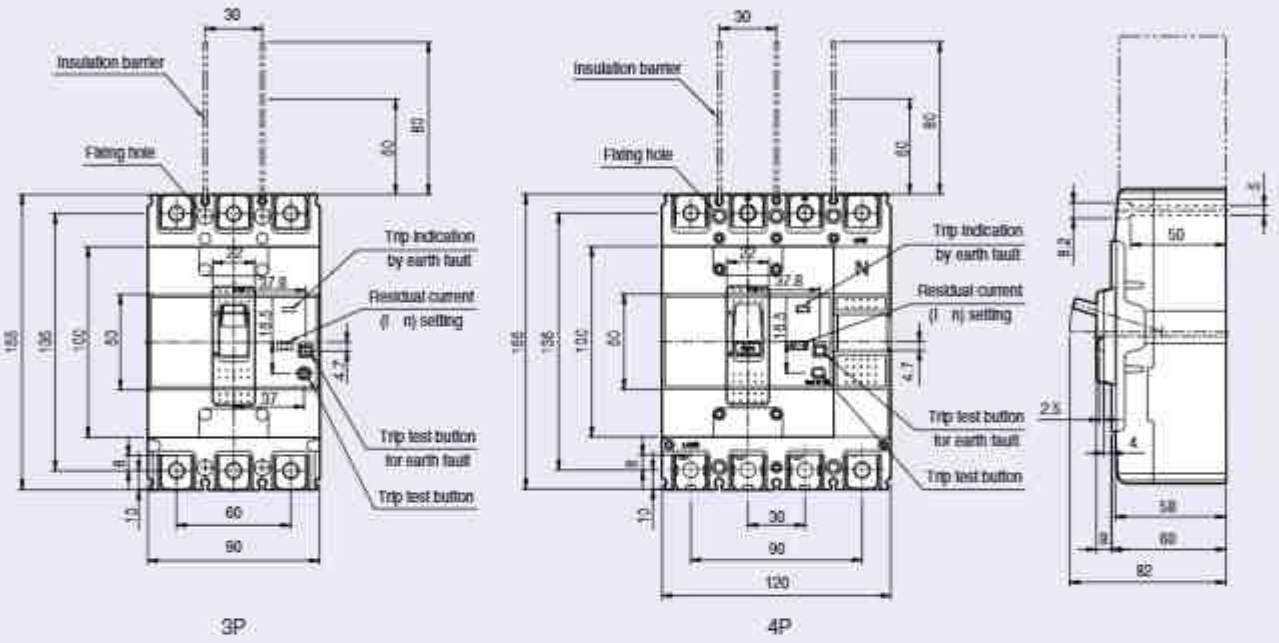
Panel drilling



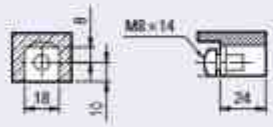
Front panel cutting



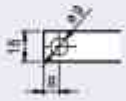
ELCB



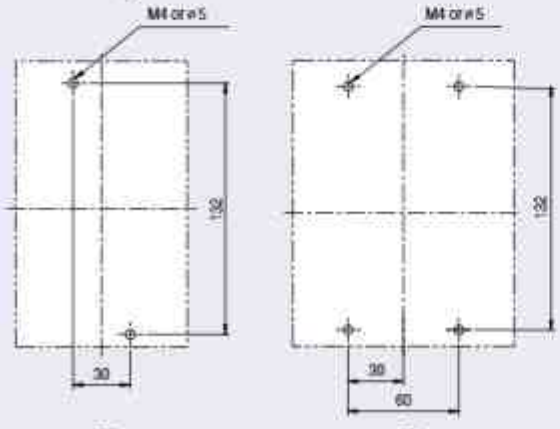
Terminal details



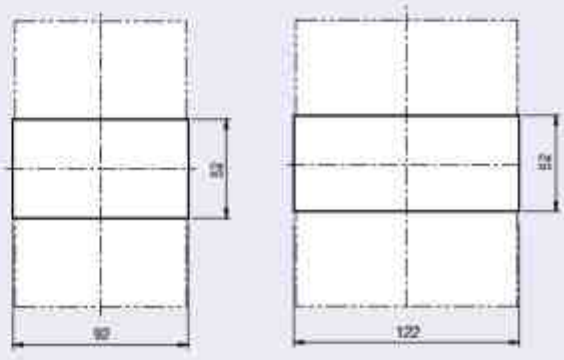
Connecting



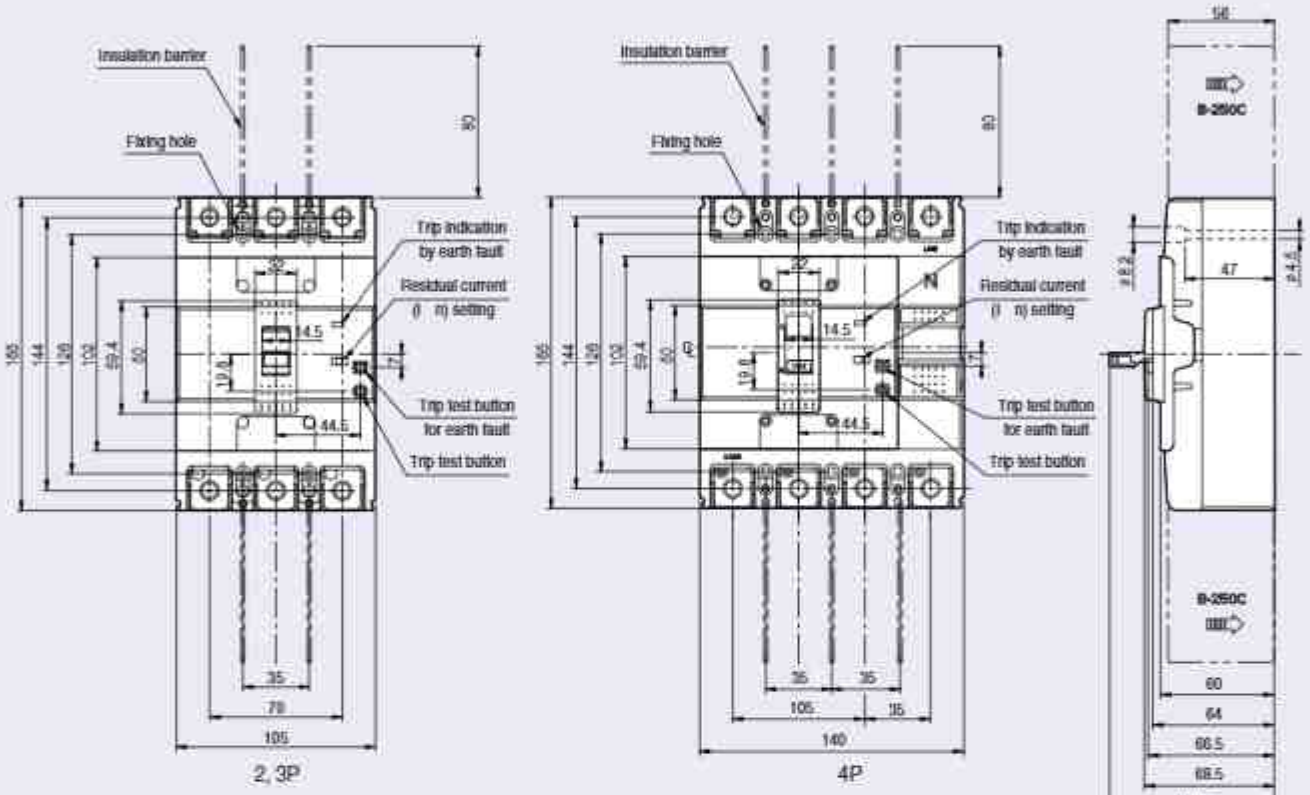
Panel drilling



Front panel cutting

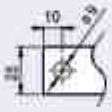


ELCB

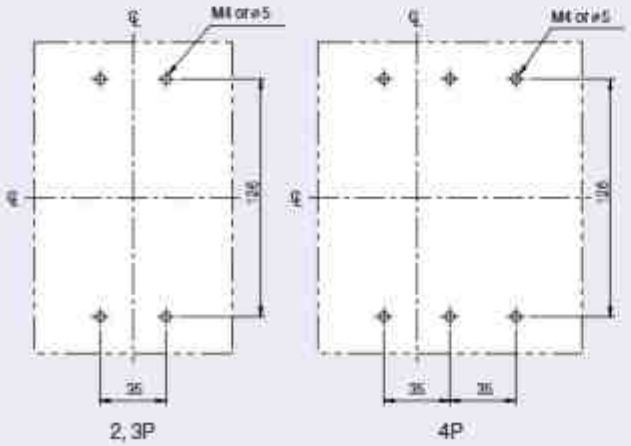


