ELCB

ELCB

Ampere

3	30AF
5	50AF
6	60AF
10	100/125AF
20	225/250AF
40	400AF
80	800 F
100	1000AF
120	12 F

Series

Rated current

5A	200A
10A	225A
15A	250A
20A	300A
30A	350A
40A	400A
50A	500A
60A	630A
75A	700A
100A	800A
125A	1000A
150A	1200A
175A	

Accessory

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

Type

N	N-type
S	S-type
H	H-type
L	L-type

Pole

2	2-pole
3	3-pole
4	4 pole

Rated residual current, Intentional time delay

30mA	30mA
100mA	100mA
100/200/500mA	100/200/500mA
1A, 1s	0.1/0.2/0.5/1A, 0/0.2/0.5/1s
2A, 2s	0.1/0.4/1/2A, 0.5/1/1.5/2s

Position & type

R LWT	Left Side Mounting	Lead Wire type
R TBT	Left Side Mounting	Terminal Block ype

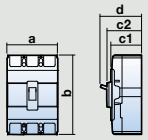
* Warning: Mounting accessories is not available at the right side ELCB (Up to 250AF)

30AF ELCB
EBS30c

EBS33c

Ratings

Frame size			30AF
Type and pole			S-type
	2-pole (2-sensor)		EBS32c
	3-pole (3-sensor)		EBS33c
	4-pole (3-sensor)		EBS34c
Rated current, In			(5-10) Note3) -15-20-30A
Rated impulse withstand voltage, Uimp			6kV
Instantaneous type	Rated residual current, I△n		30, 100, 100/200/500, 100/300/500mA (Adjustable)
	Residual current off-time at I△n		≤0.1 sec
	Rated operational voltage, Ue		AC: 220/460V
Time delay type	Rated residual current		0.1/0.2/0.5/1A, 0.1/0.4/1/2A (Adjustable)
	Intentional time delay		0/0.2/0.5/1s, 0.5/1/1.5/2s (Adjustable)
Wiring system	2-pole (2-sensor)		1Ø2W
	3-pole (3-sensor)		1Ø2W, 1Ø3W, 3Ø3W
	4-pole (3-sensor)		1Ø2W, 1Ø3W, 3Ø3W, 3Ø4W
Rated short-circuit breaking capacity, Icu			S-type
	AC	460V	14 (10)kA
		415V	14 (10)kA
		220/250V	30 (25)kA
Ics=%×Icu			100%
Protective function			Overload, short-circuit and ground fault
Type of trip unit			Thermal-magnetic
Magnetic trip range			400A
Life cycle Note6)	Mechanical		25,000 operations
	Electrical		10,000 operations
Connection	Standard		Front connection
	Optional		Rear connection
Mounting	Standard		Screw fixing

Dimensions (mm)	Pole	2p	3p	4p
	a	75		100
	b	130		130
	c1 Note1)	60		60
	c2 Note1)	64		64
	d	82		82
Weight, kg	Standard	0.5	0.7	0.9

Certification	Pole	3p	4p
CE marking	CE	○	○

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

For more information

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

Ordering types

Breaker types

Instantaneous type

EBS33c / 5 / 30

Code	Frame size/ Pole
EBS32c	EBS 30AF 2P
EBS33c	EBS 30AF 3P
EBS34c	EBS 30AF 4P

Code	Rated current
5	5A
10	10A
15	15A
20	20A
25	25A
30	30A

Code	Rated residual current
30	30mA
100	100mA
100/200/500	100/200/500mA
100/300/500	100/300/500mA

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

Time delay type

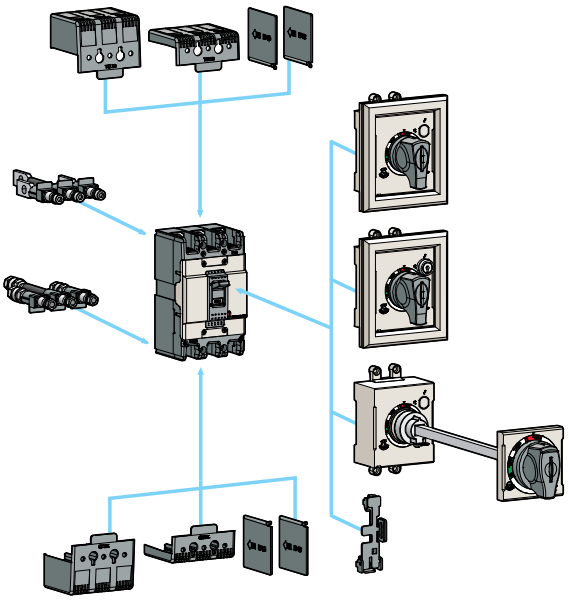
EBS33c / 5 / 1A1s

Code	Frame size/ Pole
EBS32c	EBS 30AF 2P
EBS33c	EBS 30AF 3P
EBS34c	EBS 30AF 4P

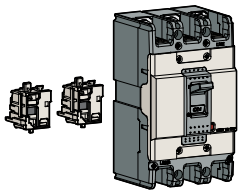
Code	Rated current
5	5A
10	10A
15	15A
20	20A
25	25A
30	30A

Code	Rated residual current	Intentional time delay
1A1s	1A	1s
2A2s	2A	2s

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

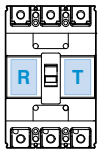


Accessories



Electrical auxiliaries

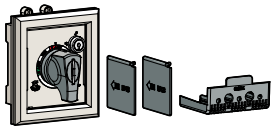
AX	Auxiliary switch
AL	Alarm switch
AX+AL	Combination switch



Maximum possibilities

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

Note) For more detail see 7-1 page



External accessories

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

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

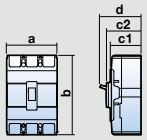
50AF ELCB
EBN50c, EBS50c, EBH50c


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 impulse withstand voltage, Uimp			6kV		
Instantaneous type	Rated residual current, I△n		30, 100, 100/200/500, 100/300/500mA (Adjustable)		
	Residual current off-time at I△n		≤0.1 sec		
	Rated operational voltage, Ue		AC: 220/460V		
Time delay type	Rated residual current		0.1/0.2/0.5/1A, 0.1/0.4/1/2A (Adjustable)		
	Intentional time delay		0/0.2/0.5/1s, 0.5/1/1.5/2s (Adjustable)		
Wiring system	2-pole (2-sensor)		1Ø2W		
	3-pole (3-sensor)		1Ø2W, 1Ø3W, 3Ø3W		
	4-pole (3-sensor)		1Ø2W, 1Ø3W, 3Ø3W, 3Ø4W		
Rated short-circuit breaking capacity, Icu			N-type	S-type	H-type
	AC	460V	14kA	18kA	50kA
		415V	14kA	18kA	50kA
		220/250V	30kA	35kA	100kA
Ics=%×Icu			100%	100%	100%
Protective function			Overload, short-circuit and ground fault		
Type of trip unit			Thermal-magnetic		
Magnetic trip range			12×In (30A and under: 400A)		
Life cycle Note5)	Mechanical		25,000 operations		
	Electrical		10,000 operations		
Connection	Standard		Front connection		
	Optional		Rear connection		
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 Note1)	60		60		60	
	c2 Note1)	64		64		64	
	d	82		82		82	
Weight, kg	Standard	0.5	0.7	0.7	0.9	1	1.2

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

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

For more information

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

Ordering types

Breaker types

Instantaneous type

EBN53c / 20 / 30

Code	Frame size/ Pole
EBN52c	EBN 50AF 2P
EBN53c	EBN 50AF 3P
EBS53c	EBS 50AF 3P
EBS54c	EBS 50AF 4P
EBH53c	EBH 50AF 3P
EBH54c	EBH 50AF 4P

Code	Rated current
15	15A
20	20A
30	30A
40	40A
50	50A

Code	Rated residual current
30	30mA
100	100mA
100/200/500	100/200/500mA
100/300/500	100/300/500mA

