Metasol



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



EBS33c

### **Ratings**

Frame size	9					30/	AF
Type and pole						S-ty	/pe
		2-ро	le (2-sensor)	EBS32c			
		3-ро	le (3-sensor)	EBS33c			
		4-po	le (3-sensor)			EBS	34c
Rated current,	In				(	5-10) Note3)	-15-20-30A
Rated impulse v	withstand voltag	je, Uin	ıp			6k	V
	Rated residua	l curre	nt, I∆n	30, 100,	100/2	00/500, 100	)/300/500mA (Adjustable)
Instantaneous type	Residual curre	ent off-	time at I∆n			≤0.1	sec
type	Rated operation	onal vo	oltage, Ue			AC: 22	0/460V
Time delay	Rated residua	l curre	nt	0.1/	0.2/0	.5/1A, 0.1/0	).4/1/2A (Adjustable)
type	Intentional tim	e dela	y	0/0	0.2/0.	5/1s, 0.5/1/	1.5/2s (Adjustable)
Wiring system		2-ро	le (2-sensor)			1Ø	2W
		3-ро	le (3-sensor)			1Ø2W, 1Ø	3W, 3Ø3W
		4-ро	le (3-sensor)	1Ø2W, 1Ø3W, 3Ø3W, 3Ø4W			3Ø3W, 3Ø4W
Rated short-circuit breaking			S-type				
capacity, Icu		AC	460V	14 (10)kA			0)kA
415V 220/2			415V	14 (10)kA			
		220/250V	30 (25)kA				
lcs=%×lcu				100%			
Protective fun	ction			Overload, short-circuit and ground fault			
Type of trip un	it			Thermal-magnetic			
Magnetic trip ra	ange					40	DA
Life cycle Note6	)	Mecl	nanical	25,000 operations			
		Elect	trical	10,000 operations			
Connection		Stan	dard	Front connection			
		Optio	onal			Rear co	nnection
Mounting		Stan	dard			Screw	fixing
Dimensions (r	nm)		Pole	2p		Зр	4p
	d		а		75		100
a	<u>c2</u> <u>c1</u>		b		130		130
			c1 Note1)		60		60
	₩ <del>C</del>		c2 Note1)		64		64
			d	82			82
Weight, kg			Standard	0.5		0.7	0.9
Certification			Pole		Зр		4p
CE mark	kina		((		0		0

### For more information

<ul> <li>Accessories</li> </ul>	▶ 7-1 page	
<ul> <li>Trip curves</li> </ul>	▶ 8-1 page	
Drawings	▶ 9-9 page	
<ul> <li>Connection and mounting</li> </ul>	▶10-2 page	

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.)

### **Breaker types**

### Instantaneous type

EI	3S33c /		5		/	30
Code	Frame size/ Pole	Code	Rated current		Code	Rated residual current
EBS32c	EBS 30AF 2P	5	5A		30	30mA
EBS33c	EBS 30AF 3P	10	10A	_	100	100mA
EBS34c	EBS 30AF 4P	15	15A	_	100/200/500	100/200/500mA
		20	20A	_	100/300/500	100/300/500mA
		25	25A			

30A

30

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



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



### **Accessories**



#### **Electrical auxiliaries**

			10
AX	AX Auxiliary switch		_
AL	Alarm switch		
AX+AL	Combination switch		



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#### Maximum possibilities

T-position	Not available			
<b>R</b> -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

Metasol



EBN53c



### **Ratings**

Frame size			50AF						
Type and pole			N-t	уре	S-t	уре	H-t	уре	
		2-pole (2-sensor)	EBI	N52c		-	-		
		3-pole (3-sensor)	EBI	N53c	EB	S53c	EBH	153c	
		4-pole (3-sensor)		-	EB	S54c	EBH	154c	
Rated current,	In				15-20-3	0-40-50A			
Rated impulse v	vithstand voltag	ge, Uimp			6	kV			
	Rated residua	al current, I∆n	30, 1	00, 100/20	00/500, 10	0/300/500	mA (Adjus	table)	
Instantaneous	Residual curr	ent off-time at I∆n			≤0.	1 sec			
type	Rated operati	ional voltage, Ue			AC: 22	20/460V			
Time delay	Rated residua	al current	(	0.1/0.2/0.	5/1A, 0.1/	/0.4/1/2A (	Adjustable	e)	
type	Intentional tim	ne delay		0/0.2/0.5	/1s, 0.5/1	I/1.5/2s (A	djustable)		
Wiring system		2-pole (2-sensor)			10	02W			
		3-pole (3-sensor)		1	Ø2W, 1Ø	93W, 3Ø3	N		
	4-pole (3-sensor)	1Ø2W, 1Ø3W, 3Ø3W, 3Ø4W							
Rated short-cir	cuit breaking		N-type S-type			H-type			
capacity, Icu A		AC 460V	14kA		18kA		50kA		
		415V	14	14kA		18kA		50kA	
		220/250V	30kA		35kA		100kA		
lcs=%×lcu			100% 100%		10	0%			
Protective fun	ction		(	Overload,	short-cire	cuit and g	round fau	lt	
Type of trip uni	t		Thermal-magnetic						
Magnetic trip ra	ange			12×I	n (30A ar	nd under:	400A)		
Life cycle Note5)	)	Mechanical	25,000 operations						
		Electrical		10,000 operations					
Connection		Standard			Front co	onnection			
		Optional			Rear co	onnection			
Mounting		Standard			Screv	v fixing			
Dimensions (r	nm)	Pole	2p	Зр	Зр	4p	Зр	4p	
	d	a	75	75	75	100	90	120	
a	<u>c2</u> <u>c1</u>	b	1	30	1	30	1	55	
		c1 Note1)	e	60		60 6		60	
	IT.	c2 Note1)	6	64	e	64	6	64	
		d	8	32	8	32	8	32	
Weight, kg		Standard	0.5	0.7	0.7	0.9	1	1.2	
Certification		Pole	2р	Зр	Зр	4p	Зр	4p	
CE marking (€									

For more information	on	
Accessories	▶ 7-1 p	age

<ul> <li>Trip curves</li> </ul>	▶ 8-1 ~ 8-2 page
Drawings	▶ 9-9 ~ 9-10 page
<ul> <li>Connection and mounting</li> </ul>	▶10-2 page

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.)

