

TemBreak & **TemBreak**

The Ultimate Safety Breaker

Molded Case Circuit Breaker



 Safety Notice

Carefully read instruction manual to ensure proper installation, connection, operation, handling and maintenance of the product.

TABLE OF CONTENTS

1. General	1-1
• Features	1-2
• Selection Chart	1-4
2. Ratings and Specifications	2-1
Molded Case Circuit Breakers	
① Economical series	2-2
② Standard series	2-3
③ High-fault level series	2-6
④ Current limiting series	2-8
⑤ Motor protection series	2-10
⑥ Switch-disconnectors	2-11
⑦ Non-automatic trip breakers	2-13
⑧ TB series for distribution boards	2-14
⑨ Current limiting series (planned to be released)	2-15
⑩ List of breakers for marine use and rated breaking capacities (approved by ship classification societies)	2-16
3. Selection	3-1
① Combination of breakers for cascade breaking	3-2
② Selection of breakers for selectivity coordination	3-4
4. Special Breakers	4-1
① Instantaneous trip only breakers	4-2
② Special instantaneous trip breakers	4-3
5. Mounting and Connection	5-1
① Type of connections and mountings	5-2
② Compression terminals	5-14
③ Terminal screw sizes and standard torques	5-16
④ Insulation distance from the line side	5-20
⑤ Reverse connection	5-22
⑥ Lists of breaker mounting screws	5-23
6. Accessories	6-1
① OCR for electronic breakers	6-2
1. TemBreak2 Electronic OCR	6-2
2. TemBreak Electronic OCR	6-6
② Internally mounted accessories	6-10
1. Overview	6-10
2. Connection diagrams and terminal numbers	6-11
3. Possible combinations	6-12
4. Ratings and operation data of auxiliary and alarm switches	6-15
5. Shunt trip device (SHT)	6-16
6. Undervoltage trip device (UVT)	6-17
③ Externally mounted accessories	6-20
1. Overview	6-20
2. Toggle extension (HA)	6-21
3. Toggle holder (HH) and toggle lock (HL)	6-22
4. Motor operators (MC)	6-24
5. External operating handles	6-30
(1) Breaker-mounted (field installable)(HB)	6-30
(2) Breaker-mounted (HB)	6-38
(3) Door-mounted (depth adjustable) (HP)	6-43
(4) Door-mounted (depth fixed) (HP)	6-55
6. Terminal covers CF/CR/CS	6-56
(1) CF for front-connected breakers	6-56
(2) CR for rear-connected and plug-in breakers	
CS for front-connected breakers with cable clamps	6-58
7. Interpole barriers (BA)	6-60
8. Terminal blocks (TF)	6-61
9. Mechanical interlock	6-68
• Slide interlock (MS)	6-68
10. Door Flange (DF)	6-85
7. Characteristics and Outline Dimensions	7-1
8. Handling and maintenance	8-1
① Transportation and storage	8-2
② Environmental operating conditions	8-2
③ Installation and connection	8-2
④ Maintenance and inspection	8-4
9. Appendix	9-1
① Handle operation and dimensions	9-2
② Mounting positions for trip button	9-3
③ Standard arrangement for plug-in type auxiliary circuit terminals (for high-performance type)	9-4
④ Standard arrangement for plug-in type auxiliary circuit terminals (for standard type)	9-5
⑤ Internal resistance and power consumptions of breakers	9-8

1

2

3

4

5

6

7

8

9

1

General

1

General

Features1-2

Selection Chart1-4

Approvals by ship classification societies

NK	NIPPON KAIJI KYOKAI
LR	Lloyd's Register of Shipping
ABS	The American Bureau of Shipping
GL	Germanischer Lloyd
BV	Bureau Veritas
CCS	China Classification Society
KR	Korean Register of Shipping
RINA	Registro Italiano Navale

Based Standards

IEC 60947-2	International Electrotechnical Commission
EN 60947-2	European Standard

Safety Breaker

Isolation capability

The isolation capability means that, as long as the main contact is closed, the toggle is not in the OFF position and cannot be locked at the OFF position.

The toggle being in the OFF position hence shows the main contact is open and personnel are not exposed to electrical shock hazard when working in the load side.

Direct Opening Action

Under the heading “Measures to minimize the risk in the event of failure”, IEC 60204-1 Safety of Machinery-Electrical Equipment of Machinery includes the following recommendation:

“the use of switching devices having positive (or direct) opening operation.”

Safety lock for Plug-in versions

There are three plug-in types available according to applications,

[For switchboards]

■Standard type

Suitable for angle-mounted or rear-connected application

■High-performance type

Suitable for angle-mounted, front panel-mounted or rear panel-mounted application. The plug-in MCCB is locked to the base when the toggle is ON. It cannot be removed unless the toggle is OFF or TRIPPED. The safety lock prevents a trip occurring as the MCCB is being removed from the base.

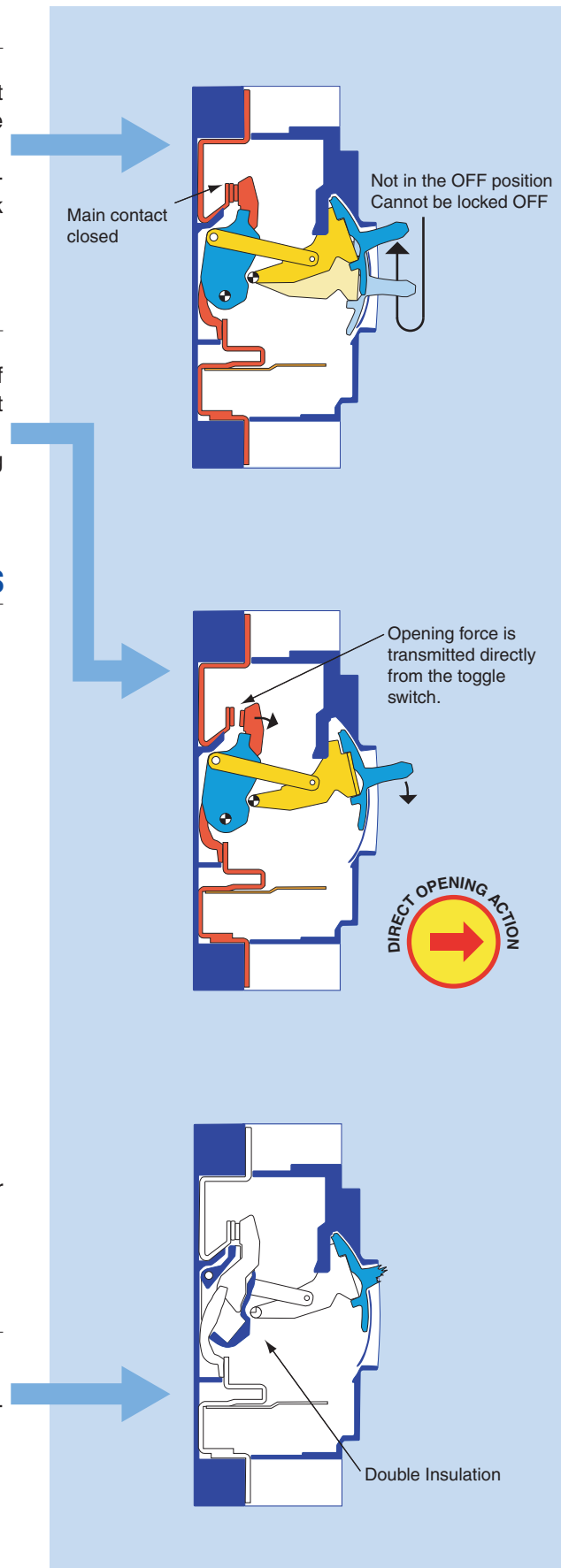


[For distribution boards]

Suitable for front-connected application where the breaker depth is smaller than for switchboards

Enhanced Insulation

The risk of touching live parts has been minimized by design. If the toggle is broken by accident or misuse, no live part is exposed.

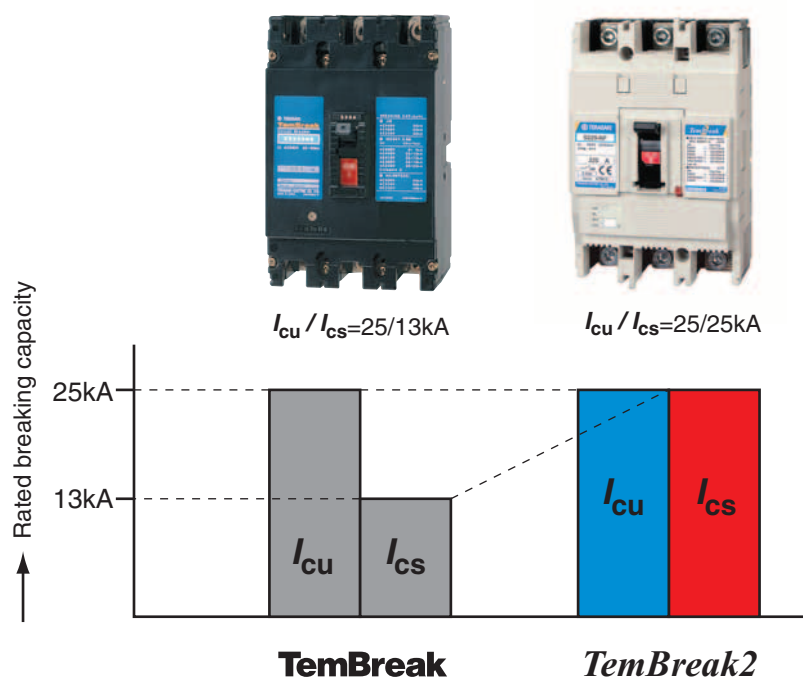


Rated service short-circuit breaking capacity (I_{cs})

The rated service short-circuit breaking capacity (I_{cs}) is the maximum short-circuit current defined by IEC 60947-2 which a circuit breaker can break in accordance with a sequence of opening and closing operations (O-CO-CO).

TemBreak2 has greatly been improved in its rated service short-circuit capacity, thereby providing more safety.

[225AF Standard series]



Smaller size and higher breaking capacity, allowing a downsizing of switchboards

TemBreak2 current limiting breakers are reduced in size to at least one-half and enhanced in breaking capacity.

- Smaller in size than existing models

50%



TL-100C



L100-NF

(100A frame)

30%



TL-225B



L225-NF

(225A frame)

50%



TL-400



L400-NE

(400A frame)

Selection Chart

Molded Case Circuit Breakers	Frame size (A)							
	30	50	100	125	225	250	400	600
Economical series		E50-SF 10kA/5kA	E100-SF 10kA/5kA			E250-SF 15kA/12kA		
Standard series							\$400-CF 30kA/30kA	
		\$50-SF 25kA/13kA		\$125-SF 25kA/13kA		\$250-SF 30kA/15kA	\$400-NF 45kA/45kA	
			\$100-NF 25kA/25kA	\$125-NF 25kA/25kA	\$225-NF 25kA/25kA	\$250-NF 25kA/25kA	Electronic \$400-NE 45kA/45kA	
High-fault level series		\$50-GF 50kA/25kA	\$100-GF 50kA/25kA	\$125-GF 50kA/25kA	\$225-GF 50kA/25kA	\$250-GF 50kA/25kA	\$400-GF 65kA/50kA	
					Electronic \$225-GE 50kA/25kA		Electronic \$400-GE 65kA/50kA	
							\$400-PF 80kA/80kA	
							Electronic \$400-PE 80kA/80kA	
Current limiting series								
			H100-NF 120kA/80kA	H125-NF 120kA/80kA	H225-NF 120kA/80kA		Electronic H400-NE 120kA/80kA	
			L100-NF 180kA/135kA	L125-NF 180kA/135kA	L225-NF 180kA/135kA		Electronic L400-NE 180kA/135kA	
Motor protection series		E50-CM 2.5kA/1.3kA	\$100-NM 25kA/25kA		\$225-NM 25kA/25kA			
Non-automatic trip breakers								
Switch-disconnectors				\$125-SN		\$250-SN		
			\$100-NN	\$125-NN			\$400-NN	
TB series for distribution boards		④ TB-5S 5kA/-						
		④ TB-5P 5kA/-						
		④ TB-5D 5kA/-						

Notes: ① For breaking capacity, see pages 2-2 to 2-15
 ② For AC500V
 ③ For AC460V
 ④ For AC250V

AC450V I_{CL} (NK) _____ AC450V I_{CS} (NK) _____

Planned to be released.
Contact us for the release date.

2

Ratings and Specifications

Molded Case Circuit Breakers

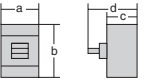
1	Economical series	2-2
2	Standard series	2-3
3	High-fault level series	2-6
4	Current limiting series	2-8
5	Motor protection series	2-10
6	Switch-disconnectors	2-11
7	Non-automatic trip breakers	2-13
8	TB series for distribution boards	2-14
9	Current limiting series (planned to be released)	2-15
10	List of breakers for marine use and rated breaking capacities (approved by ship classification societies)	2-16

2

Ratings and Specifications

Molded Case Circuit Breakers

1 Economical series

Frame size (A)	50	100	250				
Type	E50-SF	E100-SF	E250-SF				
Number of poles	2 3	2 3	2* 3				
■ Ratings							
Rated current, A	10 40	10 40 100	125 250				
Calibrated at 45°C	15 50	15 50	150				
	20	20 60	175				
	30	30 75	200				
			225				
* center pole omitted							
Rated insulation voltage [U_i] V	AC 690	690	690	690			
Rated impulse withstand voltage [U_{imp}] kV	6	6	8	8			
■ Rated breaking capacity, kA							
NK	AC 690V	—	—	—			
I_{cu}/I_{cs} (sym)	450V	10/— ⑬	10/— ⑬	15/12	15/12		
	240V	25/— ⑭	25/— ⑭	35/27	35/27		
	① DC 250V	7.5/—	7.5/—	—	—		
IEC60947-2	AC 690V	—	—	—	—		
I_{cu}/I_{cs} (sym)	500V	7.5/3.8	7.5/3.8	10/7.5	10/7.5		
	440V	10/5	10/5	15/12	15/12		
	415V	10/5	10/5	25/19	25/19		
	380V	16/8	16/8	25/19	25/19		
	240V	25/13	25/13	35/27	35/27		
	① DC 250V	7.5/3.8	7.5/3.8	15/12	15/12		
	125V	15/7.5	15/7.5	25/19	25/19		
	—	—	—	—	—		
■ Rated short time withstand current, kA							
■ External dimensions, mm							
	a	50 75	50 75	105 105	105 105		
	b	130	130	165	165		
	c	68	68	68	68		
	d	87	87	95	95		
Weight (● marked standard type) kg	0.48 0.74	0.48 0.74	1.5 1.5	1.5 1.5			
■ Connections and Mountings							
Front-connected (FC)	Terminal screws	●	●	●	●		
	With extension bars	—	—	○ (BAR)	○ (BAR)		
Rear-connected (RC)	Bolt studs	○	○	—	—		
	Flat bar studs	—	—	○	○		
Plug-in (PM)	For switchboards Standard (PMC)	○	○	— ○	— ○		
	High-performance (PMB)	—	—	—	—		
	For distribution boards (PMC)	○	○	—	—		
Flush-mounted (FP)	Bolt studs	○	○	—	—		
	Flat bar studs	—	—	○	○		
Draw-out type (DR)	—	—	—	—	—		
TemPlug70 (PG)	—	—	— ○	— ○			
TemPlug45B (PG4)	—	—	—	—			
DIN rail mount	—	—	—	—			
Clip-in chassis mount	—	—	—	—			
■ Accessories (optional) Symbol							
Internally mounted	Auxiliary switch	A X	●	●			
	Alarm switch	A L	●	●			
	Shunt trips	S H	●	●			
	Undervoltage trips	U V	● ⑥	● ⑥			
	Motor operator	M C	— ●	— ●			
Externally mounted	External operating handle	Breaker-mounted H B	— ●	— ●			
		Door-mounted (variable depth) H P	— ●	— ●			
	Toggle extension	H A	—	—			
	Mechanical interlock	Slide type M S	— ●	— ●			
	Toggle holder	H H	●	●			
	Toggle lock	H L	●	●			
	Terminal cover	For front-connected C F	●	●			
		For rear-connected and plug-in C R	●	●			
	Interpole barrier	B A	●	● ③	● ③		
	Terminal block for lead	T F	●	●			
	Door flange	D F	●	●			
■ Standard specifications							
Overcurrent trip mechanism	Thermal-magnetic ⑦	Thermal-magnetic ⑦	Thermal-magnetic	Thermal-magnetic			
Trip button (color)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)			
Handle position indication (ON: Red, OFF: Green)	Yes	Yes	Yes	Yes			
Suitability for isolation	Non	Non	Yes	Yes			
CE marking	Non	Non	Yes	Yes			
Page on which characteristics and outline dimensions are shown	7-2	7-4	7-16	7-16			

Notes:

● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering. ● : "yes" or "available". — : "no" or "not available".

① : DC rating available on request. ③ : Line side interpole barriers are supplied as standard. (Front connection only)

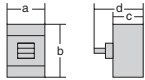
⑥ : The UVT controller is installed externally, when provided with AC UVT. ⑦ : Hydraulic-magnetic type for below 10A rating. ⑬ : at 500V AC. ⑭ : at 250V AC.

2

Ratings and Specifications

Molded Case Circuit Breakers

2 Standard series

Frame size (A)	50	100	125	125	225	250
Type	\$50-SF	\$100-NF	\$125-SF	\$125-NF	\$225-NF	\$250-SF
Number of poles	2 3	2 3 4	2 3 4 2 3 4	2 3 4	2* 3 4	2* 3 4 2* 3 4
■ Ratings						
Rated current, A	15	15 50	15 50 125	125	125 200	125 250
Calibrated at 45°C	20	20 60	20 60		150 225	150
	30	30 75	30 75		175	175
	40	40 100	40 100			200
	50					225
* center pole omitted						
Rated insulation voltage [U_i] V AC	690	690	690	690	690	690
Rated impulse withstand voltage [U_{imp}] kV	8	8	8	8	8	8
■ Rated breaking capacity, kA						
NK AC 690V	—	6/6	—	6/6	7.5/7.5	—
I_{cu}/I_{cs} (sym)	450V 25/13	25/25	25/13	25/25	25/25	30/15
	240V 50/25	50/50	50/25	50/50	65/65	85/43
① DC 250V	25/13	25/19	25/13	25/19	40/40	25/13
IEC60947-2 AC 690V	6/3	6/6	6/3	6/6	7.5/7.5	4/4
I_{cu}/I_{cs} (sym)	500V 12/6	22/22	12/6	22/22	25/25	25/13
	440V 25/13	25/25	25/13	25/25	25/25	30/15
	415V 30/15	30/30	30/15	30/30	35/35	40/20
	380V 30/15	30/30	30/15	30/30	35/35	40/20
① DC 240V	50/25	50/50	50/25	50/50	65/65	85/43
	250V 25/13	25/19	25/13	25/19	40/40	25/13
	125V 40/20	40/30	40/20	40/30	40/40	40/20
■ Rated short time withstand current, kA						
■ External dimensions, mm						
	a 50 75	60 90 120	50 75 100	50 75 100	60 90 120	105 105 140
	b 130	155	130	130	155	165
	c 68	68	68	68	68	68
	d 95	92	95	95	92	95
Weight (● marked standard type) kg	0.6 0.8	0.7 1.1 1.4	0.6 0.8 1.0	0.6 0.8 1.0	0.7 1.1 1.4	1.5 1.5 1.9
■ Connections and Mountings						
Front-connected (FC) Terminal screws	●	●	●	●	●	●
With extension bars	○ (BAR)	○ (BAR)	○ (BAR)	○ (BAR)	○ (BAR)	○ (BAR)
Rear-connected (RC) Bolt studs	—	—	—	—	—	—
Flat bar studs	○	○	○	○	○	○
Plug-in (PM) For switchboards Standard (PMC)	— ○	— ○ —	— ○ —	— ○ —	— ○ —	— ○ —
High-performance (PMB)	—	—	—	—	—	—
For distribution boards (PMC)	○	— ○ —	○ —	○ —	○	—
Flush-mounted (FP) With flat bar studs	○	○	○ —	○ —	○	○
Draw-out type (DR)	—	—	—	—	—	—
TemPlug70 (PG)	—	○ ○ —	—	—	○ ○ —	— ○ —
TemPlug45B (PG4)	—	—	—	—	—	—
DIN rail mount	— ○ ①	— ○ ①	— ○ ①	— ○ ①	— ○ ①	—
Clip-in chassis mount	—	—	—	—	—	—
■ Accessories (optional) Symbol						
Internally mounted						
Auxiliary switch A X	●	●	●	●	●	●
Alarm switch A L	●	●	●	●	●	●
Shunt trips S H	●	●	●	●	●	●
Undervoltage trips U V	●	●	●	●	●	●
Externally mounted						
Motor operator M C	—	— ●	—	—	— ●	— ●
External operating handle H B	—	— ●	— ●	— ●	— ●	— ●
Door-mounted (variable depth) H P	—	— ●	— ●	— ●	— ●	— ●
Toggle extension H A	—	—	—	—	—	—
Mechanical interlock Slide type M S	—	— ●	— ●	— ●	— ●	— ●
Toggle holder H H	●	●	●	●	●	●
Toggle lock H L	●	●	●	●	●	●
Terminal cover For front-connected C F	●	●	●	●	●	●
For rear-connected and plug-in C R	●	●	●	●	●	●
Interpole barrier B A	● ③	● ③	● ③	● ③	● ③	● ③
Terminal block for lead T F	●	●	●	●	●	●
Door flange D F	●	●	●	●	●	●
■ Standard specifications						
Overcurrent trip mechanism	Thermal-magnetic	Thermal-magnetic	Thermal-magnetic	Thermal-magnetic	Thermal-magnetic	Thermal-magnetic
Trip button (color)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)
Handle position indication (ON: Red, OFF: Green)	Yes	Yes	Yes	Yes	Yes	Yes
Suitability for isolation	Yes	Yes	Yes	Yes	Yes	Yes
CE marking	Yes	Yes	Yes	Yes	Yes	Yes
Page on which characteristics and outline dimensions are shown	7-6	7-10	7-8	7-8	7-12	7-16

Notes:

● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering. ▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available".

① : DC rating available on request. ③ : Line side interpole barriers are supplied as standard. (Front connection only)

⑥ : The UVT controller is installed externally, when provided with AC UVT. ⑦ : Hydraulic-magnetic type for below 10A rating. ⑪ : Provided with DIN rail adaptor.

2

Ratings and Specifications

2

Ratings and Specifications

Molded Case Circuit Breakers

2 Standard series

Frame size (A)		250	400	400	400	630	630	630	
Type		\$250-NF	\$400-CF	\$400-NF	\$400-NE	\$630-CF	\$630-NF	\$630-NE	
Number of poles		2 * 3 4	3 4	3 4	3 4	3 4	3 4	3 4	
Ratings									
Rated current, A		250	125 250	125 250	(Adjustable) (Adjustable)	500	500	(Adjustable)	
Calibrated at 45°C			150 300	150 300	125 175	600	600	250 500	
			175 350	175 350	150 200	630	630	300 600	
			200 400	200 400	175 225			350 630	
			225	225	200 250			400	
					225 300				
					350				
					400				
* center pole omitted									
Rated insulation voltage [U_i] V		AC 690	690	690	690	690	690	690	
Rated impulse withstand voltage [U_{imp}] kV		8	8	8	8	8	8	8	
Rated breaking capacity, kA									
NK		AC 690V	7.5/7.5	15/15	20/15	10/10	20/20	20/20	
I_{cu}/I_{cs} (sym)		450V	25/25	30/30	45/45	30/30	50/50	50/50	
		240V	65/65	50/50	85/85	50/50	85/85	85/85	
		① DC 250V	40/40	40/40	—	—	—	—	
IEC60947-2		AC 690V	7.5/7.5	15/15	20/15	10/10	20/20	20/20	
I_{cu}/I_{cs} (sym)		500V	25/25	22/22	30/30	15/15	30/30	30/30	
		440V	25/25	30/30	45/45	30/30	50/50	50/50	
		415V	35/35	36/36	50/50	36/36	50/50	50/50	
		380V	35/35	36/36	50/50	36/36	50/50	50/50	
		240V	65/65	50/50	85/85	50/50	85/85	85/85	
		① DC 250V	40/40	40/40	40/40	50/50	50/50	—	
		125V	40/40	40/40	40/40	50/50	50/50	—	
Rated short time withstand current, kA		—	—	—	5 (0.3sec)	—	—	10 (0.3sec)	
External dimensions, mm									
		a	105 105 140	140 185	140 185	210 280	210 280	210 280	
		b	165	260	260	273	273	273	
		c	68	103	103	103	103	103	
		d	92	145	145	145	145	145	
Weight (● marked standard type) kg			1.5 1.5 1.9	4.2 5.6	4.2 5.6	8.0 11.0	8.0 11.0	8.7 11.9	
Connections and Mountings									
Front-connected (FC)		Terminal screws	●	●	●	—	—	—	
		With extension bars	○ (BAR)	○ (BAR)	○ (BAR)	●	●	●	
Rear-connected (RC)		Bolt studs	—	—	—	—	—	—	
		Flat bar studs	○	○	○	○	○	○	
Plug-in (PM)		For switchboards Standard (PMC)	— ○ —	○ —	○ —	○ —	○ —	○ —	
		High-performance (PMB)	○	○	○	○	○	○	
		For distribution boards (PMC)	—	—	—	—	—	—	
Flush-mounted (FP)		With flat bar studs	○	○	○	○	○	○	
Draw-out type (DR)			—	▲	▲	▲	▲	▲	
TemPlug70 (PG)			— ○ —	○ —	○ —	○ —	○ —	○ —	
TemPlug45B (PG4)			—	—	—	—	—	—	
DIN rail mount			—	—	—	—	—	—	
Clip-in chassis mount			—	—	—	—	—	—	
Accessories (optional)		Symbol							
Internally mounted	Auxiliary switch		●	●	●	●	●	●	
	Alarm switch		●	●	●	●	●	●	
	Shunt trips		●	●	●	●	●	●	
	Undervoltage trips		●	●	●	●	●	●	
	Motor operator		●	●	●	●	●	●	
Externally mounted	External operating handle		●	●	●	●	●	●	
	Door-mounted (variable depth)		●	●	●	●	●	●	
	Toggle extension		—	—	—	—	●	●	
	Mechanical interlock⑨ Slide type		—	—	—	—	●	●	
	Toggle holder		●	●	●	●	●	●	
	Toggle lock		●	●	●	●	●	●	
	Terminal cover For front-connected		●	●	●	●	●	●	
	For rear-connected and plug-in		●	●	●	●	●	●	
	Interpole barrier		● ③	● ③	● ③	● ③	● ③	● ③	
	Terminal block for lead		●	●	●	●	●	●	
Standard specifications									
Overcurrent trip mechanism		Thermal-magnetic	Thermal-magnetic	Thermal-magnetic	Electronic ⑯	Thermal-magnetic(adjustable)	Thermal-magnetic(adjustable)	Electronic ⑯	
Trip button (color)		Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	
Handle position indication (ON: Red, OFF: Green)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Suitability for isolation		Yes	Yes	Yes	Yes	Yes	Yes	Yes	
CE marking		Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Page on which characteristics and outline dimensions are shown		7-18	7-20	7-20	7-30	7-34	7-34	7-36	

Notes:

● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering. ▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available".

① : DC rating available on request. ③ : Line side interpole barriers are supplied as standard. (Front connection only) ⑨ : The mechanical interlock is not applicable to the draw-out type (DR).

⑯ : Optional pretrip alarm or ground fault trip function available on request.

2

Ratings and Specifications

Molded Case Circuit Breakers

2 Standard series

			800		800		800		1250		1600		2000		TemBreak			
Frame size (A)			800		800		800		1250		1600		2000					
Type			S800-CF		S800-NF		S800-NE		S1250-NE		S1600-NE		XS2000NE					
Number of poles			3 4		3 4		3 4		3 4		3 4		3 4					
Ratings																		
Rated current, A			700		700		(Adjustable)		(Adjustable)		(Adjustable)		(Adjustable)					
Calibrated at 45°C			800		800		350 600 400 700 450 800 500		500 1000 600 1200 700 1250 800		700 1200 800 1400 900 1600 1000		1000 1600 1200 1800 1400 2000					

Notes:

● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering. ▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available".

① : DC rating available on request. ② : Supplied as standard. ③ : Line side interpole barriers are supplied as standard. (Front connection only) ⑥ : The UVT controller is installed externally, when provided with AC UVT. ⑨ : The mechanical interlock is not applicable to the draw-out type (DR). ⑫ : Being or will be applied. ⑬ : at 500V AC. ⑯ : Optional pretrip alarm or ground fault trip function available on request. ⑳ : One is supplied with every five breakers. Please specify if more are required. ㉓ : Fixed depth, not adjustable.

2

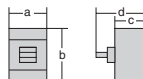
Ratings and Specifications

2

Ratings and Specifications

Molded Case Circuit Breakers

3 High-fault level series

Frame size (A)			50	100	125	225	250	225	400	400
Type			\$50-GF	\$100-GF	\$125-GF	\$225-GF	\$250-GF	\$225-GE	\$400-GF	\$400-GE
Number of poles			3 4	2 3 4	2 3 4	2* 3 4	2* 3 4	3 4	3 4	3 4
■ Ratings										
Rated current, A			15	15 60	125	125	250	(Adjustable)	125 250	(Adjustable) (Adjustable)
Calibrated at 45°C			20	20 75		150		125	150 300	125 175
			30	30 100		175		150	175 350	150 200
			40	40		200		175	200 400	175 225
			50	50		225		200	225	200 250
								225		225 300
										350 400
* center pole omitted										
Rated insulation voltage {U _i } V AC			690	690	690	690	690	690	690	690
Rated impulse withstand voltage {U _{imp} } kV			8	8	8	8	8	8	8	8
■ Rated breaking capacity, kA										
NK	AC	690V	6/6	6/6	6/6	7.5/7.5	7.5/7.5	7.5/7.5 ⑫	20/15	20/15
		450V	50/25	50/25	50/25	50/25	50/25 ⑫	65/50	65/50	
		240V	85/85	85/85	85/85	85/85	85/85 ⑫	100/85	100/85	
		① DC 250V	40/40	40/40	40/40	40/40	—	—	—	
IEC60947-2	AC	690V	6/6	6/6	6/6	7.5/7.5	7.5/7.5	7.5/7.5	20/15	20/15
		500V	25/22	25/22	25/22	25/25	25/25	30/30	30/30	
		440V	50/25	50/25	50/25	50/25	50/25	65/50	65/50	
		415V	65/33	65/33	65/33	65/35	65/35	70/50	70/50	
I _{cu} /I _{cs} (sym)	① DC	380V	65/33	65/33	65/33	65/35	65/35	65/35	70/50	70/50
		240V	85/85	85/85	85/85	85/85	85/85	100/85	100/85	
		250V	40/40	40/40	40/40	40/40	—	40/40	—	
		125V	40/40	40/40	40/40	40/40	—	40/40	—	
■ Rated short time withstand current, kA		—	—	—	—	—	—	—	5 (0.3sec)	
■ External dimensions, mm										
	a	90 120	60 90 120	60 90 120	105 105 140	105 105 140	105 140	140 185	140 185	
	b	155	155	155	165	165	165	260	260	
	c	68	68	68	68	68	103	103	103	
	d	92	92	92	92	92	127	145	145	
Weight (● marked standard type) kg			1.1 1.4	0.7 1.1 1.4	0.7 1.1 1.4	1.5 1.5 1.9	1.5 1.5 1.9	2.3 3.1	4.2 5.6	4.3 5.7
■ Connections and Mountings										
Front-connected (FC)	Terminal screws	●	●	●	●	●	●	●	●	●
	With extension bars	○ (BAR)	○ (BAR)	○ (BAR)	○ (BAR)	○ (BAR)	○ (BAR)	○ (BAR)	○ (BAR)	○ (BAR)
Rear-connected (RC)	Bolt studs	—	—	—	—	—	—	—	—	—
	Flat bar studs	○	○	○	○	○	○	○	○	○
Plug-in (PM)	For switchboards Standard (PMC)	○ —	— ○ —	— ○ —	— ○ —	— ○ —	— ○ —	○ —	○ —	○ —
	High-performance (PMB)	○ —	— ○ —	— ○ —	— ○ —	— ○ —	— ○ —	—	—	—
Flush-mounted (FP)	For distribution boards (PMC)	○ —	— ○ —	— ○ —	—	—	—	—	—	—
	With flat bar studs	○	○	○	○	○	○	○	○	○
Draw-out type (DR)			—	—	—	—	—	—	—	—
TemPlug70 (PG)			○ —	○ ○ —	○ ○ —	— ○ —	— ○ —	▲ —	○ —	○ —
TemPlug45B (PG4)			—	—	—	—	—	—	—	—
DIN rail mount			○ ⑪	— ○ ⑪	— ○ ⑪	—	—	—	—	—
Clip-in chassis mount			—	—	—	—	—	—	—	—
■ Accessories (optional)			Symbol							
Internally mounted	Auxiliary switch	A X	●	●	●	●	●	●	●	●
	Alarm switch	A L	●	●	●	●	●	●	●	●
	Shunt trips	S H	●	●	●	●	●	●	●	●
	Undervoltage trips	U V	●	●	●	●	●	●	●	●
Externally mounted	Motor operator	M C	●	— ●	— ●	— ●	— ●	— ●	— ●	— ●
	External operating handle	H B	●	— ●	— ●	— ●	— ●	— ●	— ●	— ●
	Door-mounted (variable depth)	H P	●	— ●	— ●	— ●	— ●	— ●	— ●	— ●
	Toggle extension	H A	—	—	—	—	—	—	—	—
	Mechanical interlock⑨ Slide type	M S	●	— ●	— ●	— ●	— ●	— ●	— ●	— ●
	Toggle holder	H H	●	●	●	●	●	●	●	●
	Toggle lock	H L	●	●	●	●	●	●	●	●
	Terminal cover For front-connected	C F	●	●	●	●	●	●	●	●
	For rear-connected and plug-in	C R	●	●	●	●	●	●	●	●
	Interpole barrier	B A	● ③	● ③	● ③	● ③	● ③	● ③	● ③	● ③
	Terminal block for lead	T F	●	●	●	●	●	●	●	●
	Door flange	D F	●	●	●	●	●	●	●	●
■ Standard specifications										
Overcurrent trip mechanism			Thermal-magnetic	Thermal-magnetic	Thermal-magnetic	Thermal-magnetic	Thermal-magnetic	Electronic ⑫	Thermal-magnetic	Electronic ⑬
Trip button (color)			Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)
Handle position indication (ON: Red, OFF: Green)			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Suitability for isolation			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CE marking			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Page on which characteristics and outline dimensions are shown			7-10	7-10	7-12	7-14	7-18	7-28	7-20	7-30

Notes:

● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering. ▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available".

① : DC rating available on request. ③ : Line side interpole barriers are supplied as standard. (Front connection only) ⑨ : The mechanical interlock is not applicable to the draw-out type (DR).

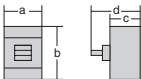
⑪ : Provided with DIN rail adaptor. ⑫ : Being or will be applied. ⑬ : Optional pretrip alarm or ground fault trip function available on request. ⑭ : Optional pretrip alarm function available on request.

2

Ratings and Specifications

Molded Case Circuit Breakers

3 High-fault level series

Frame size (A)			400		400		630		630		800		800		1250			
Type			S400-PF		S400-PE		S630-RF		S630-RE		S800-RF		S800-RE		S1250-GE			
Number of poles			3 4		3 4		3 4		3 4		3 4		3 4		3 4			
Ratings																		
Rated current, A			250		(Adjustable) 125 175		500		(Adjustable) 250 500		700		(Adjustable) 350 600		(Adjustable) 500 1000			
Calibrated at 45°C			300		150 200		630		300 600		800		400 700		600 1200			
			350		175 225				350 630				450 800		700 1250			
			400		200 250				400				500		800			
					225 300													
					350													
					400													
Rated insulation voltage (U _i) V			AC 690		690		690		690		690		690		690			
Rated impulse withstand voltage (U _{imp}) kV			8		8		8		8		8		8		8			
Rated breaking capacity, kA																		
NK			AC 690V		20/15		20/15		25/20 ⑫		25/20 ⑫		25/20 ⑫		25/20 ⑫		45/34 ⑫	
I _{cu} /I _{cs} (sym)			450V		80/80		80/80		65/50 ⑫		65/50 ⑫		65/50 ⑫		65/50 ⑫		85/65 ⑫	
			240V		100/85		100/85		100/75 ⑫		100/75 ⑫		100/75 ⑫		100/75 ⑫		125/94 ⑫	
			① DC 250V		—		—		—		—		—		—		—	
IEC60947-2			AC 690V		20/15		20/15		25/20		25/20		25/20		25/20		45/34	
I _{cu} /I _{cs} (sym)			500V		30/30		30/30		45/34		45/34		45/34		45/34		65/50	
			440V		80/80		80/80		65/50		65/50		65/50		65/50		85/65	
			415V		85/85		85/85		70/50		70/50		70/50		70/50		85/65	
			380V		85/85		85/85		70/50		70/50		70/50		70/50		100/75	
			240V		100/85		100/85		100/75		100/75		100/75		100/75		125/94	
			① DC 250V		40/40		—		50/50		—		50/50		—		—	
			125V		40/40		—		50/50		—		50/50		—		—	
Rated short time withstand current, kA			—		5 (0.3sec)		—		10 (0.3sec)		—		10 (0.3sec)		15 (0.3sec)			
External dimensions, mm																		
			a	140	185	140	185	210	280	210	280	210	280	210	280	210	280	
			b	260		260		273		273		273		273		370		
			c	103		103		103		103		103		103		120		
			d	145		145		145		145		145		145		171		
Weight (● marked standard type) kg			4.2	5.6	4.3	5.7	8.0	11.0	8.7	11.9	8.5	11.5	9.1	12.3	19.8	25.0		
Connections and Mountings																		
Front-connected (FC)			Terminal screws		●		●		—		—		—		—		—	
			With extension bars		○ (BAR)		○ (BAR)		●		●		●		●		—	
Rear-connected (RC)			Bolt studs		—		—		—		—		—		—		—	
			Flat bar studs		○		○		○		○		○		○		—	
Plug-in (PM)			For switchboards Standard (PMC)		○ —		○ —		○ —		○ —		○ —		○ —		○	
			High-performance (PMB)		○		○		○		○		○		○		—	
			For distribution boards (PMC)		—		—		—		—		—		—		—	
Flush-mounted (FP)			With flat bar studs		○		○		○		○		○		○		○	
Draw-out type (DR)			▲		▲		▲		▲		▲		▲		▲		—	
TemPlug70 (PG)			○ —		○ —		○ —		○ —		—		—		—		—	
TemPlug45B (PG4)			—		—		—		—		—		—		—		—	
DIN rail mount			—		—		—		—		—		—		—		—	
Clip-in chassis mount			—		—		—		—		—		—		—		—	
Accessories (optional)			Symbol															
Internally mounted	Auxiliary switch		A X		●		●		●		●		●		●		—	
	Alarm switch		A L		●		●		●		●		●		●		—	
	Shunt trips		S H		●		●		●		●		●		●		—	
	Undervoltage trips		U V		●		●		●		●		●		●		—	
	Motor operator		M C		●		●		●		●		●		●		—	
Externally mounted	External operating handle		Breaker-mounted H B		●		●		●		●		●		●		—	
	Door-mounted (variable depth)		H P		●		●		●		●		●		●		—	
	Toggle extension		H A		—		—		●		●		●		●		24	
	Mechanical interlock⑨ Slide type		M S		●		●		●		●		●		●		—	
	Toggle holder		H H		●		●		●		●		●		●		—	
	Toggle lock		H L		●		●		●		●		●		●		—	
	Terminal cover For front-connected		C F		●		●		●		●		●		●		—	
	For rear-connected and plug-in		C R		●		●		●		●		●		●		—	
	Interpole barrier		B A		● ③		● ③		● ③		● ③		● ③		● ③		—	
	Terminal block for lead		T F		●		●		●		●		●		●		—	
Standard specifications																		
Overcurrent trip mechanism			Thermal-magnetic		Electronic ⑩		Thermal-magnetic		Electronic ⑩		Thermal-magnetic		Electronic ⑩		Electronic ⑩			
Trip button (color)			Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)			
Handle position indication (ON: Red, OFF: Green)			Yes		Yes		Yes		Yes		Yes		Yes		Yes			
Suitability for isolation			Yes		Yes		Yes		Yes		Yes		Yes		Yes			
CE marking			Yes		Yes		Yes		Yes		Yes		Yes		Yes			
Page on which characteristics and outline dimensions are shown			7-20		7-30		7-34		7-36		7-40		7-42		7-46			

4 Current limiting series

Notes:

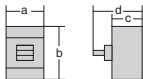
- : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering. ▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available".
- ① : DC rating available on request. ③ : Line side interpole barriers are supplied as standard. (Front connection only) ⑥ : The UVT controller is installed externally, when provided with AC UVT.
- ⑨ : The mechanical interlock is not applicable to the draw-out type (DR). 16 : Optional pretrip alarm or ground fault trip function available on request. 23 : at 460V AC.
- 24 : One is supplied with every five breakers. Please specify if more are required.