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

Time delay type

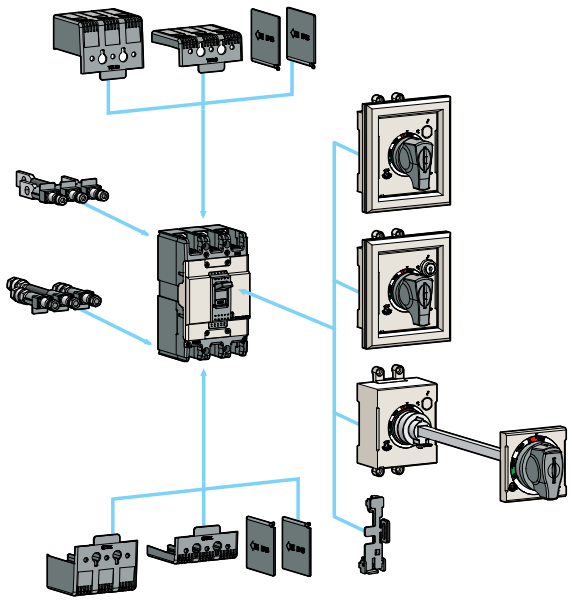
EBN53c / 20 / 1A1s

Code	Frame size/ Pole
EBN52c	EBN 50AF 2P
EBN53c	EBN 50AF 3P
EBS53c	EBS 50AF 3P
EBS54c	EBS 50AF 4P
EBH53c	EBH 50AF 3P
EBH54c	EBH 50AF 4P

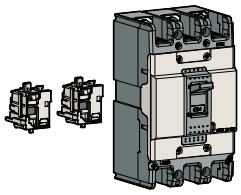
Code	Rated current
15	15A
20	20A
30	30A
40	40A
50	50A

Code	Rated residual current	Intentional time delay
1A1s	1A	1s
2A2s	2A	2s

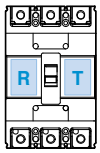
Note) EBS53c/20/30: EBS53c, Rated current 20A, Time delay type 1A1s



Accessories



Electrical auxiliaries

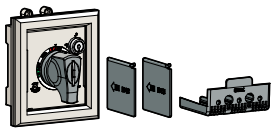


AX	Auxiliary switch
AL	Alarm switch
AX+AL	Combination switch

Maximum possibilities

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

Note) For more detail see 7-1 page



External accessories

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

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

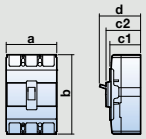
60AF ELCB
EBN60c, EBS60c


EBN63c


EBS63c

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 impulse withstand voltage, Uimp			6kV	
Instantaneous type	Rated residual current, I⊿n		30, 100, 100/200/500, 100/300/500mA (Adjustable)	
	Residual current off-time at I⊿n		≤0.1 sec	
	Rated operational voltage, Ue		AC: 220/460V	
Time delay type	Rated residual current		0.1/0.2/0.5/1A, 0.1/0.4/1/2A (Adjustable)	
	Intentional time delay		0/0.2/0.5/1s, 0.5/1/1.5/2s (Adjustable)	
Wiring system	2-pole (2-sensor)		-	
	3-pole (3-sensor)		1Ø2W, 1Ø3W, 3Ø3W	
	4-pole (3-sensor)		1Ø2W, 1Ø3W, 3Ø3W, 3Ø4W	
Rated short-circuit breaking capacity, Icu			N-type	S-type
	AC	460V	14kA	18kA
		415V	14kA	18kA
		220/250V	30kA	35kA
Ics=%×Icu			100%	100%
Protective function			Overload, short-circuit and ground fault	
Type of trip unit			Thermal-magnetic	
Magnetic trip range			12×In	
Life cycle Note5)	Mechanical		25,000 operations	
	Electrical		10,000 operations	
Connection	Standard		Front connection	
	Optional		Rear connection	
Mounting	Standard		Screw fixing	

Dimensions (mm)	Pole	3p	3p	4p
	a	75	75	100
	b	130	130	130
	c1 Note1)	60	60	60
	c2 Note1)	64	64	64
	d	82	82	82
Weight, kg	Standard	0.7	0.7	0.9

Certification	Pole	3p	3p	4p
CE marking	CE	○	○	

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

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

Ordering types

Breaker types

Instantaneous type

EBN63c	/	60	/	30

Code	Frame size/ Pole
EBN63c	EBN 60AF 3P
EBS63c	EBS 60AF 3P
EBS64c	EBS 60AF 4P

Code	Rated current
60	60A

Code	Rated residual current
30	30mA
100	100mA
100/200/500	100/200/500mA
100/300/500	100/300/500mA

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

Time delay type

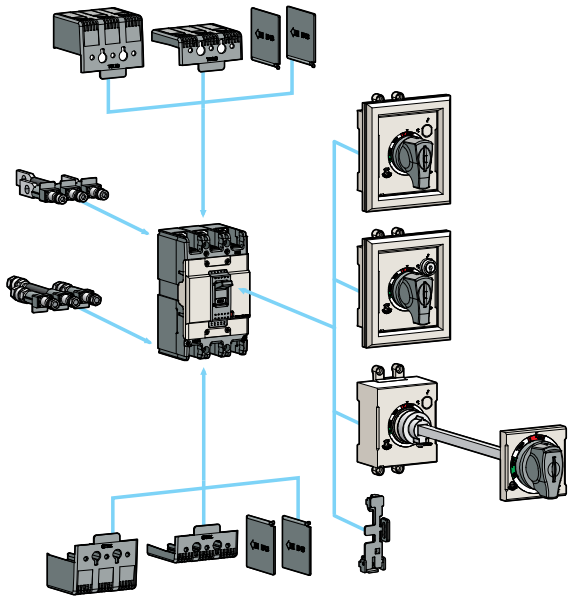
EBN63c	/	60	/	1A1s

Code	Frame size/ Pole
EBN63c	EBN 60AF 3P
EBS63c	EBS 60AF 3P
EBS64c	EBS 60AF 4P

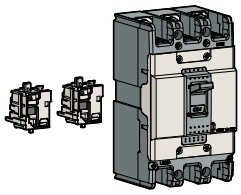
Code	Rated current
60	60A

Code	Rated residual current	Intentional time delay
1A1s	1A	1s
2A2s	2A	2s

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

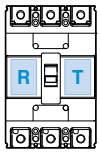


Accessories



Electrical auxiliaries

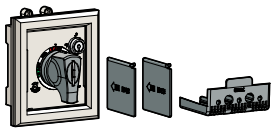
AX	Auxiliary switch
AL	Alarm switch
AX+AL	Combination switch



Maximum possibilities

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

Note) For more detail see 7-1 page



External accessories

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

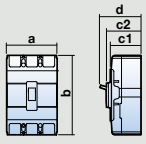
Note) For more detail see 7-9 ~ 7-23 page
- Single type: This cover is used without auxiliary handle.
- D-handle type: This cover is used with D-handle.
- N-handle type: This cover is used with N-handle.

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 impulse withstand voltage, Uimp			6kV
Instantaneous type	Rated residual current, I⊿n		30, 100, 100/200/500, 100/300/500mA (Adjustable)
	Residual current off-time at I⊿n		≤0.1 sec
	Rated operational voltage, Ue		AC: 220/460V
Time delay type	Rated residual current		0.1/0.2/0.5/1A, 0.1/0.4/1/2A (Adjustable)
	Intentional time delay		0/0.2/0.5/1s, 0.5/1/1.5/2s (Adjustable)
Wiring system	2-pole (2-sensor)		1Ø2W
	3-pole (3-sensor)		1Ø2W, 1Ø3W, 3Ø3W
	4-pole (3-sensor)		1Ø2W, 1Ø3W, 3Ø3W, 3Ø4W
Rated short-circuit breaking capacity, Icu			N-type
	AC	460V	18kA
		415V	18kA
		220/250V	35kA
Ics=%×Icu			100%
Protective function			Overload, short-circuit and ground fault
Type of trip unit			Thermal-magnetic
Magnetic trip range			12×In
Life cycle Note5)	Mechanical		25,000 operations
	Electrical		10,000 operations
Connection	Standard		Front connection
	Optional		Rear connection
Mounting	Standard		Screw fixing

Dimensions (mm)	Pole	2p	3p	4p
	a	75	75	100
	b	130	130	130
	c1 Note1)	60	60	60
	c2 Note1)	64	64	64
	d	82	82	82
Weight, kg	Standard	0.5	0.7	0.9