### **Breaker types**

### Instantaneous type

EI	BN53c /		20		/	30
Code	Frame size/ Pole	Code	Rated current		Code	Rated residual current
EBN52c	EBN 50AF 2P	15	15A		30	30mA
EBN53c	EBN 50AF 3P	20	20A		100	100mA
EBS53c	EBS 50AF 3P	30	30A	-	100/200/500	100/200/500mA
EBS54c	EBS 50AF 4P	40	40A	-	100/300/500	100/300/500mA
EBH53c	EBH 50AF 3P	50	50A	-		
EBH54c	EBH 50AF 4P					

1A1s

Intentional

time delay

1s

2s

Rated residual

current

1A

2A

Code

1A1s

2A2s

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

#### Time delay type

E	BN53c /			20
Code	Frame size/ Pole		Code	Rated current
EBN52c	EBN 50AF 2P		15	15A
EBN53c	EBN 50AF 3P		20	20A
EBS53c	EBS 50AF 3P		30	30A
EBS54c	EBS 50AF 4P		40	40A
EBH53c	EBH 50AF 3P		50	50A
EBH54c	EBH 50AF 4P	_		

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



### **Accessories**



#### **Electrical auxiliaries**

AX	Auxiliary switch	
AL	Alarm switch	R 🖬 T
AX+AL	Combination switch	

### Maximum possibilities

T-position	Not available			
<b>R-position</b>	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.

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## **60AF ELCB** EBN60c, EBS60c

Metasol



EBN63c



EBS63c

#### For more information . . 71

<ul> <li>Connection and mounting</li> </ul>	▶10-2 page
Drawings	▶ 9-9 page
<ul> <li>Trip curves</li> </ul>	▶ 8-1 page
<ul> <li>Accessories</li> </ul>	7-1 page

### **Ratings**

Frame size			60AF					
Type and pole			N-type	S-I	уре			
		2-pole (2-sensor)	-	-				
		3-pole (3-sensor)	EBN63c	EB	S63c			
		4-pole (3-sensor)	-	EB	S64c			
Rated current, I	n		60	A				
Rated impulse w	vithstand voltag	je, Uimp	6kV					
	Rated residua	al current, I∆n	30, 100, 100/200/500, 100	100/300/500mA (Adjustable)				
Instantaneous	Residual curr	rent off-time at I∆n	≤0.1	sec				
type	Rated operat	ional voltage, Ue	AC: 220/460V					
Time delay	Rated residua	al current	0.1/0.2/0.5/1A, 0.1/0	).4/1/2A (Adju	stable)			
type	Intentional tin	ne delay	0/0.2/0.5/1s, 0.5/1/	1.5/2s (Adjus	table)			
Wiring system		2-pole (2-sensor)	-					
		3-pole (3-sensor)	1Ø2W, 1Ø3	3W, 3Ø3W				
		4-pole (3-sensor)	1Ø2W, 1Ø3W,	3Ø3W, 3Ø4\	N			
Rated short-cire	cuit breaking		N-type S-type					
capacity, Icu AC		AC 460V	14kA	18	18kA			
		415V	14kA	18kA				
		220/250V	30kA 35kA					
lcs=%×lcu			100% 100%					
Protective fund	ction		Overload, short-circ	uit and groun	d fault			
Type of trip unit			Thermal-	magnetic				
Magnetic trip ra	nge		12>	<in< td=""><td></td></in<>				
Life cycle Note5)		Mechanical	25,000 operations					
		Electrical	10,000 operations					
Connection		Standard	Front connection					
		Optional	Rear cor	nnection				
Mounting		Standard	Screw	fixing				
Dimensions (m	nm)	Pole	Зр	Зр	4p			
t	d . c2	a	75	75	100			
	c1	b	130	130	130			
		c1 Note1)	60	60	60			
		c2 Note1)	64	64	64			
		d	82	82	82			
Weight, kg		Standard	d 0.7 0.7					
Certification		Pole	Зр	Зр	4p			
CE markir	na	(€	0 0					

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.)

### **Breaker types**

### Instantaneous type



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

#### Time delay type EBN63c 60 1A1s Frame size/ Pole Intentional Rated Rated residual Code Code Code current current time delay EBN63c EBN 60AF 3P 1A1s 1A 1s 60A 60 EBS63c EBS 60AF 3P 2A2s 2A 2s EBS64c EBS 60AF 4P

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



### **Accessories**



#### **Electrical auxiliaries**

AX	Auxiliary switch	ł	
AL	Alarm switch		R
AX+AL	Combination switch	ł	

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#### Maximum possibilities

T-position Not available				
<b>R</b> -position	Option of AX or AL or AX+AL			
Note) For more detail see 7-1 nage				



#### **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

-		
For	more information	

Accessories	▶ 7-1 page	
Trip curves	▶ 8-1 page	
Drawings	▶ 9-9 page	
<ul> <li>Connection and mounting</li> </ul>	▶10-2 page	

### **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					
	Rated residu	al current, I∆n	30, 100, 100/200/500, 100/300/500mA (Adjustable)					
Instantaneous type	Residual cur	rent off-time at I∆n		≤0.1 sec				
ijpo	Rated opera	tional voltage, Ue		AC: 220/460V				
Time delay	Rated residu	al current	0.1/0.2/0.5	/1A, 0.1/0.4/1/2A (/	Adjustable)			
type	Intentional tir	ne delay	0/0.2/0.5/	′1s, 0.5/1/1.5/2s (A	djustable)			
Wiring system		2-pole (2-sensor)	or) 1Ø2W					
		3-pole (3-sensor)	19	02W, 103W, 303V	N			
		4-pole (3-sensor)	1Ø2W, 1Ø3W, 3Ø3W, 3Ø4W		Ø4W			
Rated short-cir	cuit breaking		N-type					
capacity, lcu		AC 460V	18kA					
		415V	18kA					
		220/250V		35kA				
lcs=%×lcu			100%					
Protective fun	ction		Overload, short-circuit and ground fault					
Type of trip unit	t		Thermal-magnetic					
Magnetic trip ra	inge			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 (n	าm)	Pole	2р	Зр	4p			
	d	а	75	75	100			
a	<u>c1</u>	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	Зр	4р			
CE marking		0	0	0				

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.)

### **Breaker types**

### Instantaneous type

EE	1	00	/		30	
Code	Frame size/ Pole	Code	Rated current	Code		Rated residual current
EBN102c	EBN 100AF 2P	60	60A	30		30mA
EBN103c	EBN 100AF 3P	75	75A	100		100mA
EBN104c	EBN 100AF 4P	100	100A	100/200/5	600	100/200/500mA
				100/300/5	600	100/300/500mA

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



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



### **Accessories**



#### **Electrical auxiliaries**

AX	Auxiliary switch	
AL	Alarm switch	RBT
AX+AL	Combination switch	

### Maximum possibilities

T-position	Not available
<b>R</b> -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.