2

Ratings and Specifications

Molded Case Circuit Breakers

4 Current limiting series

Frame size (A)			100		125		225		400		630		800					
Type			L100-NF		L125-NF		L225-NF		L400-NE		L630-NE		L800-NE					
Number of poles			3 4		3 4		3 4		3 4		3 4		3 4					
■ Ratings																		
Rated current, A			15	50	125		125		(Adjustable)	(Adjustable)	(Adjustable)		(Adjustable)					
Calibrated at 45°C			20	60			150		125	175	250	500	350	600				
			30	75			175		150	200	300	600	400	700				
			40	100			200		175	225	350	630	450	800				
							225		200	250	400		500					
									225	300								
										350								
										400								
Rated insulation voltage {U _i } V			AC 690		690		690		690		690		690					
Rated impulse withstand voltage {U _{imp} } kV			8		8		8		8		8		8					
■ Rated breaking capacity, kA																		
NK	AC	690V	25/20	25/20	25/20	25/20	50/50	25/20	25/20	25/20	25/20	25/20	25/20					
		450V	180/135	180/135	180/135	180/135	180/135	180/135	180/135	180/135	180/135	180/135	180/135					
		240V	200/150 ③	200/150 ③	200/150 ③	200/150 ③	200/150 ③	200/150 ③	200/150	200/150	200/150	200/150	200/150					
		250V	—	—	—	—	—	—	—	—	—	—	—					
IEC60947-2	AC	690V	25/20	25/20	25/20	25/20	50/50	25/20	25/20	25/20	25/20	25/20	25/20					
		500V	65/65	65/65	65/65	65/65	65/65	45/34	45/34	45/34	45/34	45/34	45/34					
		440V	180/135	180/135	180/135	180/135	180/135	180/135	180/135	180/135	180/135	180/135	180/135					
		415V	200/150	200/150	200/150	200/150	200/150	200/150	200/150	200/150	200/150	200/150	200/150					
I _{cu} /I _{cs} (sym)	① DC	380V	200/150	200/150	200/150	200/150	200/150	200/150	200/150	200/150	200/150	200/150	200/150					
		240V	200/150	200/150	200/150	200/150	200/150	200/150	200/150	200/150	200/150	200/150	200/150					
		250V	40/40	40/40	40/40	40/40	—	—	—	—	—	—	—					
		125V	40/40	40/40	40/40	—	—	—	—	—	—	—	—					
■ Rated short time withstand current, kA									5 (0.3sec)		10 (0.3sec)		10 (0.3sec)					
■ External dimensions, mm																		
			a	105	140	105	140	105	140	140	185	210	280	210	280			
			b	165		165		165		260		273		273				
			c	103		103		103		140		140		140				
			d	127		127		127		182		182		182				
Weight (● marked standard type) kg			2.4	3.2	2.4	3.2	2.4	3.2	7.1	9.4	13.5	19.6	14.3	20.3				
■ Connections and Mountings																		
Front-connected (FC)	Terminal screws	●		●		●		●		—		—						
	With extension bars	○ (BAR)		○ (BAR)		○ (BAR)		○ (BAR)		●		●						
Rear-connected (RC)	Bolt studs	—		—		—		—		—		—						
	Flat bar studs	○		○		○		○		○		○						
Plug-in (PM)	For switchboards	○	—	○	—	○	—	○	—	○	—	○	—	○	—			
	Standard (PMC)	○		○		○		○		○		○		○				
	High-performance (PMB)	—		—		—		—		—		—		—				
For distribution boards (PMC)		—		—		—		—		—		—		—				
Flush-mounted (FP)	With flat bar studs	○		○		○		○		○		○		○				
Draw-out type (DR)		—		—		—		—		▲		▲		▲				
TemPlug70 (PG)		—		—		—		—		—		—		—				
TemPlug45B (PG4)		—		—		—		—		—		—		—				
DIN rail mount		—		—		—		—		—		—		—				
Clip-in chassis mount		—		—		—		—		—		—		—				
■ Accessories (optional)			Symbol															
Internally mounted	Auxiliary switch	A X	●		●		●		●		●		●					
	Alarm switch	A L	●		●		●		●		●		●					
	Shunt trips	S H	●		●		●		●		●		●					
	Undervoltage trips	U V	●		●		●		●		●		●					
Externally mounted	Motor operator	M C	●		●		●		●		●		●					
	External operating handle	H B	●		●		●		●		●		●					
	Door-mounted (variable depth)	H P	●		●		●		●		●		●					
	Toggle extension	H A	—		—		—		—		●		●					
	Mechanical interlock⑨ Slide type	M S	●		●		●		●		●		●					
	Toggle holder	H H	●		●		●		●		●		●					
	Toggle lock	H L	●		●		●		●		●		●					
	Terminal cover For front-connected	C F	●		●		●		●		●		●					
	For rear-connected and plug-in	C R	●		●		●		●		●		●					
	Interpole barrier	B A	● ③		● ③		● ③		● ③		● ③		● ③					
	Terminal block for lead	T F	●		●		●		●		●		●					
	Door flange	D F	●		●		●		●		●		●					
■ Standard specifications																		
Overcurrent trip mechanism			Thermal-magnetic		Thermal-magnetic		Thermal-magnetic		Electronic ⑩		Electronic ⑩		Electronic ⑩					
Trip button (color)			Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)					
Handle position indication (ON: Red, OFF: Green)			Yes		Yes		Yes		Yes		Yes		Yes					
Suitability for isolation			Yes		Yes		Yes		Yes		Yes		Yes					
CE marking			Yes		Yes		Yes		Yes		Yes		Yes					
Page on which characteristics and outline dimensions are shown			7-22		7-24		7-26		7-32		7-38		7-44					

Notes:

● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering. ▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available".

① : DC rating available on request. ③ : Line side interpole barriers are supplied as standard. (Front connection only) ⑨ : The mechanical interlock is not applicable to the draw-out type (DR).

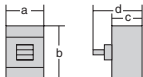
⑩ : Optional pretrip alarm or ground fault trip function available on request. ⑪ : Also applicable to AC415V.

2

Ratings and Specifications

Molded Case Circuit Breakers

5 Motor protection series

Frame size (A)			50	100	225					
Type			E50-CM	S100-NM	S225-NM					
Number of poles			3	3	3					
Ratings										
Motor rated capacity (kW)										
and breaker rated current (A)										
Calibrated at 45°C										
Note: Select an appropriate one depending on the total load current of the motor operator.										
Rated insulation voltage [U _i] V			AC							
Rated impulse withstand voltage [U _{imp}] kV										
Rated breaking capacity, kA										
NK	AC	690V								
I _{cu} /I _{cs} (sym)		450V								
		240V								
	DC	250V								
IEC 60947-2	AC	440V								
I _{cu} /I _{cs} (sym)		415V								
		380V								
		240V								
	DC	250V								
External dimensions, mm										
			a	75	90	105				
			b	130	155	165				
			c	68	68	68				
			d	87	92	92				
Weight (● marked standard type) kg			0.74	1.1	1.5					
Connections and Mountings										
Front-connected (FC)			Terminal screws	●	●	●				
			With extension bars	—	○ (BAR)	○ (BAR)				
Rear-connected (RC)			Bolt studs	○	—	—				
			Flat bar studs	—	○	○				
Plug-in (PM)			For switchboards Standard (PMC)	○	—	—				
			High-performance (PMB)	—	—	—				
			For distribution boards (PMC)	○	—	—				
Flush-mounted (FP)			Bolt studs	○	—	—				
			Flat bar studs	—	○	○				
Draw-out type (DR)			—	—	—	—				
TemPlug70 (PG)			—	○	○	—				
TemPlug45B (PG4)			—	—	—	—				
DIN rail mount			—	○ ⑪	—	—				
Clip-in chassis mount			—	—	—	—				
Accessories (optional)			Symbol							
Internally mounted	Auxiliary switch		A X	●	●	●				
	Alarm switch		A L	●	●	●				
	Shunt trips		S H	●	●	●				
	Undervoltage trips		U V	—	●	●				
Externally mounted	Motor operator		M C	—	●	●				
	External operating handle		Breaker-mounted	H B	●	●				
			Door-mounted (variable depth)	H P	●	●				
	Toggle extension		H A	—	—	—				
	Mechanical interlock Slide type		M S	●	●	●				
	Toggle holder		H H	●	●	●				
	Toggle lock		H L	●	●	●				
	Terminal cover		For front-connected	C F	●	●	●			
			For rear-connected and plug-in	C R	●	●	●			
	Interpole barrier		B A	●	● ③	● ③				
	Terminal block for lead		T F	●	●	●				
Door flange		D F	●	●	●					
Standard specifications										
Overcurrent trip mechanism			Thermal-magnetic ⑦	Thermal-magnetic	Thermal-magnetic					
Trip button (color)			Yes (Red)	Yes (Red)	Yes (Red)					
Handle position indication (ON: Red, OFF: Green)			Yes	Yes	Yes					
Suitability for isolation			Non	Yes	Yes					
CE marking			Non	Yes	Yes					
Page on which characteristics and outline dimensions are shown			7-50	7-52	7-54					

Notes:

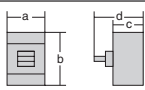
- : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering. ● : "yes" or "available". — : "no" or "not available".
 ③ : Line side interpole barriers are supplied as standard. (Front connection only) ⑪ : Provided with DIN rail adaptor. ⑬ : at 500V AC. ⑭ : at 250V AC.
 ⑦ : Hydraulic-magnetic type for below 5A rating.

2

Ratings and Specifications

Molded Case Circuit Breakers

6 Switch-disconnectors

Frame size (A)		100	125	125	250	400	630
Type		\$100-NN	\$125-SN	\$125-NN	\$250-SN	\$400-NN	\$630-GN
Number of poles		3 4	3 4	3 4	3 4	3 4	3 4
Ratings							
Rated current, A		100	100	125	225	400	630
Rated insulation voltage [U_i] V		AC 690	690	690	690	690	690
Rated operational voltage V		AC 690	690	690	690	690	690
		DC 250	250	250	250	250	250
Rated short circuit making capacity, kA peak		3.6	2.8	2.8	6	9	17
Rated short time withstand current, kA		2 (0.3sec)	2 (0.3sec)	2 (0.3sec)	3 (0.3sec)	5 (0.3sec)	10 (0.3sec)
Rated impulse withstand voltage [U_{imp}] kV		8	8	8	8	8	8
Performance							
Utilization category		AC 690V	AC-23A	AC-23A	AC-23A	AC-23A	AC-23A
IEC 60947-3		DC 250V	DC-22A	DC-22A	DC-22A	DC-22A	DC-22A
Upstream breaker (OCPD) 29		S100-NF	S125-SF	S125-SF	S250-SF	S400-NF	S630-NF
External dimensions, mm							
	a	90 120	75 100	75 100	105 140	140 185	210 280
	b	155	130	130	165	260	273
	c	68	68	68	68	103	103
	d	92	95	95	95	145	145
Weight (● marked standard type) kg		1.1 1.4	0.7 0.9	0.7 0.9	1.5 1.9	4.2 5.6	8.0 11.0
Connections and Mountings							
Front-connected (FC)	Terminal screws	●	●	●	●	●	—
	With extension bars	○ (BAR)	○ (BAR)	○ (BAR)	○ (BAR)	○ (BAR)	●
Rear-connected (RC)	Bolt studs	—	—	—	—	—	—
	Flat bar studs	○	○	○	○	○	○
Plug-in (PM)	For switchboards Standard (PMC)	○ —	○ —	○ —	○ —	○ —	○ —
	High-performance (PMB)	○	—	○	—	○	○
For distribution boards (PMC)		○ —	○ —	○ —	—	—	—
Flush-mounted (FP) With flat bar studs		○	○	○	○	○	○
Draw-out type (DR)		—	—	—	—	▲	▲
TemPlug70 (PG)		○ —	—	—	○ —	○ —	○ —
TemPlug45B (PG4)		—	—	—	—	—	—
DIN rail mount		○ ①	○ ①	○ ①	○ ①	—	—
Clip-in chassis mount		—	—	—	—	—	—
Accessories (optional) Symbol							
Internally mounted	Auxiliary switch A X	●	●	●	●	●	●
	Alarm switch A L	●	●	●	●	●	●
	Shunt trips S H	●	●	●	●	●	●
	Undervoltage trips U V	●	●	●	●	●	●
Externally mounted	Motor operator M C	●	—	—	●	●	●
	External operating handle Breaker-mounted H B	●	●	●	●	●	●
	Door-mounted (variable depth) H P	●	●	●	●	●	●
	Toggle extension H A	—	—	—	—	—	●
	Mechanical interlock⑨ Slide type M S	●	●	●	●	●	●
	Toggle holder H H	●	●	●	●	●	●
	Toggle lock H L	●	●	●	●	●	●
	Terminal cover For front-connected C F	●	●	●	●	●	●
	For rear-connected and plug-in C R	●	●	●	●	●	●
	Interpole barrier B A	● ③	● ③	● ③	● ③	● ③	● ③
	Terminal block for lead T F	●	●	●	●	●	●
	Door flange D F	●	●	●	●	●	●
Standard specifications							
Trip button (color)		Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)
Handle position indication (ON: Red, OFF: Green)		Yes	Yes	Yes	Yes	Yes	Yes
Suitability for isolation		Yes	Yes	Yes	Yes	Yes	Yes
CE marking		Yes	Yes	Yes	Yes	Yes	Yes
Page on which characteristics and outline dimensions are shown		7-56	7-58	7-58	7-60	7-62	7-66

Notes:

- : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering. ▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available".
 ③ : Line side interpole barriers are supplied as standard. (Front connection only) ⑨ : The mechanical interlock is not applicable to the draw-out type (DR). ① : Provided with DIN rail adaptor.
 29 : Required for overcurrent protection. Rated conditional short-circuit current [I_{cc}] will be the same as Rated short-circuit breaking capacity of upstream breaker.

2

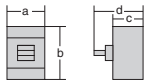
Ratings and Specifications

2

Ratings and Specifications

Molded Case Circuit Breakers

6 Switch-disconnectors

Frame size (A)		800	1250	1600					
Type		S800-NN	S1250-NN	S1600-NN					
Number of poles		3 4	3 4	3 4					
■ Ratings									
Rated current, A		800	1250	1600					
Rated insulation voltage [U_i] V		AC 690	690	690					
Rated operational voltage V		AC 690	690	690					
		DC 250	250	250					
Rated short circuit making capacity, kA peak		17	32	45					
Rated short time withstand current, kA		10 (0.3sec)	15 (0.3sec)	20 (0.3sec)					
Rated impulse withstand voltage [U_{imp}] kV		8	8	8					
■ Performance									
Utilization category		AC 690V	AC-23A	AC-23A					
IEC 60947-3		DC 250V	DC-22A	DC-22A					
Upstream breaker (OCPD) 29		S800-NF	S1250-NE	S1600-NE					
■ External dimensions, mm									
		a 210 280	210 280	210 280					
		b 273	370	370					
		c 103	120	140					
		d 145	171	191					
Weight (● marked standard type) kg		8.0 11.5	18.2 23.4	24.9 32.9					
■ Connections and Mountings									
Front-connected (FC) Terminal screws		●	●	○					
		With extension bars	○	○					
Rear-connected (RC) Bolt studs		○	○	●					
		Flat bar studs	○	○					
Plug-in (PM) For switchboards Standard (PMC)		○ —	○ —	—					
		High-performance (PMB)	○	—					
		For distribution boards (PMC)	○	—					
Flush-mounted (FP) With flat bar studs		○	○	○					
Draw-out type (DR)		▲	▲	○					
TemPlug70 (PG)		—	—	—					
TemPlug45B (PG4)		—	—	—					
DIN rail mount		—	—	—					
Clip-in chassis mount		—	—	—					
■ Accessories (optional) Symbol									
Internally mounted	Auxiliary switch	A X	●	●					
	Alarm switch	A L	●	●					
	Shunt trips	S H	●	●					
	Undervoltage trips	U V	●	●					
Externally mounted	Motor operator	M C	●	●					
	External operating handle	Breaker-mounted H B	●	●					
		Door-mounted (variable depth) H P	●	●					
	Toggle extension	H A	●	● 24	● 24				
	Mechanical interlock 9 Slide type	M S	●	●	●				
	Toggle holder	H H	●	●	●				
	Toggle lock	H L	●	●	●				
	Terminal cover	For front-connected C F	●	●	—				
		For rear-connected and plug-in C R	●	—	—				
	Interpole barrier	B A	● ③	● ③	● ③				
	Terminal block for lead	T F	●	●	●				
	Door flange	D F	●	●	●				
■ Standard specifications									
Trip button (color)		Yes (Red)	Yes (Red)	Yes (Red)					
Handle position indication (ON: Red, OFF: Green)		Yes	Yes	Yes					
Suitability for isolation		Yes	Yes	Yes					
CE marking		Yes	Yes	Yes					
Page on which characteristics and outline dimensions are shown		7-68	7-70	7-72					

- Notes:**
- : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering. ▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available".
- ③ : Line side interpole barriers are supplied as standard. (Front connection only) ⑨ : The mechanical interlock is not applicable to the draw-out type (DR).
- 24 : One is supplied with every five breakers. Please specify if more are required.
- 29 : Required for overcurrent protection. Rated conditional short-circuit current [I_{cc}] will be the same as Rated short-circuit breaking capacity of upstream breaker.

2

Ratings and Specifications

Molded Case Circuit Breakers

7 Non-automatic trip breakers

		TemBreak																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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Notes:

● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering. ▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available".

② : Supplied as standard. ⑥ : The UVT controller is installed externally, when provided with AC UVT. ⑨ : The mechanical interlock is not applicable to the draw-out type (DR).

②⑨ : Required for overcurrent protection. Rated conditional short-circuit current [I_{cc}] will be the same as Rated short-circuit breaking capacity of upstream breaker.

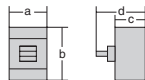
⑬ : Fixed depth, not adjustable.

2

Ratings and Specifications

Molded Case Circuit Breakers

8 TB series for distribution boards

Frame size (A)		50				50		50	
Type		TB-5S				TB-5P		TB-5D	
Number of poles		1	2	3	4	1	2	2	
■ Ratings									
Rated current, A		10	30	30		10	30	10	30
Calibrated at 45°C		15	40	50		15	40	15	40
		20	50			20	50	20	50
Rated voltage V		265	460	460	460	265	460	250	
		125	125	—	—	—	125	125	
■ Rated breaking capacity, kA									
NK		AC	250 V		—	5 (44)	5 (44)		
(sym)			125 V		—	42	42		
		DC	125 V		—	5	5		
■ External dimensions, mm									
		a	25	50	75	100	25	50	50
		b	95				74.5	74.5	
		c	60				60	60	
		d	77	79			77	79	79
Weight kg		0.16	0.34	0.5	0.66	0.13	0.28	0.28	
■ Connecting scheme									
Front-connected both on the line and load sides		●				—		—	
Plug-in on the line side and front-connected on the load side		—				●		—	
Plug-in both on the line and load sides		—				—		●	
■ Mounting scheme (optional)									
Clip-in chassis		●				—		—	
Single mounting base		—				● (47)		● (47)	
Double mounting base		—				● (47)		● (47)	
■ Accessories (optional)		Symbol							
Toggle holder		H H		●		●		●	
Toggle lock		H L		● —		● —		—	
Toggle cap		H C		● —		● —		—	
Interpole barrier		B A		— ●		— ●		●	
■ Standard specifications									
Overcurrent trip mechanism		Thermal-magnetic				Thermal-magnetic		Thermal-magnetic	
Trip button (color)		Non				Non		Non	
Handle position indication (ON: Red, OFF: Green)		Non				Non		Non	
Suitability for isolation		Non				Non		Non	
CE marking		Non				Non		Non	
Page on which characteristics and outline dimensions are shown		7-80				7-82		7-84	

Notes:

● : "yes" or "available". — : "no" or "not available".

44 : 2.5kA for 10A.

47 : Specify the branch bars when ordering.

9 Current limiting series (planned to be released)

Notes:

● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering. ▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available".
 ③ : Line side interpolate barriers are supplied as standard. (Front connection only) ⑨ : The mechanical interlock is not applicable to the draw-out type (DR). ⑫ : Being or will be applied.
 ⑩⑬ : Optional pretrip alarm or ground fault trip function available on request. ⑭ : One is supplied with every five breakers. Please specify if more are required.

2

Ratings and Specifications

Molded Case Circuit Breakers

10 List of breakers for marine use and rated breaking capacities (approved by ship classification societies)

TemBreak2

Frame size	Type	Rated current(A)	Poles	Rated voltage (V)	Rated breaking capacities, kA (sym.) Values enclosed in square brackets "[]" represent the making current, kA.							
					N K		L R		A B S		G L	
					<i>I_{cu}</i>	<i>I_{cs}</i>	<i>I_{cu}</i>	<i>I_{cs}</i>	<i>I_{cu}</i>	<i>I_{cs}</i>	<i>I_{cu}</i>	<i>I_{cs}</i>
50	E50-SF	10,15,20,30,40,50	2	AC450	10[18.5]13	—	10[18.5]13	—	10[18.5]13	—	10[18.5]	5[7.65]
			3	AC240	25[53.2]14	—	25[53.2]14	—	25[53.2]14	—	25[52.5]	13[26]
				AC115	42[95.6]15	—	42[95.6]15	—	42[95.6]15	—	42[95.6]3	21[44.1]3
				DC250	7.5[7.5]	—	7.5[7.5]	—	7.5[7.5]	—	7.5[7.5]	—
	E50-CM	0.7,1.4,2,2.6,4,5,8,10,12,16,25,32,40,45	3	AC450	2.5[3.8]13	—	2.5[3.8]13	—	2.5[3.8]13	—	—	—
				AC240	5[8.7]14	—	5[8.7]14	—	5[8.7]14	—	—	—
	S50-SF	15,20,30,40,50	2	AC690	—	—	—	—	—	—	—	—
			3	AC450	25[54.4]	13[29.6]	25[54.4]	13[29.6]	25[54.4]	13[29.6]	25[54.4]	13[29.6]
				AC240	50[117]	25[56.9]	50[117]	25[56.9]	50[117]	25[56.9]	50[117]	25[56.9]
				DC250	25[25]	13[13]	25[25]	13[13]	25[25]	13[13]	25[25]	13[13]
	S50-GF	15,20,30,40,50	3	AC690	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]
				AC500	—	—	25[52.5]	22[46.2]	25[52.5]	22[46.2]	25[52.5]	22[46.2]
				AC450	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]
				AC415	—	—	65[143]	33[69.3]	65[143]	33[69.3]	65[143]	33[69.3]
				AC240	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]
	S50-GFL	15,20,30,40,50	3	AC690	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]
				AC500	—	—	25[52.5]	22[46.2]	25[52.5]	22[46.2]	25[52.5]	22[46.2]
				AC450	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]
				AC415	—	—	65[143]	33[69.3]	65[143]	33[69.3]	65[143]	33[69.3]
				AC240	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]
	S50-GFH	15,20,30,40,50	3	AC690	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]
				AC500	—	—	25[52.5]	22[46.2]	25[52.5]	22[46.2]	25[52.5]	22[46.2]
				AC450	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]
				AC415	—	—	65[143]	33[69.3]	65[143]	33[69.3]	65[143]	33[69.3]
				AC240	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]
100	E100-SF	10,15,20,30,40,50,60,75,100	2	AC450	10[18.5]13	—	10[17.2]	5[8.4]	10[18.5]13	—	10[18.5]	5[7.5]
			3	AC240	25[53.2]14	—	25[60.5]	13[26.1]	25[53.2]14	—	25[52.5]	13[26]
				AC115	42[95.6]15	—	42[97.9]3	—	42[95.6]15	—	42[95.6]3	21[44.1]3
				DC250	7.5[7.5]	—	—	—	7.5[7.5]	—	7.5[7.5]	—
	S100-NF	15,20,30,40,50,60,75,100	2	AC690	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]
			3	AC500	—	—	22[46.2]	22[46.2]	22[46.2]	22[46.2]	22[46.2]	22[46.2]
				AC450	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]
				AC415	—	—	30[63]	30[63]	30[63]	30[63]	30[63]	30[63]
				AC240	50[115]	50[115]	50[115]	50[115]	50[115]	50[115]	50[115]	50[115]
				DC250	25[25]	19[19]	25[25]	19[19]	25[25]	19[19]	25[25]	19[19]
	S100-NFL	15,20,30,40,50,60,75,100	2	AC690	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]
			3	AC500	—	—	22[46.2]	22[46.2]	22[46.2]	22[46.2]	22[46.2]	22[46.2]
				AC450	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]
				AC415	—	—	30[63]	30[63]	30[63]	30[63]	30[63]	30[63]
				AC240	50[115]	50[115]	50[115]	50[115]	50[115]	50[115]	50[115]	50[115]
				DC250	25[25]	19[19]	25[25]	19[19]	25[25]	19[19]	25[25]	19[19]
	S100-NFH	15,20,30,40,50,60,75,100	2	AC690	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]
			3	AC500	—	—	22[46.2]	22[46.2]	22[46.2]	22[46.2]	22[46.2]	22[46.2]
				AC450	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]
				AC415	—	—	30[63]	30[63]	30[63]	30[63]	30[63]	30[63]
				AC240	50[115]	50[115]	50[115]	50[115]	50[115]	50[115]	50[115]	50[115]
				DC250	25[25]	19[19]	25[25]	19[19]	25[25]	19[19]	25[25]	19[19]
	S100-NM	16,24,32,40,45,60,75,90,100	3	AC450	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]
				AC415	—	—	—	—	30[63]	30[63]	—	—
				AC240	50[115]	50[115]	50[115]	50[115]	50[115]	50[115]	50[115]	50[115]
	S100-GF	15,20,30,40,50,60,75,100	2	AC690	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]
			3	AC500	—	—	25[52.5]	22[46.2]	25[52.5]	22[46.2]	25[52.5]	22[46.2]
				AC450	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]
				AC415	—	—	65[143]	33[69.3]	65[143]	33[69.3]	65[143]	33[69.3]
				AC240	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]
	S100-GFL	15,20,30,40,50,60,75,100	2	AC690	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]
			3	AC500	—	—	25[52.5]	22[46.2]	25[52.5]	22[46.2]	25[52.5]	22[46.2]
				AC450	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]
				AC415	—	—	65[143]	33[69.3]	65[143]	33[69.3]	65[143]	33[69.3]
				AC240	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]

Notes: ① : at 450V AC. ② : at 240V AC. ③ : at 120V AC. ④ : at 660V AC. ⑤ : at 525V AC. ⑫ : Being or will be applied.

⑦ : at 220V AC. ⑧ : at 110V AC. ⑨ : at 225V AC. ⑩ : at 440V AC. ⑬ : at 500V AC. ⑭ : at 250V AC. ⑮ : at 125V AC.

Molded Case Circuit Breakers

10 List of breakers for marine use and rated breaking capacities (approved by ship classification societies)

TemBreak2

Frame size	Type	Rated current(A)	Poles	Rated voltage (V)	Rated breaking capacities, kA (sym.) Values enclosed in square brackets "[]" represent the making current, kA.							
					B V		C C S		K R		R I N A	
					I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}
50	E50-SF	10,15,20,30,40,50	2	AC450	10[17]12	5[7.65]12	10[18.5]	5[7.65]	10[18.5]13	—	12	12
			3	AC240	25[52.5]12	13[26]12	25[53.2]	13[26]	25[53.2]14	—	12	12
				AC115	—	—	42[95.6]15	—	42[95.6]15	—	—	—
				DC250	—	—	7.5[7.5]	—	7.5[7.5]	—	12	—
	E50-CM	0.7,1.4,2,2.6,4,5,8,10,12,16,25,32,40,45	3	AC450	—	—	—	—	2.5[3.8]13	—	—	—
				AC240	—	—	—	—	5[8.7]14	—	—	—
	S50-SF	15,20,30,40,50	2	AC690	—	—	—	—	—	—	—	—
			3	AC450	25[54.4]12	13[29.6]12	25[54.4]	13[29.6]	25[54.4]	13[29.6]	12	12
				AC240	50[117]12	25[56.9]12	50[117]	25[56.9]	50[117]	25[56.9]	12	12
				DC250	25[25]12	13[13]12	25[25]	13[13]	25[25]	13[13]	12	12
	S50-GF	15,20,30,40,50	3	AC690	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	—	—
				AC500	25[52.5]	22[46.2]	—	—	25[52.5]	22[46.2]	—	—
				AC450	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]	—	—
				AC415	65[143]	33[69.3]	—	—	65[143]	33[69.3]	—	—
				AC240	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	—	—
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	—	—
	S50-GFL	15,20,30,40,50	3	AC690	6[9.29]12	6[9.29]12	—	—	6[9.29]	6[9.29]	—	—
				AC500	25[52.5]12	22[46.2]12	—	—	25[52.5]	22[46.2]	—	—
				AC450	50[112]12	25[54.4]12	—	—	50[112]	25[54.4]	—	—
				AC415	65[143]12	33[69.3]12	—	—	65[143]	33[69.3]	—	—
				AC240	85[201]12	85[201]12	—	—	85[201]	85[201]	—	—
				DC250	40[40]12	40[40]12	—	—	40[40]	40[40]	—	—
	S50-GFH	15,20,30,40,50	3	AC690	6[9.29]12	6[9.29]12	—	—	6[9.29]	6[9.29]	—	—
				AC500	25[52.5]12	22[46.2]12	—	—	25[52.5]	22[46.2]	—	—
				AC450	50[112]12	25[54.4]12	—	—	50[112]	25[54.4]	—	—
				AC415	65[143]12	33[69.3]12	—	—	65[143]	33[69.3]	—	—
				AC240	85[201]12	85[201]12	—	—	85[201]	85[201]	—	—
				DC250	40[40]12	40[40]12	—	—	40[40]	40[40]	—	—
100	E100-SF	10,15,20,30,40,50,60,75,100	2	AC450	10[17.2]12	5[7.86]12	10[18.5]	5[7.65]	10[18.5]13	—	12	12
			3	AC240	25[59.0]12	13[27.7]12	25[53.2]	13[26]	25[53.2]14	—	12	12
				AC115	—	—	42[95.6]15	—	42[95.6]15	—	—	—
				DC250	—	—	7.5[7.5]	—	7.5[7.5]	—	12	—
	S100-NF	15,20,30,40,50,60,75,100	2	AC690	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9]	6[9]
			3	AC500	22[46.2]	22[46.2]	—	—	22[46.2]	22[46.2]	—	—
				AC450	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[52.5]	25[52.5]
				AC415	30[63]	30[63]	—	—	30[63]	30[63]	—	—
				AC240	50[115]	50[115]	50[115]	50[115]	50[115]	50[115]	50[105]	50[105]
				DC250	25[25]	19[19]	25[25]	19[19]	25[25]	19[19]	25[25]	19[19]
	S100-NFL	15,20,30,40,50,60,75,100	2	AC690	6[9.29]12	6[9.29]12	—	—	6[9.29]	6[9.29]	—	—
			3	AC500	22[46.2]12	22[46.2]12	—	—	22[46.2]	22[46.2]	—	—
				AC450	25[54.4]12	25[54.4]12	—	—	25[54.4]	25[54.4]	—	—
				AC415	30[63]12	30[63]12	—	—	30[63]	30[63]	—	—
				AC240	50[115]12	50[115]12	—	—	50[115]	50[115]	—	—
				DC250	25[25]12	19[19]12	—	—	25[25]	19[19]	—	—
	S100-NFH	15,20,30,40,50,60,75,100	2	AC690	6[9.29]12	6[9.29]12	—	—	6[9.29]	6[9.29]	—	—
			3	AC500	22[46.2]12	22[46.2]12	—	—	22[46.2]	22[46.2]	—	—
				AC450	25[54.4]12	25[54.4]12	—	—	25[54.4]	25[54.4]	—	—
				AC415	30[63]12	30[63]12	—	—	30[63]	30[63]	—	—
				AC240	50[115]12	50[115]12	—	—	50[115]	50[115]	—	—
				DC250	25[25]12	19[19]12	—	—	25[25]	19[19]	—	—
	S100-NM	16,24,32,40,45,60,75,90,100	3	AC450	25[54.4]12	25[54.4]12	—	—	25[54.4]	25[54.4]	—	—
				AC415	—	—	—	—	30[63]	30[63]	—	—
				AC240	50[115]12	50[115]12	—	—	50[115]	50[115]	—	—
	S100-GF	15,20,30,40,50,60,75,100	2	AC690	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9]	6[9]
			3	AC500	25[52.5]	22[46.2]	—	—	25[52.5]	22[46.2]	—	—
				AC450	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]	50[105]	25[52.5]
				AC415	65[143]	33[69.3]	—	—	65[143]	33[69.3]	—	—
				AC240	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[187]	85[187]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]
	S100-GFL	15,20,30,40,50,60,75,100	2	AC690	6[9.29]12	6[9.29]12	—	—	6[9.29]	6[9.29]	—	—
			3	AC500	25[52.5]12	22[46.2]12	—	—	25[52.5]	22[46.2]	—	—
				AC450	50[112]12	25[54.4]12	—	—	50[112]	25[54.4]	—	—
				AC415	65[143]12	33[69.3]12	—	—	65[143]	33[69.3]	—	—
				AC240	85[201]12	85[201]12	—	—	85[201]	85[201]	—	—
				DC250	40[40]12	40[40]12	—	—	40[40]	40[40]	—	—

Molded Case Circuit Breakers

10 List of breakers for marine use and rated breaking capacities (approved by ship classification societies)

TemBreak2

Frame size	Type	Rated current(A)	Poles	Rated voltage (V)	Rated breaking capacities, kA (sym.) Values enclosed in square brackets "[]" represent the making current, kA.							
					N K		L R		A B S		G L	
					<i>I_{cu}</i>	<i>I_{cs}</i>	<i>I_{cu}</i>	<i>I_{cs}</i>	<i>I_{cu}</i>	<i>I_{cs}</i>	<i>I_{cu}</i>	<i>I_{cs}</i>
100	S100-GFH	15,20,30,40,50,60,75,100	2	AC690	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]
			3	AC500	—	—	25[52.5]	22[46.2]	25[52.5]	22[46.2]	25[52.5]	22[46.2]
				AC450	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]
				AC415	—	—	65[143]	33[69.3]	65[143]	33[69.3]	65[143]	33[69.3]
				AC240	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]
	H100-NF	15,20,30,40,50,60,75,100	3	AC690	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]
				AC500	—	—	45[94.5]⑤	45[94.5]⑤	45[94.5]	45[94.5]	45[94.5]	45[94.5]
				AC450	120[283]	80[191]	120[283]	80[191]	120[283]	80[191]	120[283]	80[191]
				AC415	—	—	125[275]	85[187]	125[275]	85[187]	125[275]	85[187]
				AC240	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]
				DC250	25[53.8]	20[43.0]	25[53.8]	20[43.0]	25[53.8]	20[43.0]	25[53.8]	20[43.0]
	L100-NF	15,20,30,40,50,60,75,100	3	AC500	—	—	65[143]⑤	65[143]⑤	65[143]	65[143]	65[143]	65[143]
				AC450	180[430]	135[315]	180[430]	135[315]	180[430]	135[315]	180[430]	135[315]
				AC415	200[484]	150[345]	200[484]	150[345]	200[484]	150[345]	200[484]	150[345]
				AC240	200[484]	150[350]	200[484]	150[350]	200[484]	150[350]	200[484]	150[350]
125	S125-SF	15,20,30,40,50,60,75,100,125	2	AC690	—	—	—	—	—	—	—	—
			3	AC450	25[54.4]	13[29.6]	25[54.4]	13[29.6]	25[54.4]	13[29.6]	25[54.4]	13[29.6]
				AC240	50[117]	25[56.9]	50[117]	25[56.9]	50[117]	25[56.9]	50[117]	25[56.9]
				DC250	25[25]	13[13]	25[25]	13[13]	25[25]	13[13]	25[25]	13[13]
	S125-NF	125	2	AC690	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]
			3	AC500	—	—	22[46.2]	22[46.2]	22[46.2]	22[46.2]	22[46.2]	22[46.2]
				AC450	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]
				AC415	—	—	30[63]	30[63]	30[63]	30[63]	30[63]	30[63]
				AC240	50[115]	50[115]	50[115]	50[115]	50[115]	50[115]	50[115]	50[115]
				DC250	25[25]	19[19]	25[25]	19[19]	25[25]	19[19]	25[25]	19[19]
	S125-GF	125	2	AC690	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]	6[9.29]
			3	AC500	—	—	25[52.5]	22[46.2]	25[52.5]	22[46.2]	25[52.5]	22[46.2]
				AC450	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]
				AC415	—	—	65[143]	33[69.3]	65[143]	33[69.3]	65[143]	33[69.3]
				AC240	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]
	H125-NF	125	3	AC690	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]
				AC500	—	—	45[94.5]⑤	45[94.5]⑤	45[94.5]	45[94.5]	45[94.5]	45[94.5]
				AC450	120[283]	80[191]	120[283]	80[191]	120[283]	80[191]	120[283]	80[191]
				AC415	—	—	125[275]	85[187]	125[275]	85[187]	125[275]	85[187]
				AC240	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]
				DC250	25[53.8]	20[43.0]	25[53.8]	20[43.0]	25[53.8]	20[43.0]	25[53.8]	20[43.0]
	L125-NF	125	3	AC500	—	—	65[143]⑤	65[143]⑤	65[143]	65[143]	65[143]	65[143]
				AC450	180[430]	135[315]	180[430]	135[315]	180[430]	135[315]	180[430]	135[315]
				AC415	200[484]	150[345]	200[484]	150[345]	200[484]	150[345]	200[484]	150[345]
				AC240	200[484]	150[350]	200[484]	150[350]	200[484]	150[350]	200[484]	150[350]
225	S225-NF	125,150,175,200,225	2 *	AC690	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]
			3	AC500	—	—	25[52.5]	25[52.5]	25[52.5]	25[52.5]	25[52.5]	25[52.5]
				AC450	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]
				AC415	—	—	35[73.5]	35[73.5]	35[73.5]	35[73.5]	35[73.5]	35[73.5]
				AC240	65[148]	65[148]	65[148]	65[148]	65[148]	65[148]	65[148]	65[148]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]
	S225-NFL	125,150,175,200,225	2 *	AC690	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]
			3	AC500	—	—	25[52.5]	25[52.5]	25[52.5]	25[52.5]	25[52.5]	25[52.5]
				AC450	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]
				AC415	—	—	35[73.5]	35[73.5]	35[73.5]	35[73.5]	35[73.5]	35[73.5]
				AC240	65[148]	65[148]	65[148]	65[148]	65[148]	65[148]	65[148]	65[148]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]
	S225-NFH	125,150,175,200,225	2 *	AC690	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]
			3	AC500	—	—	25[52.5]	25[52.5]	25[52.5]	25[52.5]	25[52.5]	25[52.5]
				AC450	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]
				AC415	—	—	35[73.5]	35[73.5]	35[73.5]	35[73.5]	35[73.5]	35[73.5]
				AC240	65[148]	65[148]	65[148]	65[148]	65[148]	65[148]	65[148]	65[148]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]
	S225-NM	125,150,175,225	3	AC450	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]
				AC415	—	—	—	—	35[73.5]	35[73.5]	—	—
				AC240	65[148]	65[148]	65[148]	65[148]	65[148]	65[148]	65[148]	65[148]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]
	S225-GF	125,150,175,200,225	2 *	AC690	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]
			3	AC500	—	—	25[52.5]	25[52.5]	25[52.5]	25[52.5]	25[52.5]	25[52.5]
				AC450	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]
				AC415	—	—	65[143]	35[73.5]	65[143]	35[73.5]	65[143]	35[73.5]
				AC240	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]

Notes: ① : at 450V AC. ② : at 240V AC. ③ : at 120V AC. ④ : at 660V AC. ⑤ : at 525V AC. ⑥ : Being or will be applied.

⑦ : at 220V AC. ⑧ : at 110V AC. ⑨ : at 225V AC. ⑩ : at 440V AC. ⑪ : at 500V AC. ⑫ : at 250V AC. ⑬ : at 125V AC.

* center pole omitted.