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

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

For more information

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

Ordering types

Breaker types

Instantaneous type

EBN103c / 100 / 30

Code	Frame size/ Pole
EBN102c	EBN 100AF 2P
EBN103c	EBN 100AF 3P
EBN104c	EBN 100AF 4P

Code	Rated current
60	60A
75	75A
100	100A

Code	Rated residual current
30	30mA
100	100mA
100/200/500	100/200/500mA
100/300/500	100/300/500mA

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

Time delay type

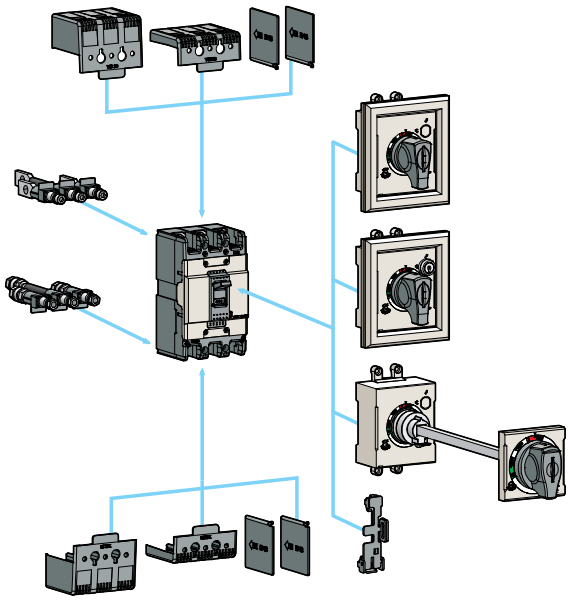
EBN103c / 100 / 1A1s

Code	Frame size/ Pole
EBN102c	EBN 100AF 2P
EBN103c	EBN 100AF 3P
EBN104c	EBN 100AF 4P

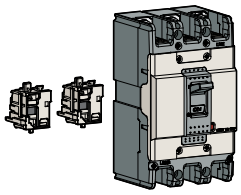
Code	Rated current
60	60A
75	75A
100	100A

Code	Rated residual current	Intentional time delay
1A1s	1A	1s
2A2s	2A	2s

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

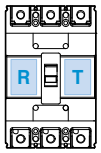


Accessories



Electrical auxiliaries

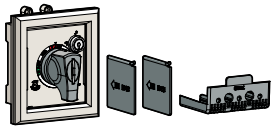
AX	Auxiliary switch
AL	Alarm switch
AX+AL	Combination switch



Maximum possibilities

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

Note) For more detail see 7-1 page



External accessories

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

Note) For more detail see 7-9~ 7-23 pageNote) For more detail see 82 page
- Single type: This cover is used without auxiliary handle.
- D-handle type: This cover is used with D-handle.
- N-handle type: This cover is used with N-handle.

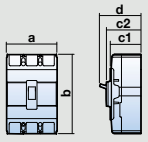
125AF ELCB
EBS125c, EBH125c


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 impulse withstand voltage, Uimp			6kV	
Instantaneous type	Rated residual current, I⊿n		30, 100, 100/200/500, 100/300/500mA (Adjustable)	
	Residual current off-time at I⊿n		≤0.1 sec	
	Rated operational voltage, Ue		AC: 220/460V	
Time delay type	Rated residual current		0.1/0.2/0.5/1A, 0.1/0.4/1/2A (Adjustable)	
	Intentional time delay		0/0.2/0.5/1s, 0.5/1/1.5/2s (Adjustable)	
Wiring system	2-pole (2-sensor)		-	
	3-pole (3-sensor)		1Ø2W, 1Ø3W, 3Ø3W	
	4-pole (3-sensor)		1Ø2W, 1Ø3W, 3Ø3W, 3Ø4W	
Rated short-circuit breaking capacity, Icu			N-type	S-type
	AC	460V	37kA	50kA
		415V	37kA	50kA
		220/250V	85kA	100kA
Ics=%×Icu			100%	100%
Protective function			Overload, short-circuit and ground fault	
Type of trip unit			Thermal-magnetic	
Magnetic trip range			12×In (30A and under: 400A)	
Life cycle Note5)	Mechanical		25,000 operations	
	Electrical		10,000 operations	
Connection	Standard		Front connection	
	Optional		Rear connection	
Mounting	Standard		Screw fixing	

Dimensions (mm)	Pole	3p	4p	3p	4p
	a	90	120	90	120
	b	155	155	155	155
	c1 Note1)	60	60	60	60
	c2 Note1)	64	64	64	64
	d	82	82	82	82
Weight, kg	Standard	1	1.2	1	1.2

Certification	Pole	3p	4p	3p	4p
CE marking	CE	○	○	○	○

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

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

Ordering types

Breaker types

Instantaneous type

EBS103c / 100 / 30

Code	Frame size/ Pole
EBS103c	EBS 125AF 3P
EBS104c	EBS 125AF 4P
EBH103c	EBH 125AF 3P
EBH104c	EBH 125AF 4P

Code	Rated current
15	15A
20	20A
30	30A
40	40A
50	50A
60	60A
75	75A
100	100A
125	125A

Code	Rated residual current
30	30mA
100	100mA
100/200/500	100/200/500mA
100/300/500	100/300/500mA

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

Time delay type

EBS103c / 100 / 1A1s

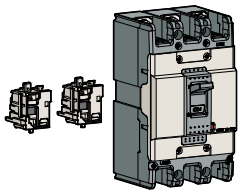
Code	Frame size/ Pole
EBS103c	EBS 125AF 3P
EBS104c	EBS 125AF 4P
EBH103c	EBH 125AF 3P
EBH104c	EBH 125AF 4P

Code	Rated current
15	15A
20	20A
30	30A
40	40A
50	50A
60	60A
75	75A
100	100A
125	125A

Code	Rated residual current	Intentional time delay
1A1s	1A	1s
2A2s	2A	2s

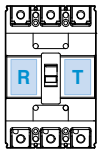
Note) EBS103c/100/30: EBS103c, Rated current 100A, Time delay type 1A1s

Accessories



Electrical auxiliaries

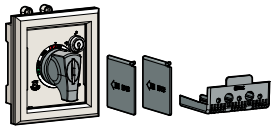
AX	Auxiliary switch
AL	Alarm switch
AX+AL	Combination switch



Maximum possibilities

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

Note) For more detail see 7-1 page



External accessories

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

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

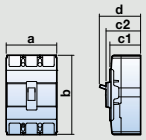
250AF ELCB
EBN250c, EBS250c, EBH250c

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 impulse withstand voltage, Uimp			6kV		
Instantaneous type	Rated residual current, I△n		30, 100, 100/200/500, 100/300/500mA (Adjustable)		
	Residual current off-time at I△n		≤0.1 sec		
	Rated operational voltage, Ue		AC: 220/460V		
Time delay type	Rated residual current		0.1/0.2/0.5/1A, 0.1/0.4/1/2A (Adjustable)		
	Intentional time delay		0/0.2/0.5/1s, 0.5/1/1.5/2s (Adjustable)		
Wiring system	2-pole (2-sensor)		1Ø2W		
	3-pole (3-sensor)		1Ø2W, 1Ø3W, 3Ø3W		
	4-pole (3-sensor)		1Ø2W, 1Ø3W, 3Ø3W, 3Ø4W		
Rated short-circuit breaking capacity, Icu			N-type	S-type	H-type
	AC	460V	26kA	37kA	50kA
		415V	26kA	37kA	50kA
		220/250V	65kA	85kA	100kA
Ics=%×Icu			100%	100%	100%
Protective function			Overload, short-circuit and ground fault		
Type of trip unit			Thermal-magnetic		
Magnetic trip range			12×In		
Life cycle Note5)	Mechanical		20,000 operations		
	Electrical		5,000 operations		
Connection	Standard		Front connection		
	Optional		Rear connection		
Mounting	Standard		Screw fixing		

Dimensions (mm)	Pole	2p	3p	3p	4p	3p	4p
	a	105	105	105	140	105	140
	b	165		165		165	
	c1 Note1)	60		60		60	
	c2 Note1)	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	○		○		○	