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### 125AF ELCB EBS125c, EBH125c



EBS103c



EBH103c

For more information

Connection and mounting ▶10-2 page

▶ 7-1 page

▶ 8-2 page

▶ 9-10 page

Accessories

Trip curves

Drawings

### **Ratings**

Frame size				125AF				
Type and pole				S-ty	/pe	H-type		
		2-pol	e (2-sensor)		-		-	
		3-pol	e (3-sensor)	EBS	103c	EBH	1103c	
		4-pole (3-sensor)		EBS	104c	EBH	1104c	
Rated current,	In			15	-20-30-40-50-	60-75-100-12	25A	
Rated impulse v	vithstand voltag	e, Uim	р		61	άV		
	Rated residua	al current, I∆n		30, 100, 10	0/200/500, 100	)/300/500mA	(Adjustable)	
Instantaneous type	Residual curre	ent off-t	ime at I∆n		≤0.1	sec		
type	Rated operational voltage, Ue				AC: 22	0/460V		
Time delay Rated residua		l currer	nt	0.1/0.	2/0.5/1A, 0.1/0	).4/1/2A (Adju	istable)	
type			/	0/0.2	2/0.5/1s, 0.5/1/	'1.5/2s (Adjus	table)	
Wiring system		2-pole (2-sensor)						
		3-pole (3-sensor)			1Ø2W, 1Ø	3W, 3Ø3W		
		4-pol	e (3-sensor)	1	Ø2W, 1Ø3W,	3Ø3W, 3Ø4W		
Rated short-cir	cuit breaking			N-ty	уре	S-type		
capacity, Icu		AC	460V	37kA		50kA		
			415V	37kA		50kA		
			220/250V	85kA		100kA		
lcs=%×lcu				10	0%	100%		
Protective fun	ction			Overl	oad, short-circ	uit and groun	d fault	
Type of trip uni	t				Thermal-	magnetic		
Magnetic trip ra	ange			12×In (30A and under: 400A)				
Life cycle Note5)		Mech	anical	25,000 operations				
		Elect	rical	10,000 operations				
Connection		Stand	dard	Front connection				
		Optio	nal	Rear connection				
Mounting		Stand	dard		Screw fixing			
Dimensions (n	nm)		Pole	Зр	4р	Зр	4p	
+	d		а	90	120	90	120	
a	c2 .c1		b	155	155	155	155	
			c1 Note1)	60	60	60	60	
			c2 Note1)	64	64	64	64	
	<u> </u>		d	82	82	82	82	
Weight, kg			Standard	1	1.2	1	1.2	
Certification			Pole	Зр	4p	Зр	4p	
CE marking			(€		0	0		

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.)

### **Breaker types**

### Instantaneous type

EE	3S103c /	1	00	/	30
Code	Frame size/ Pole	Code	Rated current	Code	Rated residual current
EBS103c	EBS 125AF 3P	15	15A	30	30mA
EBS104c	EBS 125AF 4P	20	20A	100	100mA
EBH103c	EBH 125AF 3P	30	30A	100/200/500	100/200/500mA
EBH104c	EBH 125AF 4P	40	40A	100/300/500	100/300/500mA
		50	50A		
		60	60A		
		75	75A		

100

125

100A

125A

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

### Time delay type

[	EBS	6103c	/	1	00	/	1A <sup>.</sup>	1s	
Code		Frame Po		Code	Rated current	Code	Rated resid current		ntentional me delay
EBS103	BC	EBS 125	SAF 3P	15	15A	1A1s	1A		1s
EBS104	lc	EBS 125	SAF 4P	20	20A	2A2s	2A		2s
EBH103	Bc	EBH 125	5AF 3P	30	30A				
EBH104	lc	EBH 125	5AF 4P	40	40A				
				50	50A	_			
				60	60A	_			
				75	75A				
				100	100A	_			
				125	125A	_			

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

### **Accessories**



#### **Electrical auxiliaries**

		. 11.
AX	Auxiliary switch	
AL	Alarm switch	
AX+AL	Combination switch	H



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#### Maximum possibilities

T-position	Not available
<b>R</b> -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

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EBN203c



EBS203c

### **Ratings**

Frame size				250AF						
Type and pole				N-t	уре	S-t	уре	H-ty	H-type	
		2-ро	le (2-sensor)	EBN	202c	-		-		
		3-ро	le (3-sensor)	EBN	203c	EBS	203c EBH		203c	
		4-po	le (3-sensor)		-	EBS	204c	EBH	204c	
Rated current, In					100-12	5-150-17	5-200-22	5-250A		
Rated impulse withs	tand voltag	je, Uim	р			61	kV			
	ted residua	al curre	ent, I∆n	30, 10	0, 100/20	0/500, 10	0/300/500	)mA (Adju	stable)	
Instantaneous type	sidual curr	ent off	time at I∆n			≤0.	1 sec			
	Rated operational voltage, Ue					AC: 22	0/460V			
Time delay Ra	ted residua	al curre	ent	C	.1/0.2/0.5	/1A, 0.1/	0.4/1/2A (	Adjustable	e)	
type Int	entional tim	ne dela	y		0/0.2/0.5	/1s, 0.5/1	/1.5/2s (A	djustable)		
Wiring system		2-ро	le (2-sensor)			1Ø	2W			
		3-ро	le (3-sensor)		1	Ø2W, 1Ø	3W, 3Ø3	N		
		4-pole (3-sensor)			1Ø2W, 1Ø3W, 3Ø3W, 3Ø4W					
Rated short-circuit	breaking			N-t	уре	S-t	S-type		H-type	
capacity, lcu		AC	460V	26	kA	37kA		50kA		
			415V	26kA		37kA		50kA		
			220/250V		65kA 8		85kA 100		)kA	
lcs=%×lcu				100% 100%		100%				
Protective functio	n			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						
		Optio	onal	Rear connection						
Mounting		Stan	dard			Screw	/ fixing			
Dimensions (mm)			Pole	2р	Зр	Зр	4р	Зр	4р	
d c2	1		а	105	105	105	140	105	140	
			b	1	65	10	65	16	65	
			c1 Note1)	6	0	60		6	0	
			c2 Note1)	6	4	6	64	6	4	
			d	87		87		8	7	
Weight, kg			Standard	1.1	1.2	1.2	1.5	1.2	1.5	
Certification			Pole	2р	Зр	Зр	4p	Зр	4р	
CE marking			(€		С	(	5	(	)	

F	or	mo	rei	nt	orm	nati	on

<ul> <li>Accessories</li> </ul>	7-1 page	
<ul> <li>Trip curves</li> </ul>	▶ 8-3 page	
Drawings	▶ 9-11 page	
Connection and mounting	▶10-2 page	

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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.)