Molded Case Circuit Breakers

10 List of breakers for marine use and rated breaking capacities (approved by ship classification societies)

TemBreak2

Frame size	Type	Rated current(A)	Poles	Rated voltage (V)	Rated breaking capacities, kA (sym.) Values enclosed in square brackets "[]" represent the making current, kA.							
					B V		C C S		K R		R I N A	
					<i>I_{cu}</i>	<i>I_{cs}</i>	<i>I_{cu}</i>	<i>I_{cs}</i>	<i>I_{cu}</i>	<i>I_{cs}</i>	<i>I_{cu}</i>	<i>I_{cs}</i>
100	S100-GFH	15,20,30,40,50,60,75,100	2	AC690	6[9.29]12	6[9.29]12	—	—	6[9.29]	6[9.29]	—	—
			3	AC500	25[52.5]12	22[46.2]12	—	—	25[52.5]	22[46.2]	—	—
				AC450	50[112]12	25[54.4]12	—	—	50[112]	25[54.4]	—	—
				AC415	65[143]12	33[69.3]12	—	—	65[143]	33[69.3]	—	—
				AC240	85[201]12	85[201]12	—	—	85[201]	85[201]	—	—
				DC250	40[40]12	40[40]12	—	—	40[40]	40[40]	—	—
	H100-NF	15,20,30,40,50,60,75,100	3	AC690	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[40]	15[30]
				AC500	45[94.5]5	45[94.5]5	—	—	45[94.5]	45[94.5]	—	—
				AC450	120[283]	80[191]	120[283]	80[191]	120[283]	80[191]	120[264]	80[176]
				AC415	125[275]	85[187]	—	—	125[275]	85[187]	—	—
				AC240	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]	150[330]	150[330]
				AC690	25[53.8]	20[43.0]	25[53.8]	20[43.0]	25[53.8]	20[43.0]	25[52.5]	19[38]
	L100-NF	15,20,30,40,50,60,75,100	3	AC500	65[143]5	65[143]5	—	—	65[143]	65[143]	—	—
				AC450	180[430]	135[315]	180[430]	135[315]	180[430]	135[315]	180[396]	135[297]
				AC415	200[484]	150[345]	200[484]	150[345]	200[484]	150[345]	—	—
				AC240	200[484]	150[350]	200[484]	150[350]	200[484]	150[350]	200[440]	150[330]
	S125-SF	15,20,30,40,50,60,75,100,125	2	AC690	—	—	—	—	—	—	—	—
			3	AC450	25[54.4]12	13[29.6]12	25[54.4]	13[29.6]	25[54.4]	13[29.6]	12	12
				AC240	50[117]12	25[56.9]12	50[117]	25[56.9]	50[117]	25[56.9]	12	12
				DC250	25[25]12	13[13]12	25[25]	13[13]	25[25]	13[13]	12	12
	S125-NF	125	2	AC690	6[9.29]12	6[9.29]12	6[9.29]	6[9.29]	6[9.29]	6[9.29]	—	—
			3	AC500	22[46.2]12	22[46.2]12	—	—	22[46.2]	22[46.2]	—	—
				AC450	25[54.4]12	25[54.4]12	25[54.4]	25[54.4]	25[54.4]	25[54.4]	—	—
				AC415	30[63]12	30[63]12	—	—	30[63]	30[63]	—	—
				AC240	50[115]12	50[115]12	50[115]	50[115]	50[115]	50[115]	—	—
				DC250	25[25]12	19[19]12	25[25]	19[19]	25[25]	19[19]	—	—
	S125-GF	125	2	AC690	6[9.29]12	6[9.29]12	6[9.29]	6[9.29]	6[9.29]	6[9.29]	—	—
			3	AC500	25[52.5]12	22[46.2]12	—	—	25[52.5]	22[46.2]	—	—
				AC450	50[112]12	25[54.4]12	50[112]	25[54.4]	50[112]	25[54.4]	—	—
				AC415	65[143]12	33[69.3]12	—	—	65[143]	33[69.3]	—	—
				AC240	85[201]12	85[201]12	85[201]	85[201]	85[201]	85[201]	—	—
				DC250	40[40]12	40[40]12	40[40]	40[40]	40[40]	40[40]	—	—
	H125-NF	125	3	AC690	20[43.0]12	15[32.6]12	20[43.0]	15[32.6]	20[43.0]	15[32.6]	—	—
				AC500	45[94.5]512	45[94.5]512	—	—	45[94.5]	45[94.5]	—	—
				AC450	120[283]12	80[191]12	120[283]	80[191]	120[283]	80[191]	—	—
				AC415	125[275]12	85[187]12	—	—	125[275]	85[187]	—	—
				AC240	150[350]12	150[350]12	150[350]	150[350]	150[350]	150[350]	—	—
				DC250	25[53.8]12	20[43.0]12	25[53.8]	20[43.0]	25[53.8]	20[43.0]	—	—
	L125-NF	125	3	AC500	65[143]512	65[143]512	—	—	65[143]	65[143]	—	—
				AC450	180[430]12	135[315]12	180[430]	135[315]	180[430]	135[315]	—	—
				AC415	200[484]12	150[345]12	200[484]	150[345]	200[484]	150[345]	—	—
				AC240	200[484]12	150[350]12	200[484]	150[350]	200[484]	150[350]	—	—
225	S225-NF	125,150,175,200,225	2 *	AC690	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[12.75]	7.5[12.75]
			3	AC500	25[52.5]	25[52.5]	—	—	25[52.5]	25[52.5]	—	—
				AC450	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[52.5]	25[52.5]
				AC415	35[73.5]	35[73.5]	—	—	35[73.5]	35[73.5]	—	—
				AC240	65[148]	65[148]	65[148]	65[148]	65[148]	65[148]	65[143]	65[143]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]
	S225-NFL	125,150,175,200,225	2 *	AC690	7.5[13.1]12	7.5[13.1]12	—	—	7.5[13.1]	7.5[13.1]	—	—
			3	AC500	25[52.5]12	25[52.5]12	—	—	25[52.5]	25[52.5]	—	—
				AC450	25[54.4]12	25[54.4]12	—	—	25[54.4]	25[54.4]	—	—
				AC415	35[73.5]12	35[73.5]12	—	—	35[73.5]	35[73.5]	—	—
				AC240	65[148]12	65[148]12	—	—	65[148]	65[148]	—	—
				DC250	40[40]12	40[40]12	—	—	40[40]	40[40]	—	—
	S225-NFH	125,150,175,200,225	2 *	AC690	7.5[13.1]12	7.5[13.1]12	—	—	7.5[13.1]	7.5[13.1]	—	—
			3	AC500	25[52.5]12	25[52.5]12	—	—	25[52.5]	25[52.5]	—	—
				AC450	25[54.4]12	25[54.4]12	—	—	25[54.4]	25[54.4]	—	—
				AC415	35[73.5]12	35[73.5]12	—	—	35[73.5]	35[73.5]	—	—
				AC240	65[148]12	65[148]12	—	—	65[148]	65[148]	—	—
				DC250	40[40]12	40[40]12	—	—	40[40]	40[40]	—	—
	S225-NM	125,150,175,225	3	AC450	25[54.4]12	25[54.4]12	—	—	25[54.4]	25[54.4]	—	—
				AC415	—	—	—	—	35[73.5]	35[73.5]	—	—
				AC240	65[148]12	65[148]12	—	—	65[148]	65[148]	—	—
	S225-GF	125,150,175,200,225	2 *	AC690	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[12.75]	7.5[12.75]
			3	AC500	25[52.5]	25[52.5]	—	—	25[52.5]	25[52.5]	—	—
				AC450	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]	50[105]	25[52.5]
				AC415	65[143]	35[73.5]	—	—	65[143]	35[73.5]	—	—
				AC240	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[187]	85[187]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]

Molded Case Circuit Breakers

10 List of breakers for marine use and rated breaking capacities (approved by ship classification societies)

TemBreak2

Frame size	Type	Rated current(A)	Poles	Rated voltage (V)	Rated breaking capacities, kA (sym.) Values enclosed in square brackets "[]" represent the making current, kA.							
					N K		L R		A B S		G L	
					<i>I_{cu}</i>	<i>I_{cs}</i>	<i>I_{cu}</i>	<i>I_{cs}</i>	<i>I_{cu}</i>	<i>I_{cs}</i>	<i>I_{cu}</i>	<i>I_{cs}</i>
225	S225-GFL	125,150,175,200,225	2 * 3	AC690	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]
				AC500	—	—	25[52.5]	25[52.5]	25[52.5]	25[52.5]	25[52.5]	25[52.5]
				AC450	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]
				AC415	—	—	65[143]	35[73.5]	65[143]	35[73.5]	65[143]	35[73.5]
				AC240	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]
	S225-GFH	125,150,175,200,225	2 * 3	AC690	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]
				AC500	—	—	25[52.5]	25[52.5]	25[52.5]	25[52.5]	25[52.5]	25[52.5]
				AC450	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]
				AC415	—	—	65[143]	35[73.5]	65[143]	35[73.5]	65[143]	35[73.5]
				AC240	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]
	S225-GE	125~225 (125,150,175,200,225)	3	AC690	7.5[13.1]⑫	7.5[13.1]⑫	⑫	⑫	⑫	⑫	⑫	⑫
				AC450	50[121]⑫	25[54.4]⑫	⑫	⑫	⑫	⑫	⑫	⑫
				AC240	85[211]⑫	85[211]⑫	⑫	⑫	⑫	⑫	⑫	⑫
	H225-NF	125,150,175,200,225	3	AC690	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]
				AC500	—	—	45[94.5]⑤	45[94.5]⑤	45[94.5]	45[94.5]	45[94.5]	45[94.5]
				AC450	120[283]	80[191]	120[283]	80[191]	120[283]	80[191]	120[283]	80[191]
				AC415	—	—	125[275]	85[187]	125[275]	85[187]	125[275]	85[187]
				AC240	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]
	L225-NF	125,150,175,200,225	3	AC690	25[53.8]	20[43.0]	25[53.8]	20[43.0]	25[53.8]	20[43.0]	25[53.8]	20[43.0]
				AC500	—	—	65[143]⑤	65[143]⑤	65[143]	65[143]	65[143]	65[143]
				AC450	180[430]	135[315]	180[430]	135[315]	180[430]	135[315]	180[430]	135[315]
				AC415	200[484]	150[345]	200[484]	150[345]	200[484]	150[345]	200[484]	150[345]
				AC240	200[484]	150[350]	200[484]	150[350]	200[484]	150[350]	200[484]	150[350]
250	E250-SF	125,150,175,200,225,250	2 * 3	AC690	—	—	—	—	—	—	—	—
				AC450	15[32.6]	12[27.3]	15[32.6]	12[27.3]	15[32.6]	12[27.3]	15[32.6]	12[27.3]
				AC240	35[83.6]	27[62.2]	35[83.6]	27[62.2]	35[83.6]	27[62.2]	35[83.6]	27[62.2]
				DC250	—	—	—	—	—	—	—	—
	S250-NF	250	2 * 3	AC690	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]
				AC500	—	—	25[52.5]	25[52.5]	25[52.5]	25[52.5]	25[52.5]	25[52.5]
				AC450	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]	25[54.4]
				AC415	—	—	35[73.5]	35[73.5]	36[75.6]	36[75.6]	35[73.5]	35[73.5]
				AC240	65[148]	65[148]	65[148]	65[148]	65[148]	65[148]	65[148]	65[148]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]
	S250-SF	125,150,175,200,225,250	2 * 3	AC690	—	—	—	—	—	—	—	—
				AC450	30[70.8]	15[32.6]	30[70.8]	15[32.6]	30[70.8]	15[32.6]	30[70.8]	15[32.6]
				AC240	85[211]	43[103]	85[211]	43[103]	85[211]	43[103]	85[211]	43[103]
				DC250	25[25]	13[13]	25[25]	13[13]	25[25]	13[13]	25[25]	13[13]
	S250-GF	250	2 * 3	AC690	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]
				AC500	—	—	25[52.5]	25[52.5]	25[52.5]	25[52.5]	25[52.5]	25[52.5]
				AC450	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]	50[112]	25[54.4]
				AC415	—	—	65[143]	35[73.5]	65[143]	36[75.6]	65[143]	35[73.5]
				AC240	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]	85[201]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]
400	S400-CF	125,150,175,200,225,250,300,350,400	3	AC690	15[32.6]	15[32.6]	15[32.6]	15[32.6]	15[32.6]	15[32.6]	15[32.6]	15[32.6]
				AC450	30[70.8]	30[70.8]	30[70.8]	30[70.8]	30[70.8]	30[70.8]	30[70.8]	30[70.8]
				AC415	—	—	36[75.6]	36[75.6]	36[75.6]	36[75.6]	36[75.6]	36[75.6]
				AC240	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]
				AC690	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]
	S400-NF	125,150,175,200,225,250,300,350,400	3	AC450	45[109]	45[109]	45[109]	45[109]	45[109]	45[109]	45[109]	45[109]
				AC415	—	—	50[105]	50[105]	50[105]	50[105]	50[105]	50[105]
				AC240	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]
				DC250	—	—	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]
				AC690	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]
				AC525	—	—	30[63]	30[63]	30[63]	30[63]	30[63]	30[63]
	S400-NE	100~400 (125,150,175,200,225,250,300,350,400)	3	AC450	45[109]	45[109]	45[109]	45[109]	45[109]	45[109]	45[109]	45[109]
				AC415	—	—	50[105]	50[105]	50[105]	50[105]	50[105]	50[105]
				AC240	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]
				AC690	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]
				AC525	—	—	30[63]	30[63]	30[63]	30[63]	30[63]	30[63]
				AC450	45[109]	45[109]	45[109]	45[109]	45[109]	45[109]	45[109]	45[109]
	S400-NEH	100~400 (125,150,175,200,225,250,300,350,400)	3	AC415	—	—	50[105]	50[105]	50[105]	50[105]	50[105]	50[105]
				AC240	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]

Notes: ① : at 450V AC. ② : at 240V AC. ③ : at 120V AC. ④ : at 660V AC. ⑤ : at 525V AC. ⑥ : Being or will be applied.

⑦ : at 220V AC. ⑧ : at 110V AC. ⑨ : at 225V AC. ⑩ : at 440V AC. ⑪ : at 500V AC. ⑫ : at 250V AC. ⑬ : at 125V AC.

* center pole omitted.

Molded Case Circuit Breakers

⑩ List of breakers for marine use and rated breaking capacities (approved by ship classification societies)

TemBreak2

Frame size	Type	Rated current(A)	Poles	Rated voltage (V)	Rated breaking capacities, kA (sym.) Values enclosed in square brackets "[]" represent the making current, kA.							
					B V		C C S		K R		R I N A	
					I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}
225	S225-GFL	125,150, 175,200, 225	2 * 3	AC690	7.5[13.1]⑫	7.5[13.1]⑫	—	—	7.5[13.1]	7.5[13.1]	—	—
				AC500	25[52.5]⑫	25[52.5]⑫	—	—	25[52.5]	25[52.5]	—	—
				AC450	50[112]⑫	25[54.4]⑫	—	—	50[112]	25[54.4]	—	—
				AC415	65[143]⑫	35[73.5]⑫	—	—	65[143]	35[73.5]	—	—
				AC240	85[201]⑫	85[201]⑫	—	—	85[201]	85[201]	—	—
				DC250	40[40]⑫	40[40]⑫	—	—	40[40]	40[40]	—	—
	S225-GFH	125,150, 175,200, 225	2 * 3	AC690	7.5[13.1]⑫	7.5[13.1]⑫	—	—	7.5[13.1]	7.5[13.1]	—	—
				AC500	25[52.5]⑫	25[52.5]⑫	—	—	25[52.5]	25[52.5]	—	—
				AC450	50[112]⑫	25[54.4]⑫	—	—	50[112]	25[54.4]	—	—
				AC415	65[143]⑫	35[73.5]⑫	—	—	65[143]	35[73.5]	—	—
				AC240	85[201]⑫	85[201]⑫	—	—	85[201]	85[201]	—	—
				DC250	40[40]⑫	40[40]⑫	—	—	40[40]	40[40]	—	—
	S225-GE	125~225 (125,150, 175,200,225)	3	AC690	⑫	⑫	—	—	⑫	⑫	—	—
				AC450	⑫	⑫	—	—	⑫	⑫	—	—
				AC240	⑫	⑫	—	—	⑫	⑫	—	—
	H225-NF	125,150, 175,200, 225	3	AC690	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[40]	15[30]
				AC500	45[94.5]⑤	45[94.5]⑤	—	—	45[94.5]	45[94.5]	—	—
				AC450	120[283]	80[191]	120[283]	80[191]	120[283]	80[191]	120[264]	80[176]
				AC415	125[275]	85[187]	—	—	125[275]	85[187]	—	—
				AC240	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]	150[330]	150[330]
				AC690	25[53.8]	20[43.0]	25[53.8]	20[43.0]	25[53.8]	20[43.0]	25[52.5]	19[38]
250	L225-NF	125,150, 175,200, 225	3	AC500	65[143]⑤	65[143]⑤	—	—	65[143]	65[143]	—	—
				AC450	180[430]	135[315]	180[430]	135[315]	180[430]	135[315]	180[396]	135[297]
				AC415	200[484]	150[345]	200[484]	150[345]	200[484]	150[345]	—	—
				AC240	200[484]	150[350]	200[484]	150[350]	200[484]	150[350]	200[440]	150[330]
	E250-SF	125,150, 175,200, 225,250	2 * 3	AC690	—	—	—	—	—	—	—	—
				AC450	15[32.6]⑫	12[27.3]⑫	15[32.6]	12[27.3]	15[32.6]	12[27.3]	⑫	⑫
				AC240	35[83.6]⑫	27[62.2]⑫	35[83.6]	27[62.2]	35[83.6]	27[62.2]	⑫	⑫
				DC250	—	—	—	—	—	—	—	—
	S250-NF	250	2 * 3	AC690	7.5[13.1]⑫	7.5[13.1]⑫	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	—	—
				AC500	25[52.5]⑫	25[52.5]⑫	—	—	25[52.5]	25[52.5]	—	—
				AC450	25[54.4]⑫	25[54.4]⑫	25[54.4]	25[54.4]	25[54.4]	25[54.4]	—	—
				AC415	35[73.5]⑫	35[73.5]⑫	—	—	36[75.6]	36[75.6]	—	—
				AC240	65[148]⑫	65[148]⑫	65[148]	65[148]	65[148]	65[148]	—	—
				DC250	40[40]⑫	40[40]⑫	40[40]	40[40]	40[40]	40[40]	—	—
	S250-SF	125,150, 175,200, 225,250	2 * 3	AC690	—	—	—	—	—	—	—	—
				AC450	30[70.8]⑫	15[32.6]⑫	30[70.8]	15[32.6]	30[70.8]	15[32.6]	⑫	⑫
				AC240	85[211]⑫	43[103]⑫	85[211]	43[103]	85[211]	43[103]	⑫	⑫
				DC250	25[25]⑫	13[13]⑫	25[25]	13[13]	25[25]	13[13]	⑫	⑫
	S250-GF	250	2 * 3	AC690	7.5[13.1]⑫	7.5[13.1]⑫	7.5[13.1]	7.5[13.1]	7.5[13.1]	7.5[13.1]	—	—
				AC500	25[52.5]⑫	25[52.5]⑫	—	—	25[52.5]	25[52.5]	—	—
				AC450	50[112]⑫	25[54.4]⑫	50[112]	25[54.4]	50[112]	25[54.4]	—	—
				AC415	65[143]⑫	35[73.5]⑫	—	—	65[143]	36[75.6]	—	—
				AC240	85[201]⑫	85[201]⑫	85[201]	85[201]	85[201]	85[201]	—	—
				DC250	40[40]⑫	40[40]⑫	40[40]	40[40]	40[40]	40[40]	—	—
400	S400-CF	125,150, 175,200, 225,250, 300,350, 400	3	AC690	15[32.6]	15[32.6]	15[32.6]	15[32.6]	15[32.6]	15[32.6]	—	—
				AC450	30[70.8]	30[70.8]	30[70.8]	30[70.8]	30[70.8]	30[70.8]	—	—
				AC415	36[75.6]	36[75.6]	—	—	—	—	—	—
				AC240	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]	—	—
				DC250	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	—	—
	S400-NF	125,150, 175,200, 225,250, 300,350, 400	3	AC690	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[40]	15[30]
				AC450	45[109]	45[109]	45[109]	45[109]	45[109]	45[109]	45[94.5]	45[94.5]
				AC415	50[105]	50[105]	—	—	—	—	—	—
				AC240	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	85[187]	85[187]
				DC250	40[40]	40[40]	—	—	—	—	40[40]	40[40]
	S400-NE	100~400 (125,150, 175,200, 225,250, 300,350,400)	3	AC690	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	⑫	⑫
				AC525	30[63]	30[63]	—	—	—	—	—	—
				AC450	45[109]	45[109]	45[109]	45[109]	45[109]	45[109]	⑫	⑫
				AC415	50[105]	50[105]	—	—	—	—	—	—
				AC240	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	⑫	⑫
				AC690	20[43.0]	15[32.6]	—	—	20[43.0]	15[32.6]	⑫	⑫
	S400-NEH	100~400 (125,150, 175,200, 225,250, 300,350,400)	3	AC525	30[63]	30[63]	—	—	—	—	—	—
				AC450	45[109]	45[109]	—	—	45[109]	45[109]	⑫	⑫
				AC415	50[105]	50[105]	—	—	—	—	—	—
				AC240	85[211]	85[211]	—	—	85[211]	85[211]	⑫	⑫
				AC690	20[43.0]	15[32.6]	—	—	—	—	—	—
				AC240	85[211]	85[211]	—	—	85[211]	85[211]	⑫	⑫

Molded Case Circuit Breakers

10 List of breakers for marine use and rated breaking capacities (approved by ship classification societies)

TemBreak2

Frame size	Type	Rated current(A)	Poles	Rated voltage (V)	Rated breaking capacities, kA (sym.) Values enclosed in square brackets "[]" represent the making current, kA.								
					N K		L R		A B S		G L		
					<i>I_{cu}</i>	<i>I_{cs}</i>	<i>I_{cu}</i>	<i>I_{cs}</i>	<i>I_{cu}</i>	<i>I_{cs}</i>	<i>I_{cu}</i>	<i>I_{cs}</i>	
400	S400-GF	125,150, 175,200, 225,250, 300,350, 400	3	AC690	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	
				AC450	65[157]	50[121]	65[157]	50[121]	65[157]	50[121]	65[157]	50[121]	
				AC415	—	—	70[154]	50[105]	70[154]	50[105]	70[154]	50[105]	
				AC240	100[233]	85[211]	100[233]	85[211]	100[233]	85[211]	100[233]	85[211]	
				DC250	—	—	40[40]	40[40]	40[40]	40[40]	40[40]	40[40]	
				—	—	—	—	—	—	—	—	—	
	S400-GE	100~400 (125,150, 175,200, 225,250, 300,350,400)	3	AC690	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	
				AC525	—	—	30[63]	30[63]	30[63]	30[63]	30[63]	30[63]	
				AC450	65[157]	50[121]	65[157]	50[121]	65[157]	50[121]	65[157]	50[121]	
				AC415	—	—	70[154]	50[105]	70[154]	50[105]	70[154]	50[105]	
				AC240	100[233]	85[211]	100[233]	85[211]	100[233]	85[211]	100[233]	85[211]	
				—	—	—	—	—	—	—	—	—	
	S400-GEH	100~400 (125,150, 175,200, 225,250, 300,350,400)	3	AC690	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	
				AC525	—	—	30[63]	30[63]	30[63]	30[63]	30[63]	30[63]	
				AC450	65[157]	50[121]	65[157]	50[121]	65[157]	50[121]	65[157]	50[121]	
				AC415	—	—	70[154]	50[105]	70[154]	50[105]	70[154]	50[105]	
				AC240	100[233]	85[211]	100[233]	85[211]	100[233]	85[211]	100[233]	85[211]	
				—	—	—	—	—	—	—	—	—	
	S400-PF	250,300, 350,400	3	AC690	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	
				AC525	—	—	30[63]	30[63]	30[63]	30[63]	30[63]	30[63]	
				AC450	80[191]	80[191]	80[191]	80[191]	80[191]	80[191]	80[191]	80[191]	
				AC415	—	—	85[187]	85[187]	85[187]	85[187]	85[187]	85[187]	
				AC240	100[233]	85[211]	100[233]	85[211]	100[233]	85[211]	100[233]	85[211]	
				DC250	—	—	—	—	—	—	—	—	—
	S400-PE	100~400 (125,150, 175,200, 225,250, 300,350,400)	3	AC690	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	20[43.0]	15[32.6]	
				AC525	—	—	30[63]	30[63]	30[63]	30[63]	30[63]	30[63]	
				AC450	80[191]	80[191]	80[191]	80[191]	80[191]	80[191]	80[191]	80[191]	
				AC415	—	—	85[187]	85[187]	85[187]	85[187]	85[187]	85[187]	
				AC240	100[233]	85[211]	100[233]	85[211]	100[233]	85[211]	100[233]	85[211]	
				—	—	—	—	—	—	—	—	—	
	H400-NE	100~400 (125,150, 175,200, 225,250, 300,350,400)	3	AC690	35[77.8]	35[77.8]	35[77.8]	35[77.8]	35[77.8]	35[77.8]	35[77.8]	35[77.8]	
				AC525	—	—	45[94.5]	45[94.5]	45[94.5]	45[94.5]	45[94.5]	45[94.5]	
				AC450	120[283]	80[191]	120[283]	80[191]	120[283]	80[191]	120[283]	80[191]	
				AC415	—	—	125[275]	85[187]	125[275]	85[187]	125[275]	85[187]	
				AC240	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]	
				—	—	—	—	—	—	—	—	—	
	L400-NE	100~400 (125,150, 175,200, 225,250, 300,350,400)	3	AC690	50[115]	50[115]	50[115]	50[115]	50[115]	50[115]	50[115]	50[115]	
				AC525	—	—	65[143]	65[143]	65[143]	65[143]	65[143]	65[143]	
				AC450	180[430]	135[315]	180[430]	135[315]	180[430]	135[315]	180[430]	135[315]	
				AC415	200[484]	150[345]	200[484]	150[345]	200[484]	150[345]	200[484]	150[345]	
				AC240	200[484]	150[350]	200[484]	150[350]	200[484]	150[350]	200[484]	150[350]	
				—	—	—	—	—	—	—	—	—	
630	S630-CF	500,600, 630	3	AC690	10[21.1]	10[21.1]	10[21.1]	10[21.1]	10[21.1]	10[21.1]	10[21.1]	10[21.1]	
				AC525	—	—	15[30]	15[30]	15[30]	15[30]	15[30]	15[30]	
				AC450	30[70.8]	30[70.8]	30[70.8]	30[70.8]	30[70.8]	30[70.8]	30[70.8]	30[70.8]	
				AC415	—	—	36[75.6]	36[75.6]	36[75.6]	36[75.6]	36[75.6]	36[75.6]	
				AC240	50[117]	50[117]	50[117]	50[117]	50[117]	50[117]	50[117]	50[117]	
				DC250	—	—	—	—	—	—	—	—	—
	S630-NF	500,600, 630	3	AC690	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	
				AC525	—	—	30[63]	30[63]	30[63]	30[63]	30[63]	30[63]	
				AC450	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]	
				AC415	—	—	50[105]	50[105]	50[105]	50[105]	50[105]	50[105]	
				AC240	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	
				DC250	—	—	—	—	—	—	—	—	—
	S630-NE	250~630 (250,300, 350,400, 500,600,630)	3	AC690	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	
				AC525	—	—	30[63]	30[63]	30[63]	30[63]	30[63]	30[63]	
				AC450	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]	
				AC415	—	—	50[105]	50[105]	50[105]	50[105]	50[105]	50[105]	
				AC240	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	
				—	—	—	—	—	—	—	—	—	
	S630-NEH	250~630 (250,300, 350,400, 500,600,630)	3	AC690	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	
				AC525	—	—	30[63]	30[63]	30[63]	30[63]	30[63]	30[63]	
				AC450	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]	
				AC415	—	—	50[105]	50[105]	50[105]	50[105]	50[105]	50[105]	
				AC240	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	
				—	—	—	—	—	—	—	—	—	
	S630-RF	500,600, 630	3	AC690	25[53.8]⑫	20[43.0]⑫	⑫	⑫	⑫	⑫	⑫	⑫	
				AC450	65[157]⑫	50[121]⑫	⑫	⑫	⑫	⑫	⑫	⑫	
				AC240	100[233]⑫	75[181]⑫	⑫	⑫	⑫	⑫	⑫	⑫	
				DC250	—	—	—	—	—	—	—	—	—
				—	—	—	—	—	—	—	—	—	—
				—	—	—	—	—	—	—	—	—	—
	S630-RE	250~630 (250,300,350,400, 500,600,630)	3	AC690	25[53.8]⑫	20[43.0]⑫	⑫	⑫	⑫	⑫	⑫	⑫	
				AC450	65[157]⑫	50[121]⑫	⑫	⑫	⑫	⑫	⑫	⑫	
				AC240	100[233]⑫	75[181]⑫	⑫	⑫	⑫	⑫	⑫	⑫	
				—	—	—	—	—	—	—	—	—	—
				—	—	—	—	—	—	—	—	—	—
				—	—	—	—	—	—	—	—	—	—
	H630-NE	250~630 (250,300, 350,400, 500,600,630)	3	AC690	25[53.8]	20[43.0]	25[53.8]	20[43.0]	25[53.8]	20[43.0]	25[53.8]	20[43.0]	
				AC525	—	—	45[94.5]	34[71.4]	45[94.5]	34[71.4]	45[94.5]	34[71.4]	
				AC450	125[295]	94[225]	125[295]	94[225]	125[295]	94[225]	125[295]	94[225]	
				AC415	—	—	125[275]	94[206.8]	125[275]	94[206.8]	125[275]	94[206.8]	
				AC240	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]	
				—	—	—	—	—	—	—	—	—	—
	L630-NE	250~630 (250,300, 350,400, 500,600,630)	3	AC690	25[53.8]	20[43.0]	25[53.8]	20[43.0]	25[53.8]	20[43.0]	25[53.8]	20[43.0]	
				AC525	—	—	45[94.5]	34[71.4]	45[94.5]	34[71.4]	45[94.5]	34[71.4]	
				AC450	180[430]	135[315]	180[430]	135[315]	180[430]	135[315]	180[430]	135[315]	
AC415				—	—	200[440]	150[330]	200[440]	150[330]	200[440]	150[330]		
AC240				200[484]	150[350]	200[484]	150[350]	200[484]	150[350]	200[484]	150[350]		
—				—	—	—	—	—	—	—	—	—	

10List of breakers for marine use and rated breaking capacities (approved by ship classification societies)

Ratings and Specifications

Molded Case Circuit Breakers

10 List of breakers for marine use and rated breaking capacities (approved by ship classification societies)

TemBreak2

Frame size	Type	Rated current(A)	Poles	Rated voltage (V)	Rated breaking capacities, kA (sym.) Values enclosed in square brackets "[]" represent the making current, kA.							
					N K		L R		A B S		G L	
					<i>I_{cu}</i>	<i>I_{cs}</i>	<i>I_{cu}</i>	<i>I_{cs}</i>	<i>I_{cu}</i>	<i>I_{cs}</i>	<i>I_{cu}</i>	<i>I_{cs}</i>
800	S800-CF	700,800	3	AC690	10[21.1]	10[21.1]	10[21.1]	10[21.1]	10[21.1]	10[21.1]	10[21.1]	10[21.1]
				AC525	—	—	15[30]	15[30]	15[30]	15[30]	15[30]	15[30]
				AC450	30[70.8]	30[70.8]	30[70.8]	30[70.8]	30[70.8]	30[70.8]	30[70.8]	30[70.8]
				AC415	—	—	36[75.6]	36[75.6]	36[75.6]	36[75.6]	36[75.6]	36[75.6]
				AC240	50[117]	50[117]	50[117]	50[117]	50[117]	50[117]	50[117]	50[117]
				DC250	—	—	—	—	—	—	—	—
	S800-NF	700,800	3	AC690	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]
				AC525	—	—	30[63]	30[63]	30[63]	30[63]	30[63]	30[63]
				AC450	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]
				AC415	—	—	50[105]	50[105]	50[105]	50[105]	50[105]	50[105]
				AC240	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]
				DC250	—	—	—	—	—	—	—	—
	S800-NE	350~800 (350,400, 450,500, 600,700,800)	3	AC690	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]
				AC525	—	—	30[63]	30[63]	30[63]	30[63]	30[63]	30[63]
				AC450	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]
				AC415	—	—	50[105]	50[105]	50[105]	50[105]	50[105]	50[105]
				AC240	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]	85[211]
	S800-NEH	350~800 (350,400, 450,500, 600,700,800)	3	AC690	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]	20[43.0]
				AC525	—	—	30[63]	30[63]	30[63]	30[63]	30[63]	30[63]
				AC450	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]	50[121]
				AC415	—	—	50[105]	50[105]	50[105]	50[105]	50[105]	50[105]
	S800-RF	700,800	3	AC690	25[53.8]⑫	20[43.0]⑫	⑫	⑫	⑫	⑫	⑫	⑫
				AC450	65[157]⑫	50[121]⑫	⑫	⑫	⑫	⑫	⑫	⑫
				AC240	100[233]⑫	75[181]⑫	⑫	⑫	⑫	⑫	⑫	⑫
				DC250	—	—	—	—	—	—	—	—
	S800-RE	350~800 (350,400,450,500, 600,700,800)	3	AC690	25[53.8]⑫	20[43.0]⑫	⑫	⑫	⑫	⑫	⑫	⑫
				AC450	65[157]⑫	50[121]⑫	⑫	⑫	⑫	⑫	⑫	⑫
				AC240	100[233]⑫	75[181]⑫	⑫	⑫	⑫	⑫	⑫	⑫
	H800-NE	350~800 (350,400, 450,500, 600,700,800)	3	AC690	25[53.8]	20[43.0]	25[53.8]	20[43.0]	25[53.8]	20[43.0]	25[53.8]	20[43.0]
				AC525	—	—	45[94.5]	34[71.4]	45[94.5]	34[71.4]	45[94.5]	34[71.4]
				AC450	125[295]	94[225]	125[295]	94[225]	125[295]	94[225]	125[295]	94[225]
				AC415	—	—	125[275]	94[206.8]	125[275]	94[206.8]	125[275]	94[206.8]
				AC240	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]	150[350]
	L800-NE	350~800 (350,400, 450,500, 600,700,800)	3	AC690	25[53.8]	20[43.0]	25[53.8]	20[43.0]	25[53.8]	20[43.0]	25[53.8]	20[43.0]
				AC525	—	—	45[94.5]	34[71.4]	45[94.5]	34[71.4]	45[94.5]	34[71.4]
				AC450	180[430]	135[315]	180[430]	135[315]	180[430]	135[315]	180[430]	135[315]
				AC415	—	—	200[440]	150[330]	200[440]	150[330]	200[440]	150[330]
				AC240	200[484]	150[350]	200[484]	150[350]	200[484]	150[350]	200[484]	150[350]
1250	S1250-NE	500~1250 (500,600,700,800, 1000,1200,1250)	3	AC690	25[53.8]⑫	20[43.0]⑫	⑫	⑫	⑫	⑫	⑫	⑫
				AC450	65[157]⑫	50[121]⑫	⑫	⑫	⑫	⑫	⑫	⑫
				AC240	100[233]⑫	75[181]⑫	⑫	⑫	⑫	⑫	⑫	⑫
	S1250-NEH	500~1250 (500,600,700,800, 1000,1200,1250)	3	AC690	25[53.8]⑫	20[43.0]⑫	⑫	⑫	⑫	⑫	⑫	⑫
				AC450	65[157]⑫	50[121]⑫	⑫	⑫	⑫	⑫	⑫	⑫
				AC240	100[233]⑫	75[181]⑫	⑫	⑫	⑫	⑫	⑫	⑫
	S1250-GE	500~1250 (500,600,700,800, 1000,1200,1250)	3	AC690	45[100]⑫	34[75.6]⑫	⑫	⑫	⑫	⑫	⑫	⑫
				AC450	85[203]⑫	65[157]⑫	⑫	⑫	⑫	⑫	⑫	⑫
				AC240	125[306]⑫	94[227]⑫	⑫	⑫	⑫	⑫	⑫	⑫
	H1250-NE	500~1200 (500,600,700, 800,1000,1200)	3	AC690	25[53.8]⑫	20[43.0]⑫	⑫	⑫	⑫	⑫	⑫	⑫
				AC450	125[295]⑫	65[157]⑫	⑫	⑫	⑫	⑫	⑫	⑫
				AC240	150[350]⑫	113[267]⑫	⑫	⑫	⑫	⑫	⑫	⑫
1600	S1600-NE	700~1600 (700,800,900,1000, 1200,1400,1600)	3	AC690	45[100]⑫	34[75.6]⑫	⑫	⑫	⑫	⑫	⑫	⑫
				AC450	85[203]⑫	65[157]⑫	⑫	⑫	⑫	⑫	⑫	⑫
				AC240	125[306]⑫	94[227]⑫	⑫	⑫	⑫	⑫	⑫	⑫
	S1600-NEH	700~1600 (700,800,900,1000, 1200,1400,1600)	3	AC690	45[100]⑫	34[75.6]⑫	⑫	⑫	⑫	⑫	⑫	⑫
				AC450	85[203]⑫	65[157]⑫	⑫	⑫	⑫	⑫	⑫	⑫
				AC240	125[306]⑫	94[227]⑫	⑫	⑫	⑫	⑫	⑫	⑫

Notes: ① : at 450V AC. ② : at 240V AC. ③ : at 120V AC. ④ : at 660V AC. ⑤ : at 525V AC. ⑫ : Being or will be applied.

⑦ : at 220V AC. ⑧ : at 110V AC. ⑨ : at 225V AC. ⑩ : at 440V AC. ⑬ : at 500V AC. ⑭ : at 250V AC. ⑮ : at 125V AC.

Molded Case Circuit Breakers

10 List of breakers for marine use and rated breaking capacities (approved by ship classification societies)

TemBreak2

Frame size	Type	Rated current(A)	Poles	Rated voltage (V)	Rated breaking capacities, kA (sym.) Values enclosed in square brackets "[]" represent the making current, kA.							
					B V		C C S		K R		R I N A	
					I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}
800	S800-CF	700,800	3	AC690	10[21.1]12	10[21.1]12	10[21.1]	10[21.1]	10[21.1]	10[21.1]	12	12
				AC525	15[30]12	15[30]12	—	—	15[30]	15[30]	12	12
				AC450	30[70.8]12	30[70.8]12	30[70.8]	30[70.8]	30[70.8]	30[70.8]	12	12
				AC415	36[75.6]12	36[75.6]12	—	—	36[75.6]	36[75.6]	12	12
				AC240	50[117]12	50[117]12	50[117]	50[117]	50[117]	50[117]	12	12
				DC250	—	—	—	—	—	—	—	—
	S800-NF	700,800	3	AC690	20[43.0]12	20[43.0]12	20[43.0]	20[43.0]	20[43.0]	20[43.0]	12	12
				AC525	30[63]12	30[63]12	—	—	30[63]	30[63]	12	12
				AC450	50[121]12	50[121]12	50[121]	50[121]	50[121]	50[121]	12	12
				AC415	50[105]12	50[105]12	—	—	50[105]	50[105]	12	12
				AC240	85[211]12	85[211]12	85[211]	85[211]	85[211]	85[211]	12	12
				DC250	—	—	—	—	—	—	—	—
	S800-NE	350~800 (350,400, 450,500, 600,700,800)	3	AC690	20[43.0]12	20[43.0]12	20[43.0]	20[43.0]	20[43.0]	20[43.0]	12	12
				AC525	30[63]12	30[63]12	—	—	30[63]	30[63]	12	12
				AC450	50[121]12	50[121]12	50[121]	50[121]	50[121]	50[121]	12	12
				AC415	50[105]12	50[105]12	—	—	50[105]	50[105]	12	12
				AC240	85[211]12	85[211]12	85[211]	85[211]	85[211]	85[211]	12	12
				DC250	—	—	—	—	—	—	—	—
	S800-NEH	350~800 (350,400, 450,500, 600,700,800)	3	AC690	20[43.0]12	20[43.0]12	20[43.0]	20[43.0]	20[43.0]	20[43.0]	12	12
				AC525	30[63]12	30[63]12	—	—	30[63]	30[63]	12	12
				AC450	50[121]12	50[121]12	50[121]	50[121]	50[121]	50[121]	12	12
				AC415	50[105]12	50[105]12	—	—	50[105]	50[105]	12	12
				AC240	85[211]12	85[211]12	85[211]	85[211]	85[211]	85[211]	12	12
				DC250	—	—	—	—	—	—	—	—
	S800-RF	700,800	3	AC690	12	12	—	—	12	12	12	12
				AC450	12	12	—	—	12	12	12	12
				AC240	12	12	—	—	12	12	12	12
				DC250	—	—	—	—	—	—	—	—
	S800-RE	350~800 (350,400,450,500, 600,700,800)	3	AC690	12	12	—	—	12	12	12	12
				AC450	12	12	—	—	12	12	12	12
				AC240	12	12	—	—	12	12	12	12
	H800-NE	350~800 (350,400, 450,500, 600,700,800)	3	AC690	25[53.8]12	20[43.0]12	25[53.8]	20[43.0]	25[53.8]	20[43.0]	12	12
				AC525	45[94.5]12	34[71.4]12	—	—	45[94.5]	34[71.4]	12	12
				AC450	125[295]12	94[225]12	125[295]	94[225]	125[295]	94[225]	12	12
				AC415	125[275]12	94[206.8]12	—	—	125[275]	94[206.8]	12	12
				AC240	150[350]12	150[350]12	150[350]	150[350]	150[350]	150[350]	12	12
	L800-NE	350~800 (350,400, 450,500, 600,700,800)	3	AC690	25[53.8]12	20[43.0]12	25[53.8]	20[43.0]	25[53.8]	20[43.0]	12	12
				AC525	45[94.5]12	34[71.4]12	—	—	45[94.5]	34[71.4]	12	12
				AC450	180[430]12	135[315]12	180[430]	135[315]	180[430]	135[315]	12	12
				AC415	200[440]12	150[330]12	—	—	200[440]	150[330]	12	12
				AC240	200[484]12	150[350]12	200[484]	150[350]	200[484]	150[350]	12	12
1250	S1250-NE	500~1250 (500,600,700,800, 1000,1200,1250)	3	AC690	12	12	12	12	12	12	12	12
				AC450	12	12	12	12	12	12	12	12
				AC240	12	12	12	12	12	12	12	12
	S1250-NEH	500~1250 (500,600,700,800, 1000,1200,1250)	3	AC690	12	12	—	—	12	12	12	12
				AC450	12	12	—	—	12	12	12	12
				AC240	12	12	—	—	12	12	12	12
	S1250-GE	500~1250 (500,600,700,800, 1000,1200,1250)	3	AC690	12	12	12	12	12	12	12	12
				AC450	12	12	12	12	12	12	12	12
				AC240	12	12	12	12	12	12	12	12
	H1250-NE	500~1200 (500,600,700, 800, 1000,1200)	3	AC690	12	12	12	12	12	12	12	12
				AC450	12	12	12	12	12	12	12	12
				AC240	12	12	12	12	12	12	12	12
1600	S1600-NE	700~1600 (700,800,900,1000, 1200,1400,1600)	3	AC690	12	12	12	12	12	12	12	12
				AC450	12	12	12	12	12	12	12	12
				AC240	12	12	12	12	12	12	12	12
	S1600-NEH	700~1600 (700,800,900,1000, 1200,1400,1600)	3	AC690	12	12	—	—	12	12	12	12
				AC450	12	12	—	—	12	12	12	12
				AC240	12	12	—	—	12	12	12	12

2

Ratings and Specifications

Molded Case Circuit Breakers

10 List of breakers for marine use and rated breaking capacities (approved by ship classification societies)

TemBreak

Frame size	Type	Rated current(A)	Poles	Rated voltage (V)	Rated breaking capacities, kA (sym.) Values enclosed in square brackets "[]" represent the making current, kA.							
					N K		L R		A B S		G L	
					O-CO	O-CO-CO	O-CO	O-CO-CO	O-CO	O-CO-CO	O-CO	O-CO-CO
50	TB-5S	10	2	AC250	2.5[4.1]	—	2.5[4.1]	—	—	—	2.5[3.57]⑦	—
				AC125	42[99.3]	—	43.5[101.6]	—	—	—	42[102]⑧	—
				DC125	5.0[5.0]	—	5.0[5.0]	—	—	—	—	—
		15,20,30,40,50	2	AC250	5.0[8.0]	—	5.0[8.0]	—	—	—	5[7.98]⑦	—
				AC125	42[99.3]	—	43.5[101.6]	—	—	—	42[102]⑧	—
				DC125	5.0[5.0]	—	5.0[5.0]	—	—	—	—	—
	TB-5P	10	2	AC250	2.5[4.1]	—	2.5[4.1]	—	2.5[4.1]	—	2.5[3.57]⑦	—
				AC125	42[99.3]	—	43.5[101.6]	—	42[99.3]	—	42[102]⑧	—
				DC125	5.0[5.0]	—	5.0[5.0]	—	5.0[5.0]	—	—	—
		15,20,30,40,50	2	AC250	5.0[8.0]	—	5.0[8.0]	—	5.0[8.0]	—	5[7.98]⑦	—
				AC125	42[99.3]	—	43.5[101.6]	—	42[99.3]	—	42[102]⑧	—
				DC125	5.0[5.0]	—	5.0[5.0]	—	5.0[5.0]	—	—	—
	TB-5D	10	2	AC250	2.5[4.1]	—	2.5[4.1]	—	2.5[4.1]	—	2.5[3.57]⑦	—
				AC125	42[99.3]	—	43.5[101.6]	—	42[99.3]	—	42[102]⑧	—
				DC125	5.0[5.0]	—	5.0[5.0]	—	5.0[5.0]	—	—	—
		15,20,30,40,50	2	AC250	5.0[8.0]	—	5.0[8.0]	—	5.0[8.0]	—	5[7.98]⑦	—
				AC125	42[99.3]	—	43.5[101.6]	—	42[99.3]	—	42[102]⑧	—
				DC125	5.0[5.0]	—	5.0[5.0]	—	5.0[5.0]	—	—	—
1000	TL-1000NE	500~1000 (500,600,700,800,900,1000)	3	AC690	—	—	45[93.8]	34[71.6]	—	—	45[92]	34[71.4]
				AC500	—	—	75[163]	57[124]	—	—	75[165]	57[125.4]
				AC460	125[295]	—	125[295]①	65[153]①	125[295]	—	125[298]①	65[153]①
				AC240	—	—	150[345]	113[263]	—	—	150[347]	113[248.6]
1200	TL-1200NE	600~1200 (600,700,800,1000,1200)	3	AC690	—	—	45[93.8]	34[71.6]	—	—	45[92]	34[71.4]
				AC500	—	—	75[163]	57[124]	—	—	75[165]	57[125.4]
				AC460	125[295]	—	125[295]①	65[153]①	125[295]	—	125[298]①	65[153]①
				AC240	—	—	150[345]	113[263]	—	—	150[347]	113[248.6]
2000	XS2000NE	1000~2000 (1000,1200,1400,1600,1800,2000)	3	AC500	85[195]	—	87.1[194.9]	—	85[195]	—	85[187]①	64[140.8]①

Notes: ① : at 450V AC. ② : at 240V AC. ③ : at 120V AC. ④ : at 660V AC. ⑤ : at 525V AC. ⑥ : Being or will be applied.
⑦ : at 220V AC. ⑧ : at 110V AC. ⑨ : at 225V AC. ⑩ : at 440V AC. ⑪ : at 500V AC. ⑫ : at 250V AC. ⑬ : at 125V AC.

Molded Case Circuit Breakers

⑩ List of breakers for marine use and rated breaking capacities (approved by ship classification societies)

TemBreak

Frame size	Type	Rated current(A)	Poles	Rated voltage (V)	Rated breaking capacities, kA (sym.) Values enclosed in square brackets "[]" represent the making current, kA.							
					B V		C C S		K R		R I N A	
					O-CO	O-CO-CO	O-CO	O-CO-CO	O-CO	O-CO-CO	O-CO	O-CO-CO
50	TB-5S	10	2	AC250	—	—	—	—	2.5[4.1]	—	—	—
				AC125	—	—	—	—	42[99.3]	—	—	—
				DC125	—	—	—	—	5.0[5.0]	—	—	—
		15,20,30,40,50	2	AC250	—	—	—	—	5.0[8.0]	—	—	—
				AC125	—	—	—	—	42[99.3]	—	—	—
				DC125	—	—	—	—	5.0[5.0]	—	—	—
	TB-5P	10	2	AC250	2.5[3.57]⑨	—	2.5[4.1]	—	2.5[4.1]	—	—	—
				AC125	42[102]⑧	—	42[99.3]	—	42[99.3]	—	—	—
				DC125	—	—	5.0[5.0]	—	5.0[5.0]	—	—	—
		15,20,30,40,50	2	AC250	5[7.98]⑨	—	5.0[8.0]	—	5.0[8.0]	—	—	—
				AC125	42[102]⑧	—	42[99.3]	—	42[99.3]	—	—	—
				DC125	—	—	5.0[5.0]	—	5.0[5.0]	—	—	—
	TB-5D	10	2	AC250	2.5[3.57]⑨	—	—	—	2.5[4.1]	—	—	—
				AC125	42[102]⑧	—	—	—	42[99.3]	—	—	—
				DC125	—	—	—	—	5.0[5.0]	—	—	—
		15,20,30,40,50	2	AC250	5[7.98]⑨	—	—	—	5.0[8.0]	—	—	—
				AC125	42[102]⑧	—	—	—	42[99.3]	—	—	—
				DC125	—	—	—	—	5.0[5.0]	—	—	—
1000	TL-1000NE	500~1000 (500,600,700,800,900,1000)	3	AC690	45[93.8]	34[71.6]	—	—	—	—	45[94.5]	34[71.4]
				AC500	—	—	—	—	—	—	—	—
				AC460	125[295]①	65[153]①	—	—	—	—	125[275]①	63[138.6]①
				AC240	—	—	—	—	—	—	—	—
				—	—	—	—	—	—	—	—	—
1200	TL-1200NE	600~1200 (600,700,800,1000,1200)	3	AC690	45[93.8]	34[71.6]	—	—	—	—	45[94.5]	34[71.4]
				AC500	—	—	—	—	—	—	—	—
				AC460	125[295]①	65[153]①	—	—	—	—	125[275]①	63[138.6]①
				AC240	—	—	—	—	—	—	—	—
				—	—	—	—	—	—	—	—	—
2000	XS2000NE	1000~2000 (1000,1200,1400,1600,1800,2000)	3	AC500	—	—	—	—	85[195]	—	—	—
				—	—	—	—	—	—	—	—	—

3

Selection

- 1 Combination of breakers for cascade breaking3-2
- 2 Selection of breakers for selectivity coordination3-4

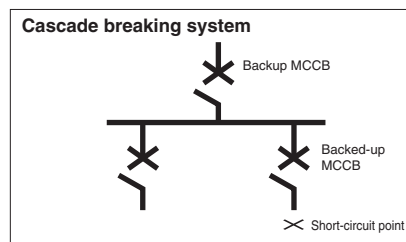
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Selection

Molded Case Circuit Breakers

1 Combination of breakers for cascade breaking

The following table shows possible combinations of backup and backed-up breakers (conforming to Appendix A, IEC 60947-2) as well as the cascade breaking capacity (kA sym.) of each combination.