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

For more information

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

Ordering types

Breaker types

Instantaneous type

EBS203c / 250 / 30

Code	Frame size/ Pole
EBN202c	EBN 250AF 2P
EBN203c	EBN 250AF 3P
EBS203c	EBS 250AF 3P
EBS204c	EBS 250AF 4P
EBH203c	EBH 250AF 3P
EBH204c	EBH 250AF 4P

Code	Rated current
100	100A
125	125A
150	150A
175	175A
200	200A
225	225A
250	250A

Code	Rated residual current
30	30mA
100	100mA
100/200/500	100/200/500mA
100/300/500	100/300/500mA

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

Time delay type

EBS203c / 250 / 1A1s

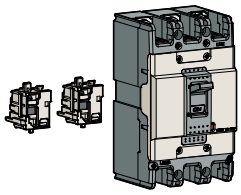
Code	Frame size/ Pole
EBN202c	EBN 250AF 2P
EBN203c	EBN 250AF 3P
EBS203c	EBS 250AF 3P
EBS204c	EBS 250AF 4P
EBH203c	EBH 250AF 3P
EBH204c	EBH 250AF 4P

Code	Rated current
100	100A
125	125A
150	150A
175	175A
200	200A
225	225A
250	250A

Code	Rated residual current	Intentional time delay
1A1s	1A	1s
2A2s	2A	2s

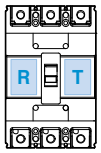
Note) EBS203c/250/30: EBS203c, Rated current 250A, Time delay type 1A1s

Accessories



Electrical auxiliaries

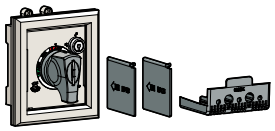
AX	Auxiliary switch
AL	Alarm switch
AX+AL	Combination switch



Maximum possibilities

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

Note) For more detail see 7-1 page



External accessories

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

Note) For more detail see7-9 ~ 7-23 page
- Single type: This cover is used without auxiliary handle.
- D-handle type: This cover is used with D-handle.
- N-handle type: This cover is used with N-handle.

400AF ELCB
EBN400c, EBS400c, EBH400c, EBL400c

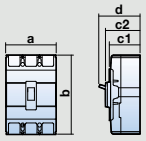

EBS403c


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 impulse withstand voltage, Uimp			6kV			
Rated operational voltage, Ue			220/460V			
Instantaneous type	Rated residual current, IΔn		30, 100/200/500mA (Adjustable)			
	Residual current off-time at IΔn		≤0.1 sec			
Time delay type	Rated residual current		0.1/0.4/1/2A (Adjustable)			
	Intentional time delay		0.5/1/1.5/2s (Adjustable)			
Wiring system		3-pole (3-sensor)	1Ø2W, 1Ø3W, 3Ø3W			
		4-pole (3-sensor)	1Ø2W, 1Ø3W, 3Ø3W, 3Ø4W			
Rated short-circuit breaking capacity, Icu			N-type	S-type	H-type	L-type
	AC	415V/460V	37kA	50kA	65kA	85kA
		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			
Life cycle Note5)	Mechanical		4,000 operations			
	Electrical		1,000 operations			
Connection	Standard		Front connection			
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 Note1)	109		109		109		109	
c2 Note1)	113		113		113		113	
d	145		145		145		145	
Weight, kg Standard	7	8.4	7	8.4	7	8.4	7	8.4

Certification		Pole	3p	4p	3p	4p	3p	4p	3p	4p
	CE marking	CE	○		○		○		○	

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

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

Ordering types

Breaker types

Instantaneous type

EBS403c / 400 / 30

Code	Frame size/ Pole
EBN403c	EBN 400AF 3P
EBN404c	EBN 400AF 4P
EBS403c	EBS 400AF 3P
EBS404c	EBS 400AF 4P
EBH403c	EBH 400AF 3P
EBH404c	EBH 400AF 4P
EBL403c	EBH 400AF 3P
EBL404c	EBH 400AF 4P

Code	Rated current
250	250A
300	300A
350	350A
400	400A

Code	Rated residual current
30	30mA
100/200/500	100/200/500mA

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

Time delay type

EBS403c / 400 / 2A2s

Code	Frame size/ Pole
EBN403c	EBN 400AF 3P
EBN404c	EBN 400AF 4P
EBS403c	EBS 400AF 3P
EBS404c	EBS 400AF 4P
EBH403c	EBH 400AF 3P
EBH404c	EBH 400AF 4P
EBL403c	EBH 400AF 3P
EBL404c	EBH 400AF 4P

Code	Rated current
250	250A
300	300A
350	350A
400	400A

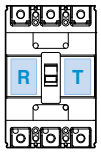
Code	Rated residual current	Intentional time delay
2A2s	2A	2s

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

Accessories

Electrical auxiliaries

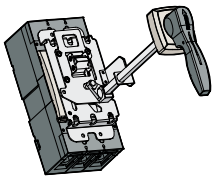
AX	Auxiliary switch
AL	Alarm switch
SHT	Shunt trip
UVT	Undervoltage trip



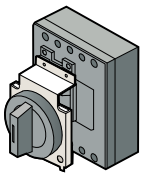
Maximum possibilities

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

Note) For more detail see 7-2 page



E-70U



N-70

External accessories

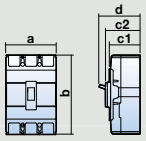
B-43B	Insulation barrier
T1-43A	Terminal cover (Long) - 2, 3pole - Single type, N-handle type
T1-44A	Terminal cover (Long) - 4pole
N-70	Rotary handle (Direct)
E-70U	Rotary handle (Extended)
MI-43	Mechanical interlock - 2, 3pole
MI-44	Mechanical interlock - 4pole

Note) For more detail see7-9 ~ 7-23 page

800AF ELCB
EBN803c, EBS803c, EBL803c

EBS803c

Ratings

Frame size			800AF		
Type and pole			**N-type**	**S-type**	**L-type**
		3-pole (3-sensor)	**EBN803c**	**EBS803c**	**EBL803c**
		4-pole (3-sensor)	-	-	-
Rated current, In			500-630-700-800A		
Rated impulse withstand voltage, Uimp			6 kV		
Rated operational voltage, Ue			220/460V		
Instantaneous type	Rated residual current, I△n		30, 100/200/500mA (Adjustable)		
	Residual current off-time at I△n		≤0.1 sec		
Time delay type	Rated residual current		0.1/0.4/1/2A (Adjustable)		
	Intentional time delay		0.5/1/1.5/2s (Adjustable)		
Wiring system		3-pole (3-sensor)	1Ø2W, 1Ø3W, 3Ø3W		
		4-pole (3-sensor)	-		
Rated short-circuit breaking capacity, Icu			**N-type**	**S-type**	**L-type**
	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		
Life cycle Note4)	Mechanical		2,500 operations		
	Electrical		500 operations		
Connection	Standard		Front connection		
Mounting	Standard		Screw fixing		
Dimensions (mm)		Pole	3p		
		a	210		
		b	280		
		c1 Note1)	109		
		c2 Note1)	113		
		d	145		
Weight, kg		Standard	11.5		
Certification		Pole	3p		
	CE marking	CE	○		

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

For more information

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

Ordering types

Breaker types

Instantaneous type

EBS803c / 800 / 30

Code	Frame size/ Pole
EBN803c	EBN 800AF 3P
EBS803c	EBS 800AF 3P
EBL803c	EBH 800AF 3P

Code	Rated current
500	500A
630	630A
700	700A
800	800A

Code	Rated residual current
30	30mA
100/200/500	100/200/500mA

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

Time delay type

EBS803c / 800 / 2A2s

Code	Frame size/ Pole
EBN803c	EBN 800AF 3P
EBS803c	EBS 800AF 3P
EBL803c	EBH 800AF 3P

Code	Rated current
500	500A
630	630A
700	700A
800	800A

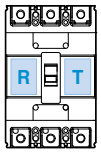
Code	Rated residual current	Intentional time delay
2A2s	2A	2s