### **Breaker types**

### Instantaneous type

EE	3S203c /	2	250		/	30
Code	Frame size/ Pole	Code	Rated current		Code	Rated residual current
EBN202c	EBN 250AF 2P	100	100A		30	30mA
EBN203c	EBN 250AF 3P	125	125A		100	100mA
EBS203c	EBS 250AF 3P	150	150A		100/200/500	100/200/500mA
EBS204c	EBS 250AF 4P	175	175A		100/300/500	100/300/500mA
EBH203c	EBH 250AF 3P	200	200A			
EBH204c	EBH 250AF 4P	225	225A	_		
		250	250A			

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

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

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

### Accessories



#### **Electrical auxiliaries**

		6
AX	Auxiliary switch	
AL	Alarm switch	
AX+AL	Combination switch	



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#### Maximum possibilities

T-position Not available			
<b>R</b> -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	

#### 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

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For	more	intorr	nation
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Accessories	▶ 7-2 page
Trip curves	▶ 8-4 page
Drawings	▶ 9-12 page

<ul> <li>Connection and mounting</li> </ul>	▶10-3 page

### **Ratings**

N+ye and poleS-ye and p	Frame size						400	)AF				
4-pole (3-sensor)EBN-04cEBN-04cEBH-40cEBL404cEBL	Type and pole			N-t	уре	S-t	уре	H-ty	уре	L-ty	уре	
Rated current, I anRated residual current, I anRated residual current, I anRated residual currentRated residual currentRated residual currentRated residual current <td row<="" td=""><td colspan="2"></td><td>3-pole (3-sensor)</td><td>EBN</td><td>403c</td><td>EBS</td><td>403c</td><td>EBH</td><td>403c</td><td>EBL</td><td>403c</td></td>	<td colspan="2"></td> <td>3-pole (3-sensor)</td> <td>EBN</td> <td>403c</td> <td>EBS</td> <td>403c</td> <td>EBH</td> <td>403c</td> <td>EBL</td> <td>403c</td>			3-pole (3-sensor)	EBN	403c	EBS	403c	EBH	403c	EBL	403c
Rated inpulse withstand voltage, Uimp       Reted repidual current, I Δn         Rated residual current, I Δn       SUDUEUSOUTA (Adjustation of the stantaneous intentional time delay         Pine delay       Rated residual current off-time at I Δn       SUDUEUSOUTA (Adjustation of the stantaneous intentional time delay         Viring system       Rated residual current       SUDUEUSUSUSUSUSUSUSUSUSUSUSUSUSUSUSUSUSU			4-pole (3-sensor)	EBN	404c	EBS	404c	EBH	404c	EBL	404c	
Rated operational voltage, UeZEUV-UEV-UEV-UEV-UEV-UEV-UEV-UEV-UEV-UEV-	Rated current,	In				25	0-300-	350-40	0A			
$\begin the table and the table and table and$	Rated impulse v	vithstand voltag	ge, Uimp				6	٢V				
Interaction of time at IAnSolual current off-time at IAnTime delayRated residual current $0.1/0.4/1/2A$ (Adjustable)Image: Solutable)VipeIntentional time delay $0.5/1/1.5/2S$ (Adjustable)Image: Solutable)Ving system3-pole (3-sensor) $102W, 103W, 303W, 304W$ Image: Solutable)Rated short-circuit breakingN-typeS-typeH-typeL-typecapacity, IcuAC415V/460V $37 kA$ $50 kA$ $65 kA$ $85 kA$ Ics=%xIcuImage: SolutableImage: SolutableImage: SolutableImage: SolutableImage: SolutableProtective functionImage: SolutableImage: SolutableImage: SolutableImage: SolutableImage: SolutableImage: SolutableMagnetic trip rangeMechanicalImage: SolutableImage: SolutableImage: SolutableImage: SolutableImage: SolutableImage: SolutableMountingStandardImage: SolutableImage: SolutableImage: SolutableImage: SolutableImage: SolutableImage: SolutableImage: SolutablePole3p4p3p4p3p4p3p4pImage: SolutableImage: Solutable <thimage: solutable<="" th=""><thimage: solutable<="" th="">Ima</thimage:></thimage:>	Rated operation	al voltage, Ue					220/	460V				
Time delayIntentional time delay $0.1/0.4/1/2.A$ (Adjustable)Vipe $0.5/1/1.5/2:s$ (Adjustable)Wiring system $3-pole (3-sensor)10^2 \times 10^3 \times 30^3 \times$	Instantaneous	Rated residu	al current, I∆n		30	), 100/2	00/500	mA (Ad	djustab	le)		
$\begin{tabular}{ c c c c c c } \hline Pole (3-sensor) & $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$	type	Residual cur	rent off-time at I∆n				≤0.1	1 sec				
$\begin triangly tri$	Time delay	Rated residu	al current			0.1/0	.4/1/2A	(Adjus	table)			
Ideal i	type	Intentional tir	me delay			0.5/1	/1.5/2s	(Adjust	table)			
Rated short-circuit breaking capacity, lcuN-typeS-typeH-typeL-typeCapacity, lcuAC415V/460V37kA50kA65kA85kA125kA20/250V50kA75kA85kA100%100%100%75%Protective functionOverload, short-circuit and ground faultThermal-ground faultThermal-ground fault75%Magnetic trip rangeMechanical $-V = V = V = V = V = V = V = V = V = V =$	Wiring system		3-pole (3-sensor)			1Ø2	W, 1Ø	3W, 3Ø	ØЗW			
Capacity, Icu       AC       415V/460V       37kA       50kA       65kA       85kA       125kA         Ics=%xIcu       100%       100%       100%       100%       100%       75%         Protective function       0verload, short-circuit and ground fault       75kA       85kA       125kA         Magnetic trip range       Verload, short-circuit and ground fault       85kA       125kA         Life cycle Note5)       Mechanical       4,000 operations       8-12ln         Life cycle Note5)       Mechanical       4,000 operations       9         Mounting       Standard       Front connection       100       184       140			4-pole (3-sensor)	1Ø2W, 1Ø3W, 3Ø3W, 3Ø4W								
	Rated short-cir	cuit breaking		N-t	уре	S-t	уре	H-ty	уре	L-ty	уре	
$\begin{tabular}{ c c c c c } \begin{tabular}{ c c c c c } \hline \begin{tabular}{ c c c c c c c } \hline \begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	capacity, lcu		AC 415V/460V	37kA		50kA		65kA		85kA		
Protective functionOverload, short-circuit and ground faultType of trip unitThermal-magneticMagnetic trip rangeMechanical $4,000$ operationsLife cycle Note5)Mechanical $4,000$ operationsElectrical $1,000$ operationsConnectionStandard $5crew$ fixingDimensions (mm)Pole3p4p3p4p3p4pa140184140184140184140184b $25r$ $25r$ $25r$ $25r$ $25r$ $25r$ CinctionStandard $25r$ $25r$ $25r$ $25r$ $25r$ $25r$ Dimensions (mm) $\frac{4}{2}$ $2$ $10$ $10$ $13$ $113$ $113$ $113$ $113$ $2$ $2$ $2$ $2$ $14$ $140$ $184$ $140$ $184$ $140$ $184$ $2$ $2$ $113$ $113$ $113$ $113$ $113$ $113$ $113$ $113$ $d$ $141$ $141$ $141$ $141$ $141$ $141$ $141$ $141$ $2$ $2$ $145$ $145$ $145$ $145$ $145$ $145$ Weight, kgStandard $7$ $8.4$ $7$ $8.4$ $7$ $8.4$ $7$ $8.4$ $7$ $8.4$			220/250V	50kA		75kA		85kA		125kA		
$\begin{tabular}{ c c c } \hline Type of trip unit $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$$	lcs=%×lcu			10	0%	100% 100% 75%			5%			
Magnetic trip range       8~12ln         Life cycle Note(5)       Mechanical       8~12ln         Life cycle Note(5)       Mechanical       8~12ln         Electrical       3.000 operations         Connection       Standard       Standard         Munting       Standard       FURE         Dimensions (mm)       Pole       3p       4p	Protective function			Overload, short-circuit and ground fault								
$\begin{tabular}{ c c c c c } \hline \begin{tabular}{ c c c c c } \hline \begin{tabular}{ c c c c c c } \hline \begin{tabular}{ c c c c c c } \hline \begin{tabular}{ c c c c c c c } \hline \begin{tabular}{ c c c c c c c } \hline \begin{tabular}{ c c c c c c c } \hline \begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Type of trip unit	t		Thermal-magnetic								
$\begin{tabular}{ c c c c c c c } \hline Electrical & $$$$ I $$$ I $$$$ I $$$ I $$$$ I $$$$ I $$$$ I $$$$$$$	Magnetic trip ra	inge		8~12ln								
Connection       Standard       Front connection         Mounting       Standard       Screw fixing         Dimensions (mm)       Pole       3p       4p	Life cycle Note5)		Mechanical			4	,000 op	peratior	IS			
Mounting       Standard       Structure         Dimensions (mm)       Pole       3p       4p       3p       4p <td></td> <td></td> <td>Electrical</td> <td colspan="6">1,000 operations</td>			Electrical	1,000 operations								
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Connection		Standard			F	ront co	nnectic	n			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Mounting		Standard	Screw fixing								
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Dimensions (n	nm)	Pole	Зр	4p	Зр	4p	Зр	4p	Зр	4p	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	F	d	а	140	184	140	184	140	184	140	184	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	a	c1	b	2	57	2	57	25	57	25	57	
d $145$ $145$ $145$ $145$ $145$ Weight, kg       Standard       7 $8.4$ <th< td=""><td></td><td></td><td>c1 Note1)</td><td>1(</td><td>09</td><td>1(</td><td>09</td><td>10</td><td>)9</td><td>1(</td><td>09</td></th<>			c1 Note1)	1(	09	1(	09	10	)9	1(	09	
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			c2 Note1)	1	13	1	13	11	13	1.	13	
CertificationPole3p4p3p4p3p4p			d	14	45	14	45	14	45	14	45	
· · · · · · · · · · · · · · · · · · ·	Weight, kg		Standard	7	8.4	7	8.4	7	8.4	7	8.4	
CE marking (E O O O O	Certification		Pole	Зр	4p	Зр	4p	Зр	4p	Зр	4p	
		CE marking	(€	(	C	(	>	C	>	C	C	