Breaker combination table for cascade breaking for 450V AC circuit (approved by NK, LR, AB)

Backup breaker		Backed-up breaker											
Rated breaking capacity sym.(kA)		E250-SF	S100-NF S125-NF S100-NFL S100-NFH	S125-SF	S225-NF S250-NF S225-NFL S225-NFH	S250-SF	S400-CF	S630-CF	S800-CF	S400-NF S400-NE S400-NEH	S50-GF S100-GF S125-GF S50-GFL S50-GFH S100-GFL S100-GFH	S225-GF S250-GF S225-GFL S225-GFH	
10		15 [32.6]	22 [51.9]	22 [51.9]	15 [32.6]	15 [32.6]	—	—	—	—	22 [51.9]	15 [32.6]	
10		15 [32.6]	22 [51.9]	22 [51.9]	15 [32.6]	15 [32.6]	—	—	—	—	22 [51.9]	15 [32.6]	
15		—	—	—	25 [56.2]	25 [56.2]	30 [70.8]	30 [70.8]	30 [70.8]	30 [70.8]	—	30 [70.8]	
25		—	—	—	—	—	30 [70.8]	30 [70.8]	30 [70.8]	30 [70.8]	42 [96.7]	42 [96.7]	
25		—	—	—	—	—	30 [70.8]	30 [70.8]	30 [70.8]	30 [70.8]	42 [96.7]	42 [96.7]	
25		—	—	—	—	—	30 [70.8]	30 [70.8]	30 [70.8]	42 [96.7]	—	42 [96.7]	
30		—	—	—	—	—	30 [70.8]	30 [70.8]	30 [70.8]	42 [96.7]	—	42 [96.7]	
30		—	—	—	—	—	—	—	—	45 [109]	—	—	
30		—	—	—	—	—	—	—	—	—	—	—	
30		—	—	—	—	—	—	—	—	—	—	—	
45		—	—	—	—	—	—	—	—	—	—	—	
50		—	—	—	—	—	—	—	—	—	—	—	
50		—	—	—	—	—	—	—	—	—	—	—	
50		—	—	—	—	—	—	—	—	—	—	—	
50		—	—	—	—	—	—	—	—	—	—	—	
65		—	—	—	—	—	—	—	—	—	—	—	
80		—	—	—	—	—	—	—	—	—	—	—	
120		—	—	—	—	—	—	—	—	—	—	—	
120		—	—	—	—	—	—	—	—	—	—	—	
120		—	—	—	—	—	—	—	—	—	—	—	

Notes: ① Values enclosed in square brackets "[]" represent the making current.

Breaker combination table for cascade breaking for 240V AC circuit (approved by NK, LR, AB)

Backup breaker		E50-SF	E100-SF	S125-SF	S100-NF S125-NF S100-NFL S100-NFH	S225-NF S250-NF S225-NFL S225-NFH
Rated breaking capacity sym,kA	Backed-up breaker	25	25	50	50	65
TB-5S	5②	25 [58.3]	25 [58.3]	25 [55.6]	25 [55.6]	—
TB-5D	5②	25 [58.3]	25 [58.3]	25 [55.6]	25 [55.6]	—
TB-5P	5②	25 [58.3]	25 [58.3]	25 [55.6]	25 [55.6]	—
E50-SF	25	—	—	50 [115]	50 [115]	50 [115]
E100-SF	25	—	—	50 [115]	50 [115]	50 [115]

Notes:

① Values enclosed in square brackets
“[]” represent the making current.

② If the rated current is 10A, the rated
breaking capacity is 2.5 kA.

	S630-NF S630-NE S630-NEH	S800-NF S800-NE S800-NEH	S400-GF S400-GE S400-GEH	S400-PF S400-PE	H100-NF H125-NF	H225-NF	H400-NE	H630-NE	H800-NE	L100-NF L125-NF	L225-NF	L400-NE	L630-NE	L800-NE
	50	50	65	80	120	120	120	125	125	180	180	180	180	180
	—	—	—	—	22 [51.9]	—	—	—	—	180 [430]	—	—	—	—
	—	—	—	—	22 [51.9]	—	—	—	—	180 [430]	—	—	—	—
	30 [70.8]	30 [70.8]	30 [70.8]	30 [70.8]	—	50 [121]	50 [121]	30 [65.2]	30 [65.2]	—	70 [165]	70 [165]	30 [70.8]	30 [70.8]
	30 [70.8]	30 [70.8]	30 [70.8]	30 [70.8]	50 [121]	50 [121]	50 [121]	30 [70.8]	30 [70.8]	180 [430]	70 [165]	70 [165]	30 [70.8]	30 [70.8]
	30 [70.8]	30 [70.8]	30 [70.8]	30 [70.8]	50 [121]	50 [121]	50 [121]	30 [65.2]	30 [65.2]	180 [430]	70 [165]	70 [165]	30 [70.8]	30 [70.8]
	42 [96.7]	42 [96.7]	42 [96.7]	42 [96.7]	—	70 [165]	70 [165]	70 [165]	70 [165]	—	130 [311]	130 [311]	85 [203]	85 [203]
	42 [96.7]	42 [96.7]	42 [96.7]	42 [96.7]	—	70 [165]	70 [165]	70 [165]	70 [165]	—	130 [311]	130 [311]	85 [203]	85 [203]
	50 [117]	50 [117]	50 [121]	50 [121]	—	—	100 [230]	70 [165]	70 [165]	—	—	130 [311]	100 [230]	100 [230]
	50 [117]	50 [117]	—	—	—	—	—	100 [230]	100 [230]	—	—	—	130 [311]	130 [311]
	—	50 [117]	—	—	—	—	—	—	100 [230]	—	—	—	—	130 [311]
	—	—	—	—	—	—	100 [230]	100 [230]	100 [230]	—	—	130 [311]	130 [311]	130 [311]
	—	—	—	—	70 [165]	70 [165]	70 [165]	—	—	180 [430]	85 [203]	85 [203]	—	—
	—	—	—	—	—	70 [165]	70 [165]	—	—	—	130 [311]	130 [311]	85 [203]	85 [203]
	—	—	—	—	—	—	—	100 [230]	100 [230]	—	—	—	130 [311]	130 [311]
	—	—	—	—	—	—	—	—	100 [230]	—	—	—	—	130 [311]
	—	—	—	—	—	—	100 [230]	100 [230]	100 [230]	—	—	130 [311]	130 [311]	130 [311]
	—	—	—	—	—	—	100 [230]	100 [230]	100 [230]	—	—	130 [311]	130 [311]	130 [311]
	—	—	—	—	—	—	—	—	—	180 [430]	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	130 [311]	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	180 [396]	180 [396]	180 [396]

3

Selection

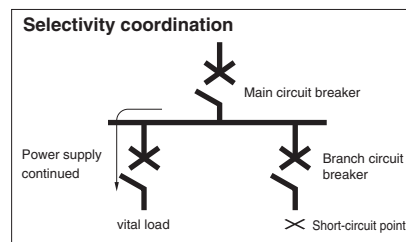
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Selection

Molded Case Circuit Breakers

2 Selection of breakers for selectivity coordination

The following table shows possible combinations of main circuit breakers and branch circuit breakers capable of selectivity coordination with the main circuit breakers as well as the breaking capacity (kA sym.) of each combination at the points where the branch circuit breaker is installed.



Breaker combination table for selectivity coordination for 450V AC circuit

Main circuit breaker Rated breaking capacity sym. (kA)		Main circuit breaker																
		S400-NE	S400-NEH	S400-GE	S400-GEH	H400-NE	L400-NE	S630-NE	S630-NEH	H630-NE	S800-NE	S800-NEH	H800-NE	※TL-1000NE	TL-1200NE	S1250-NEH	S1600-NEH	※XS2000NE
Branch circuit breaker		45	45	65	65	120	180	50	50	125	50	50	125	125	125	65	85	85
E50-SF E100-SF	10	5	6	5	6	5	5	10	10	10	10	10	10	10	10	10	10	10
E225-NEL E225-NFH E250-NF E250-SF	15	5	6	5	6	5	5	15	15	15	15	15	15	15	15	15	15	15
S50-SF S100-NF S100-NFH S100-NFL S125-NF S125-SF	25	5	6	5	6	5	5	22	25	25	22	25	25	25	25	25	25	25
S225-NF S225-NFH S225-NFL S250-NF	25	5	6	5	6	5	5	25	25	25	25	25	25	25	25	25	25	25
S250-SF	30	5	6	5	6	5	5	25	30	30	25	30	30	30	30	30	30	30
S400-CF	30	—	—	—	—	—	—	—	25	—	25	25	25	25	30	30	30	30
S630-CF	30	—	—	—	—	—	—	—	—	—	—	—	—	—	30	30	30	30
S800-CF	30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20	30
S50-GF S50-GFH S50-GFL	50	5	6	5	6	5	5	42	45	50	42	45	50	50	50	50	50	50
S100-GF S100-GFH S100-GFL S125-GF	50	5	6	5	6	5	5	42	45	50	42	45	50	50	50	50	50	50
S225-GF S225-GFH S225-GFL S250-GF	50	5	6	5	6	5	5	50	50	50	50	50	50	50	50	50	50	50
S400-PF	80	—	—	—	—	—	—	—	—	—	25	25	25	—	50	—	—	50
S400-NE S400-NEH S400-NF	45	—	—	—	—	—	—	—	25	—	25	25	25	45	45	45	45	45
S400-GE S400-GEH S400-GF	65	—	—	—	—	—	—	—	25	—	25	25	25	50	50	50	50	50
S400-PE	80	—	—	—	—	—	—	—	—	—	25	25	25	—	50	—	—	50
S630-NE S630-NEH S630-NF	50	—	—	—	—	—	—	—	—	—	—	—	—	12	30	30	30	35
S800-NE S800-NEH S800-NF	50	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20	35
H100-NF H125-NF	120	—	—	—	—	—	—	—	—	30	—	—	50	—	120	—	—	85
H225-NF	120	—	—	—	—	—	—	—	—	15	—	—	15	—	25	—	—	75
H400-NE	120	—	—	—	—	—	—	—	—	—	—	—	—	—	25	—	—	35
L100-NF L125-NF	180	—	—	—	—	—	—	—	—	60	—	—	125	—	125	—	—	85
L225-NF	180	—	—	—	—	—	—	—	—	—	—	—	20	—	35	—	—	85
L400-NE	180	—	—	—	—	—	—	—	—	—	—	—	—	—	25	—	—	85
H630-NE	125	—	—	—	—	—	—	—	—	—	—	—	—	—	15	—	—	35
L630-NE	180	—	—	—	—	—	—	—	—	—	—	—	—	—	15	—	—	35
H800-NE	125	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	35
L800-NE	180	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	35

Note: The table assumes that:

The trip pickup current of the main circuit breakers is set to the maximum;

The main circuit breakers are provided with the long time delay, short time delay and instantaneous trip functions;

For CCS, the values are being or will be applied. Contact us for the details.

The main circuit breakers marked with ※ are high instantaneous trip breakers.

4 Special Breakers

1	Instantaneous trip only breakers	4-2
2	Special instantaneous trip breakers	4-3
1.	High Instantaneous Trip	4-3
2.	Low Instantaneous Trip	4-4

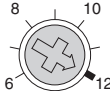
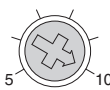
4

Special Breakers

Molded Case Circuit Breakers

1 Instantaneous trip only breakers

These are standard breakers without the thermal overload trip. They have the instantaneous tripping characteristic, normally used when short circuit protection only is required. Other ratings and specifications and outline dimensions of these breakers are the same as those of standard breakers of the same types.

Category	Type	For AC/DC	Rated current, A	Code number	Instantaneous trip current, A									
Fixed instantaneous trip ①	E50-SF	AC or DC If the DC version is required, please state so when ordering. The AC version is provided unless otherwise stated when ordering.	15I	I22	225±75									
			20I	I30	300±100									
			30I	I45	450±150									
			40I	I60	600±200									
			50I	I75	750±250									
			15I	I18	180±36									
	S50-GF		20I	I24	240±48									
			30I	I36	360±72									
			40I	I48	480±96									
			50I	I60	600±120									
			100I	I97	975±225									
			100I	I130	1300±300									
	S100-NF S100-GF H100-NF L100-NF		15I	I18	180±36									
			20I	I24	240±48									
			30I	I36	360±72									
			40I	I48	480±96									
			50I	I60	600±120									
				I72	720±144									
			100I	I90	900±180									
				I120	1200±240									
			S125-SF	③	125I	I60	600±120							
						I100	1000±200							
					I160	1600±320								
					I162	1625±325								
					I195	1950±390								
					I227	2275±455								
S225-NF S225-GF H225-NF L225-NF	225I		I260	2600±520										
			I292	2925±585										
		250I		I162	1625±325									
				I195	1950±390									
				I227	2275±455									
				I260	2600±520									
				I292	2925±585									
			E250-SF S250-SF											
Adjustable instantaneous trip ②	S400-CF S400-NF S400-GF	AC or DC If the DC version is required, please state so when ordering. The AC version is provided unless otherwise stated when ordering.	400I	Dial position										
				Code number	12	11	10	9	8	7	6			
				V125	1500	1375	1250	1125	1000	875	750			
				V150	1800	1650	1500	1350	1200	1050	900			
				V175	2100	1925	1750	1575	1400	1225	1050			
				V200	2400	2200	2000	1800	1600	1400	1200			
				V225	2700	2475	2250	2025	1800	1575	1350			
				V250	3000	2750	2500	2250	2000	1750	1500			
				V300	3600	3300	3000	2700	2400	2100	1800			
				V350	4200	3850	3500	3150	2800	2450	2100			
				V400	4800	4400	4000	3600	3200	2800	2400			
				S630-CF S630-NF S630-RF	630I	Dial position								
	Code number		10			9	8	7	6	5				
	V500		5000			4500	4000	3500	3000	2500				
	V600		6000			5400	4800	4200	3600	3000				
	V630		6300			5670	5040	4410	3780	3150				
	V700		7000			6300	5600	4900	4200	3500				
	S800-CF S800-NF S800-RF		800I	V800	8000	7200	6400	5600	4800	4000	Selector dial			

• The instantaneous trip current values shown in the table above are standard settings. Contact us if you require other settings.

Notes:

① Setting tolerance: ±20% (Please specify the code number).

② For AC:

The selector dial is factory set to position "12" unless the instantaneous trip current is specified. Setting tolerance: ±20% (Please specify the code number).

For DC:

The instantaneous trip current cannot be adjusted by the customer. The instantaneous trip current is factory set to the value specified by the customer.

Setting tolerance: ±20% (State the version (DC), code number and instantaneous trip current you require).

③ Common for AC use and DC use. In case of DC use the instantaneous trip current will be about 1.4 times that of the figures in the table. Setting tolerance ±20%.

INST TRIP ONLY
INST * * * * A

Nameplate installed on the magnetic breakers only

1. High Instantaneous Trip

High instantaneous trip breakers are the breakers having a high instantaneous trip pickup current. Use these breakers in order to achieve selective coordination or to provide protection on the primary side of transformer.

Category	Type (Reference type ③)	Rated current, A		Instantaneous trip pickup current, A
Thermal - Magnetic type ①	S50-GFH (S50-GF)	15		300
		20		400
		30		600
		40		800
		50		1000
	S100-NFH (S100-NF) S100-GFH (S100-GF)	15		300
		20		400
		30		600
		40		800
		50		1000
		60		1200
		75		1500
	S225-NFH (S225-NF) S225-GFH (S225-GF)	100		1800
		125		2250
		150		2700
		175		3150
		200		3600
Electronic type ②	S400-NEH (S400-NE) S400-GEH (S400-GE)	CT rated current (I_{CT}), A	Rated current (I_R), A	6300
		400	175	
			200	
			225	
			250	
			300	
			350	
	S630-NEH (S630-NE)	CT rated current (I_{CT}), A	Rated current (I_R), A	10000
		630	250	
			300	
			350	
			400	
			500	
			600	
	S800-NEH (S800-NE)	CT rated current (I_{CT}), A	Rated current (I_R), A	10000
		800	350	
			400	
			450	
			500	
			600	
			700	
	S1250-NEH (S1250-NE)	CT rated current (I_{CT}), A	Rated current (I_R), A	15000
		1250	800	
			1000	
			1200	
			1250	
		1600	700	
			800	
	S1600-NEH (S1600-NE)	CT rated current (I_{CT}), A	Rated current (I_R), A	19200
		1600	900	
			1000	
			1200	
			1400	
			1500	
			1600	
	XS2000NE ④	CT rated current (I_{CT}), A	Rated current (I_R), A	35000
		2000	1000	
			1200	
			1400	
			1600	
			1800	

Notes:

① Setting tolerance: $\pm 10\%$. ② Setting tolerance: $\pm 20\%$. ③ Ratings and specifications, except for the instantaneous trip pickup current, and outline dimensions of the High-Inst breakers are the same as those of the reference breakers enclosed in parentheses.

④ An optional trip indicator cannot be added.



4

Special Breakers

Molded Case Circuit Breakers

2 Special instantaneous trip breakers

2. Low Instantaneous Trip

Low instantaneous trip breakers are the breakers having a low instantaneous trip pickup current. Use these breakers in order to achieve selective coordination with a high-voltage fuse located on the primary side of the breakers.

Category	Type (Reference type ②)	Rated current, A	Instantaneous trip pickup current, A
Thermal - Magnetic ①	S50-GFL (S50-GF)	15	90
		20	120
		30	180
		40	240
		50	300
		15	90
	S100-NFL (S100-NF) S100-GFL (S100-GF)	20	120
		30	180
		40	240
		50	300
		60	360
		75	450
		100	600
		125	750
		150	900
		175	1050
	S225-NFL (S225-NF) S225-GFL (S225-GF)	200	1200
		225	1350

Notes:

① Setting tolerance: $\pm 10\%$.

② Ratings and specifications, except for the instantaneous trip pickup current, and outline dimensions of the Low-Inst breakers are the same as those of the reference breakers enclosed in parentheses.



5

Mounting and Connection

1	Type of connections and mountings	5-2
	List of connecting type	5-2
	Connecting parts	5-6
	Plug-in type (PM)	5-8
	1. For switchboards	5-8
	2. For distribution boards	5-9
2	Compression terminals	5-14
3	Terminal screw sizes and standard torques	5-16
4	Insulation distance from the line side	5-20
5	Reverse connection	5-22
6	Lists of breaker mounting screws	5-23

5

Mounting and Connection

Molded Case Circuit Breakers

1 Type of connections and mountings

List of Connecting Types

Connecting types (Abbreviation)	Front-connected (FC)			Rear-connected (RC)																			
	For compression terminals/flat bars	With extension bars	With cable clamps	Flat bar studs																			
				Stud can be turned 45° or 90°	Stud can be tured 90°																		
Outer view Breaker																							
S50-SF, S125-SF, S125-SN	●	○	—	○ *	—																		
S50-GF, S100-NF, S100-GF, S100-NN S125-NF, S125-GF, S125-NN S100-NM	●	○	△	○	—																		
H100-NF, H125-NF, H225-NF, H225-GE	●	○	△	○	—																		
L100-NF, L125-NF, L225-NF	●	○	△	○	—																		
S225-NF, S225-GF S250-NF, S250-GF S225-NM	●	○	△	○	—																		
E250-SF, S250-SF, S250-SN	●	○	△	○	—																		
S400-CF, S400-NF, S400-NE S400-GF, S400-GE, S400-PF S400-PE, S400-NN	●	○	△	○	—																		
H400-NE, L400-NE	●	○	△	○	—																		
S630-CF, S630-NF, S630-NE, S630-RF S630-RE, S630-GN	—	●	△	—	○																		
H630-NE, L630-NE	—	●	△	—	○																		
S800-CF, S800-NF, S800-NE, S800-RF S800-RE, S800-NN	—	●	—	—	○																		
H800-NE, L800-NE	—	●	—	—	○																		
Remarks	Connect compression terminals or flat bars directly to breaker terminals.	Extension bars are attached to breaker terminals. Connect compression terminals or flat bars to the extension bars.	Cable clamps are attached to breaker terminals. Connect wires directly to cable clamps.	- Flat bar studs will be factory installed in the horizontal position unless otherwise specified. - Flat bar studs in the vertical position are available on request. Please select a position code from those shown in the table below: <table><tr><th rowspan="2">Position code</th><th colspan="2">Position of flat bar studs</th></tr><tr><th>Line side</th><th>Load side</th></tr><tr><td>RC-A</td><td>Vertical</td><td>Horizontal</td></tr><tr><td>RC-B</td><td>Horizontal</td><td>Vertical</td></tr><tr><td>RC-C</td><td>Vertical</td><td>Vertical</td></tr><tr><td>RC-D</td><td>Horizontal</td><td>Horizontal</td></tr></table> *: The studs are horizontal direction only.			Position code	Position of flat bar studs		Line side	Load side	RC-A	Vertical	Horizontal	RC-B	Horizontal	Vertical	RC-C	Vertical	Vertical	RC-D	Horizontal	Horizontal
Position code	Position of flat bar studs																						
	Line side	Load side																					
RC-A	Vertical	Horizontal																					
RC-B	Horizontal	Vertical																					
RC-C	Vertical	Vertical																					
RC-D	Horizontal	Horizontal																					

See pages 5-16 and 5-17 for dimensions and tightening torques of terminal screws.

Notes:

①. Except 4-pole breakers.

②. May not be applied to 2 or 4-pole breakers of some types.

③. See page 5-8 for details.

④. See page 5-8 and 5-9 for details.

⑤. TemPlug 45B (PG4) is not applicable.

	Plug-in (PM) For switchboards ③	Plug-in (PM) For distribution boards ①④	Flush Plate (FP) Flat bar studs	Draw-out type (DR)	<i>TemPlug</i> (PG)(PG4)②
					
	○	○	○	—	—
	○	○	○	—	○
	○	—	○	—	▲
	○	—	○	—	—
	○	—	○	—	○
	○	—	○	—	○ ⑤
	○	—	○	▲	○
	○	—	○	▲	—
	○	—	○	▲	○
	○	—	○	▲	—
	○	—	○	▲	—
	○	—	○	▲	—
	○	—	○	▲	—
	- To make connection, push the breaker into the mounting base already wired to the main and control circuits. The breaker can be fixed by the mounting screws. - High-performance models have a safety mechanism that prevents them from being mounted or removed as long as they are in the ON state. - Models meeting protection grade IP20 are available as options. IEC 60529 specifies that IP20-compliant devices be designed and constructed so that live parts of the devices cannot be touched by hand. When ordering the products, please specify as "IP20 applied products".	Plug-in type with front connection suitable for the small depth.	- Install the mounting frame directly to a panel. - Use the flat bar studs in the same manner as for rear-connected breakers. - The plate is painted in Munsell 5Y 7/1.	- To make connection, push the breaker into the draw-out cradle already wired to the main and control circuits. The draw-out cradle has two positions "Connected" and "Isolated". - The breakers have a safety mechanism that prevents them from being mounted or removed as long as they are in the ON state. - Models meeting protection grade IP20 are available as options. IEC 60529 specifies that IP20-compliant devices be designed and constructed so that live parts of the devices cannot be touched by hand. When ordering the products, please specify as "IP20 applied products".	- Simply plugging <i>TemPlug</i> onto the main busbars in a switchboard completes the connection of the breaker to a power distribution line. Use plug-in base mounting screws to secure the breaker. Direct coupling of the plug-in base to the main busbars reduces the lead time involved in completing a power distribution system. - If the frame size or rated current of the breakers is changed, all you have to do is to replace the <i>TemPlug</i>.

● : Standard. This configuration used unless otherwise specified.

○ : Optional standard. Specify when ordering.

▲ : Semi-standard.

△ : Custom-built. Contact us for details.

— : "no" or "not available".

5

Mounting and Connection

Molded Case Circuit Breakers

1 Type of connections and mountings

List of Connecting Types

Breaker	Connecting types (Abbreviation)	Front-connected (FC)		Rear-connected (RC)			
		For compression terminals/flat bars	With extension bars	Flat bar studs			Bolt studs
				Stud can be turned 90°	Fixed ①		
TB-5S		●	—	—	—	—	
TB-5P		● (Load side)	—	—	—	—	
TB-5D		—	—	—	—	—	
E50-SF, E100-SF, E50-CM		●	—	—	—	○	
S1250-NE, S1250-GE, S1250-NN		—	●	—	○ ②	—	
TL-1000NE, TL-1200NE		—	●	—	○ ②	—	
S1600-NE, S1600-NN		—	○	—	● ③	—	
XS2000NE, XS2000NN		—	○	—	● ③	—	
Remarks		• Connect compression terminals directly to breaker terminals.	• Extension bars are attached to breaker terminals. Connect compression terminals or flat bars to the extension bars.				

See pages 5-18 and 5-19 for dimensions and tightening torques of terminal screws.

Notes:

①. Breakers are mounted on angles.

②. Flat bar studs will be factory installed in the horizontal position unless otherwise specified. If vertical installation is required, please state when ordering.

③. Vertical installation only

④. The breakers can be installed on the panel door using mounting frame supplied as standard.

⑤. The breakers can be installed on the mounting angle as well as Rear-connected breakers.

⑥. See page 5-8 for details.

Position code	Position of flat bar studs	
	Line side	Load side
RC-A	Vertical	Horizontal
RC-B	Horizontal	Vertical
RC-C	Vertical	Vertical
RC-D	Horizontal	Horizontal

Plug-in (PM)		Draw-out type (DR)		Flush Plate (FP)
For switchboards ⑥	For distribution boards	Two-position type	Three-position type	Flat bar studs
—	—	—	—	—
—	● (Line side)	—	—	—
—	●	—	—	—
—	○	—	—	—
○	—	▲	—	○ ② ④
○	—	▲	—	○ ② ④
—	—	—	—	○ ③ ④
—	—	—	○	○ ③ ⑤
- To make connection, push the breaker into the plug-in base cradle already wired to the main and control circuits. Use breaker mounting screws to secure the breaker. - The breakers have a safety mechanism that prevents them from being mounted or removed as long as they are in the ON state. - Models meeting protection grade IP20 are available as options. IEC 60529/JIS C 0920 specify that IP20-compliant devices be designed and constructed so that live parts of the devices cannot be touched by hand.	Plug-in type with front connection suitable for the small depth.	- To make connection, push the breaker into the draw-out cradle already wired to the main and control circuits. The draw-out cradle has two positions "Connected" and "Isolated". - The breakers are fitted with a safety trip. If an attempt is made to remove the breakers while ON position it will automatically trip. - Models meeting protection grade IP20 are available as options. IEC 60529/JIS C 0920 specify that IP20-compliant devices be designed and constructed so that live parts of the devices cannot be touched by hand. When ordering the products, please specify as "IP20 applied products". - The auxiliary circuit is connected or isolated automatically through the auxiliary circuit terminals of a plug-in breaker. (When the motor operator is mounted, the auxiliary circuit is connected or isolated manually.)	- To make connection, push the breaker into the draw-out cradle already wired to the main and control circuits. The draw-out cradle has three positions "Connected", "Test" and "Isolated". - The breakers are fitted with a safety trip. If an attempt is made to remove the breakers while ON position it will automatically trip. - Safety shutters are available as option which automatically cover the live parts on the cradle side in the isolated position. - The auxiliary circuit is connected or isolated automatically by the disconnecter. Connected on "CONN" and "TEST" position. Isolated on "ISOLATED" position.	The plate is painted in Munsell 5Y 7/1.

● : Standard. This configuration used unless otherwise specified.

○ : Optional standard. Specify when ordering.

▲ : Semi-standard.

△ : Custom-built. Contact us for details.

— : "no" or "not available".

5

Mounting and Connection

Molded Case Circuit Breakers

1 Type of connections and mountings

Connecting parts

There are the following connecting/mounting hardware available as options:

1. Extension bars for front conection

Type	Number of poles	Applicable breakers		Min order qty	Constituent parts			Remarks
					Extension bar	Screw B	Screw C	
T2FB12L2SH	2	\$50-SF	Straight extension bars	1/2 ①	2	2	2	
T2FB12L3SH	3				3	3	3	
T2FB12L2SB	2				4	4	4	
T2FB12L3SB	3	\$50-SF	Straight extension bars	1	6	6	6	
T2FB12L2SH	2				2	2	2	
T2FB12L3SH	3				3	3	3	
T2FB12L4SH	4	\$125-SF, \$125-SN	Straight extension bars	1/2 ①	4	4	4	
T2FB12L2SB	2				4	4	4	
T2FB12L3SB	3				6	6	6	
T2FB12L4SB	4	\$125-SF, \$125-SN	Straight extension bars	1	8	8	8	
T2FB12L2H	2				2	2	2	
T2FB12H	3				3	3	3	
T2FB12H	4	\$100-NM, \$100-NN	Straight extension bars	1/2 ①	4	4	4	
T2FB12H	4	\$125-NF, \$125-GF, \$125-NN			4	4	4	
T2FB12B	2	\$50-GF, \$100-NF, \$100-GF			4	4	4	
T2FB12B	3	\$100-NM, \$100-NN	Straight extension bars	1	6	6	6	
T2FB12B	4	\$125-NF, \$125-GF, \$125-NN			8	8	8	
T2FB25L3WH	3	H100-NF, L100-NF	Spread extension bars	1/2 ①	3	3	3	
T2FB25L4WH	4	H125-NF, L125-NF			4	4	4	
T2FB25L3WB	3	\$225-NF, \$225-GF, \$225-GE, \$225-NM, H225-NF, L225-NF			6	6	6	
T2FB25L4WB	4	\$250-NF, \$250-GF, E250-SF, \$250-SF, \$250-SN	Spread extension bars	1	8	8	8	
T2FB25L2SH	2	H100-NF, L100-NF			2	2	2	
T2FB25L3SH	3	H125-NF, L125-NF			3	3	3	
T2FB25L4SH	4	\$225-NF, \$225-GF, \$225-GE, \$225-NM, H225-NF, L225-NF	Straight extension bars	1/2 ①	4	4	4	
T2FB25L2SB	2	\$250-NF, \$250-GF, E250-SF, \$250-SF, \$250-SN			4	4	4	
T2FB25L3SB	3	H100-NF, L100-NF			6	6	6	
T2FB25L4SB	4	H125-NF, L125-NF	Straight extension bars	1	8	8	8	
T2FB25L3SB	3	\$225-NF, \$225-GF, \$225-GE, \$225-NM			6	6	6	
T2FB25L4SB	4	H225-NF, L225-NF			8	8	8	
T2FB402H	2	\$400-CF, \$400-NF, \$400-PF, \$400-NN	Spread extension bars	1/2 ①	2	2	2	
T2FB403H	3	\$400-NE, \$400-GF, \$400-GE, \$400-PE			3	3	3	
T2FB404H	4	H400-NE, L400-NE			4	4	4	
T2FB402B	2	\$400-CF, \$400-NF, \$400-PF, \$400-NN	Spread extension bars	1	4	4	4	
T2FB403B	3	\$400-NE, \$400-GF, \$400-GE, \$400-PE			6	6	6	
T2FB404B	4	H400-NE, L400-NE			8	8	8	

● See page 5-16 for screws B and C.

Note ①: Two sets, one for the line side and one for the load side, are required per breaker.

2. Flat bar stud for rear connection

Type	Number of poles	Applicable breakers		Min order qty	Constituent parts			Remarks
					Stud bar	Screw D	Screw E	
T2RP05L2S	2	\$50-SF, \$125-SF (15-50A)		1	4	4	4	
T2RP05L3S	3				6	6	6	
T2RP12L2S	2				4	4	4	
T2RP12L3S	3	\$125-SF, \$125-SN (60-125A)		1	6	6	6	
T2RP12L4S	4				8	8	8	
T2RP122S	2				4	4	4	
T2RP123S	3	\$50-GF, \$100-NF, \$100-GF		1 ①	6	6	6	
T2RP124S	4	\$100-NM, \$100-NN			8	8	8	
T2RP252S	2	\$125-NF, \$125-GF, \$125-NN			4	4	4	
T2RP253S	3	\$225-NF, \$225-GF, \$225-GE, \$225-NM		1 ①	6	6	6	
T2RP254S	4	H225-NF, L225-NF			8	8	8	
T2RP25L2S	2	\$250-NF, \$250-GF			4	4	4	
T2RP25L3S	3	E250-SF, \$250-SF, \$250-SN		1 ①	6	6	6	
T2RP25L4S	4				8	8	8	
T2RP253L	3				6	6	6	
T2RP254L	4	H100-NF, L100-NF		1 ①	8	8	8	
T2R0403S	3	H125-NF, L125-NF			6	6	6	
T2RP404S	4	H225-NF, L225-NF			8	8	8	
T2RP403L	3	\$400-CF, \$400-NF, \$400-PF, \$400-NN		1 ①	6	6	6	
T2RP404L	4	\$400-NE, \$400-GF, \$400-GE, \$400-PE			8	8	8	
T2RP403L	3	\$400-NE, \$400-GF, \$400-GE, \$400-PE			6	6	6	
T2RP404L	4	H400-NE, L400-NE		①	8	8	8	

● See page 5-16 for screws D and E.

Note ①: The studs can be rotated to four angular positions: 0 (horizontal), 45, 90 (vertical) and 135 degrees.

3. Plug-in base

Type		Number of poles	IP20	Applicable breakers	Min order qty	Constituent parts		Remarks
						Plug-in base	Nut J	
Standard	XDM1-2	2	Non	E50-SF,E100-SF	1	1	4	It is recommended to order plug-in base along with breakers. Separately available plug-in base are for the convenience of customers who want to make wiring of the mounts in advance.
	XDM1-3	3		E50-SF,E100-SF,E50-CM	1	1	6	
	T2PM12E3	3		S50-GF,S100-NF,S100-GF,S100-NN,S125-NF,S125-GF,S125-NN	1	1	6	
	T2PM12LT3	3		S50-SF,S125-SF,S125-SN	1	1	6	
	T2PM25E3	3		S225-NF,S225-GF,S225-GE S250-NF,S250-GF H100-NF,L100-NF,H125-NF,L125-NF,H225-NF,L225-NF	1	1	6	
	T2PM25LE3	3		E250-SF,S250-SF,S250-SN	1	1	6	
	T2PM40E3	3		S400-CF,S400-NF,S400-NE,S400-NN,S400-GF S400-GE,S400-PF,S400-PE,H400-NE,L400-NE	1	1	6	
	T2PM80E3	3		S630-CF,S630-NF,S630-NE,S630-RF,S630-RE,S630-GN S800-CF,S800-NF,S800-NE,S800-RF,S800-RE,S800-NN	1	1	6	
	T2PM80M3	3		H630-NE,L630-NE,H800-NE,L800-NE	1	1	6	
	T2PMX3E3	3		S1250-NE,S1250-GE,S1250-NN	1	1	6	
	T2PMX3E4	4		S1250-NE,S1250-GE	1	1	8	
	XDM8-3	3		TL-1000NE,TL-1200NE	1	1	6	
	XDM8-4	4		TL-1000NE,TL-1200NE	1	1	8	
	XDM1-2 ①	2		E50-SF,E100-SF	1	1	4	
	XDM1-3 ①	3		E50-SF,E100-SF,E50-CM	1	1	6	
	T2PM12LC3	3		S50-SF,S125-SF,S125-SN	1	1	6	
	T2PM12C3	3		S50-GF,S100-NF,S100-GF,S100-NN,S125-NF,S125-GF,S125-NN	1	1	6	
	T2PM25C3	3		S225-NF,S225-GF,S225-GE S250-NF,S250-GF H100-NF,L100-NF,H125-NF,L125-NF,H225-NF,L225-NF	1	1	6	
	T2PM25LC3	3	E250-SF,S250-SF,S250-SN	1	1	6		
	T2PM40C3	3	S400-CF,S400-NF,S400-NE,S400-NN,S400-GF S400-GE,S400-PF,S400-PE,H400-NE,L400-NE	1	1	6		
	T2PM80C3	3	S630-CF,S630-NF,S630-NE,S630-RF,S630-RE,S630-GN S800-CF,S800-NF,S800-NE,S800-RF,S800-RE,S800-NN	1	1	6		
	T2PM80N3	3	H630-NE,L630-NE,H800-NE,L800-NE	1	1	6		
	T2PMX3C3	3	S1250-NE,S1250-GE,S1250-NN	1	1	6		
	T2PMX3C4	4	S1250-NE,S1250-GE	1	1	8		
	XDM8-3 ②	3	TL-1000NE,TL-1200NE	1	1	6		
	XDM8-4 ②	4	TL-1000NE,TL-1200NE	1	1	8		
High-performance	T2PM12B2	2	Non	S50-GF,S100-NF,S100-GF,S100-NN S125-NF,S125-GF,S125-NN	1	1	4	
	T2PM12B3	3				1	6	
	T2PM12B4	4				1	8	
	T2PM25B3	3		S225-NF,S225-GF,S225-GE S250-NF,S250-GF H100-NF,L100-NF,H125-NF,L125-NF H225-NF,L225-NF	1	1	6	
	T2PM25B4	4		1		8		
	T2PM40B3	3		S400-CF,S400-NF,S400-NE,S400-NN,S400-GF S400-GE,S400-PF,S400-PE,H400-NE,L400-NE	1	1	6	
	T2PM40B4	4		1		8		
	T2PM80B3	3		S630-CF,S630-NF,S630-NE,S630-RF,S630-RE,S630-GN S800-CF,S800-NF,S800-NE,S800-RF,S800-RE,S800-NN	1	1	6	
	T2PM80B4	4		1		8		
	T2PM12P2	2		Compliant	S50-GF,S100-NF,S100-GF,S100-NN S125-NF,S125-GF,S125-NN	1	1	4
	T2PM12P3	3	1				6	
	T2PM12P4	4	1				8	
	T2PM25P3	3	S225-NF,S225-GF,S225-GE S250-NF,S250-GF H100-NF,L100-NF,H125-NF,L125-NF H225-NF,L225-NF		1	1	6	
	T2PM25P4	4	1			8		
	T2PM40P3	3	S400-CF,S400-NF,S400-NE,S400-NN,S400-GF S400-GE,S400-PF,S400-PE,H400-NE,L400-NE		1	1	6	
	T2PM40P4	4	1			8		
	T2PM80P3	3	S630-CF,S630-NF,S630-NE,S630-RF,S630-RE,S630-GN S800-CF,S800-NF,S800-NE,S800-RF,S800-RE,S800-NN		1	1	6	
	T2PM80P4	4	H630-NF,L630-NF,H800-NF,L800-NF	1		8		

• See page 5-17 or 5-19 for Nut J.

Notes: ① Please order 1 piece IP cover for 1 piece plug-in base. IP cover codes: IPC12 for 2 poles, IPC13 for 3 poles.

② When ordering the products, please specify as "IP20 applied products".

4. Flush Plate (with flat bar studs)

Type	Number of poles	Connection ①	Applicable breakers	Min order qty	Constituent parts					Remarks
					Flush plate ②		Flush-mounting frame	Stud bar	Frame mounting screw	
T2FP12S2	2	①	S50-GF	1	—	1	1	—	2	4
T2FP12S3	3		S100-NF,S100-GF,S100-NN						4	
T2FP12S4	4		S125-NF,S125-GF,S125-NN						4	
T2FP25S3	3	①	S225-NF,S225-GF	1	—	1	1	—	4	4
T2FP25S4	4		S225-GE,S250-NF S250-GF						4	
T2FP25L3	3	①	H100-NF,L100-NF,H125-NF,L125-NF	1	—	1	1	—	4	4
T2FP25L4	4		H225-NF,L225-NF,H250-NF,L250-NF						4	
T2FP40S3	3	①	S400-CF,S400-NF,S400-GF	1	—	1	1	—	③	4
T2FP40S4	4		S400-GE,S400-NN						③	
T2FP40L3	3	①	H400-NE,L400-NE	1	—	1	1	—	③	4
T2FP40L4	4								③	

Notes:

①. Possible mounting positions include four angular ones: 0 (horizontal), 45, 90 (vertical) and 135 degrees.

②. The flash plate is painted in Munsell 5Y 7/1.

③. Use the breaker mounting screws (supplied with the breaker) to secure the breaker in the flush-mounting frame.

④. Stud bars are not supplied with the flush-mounting frame. See "2. Studs for rear connection" on page 5-6 to select and order suitable studs.