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

Accessories

Electrical auxiliaries

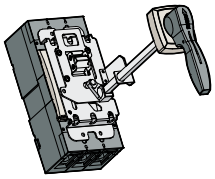
AX	Auxiliary switch
AL	Alarm switch
SHT	Shunt trip
UVT	Undervoltage trip



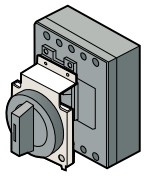
Maximum possibilities

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

Note) For more detail see 7-2 page



E-80U



N-80

External accessories

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

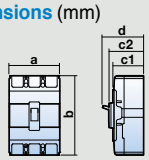
Note) For more detail see 7-9 ~ 7-23 page

1000/1200AF ELCB
EBS1003b, EBS1203b

① Adjustable instantaneous for each phase

Ratings

Frame size			1000AF	1200AF
Type and pole			S-type	S-type
	3-pole (3-sensor)		EBS1003b	EBS1203b
	4-pole (3-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	
		220/250V	125kA	
Protective function			Overload, short-circuit and ground fault	
Type of trip unit			Thermal-magnetic	
Magnetic trip range			3~6×In ...①	
Life cycle Note3)	Mechanical		2,500 operations	
	Electrical		500 operations	
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	



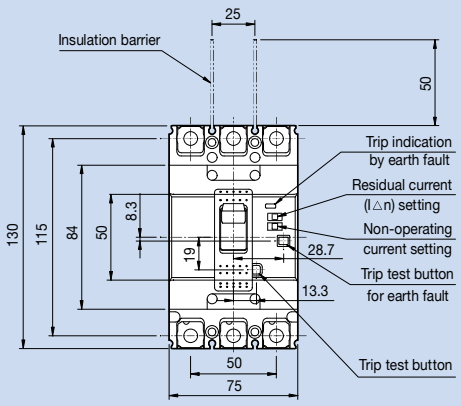
Note) 1. Do not test withstand voltage or insulation resistance test between poles to avoid the damage of the PCB.
2. Rated non-trip current sensitivity is equal to or less than 50% of the rated current sensitivity.
3. Life cycle means not guarantee but limitation
(Quality guarantee: On/Off frequency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

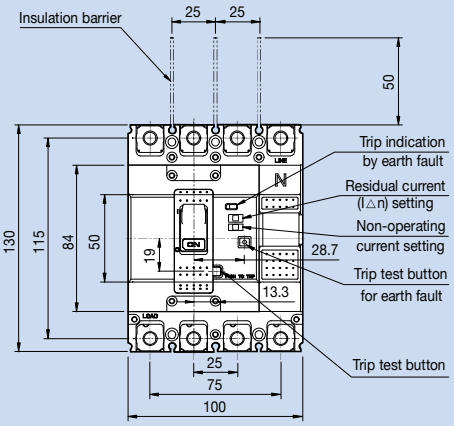
For more information
• Trip curves ▶ 8-5 page
• Drawings ▶ 9-14 page

ELCB

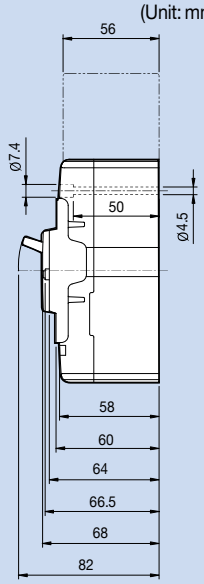
EBN50c EBS30c
EBN60c EBS50c
EBN100c EBS60c

(Unit: mm)

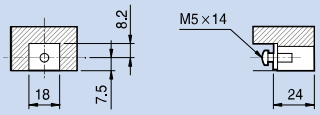




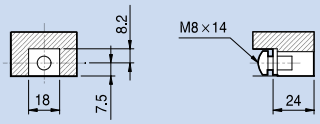
4P



Terminal details

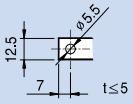


(≤ 50A)

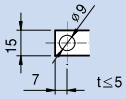


(≥60A)

Connecting

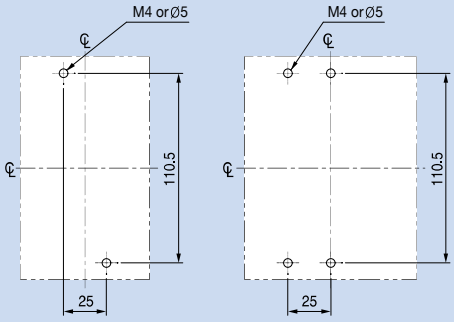


(≤ 50A)



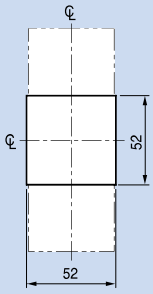
(≥60A)

Panel drilling

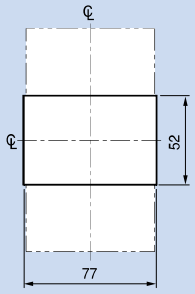


4P

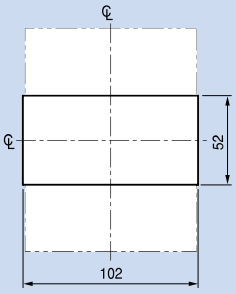
Front panel cutting



2P



3P



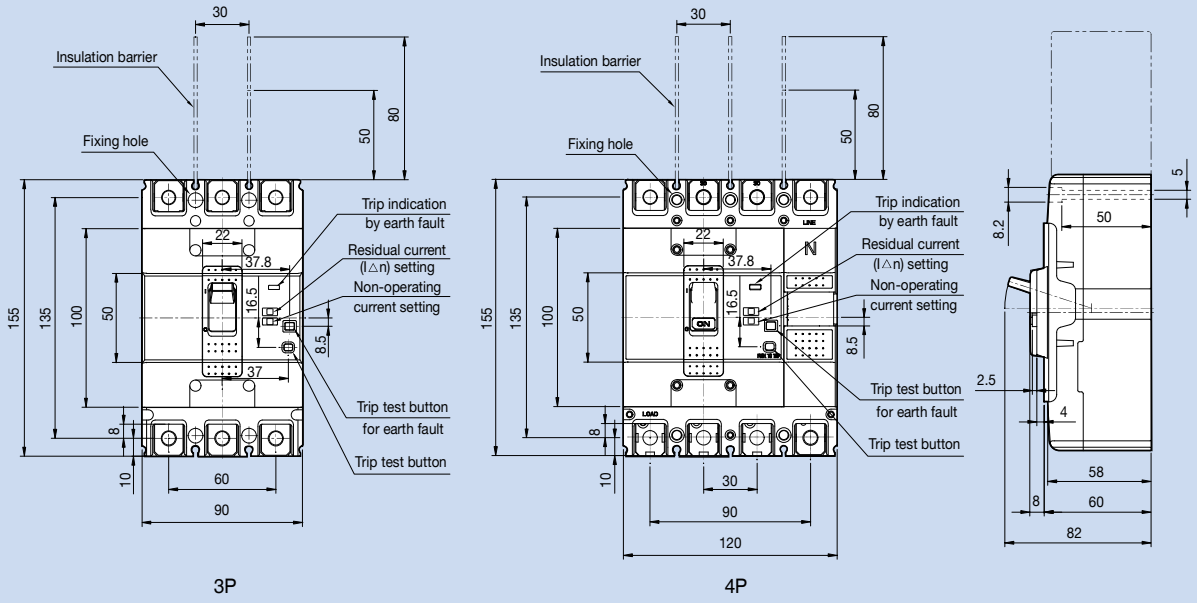
4P

Dimensions

ELCB

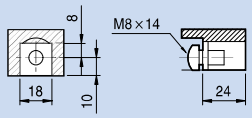
EBS125c | EBH50c | EBH125c

(Unit: mm)