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.)

### **Breaker types**

### Instantaneous type

EE	3S403c /		400	/	30
Code	Frame size/ Pole	Code	Rated current	Code	Rated residual current
EBN403c	EBN 400AF 3P	250	250A	30	30mA
EBN404c	EBN 400AF 4P	300	300A	100/200/500	100/200/500mA
EBS403c	EBS 400AF 3P	350	350A		
EBS404c	EBS 400AF 4P	400	400A		
EBH403c	EBH 400AF 3P				
EBH404c	EBH 400AF 4P				
EBL403c	EBH 400AF 3P				
EBL404c	EBH 400AF 4P				

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



### Accessories



#### **Electrical auxiliaries**

		(IOI00
AX	Auxiliary switch	
AL	Alarm switch	R
SHT	Shunt trip	
UVT	Undervoltage trip	เกิด

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R		Т
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#### Maximum possibilities

T-position	Not available			
<b>R</b> -position	Option of 2AX, 2AL and SHT or UVT			
Note) For more detail see 7-2 page				

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E-70U

#### **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 o	lateil ago7.0 7.02 page

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



### **800AF ELCB** EBN803c, EBS803c, EBL803c

Metasol



For more inform	nation
<ul> <li>Accessories</li> </ul>	▶ 7-2 page
Tria arreas	<b>b</b> 0 4 means

<ul> <li>Trip curves</li> </ul>	8-4 page
<ul> <li>Drawings</li> </ul>	▶ 9-14 page
<ul> <li>Connection and mounting</li> </ul>	▶10-3 page

### **Ratings**

Frame size					800AF	
Type and pole				N-type	S-type	L-type
		3-pol	e (3-sensor)	EBN803c	EBS803c	EBL803c
		4-pol	e (3-sensor)	-	-	-
Rated current, In				500-630-700-800A		
Rated impulse with	thstand voltag	e, Uim	р		6 kV	
Rated operationa	l voltage, Ue				220/460V	
Instantaneous	Rated residua	al curre	ent, I∆n	30, 100	)/200/500mA (Adju	stable)
type	Residual curr	ent off-	time at I∆n		≤0.1 sec	
Time delay	Rated residua	al curre	ent	0.1	/0.4/1/2A (Adjustat	ole)
type	Intentional tim	ne dela	у	0.5	5/1/1.5/2s (Adjustat	ole)
Wiring system		3-pol	e (3-sensor)	19	02W, 103W, 303	N
		4-pol	e (3-sensor)	-		
Rated short-circuit breaking				N-type	S-type	L-type
capacity, Icu		AC	415/460V	37kA	65kA	85kA
			220/250V	50kA	85kA	125kA
lcs=%×lcu				100%	100%	75%
Protective func	tion			Overload, short-circuit and ground fault		
Type of trip unit				Thermal-magnetic		
Magnetic trip rar	ige			8~12In		
Life cycle Note4)		Mech	anical	2,500 operations		
		Elect	rical		500 operations	
Connection		Stand	dard		Front connection	
Mounting		Stand	dard		Screw fixing	
Dimensions (mr	n)		Pole	Зр		
	<u>d</u>		а		210	
a	<u>c2</u> c1		b		280	
	_		c1 Note1)		109	
			c2 Note1)		113	
			d	145		
Weight, kg			Standard		11.5	
Certification			Pole		Зр	
	CE marking		(€		0	

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.)