Terminal details

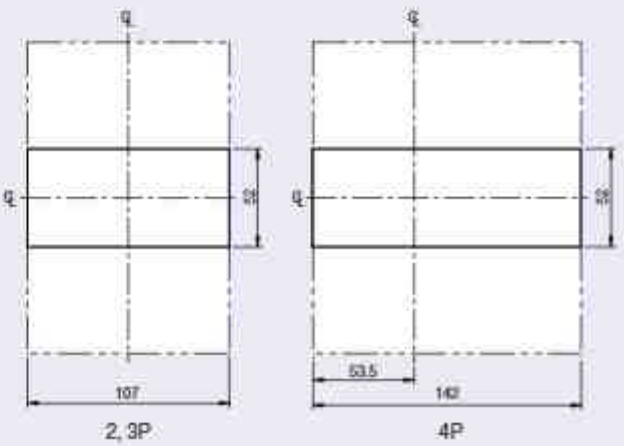
Connecting



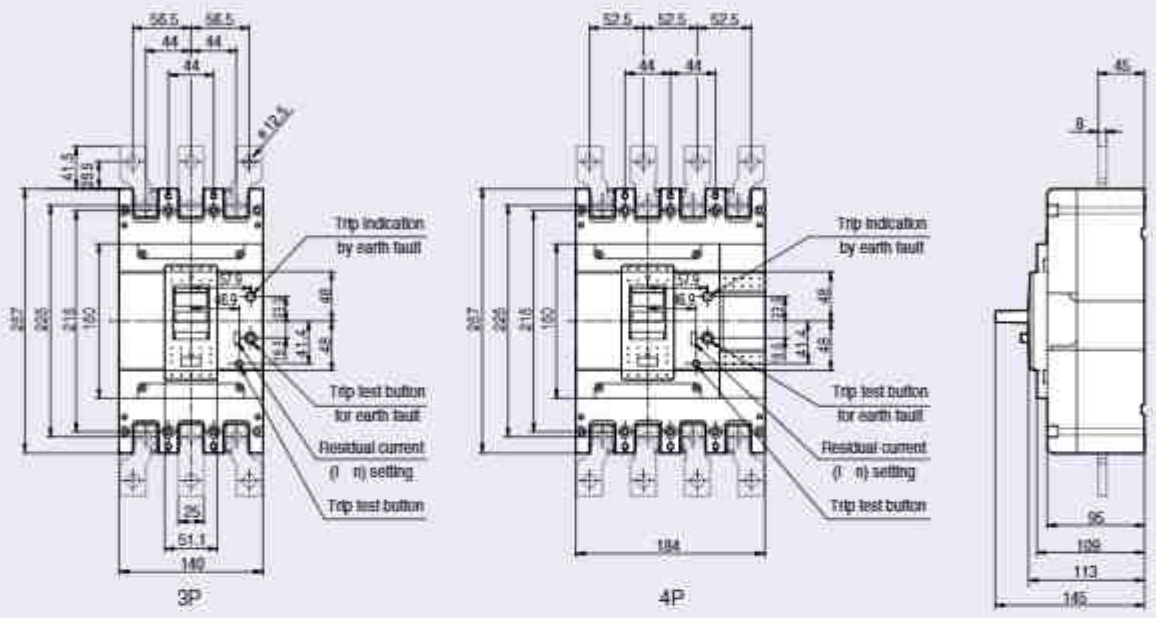
Panel drilling



Front panel cutting

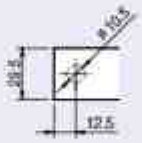


ELCB

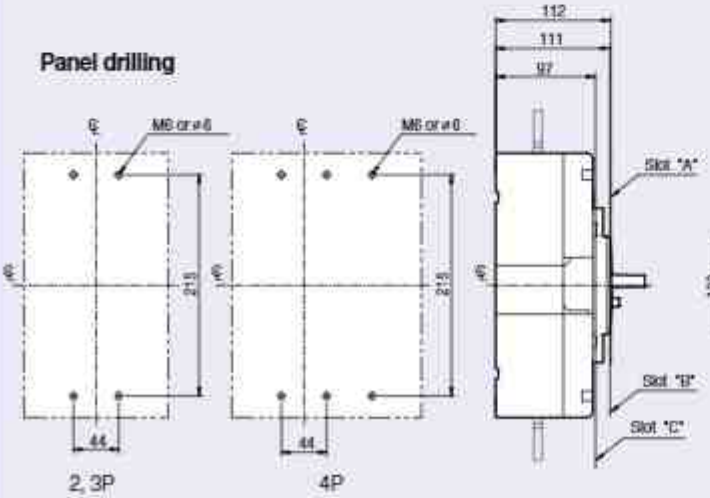


Terminal details

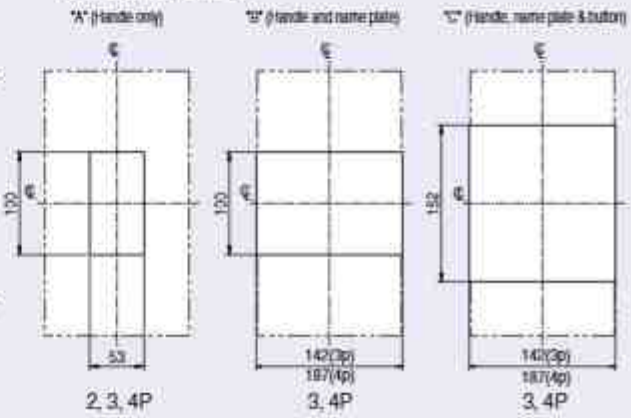
Connecting



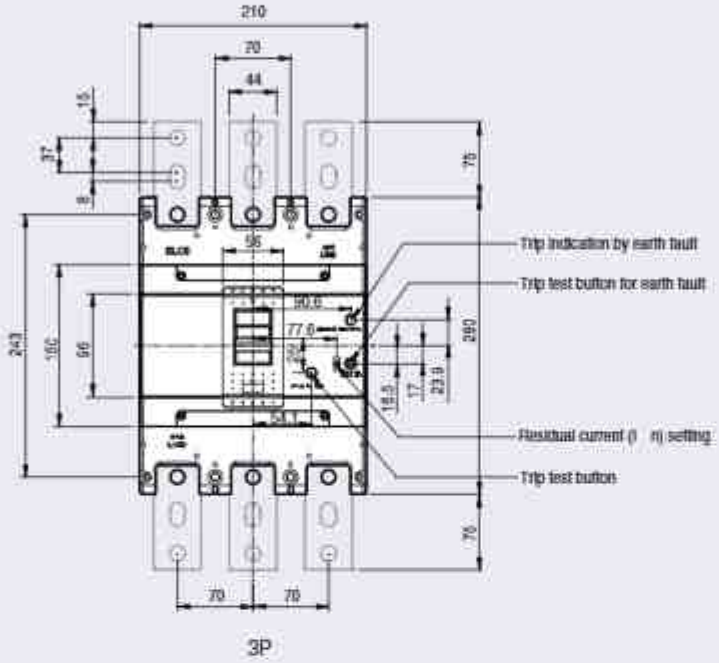
Panel drilling



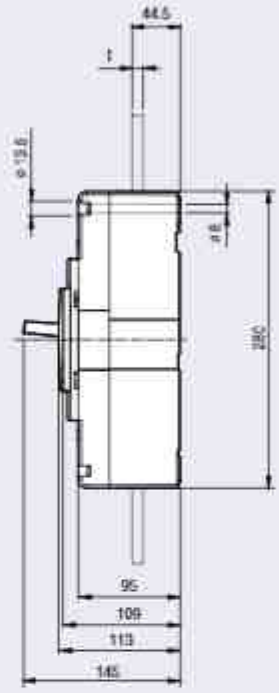
Front panel cutting