5

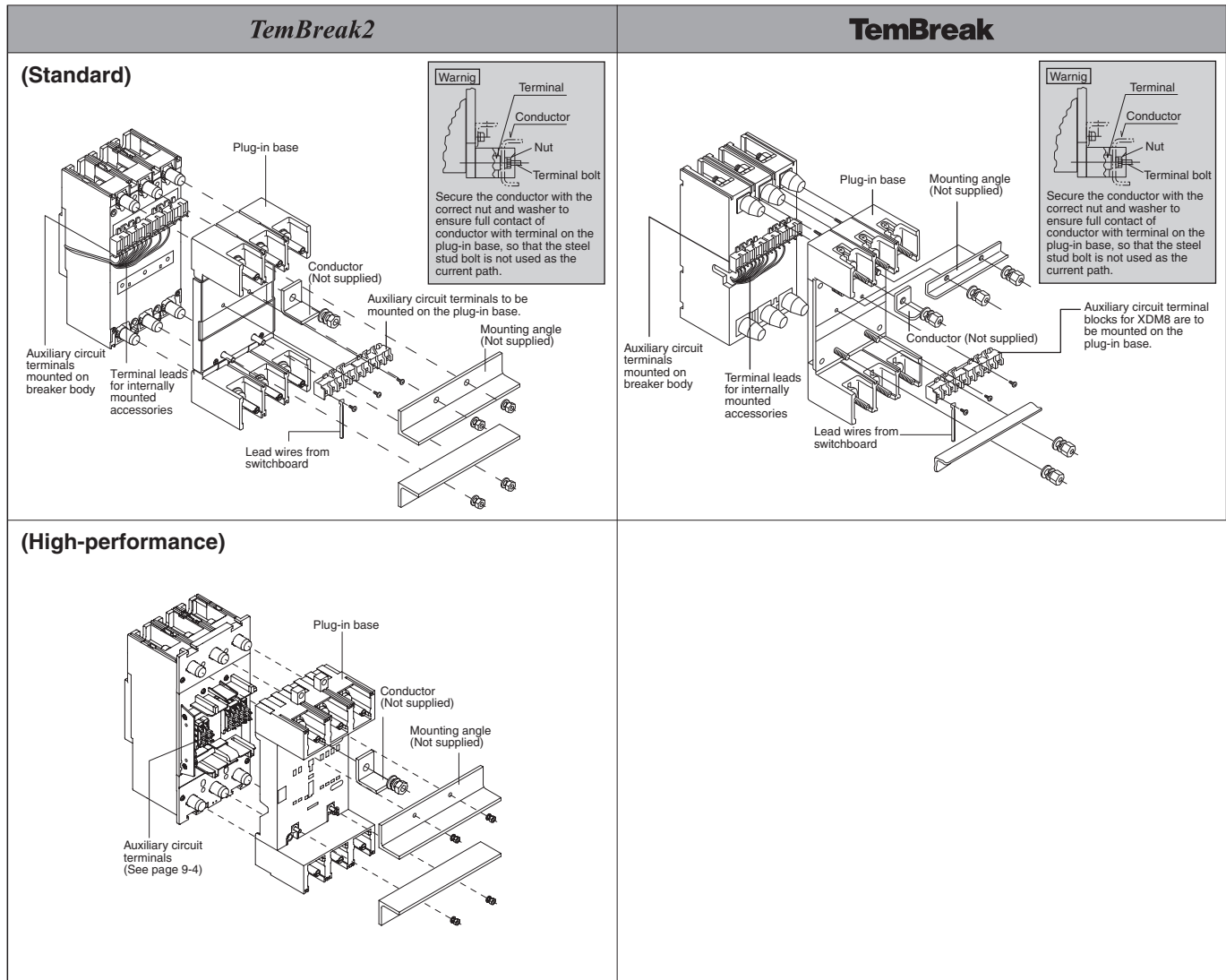
Mounting and Connection

Molded Case Circuit Breakers

1 Type of connections and mountings

Plug-in type (PM)

1. For switchboards



2. For distribution boards

Plug-in base

Frame size (A)	Breaker	No. of poles	Order codes for Plug-in bases	
50	S50-SF	2	For double	T2PM12LD2
			For single	T2PM12LS2
		3	For double	T2PM12LD3
			For single	T2PM12LS3
	S50-GF	3	For double	XDA2D-3
			For single	XDA2S-3
	E50-SF, E100-SF	2	For double	XDA1D-2
			For single	XDA1S-2
3		For double	XDA1D-3	
		For single	XDA1S-3	
100	S100-NF, S100-GF, S100-NN	3	For double	XDA2D-3
			For single	XDA2S-3
125	S125-SF	2	For double	T2PM12LD2
			For single	T2PM12LS2
		3	For double	T2PM12LD3
			For single	T2PM12LS3
	S125-SN	3	For double	T2PM12LD3
			For single	T2PM12LS3

5

Mounting and Connection

Molded Case Circuit Breakers

1 Type of connections and mountings

■ Components / Parts to be purchased

Breaker	Components / Parts to be purchased				Mounting/connecting screws			Remarks
		Name	Type	Qty	Size	Qty	Remarks	
E50-SF E50-CM E100-SF	For double	Plug-in base	XDA1D-2	2	M4×30	2	For breaker mounting	For 2-pole breaker
			XDA1D-3	2	M4×30	4	For breaker mounting	For 3-pole breaker
		Branching bar (thickness)	2RT-LD (t=2)	2	M5×12	2	For busbar connection	For 10 – 50A
					M4×8	4	For Mounting base installation	
			22S-LD (t=2)	1	M5×12	1	For busbar connection	For 60 – 100A
					M4×8	2	For Mounting base installation	
			2RT-LD10 (t=3)	2	M5×12	2	For busbar connection	
					M4×8	4	For Mounting base installation	
			22S-LD10 (t=3)	1	M5×12	1	For busbar connection	
					M4×8	2	For Mounting base installation	
	For single	Connecting plate	Connecting plate 2 (for 2-pole breaker)	1	M4×35	4		
			Connecting plate 3PD (for 3-pole breaker)	1	M4×35	4		
		Insulator for arc	Arc guard 2PD (for 2-pole breaker)	1				
			Arc guard 3PD (for 3-pole breaker)	1				
		Branching bar barrier	Busbar barrier D	2				
		Plug-in base	XDA1S-2	1	M4×30	2	For breaker mounting	For 2-pole breaker
			XDA1S-3	1	M4×30	4	For breaker mounting	For 3-pole breaker
		Branching bar (thickness)	1R-LD (t=2)	1	M5×12	3	For busbar connection	For 10 – 50A
			1S-LD (t=2)	1				
			1T-LD (t=2)	1	M4×8	3	For Mounting base installation	
			1R-LD10 (t=3)	1	M5×12	3	For busbar connection	For 60 – 100A
			1S-LD10 (t=3)	1				
			1T-LD10 (t=3)	1	M4×8	3	For Mounting base installation	
S50-SF S125-SF S125-SN	For double	Plug-in base	T2PM12LD2	2	M4×30	2		For 2-pole breaker
			T2PM12LD3	2	M4×30	4		For 3-pole breaker
		Branching bar (thickness)	2RT-LDB (t=2)	2	M5×12	2	For busbar connection	For 15 – 50A
					M4×8	4	For Mounting base installation	
			22S-LDB (t=2)	1	M5×12	1	For busbar connection	For 60 – 125A
					M4×8	2	For Mounting base installation	
			2RT-LD10B (t=3)	2	M5×12	2	For busbar connection	
					M4×8	4	For Mounting base installation	
			22S-LD10B (t=3)	1	M5×12	1	For busbar connection	
					M4×8	2	For Mounting base installation	
	For single	Connecting plate	Connecting plate 2 (for 2-pole breaker)	1	M4×35	4		
			Connecting plate 3PD (for 3-pole breaker)	1	M4×35	4		
		Insulator for arc	Arc guard 2PD (for 2-pole breaker)	1				
			Arc guard 3PD (for 3-pole breaker)	1				
		Branching bar barrier	Busbar barrier D	2				
		Plug-in base	T2PM12LS2	1	M4×30	2	For breaker mounting	For 2-pole breaker
			T2PM12LS3	1	M4×30	4	For breaker mounting	For 3-pole breaker
		Branching bar (thickness)	1R-LDB (t=2)	1	M5×12	3	For busbar connection	For 15 – 50A
			1S-LDB (t=2)	1				
			1T-LDB (t=2)	1	M4×8	3	For Mounting base installation	
			1R-LD10B (t=3)	1	M5×12	3	For busbar connection	For 60 – 125A
			1S-LD10B (t=3)	1				
			1T-LD10B (t=3)	1	M4×8	3	For Mounting base installation	
S50-GF S100-NF S100-GF S100-NN S125-NF S125-GF S125-NN	For double	Plug-in base	XDA2D-3	2	M5×25	4	For breaker mounting	For 3-pole breaker
		Branching bar (thickness)	2RT-LE (t=2)	2	M5×12	2	For busbar connection	For 10 – 50A
					M4×8	4	For Mounting base installation	
			22S-LE (t=2)	1	M5×12	1	For busbar connection	For 60 – 125A
					M4×8	2	For Mounting base installation	
			2RT-LE10 (t=3)	2	M5×12	2	For busbar connection	
					M4×8	4	For Mounting base installation	
			22S-LE10 (t=3)	1	M5×12	1	For busbar connection	
					M4×8	2	For Mounting base installation	
		Connecting plate	Connecting plate 3P (for 3-pole breaker)	1	M4×35	4		
	For single	Insulator for arc	Arc guard 3P (for 3-pole breaker)	1				
		Branching bar barrier	Busbar barrier E	2				
		Plug-in base	XDA2S-3	1	M4×30	4	For breaker mounting	For 3-pole breaker
		Branching bar (thickness)	1R-LE (t=2)	1	M5×12	3	For busbar connection	For 10 – 50A
			1S-LE (t=2)	1				
			1T-LE (t=2)	1	M4×8	3	For Mounting base installation	
			1R-LE10 (t=3)	1	M5×12	3	For busbar connection	For 60 – 125A
			1S-LE10 (t=3)	1				
			1T-LE10 (t=3)	1	M4×8	3	For Mounting base installation	

Notes:

- ①. The number required to form either single or double plug-in base for 3-pole construction.
- ②. Branch bars for 10 - 50A and 60 - 125A differ in thickness only. The conductor for 10 - 50A (2 mm thick) can be used for applications where the breaker rated current is 50A or less.

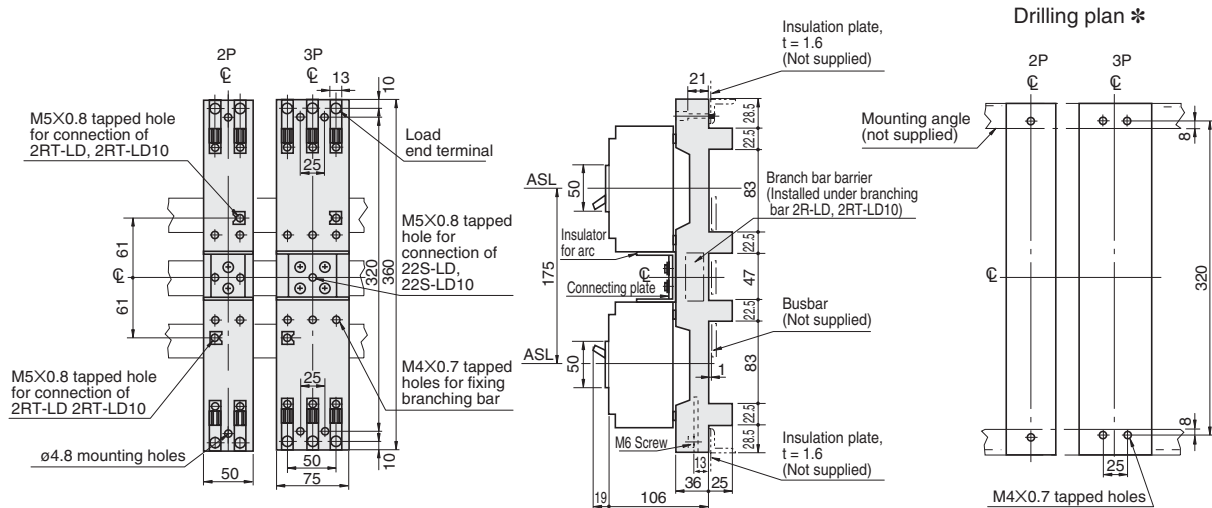
Outline dimensions

XDA1D-2, XDA1S-2, XDA1D-3, XDA1S-3

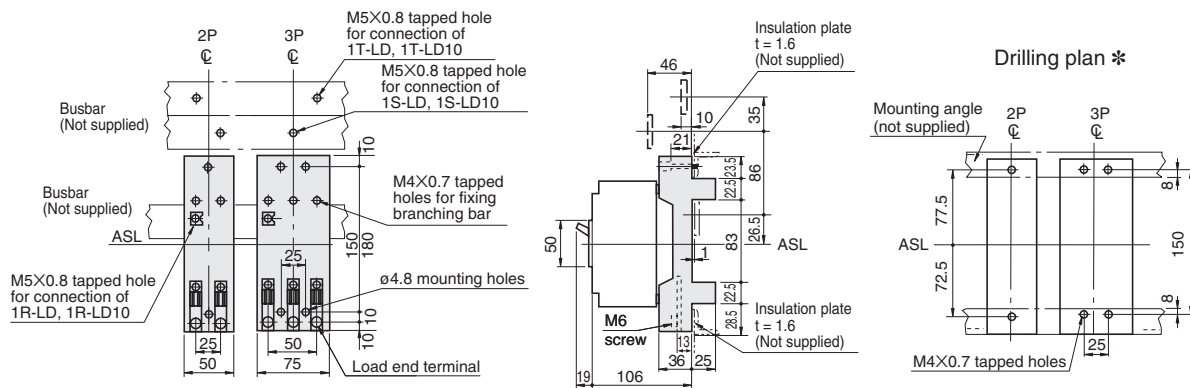
Applicable breaker types

E50-SF	E50-CM	E100-SF
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■ XDA1D-2, XDA1D-3 (3 poles only for E50-CM)



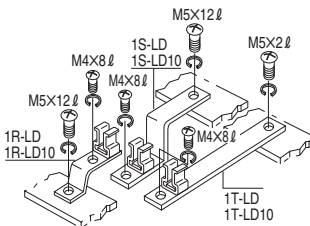
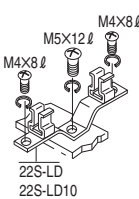
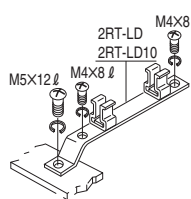
■ XDA1S-2, XDA1S-3 (3 poles only for E50-CM)



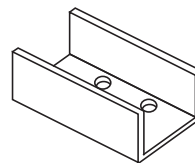
* Allow a clearance of 5 mm from the adjacent breaker if optional internally mounted accessories are installed.

■ Components / Parts to be purchased

● Branching bar



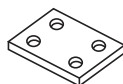
● Insulator for arc



● Branching bar barrier



● Connecting plate



* Screws are not supplied.

5

Mounting and Connection

Molded Case Circuit Breakers

1 Type of connections and mountings

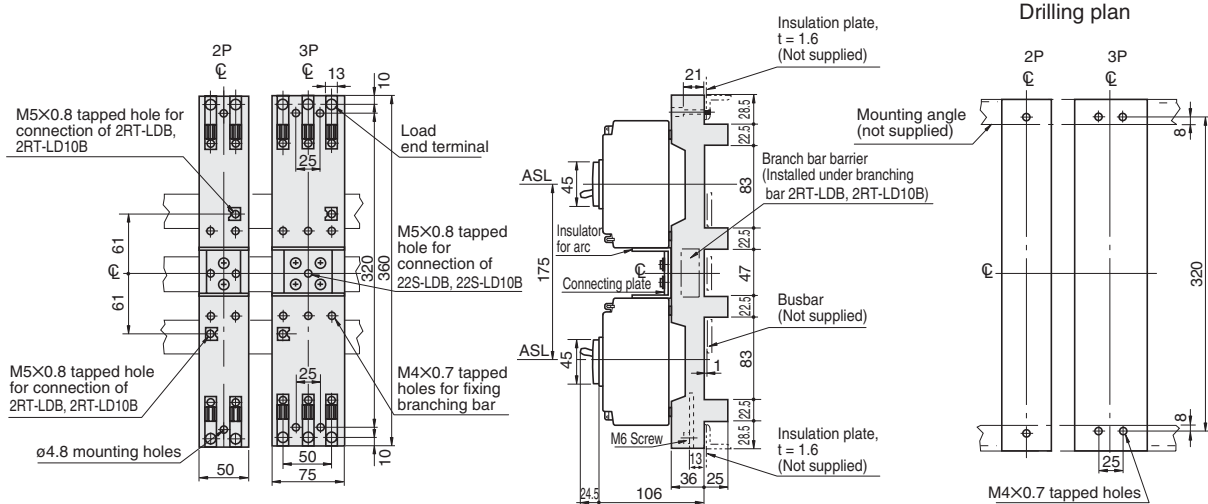
Outline dimensions

T2PM12LD2, T2PM12LD3, T2PM12LS2, T2PM12LS3

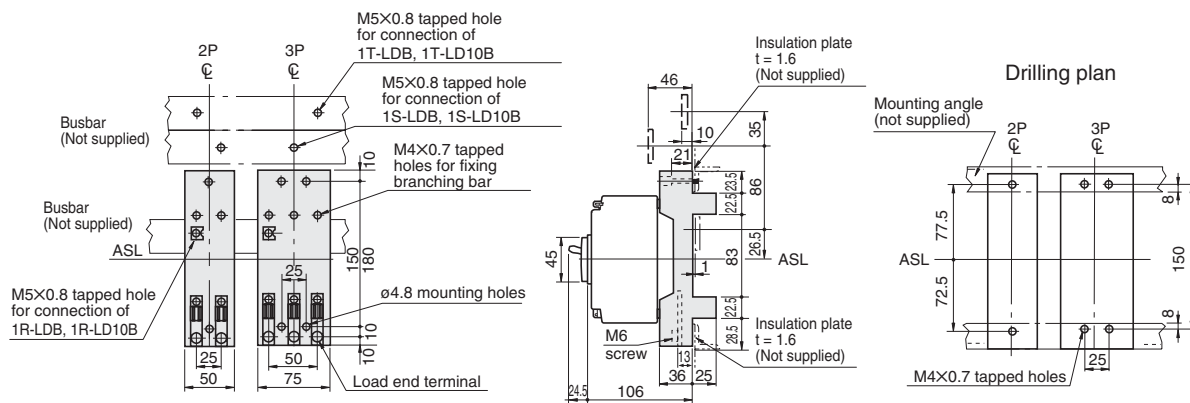
Applicable breaker types

S50-SF	S125-SF	S125-SN
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■ T2PM12LD2, T2PM12LD3

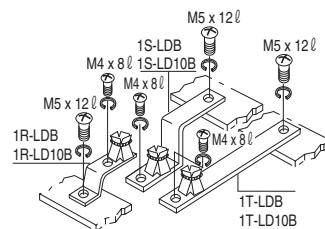
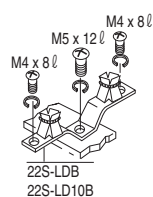
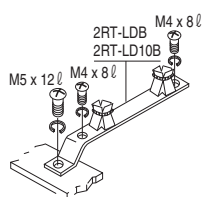


■ T2PM12LS2, T2PM12LS3

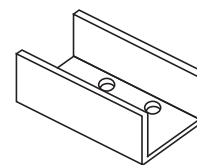


■ Components / Parts to be purchased

● Branching bar



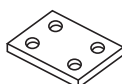
● Insulator for arc



● Branching bar barrier



● Connecting plate



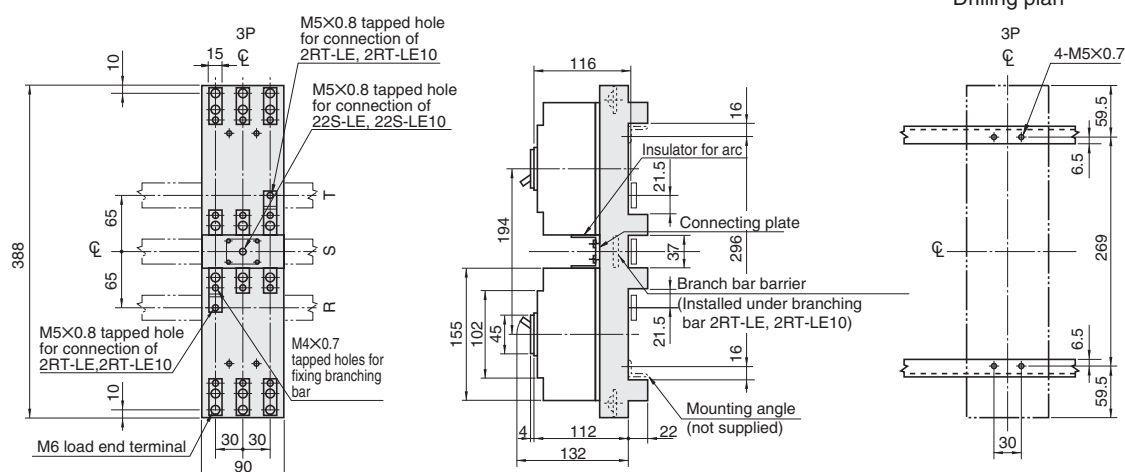
* Screws are not supplied.

Outline dimensions

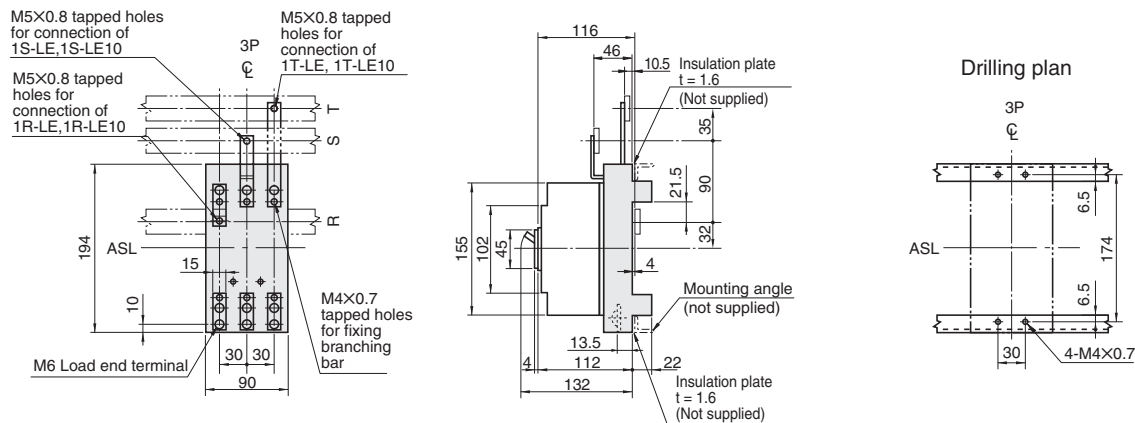
XDA2D-3, XDA2S-3

Applicable breaker types						
S50-GF	S100-NF	S100-GF	S100-NN	S125-NF	S125-GF	S125-NN

■ XDA2D-3

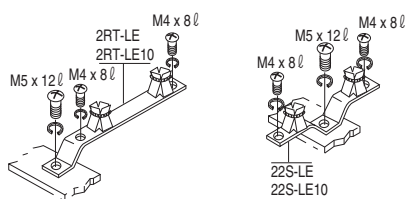


■ XDA2S-3

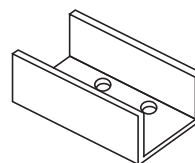


■ Components / Parts to be purchased

● Branching bar



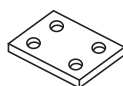
● Insulator for arc



● Branching bar barrier



● Connecting plate



* Screws are not supplied.

5

Mounting and Connection

Molded Case Circuit Breakers

2 Compression terminals

Front connected type (without extension bar)

Frame size (A)	Breaker	Nominal wire size (mm ²)									
		2	5.5	8	14	22	38	60	80	100	150
50	E50-SF, S50-SF	R2-5 (R2-6)	R5.5-5 (R5.5-6)	R8-5 (R8-6)	R14-5	NTMCB22-5S AMP33114					
	S50-GF	R2-8	R5.5-8	R8-8	R14-8	R22-8	AMP322870 JST38-S8 NTK-R38-8-1 NTM38-8S	60-2BA Note ③ CB60-8			
100	S100-NF, S100-GF, S100-NM										
	S100-NN										
	H100-NF, L100-NF										
125	E100-SF, S125-SF, S125-SN, S125-NN (15-50A)	R2-5 (R2-6)	R5.5-5 (R5.5-6)	R8-5 (R8-6)	R14-5	NTMCB22-5S AMP33114					
	(60-125A)			R8-8	R14-8	R22-8	AMP322870 JST38-S8 NTM38-8S	60-2BA Note ③ CB60-8			
	H125-NF, L125-NF	R2-8	R5.5-8	R8-8	R14-8	R22-8	AMP322870 JST38-S8 NTK-R38-8-1 NTM38-8S	60-2BA Note ③ CB60-8			
225	S225-NF, S225-GF, S225-GE, S225-NM H225-NF, L225-NF						R38-8	R60-8	80-3BA Note ③ CB80-8	100-3BA Note ③ CB100-8	CB150-8
250	S250-NF, S250-GF, E250-SF S250-SF, S250-SN										
400	S400-CF, S400-NF, S400-NE S400-GF, S400-GE, S400-NN S400-PF, S400-PE H400-NE, L400-NE						R38-10 Note ②	R60-10 Note ②	80-4B Note ② CB80-10 Note ②	100-4B Note ② CB100-10 Note ②	150-4B Note ② CB150-10 Note ②

Front connected type (with extension bar)

Frame size (A)	Breaker	Nominal wire size (mm²)							
		38	60	80	100	150	200	325	
225, 250	S225-NF, S225-GF, S225-GE, S225-NM H225-NF, L225-NF S250-NF, S250-GF, E250-SF S250-SF, S250-SN	3P	R38-10	R60-10	R80-10	R100-10	R150-10		
		4P					CB150-10		
400	S400-CF, S400-NF, S400-NE S400-GF, S400-GE, S400-NN S400-PF, S400-PE H400-NE, L400-NE		R38-12	R60-12	R80-12	R100-12	R150-12	R200-12	JST325-12
630	S630-CF, S630-NF, S630-NE, S630-RF, S630-RE S630-GN H630-NE, L630-NE			R60-12 RD60-12	R80-12 RD80-12	R100-12 RD100-12	R150-12 RD150-12	R200-12 RD200-12	JST325-12 SD325-12
800	S800-CF, S800-NF, S800-NE, S800-RF, S800-RE S800-NN H800-NE, L800-NE								
1250	S1250-NE, S1250-GE, S1250-NN				R80-12 RD80-12	R100-12 RD100-12	R150-12 RD150-12	R200-12 RD200-12	JST325-12 SD325-12
1000	TL-1000NE				R80-12 RD80-12	R100-12 RD100-12	R150-12 RD150-12	R200-12 RD200-12	JST325-12 SD325-12
1200	TL-1200NE				R80-12 RD80-12	R100-12 RD100-12	R150-12 RD150-12	R200-12 RD200-12	JST325-12 SD325-12

Notes:

- Commercially made compression terminals can be used (refer to  boxes)
R/RD : JIS-compliant
CB : JEM 1399-compliant
AMP : Made by Nippon AMP Co., Ltd.
JST : Made by Japan Solderless Terminal Manufacturing Co., Ltd.
NTK : Made by Nippon Tanshi Co., Ltd.
NTM : Made by Nichifu Terminal Industries Co., Ltd.

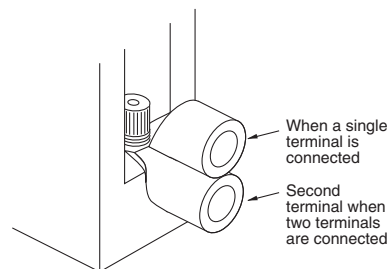
- Only a single terminal can be connected.

- Compression terminals in  box cells are made by us at Terasaki. They are available from us or our authorized agents.

- Compression terminals enclosed in parentheses are to be used as the lower terminal when two terminals are connected.

Connection (two terminals)

If a shortage of insulating occurs between the mounting plate and a terminal, use a recommended taping or insulator.

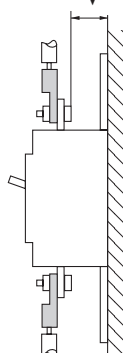


Terasaki made compression terminals are used (refer to  box)

60-2BA	80-3BA	80-4B
100-3BA	100-4B	150-4B

Connection (one electric cable)

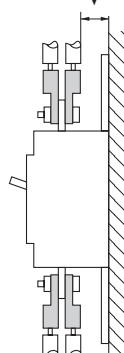
If a shortage of insulating occurs, use a recommended taping or insulator.



(Make connection so that the screw heads face toward the mounting surface.)

Connection (two electric cables)

If a shortage of insulating occurs, use a recommended taping or insulator.



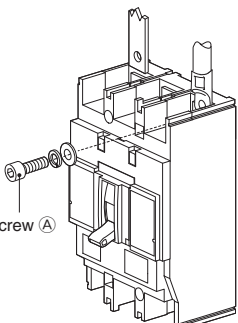
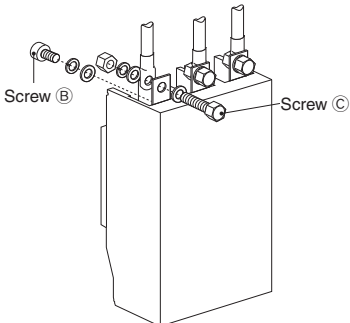
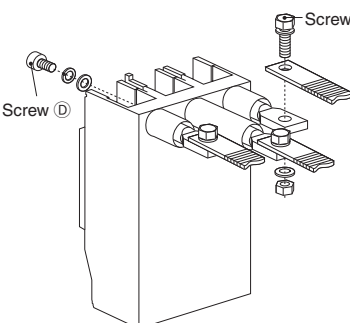
(Make connection so that the screw heads face toward the mounting surface.)

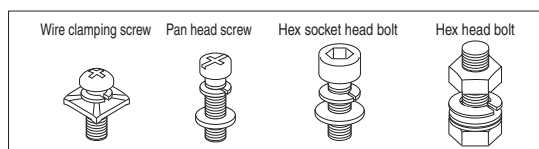
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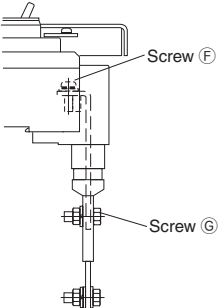
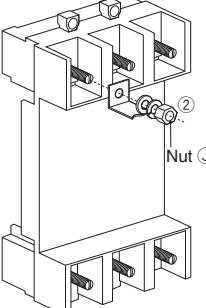
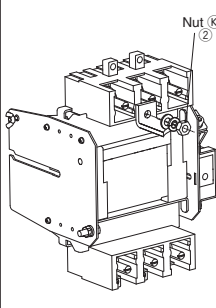
Mounting and Connection

Molded Case Circuit Breakers

3 Terminal screw sizes and standard torques

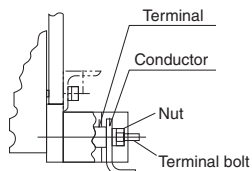
Connecting types Type		Front connection (FC)						Rear connection (RC) (Flat bar stud)				
												
Frame size (A)	Breaker	Compression terminal		Extension bar								
		Screw size (A)	Torque (N·m)	Screw size (B)	Torque (N·m)	Screw size (C)	Torque (N·m)	Screw size (D)	Torque (N·m)	Screw size (E)	Torque (N·m)	
50	S50-SF	Wire clamping M5×14	2.3~3.4	Wire clamping M5×14	2.3~3.4	Hex head M8×22	11.8~18.6	Pan head M5×14	2.3~2.8	Hex head M6×22	2.7~4.5	
	S50-GF	Pan head M8×16	4.9~6.9	Pan head M8×16	4.9~6.9	Hex head M8×25	11.8~18.6	Hex socket head M6×20	7.8~11.8	Hex head M8×25	11.8~18.6	
100	S100-NF, S100-GF	Pan head M8×16	4.9~6.9	Pan head M8×16	4.9~6.9	Hex head M8×25	11.8~18.6	Hex socket head M6×20	7.8~11.8	Hex head M8×25	11.8~18.6	
	S100-NN											
	S100-NM	Pan head M8×16	4.9~6.9	Pan head M8×16	4.9~6.9	Hex head M8×25	11.8~18.6	Hex socket head M6×20	7.8~11.8	Hex head M8×25	11.8~18.6	
	H100-NF, L100-NF	Hex socket head M8×20	7.8~12.7	Hex socket head M8×20	7.8~12.7	Hex head M10×25	22.5~37.2	Hex socket head M6×20	7.8~11.8	Hex head M8×25	11.8~18.6	
125	S125-SF	Wire clamping M5×14	2.3~3.4	Wire clamping M5×14	2.3~3.4	Hex head M8×22	11.8~18.6	Pan head M5×14	2.3~2.8	Hex head M6×22	2.7~4.5	
	15~50A											
	S125-SF	Pan head M8×14	4.9~6.9	Pan head M8×14	4.9~6.9	Hex head M8×22	11.8~18.6	Hex socket head M6×16	7.8~11.8	Hex head M8×23	11.8~18.6	
	60~125A											
	S125-SN	Pan head M8×14	4.9~6.9	Pan head M8×14	4.9~6.9	Hex head M8×22	11.8~18.6	Hex socket head M6×16	7.8~11.8	Hex head M8×23	11.8~18.6	
	S125-NF, S125-GF	Pan head M8×16	4.9~6.9	Pan head M8×16	4.9~6.9	Hex head M8×25	11.8~18.6	Hex socket head M6×20	7.8~11.8	Hex head M8×25	11.8~18.6	
225	S125-NN											
	H125-NF, L125-NF	Hex socket head M8×20	7.8~12.7	Hex socket head M8×20	7.8~12.7	Hex head M10×25	22.5~37.2	Hex socket head M6×20	7.8~11.8	Hex head M8×25	11.8~18.6	
	S225-NF, S225-GF	Hex socket head M8×20	7.8~12.7	Hex socket head M8×20	7.8~12.7	Hex head M10×25	22.5~37.2	Hex socket head M6×20	7.8~11.8	Hex head M8×25	11.8~18.6	
	S225-GE											
250	H225-NF, L225-NF	Hex socket head M8×20	7.8~12.7	Hex socket head M8×20	7.8~12.7	Hex head M10×25	22.5~37.2	Hex socket head M6×20	7.8~11.8	Hex head M8×25	11.8~18.6	
	S225-NN											
	S225-NM	Hex socket head M8×20	7.8~12.7	Hex socket head M8×20	7.8~12.7	Hex head M10×25	22.5~37.2	Hex socket head M6×20	7.8~11.8	Hex head M8×25	11.8~18.6	
400	E250-SF, S250-SF	Hex socket head M8×18	7.8~12.7	Hex socket head M8×18	7.8~12.7	Hex head M10×25	22.5~37.2	Hex socket head M6×18	7.8~11.8	Hex head M8×25	11.8~18.6	
	S250-SN											
	S250-NF, S250-GF	Hex socket head M8×20	7.8~12.7	Hex socket head M8×20	7.8~12.7	Hex head M10×25	22.5~37.2	Hex socket head M6×20	7.8~11.8	Hex head M8×25	11.8~18.6	
630	S400-CF, S400-NF	Hex socket head M10×25	13.7~22.5	Hex socket head M10×25	13.7~22.5	Hex head M12×35	40.2~65.7	Special hex socket head M10×20	18.6~29.4	Hex head M12×35	40.2~65.7	
	S400-NES											
	S400-GF											
	S400-GE, S400-PF											
	S400-PE, S400-NN											
800	H400-NE, L400-NE	Hex socket head M10×30	13.7~22.5	Hex socket head M10×30	13.7~22.5							
	S630-CF, S630-NF	—	—	Hex socket head M8×25×2	Extension bars are fitted as standard.	Hex head M12×40	40.2~65.7	Special hex socket head M10×27	18.6~29.4	Hex head M12×40	40.2~65.7	
	S630-NE, S630-RF											
	S630-RE, S630-GN											
	H630-NE, L630-NE											
800	S800-CF, S800-NF	—	—	Hex socket head M8×25×2	Extension bars are fitted as standard.	Hex head M12×40	40.2~65.7	Special hex socket head M10×27	18.6~29.4	Hex head M12×40	40.2~65.7	
	S800-NE, S800-RF											
	S800-RE, S800-NN											
	H800-NE, L800-NE											



	Flush Plate (FP)				Plug-in (PM)		Draw-out (DR)	
								
	With flat bar stud							
	Screw size (F)	Torque (N·m)	Screw size (G)	Torque (N·m)	Nut size (J)	Torque (N·m)	Nut size (K)	Torque (N·m)
	Pan head M5×14	2.3~2.8	Hex head M6×22	2.7~4.5	Hex. nut M6	3.6~6.0	—	—
	Hex socket head M6×20	7.8~11.8	Hex head M8×25	11.8~18.6	Hex. nut M6	3.6~6.0	—	—
	Hex socket head M6×20	7.8~11.8	Hex head M8×25	11.8~18.6	Hex. nut M6	3.6~6.0	—	—
	Hex socket head M6×20	7.8~11.8	Hex head M8×25	11.8~18.6	—	—	—	—
	Hex socket head M6×20	7.8~11.8	Hex head M8×25	11.8~18.6	Hex. nut M8	8.8~14.7	—	—
	Pan head M5×14	2.3~2.8	Hex head M6×22	2.7~4.5	Hex. nut M6	3.6~6.0	—	—
	Hex socket head M6×16	7.8~11.8	Hex head M8×23	11.8~18.6	Hex. nut M6	3.6~6.0	—	—
	Hex socket head M6×16	7.8~11.8	Hex head M8×23	11.8~18.6	Hex. nut M6	3.6~6.0	—	—
	Hex socket head M6×20	7.8~11.8	Hex head M8×25	11.8~18.6	Hex. nut M6	3.6~6.0	—	—
	Hex socket head M6×20	7.8~11.8	Hex head M8×25	11.8~18.6	Hex. nut M8	8.8~14.7	—	—
	Hex socket head M6×20	7.8~11.8	Hex head M8×25	11.8~18.6	Hex. nut M8	8.8~14.7	—	—
	Hex socket head M6×20	7.8~11.8	Hex head M8×25	11.8~18.6	—	—	—	—
	Hex socket head M6×18	7.8~11.8	Hex head M8×25	11.8~18.6	Hex. nut M8	8.8~14.7	—	—
	Hex socket head M6×20	7.8~11.8	Hex head M8×25	11.8~18.6	Hex. nut M8	8.8~14.7	—	—
	Special hex socket head M10×40	18.6~29.4	Hex head M12×35	40.2~65.7	Hex. nut M10	18.6~29.4	Hex. nut M10	18.6~29.4
	Special hex socket head M10×27	18.6~29.4	Hex head M12×40	40.2~65.7	Hex. nut M12	32.3~51.9	Note ①	
	Special hex socket head M10×27	18.6~29.4	Hex head M12×40	40.2~65.7	Hex. nut M12	32.3~51.9	Note ①	

Notes:

- ①. Connecting method and standard torques are same as plug-in (PM).
- ②. Secure the conductor with the correct nut and washer to ensure full contact of conductor with terminal on the plug-in base, so that the steel terminal bolt is not used as the current path.

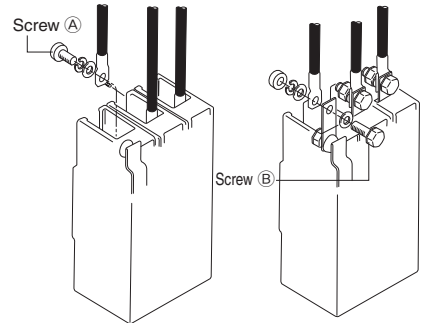
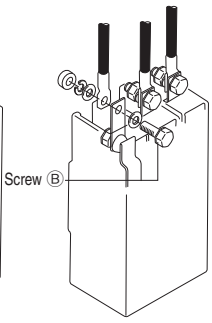
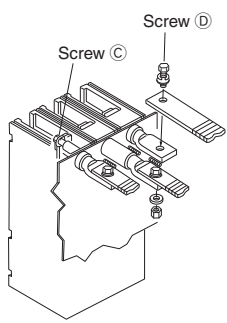
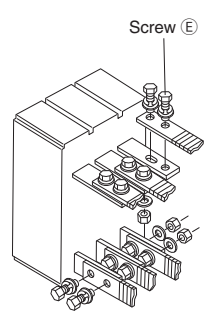


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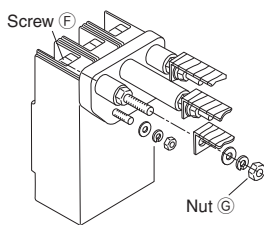
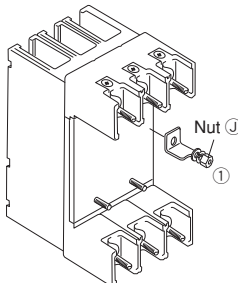
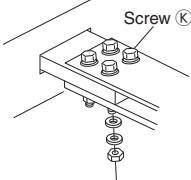
Mounting and Connection

Molded Case Circuit Breakers

3 Terminal screw sizes and standard torques

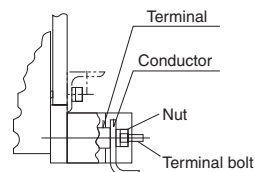
Connecting types Type		Front connection (FC)				Rear connection (RC) (Flat bar stud)					
											
Frame size (A)	Breaker	Compression terminal		Extension bar		Screw size (C) Torque (N·m)		Screw size (D) Torque (N·m)		Screw size (E) Torque (N·m)	
50	TB-5S, TB-5P	Pan head M5×12	2.3~3.4	—	—	—	—	—	—	—	—
	TB-5D	—	—	—	—	—	—	—	—	—	—
	E50-SF	Pan head M5×12	2.3~3.4	—	—	—	—	—	—	—	—
100	E100-SF (10~50A)	Pan head M5×12	2.3~3.4	—	—	—	—	—	—	—	—
	E100-SF (60~100A)	Pan head M8×14	4.9~6.9	—	—	—	—	—	—	—	—
1000	TL-1000NE	—	—	Hex head M12×55	40.2~65.7	—	—	—	—	Hex head M12×47	40.2~65.7
1200	TL-1200NE	—	—	Hex head M12×55	40.2~65.7	—	—	—	—	Hex head M12×47	40.2~65.7
1250	S1250-NE, S1250-GE S1250-NN	—	—	Hex head M12×55	40.2~65.7	—	—	—	—	Hex head M12×47	40.2~65.7
1600 ②	S1600-NE S1600-NN	—	—	Hex head M12×60	40.2~65.7	—	—	—	—	Hex head M10×45	22.5~37.2
2000 ②	XS2000NE XS2000NN	—	—	Hex head M10×60	22.5~37.2	—	—	—	—	Hex head M10×60	22.5~37.2

Note ②: Terminal screws for 1600AF and over are not provided as standard.

Rear connection (RC) (Bolt stud)				Plug-in (PM)		Draw-out (DR)	
							
Screw size (F)	Torque (N · m)	Nut size (G)	Torque (N · m)	Nut size (J)	Torque (N · m)	Screw size (K)	Torque (N · m)
—	—	—	—	—	—	—	—
—	—	—	—	Pan head M5×8 (screw)①	2.2～3.5	—	—
Pan head M4×12	1.1～1.7	Hex. nut M6	2.7～4.5	Hex. nut M6	3.6～6.0	—	—
Pan head M4×14	1.1～1.7	Hex. nut M6	2.7～4.5	Hex. nut M6	3.6～6.0	—	—
Hex head M6 nut	2.7～4.5	Hex. nut M8	6.9～10.8	Hex. nut M6	3.6～6.0	—	—
—	—	—	—	Hex. nut M12×47 (screw)	40.2～65.7	—	—
—	—	—	—	Hex. nut M12×47 (screw)	40.2～65.7	—	—
—	—	—	—	Hex. nut M12×47 (screw)	40.2～65.7	—	—
—	—	—	—	—	—	Hex head M10×45	22.5～37.2
—	—	—	—	—	—	Hex head M10×60	22.5～37.2

Note:

①. Secure the conductor with the correct nut and washer to ensure full contact of conductor with terminal on the plug-in base, so that the steel terminal bolt is not used as the current path.