### **Breaker types**

### Instantaneous type



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



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

### Accessories



#### **Electrical auxiliaries**

		_ (10)ဩ
AX	Auxiliary switch	
AL	Alarm switch	R
SHT	Shunt trip	
UVT	Undervoltage trip	เคย

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R		Т		
σ		٩		
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#### Maximum possibilities

T-position	Not available			
<b>R</b> -position	Option of 2AX, 2AL and SHT or UVT			
Note) For more detail see 7-2 page				

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#### 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

Metasol



For more information

▶ 8-5 page

▶ 9-14 page

Trip curves

Drawings

### **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 curre	ent, I∆n		100/200/500m/	A (Adjustable)	
Residual current off	-time at I∆ı	ı	≤0.1	sec	
Rated operational v	oltage, Ue		AC: 4	60V	
Wiring system	3-pole (	3-sensor)	1Ø2W, 1Ø3W, 3Ø3W		
Rated short-circuit	t breaking		S-Type	S-Type	
capacity, Icu	AC	415/460V	85	(A	
		220/250V	125kA		
Protective function			Overload, short-circuit and ground fault		
Type of trip unit			Thermal-magnetic		
Magnetic trip range	e		3~6×Inᠿ		
Life cycle <sup>Note3)</sup>	Mechar	ical	2,500 operations		
Elec		al	500 operations		
Connection	ction Standard		Front connection		
Mounting	Standar	d	Screw	fixing	
Dimensions (mm)		Pole	3¢	0	
. a .	d c2	а	22	0	
		b	56	5	
_ <u>_</u>	1	С	10	5	
		d	15	9	
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.)

### **ELCB**









**Terminal details** 







## Connecting





Panel drilling





### Front panel cutting



## Dimensions





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50c	EBS250c	EBH250c	
	Trip indication by earth fault Residual current	(Unit: mm)	

### **ELCB**

Insulation barrier

60

64

66.5

68.5

86.85

Metasol



Insulation barrier





107

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### 9



## Dimensions

Metasol



### ELCB (Time delay type)



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110

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44

EBS400c

EBL400c

### (Unit: mm)

95

109

113





**Terminal details** 





Connecting



#### Panel drilling



#### Front panel cutting

Slot "B"





### ELCB (Instantaneous type)



EBS800c

EBL800c



### ELCB (Time delay type)



EBL800c

#### (Unit: mm)







93.5

10\_\_\_\_34.5

Terminal details



#### Connecting



### Panel drilling



### Front panel cutting







152

## **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	¢	( <sup>t</sup> )	( <sup>th</sup> )	( <del>)</del>	Ť
	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)
	P				
Terminal bolt	<b>3~50A</b> 2P: 4EA (M5 × 14) 3P: 6EA (M5 × 14) 4P: 8EA (M5 × 14) <b>60~100A</b> 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	<b>(1</b> B-13	<b>(1</b> ) 10-23	<b>(1</b> 8-23		
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		

### **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.

IFC IEE		TEST	Ref. Certificate No.	IFC I		TEST	Rol. Certificate He
Source Stores	CERT	IFICATE	NL-14106041		CERT	IFICATE	AL-14218/A2
		OGNITION OF TES MENT (IECEE) CB			M FOR MUTUAL REC RELECTRICAL EQUI		
taund by	KEMA Quelly B.V.			Investory.	KEMA Quality B.V.		
Product	Moulded case circuit-by	Tabler .		Product	Moulded case oncub b	wither (earth leatings droug	breaker)
Approxime	LS Industrial Bystems Co., LM	1026-6, Hogye-dong, Dono an gu Anysho al,	Kones, Republic of	Addmant	LS industrial Bystems Co., LM.	1038-6, Hogye-dong, Dong-an-go Anyang-el, Dyeonggi-do	Karwa, Republic of
ter-factorer	LS Industrial Systems	Oyeonggi-do 1020-6. Hogye-dong	Koree, Republic of	Manufacturer	LS industrial Systems Co., LM	1006-6, Hogye-dong, Dong-an-gu Anyang-el, Dyeonogi-do	Korea, Republic of
actor)	LS industrial Systems Co., Ltd. Cheorgals Photo	Darig an-gu Aryang e. Oyeonggi-do 1, Sengeong-dong. Heungdeok gu Cheonga e. Chungcheongbuk-do	Korea, Republic of	Family	LS industrial Bystems Co., LM. Cheorigilu Rant	1. Songeong-cong. Heurgbeck-gu Cheongu- al, Chungsheorgbak-to	Korea, Republic of
Tamg and process the second co	3. paties MOCB thermal th = 15, 20, 30, 40, 90, Us = 250, 240, 250, 41 Us = 750 Vice Ump = 5 W Iou = 100 AA, at 220, 24 pt 415, 440, 400 V, Ion Rated Trequency = 500 Gat A.	Unagradic) 60, 75, 100, 125 A 5, 440, 460 Vac 6, 250 V and 50 kA + 100 Nac		Rang and procp characteristics	07-wma/magreelo-with fault detection: 30 mA, is + 15, 20, 30, 40, 50, 125A Us + 202, 240, 250 an Ul = 400 Vali Us + 100 AA at 220, 3 Iso + 100 AA at 250, 4 Iso + 100 M, at 220, 3 Iso + 100 M, at 250, 4 Iso + 100 M, at 250, 5 Iso	electronic golund 100/200500 w/J 00/78/300 and t 415, 440, 480 V/ac d; 280 V enel 4 400 V	
Table Harris (Farty)	1.6			Trains Insels (If July	CHA LA		
toden Type	ABHS3c, ABS103c, AB	H103c		Monar Troin	ED5 1034, EDH 534, E		
vietoval infermation:	WMT procedure			televence:		arr yate	
ample of product	60947-25+6-4)			Addantal Albertal	10000000000000000000000000000000000000		
contermity with IEC				Sample of product tested to be the conformity with RE	100 / 1 / Hall of 12		
Test Report Ref. No.	2109068.51 (166 pager	0		Tweet Wasport Weit, It			
The CO Test Certificate	e is asset by the National	Certification Body		The CB Test Carl	Acres is based by the follows	Carthoptic Body	
KEMA Guality B.V. Uharhtsawog 310 P.O. Box 5185 6802 ED Avribert The Netherlands	25	K	EMA₹	REIMA Quality 61 Utractraseung 31 P.O. Box 5180 6902 ED Annhard The Natherlands	ARE	Dilliamental and	ЕМА⋞
						1.	
Served by HL Scher	chick .			Squark by HL. 8	ichenistik.		