ELCB



3P

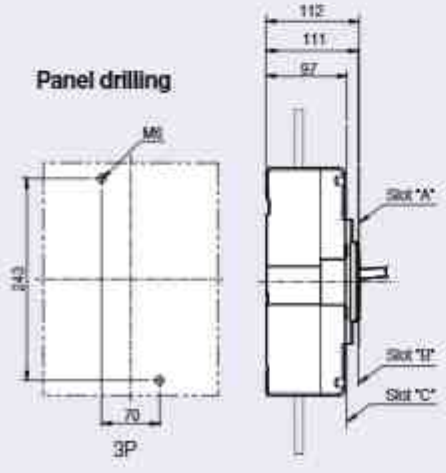


600AF : 7t
800AF : 10t

Terminal details

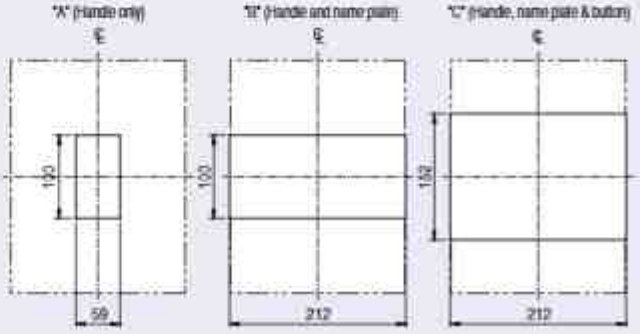
Connecting

Panel drilling

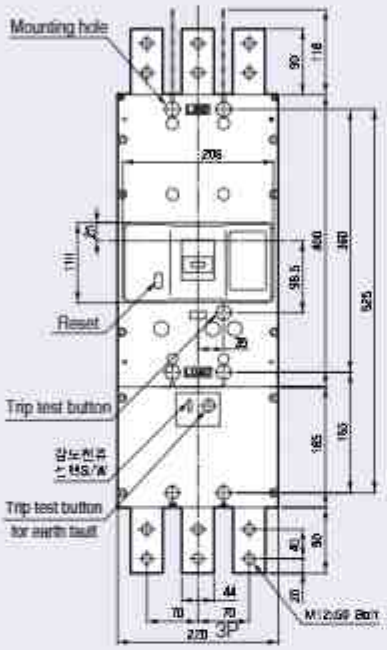


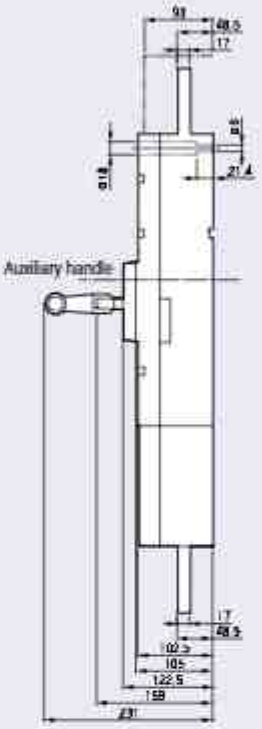
3P

Front panel cutting

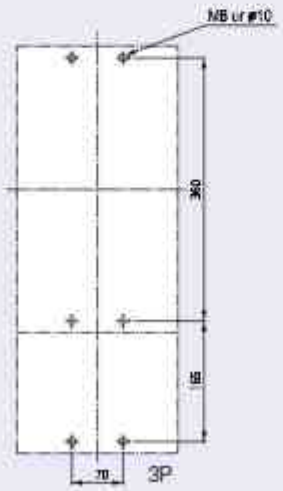


ELCB

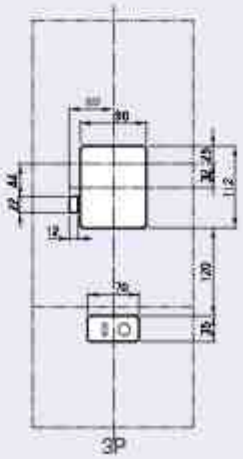




Panel drilling

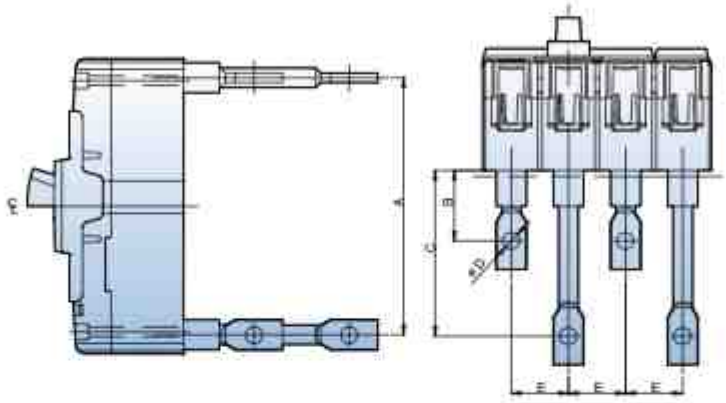


Front panel cutting