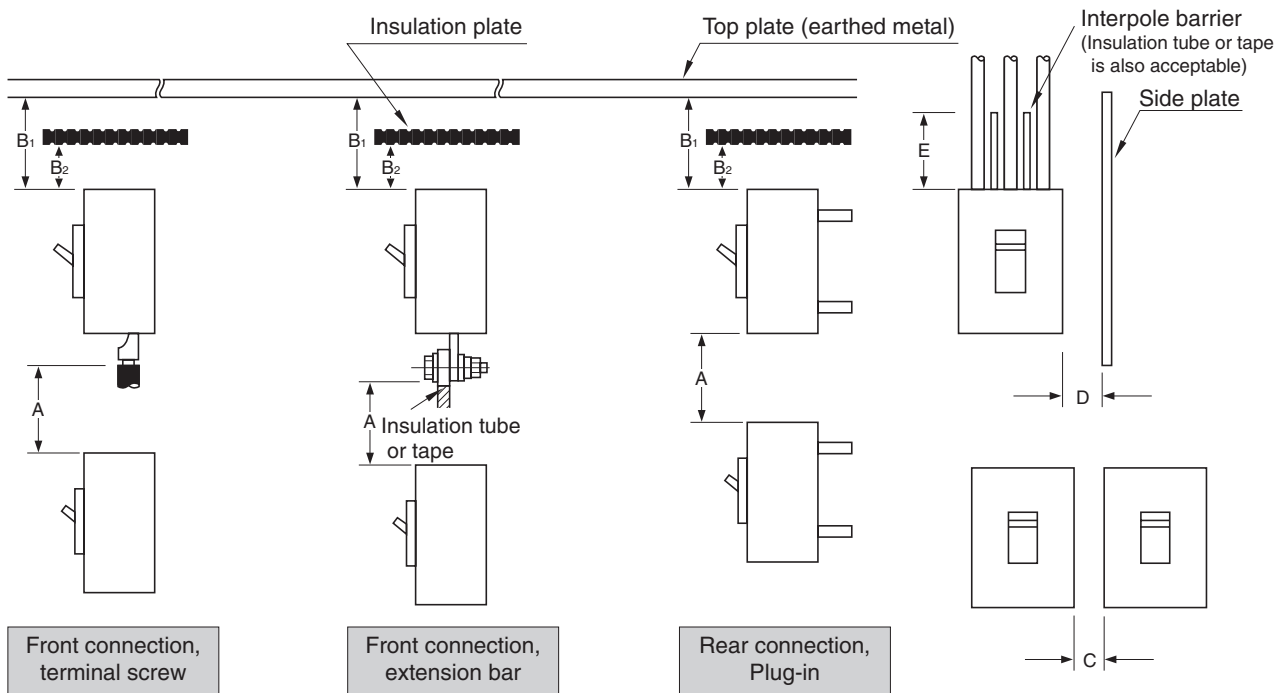
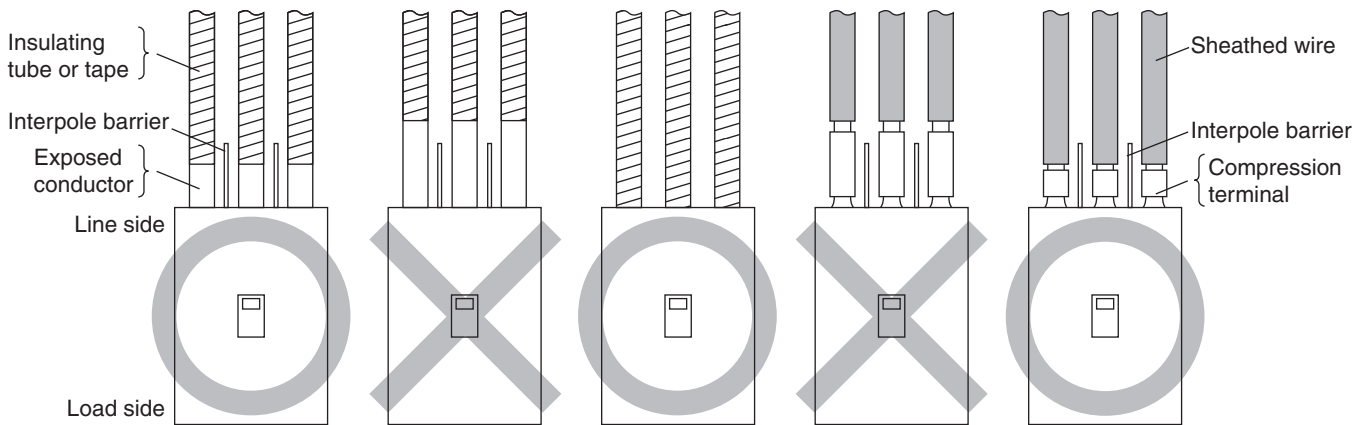
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Mounting and Connection

Molded Case Circuit Breakers

4 Insulation distance from the line side

The insulation distance between the breaker and earthed metal parts and insulators shown in the table on the next page must be maintained to prevent arcing faults occurring due to conductive ionised gas. In addition, completely cover exposed conductors, to their roots at the breaker or to below the height protected by interpole barriers, on the line side of the breaker using insulation tube or tape, in order to provide positive protection against short circuit or ground fault due to metal chipping, surge voltage, dust particles or salt. Be sure to install the interpole barriers supplied with the breaker.



- A . Distance from lower breaker to exposed live part of upper breaker terminal (front connection) or distance from lower breaker to end face of upper breaker (rear connection).
- B1 . Distance from end face of breaker to top plate.
- B2 . Distance from end face of breaker to insulation plate.
- C . Gap between breakers.
- D . Distance from side of breaker to side plate (earthed metal).
- E . Dimension of insulation over exposed conductors.

Insulation distance, mm (AC 460 V or less) ^{Note ①}

Molded Case Circuit Breakers

Series	Breaker	A Note②	B1	B2	C	D	E
Economical	E50-SF E100-SF	30	10	10	*	Possible to set close	25 Not less than the length of the bare live part ^{Note ③}
	E250-SF	50	40	40	*	Possible to set close	50 Not less than the length of the bare live part ^{Note ③}
Standard	S50-SF	30	30	10	*	Possible to set close	25 Not less than the length of the bare live part ^{Note ③}
	S125-SF	30	30	10	*	Possible to set close	25 Not less than the length of the bare live part ^{Note ③}
	S100-NF S125-NF	50	50	10	*	Possible to set close	25 Not less than the length of the bare live part ^{Note ③}
	S250-SF	50	50	40	*	Possible to set close	50 Not less than the length of the bare live part ^{Note ③}
	S225-NF S250-NF	50	50	40	*	Possible to set close	50 Not less than the length of the bare live part ^{Note ③}
	S400-CF S400-NF S400-NE	100	80	60	*	Possible to set close	80 Not less than the length of the bare live part ^{Note ③}
	S630-CF S630-NF S630-NE	120	100	80		Possible to set close	80 Not less than the length of the bare live part ^{Note ③}
	S800-CF S800-NF S800-NE	120	100	80		Possible to set close	80 Not less than the length of the bare live part ^{Note ③}
	S1250-NE	150	120	80		Possible to set close	80 Not less than the length of the bare live part ^{Note ③}
	S1600-NE	150	150	100		Possible to set close	100 Not less than the length of the bare live part ^{Note ③}
High-fault Level	S50-GF S100-GF S125-GF	75	60	25	*	Possible to set close	25 Not less than the length of the bare live part ^{Note ③}
	S225-GF S225-GE S250-GF	100	80	60	*	Possible to set close	50 Not less than the length of the bare live part ^{Note ③}
	S400-GF S400-GE	100	80	60	*	Possible to set close	50 Not less than the length of the bare live part ^{Note ③}
	S400-PF S400-PE	120	120	80	*	Possible to set close	80 Not less than the length of the bare live part ^{Note ③}
	S600-RF S600-RE	150	120	80		Possible to set close	80 Not less than the length of the bare live part ^{Note ③}
	S800-RF S800-RE	150	120	80		Possible to set close	80 Not less than the length of the bare live part ^{Note ③}
	S1250-GE	150	150	100		Possible to set close	100 Not less than the length of the bare live part ^{Note ③}
Current-limiting	H100-NF H125-NF H225-NF	100	80	60	*	Possible to set close	50 Not less than the length of the bare live part ^{Note ③}
	H400-NE	120	120	80	*	Possible to set close	80 Not less than the length of the bare live part ^{Note ③}
	H630-NE H800-NE	120	120	80		Possible to set close	80 Not less than the length of the bare live part ^{Note ③}
	TL-1000NE TL-1200NE	150	150	100		Possible to set close	100 Not less than the length of the bare live part ^{Note ③}
	L100-NF L125-NF L225-NF	100	80	60	*	Possible to set close	50 Not less than the length of the bare live part ^{Note ③}
	L400-NE	120	120	80	*	Possible to set close	80 Not less than the length of the bare live part ^{Note ③}
	L630-NE L800-NE	120	120	80		Possible to set close	80 Not less than the length of the bare live part ^{Note ③}
Motor protection	S100-NM	50	50	10	*	Possible to set close	25 Not less than the length of the bare live part ^{Note ③}
	S225-NM	50	50	40	*	Possible to set close	50 Not less than the length of the bare live part ^{Note ③}

Notes:

- ①. Required to allow free and uninterrupted flow of arc gases. Ensure additional clearance or insulation distance if required to perform wiring, barrier installation or electrical work or to meet the need for more insulation distance between bare live parts and grounded metal members in a switchboard or the like.
 - ②. The figures are for lower breakers.
 - ③. For front connection breakers, insulate all exposed conductors of the line side until the breaker end. If interpole barriers are packed, be sure to use the barriers; more over, insulate all exposed conductors by insulating tape or the like so that the tape overlaps with the barriers.
- *. If using extension bars (optional), ensure the insulation distance specified for the application.

5

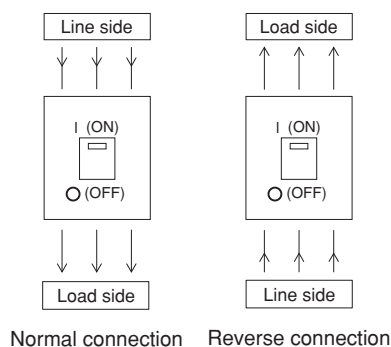
Mounting and Connection

Molded Case Circuit Breakers

5 Reverse connection

The breakers are available for normal connection by default. Reverse connection is optionally allowed. See the tables below.

Breaker	AC240V	AC415V	AC450V
E50-SF, E100-SF, E250-SF S50-SF, S50-GF, S100-NF, S100-GF S100-NM, S100-NN S125-SF, S125-NF, S125-GF S125-NN, S125-SN H100-NF, L100-NF H125-NF, L125-NF S225-NF, S225-GF, S225-GE, S225-NM H225-NF, L225-NF S250-SF, S250-NF, S250-GF, S250-SN S400-CF, S400-NF, S400-NE, S400-NN S400-GF, S400-GE, S400-PF, S400-PE H400-NE, L400-NE S630-CF, S630-NF, S630-NE, S630-RF S630-RE, S630-GN S800-CF, S800-NF, S800-NE, S800-RF S800-RE, S800-NN H630-NE, L630-NE, H800-NE, L800-NE S1250-NE, S1250-GE, S1250-NN S1600-NE, S1600-NN TB-5S, TB-5P, TB-5D XS2000NE, XS2000NN TL-1000NE, TL-1200NE	○	○	○



Series	Breaker	Number of poles	Front-connected (FC)		Rear-connected (RC)		Plug-in (PM) for switchboards			
			Screw size	Qty	Screw size	Qty	Standard		High-fault Level	
							Screw size	Qty	Screw size	Qty
Economical	E50-SF	2,3	Pan head M4×35	2	Pan head M4×35	2	Pan head M4×35	2	—	—
	E100-SF	2,3	Pan head M4×65	2	Pan head M4×65	2	Pan head M4×65	2	—	—
	E250-SF	2,3	Pan head M4×55	2	Pan head M4×55	2	Pan head M4×65	2	—	—
Standard	S50-SF	2,3	Pan head M4×61	2	Pan head M4×61	2	Pan head M4×75	2	—	—
	S50-GF	3	Pan head M4×55	2	Pan head M4×55	2	Pan head M4×58	2	Pan head M4×80	2
		4	Pan head M4×55	4	Pan head M4×55	4	Pan head M4×58	4	Pan head M4×80	4
	S100-NF, S100-GF	2,3	Pan head M4×55	2	Pan head M4×55	2	Pan head M4×58	2	Pan head M4×80	2
		4	Pan head M4×55	4	Pan head M4×55	4	Pan head M4×58	4	Pan head M4×80	4
	S125-SF	2,3	Pan head M4×61	2	Pan head M4×61	2	Pan head M4×75	2	—	—
		4					Pan head M4×75	4		
	S125-NF, S125-GF	2,3	Pan head M4×55	2	Pan head M4×55	2	Pan head M4×58	2	Pan head M4×80	2
		4	Pan head M4×55	4	Pan head M4×55	4	Pan head M4×58	4	Pan head M4×80	4
	S100-NM	3	Pan head M4×55	2	Pan head M4×55	2	—	—	—	—
	S225-NF, S225-GF	2,3	Pan head M4×55	2	Pan head M4×55	2	Pan head M4×65	2	Pan head M4×80	2
	S250-NF, S250-GF	4	Pan head M4×55	4	Pan head M4×55	4	Pan head M4×65	4	Pan head M4×80	4
	S250-SF	2,3	Pan head M4×55	2	Pan head M4×55	2	Pan head M4×65	2	—	—
		4	Pan head M4×55	4	Pan head M4×55	4	Pan head M4×65	4	—	—
	S225-GE	3	Pan head M4×90	2	Pan head M4×90	2	Pan head M4×100	2	Pan head M4×115	4
		4	Pan head M4×90	4	Pan head M4×90	4	Pan head M4×100	4	Pan head M4×115	4
	S225-NM	3	Pan head M4×55	2	Pan head M4×55	2	—	—	—	—
	S400-CF, S400-NF S400-GF S400-NE, S400-GE S400-PF, S400-PE	3,4	Pan head M6×100	4	Pan head M6×100	4	Pan head M6×100	4	Pan head M6×120	4
	S630-CF, S630-NF, S630-RF S630-NE, S630-RE S800-CF, S800-NF, S800-RF S800-NE, S800-RE	3,4	Pan head M8×45	4	Pan head M8×45	4	Cap nut *	4	Pan head M8×45	4
	S1250-NE, S1250-GE	3,4	Pan head M8×50	4	Pan head M8×50	4	Cap nut *	4	—	—
	S1600-NE	3,4	Pan head M8×50	4	Pan head M8×50	4	—	—	—	—
Current limiting	H100-NF, H125-NF, H225-NF	3	Pan head M4×90	2	Pan head M4×90	2	Pan head M4×100	2	Pan head M4×115	4
	L100-NF, L125-NF, L225-NF	4	Pan head M4×90	4	Pan head M4×90	4	Pan head M4×100	4	Pan head M4×115	4
	H400-NE, L400-NE	3,4	Pan head M6×140	4	Pan head M6×140	4	Pan head M6×140	4	Pan head M6×160	4
	H630-NE, L630-NE H800-NE, L800-NE	3,4	Pan head M8×85	4	Pan head M8×85	4	Cap nut *	4	Pan head M8×85	4
Switch disconnector	S125-SN	3	Pan head M4×61	2	Pan head M4×61	2	Pan head M4×80	2	—	—
		4					Pan head M4×80	4		
	S100-NN, S125-NN	3	Pan head M4×55	2	Pan head M4×55	2	Pan head M4×58	2	Pan head M4×80	2
		4	Pan head M4×55	4	Pan head M4×55	4	Pan head M4×58	4	Pan head M4×80	4
	S250-SN	3	Pan head M4×55	2	Pan head M4×55	2	Pan head M4×55	2	—	—
		4	Pan head M4×55	4	Pan head M4×55	4	Pan head M4×55	4	—	—
	S400-NN	3,4	Pan head M6×100	4	Pan head M6×100	4	Pan head M6×100	4	Pan head M6×120	4
	S630-GN, S800-NN	3,4	Pan head M8×45	4	Pan head M8×45	4	Cap nut *	4	Pan head M8×45	4
	S1250-NN	3,4	Pan head M8×50	4	Pan head M8×50	4	Cap nut *	4	—	—
	S1600-NN	3,4	Pan head M8×50	4	Pan head M8×50	4	—	—	—	—

※. Width across flats of hex socket: 8 mm (M10), thread size: M8

Series	Breaker	Number of poles	Front-connected (FC)		Rear-connected (RC)		Plug-in (PM) for switchboards	
			Screw size	Qty	Screw size	Qty	Standard	Qty
Standard	XS2000NE	3,4	Hex socket head M10×160	4	Hex socket head M10×120	4	—	—
Current limiting	TL-1000NE, TL-1200NE	3,4	Pan head M8×50	4	Pan head M8×50	4	Cap nut *	4
Non-automatic trip breaker	XS2000NN	3,4	Hex socket head M10×160	4	Hex socket head M10×120	4	—	—

Notes:

①. The length of mounting screws may differ from the standard one if the breaker is equipped with external accessories (motor operator, external operation handle, etc.)

Consult the operating Instructions of external accessories for details.

※. Width across flats of hex socket: 8 mm (M10), thread size: M8

6

Accessories

1	OCR for electronic breakers	6-2
1.	TemBreak2 Electronic OCR	6-2
2.	TemBreak Electronic OCR	6-6
2	Internally mounted accessories	6-10
1.	Overview	6-10
2.	Connection diagrams and terminal numbers	6-11
3.	Possible combinations	6-12
4.	Ratings and operation data of auxiliary and alarm switches	6-15
5.	Shunt trip device (SHT)	6-16
6.	Undervoltage trip device (UVT)	6-17
3	Externally mounted accessories	6-20
1.	Overview	6-20
2.	Toggle extension (HA)	6-21
3.	Toggle holder (HH) and toggle lock (HL)	6-22
4.	Motor operators (MC)	6-24
5.	External operating handles	6-30
	(1) Breaker-mounted (field installable)(HB)	6-30
	(2) Breaker-mounted (HB)	6-38
	(3) Door-mounted (depth adjustable) (HP)	6-43
	(4) Door-mounted (depth fixed) (HP)	6-55
6.	Terminal covers CF/CR/CS	6-56
	(1) CF for front-connected breakers	6-56
	(2) CR for rear-connected and plug-in breakers	
	CS for front-connected breakers with cable clamps	6-58
7.	Interpole barriers (BA)	6-60
8.	Terminal blocks (TF)	6-61
9.	Mechanical interlock	6-68
	• Slide interlock (MS)	6-68
10.	Door Flange (DF)	6-85

6

Accessories

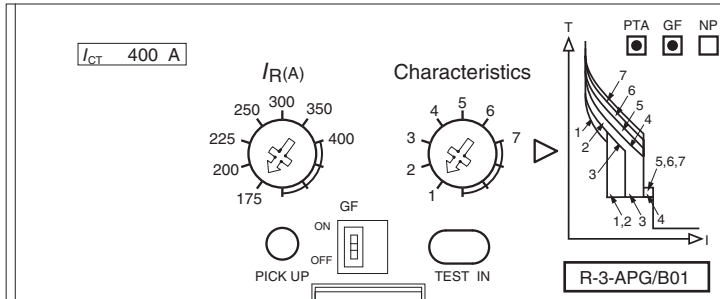
Molded Case Circuit Breakers

1 OCR for electronic breakers

1. TemBreak2 Electronic OCR (Standard type)

(1) Overcurrent trip characteristics

■ TemBreak2 electronic OCR for S400-NE



■ TemBreak2 OCR Specifications

CT rated current (I_{CT})	poles	Protection code	Long time, Short time, Instantaneous	Preferential trip alarm (PTA)	Ground fault trip (GF)	Neutral protection (NP)
			A	P	G	N
250	3	A	●	—	—	—
	3	AP	●	●	—	—
	4	A	●	—	—	—
	4	AP	●	●	—	—
	4	AN	●	—	—	●
400 630 800 1000 1250 1600	4	APN	●	●	—	●
	3	A	●	—	—	—
	3	AP	●	●	—	—
	3	AG	●	—	●	—
	3	APG	●	●	●	—
	4	A	●	—	—	—
	4	AP	●	●	—	—
	4	AN	●	—	—	●
	4	APN	●	●	—	●
	4	AGN	●	—	●	●
	4	APGN	●	●	●	●

■ OCR characteristics for S400-NE

Characteristics No.		1	2	3	4	5	6	7
Long time-delay pick-up current (A) : (I_p)		CT rated current : (I_{CT}) = 250A 125, 150, 175, 200, 225						
		CT rated current : (I_{CT}) = 400A 175, 200, 225, 250, 300, 350, 400						
Long time-delay time settings (s) : (t_p)		11	21	21	5	10	19	29
		at 200%×(I_p)				at 600%×(I_p)		
		Setting tolerance ±20%						
Short time-delay pick-up current (A) : (I_{sd})		2.5	2.5	5	10	10	10	10
		Setting tolerance ±15%						
Short time-delay time settings (s) : (t_{sd})		0.1	0.1	0.1	0.1	0.2	0.2	0.2
		Total clearing time +50ms, resettable time −20ms						
Instantaneous trip pick-up current (A) : (I_l)		(I_p)×1400% Setting tolerance ±20%			Max: (I_{CT})×1300%			
Option	Preferential trip alarm							
	Pick-up current (A) : (I_p)		(I_p)×80% Setting tolerance ±10%					
	Time-settings (s) : (t_p)		Definite time-delay characteristic, 40sec. Setting tolerance ±10%					
	Ground fault trip							
	Pick-up current (A) : (I_g)		(I_{CT})×20% Setting tolerance ±15%①					
	Time-settings (s) : (t_g)		Definite time-delay characteristic, 0.2sec. Total tripping time +50ms, resettable time −20ms.					
	Neutral protection							
	Pick-up current (A) : (I_h)	(I_p)×100% or 50% selectable ②						
	Time-settings (s) : (t_h)	(t_h)=(t_p) Same as Long time-delay time settings						

Notes:

- ①. Ground fault trip is not available when (I_{CT}) is 250A.
- ②. In case of (I_p)<(I_{CT}), the setting tolerance becomes big when (I_p) is set at (I_p)×50%. Characteristic No.4 will be applied as standard setting unless otherwise specified.

■ Applicable breakers

Frame size (A)	Type of breaker
225	S225-GE
400	S400-NE, S400-GE, S400-PE H400-NE, L400-NE
630	S630-NE, S630-RE, H630-NE, L630-NE
800	S800-NE, S800-RE, H800-NE, L800-NE
1250	S1250-NE, S1250-GE
1600	S1600-NE

TemBreak2 electronic OCR allows you to achieve a wide range of protection simply by setting two dials located on the front of the breakers; one for selecting the rated current and the other for selecting a protection characteristic.

Coming standard with seven protection characteristics, the OCR provides optimum selective coordination between upstream breakers and downstream breakers and/or loads.

(5 protection characteristics for S225-GE)

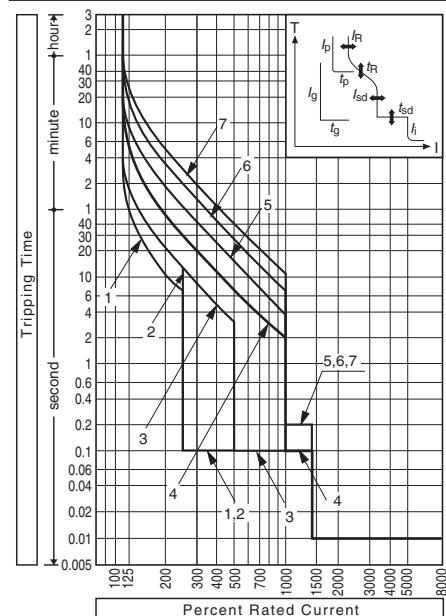
Characteristic 1: For generator protection

Characteristics 2, 3 and 4: For general feeder protection. The possibility of selecting one from three options makes it easy to achieve selective coordination with upstream or downstream breakers.

Characteristics 5, 6 and 7: For motor protection. The selection of the option best suited to motor startup characteristics provides an optimum protection solution to motors.

If you require a characteristic which is not available as a preset on our standard electronic protection unit, send us the details and we will program a customized characteristic to your specification. Note: Characteristic is programmable within certain limits. Contact us for details.

Time/Current characteristic curves



Ex.S400-NE

(2) Optional OCR functions

■ Pretrip alarm (PTA)

The pretrip alarm function causes the alarm LED to flash when the load current exceeds 80% of the rated current (I_R) and, after 40 seconds, provides a contact output (1a). The contact output can be used to provide an alarm. The PTA function uses RMS sensing and hence does not suffer a malfunction due to harmonics. Control power and the OCR controller (supplied by Terasaki) are required to use this function.

Note ① : When the OCR controller is installed on the breaker, the breaker cannot be equipped with a terminal block for connection to the shunt trip device and undervoltage trip device.

● Specifications of OCR controller

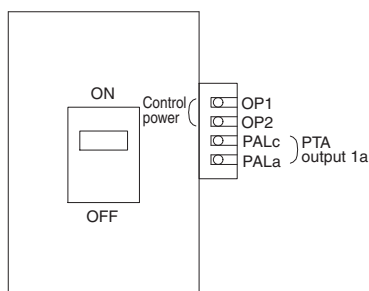
Control voltage ② (Rated voltage)	AC100 – 120 V or AC200 – 240 V
Current consumption, VA	2VA
Note ② : The control voltage must be 85 to 110% of the rated voltage. Please state the rated voltage when ordering.	

Operating time (s) [t_p]	40 secs (fixed definite time-delay) setting tolerance is $\pm 10\%$.		
Output contact	Normally open contact, (1a) Integral lead is standard. length (450mm)		
		Resistive load	Inductive load
Rating of contact	250V AC	125V A (2A max)	20V A (2A max)
	220V DC	60W (2A max)	10W (2A max)
Tripped indication	Pick-up LED flickers		

NOTE: the pick-up LED flickers at a higher current than [I_p].
When higher current flows continuously for 40 secs, the contact (1a) automatically resets.

● OCR controller connection diagram

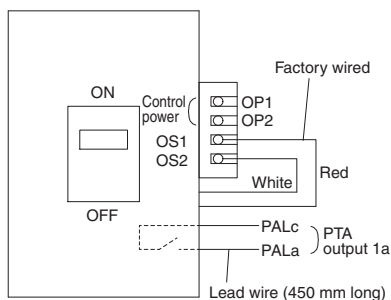
Applicable breakers: S225-GE



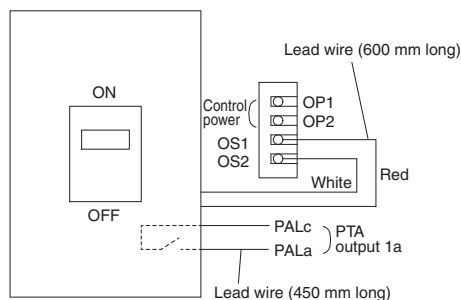
Note ③ : Separate installation of the OCR controller is not available.

Applicable breakers: S400-NE, S400-GE, S400-PE, H400-NE, L400-NE
S630-NE, S630-RE, H630-NE, L630-NE
S800-NE, S800-RE, H800-NE, L800-NE
S1250-NE, S1250-GE, S1600-NE

OCR controller installed on the breaker



OCR controller installed external to the breaker



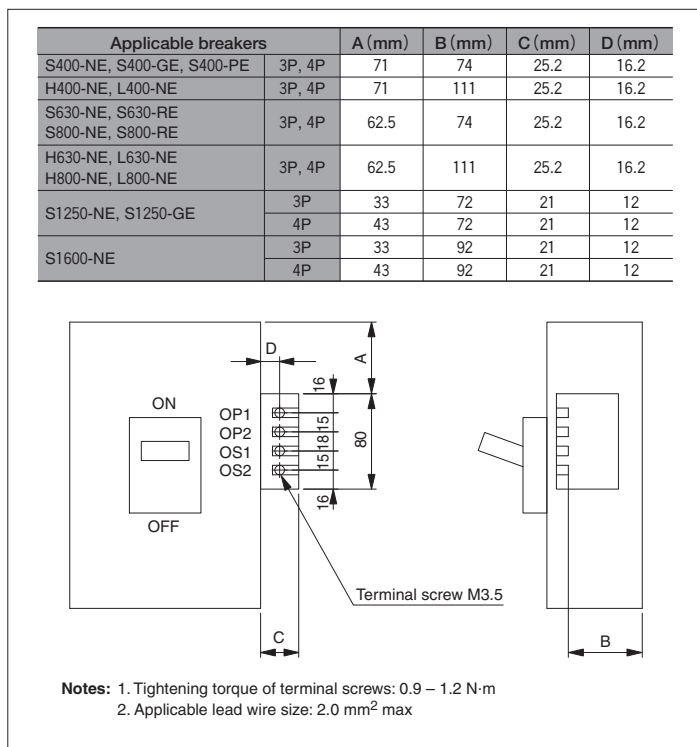
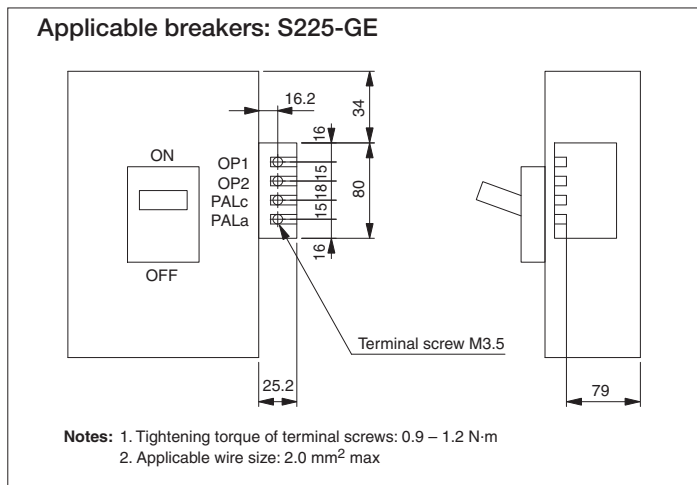
Note ④ : Standard installation of the OCR controller is on the right side of the breaker.
Separate installation is standard for the flush-mounted breakers.

Molded Case Circuit Breakers

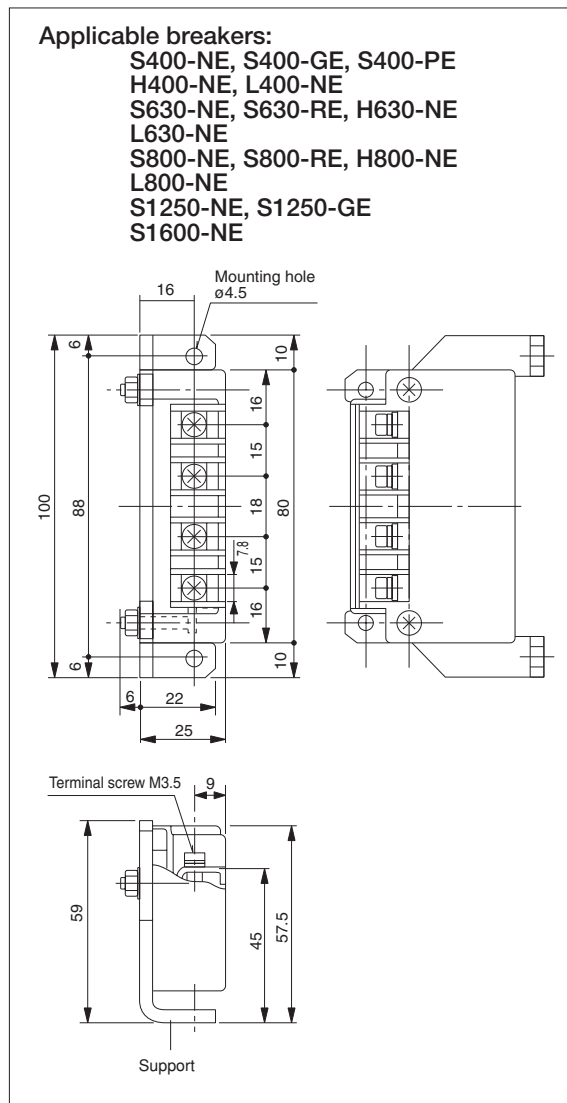
1 OCR for electronic breakers

(2) Optional OCR functions

- Mounting dimensions and terminal arrangement of the OCR controller installed on the breaker



- Outline of the OCR controller installed external to the breaker



■ Ground fault trip (GF)

The ground fault trip pickup current is 20% of the CT rated current (I_{CT}). The GF function provides protection against fire that may be caused by arcing ground fault current. The GF function is not available when I_{CT} is 250A.

Note: Separate type neutral CT is required when the GF function is added to a 3-pole breaker used in a 3-phase, 4-wire system. Contact us for details.

■ N-phase protection (NP)

The NP function is available on 4-pole breakers and provides protection to the neutral conductor in a 3-phase, 4-wire system against overcurrent. The NP pickup current (I_N) can be selected with 1.0 or $0.5 \times I_R$ rated current. For S225 and H225, I_N is $1.0 \times I_R$ only. Characteristic of N-phase protection (t_N vs I_N) is identical to characteristic of phase protection (t_R vs I_R).

6

Accessories

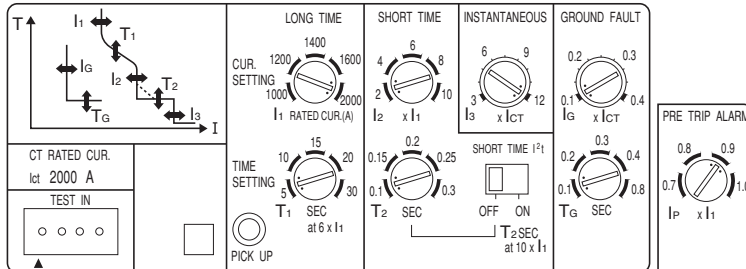
Molded Case Circuit Breakers

1 OCR for electronic breakers

2. TemBreak Electronic OCR

(1) Overcurrent trip characteristics

■ TemBreak electronic OCR for XS2000NE



Standard Protective Characteristics

The electronic type TemBreak incorporates an adjustable long time-delay, short time-delay and instantaneous trips, enabling co-ordination with fuses on the high voltage side and down stream breakers.

Adjustable LTD

Essential for general industrial plants and generator protection

Ramp Characteristic [I^2t], STD

The ramp characteristic [I^2t] enables precise co-ordination with thermal magnetic MCCBs or fuses. The ramp characteristic or the definite time-delay characteristic can be used by operating the OFF-ON switch (on for [I^2t] ramp characteristic).

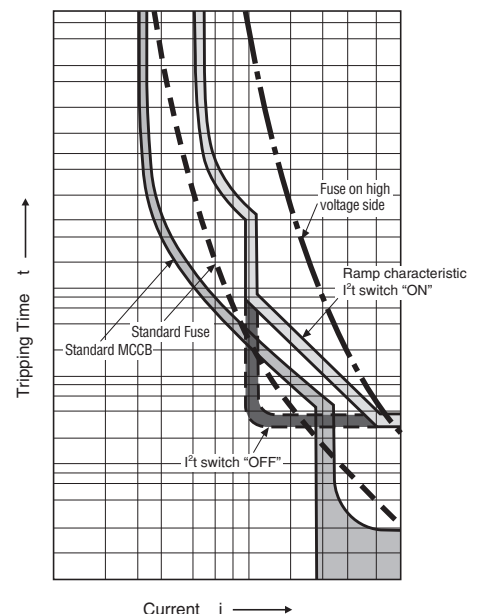
The definite time-delay characteristic is 1000% of the rated current [I_1]

■ OCR characteristics for XS2000NE

CT rated current (A) (I_{CT})	2000
Long time-delay pick-up current (A) (I_1)	1000, 1200, 1400, 1600, 1800, 2000
Long time-delay time settings (S) (T_1)	(5–10–15–20–30) at (I_1) x 600% current Setting tolerance $\pm 20\%$
Short time-delay pick-up current (A) (I_2)	(I_1) x 200, 400, 600, <u>800</u> , 1000% Setting tolerance $\pm 15\%$
Short time-delay time settings (S) (T_2)	Opening time (0.1, 0.15, <u>0.2</u> , 0.25, 0.3) in the definite time-delay. Total clearing time is +50ms and resettable time –20ms for the time-delay settings
Instantaneous trip pick-up current (A) (I_3)	Continuously adjustable from (I_{CT}) x 300 ~ <u>1200</u> %. Setting tolerance $\pm 20\%$
Pre-trip alarm pick-up current (A) (I_P) (optional)	(I_1) x 70, 80, 90, 100% Setting tolerance $\pm 10\%$
Pre-trip alarm time setting (S) (T_P) (optional)	40 fixed definite time-delay. Setting tolerance $\pm 10\%$
Ground fault trip pick-up current (A) (I_G) (optional) ⁶⁴	Continuously adjustable from (I_{CT}) x <u>10</u> ~ 40% Setting tolerance $\pm 15\%$
Ground fault trip-time setting (S) (T_G) (optional) ⁶⁴	Opening time (0.1, 0.2, 0.3, 0.4, <u>0.8</u>) in the definite time- delay. Total clearing time is +50ms and resettable time –20ms for the time-delay settings

NOTE: The underlined values will be applied as standard ratings unless otherwise specified when ordering

Time/Current characteristic curves



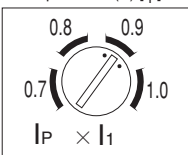
(2) Optional OCR functions

■ Pretrip alarm (PTA)

The pretrip alarm function causes the alarm LED to flash when the load current exceeds the pre-set current value and, after 40 seconds, provides a contact output (1a). The contact output can be used to provide an alarm. The PTA function uses RMS sensing and hence does not suffer a malfunction due to harmonics. Control power and the OCR controller (supplied by Terasaki) are required to use this function.

● PTA specifications

Pick-up current (A) [I_P]



Adjustable steps of 70, 80, 90, 100% of the selected rated current [I_1].

Setting tolerance $\pm 10\%$

Note: The long time-delay trip does not operate 'first' when the pick-up current is adjusted to 100% of the rated current [I_1].

Operating time (s) [T_P]

40 secs (fixed definite time-delay) setting tolerance is $\pm 10\%$.

Output contact

Normally open contact, (1a) Integral lead is standard length (450mm)

	Resistive load	Inductive load
Rating of contact	250V AC 125V A (2A max)	20V A (2A max)
	220V DC 60W (2A max)	10W (2A max)

Tripped indication ①

Pick-up LED flickers

Note ①: the pick-up LED flickers at a higher current than [I_P].

When higher current flows continuously for 40 secs, the contact (1a) automatically resets.

● OCR controller (PTA and trip indication)

The OCR controller is installed in the left hand of the breaker (standard). This can also be installed externally to the breaker (please specify when ordering).

● Specifications of OCR controller

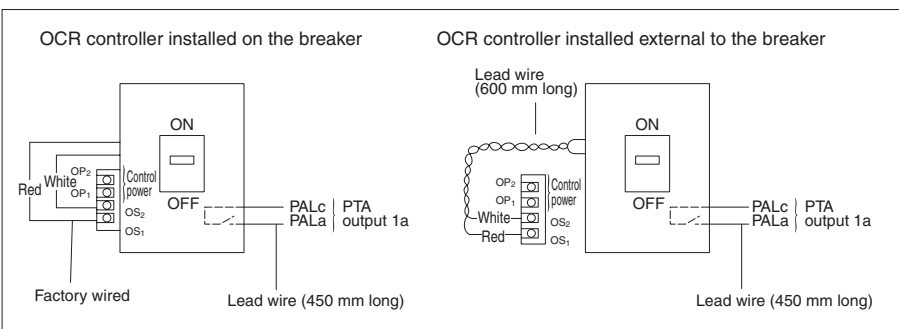
Control voltage ② AC100 - 120 V or AC200 - 240 V

(Rated voltage)

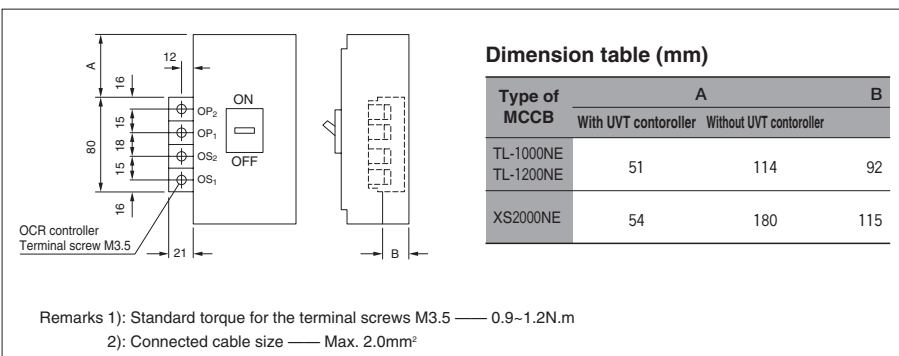
Current consumption, VA 2VA

Note ②: The control voltage must be 80 to 110% of the rated voltage. Please state the rated voltage when ordering.

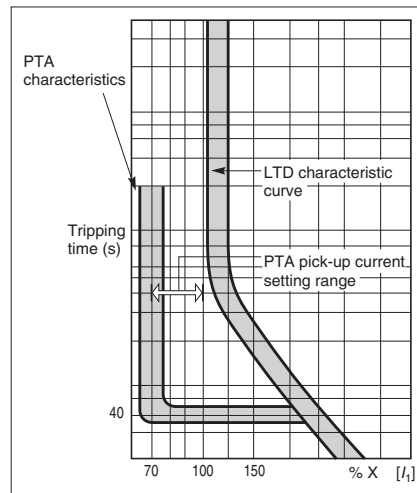
● OCR controller connection diagram



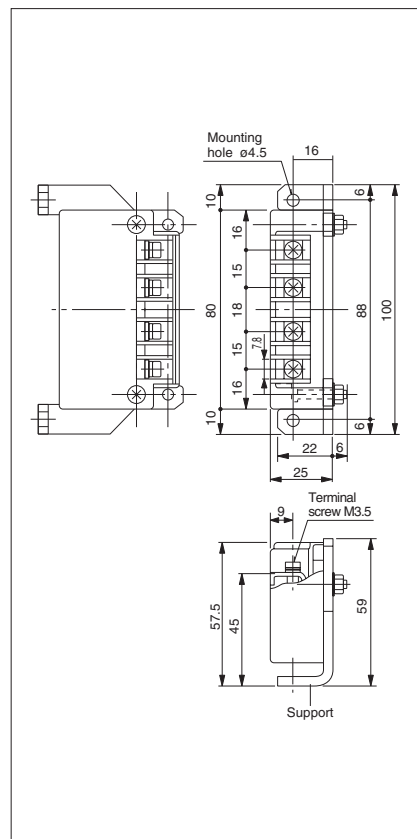
● Mounting dimensions and terminal arrangement of the OCR controller installed on the breaker



● PTA Characteristics



● Outline of the OCR controller installed external to the breaker



6

Accessories

Molded Case Circuit Breakers

1 OCR for electronic breakers

(2) Optional OCR functions

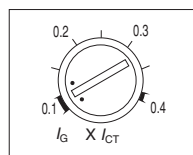
■ Ground fault trip (GF)

The ground fault trip pickup current is 10 to 40% of the CT rated current (I_{CT}). The GF function provides protection against fire that may be caused by arcing ground fault current.

Note that a separate type neutral CT is required when the GF function is added to a 3-pole breaker used in a 3-phase, 4-wire system. Contact us for details.

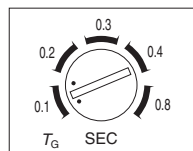
● GF Specifications

Pick-up current (A): [I_G]



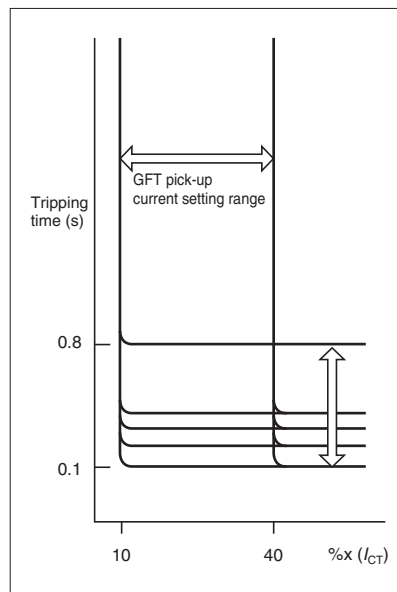
Continuously adjustable from 10 to 40% of the rated CT current [I_{CT}].
Setting tolerance $\pm 15\%$

Time-delay (S) [T_G]



The GFT has a definite time-delay characteristic and is adjustable in steps of 0.1, 0.2, 0.3, 0.4 and 0.8s.
Total clearing time is +50ms and resettable time is -20ms for the pre-set time-delay.