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## **Technical information**

### 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.

- 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°C, you are advised to use it according to the current corrected for each level of ambient temperature in catalog.
- If used in conditions of highly humidity, the dielectric strength or electric performance may be degraded.



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



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



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

### Special use environment

### Environment where ambient temperature exceeds 40°C

The 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°C the passing current needs to be reduced so that the temperature of such element as internal insulator of MCCB exceed the maximum allowable temperature.

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

	Ampere		Rated	Model name of breaker	Rated	Table of	Table of rated current corrected according to ambient temperature (A)					
	frame	•	current	Model name of breaker	current	10℃	<b>20</b> ℃	<b>30℃</b>	<b>40</b> ℃	45℃	<b>50℃</b>	55℃
			3		3	3	3	3	3	3	,	3
			5	ABS30c	5	5	5	5	5	5	5	4
		30	10		10	10	10	10	10	10		
		30	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	50	49	47	45
		60	60	ABN60c, ABS60c	60	60	60	60	60	58	5     4       14     1       19     1       28     2       38     3       47     4       56     5       71     6       94     9       116     11       163     11       209     11       233     2       242     23       291     2	55
	-	00	75	ABN100c, ABN100e	75	75	75	75	75	73	5         14         19         28         38         47         56         71         6         94         116         140         186         186         233         242         291         2339         388	68
	•	00	100	ADITIOC, ADITIOC	100	100	100	100	100	97		91
	12	5	125	ABH50c, ABS125c, ABH125c, ABL125c	125	125	125	125	125	121	116	107
			150		150	150	150	150	150	145	140	128
			175	ABN250c, ABS250c,	175	175	175	175	175	169	163	150
	250		200		200	200	200	200	200	193	186	171
			225	ABH250c, ABL250c	225	225	225	225	225	217	209	193
			250		250	250	250	250	250	241	233	214
			250		250	250	250	250	250	246	242	238
	400		300	ABN400c, ABS400c	300	300	300	300	300	295	50°C         55°C           3         3           5         4           14         13           19         18           28         27           38         36           47         45           56         55           71         68           94         91           163         150           163         150           186         171           294         91           12         209           186         171           209         193           233         214           242         238           291         287           339         332           388         381           388         381	287
	400		350	ABH400c, ABL400c	350	350	350	350	350	345		
			400		400	400	400	400	400	394	388	381
	800		700	ABN800c, ABS800c	700	700	700	700	700	689	679	668
	000		800	ABL800c	800	800	800	800	800	788	776	764

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

## **Technical document**

## Special use environment

# Table of rated current for Metasol ELCB correctedaccording to ambient temperature

Ampere frame			Rated	Madal assess of huseless	Rated	Table of rated current corrected according to ambient temperatur					ature (A	
			current	Model name of breaker	current	10℃	<b>20</b> ℃	30℃	<b>40</b> ℃	45℃	<b>50</b> ℃	<b>55℃</b>
			15		15	15	15	15	15	15	15	15
		30	20	EBS30c	20	20	20	20	20	19	19	18
			30		30	30	30	30	30	29	28	27
		<b>50</b> 40 50			40	40	40	40	40	39	38	36
50	50	50	EBN50c, EBS50c	50	50	50	50	50	49	47	45	
		60	60	EBN60c, EBS60c	60	60	60	60	60	58	56	55
100	0	75	EBN100c	75	75	75	75	75	73	71	68	
	0	100	EDINTOUC	100	100	100	100	100	97	94	91	
125			125	EBH50c, EBS125c, EBH125c	125	125	125	125	125	121	116	10
			150		150	150	150	150	150	145	140	12
			175		175	175	175	175	175	169	163	15
2	50		200	EBN250c, EBS250c,	200	200	200	200	200	193	186	17
			225	EBH250c	225	225	225	225	225	217	209	19
			250		250	250	250	250	250	241	233	21
			250		250	250	250	250	246	242	238	238
	~~		300	EBN400c, EBS400c,	300	300	300	300	295	291	287	28
400			350	EBH400c, EBL400c	350	350	350	350	345	339	332	55℃ 15 18
			400		400	400	400	400	394	388	381	38
	~~		700	EBN800c, EBS800c	700	700	700	700	689	679	668	668
8	00		800	EBL800c	800	800	800	800	788	776	764	764

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

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

Although MCCB is not affected by conduction switch, trip, or short circuit isolation in the temperature of - 20°C, it is highly recommended to use a temperature maintaining device such as space heater. In addition, transportation and passing in stone-cold area in the temperature as low as -40°C is allowed but it is 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)  $\times$  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

### **Technical document**

### Environment with vibration and impulse exercised

#### Impact of vibration and impulse

An excessive vibration and impulse may cause damage on breaker or other security problems including dynamic strength. An appropriate consideration is required to select a right MCCB for an adverse environmental stress such as this one. Moreover, this stress may incur from vibration during transportation, magnetic impulse while manipulating a switch or may be affected by equipment in surrounding area.

There is a standard call [Vibration testing method for small electric appliances] for vibration and impulse test for electric equipment and the seismic and endurance tests of Molded Case Circuit Breaker are conducted in accordance with this standard, considering the circumstance mentioned above.

#### Vibration

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

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

\* 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.  $Ph = \sigma fBmn$ 
  - Bm: Maximum value of magnetic flux density, n: constant (1.6~2.0), f: Frequency,  $\sigma$ : Hysteresis constant
- \* Eddy current: It refers to an induced electric current formed within the body of a conductor when it moves through a non-uniform or changing magnetic field. The eddy current that incurs at winding of transformer or core is considered as one of the transformer losses as a part of exciting current. It is also called 'eddy current loss'.