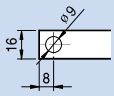


3P 4P

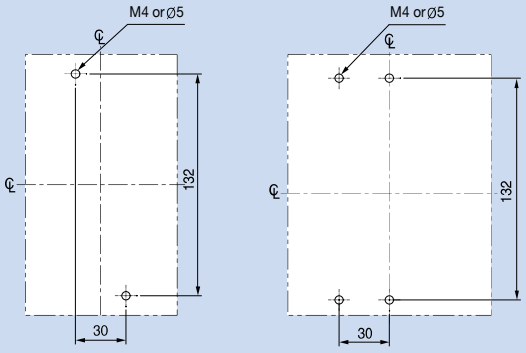
Terminal details



Connecting

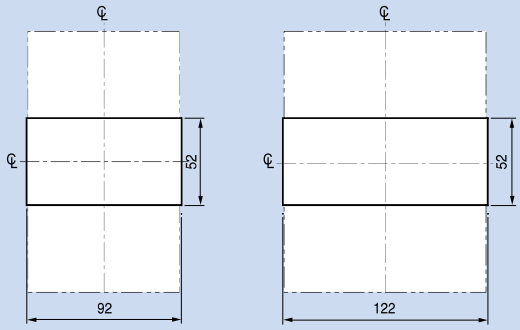


Panel drilling



3P 4P

Front panel cutting

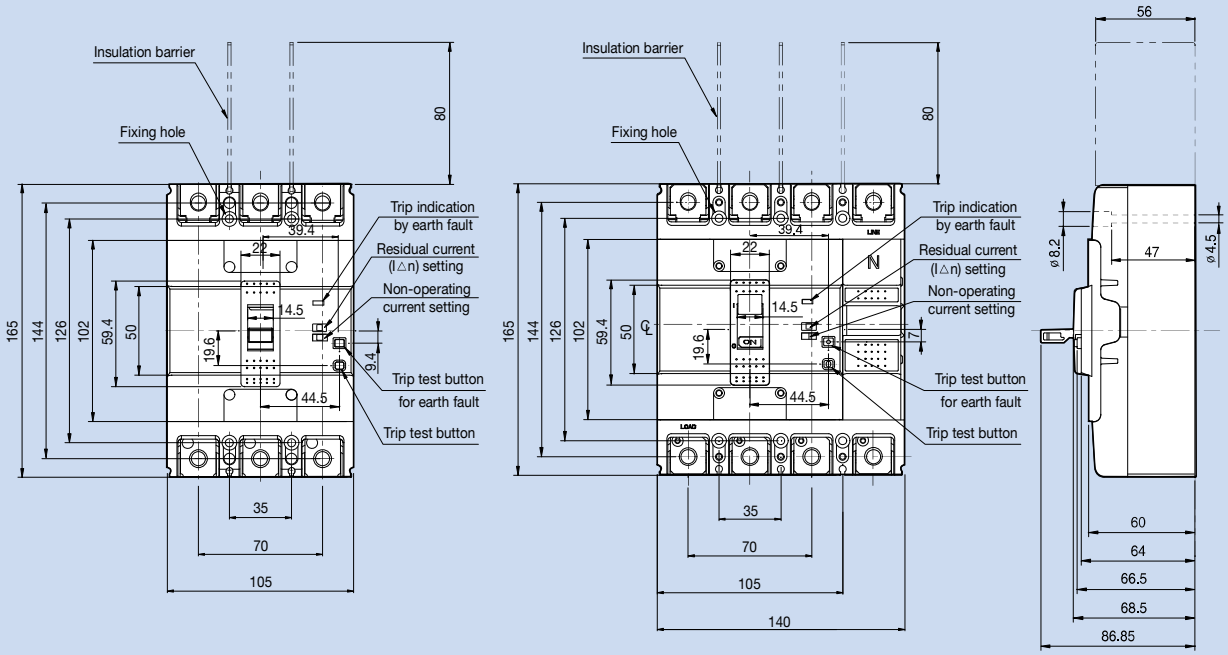


3P 4P

ELCB

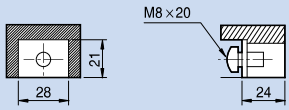
EBN250c | EBS250c | EBH250c

(Unit: mm)

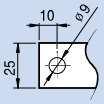


4P

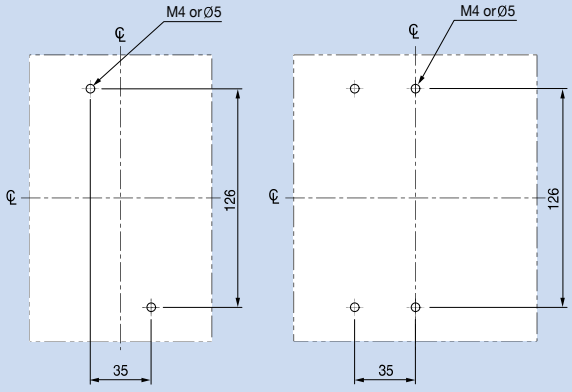
Terminal details



Connecting

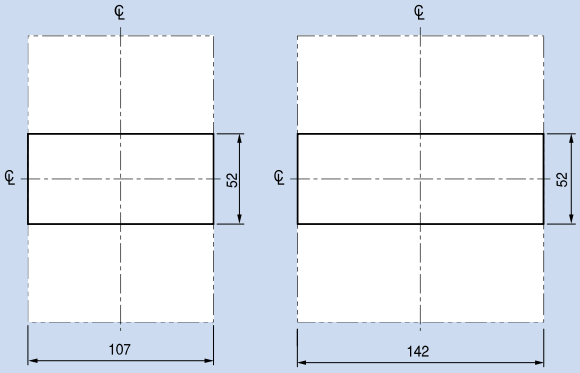


Panel drilling



4P

Front panel cutting



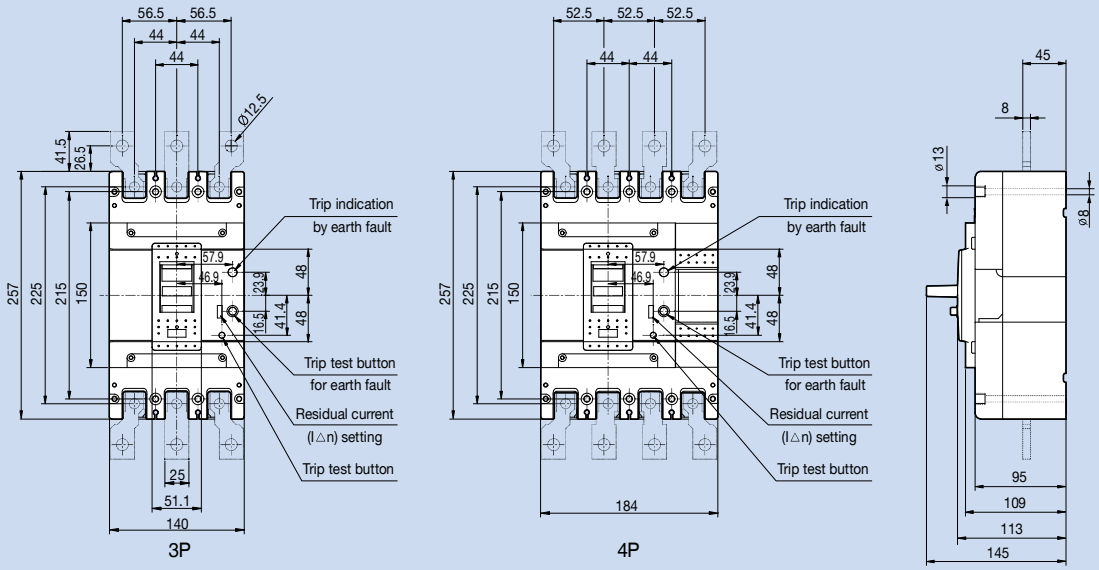
4P

Dimensions

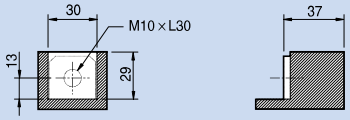
ELCB (Instantaneous type)

EBN400c | EBS400c | EBH400c | EBL400c

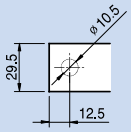
(Unit: mm)