● GF characteristics

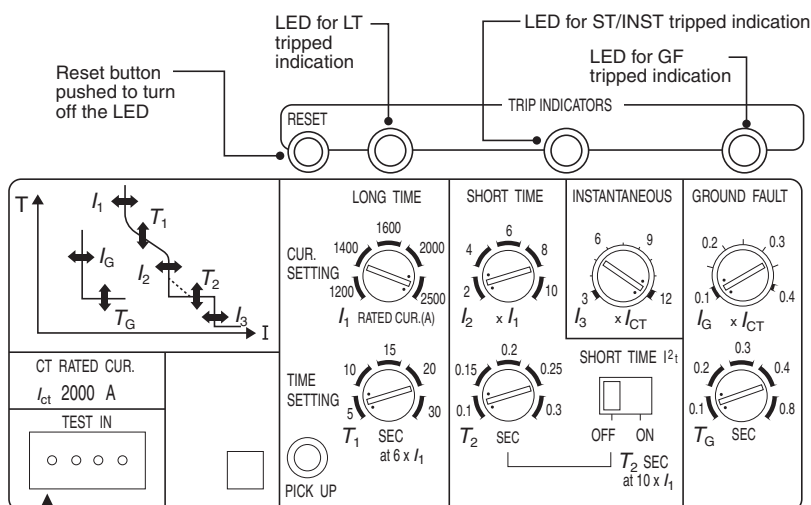


■ Trip indicators

The LEDs, when lit, indicate which trip function tripped the breaker; Long time-delay (LTD), short time-delay/instantaneous (ST/INST) or ground fault (GF) (control power required)

If a pre-trip alarm (PTA) is fitted, the LED control power can be used (common). See page 6-7 for PTA. This is not applicable to high instantaneous trip breakers (See page 4-3).

● Trip indicator display

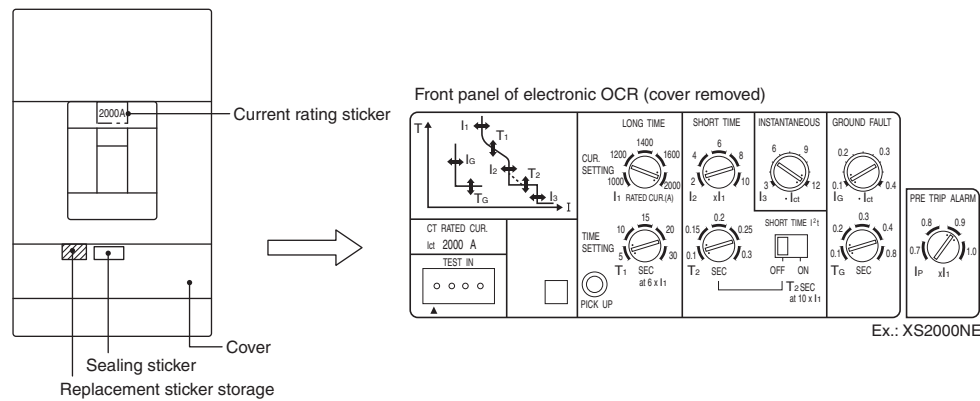


Example XS2000NE

(3) How to change the tripping characteristics

The electronic breakers are designed so that their protective functions, i.e., long time delay trip, short time delay trip, instantaneous trip, ground fault trip and pretrip alarm functions, can be adjusted depending on a change in load or layout of power distribution lines.

Outer view



Item	Rated current	Long time delay trip, short time delay trip, instantaneous trip, ground fault trip, pretrip alarm
Adjusting procedure	• Turn OFF the breaker before changing the settings. 1. Peel the sealing sticker off, loosen the cover mounting screws and remove the cover. 2. Rotate the “RATED CUR. (A)” dial using a flatblade screwdriver so that the black points on the dial point the desired position. LONG TIME CT RATED CUR. I_{ct} 2000 A (Ex.: XS2000NE) 3. Take an appropriate current rating sticker and a sealing sticker from the replacement sticker storage. 4. Peel the existing current rating sticker off and affix the replacement current rating sticker. 5. Reinstall the cover and affix the replacement sealing sticker.	• Turn OFF the breaker before changing the settings. 1. Peel the sealing sticker off, loosen the cover mounting screws and remove the cover. 2. Rotate the desired dial using a flatblade screwdriver so that the black points on the dial point the desired position. The instantaneous trip and ground fault trip pickup current can be continuously adjusted. 3. Take a sealing sticker from the replacement sticker storage. 4. Reinstall the cover and affix the replacement sealing sticker.

6

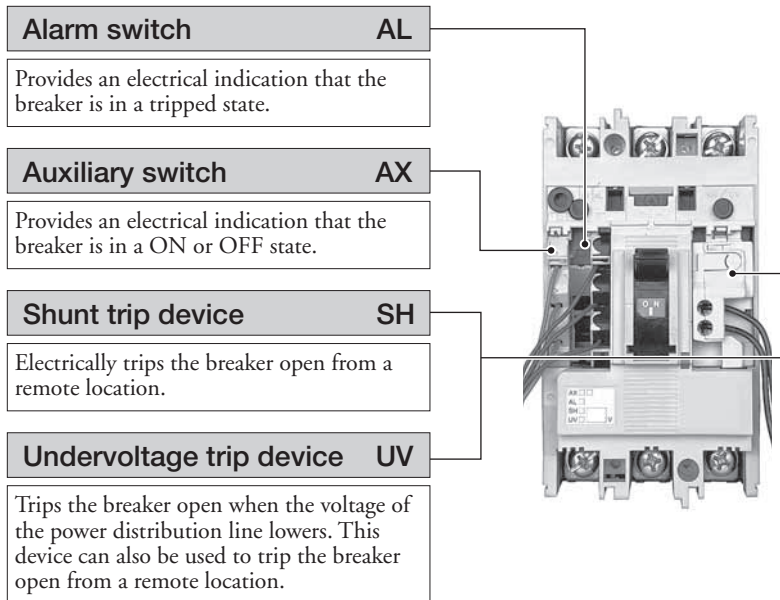
Accessories

Molded Case Circuit Breakers

2 Internally mounted accessories

1. Overview

The following internally mounted accessories are available. See the tables of possible combinations of internally mounted accessories on pages 6-12 to 6-14 for the number of accessories that can be installed per breaker and their locations.



Caution: Combined use of SH and UV is not available.

Termination or ending of lead wires from accessories

There are three manners in which lead wires from accessories are ended or terminated, as shown below:

Lead wires are open:

- Standard lead wire ending manner for front-connected, rear-connected and flush-mounted breakers. Lead wires from accessories are derived vertically, thereby enabling contact mounting.

Lead wire specifications

accessory	Grade	Size	Finished OD	Length	Color
SH	Heat resistant	0.5mm ²	3mmø	500mm	Black
UV			3mmø	500mm	Black
AX			1.8mmø	700mm	Gray
AL			1.8mmø	700mm	Black



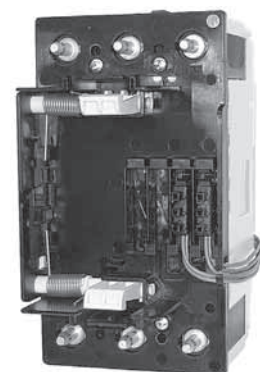
Lead wires are terminated in a terminal block:

- Optional lead wire termination manner for front-connected and rear-connected breakers.
- There are two types of terminal blocks available depending on the direction in which lead wires are derived; vertical and horizontal. See pages 6-61 to 6-67 for details.



Lead wires are ended at auxiliary circuit (self-engaging) terminals:

- Standard lead wire ending manner for plug-in breakers.
- See pages 9-4 and 9-7 for the standard arrangement of auxiliary circuit terminals. Contact us for other arrangements.



Molded Case Circuit Breakers

2 Internally mounted accessories

2. Connection diagrams and terminal numbers

Accessory	Combination symbol	Connection diagram and terminal No.		Remarks
Shunt trip device (SH)		• With anti-burn switch		Applicable to E50-SF, E100-SF, E50-CM, TL-1000NE and TL-1200NE. Shunt trips are fitted with anti-burn switches.
		• Without anti-burn switch		Applicable to other breakers except above breakers. Shunt trips are continuous rating without anti-burn switches.
Undervoltage trip device (UV)		For AC With UVT controller		Applicable to E50-SF, E100-SF, TL-1000NE and TL-1200NE. UVT controller is required for AC UVT. See page 6-18 for the details.
				Applicable to other breakers except above breakers.
Auxiliary switch (AX)				1pc Aux. SW installed.
				2pcs Aux. SW installed.
				4pcs Aux. SW installed.
				6pcs Aux. SW installed.
				Applicable to E50-SF, E100-SF and E50-CM
Alarm switch (AL)				1pc Alarm. SW installed.
				2pcs Alarm. SW installed. Available for S125-SF, S250-SF, S630, S800, S1250 and S1600.
				Applicable to E50-SF, E100-SF and E50-CM

6

Accessories

Molded Case Circuit Breakers

2 Internally mounted accessories

3. Possible combinations

Molded Case Circuit Breakers

Economical series				E225-NF	E250-SF			
Standard series	S50-SF S125-SF	S50-SF S125-SF	S100-NF S125-NF	S100-NF S125-NF S225-NF S250-NF	S250-SF	S400-CF S400-NF S400-NE	S630-CF S630-NF S630-NE S800-CF S800-NF S800-NE	S1250-NE S1600-NE
Type				S50-GF S100-GF S125-GF S225-GF S250-GF		S400-GF S400-GE S400-PF S400-PE	S630-RF S630-RE S800-RF S800-RE	S1250-GE
Current limiting series				H100-NF H125-NF H225-NF		H400-NE	H630-NE H800-NE	
Current limiting series				L100-NF L125-NF L225-NF		L400-NE	L630-NE L800-NE	
Motor protection series				S100-NM S225-NM				
Number of poles ①	2	3	2	3	3	3	3	3
Combinations of accessories	AX							
	AL							
	SH							
	UV							
	AX AL							
	AX SH							
	AX UV							
	AL SH							
	AL UV							
	AX AL SH							
	AX AL UV							

Notes:

①: The two-pole type breaker obtained by modifying a three-pole breaker by removing the conductive part of its central pole is regarded as the same as the three-pole type.

Molded Case Circuit Breakers

	E50-SF	E50-SF	E100-SF	E100-SF		
Economical series						
Standard series						XS2000NE
Type						
High-fault level series						
Current limiting series					TL-1000NE TL-1200NE	
Number of poles ①	2	3	2	3	3	3
Combinations of accessories						
AX						
AL						
SH						
② UV						
AX AL						
AX SH						
AX ② UV						
AL SH						
AL ② UV						
AX AL SH						
AX AL UV						

Notes:

- ① : The two-pole type breaker obtained by modifying a three-pole breaker by removing the conductive part of its central pole is regarded as the same as the three-pole type.
For the four-pole type, also see the column for the three-pole type.
- ② : A breaker with AC UVT is provided with an external UVT controller. See page 6-18.

Molded Case Circuit Breakers

Motor protection series

Type	E50-CM
Number of poles	3
AX	
AL	
SH	
UV	
AX AL	
AX SH	
AX UV	
AL SH	
AL UV	
AX AL SH	
AX AL UV	

Molded Case Circuit Breakers

2 Internally mounted accessories

3. Possible combinations

Molded Case Circuit Breakers

Switch disconnectors

Type	S125-SN	S100-NN S125-NN	S250-SN	S400-NN	S630-GN S800-NN	S1250-NN S1600-NN
Number of poles	3	3	3	3	3	3
AX						
AL						
SH						
UV						
Combinations of accessories						
AX AL						
AX SH						
AX UV						
AL SH						
AL UV						
AX AL SH						
AX AL UV						

Molded Case Circuit Breakers

Non-automatic breakers

Type	XS2000NN
Number of poles	3
AX	
AL	
SH	
UV	
Combinations of accessories	
AX AL	
AX SH	
AX ② UV	
AL SH	
AL ② UV	
AX AL SH	
AX AL ② UV	

Notes:

② : A breaker with AC UVT is provided with an external UVT controller. See page 6-18.

4. Ratings and operation data of auxiliary and alarm switches

(1) Ratings of AX and AL

• The applicable load of the switch shall be no larger than the rating and no smaller than the minimum load.

Type of breaker	Standard						For microload ①			
	AC (V)			DC (V)			Minimum load	DC (V)		Minimum load
	Voltage (V)	Current (A)		Voltage (V)	Current (A)			Voltage (V)	Current (A)	
		Resistive load	Inductive load ②		Resistive load	Inductive load ②				
E225-NF E250-SF S50-SF S125-SF S50-GF S100-NF, S100-GF S125-NF, S125-GF S225-NF, S225-GF S225-GE S250-NF, S250-GF S400-CF, S400-NF S400-GF, S400-GE S400-PF, S400-PE S630-CF, S630-NF, S630-RF S630-NE, S630-RE S800-CF, S800-NF, S800-RF S800-NE, S800-RE S1250-NE S1600-NE S250-SF H100-NF, L100-NF H125-NF, L125-NF H225-NF, L225-NF H400-NF, L400-NE H630-NE, L630-NE H800-NE, L800-NE S100-NM S225-NM S125-SN S250-SN S100-NN S125-NN S400-NN S630-GN S800-NN S1250-NN S1600-NN	480	—	—	250	—	—	DC15V 100mA	30	0.1	DC5V 1mA
S630-NE, S630-RE S800-CF, S800-NF, S800-RF S800-NE, S800-RE S1250-NE S1600-NE S250-SF H100-NF, L100-NF H125-NF, L125-NF H225-NF, L225-NF H400-NF, L400-NE H630-NE, L630-NE H800-NE, L800-NE S100-NM S225-NM S125-SN S250-SN S100-NN S125-NN S400-NN S630-GN S800-NN S1250-NN S1600-NN	250	3	2	125	0.4	0.05				
S100-NM S225-NM S125-SN S250-SN S100-NN S125-NN S400-NN S630-GN S800-NN S1250-NN S1600-NN	125	3	2	30	3	2				
E50-SF, E100-SF, E50-CM	480	—	—	250	0.2	0.03	DC6V 100mA DC24V 25mA	125	0.1	DC6V 5mA DC24V 1.25mA
	250	3	2	125	0.4	0.05		30	0.1	
	125	3	2	30	3	2				
XS2000NE TL1000-NE, TL1200-NE XS2000NN	480	3	2	250	0.3	0.3	DC5V 160mA DC30V 26.7mA	30	0.1	DC5V 1mA DC30V 1mA
	250	5	5	125	0.6	0.6				
	125	5	5	30	5	4				

Note: ① This is a custom-made product. When ordering for this product, specify that it is intended for minute load use.

Note: ② The inductive load means power factor of no smaller than 0.4 and time constant of no larger than 7 ms.

(2) Operation of AX and AL

Switch	Breaker status	[ON]	[OFF]	[TRIP]
Auxiliary switch (AX) status		11/AXc-14/AXa "Closed" 11/AXc-12/AXb "Open"	11/AXc-14/AXa "Open" 11/AXc-12/AXb "Closed"	11/AXc-14/AXa "Open" 11/AXc-12/AXb "Closed"
Alarm switch (AL) status		91/ALc-94/ALa "Open" 91/ALc-92/ALb "Closed"	91/ALc-94/ALa "Open" 91/ALc-92/ALb "Closed"	91/ALc-94/ALa "Closed" 91/ALc-92/ALb "Open"

5. Shunt trip device (SH)

Ratings of SHT

Type of breaker	Peak exciting current, A						
	Rated voltage	AC (V)			DC (V)		
		100-120	200-240	380-450	24	48	100-120 200-240
E225-NF E250-SF S50-GF, S50-SF S100-NF, S100-GF S125-NF, S125-GF S125-SF S225-NF, S225-GF S225-GE S250-NF, S250-GF S250-SF S400-CF, S400-NF S400-GF, S400-GE S400-PF, S400-PE S630-CF, S630-NF, S630-RF S630-NE, S630-RE S800-CF, S800-NF, S800-RF S800-NE, S800-RE S1250-NE, S1250-GE S1600-NE H100-NF, L100-NF H225-NF, L225-NF H125-NF, L125-NF H400-NE, L400-NE H630-NE, L630-NE H800-NE, L800-NE S100-NM S225-NM S100-NN S125-SN S250-SN S400-NN S630-GN S800-NN S1250-NN S1600-NN		0.014	0.014	0.0065	0.03	0.03	0.011 0.011

Type of breaker	Peak exciting current, A					
	Rated voltage	AC (V)		DC (V)		
		100-115	200-480	24	48	100-115 200-230
E50-SF, E100-SF, E50-CM		3.4	0.83	1.6	0.71	0.4 0.16
XS2000NE, XS2000NN		1.1	① 0.4 (AC200-240V) 0.93 (AC380-480V)	2.52	1.55	0.67 0.35
TL1000-NE, TL1200-NE		1.1	0.93	2.52	1.55	0.67 0.35

Notes:

①: Exclusive use for 200V class and 400V class.

(1) The permissible voltage range is from 85% to 110% of the rated voltage for AC or 75% to 125% thereof for DC.

Ensure that the voltage does not drop exceeding the permissible voltage range when SHT is actuated.

(2) Breaker contacts usually start opening within 30 ms after the rated voltage is applied to the breaker.

6. Undervoltage trip device (UV)

Ratings of UVT with Inst

Type of breaker	Power supply capacity, VA ①			Exciting current, mA ①			
	Rated voltage	AC (V)			DC (V)		
		100-120	200-240	380-450	24	100-120	200-240
S50-GF S100-NF, S100-GF S125-NF, S125-GF S225-NF, S225-GF S225-GE S250-NF, S250-GF S400-CF, S400-NF S400-NE S400-GF, S400-GE S400-PF, S400-PE H100-NF, L100-NF H125-NF, L125-NF H225-NF, L225-NF H400-NE, L400-NE S100-NM S225-NM S100-NN S400-NN	1.4	2.8	2.3	23	10	10	
S50-SF, S125-SF, S125-SN E250-SF, S250-SF, S250-SN	1.4	1.5	2.3	23	10	3.5	

Note: ①: No UVT controller is required.

Type of breaker	Power supply capacity, VA ①							Exciting current, mA ①		
	Rated voltage	AC (V)						DC (V)		
		100-110	115-120	200-220	230-240	380-415	440-450	24	100-120	200-240
S630-CF, S630-NF, S630-RF S630-NE, S630-RE S800-CF, S800-NF, S800-RF S800-NE, S800-RE S1250-NE, S1250-GE S1600-NE H630-NE, L630-NE H800-NE, L800-NE S630-GN S800-NN S1250-NN S1600-NN	1.3	1.4	2.4	2.6	1.9	2.1	29	13	11	

Note: ①: No UVT controller is required.

Type of breaker	Power supply capacity, VA ②			Exciting current, mA ①			
	Rated voltage	AC (V)			DC (V)		
		100-120	200-240	380-450	24	100-120	200-240
E50-SF, E100-SF	5 min	5 min	5 min	18.2	4.8	—	
XS2000NE, XS2000NN	5 min	5 min	5 min	22.7	6	—	
TL1000-NE, TL1200-NE	5 min	5 min	5 min	22.7	6	—	

Notes: ①: No UVT controller is required.

②: Equipped with the UVT controller. See page 6-18 for specifications of the UVT controller.

2 Internally mounted accessories

6. Undervoltage trip device (UV)

UVT with time delays for TemBreak2

TemBreak2 UVT are available with 500 ± 300 msec time delays.

UVT controller is installed on the breaker.

Rating of UVT with time delay

Time delays: 500 ± 300 msec.

Applicable breakers	Power supply capacity, VA							Exciting current, mA				
	Rated voltage	AC (V)						DC (V)				
		100-110	115-120	200-220	230-240	380-415	440-450	24	100-110	115-120	200-220	230-240
S50-GF, S100, S125-NF, S125-GF, S125-NN, E250, S225, S250-NF, S250-GF, H100, H125, H225, L100, L125, L225, S400, H400, L400	1.1	1.3	2.1	2.5	1.5	1.7	22	7.6	8.3	8.6	9.3	
S50-SF, S125-SF, S125-SN E250-SF, S250-SF, S250-SN	1.4	1.4	1.5	1.5	2.3	2.3	23	8.3	8.3	3.5	3.5	

Applicable breakers	Power supply capacity, VA							Exciting current, mA				
	Rated voltage	AC (V)						DC (V)				
		100-110	115-120	200-220	230-240	380-415	440-450	24	100-110	115-120	200-220	230-240
S630, S800, H630, L630, H800, L800, S1250, S1600	1.5	1.6	2.4	2.9	2.1	2.3	29	13	13	11	11	

- Mounting dimensios and terminal arrangement of the UVT controller installed on the breaker

Applicable breakers		A (mm)	B (mm)	C (mm)	D (mm)
S50-GF, S100, S125-NF, S125-GF, S125-NN	2P, 3P, 4P	28.5	44	25.2	16.2
S50-SF, S125-SF, S125-SN	2P, 3P, 4P	34	55	24	15
S225, S250-NF, S250-GF (except S225-GE)	3P, 4P	33.5	44	25.2	16.2
E250-SF, S250-SF, S250-SN	3P, 4P	49.5	55	24	15
S225-GE H100, H1 H225 L100, L125, L225	3P, 4P	33.5	79	25.2	16.2
S400	3P, 4P	71	74	25.2	16.2
H400, L400	3P, 4P	71	111	25.2	16.2
S630, S800	3P, 4P	62.5	74	25.2	16.2
H630, L630, H800, L800	3P, 4P	62.5	111	25.2	16.2

• The UVT controller is installed in the right hand side of the breaker

Notes: 1. Tightening torque of terminal screws: 0.9 – 1.2 N·m
2. Applicable lead wire size: 2.0 mm² max

Applicable breakers	A (mm)	B (mm)	C (mm)	D (mm)
S1250	114	72	21	12
S1600	114	92	21	12

• The UVT controller is installed in the left hand side of the breaker

Notes: 1. Tightening torque of terminal screws: 0.9 – 1.2 N·m
2. Applicable lead wire size: 2.0 mm² max

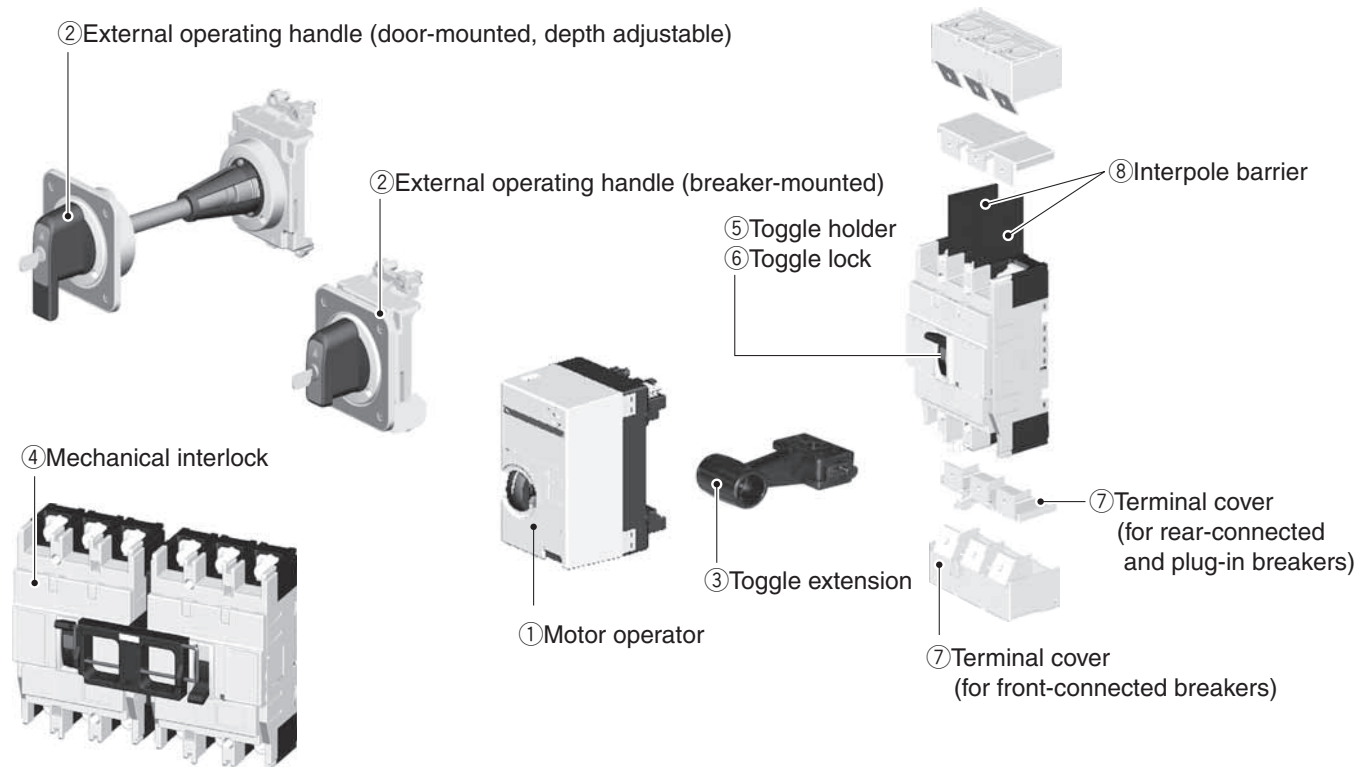
6

Accessories

Molded Case Circuit Breakers

3 Externally mounted accessories

1. Overview



1 Motor operator MC

Allows electrical operation (closing, opening and resetting) of the breaker.

2 External operating handle HB

Allows the breaker installed in a switchboard or box to be operated from outside.

Breaker-mounted HB

The handle is mounted directly on the breaker.

Door-mounted (depth adjustable) HP

The handle is coupled to the breaker through a shaft.

3 Toggle extension HA

Lessens the force require to close, open or reset the breaker. (Applicable to breakers with a frame size of 600A or larger)

4 Mechanical interlock MS

Provides an interlock that allows one of two breakers to be closed.

Slide type MS

5 Toggle holder HH

Holds the breaker on or off when simply fitted onto the breaker toggle.

6 Toggle lock HL

Allows the breaker to be locked on or off with commercially available padlocks.

7 Terminal cover CF

Prevents live parts of the breaker from being exposed.

For front-connected breakers CF

For rear-connected and plug-in breakers CR

For front-connected breakers with cable clamps CS

8 Interpole barrier BA

Enhances electrical insulation between poles and prevents short-circuit due to electrically conductive foreign matter.

9 Terminal block TF

Terminates lead wires from internally mounted accessories.

10 Door flange DF

Is intended to cover the cutout of a switchboard panel from the front.

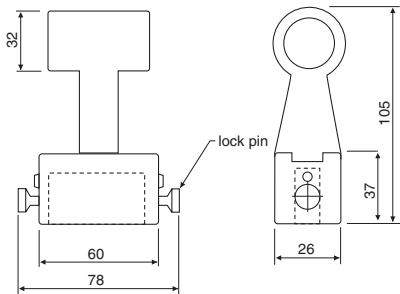
11 DIN rail adaptor DF

Allows the breaker to be mounted on DIN rails.

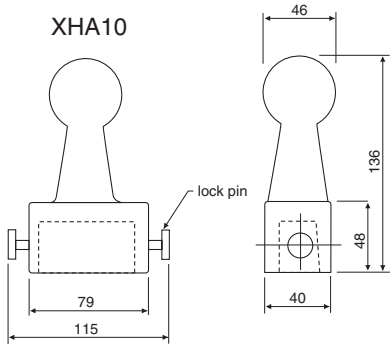
2. Toggle extension (HA)

Outline dimensions

XHA9B, T2HA80

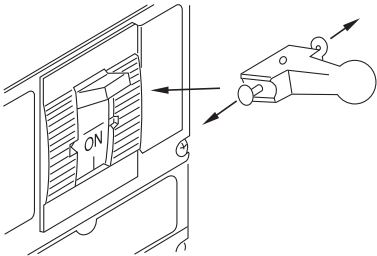


XHA10



Frame size (A)	Type of breaker		Toggle extension Order codes
630	S630-CF, S630-NF, S630-NE	①	T2HA80
	S630-RF, S630-RE		
	S630-GN, H630-NE, L630-NE		
800	S800-CF, S800-NF, S800-NE	①	T2HA80
	S800-RF, S800-RE		
	S800-NN, H800-NE, L800-NE		
1000	TL-1000NE	②	XHA9B
1200	TL-1200NE		
1250	S1250-NE, S1250-GE, S1250-NN	②	T2HA80
1600	S1600-NE, S1600-NN		
2000	XS2000NE, XS2000NN	③	XHA10

Note: ① Optional. Specify when ordering.
 ② One is supplied with every five breakers. Please specify if more are required.
 ③ Supplied as standard.



• **Mounting and Removal**
 Pull lock pins out left and right in direction of the arrows, and slot the toggle extension in place. The lock pins are spring loaded. Removal-Pull out left and right hand lock pins and hold while removing.

6

Accessories

Molded Case Circuit Breakers

3 Externally mounted accessories

3. Toggle holder (HH) and toggle lock (HL)

Toggle holder (HH)

Simply fitting the toggle holder onto the breaker toggle disables breaker operation without using padlocks.

Toggle lock (HL)

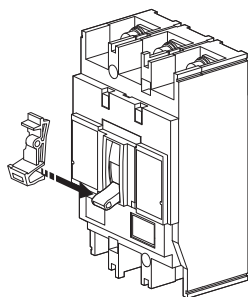
The toggle lock is a tool that locks the breaker on or off. When an overcurrent occurs, the breaker will trip even if the breaker toggle is locked in the ON position.
(Use commercially available padlocks).

Toggle holders/toggle locks

Frame size (A)	Type of breaker	Toggle holder		Figure	Toggle lock		Figure
		Order codes	Marking codes		Order codes	Marking codes	
50	S50-SF	T2HH25L	T2HH25L	1	T2HL25L	T2HL25L	2
100	S100-NF S100-GF, S50-GF H100-NF L100-NF S100-NM S100-NN	T2HH25	T2HH25	1	T2HL25	T2HL25	2
125	S125-NF, S125-NN	T2HH25	T2HH25	1	T2HL25	T2HL25	2
	S125-SF, S125-SN	T2HH25L	T2HH25L	1	T2HL25L	T2HL25L	2
	S125-GF H125-NF L125-NF	T2HH25	T2HH25	1	T2HL25	T2HL25	2
225	E225-NF S225-NF S225-GF, S225-GE H225-NF L225-NF S225-NM	T2HH25	T2HH25	1	T2HL25	T2HL25	2
	S250-NF	T2HH25	T2HH25	1	T2HL25	T2HL25	2
	E250-SF, S250-SF, S250-SN	T2HH25L	T2HH25L	1	T2HL25L	T2HL25L	2
400	S250-GF	T2HH25	T2HH25	1	T2HL25	T2HL25	2
	E400-NF S400-CF, S400-NF S400-NE S400-GF, S400-GE S400-PF, S400-PE H400-NE L400-NE S400-NN	T2HL40 ①	T2HL40	3	T2HL40	T2HL40	3
	S630-CF, S630-NF S630-NE, S630-RF, S630-RE H630-NE L630-NE S630-GN	T2HL40 ①	T2HL40	3	T2HL40	T2HL40	3
800	S800-CF, S800-NF S800-NE, S800-RF, S800-RE H800-NE L800-NE S800-NN	T2HL40 ①	T2HL40	3	T2HL40	T2HL40	3
1250	S1250-NE S1250-GE S1250-NN	T2HLX6	XKC9	6 (I=86)	T2HLX6	XKC9	6 (I=86)
1600	S1600-NE S1600-NN	T2HLX6	XKC9	6 (I=86)	T2HLX6	XKC9	6 (I=86)
50 100	TB-5S, TB-5P TB-5D	for 1P...TKB-50SGH (TAA-5CR) ②	for 1P...TKB-50SGH (TAA-5CR) ②	7 (a)	TKB-50SG	TKB-50SG	5
		for 2P...TAA-52SH for 3P...TAA-53SH	for 2P...TAA-52SH for 3P...TAA-53SH	7 (b)	—	—	—
	E50-SF, E100-SF, E50-CM	TKB-1DH	—	4	③	—	4
1000	TL-1000NE	XKC9	XKC9	6 (I=86)	XKC9	XKC9	6 (I=86)
1200	TL-1200NE	XKC9	XKC9	6 (I=86)	XKC9	XKC9	6 (I=86)
2000	XS2000NE XS2000NN	XKC10	XKC10	6 (I=94)	XKC10	XKC10	6 (I=94)

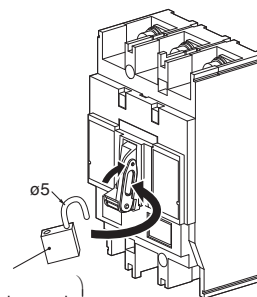
Notes: ①. Same as toggle lock.
②. Order codes shown in parentheses "()" are toggle caps. The colour is Red.
③. A hole must be drilled in the breaker toggle. Please state "with toggle lock (HL)" when ordering.

Fig. 1



Red

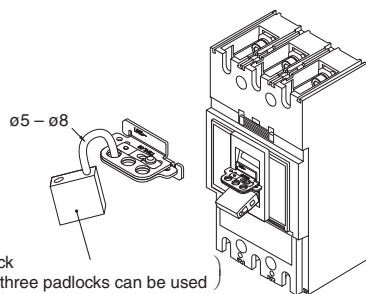
Fig. 2



Red

(Padlock
Up to three padlocks can be used)

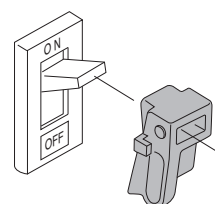
Fig. 3



Red

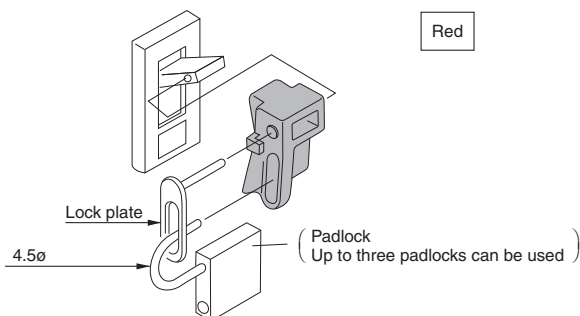
(Padlock
Up to three padlocks can be used)

Fig. 4



Red

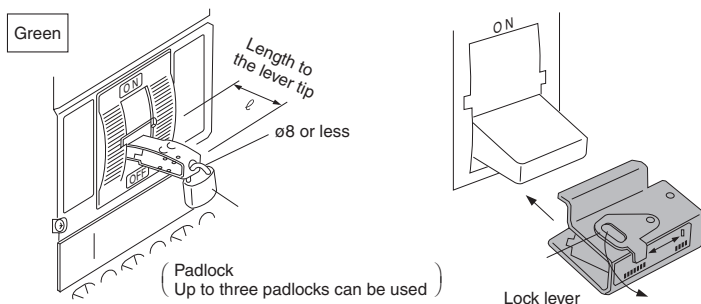
Fig. 5



Red

(Padlock
Up to three padlocks can be used)

Fig. 6



Green

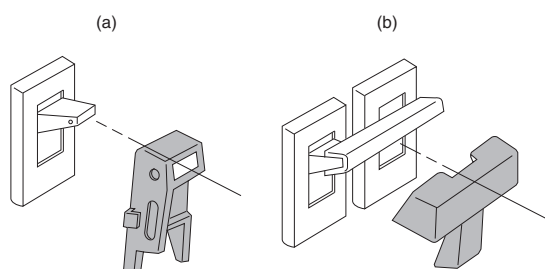
(Padlock
Up to three padlocks can be used)

Lock lever

Toggle holder (HH): Make sure the lock lever of the toggle holder is in the UNLOCK position, fit the toggle holder onto the toggle and swing the lock lever to the LOCK position. The toggle is now locked on or off.

Toggle lock (HL): Padlock the toggle in the ON or OFF position.

Fig. 7



Red

6

Accessories

Molded Case Circuit Breakers

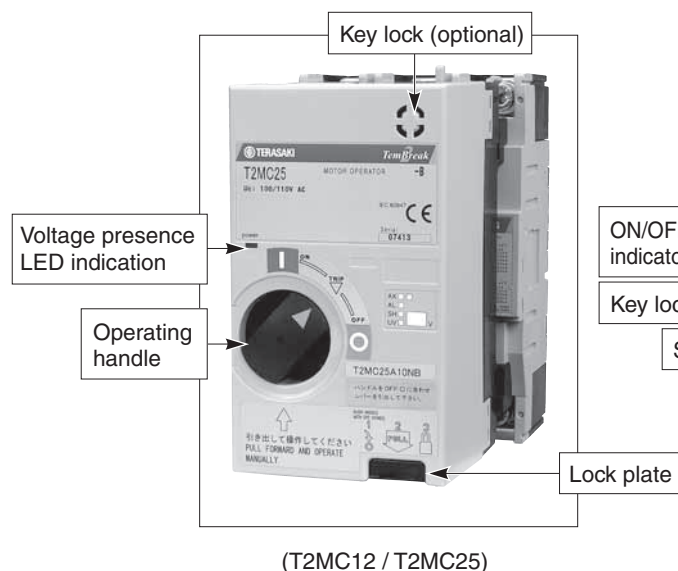
3 Externally mounted accessories

4. Motor operators (MC)

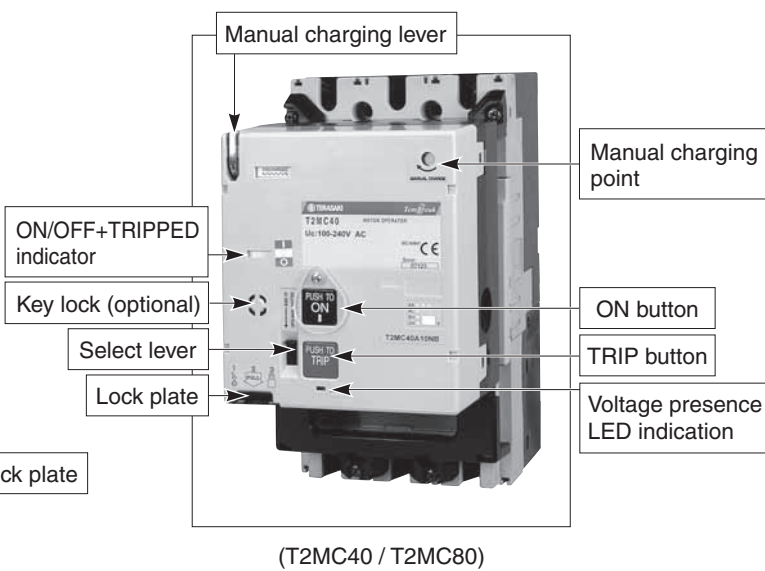
4-1. TemBreak2

Motor driven type

Spring charged type



(T2MC12 / T2MC25)



(T2MC40 / T2MC80)

Ratings and Specifications

	T2MC12	T2MC25	T2MC25L	T2MC40	T2MC80
Type of breaker	S50-GF S100-NF S100-GF S125-NF S125-GF H100-NF L100-NF H125-NF L125-NF S100-NM S100-NN S125-NN	E225-NF S225-GF S225-GE S250-NF S250-GF H225-NF L225-NF S225-NM	E250-SF S250-SF S250-SN	S400-CF, S400-NF S400-GF S400-NE, S400-GE S400-PF, S400-PE H400-NE, L400-NE S400-NN	S630-CF, S630-NF, S630-RF S630-NE, S630-RE S800-CF, S800-NF, S800-RF S800-NE, S800-RE H630-NE, L630-NE H800-NE, L800-NE S630-GN S800-NN
Rated operational voltage ①	● AC100-110V ● AC200-220V ● AC230-240V ● DC24V ● DC48V ● DC100-110V ● DC200-220V			● AC100-240V ● ADC24-48V ● DC100-120V	● AC100-240V ● ADC24-48V ● DC100-120V
Peak steady-state/starting current, A ②	AC100-110V 4.5/8 AC200-220V 4/8 AC230-240V 3.5/7 DC24V 18/26 DC48V 12/18 DC100-110V 2.2/6 DC200-220V 2.2/5.5			—/1.9(ON) 1.3/3.8(OFF, RESET) —/3.3(ON) 0.9/3.8(OFF, RESET) —/3.3(ON) 0.9/3.8(OFF, RESET) —/9.2(ON) 4.3/9.8(OFF, RESET) —/3.8(ON) 2.0/5.2(OFF, RESET) —/1.3(ON) 1.2/2.9(OFF, RESET)	—/2.2(ON) 1.7/3.5(OFF, RESET) —/2.2(ON) 1.3/3.5(OFF, RESET) —/2.2(ON) 1.3/3.5(OFF, RESET) —/2.2(ON) 1.3/3.5(OFF, RESET)
Operation method	Motor driven (direct drive system)			Spring driven	Spring driven
Operating time, s at rated voltage	ON 0.1 OFF/RESET 0.1③④			ON 0.1 OFF/RESET 1.5③④	ON 0.1 OFF/RESET 1.5③④
Operating switch ratings	100V 0.1A (Open voltage/current: 44 V/4 mA)⑤			100V 0.1A (Open voltage/current: 48 V/1 mA)	100V 0.1A (Open voltage/current: 48 V/1 mA)
Power supply required	300VA or higher			300VA or higher	300VA or higher
Dielectric withstand voltage (for one minute)	AC1500V (AC 1000 V for DC 24/48 V)			AC1500V (AC 1000 V for DC 24/48 V)	AC1500V (AC 1000 V for DC 24/48 V)
Weight	1.4kg			3.5kg	3.5kg

Notes:

- ① : Permissible operating range is 85 to 110%. A power transformer is available as option for AC380V or AC400-460V.
- ② : The currents shown are the maximum values at the maximum rated operational voltage.
- ③ : The operating time is the value when the rated operational voltage is supplied.
Allow a longer time for the motor operator to complete the operation.
- ④ : The motor operator is of a short time duty. Do not subject it to more than 10 continuous ON-OFF operations. If this occurs, allow the motor operator to cool for at least 15 minutes.
- ⑤ : When the rated operational voltage is DC24V the open voltage will be DC22V.

Features

★ Installation and removal ease

T2MC12/25/25L: Simply rotate two knobs allows the motor operator to be installed on or removed from the breaker.

T2MC40/80: The compact and lightweight design enables easy installation and removal.

★ High-speed, stable actuation

The operating time as short as up to 0.1 second makes it possible to use the motor operators for synchronized closing of breakers.

★ Silent operation

T2MC12/25/25L use a direct drive system, providing operational silence.

★ “Lock-in off” capability

This capability allows the breaker to be padlocked in the OFF state. Up to three padlocks with a 5 to 8 mm hasp diameter can be used. Padlocks are not supplied.

★ Compact and lightweight

T2MC40/80 is of compact design where the OCR of the breakers does not hide behind the operator, and thus does not need to be removed when changes in setting of the OCR are to be made.

Motorized operation

The motor operator has an input-signal self-hold circuit; closing the ON or OFF switch (see circuit diagrams shown below) momentarily allows activating the motor operator. To reset the tripped breaker to the OFF position, close the OFF (RESET) switch.

The voltage presence LED indication is on when the power is supplied to the motor operator.

■ Auto reset feature (optional)

The auto reset feature allows the breaker to be automatically reset approx. 1.5 seconds after the breaker trips open. This option contains auto-reset switches and does not require to use auxiliary or alarm switches installed in the breaker.

Note : that after the thermal OCR trips a thermal-magnetic breaker, the breaker cannot be immediately closed though it can be auto-reset.

Wait for a few minutes after the tripping and provide a close signal to the breaker.

This option resets the tripped breaker automatically, regardless of the cause of the tripping.