## Use environment with vibration and impulse applied

		Test	Internal impulse
Test condition	Mounting vibration, direction of impulse	<ul> <li>Vertical mounting</li> <li>Top-down, Left-right, Front-back</li> <li>Left-right, Front-back</li> <li>Top-down</li> <li>Line connection</li> </ul>	<ul> <li>Picture 1, 2, 3, 4</li> <li>(→ Represents the direction of drop)</li> <li>Picture 1 Picture 2</li> <li>Picture 1 Picture 2</li> <li>Picture 2</li> <li>Picture 3 Picture 4</li> </ul>
	Status of MCCB	<ul><li>(1) Non-conduction (On or Off status)</li><li>(2) Status where rated current is conducted until the temperature of MCCB becomes constant and keeps being conducted</li></ul>	Non-conduction (On or Off status)
Test result	Judgment condition	<ul> <li>If it is On, it should not be Off</li> <li>If it is Off, it should not be On</li> <li>No abnormal status such as damage, transformation, or annealing of nut part</li> <li>Characteristics of switch and trip after the test must be normal</li> </ul>	

### [Table of seismic performance and internal impulse performance]

# Certifications

Metasol

### МССВ

5				
$\square$	Туре	Appr	ovals	Certificates
$ \rangle$	Certificate	Safet certi	IEC	KEMA
	Mark and	<b>K</b>	CE	кемаҢ
_	name		CE	KEMA
Тур		Korea	Europe	Netherlands
	ABS32c	•	•	•
	ABS33c	•	•	•
	ABS34c	•	•	•
	ABN52c	•	٠	•
	ABN53c	•	•	•
	ABN54c	•	•	•
	ABS52c	•	•	•
	ABS53c	•	•	•
	ABS54c	•	•	•
	ABN62c	•	•	•
	ABN63c	•	•	•
	ABN64c	•	•	•
	ABS62c	•	•	•
	ABS63c	•	•	•
	ABS64c	•	•	•
	ABN102c	•	•	•
	ABN103c	•	•	•
	ABN104c	•	٠	•
	ABS32d	•	٠	•
	ABS33d	•	•	•
	ABS34d	•	•	•
AF	ABN52d	•	•	•
~250	ABN53d	•	•	•
MCCB 30~250AF	ABN54d	•	•	•
BO	ABS52d	•	•	•
ž	ABS53d	•	•	•
	ABS54d	•	•	•
	ABN62d	•	•	•
	ABN63d	•	•	•
	ABN64d	•	•	•
	ABS62d	•	•	•
	ABS63d	•	•	•
	ABS64d	•	•	•
	ABN102d	•	•	•
	ABN103d	•	•	•
	ABN104d	•	•	•
	ABP52c	•	•	•
	ABP53c	•	•	•
	ABP54c	•	•	•
	ABH52c	•	•	•
	ABH53c	•	•	•
	ABH54c	•	•	•
	ABS102c	•	•	•
	ABS103c	•	•	•
	ABS104c	•	•	•
	ABP102c	•	•	•
	ABP103c	•	•	•

$\square$	Туре	Appro	ovals	Certificates
	Certificate	Safet certi	IEC	KEMA
	Mark and name	<b>K</b>	CE	<i>кема</i> <u></u> кема
Туре		Keree	CE	
1.71		Korea	Europe	Netherlands
	ABP104c	•	•	•
	ABH102c	•	•	•
	ABH103c	•	•	•
	ABH104c	•	•	•
	ABN202c	•	•	•
ΑF	ABN203c	•	•	•
MCCB 30~250AF	ABN204c	•	•	•
30~	ABS202c	•	•	•
B	ABS203c	•	•	•
Β	ABS204c	•	•	•
	ABP202c	•	•	•
	ABP203c	•	•	•
	ABP204c	•	•	•
	ABH202c	•	•	•
	ABH203c	•	•	•
	ABH204c	•	•	•
	ABN402c	•	•	•
	ABN403c	•	•	•
	ABN404c	•	•	•
	ABS402c	•	•	•
	ABS403c	•	•	•
	ABS404c	•	•	•
	ABH402c ABH403c	•	•	•
	ABH403C	•	•	•
	ABL402c			•
	ABL402c	•	•	•
	ABL4000	•	•	•
	ABN602c	•	•	•
₽F	ABN603c		•	•
800/	ABN604c		•	•
MCCB 400~800AF	ABS602c		•	•
B4	ABS603c		•	•
MCC	ABS604c		•	•
	ABL602c		٠	•
	ABL603c		•	•
	ABL604c		•	•
	ABN802c		•	•
	ABN803c		•	•
	ABN804c		•	•
	ABS802c		٠	•
	ABS803c		•	•
	ABS804c		•	•
	ABL802c		•	•
	ABL803c		•	•
	ABL804c		•	•

### ELCB

	Туре	Appr	ovals	Certificates
$ \rangle$	Certificate	Safet certi	IEC	KEMA
	Mark and	ŝ	()	КЕМАҢ
	name		CE	KEMA
Тур	e	Korea	Europe	Netherlands
	EBS32c	•	•	•
	EBS33c	•	•	•
	EBS34c	•	•	•
	EBN52c	•	•	•
	EBN53c	•	•	•
	EBS53c	•	•	•
	EBS54c	•	•	•
	EBN63c	•	•	•
	EBS63c	•	•	•
	EBS64c	•	•	•
	EBN102c	•	•	•
	EBN103c	•	•	•
	EBN104c	•	•	•
	EBS33d	•	•	•
	EBS34d	•	•	•
	EBN52d	•	•	•
	EBN53d	•	•	•
	EBS53d	•	•	•
	EBS54d	•	•	•
AF	EBN63d	•	•	•
-250	EBS63d	•	•	•
ELCB 30~250AF	EBS64d	•	•	•
ILCE	EBN102d	•	•	•
	EBN103d	•	•	•
	EBN104d	•	•	•
	EBP53c	•	•	•
	EBP54c	•	•	•
	EBH53c	•	•	•
	EBH54c	•	•	•
	EBS103c	•	•	•
	EBS104c	•	•	•
	EBP103c	•	•	•
	EBP104c	•	•	•
	EBH103c	•	•	•
	EBH104c	•	•	•
	EBN202c	•	•	•
	EBN203c	•	•	•
	EBS203c	•	•	•
	EBS204c	•	•	•
	EBP203c	•	•	•
	EBP204c	•	•	•
	EBH203c	•	•	•
	EBH204c	•	•	•

Note: • (Completion)