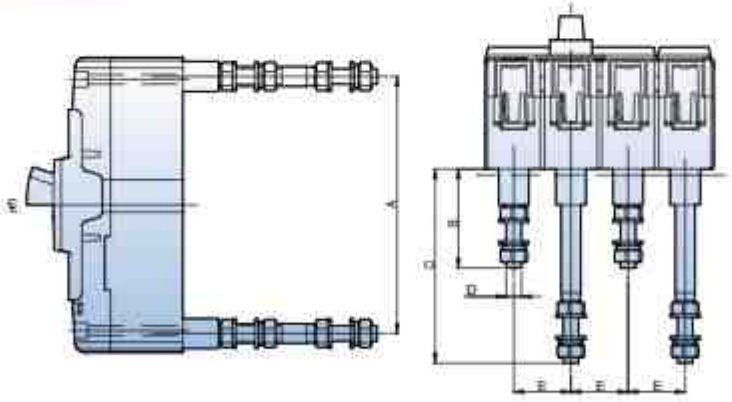
Rear connection terminals

Bar type



MCCB	A	B	C	D	E
ABN100c	115	37	87	ø 8.5	25
ABH125c	135	37	87	ø 8.5	30
ABH250c	144	57.5	93.5	ø 8.5	35
ABS400c	225	72	-	ø 14	44
ABS800c	243	108.7	-	ø 14	70

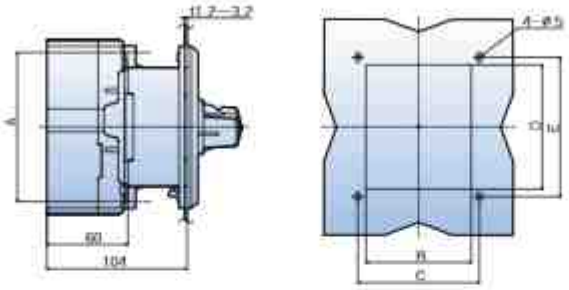
Round type



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

Rotary handles

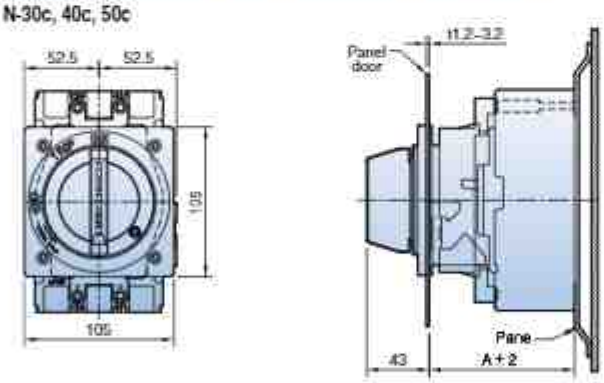
Direct mounting type (D-Handle, 30~250AF)