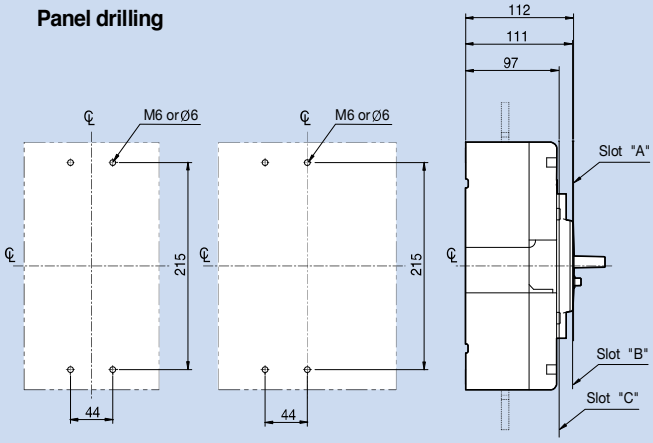
Terminal details



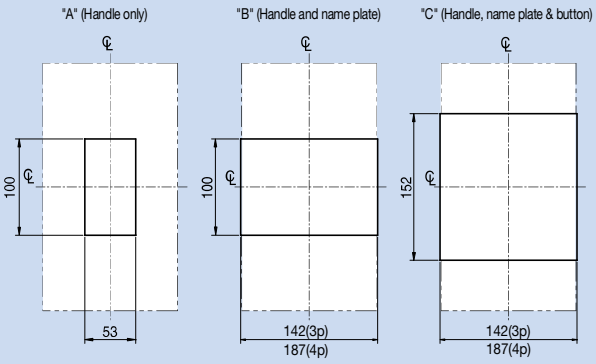
Connecting



Panel drilling



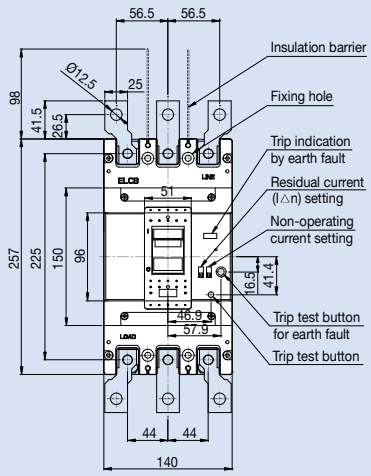
Front panel cutting



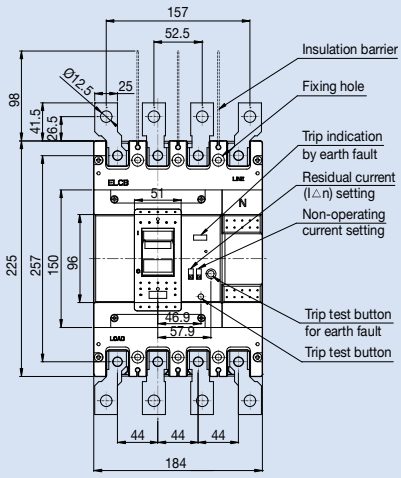
ELCB (Time delay type)

EBN400c | EBS400c | EBH400c | EBL400c

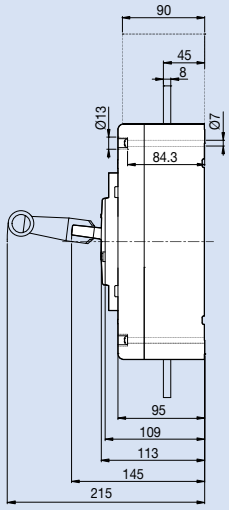
(Unit: mm)



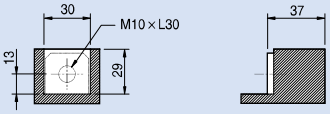
3P



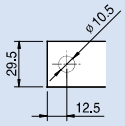
4P



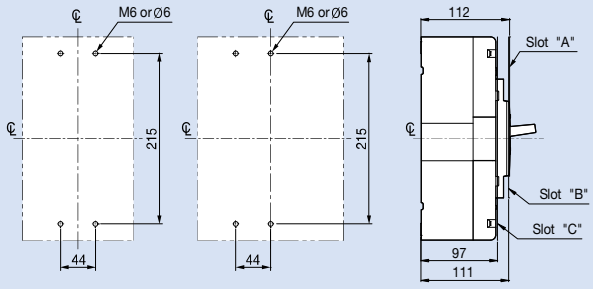
Terminal details



Connecting

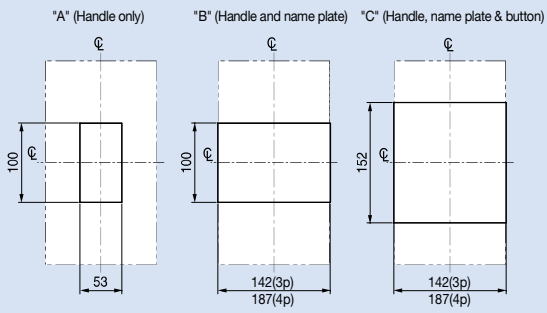


Panel drilling



2, 3P | 4P

Front panel cutting

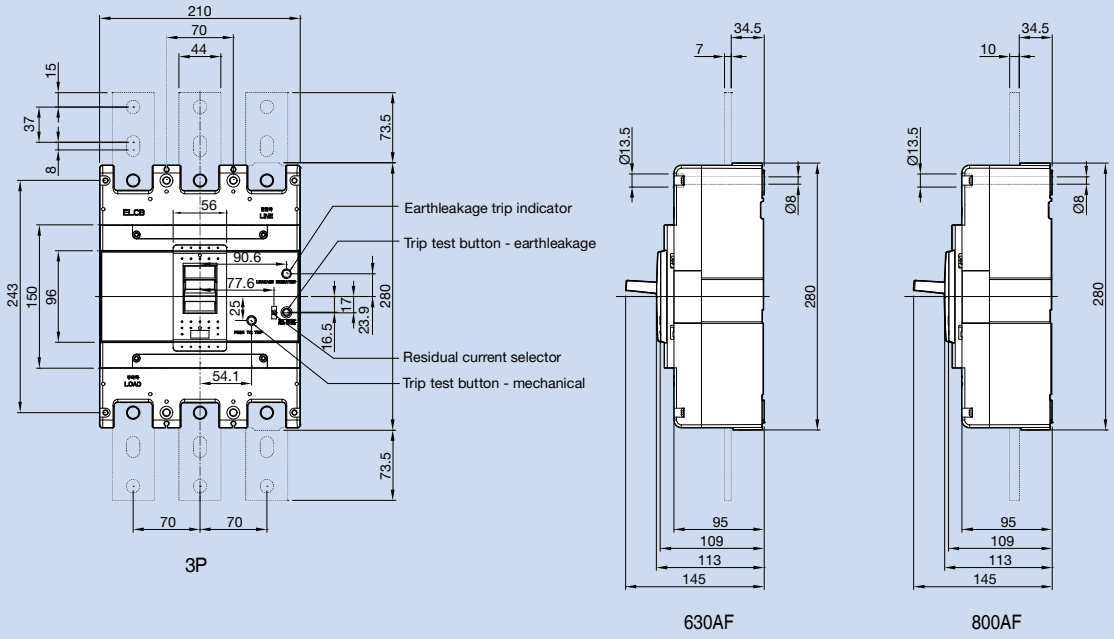


2, 3, 4P | 3, 4P | 3, 4P

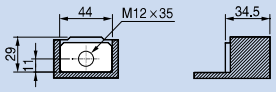
ELCB (Instantaneous type)

EBN800c | EBS800c | EBL800c

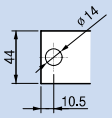
(Unit: mm)