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)

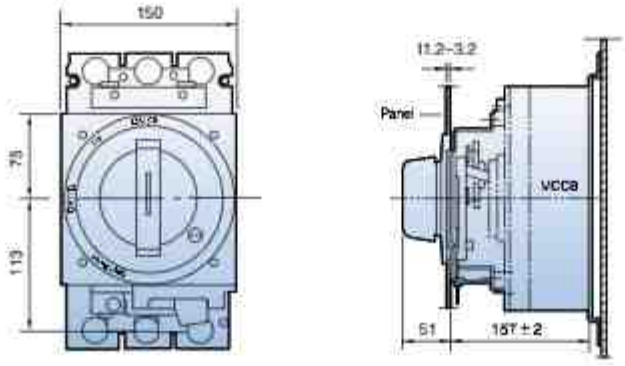
N-30c, 40c, 50c



N-Handle	N-30c	N-40c	N-50c
A (mm)	103	103	103

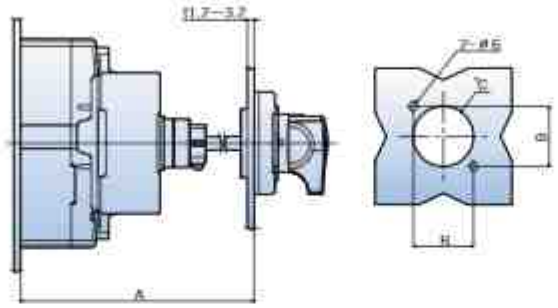
Direct mounting type (N-Handle, 400~800AF)

E-70, N-80



Rotary handles

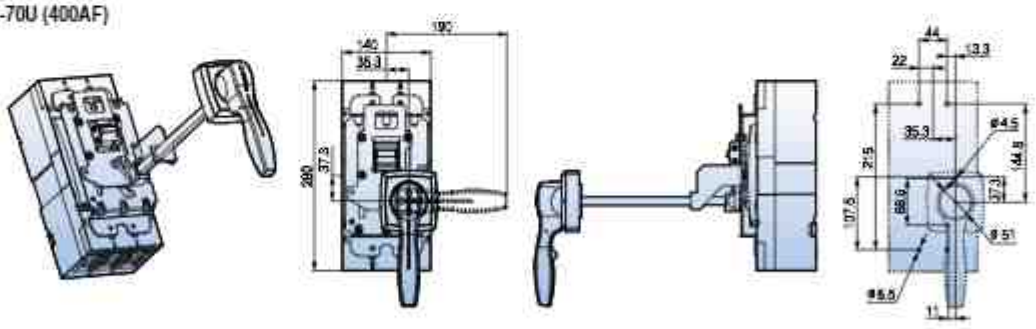
Extended mounting type (E-Handle) (30~250AF)



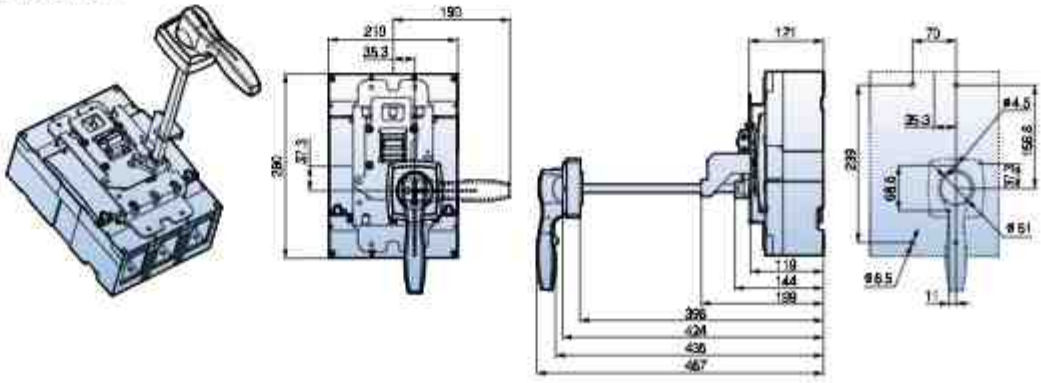
Type	A (mm)	B (mm)	C (mm)	Remarks
EH100	min 150, max 573.5 (SHAFT469mm)	47	ø 53	100AF
EH125	min 150, max 573.5 (SHAFT469mm)	47	ø 53	125AF
EH250	min 150, max 571.5 (SHAFT469mm)	47	ø 53	250AF

Extended mounting type (N-Handle, 400~800AF)

E-70U (400AF)



E-80U (800AF)



Standard accessories

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

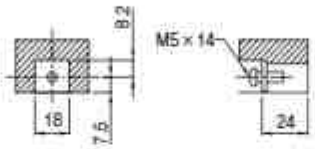
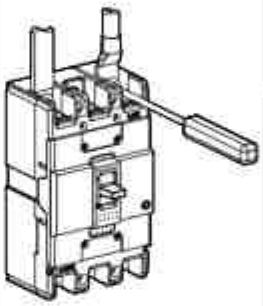
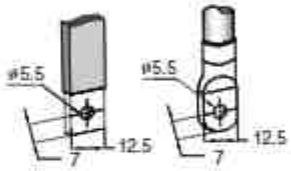
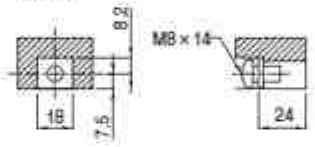
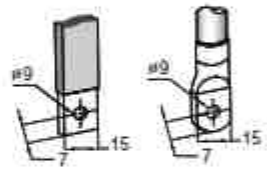
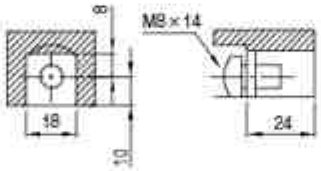
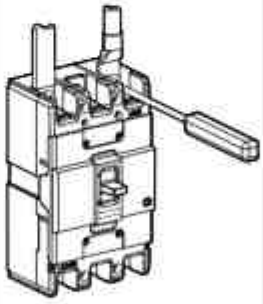
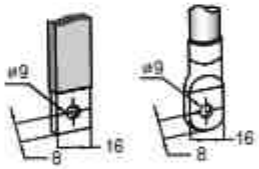
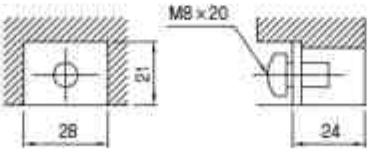
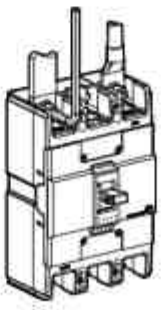
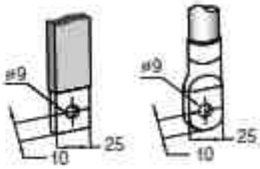
Item	ABN100c	ABH125c	ABH250c	400AF	630/800AF
Fixing screw					
	2P: 2EA (M4×60) 3P: 2EA (M4×60) 4P: 4EA (M4×60)	2P: 2EA (M4×60) 3P: 2EA (M4×60) 4P: 4EA (M4×60)	2P: 2EA (M4×55) 3P: 4EA (M4×55) 4P: 4EA (M4×55)	2P: 2EA (M6×100) 3P: 4EA (M6×100) 4P: 4EA (M6×100)	2P: 2EA (M6×100) 3P: 4EA (M6×100) 4P: 4EA (M6×100)
Terminal bolt					
	15~30A 2P: 4EA (M5×14) 3P: 6EA (M5×14) 4P: 8EA (M5×14) **40~100A** 2P: 4EA (M8×14) 3P: 6EA (M8×14) 4P: 8EA (M8×14)	2P: 4EA (M8×14) 3P: 6EA (M8×14) 4P: 8EA (M8×14)	2P: 4EA (M8×20) 3P: 6EA (M8×20) 4P: 8EA (M8×20)	2P: 4EA (M10×30) 3P: 6EA (M10×30) 4P: 8EA (M10×30)	2P: 2EA (M12×35) 3P: 6EA (M12×35) 4P: 8EA (M12×35)
Insulation barrier					
	2P: 1EA 3P: 2EA 4P: 3EA	2P: 1EA 3P: 2EA 4P: 3EA	2P: 1EA 3P: 2EA 4P: 3EA	2P: 1EA 3P: 2EA 4P: 3EA	2P: 1EA 3P: 2EA 4P: 3EA

외부조작핸들 형식 및 부착나사

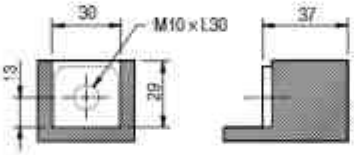
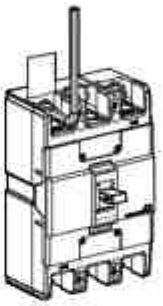
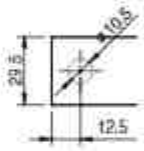
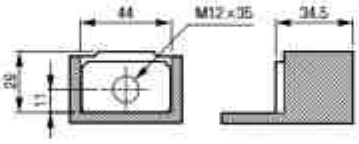
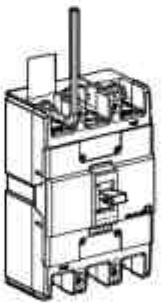
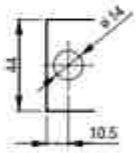
핸들형식	N-30c	N-40c	N-50c	N-70	N-90
적용 MCCB	ABN 50c/60c/100c ABS 30c/50c/60c	ABS 125c ABH 50c ABH 125c	ABN 250c ABS 250c ABH 250c	ABN 400c ABS 400c ABH 400c ABL 400c	ABN 630c/800c ABS 630c/800c ABL 630c/800c
적용 ELCB	EBN 50c/60c/100c EBS 30c/50c/60c	EBS 125c EBH 50c EBH 125c	EBN 250c EBS 250c EBH 250c	EBN 400c EBS 400c EBH 400c EBL 400c	EBN 630c/800c EBS 630c/800c EBL 630c/800c
고정용 나사	-	-	-	M6×16	M6×16
부착 나사	M4×85	M4×85	M4×85	M6×110	M6×110

핸들형식	DH/EH100	DH/EH125	DH/EH250
부착 나사	M4×70	M4×70	M4×70

Connection

MCCB	Terminal (mm)	Tightening torque (kgf · cm)	Conductor (mm)
ABN100c	[3~30A] 	M5 : 23 – 28 M8 : 55 – 75 	[5~30A] 
	[40~100A] 		[60~100A] 
ABH125c		M8 : 55 – 75 	
ABH250c		M8 : 80 – 130 	

Connection

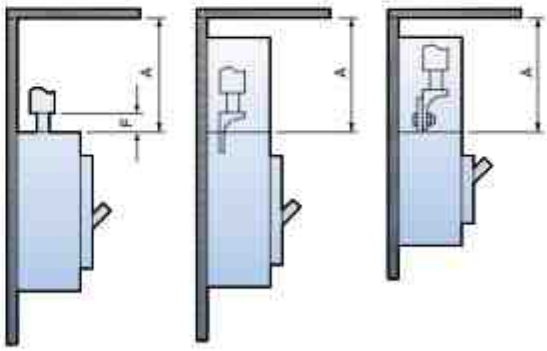
MCCB	Terminal (mm)	Tightening torque (kgf · cm)	Conductor (mm)
400AF		M10 : 240~300 (Terminal) M10 : 240~300 (Busbar) 	
800AF		M12 : 400~500 (Terminal, Busbar) 	

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
	ABS30c	30	25
	ABS50c	40	30
	ABS60c	40	30
125AF	ABS125c	50	40
	ABH50c	50	40
	ABH125c	100	80
250AF	ABN250c	100	80
	ABS250c	100	80
	ABH250c	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