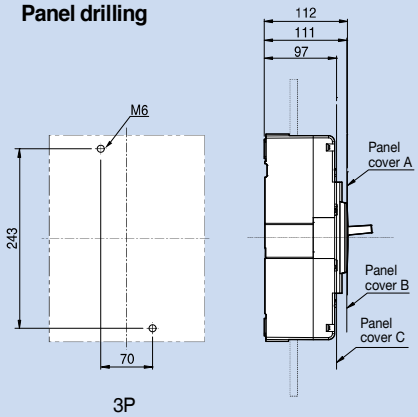
Terminal details



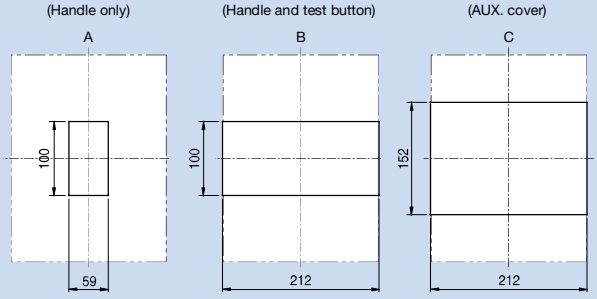
Connecting



Panel drilling



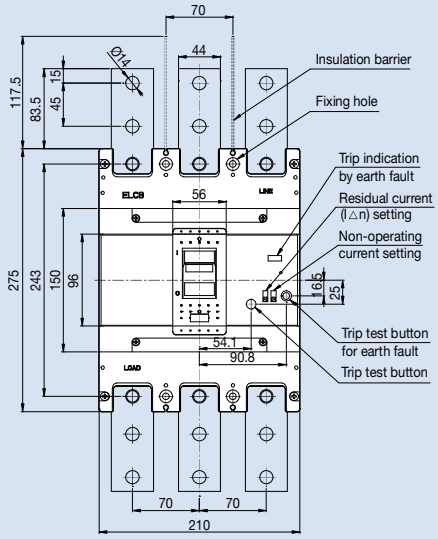
Front panel cutting



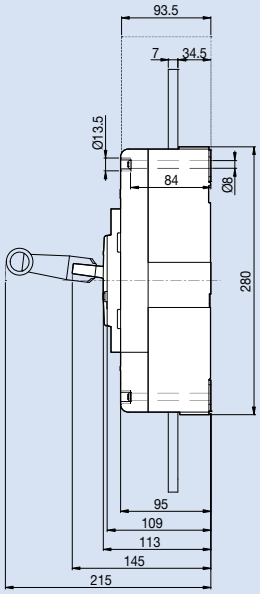
ELCB (Time delay type)

EBN800c | EBS800c | EBL800c

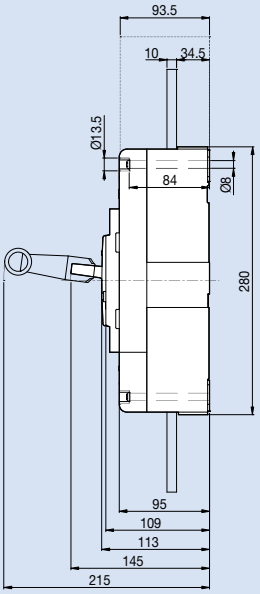
(Unit: mm)



3P

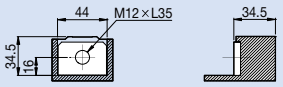


630AF

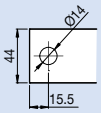


800AF

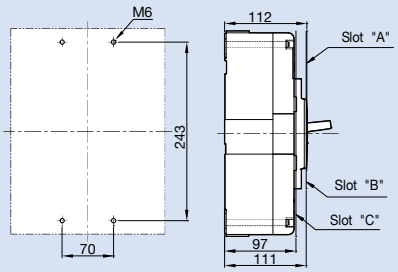
Terminal details



Connecting

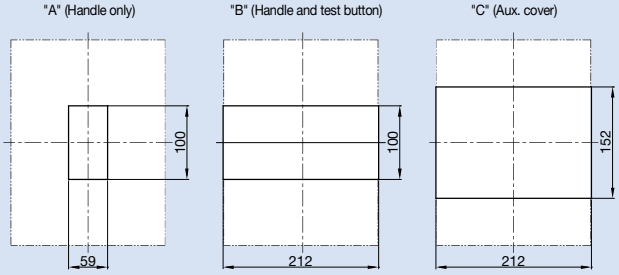


Panel drilling



3P

Front panel cutting



Technical information

Standard accessories

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

Item	100AF	125AF	250AF	400AF	800AF
Fixing screw					
	2P: 2EA (M4×60) 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: 2EA (M4×55) 4P: 4EA (M4×55)	2P: 4EA (M6×100) 3P: 4EA (M6×100) 4P: 4EA (M6×100)	2P: 4EA (M6×100) 3P: 4EA (M6×100) 4P: 4EA (M6×100)
Terminal bolt					
	3~50A 2P: 4EA (M5×14) 3P: 6EA (M5×14) 4P: 8EA (M5×14) **60~100A** 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: 4EA (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

Fixing screws for rotary handles

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

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

Standards & approval

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

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

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

The following certificates are available on a request.

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

CE conformity marking

The CE conformity marking shall indicate conformity to all the obligations imposed on the manufacturer, as regards his products, by virtue of the european community directives providing for the affixing of the CE marking.
When the CE marking is affixed on a product, it represents a declaration of the manufacturer or of his authorized representative that the product in question conforms to all the applicable provisions including the conformity assessment procedures.


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

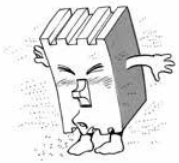
Standard use environment for molded case circuit breaker

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, conductive powder 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		
	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, ABN100e	75	75	75	75	75	73	71	68
	100		100	100	100	100	100	97	94	91
125	125	ABH50c, ABS125c, ABH125c, ABL125c	125	125	125	125	125	121	116	107
250	150	ABN250c, ABS250c, ABH250c, ABL250c	150	150	150	150	150	145	140	128
	175		175	175	175	175	175	169	163	150
	200		200	200	200	200	200	193	186	171
	225		225	225	225	225	225	217	209	193
	250		250	250	250	250	250	241	233	214
400	250	ABN400c, ABS400c 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	700	ABN800c, ABS800c ABL800c	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	EBN250c, EBS250c, 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	246	242	238	238
	300		300	300	300	300	295	291	287	287
	350		350	350	350	350	345	339	332	332
	400		400	400	400	400	394	388	381	381
800	700	EBN800c, EBS800c EBL800c	700	700	700	700	689	679	668	668
	800		800	800	800	800	788	776	764	764

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.

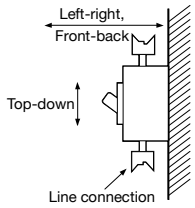
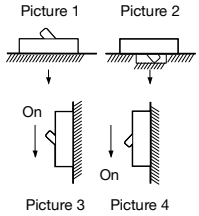
* Core loss: It refers to the electrical loss in a transformer caused by magnetization of the core that changes over time and is categorized into hysteresis loss and eddy current loss.

* 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	

Certifications

MCCB

	Type	Approvals		Certificates
	Certificate	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
	Certificate	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
	Certificate	Safet certi	IEC	KEMA
	Mark and name		CE	KEMA
	Type	Korea	Europe	Netherlands
ELCB 30~250AF	EBS32c	●	●	●
	EBS33c	●	●	●
	EBS34c	●	●	●
	EBN52c	●	●	●
	EBN53c	●	●	●
	EBS53c	●	●	●
	EBS54c	●	●	●
	EBN63c	●	●	●
	EBS63c	●	●	●
	EBS64c	●	●	●
	EBN102c	●	●	●
	EBN103c	●	●	●
	EBN104c	●	●	●
	EBS33d	●	●	●
	EBS34d	●	●	●
	EBN52d	●	●	●
	EBN53d	●	●	●
	EBS53d	●	●	●
	EBS54d	●	●	●
	EBN63d	●	●	●
	EBS63d	●	●	●
	EBS64d	●	●	●
	EBN102d	●	●	●
	EBN103d	●	●	●
	EBN104d	●	●	●
	EBP53c	●	●	●
	EBP54c	●	●	●
	EBH53c	●	●	●
	EBH54c	●	●	●
	EBS103c	●	●	●
	EBS104c	●	●	●
	EBP103c	●	●	●
	EBP104c	●	●	●
	EBH103c	●	●	●
	EBH104c	●	●	●
	EBN202c	●	●	●
	EBN203c	●	●	●
	EBS203c	●	●	●
	EBS204c	●	●	●
	EBP203c	●	●	●
	EBP204c	●	●	●
	EBH203c	●	●	●
	EBH204c	●	●	●

Note: ● (Completion)