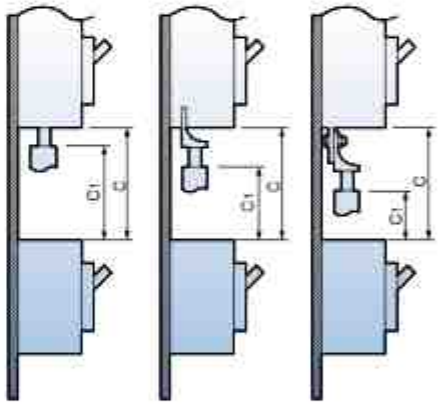


Safety clearance

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	The dimension of bare conduct + C1
	ABN60c	40	25	
	ABN100c	50	30	
	ABS30c	30	25	
	ABS50c	40	30	
	ABS60c	40	30	
125AF	ABS125c	50	40	
	ABH50c	50	40	
	ABH125c	100	80	
250AF	ABN250c	100	80	
	ABS250c	100	80	
	ABH250c	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	



Direct connection of cable

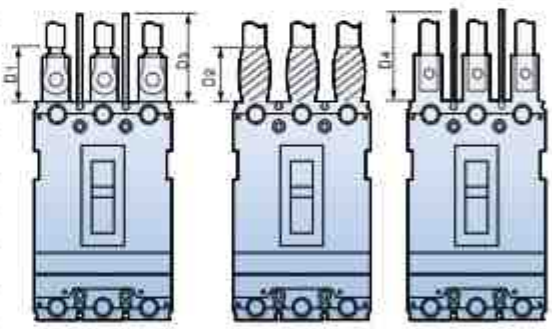
Connection by using a crimp-type terminal lug

Connection by using a crimp-type terminal lug to the extended terminal

Insulated length of main terminal of circuit breaker

- D1: Connection by solerless 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

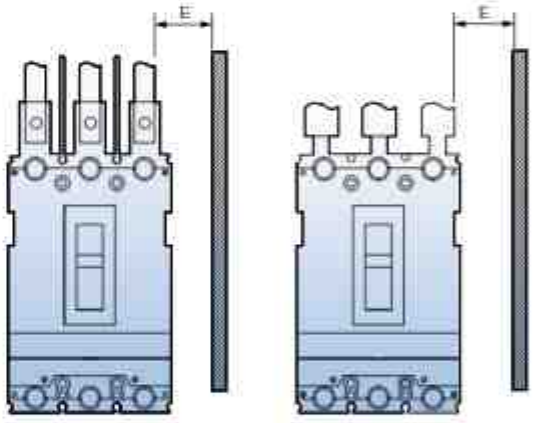
Frame size	Description	D1 (mm)	D2 (mm)	D3 (mm)	D4 (mm)
100AF	ABN50c	The dimension of bare conduct + 20	40	The dimension of bare conduct + 20	40
	ABN60c		40		40
	ABN100c		50		50
	ABS30c		30		30
	ABS50c		40		40
	ABS60c		40		40
125AF	ABS125c		50		50
	ABH50c		50		50
	ABH125c		50		50
250AF	ABN250c		50		50
	ABS250c		50		50
	ABH250c		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

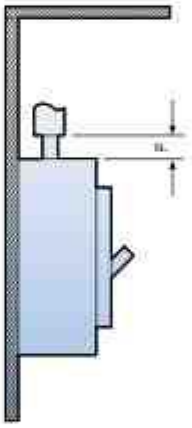
Minimum distance to metallic side panels

Frame size	Description	E(mm)	
		460V	250V
100AF	ABN50c	25	15
	ABN60c	25	15
	ABN100c	25	15
	ABS30c	20	15
	ABS50c	25	15
	ABS60c	25	15
125AF	ABS125c	25	15
	ABH50c	25	15
	ABH125c	50	20
250AF	ABN250c	50	15
	ABS250c	50	15
	ABH250c	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

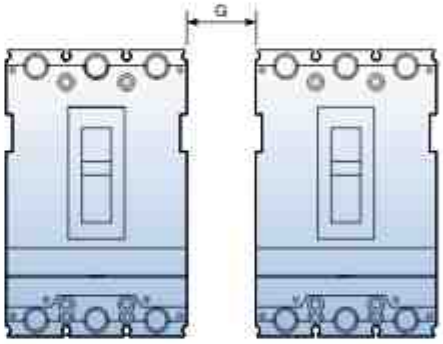
Frame size	Description	F(mm)
100AF	ABN50c	10
	ABN60c	10
	ABN100c	-
	ABS30c	5
	ABS50c	10
	ABS60c	10
125AF	ABS125c	-
	ABH50c	10
	ABH125c	20
250AF	ABN250c	-
	ABS250c	-
	ABH250c	-
400AF	ABN400c	10
	ABS400c	10
	ABH400c	10
	ABL400c	10
800AF	ABN800c	10
	ABS800c	10
	ABL800c	10



Safety clearance

Minimal distance between two adjacent breakers (With terminal covers)

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



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
- Full type test report issued by KEMA

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.


CB TEST CERTIFICATE

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

KEMA


CB TEST CERTIFICATE

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

KEMA

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℃~+40℃ (However, the average for the duration of 24 hours must not exceed 35℃.)
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 and other corrosive materials do not exist

- If a standard circuit breaker is used in high temperature exceeding 40℃, 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℃.
- Passing or storage in stone-cold area is allowed in the temperature of 40℃.
- The operating characteristic of the breaker with a thermal magnetic trip element changes as the base ambient temperature is adjusted to 40℃.

- 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℃

The temperate 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℃ 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℃ 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℃	20℃	30℃	40℃	45℃	50℃	55℃
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
50	40	ABN50c, ABS50c	40	40	40	40	40	39	38	36
	50		50	50	50	50	50	49	47	45
60	60	ABN60c, ABS60c	60	60	60	60	60	58	56	55
100	75	ABN100c	75	75	75	75	75	73	71	68
	100		100	100	100	100	100	97	94	91
125	125	ABH50c, ABS125c, ABH125c	125	125	125	125	125	121	116	107
250	150	ABN200c, ABS200c, ABH250c	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 ABH400c, ABL400c	250	250	250	250	250	246	242	238
	300		300	300	300	300	300	295	291	287
	350		350	350	350	350	350	345	339	332
	400		400	400	400	400	400	394	388	381
800	500	ABN800c, ABS800c ABL800c	500	500	500	500	500	492	485	477
	630		630	630	630	630	630	621	611	602
	700		700	700	700	700	700	689	679	668
	800		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℃	20℃	30℃	40℃	45℃	50℃	55℃
30	15	EBS30c	15	15	15	15	15	15	15	15
	20		20	20	20	20	20	19	19	18
	30		30	30	30	30	30	29	28	27
50	40	EBN50c, EBS50c	40	40	40	40	40	39	38	36
	50		50	50	50	50	50	49	47	45
60	60	EBN60c, EBS60c	60	60	60	60	60	58	56	55
100	75	EBN100c	75	75	75	75	75	73	71	68
	100		100	100	100	100	100	97	94	91
125	125	EBH50c, EBS125c, EBH125c	125	125	125	125	125	121	116	107
250	150	EBN200c, EBS200c, EBH250c	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	EBN400c, EBS400c EBH400c, EBL400c	250	250	250	250	250	246	242	238
	300		300	300	300	300	300	295	291	287
	350		350	350	350	350	350	345	339	332
	400		400	400	400	400	400	394	388	381
800	500	EBN800c, EBS800c EBL800c	500	500	500	500	500	492	485	477
	630		630	630	630	630	630	621	611	602
	700		700	700	700	700	700	689	679	668
	800		800	800	800	800	800	788	776	764

Special Use Environment

Environment where Ambient Temperature is -5℃ 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℃, 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℃ is allowed but it is recommend 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 (rated voltage) × 0.82 (correction parameter) = 492V.
  2) How to Correct Current:
     - If the rated voltage is AC 800A at above 4,000m sea level, 800A (rated current) × 0.96(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.
αg=0.002 × frequency(Hz) × double amplitude (mm)
* αg: multiple of gravitational acceleration (g=9.8m/sec2)
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 less 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.

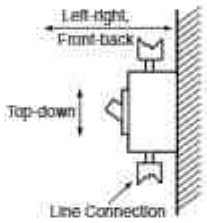
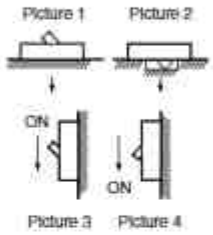
* Core loss: It refers to the electrical loss in a transformer caused by magnetization of the core that changes over time and is categorized into hysteresis loss and eddy current loss.

* Hysteresis loss: It takes up the majority portion of no-load loss of electric equipment and is calculated like this.
$Ph = \sigma f Bmn$
Bm: maximum value of magnetic flux density, n: constant(1.6~2.0), f: frequency, σ: 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**	• Vertical mounting • Top-down, Left-right, Front-back 	• Picture 1, 2, 3, 4 (→ represents the direction of drop) 
	Status of MCCB	(1) Non-conduction (ON or OFF status) (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**	• If it is ON, it should not be OFF • If it is OFF, it should not be ON • No abnormal status such as damage, transformation, or annealing of nut part • Characteristics of switch and trip after the test must be normal	

Cerfications

MCCB

	Type	Approvals		Certificates
	Cerficate	Safet certi	IEC	KEMA
	Mark and name		CE	KEMA
	Type	Korea	Europe	Netherlands
MCCB 30~250AF	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	●	●	●

	Type	Approvals		Certificates
	Cerficate	Safet certi	IEC	KEMA
	Mark and name		CE	KEMA
	Type	Korea	Europe	Netherlands
MCCB 30~250AF	ABP104c	●	●	●
	ABH102c	●	●	●
	ABH103c	●	●	●
	ABH104c	●	●	●
	ABN202c	●	●	●
	ABN203c	●	●	●
	ABN204c	●	●	●
	ABS202c	●	●	●
	ABS203c	●	●	●
	ABS204c	●	●	●
	ABP202c	●	●	●
	ABP203c	●	●	●
	ABP204c	●	●	●
	ABH202c	●	●	●
	ABH203c	●	●	●
	ABH204c	●	●	●
MCCB 400~800AF	ABN402c	●	●	●
	ABN403c	●	●	●
	ABN404c	●	●	●
	ABS402c	●	●	●
	ABS403c	●	●	●
	ABS404c	●	●	●
	ABH402c	●	●	●
	ABH403c	●	●	●
	ABH404c	●	●	●
	ABL402c	●	●	●
	ABL403c	●	●	●
	ABL404c	●	●	●
	ABN602c		●	●
	ABN603c		●	●
	ABN604c		●	●
	ABS602c		●	●
	ABS603c		●	●
	ABS604c		●	●
	ABL602c		●	●
	ABL603c		●	●
	ABL604c		●	●
	ABN802c		●	●
	ABN803c		●	●
	ABN804c		●	●
	ABS802c		●	●
	ABS803c		●	●
	ABS804c		●	●
	ABL802c		●	●
	ABL803c		●	●
	ABL804c		●	●

ELCB

	Type	Approvals		Certificates
	Cerficate	Safet certi	IEC	KEMA
	Mark and name		CE	KEMA
	Type	Korea	Europe	Netherlands
ELCB 30~250AF	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	●	●	●
	EBH54c	●	●	●
	EBS103c	●	●	●
	EBS104c	●	●	●
	EBP103c	●	●	●
	EBP104c	●	●	●
	EBH103c	●	●	●
	EBH104c	●	●	●
	EBN202c	●	●	●
	EBN203c	●	●	●
	EBS203c	●	●	●
	EBS204c	●	●	●
	EBP203c	●	●	●
	EBP204c	●	●	●
	EBH203c	●	●	●
	EBH204c	●	●	●

Note: ● (Completion)