Manual operation

T2MC12/25/25L: Pull the operating handle out. Rotating the handle counterclockwise turns ON the breaker and clockwise turns OFF or resets the breaker.

T2MC40/80 : Use the spring charging handle to charge the spring and press the ON or TRIP button.

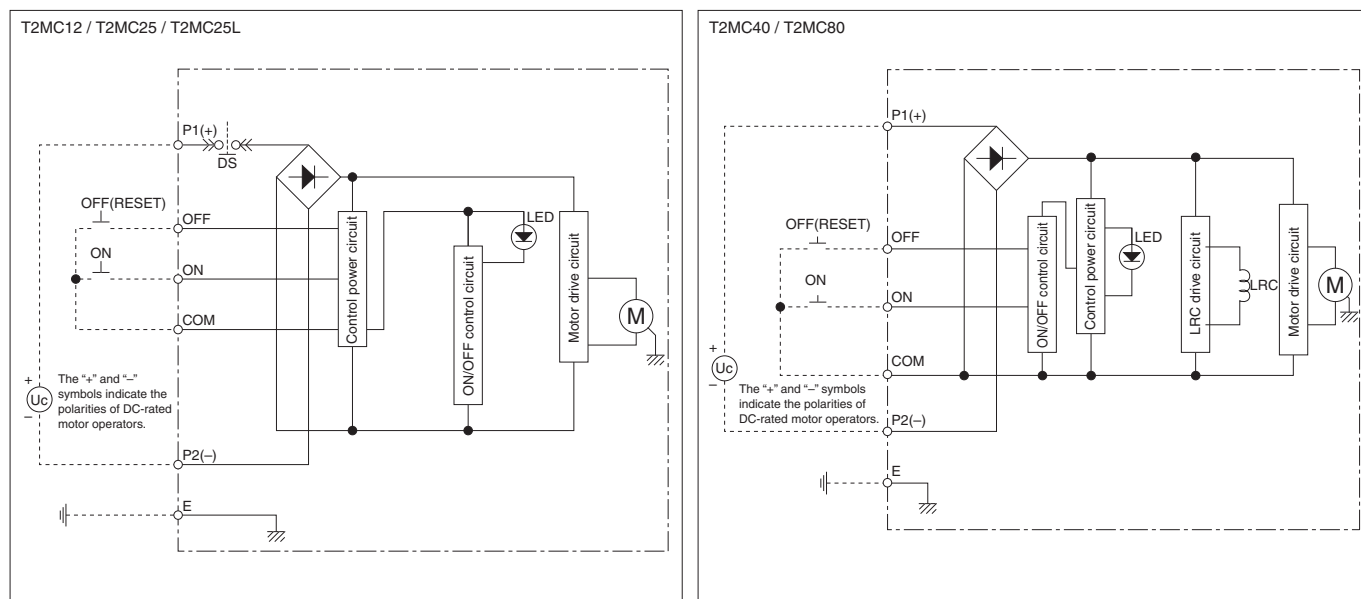
T2MC40/80 : When the TRIP button is pressed while the control power is supplied, the breaker turns OFF and if equipped with an alarm switch, it provides an output signal.

Operation precautions

1. Ensure that the actual operation voltage ranges from 85% to 110% of the rated one.
2. Use operation switches whose ratings and power capacity is as specified in the “Ratings and Specifications” table on the previous page.
3. Use noise filters if the control power supply of the motor operator is shared by peripheral devices. Otherwise, power supply noise may cause malfunction of the peripheral devices.
4. When the motors are used in conjunction with the mechanical interlock the electrical interlock should be provided between the motors in order to avoid the simultaneous closing. The followings are the available electrical interlock cables.

Interlock cables Order codes	Length	Remarks
T2MM25L05	500mm	for the electrical interlock between T2MC12 and T2MC25/25L.
T2MM25L15	1500mm	
T2MM40L06	600mm	for the electrical interlock between T2MC40 and T2MC80.
T2MM40L21	2100mm	
T2MM40S06	600mm	for the electrical interlock between T2MC40 and T2MC12/25/25L.
T2MM40S21	2100mm	

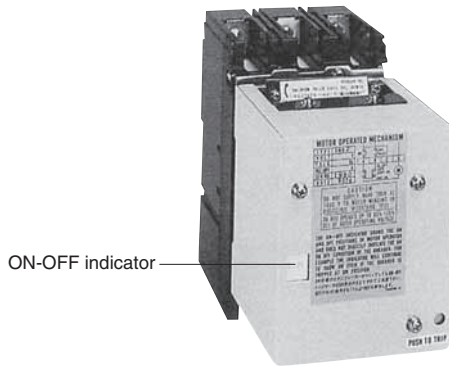
Control circuit diagrams of motor operators



4. Motor operators (MC)

4-2. TemBreak

Motor driven type



(XMB1)



(XMB10)

Ratings and Specifications

	XMB1	XMB10
Series/type of breaker	E50-SF E100-SF	XS2000NE XS2000NN
Rated operational voltage ①	●AC100-110V ●AC200-220V ●DC100V ●DC110V	●AC100-110V ●AC200-220V ●DC100-110V
Auto reset	Optional ②	Optional ②
	Non	Non
Peak steady-state/ starting current, A ③	AC100-110V	2.0/4.5
	AC200-220V	1.0/2.0
	DC100V	—⑥
	DC110V	—⑥
Operation method	Motor driven	Motor driven
Operating time, s at rated voltage	ON	1.2
	OFF/RESET	0.85 ④⑤
Operating switch ratings	250V, 5A	250V, 5A
Power supply required	100 VA or higher	300VA or higher
Dielectric withstand voltage (for one minute)	AC1000V	AC1000V
Weight	1.8	16

Notes: ① Ensure that the actual operation voltage is within the following range:
85% to 110% of the AC rated voltage, or
75% to 110% of the DC rated voltage
In case the rated operation voltage is AC 380 V or
AC 400 to 460 V, optional power supply
transformers are available on request.

② Auto reset require to use auxiliary switch (1b)
installed in the breaker. If the number of auxiliary
switches is insufficient, actuate an external relay
via an auxiliary switch (1a) and use the relay
contact (1b) for auto reset.

③ The currents shown are the maximum values at
the maximum rated operational voltage.

④ The operating time assume the motor operator is
supplied with the rated operation voltage. Longer
operating time will be required under actual
operating conditions.

⑤ The motor operator is short-time rated. The
number of continuous switching (ON-OFF) cycles
must not exceed 10. After any 10 continuous
switching cycles, provide a pause of at least 15
minutes to the motor operator for cooling.

⑥ Can be custom-made on request. The outline
dimensions of the motor operator will be larger. An
auto-reset switch cannot be used. Contact us for
details.

Operation mechanism

Motorized operation

■Breaker ON

Closing the ON switch throws the motor switch from contact status “1-2” to “3-2”, thereby activating the X relay and energizing the motor operator to turn the breaker ON. When the breaker turns ON, the motor switch is thrown from contact status “3-2” to “1-2”, thereby releasing the X relay to de-energize and stop the motor operator.

■Breaker OFF

Closing the OFF/RESET switch throws the motor switch from contact status “3-2” to “1-2”, thereby activating the Y relay and energizing the motor operator to turn the breaker OFF. When the breaker turns OFF, the motor switch is thrown from contact status “1-2” to “3-2”, thereby releasing the Y relay to de-energize and stop the motor operator.

■Breaker RESET

To reset the tripped breaker to the OFF position, close the OFF/RESET switch.

■Breaker auto-reset (optional)

Using the AUTO RESET auxiliary switch (1b) of the breaker allows resetting the breaker automatically when the breaker trips open.

Note: Do not use a normally closed switch as the ON switch. Doing so will result in “ON-TRIP-RESET-ON” cycles repeated unless the cause of tripping is removed.

Manual operation

Mount the operating handle onto the mounting shaft located on the front of the motor operator and rotate the shaft to turn the breaker ON or OFF. Rotating the handle anti-clockwise turns ON the breaker and clockwise turns OFF or resets the breaker. When the operating handle is mounted, the motorized operation mechanism is disengaged. Removing the handle engages the motorized operation mechanism to enable motorized operation.

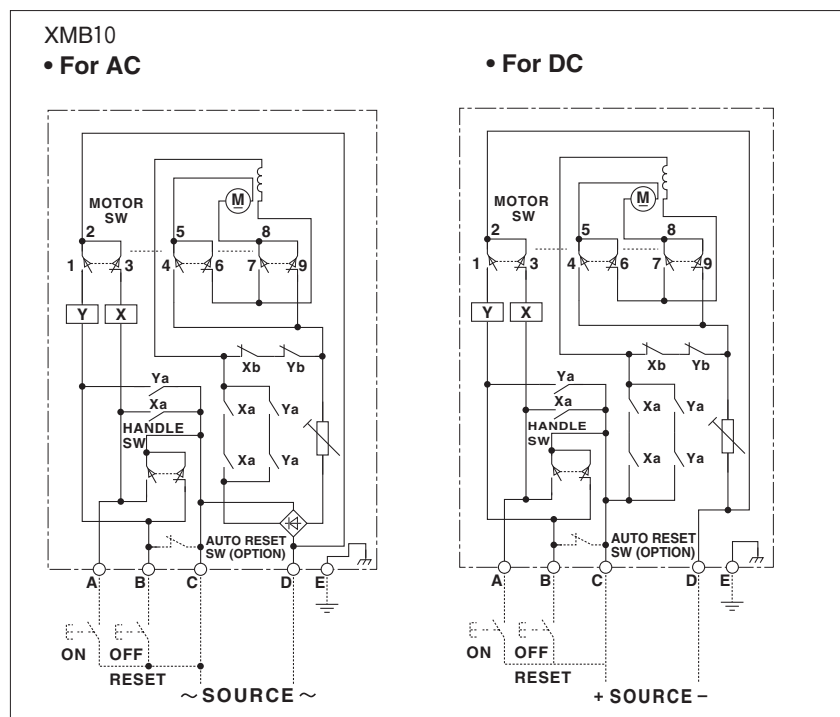
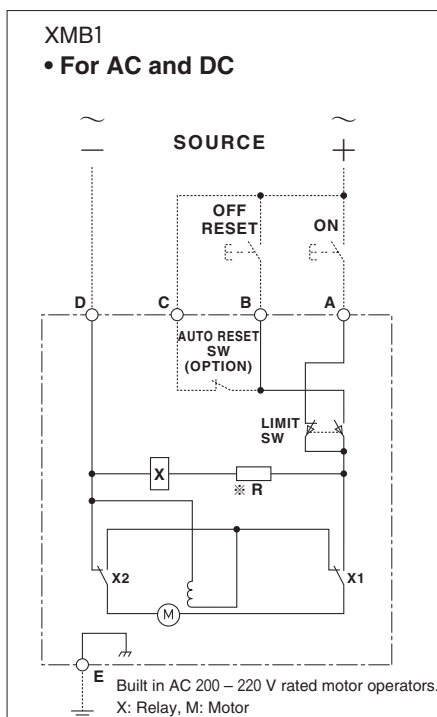
■Handle switch

With the addition of a handle switch, the motor operator mechanism can be automatically brought to the manually operated position (ON or OFF) on removal of the handle, providing that the motor operator is powered up.

Operation precautions

- When the breaker is ON and is then tripped, the ON/OFF indicator on the motor operator will indicate ON until the breaker is reset.
Note: The breaker's condition may differ.
- When a thermal-magnetic breaker is tripped by the thermal OCR, wait for a few minutes; then reset the breaker.
- When a breaker equipped with the UVT device is in the OFF position and the UVT device is deenergized, the breaker cannot be closed. To close such a breaker, perform ON and OFF (RESET) operation on the motor operator once and repeat ON operation. The breaker will be able to closed.
(Breaker XS2000NE can be closed without the need for the ON and OFF (RESET) operation on the motor operator described above).
- Use noise filters if the control power supply of the motor operator is shared by peripheral devices. Otherwise, power supply noise may cause malfunction of the peripheral devices.

Control circuit diagrams of motor operators



6

Accessories

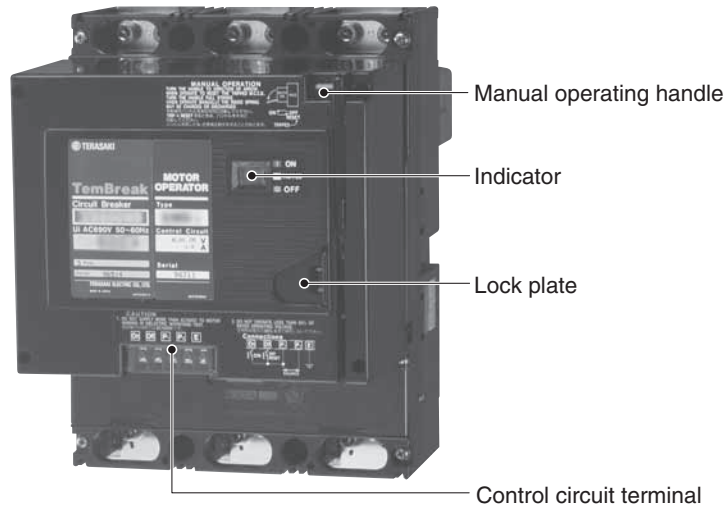
Molded Case Circuit Breakers

3 Externally mounted accessories

4. Motor operators (MC)

4-3. *TemBreak2*, TemBreak

Spring charged type



(T2MCX6 / XMD9)

Ratings and Specifications

		T2MCX6	XMD9
Applicable breakers		S1250-NE, S1250-GE, S1250-NN S1600-NE, S1600-NN	TL-1000NE, TL-1200NE
Rated operational voltage ①		● AC100-115V ● AC200-230V ● DC100-110V ● DC24V	
Peak steady-state/ starting current, A ②	AC100-115V	ON	—/3.1
		OFF, RESET	1.8/6.0
	AC200-230V	ON	—/1.2
		OFF, RESET	1.0/3.2
	DC100-110V	ON	—/0.8
		OFF, RESET	1.1/4.2
	DC24V	ON	—/4.5
		OFF, RESET	4.0/12.0
Operation method		Spring charged	
Operating time, s	ON (Max)	0.06	
@ rated voltage	OFF/RESET	3 ③	
Power supply required		300VA	
Dielectric withstand voltage (for one minute)		AC1500V ④	
Weight		6.4kg	

Notes:

- ① : Permissible operating range
 AC → 85 to 110%
 DC → 75 to 110%
 A power transformer is available as option for AC380V or AC400-460V.
- ② : The currents shown are the maximum values at the maximum rated operational voltage.
- ③ : The operating time is the value when the rated operational voltage is supplied.
 Allow a longer time for the motor operator to complete the operation.
- ④ : Dielectric withstand voltage for DC 24 V motor is AC 500 V.

Features

★ Clear status indication

Color indication: Red means ON, green OFF and white TRIPPED.

★ Quick closing

Energy in a charged spring closes the breaker 60 msec or less.

High-speed, time-stable operation is ensured after multiple times of closing cycles.

★ Equipped with anti-pumping circuit

When the closing signal is applied, TRIP-RESET-ON cycles are not repeated even though the cause of tripping is in the breaker.

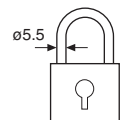
★ Ease of manual ON-OFF operation

Simply pressing the ON or OFF button closes or opens the breaker.

★ “Lock-in off” capability

This capability allows the breaker to be padlocked in the OFF state.

Padlocks are not supplied.



Operation mechanism

Motorized operation

■Breaker ON

Closing the ON switch activates the latch release coil (LRC), thereby releasing the closing spring to turn the breaker ON.

■Breaker OFF (RESET)

Closing the OFF/RESET switch activates the (Y) control relay, thereby starting the motor to turn the breaker OFF. At the same time, the closing spring is charged. The motor is deenergized when the breaker turns OFF (RESET).

■Breaker auto-reset (optional)

The auto-reset option uses an auto-reset switch (alarm switch) through which the closing spring is charged and the breaker is reset automatically after the breaker trips open. This option both for XMD and T2MC will be factory wired.

Notes: 1. For S1250 and S1600, installable alarm switch will be only 1 piece.

2. When the breaker is equipped with the auto-reset option, a signal self-hold circuit is required because the signal provided by the alarm switch is a pulse.

3. Not applicable to thermal-magnetic breakers

Manual operation *

■Breaker ON · OFF (RESET)

Pulling down the operating lever turns the breaker ON and OFF/RESET alternately.

The handle returns to the original position when released.

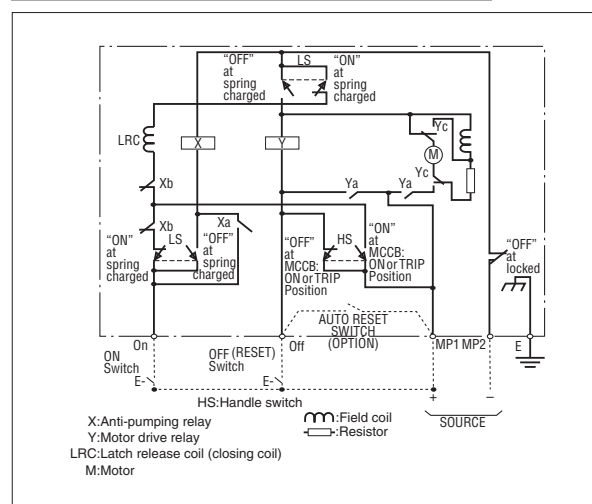
※ With auto-charge/discharge feature:

When manual ON operation is performed while the control power is applied, the handle switch (HS) operates to discharge the closing spring. OFF operation causes the closing spring to be charged.

When manual ON or OFF operation is performed while the control power is lost, and afterwards the control power is recovered, the closing spring is discharged or charged in the same manner as described above.

When the auto-charge/discharge action is in progress, mechanical noises will be heard. The noises however do not mean a failure.

Control circuit diagram (XMD series)



Operation Precautions

- Ensure that the actual operation voltage ranges from 85% to 110% for AC or 75% to 110% for DC of the rated one.
- The currents shown are the maximum values at the maximum rated operational voltage.
- When conducting the dielectric withstand voltage test, apply voltage between the control terminal group and ground. Ensure that the test voltage does not exceed AC 1500 V (AC 500 V if the rated operation voltage is DC 24 V).
- If the breaker is equipped with the UVT device, ensure that the UVT device is reset before providing a closing signal to the breaker.
- It takes up to three seconds to complete motorized OFF operation. If the breaker requires to be immediately opened from a remote location in an emergency, add the SHT or UVT device to the breaker for remote electrical tripping.
- When a thermal-magnetic breaker is tripped by the thermal OCR, wait for a few minutes; then reset the breaker.
- Make sure that the current and switching capacities of the operation switch are appropriate for the application.
- Avoid repeated and continuous applications of the operation power supply to the motor operator.
- Use noise filters if the control power supply of the motor operator is shared by peripheral devices. Otherwise, power supply noise may cause malfunction of the peripheral devices.
- Be sure to apply power to control power terminal MP1. If the breaker is turned ON or OFF manually without power applied to MP1, the auto charge/discharge feature is disabled, and thus the motor operator will not be activated next time. In such a case, applying the rated operation voltage between control power terminals MP1 and MP2 will enable the auto charge/discharge feature.

6

Accessories

Molded Case Circuit Breakers

3 Externally mounted accessories

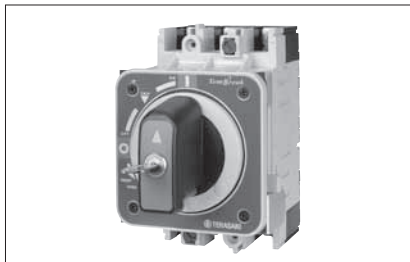
5. External operating handles

5-1. Breaker-mounted (field installable) (HB)

The external operating handle is a tool that allows the breaker installed in a switchboard to be operated from outside and complies with IEC 60204-1.

The breaker-mounted type external operating handle is designed to be mounted directly to the breaker body.

Outer view



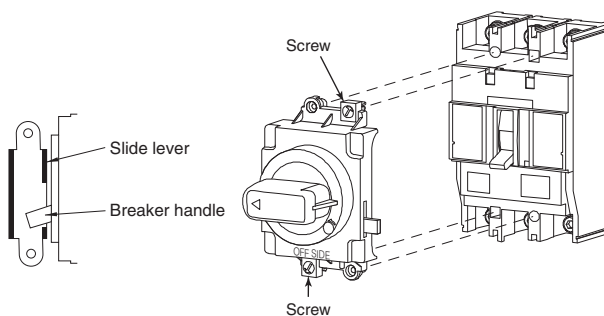
Mounting instructions

The external operating handle has not been mounted on the breakers.

For details on how to mount the handle, see the Operating Instructions packaged with the product.

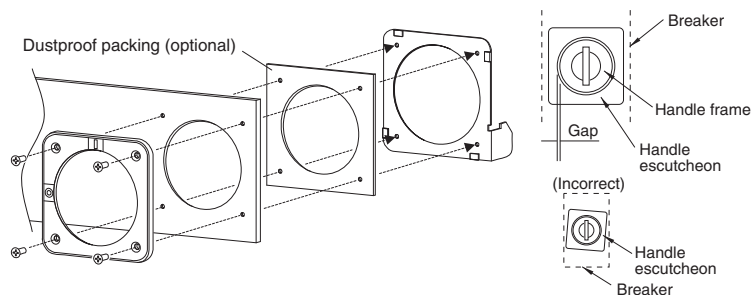
[1] Mounting of external operating handle assembly

- Make sure that the breaker is in the OFF position.
 - Put the external operating handle assembly onto the breaker in place so that the breaker handle is engaged with the handle catch of the assembly.
- Tighten the screw to secure the handle assembly.



[2] Installation of handle escutcheon and latch plate

- Drill holes in the panel according to the panel cutout dimensions.
- Sandwich the panel between the handle escutcheon and latch plate and temporarily tighten using the supplied screws.
- Close the panel.
- Make adjustment so that the gap between the handle assembly and handle escutcheon is even and the assembly is not inclined against the breaker.



Breaker mounting direction

The ON and OFF positions of the handle and the positions of drilled holes in the panel do not need to be changed depending on the breaker mounting direction. The upper power supply type is standard. If a non-standard type is required, state the type when ordering.

R : Right power supply type	U: Upper power supply type (standard)	L: Left power supply type

- For a change in mounting direction, see the Operating Instructions packaged with the product.

■ Panel lock mechanism

The external operating handle keeps the panel door locked when in the 'ON' position. There are two types, RESET, Open and OFF, Open.

(1) Reset, Open (Standard type)

The handle is turned to the 'RESET/OPEN COVER' position to open the panel door.

(2) OFF, Open

The handle is turned to the OFF position to open the panel door.

● Panel lock release knob

The release knob enables the panel door to be opened with the handle in the 'ON' position. To release: turn the release knob in the direction of anti-clockwise with a flat-bladed screwdriver.

● Safety interlock (Standard)

The safety interlock prevents the breaker from turning ON as long as the panel is open. This interlock can be released using the hook lever.

■ Toggle lock mechanism

● Padlock (Standard)

This mechanism allows the breaker to be padlocked in the OFF position.

Padlocks are not supplied.

Up to three padlocks can be installed.

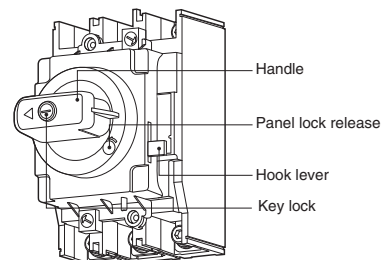


Padlock dimensions (mm)

Type of handle	A	Dia.
T2HB	13 min	ø5.5-8

● Key lock (Optional)

Key locking is possible in the OFF position. Key lock is not available for the breakers marked by ① in the following table.



■ Protection degree (IEC 60529)

IP30	standard specification
IP50	optional, with a dust proof packing
IP55	special specification

Possible combinations of breaker and external operating handle

TemBreak2

Frame size	Type of breaker	Type of external operating handle
50	S50-SF	T2HB16L ①
	S50-GF	T2HB12
100	S100-NF	T2HB12
	S100-GF	T2HB12
	H100-NF	T2HB25
	L100-NF	T2HB25
	S100-NM	T2HB12
	S100-NN	T2HB12
125	S125-SF	T2HB16L ①
	S125-NF	T2HB12
	S125-GF	T2HB12
	H125-NF	T2HB25
	L125-NF	T2HB25
	S125-SN	T2HB16L ①
	S125-NN	T2HB12
225	E225-NF	T2HB25
	S225-NF	T2HB25
	S225-GF	T2HB25
	S225-GE	T2HB25
	H225-NF	T2HB25
	L225-NF	T2HB25
	S225-NM	T2HB25
250	E250-SF	T2HB25L ①
	S250-SF	T2HB25L ①
	S250-NF	T2HB25
	S250-GF	T2HB25
	S250-SN	T2HB25L ①

Frame size	Type of breaker	Type of external operating handle
400	S400-CF	T2HB40
	S400-NF	T2HB40
	S400-NE	T2HB40
	S400-GF	T2HB40
	S400-GE	T2HB40
	S400-PF	T2HB40
	S400-PE	T2HB40
	H400-NE	T2HB40
	L400-NE	T2HB40
	S400-NN	T2HB40
630	S630-CF	T2HB80
	S630-NF	T2HB80
	S630-NE	T2HB80
	S630-RF	T2HB80
	S630-RE	T2HB80
	H630-NE	T2HB80
	L630-NE	T2HB80
	S630-GN	T2HB80
800	S800-CF	T2HB80
	S800-NF	T2HB80
	S800-NE	T2HB80
	S800-RF	T2HB80
	S800-RE	T2HB80
	H800-NE	T2HB80
	L800-NE	T2HB80
	S800-NN	T2HB80
1250	S1250-NE	T2HBX6
	S1250-GE	T2HBX6
	S1250-NN	T2HBX6
1600	S1600-NE	T2HBX6
	S1600-NN	T2HBX6

Note ① : Key lock is not available.

■ To be stated when ordering

Order code T2HB12 U R 3 B T

Type of external operating handle	Breaker mounting direction	Panel lock	Protection degree	Colour	Key lock
T2HB12 T2HB16L T2HB25 T2HB25L T2HB40 T2HBX6 T2HB80	U: Upper power supply type * R: Right power supply type L: Left power supply type	R : RESET open * F : OFF open	3 : IP30 * 5 : IP50 S : IP55 (special spec.)	B : Black handle (Light gray base) * R : Red handle (Yellow base)	W : with key lock T : without key lock *

*: standard specification

5. External operating handles

ASL: Arrangement Standard Line

HL: Handle Frame Centre Line

CL: Handle Centre Line

■ Outline dimensions

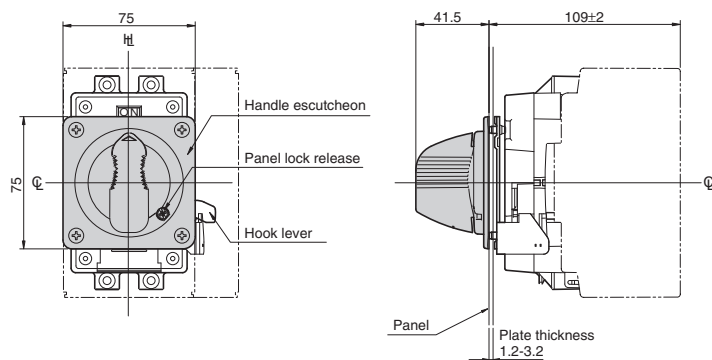
T2HB16L

Applicable breaker types

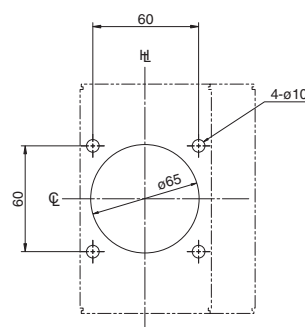
S50-SF

S125-SF S125-SN

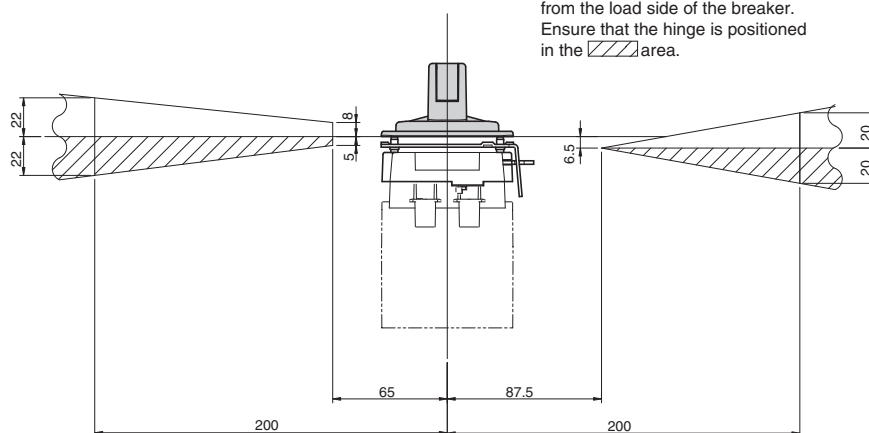
● Outline dimensions



● Panel cutout dimensions



- Positions of the hinge and handle as seen from the load side of the breaker. Ensure that the hinge is positioned in the  area.



T2HB25L

5. External operating handles

ASL: Arrangement Standard Line

HL: Handle Frame Centre Line

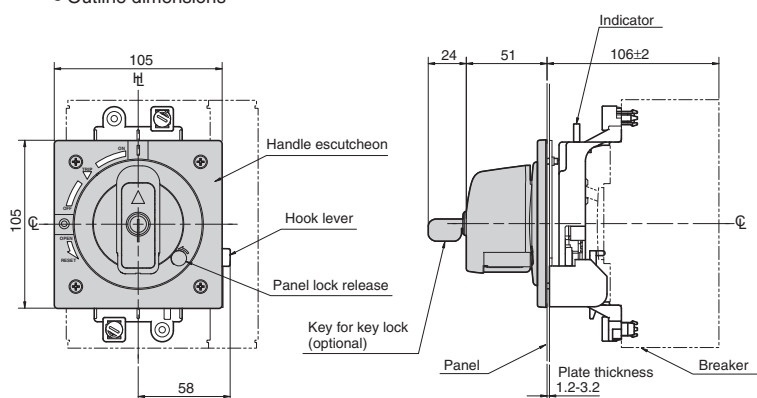
CL: Handle Centre Line

Outline dimensions

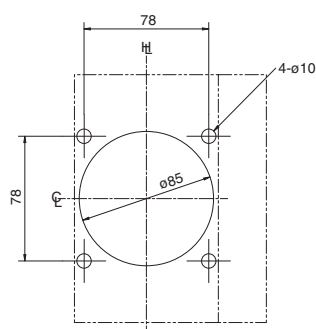
T2HB12

Applicable breaker types			
S50-GF			
S100-NF	S100-GF	S100-NM	S100-NN
S125-NF	S125-GF	S125-NN	

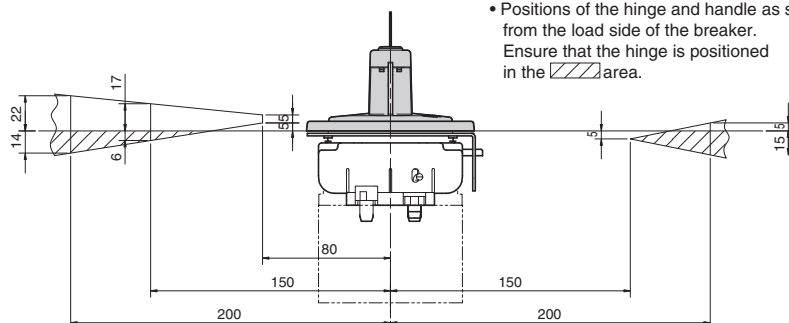
Outline dimensions



Panel cutout dimensions



- Positions of the hinge and handle as seen from the load side of the breaker. Ensure that the hinge is positioned in the hatched area.

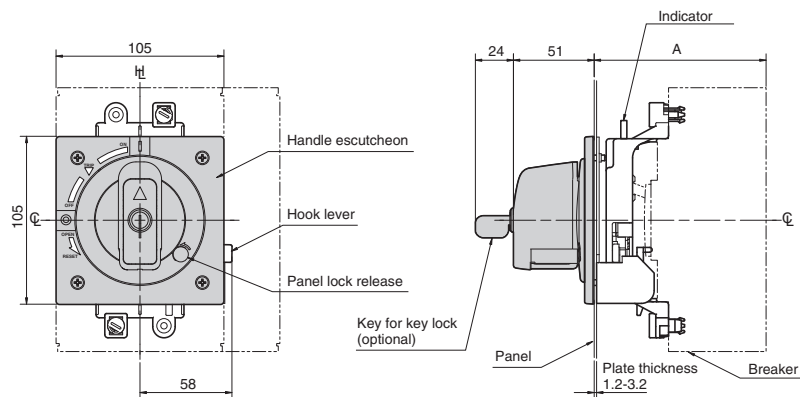


ASL: Arrangement Standard Line
 $\overline{H}$: Handle Frame Centre Line
 $\overline{C}$: Handle Centre Line

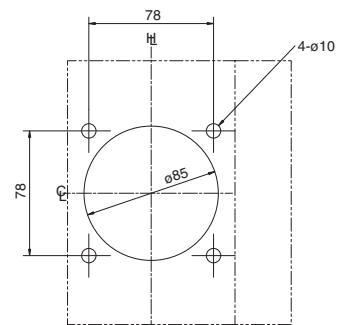
T2HB25

Applicable breaker types			A
E225-NF			106 ± 2
S225-NF	S225-NF	S225-NM	
E250-NF	S250-NF	S250-GF	
H100-NF	L100-NF		141 ± 2
H225-NF	L225-NF		
S225-GE			
H125-NF	L125-NF		

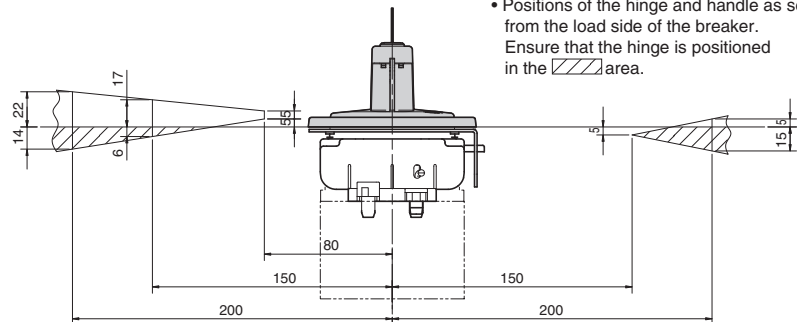
• Outline dimensions



• Panel cutout dimensions



- Positions of the hinge and handle as seen from the load side of the breaker. Ensure that the hinge is positioned in the  area.



5. External operating handles

ASL: Arrangement Standard Line

HL: Handle Frame Centre Line

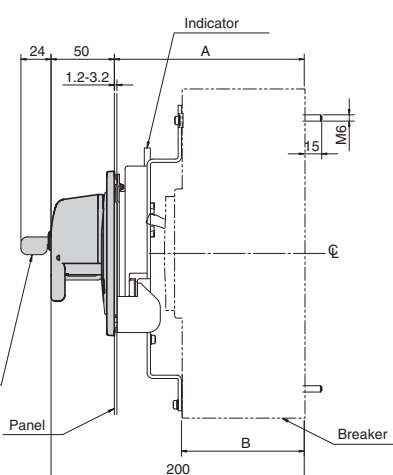
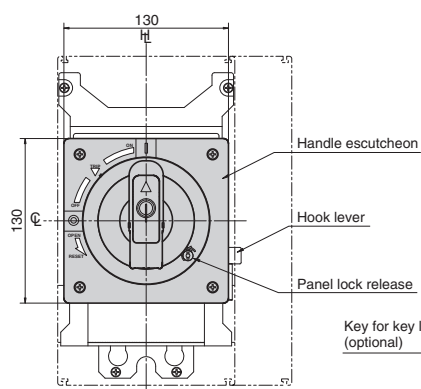
CL: Handle Centre Line

Outline dimensions

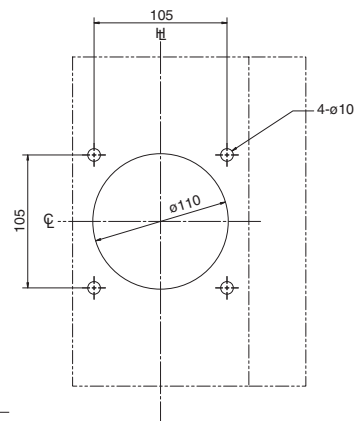
T2HB40

Applicable breaker types				A	B
S400-CF	S400-NF	S400-NE	S400-GF	150 ± 2	97
S400-GE	S400-PF	S400-PE	S400-NN		
H400-NE	L400-NE			187 ± 2	134

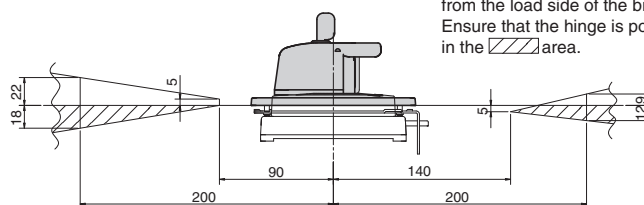
Outline dimensions



Panel cutout dimensions



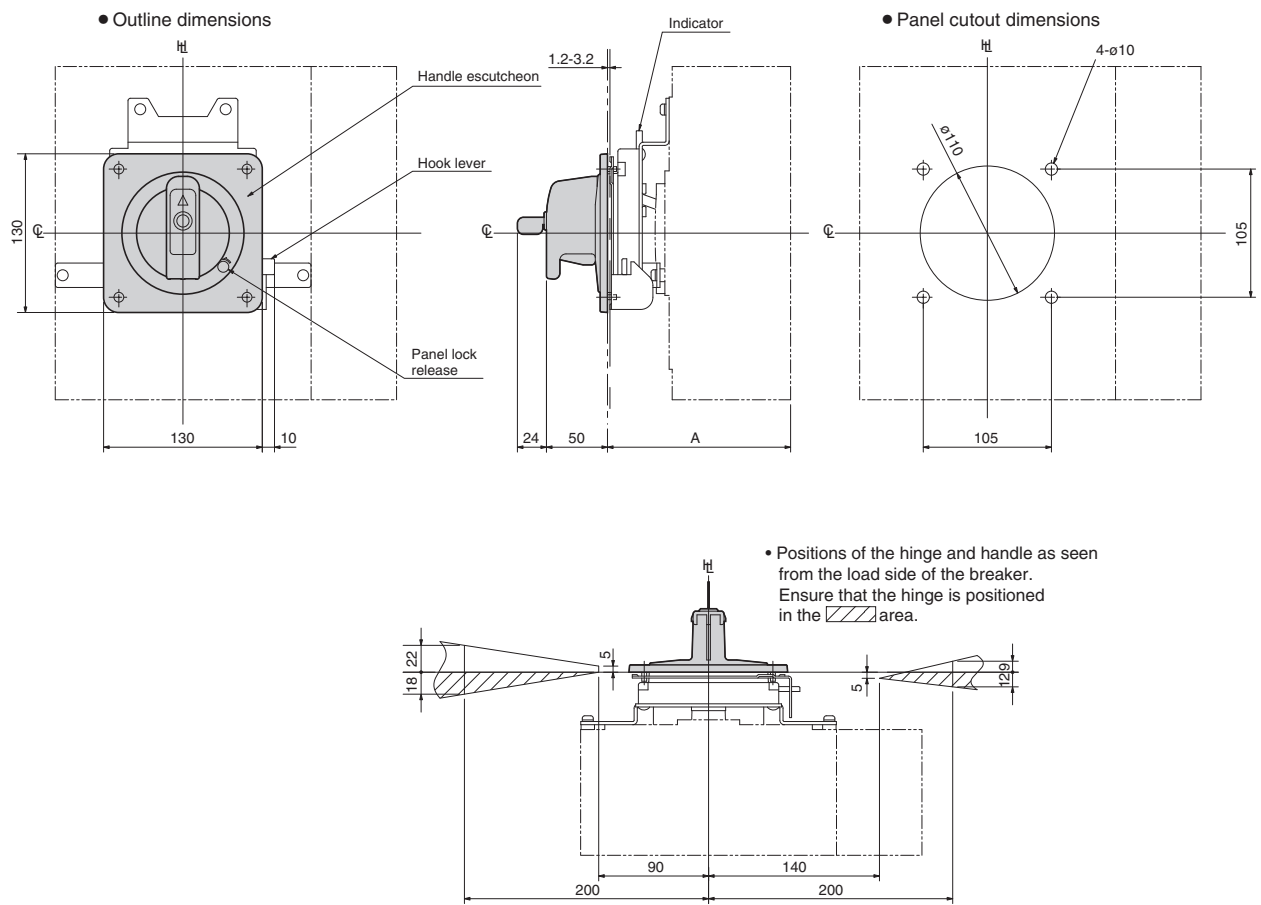
- Positions of the hinge and handle as seen from the load side of the breaker. Ensure that the hinge is positioned in the  area.



ASL: Arrangement Standard Line
 HL: Handle Frame Centre Line
 CL: Handle Centre Line

T2HB80

Applicable breaker types						A
S630-CF	S630-NF	S630-RF	S630-NE	S630-RE	S630-GN	150±2
S800-CF	S800-NF	S800-RF	S800-NE	S800-RE	S800-NN	
H630-NE	L630-NE					187±2
H800-NE	L800-NE					

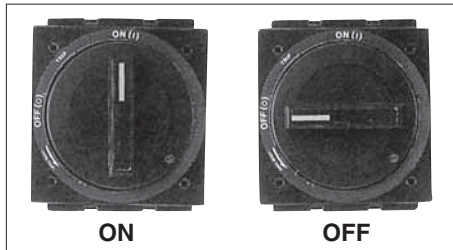


5. External operating handles

5-2. Breaker-mounted (HB)

The external operating handle is a tool that allows the breaker installed in a switchboard to be operated from outside. The breaker-mounted type external operating handle is designed to be mounted directly to the breaker body.

Outer view



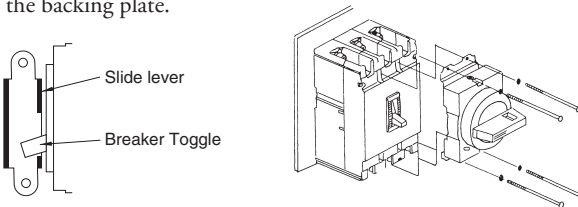
Mounting instructions

The external operating handle has not been mounted on the breakers. For details on how to mount the handle, see the Operating Instructions packaged with the product.

[1] Mounting of external operating handle assembly

1.1 Secured to backing plate (TFJ21B / TFJ21XH)

- Make sure that the breaker is in the OFF position.
- Put the external operating handle assembly onto the breaker in place so that the breaker toggle is engaged with the slide lever of the assembly. Secure the assembly together with the breaker to the backing plate.

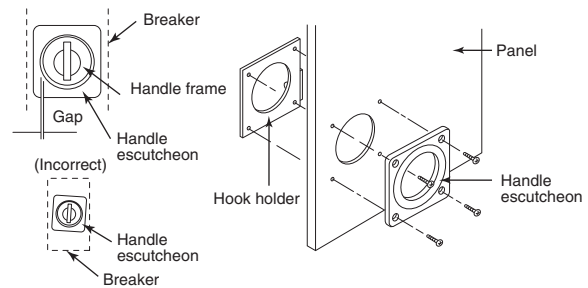


1.2 Secured to breaker cover (TFJ38X / T2HBX6)

- Make sure that the breaker is in the OFF position.
- Remove the four breaker cover mounting screws at the positions where the external operating handle assembly is secured.
- Put the handle assembly onto the breaker in place so that the breaker toggle is engaged with the slide lever of the assembly. Use the supplied mounting screws to secure the assembly to the breaker.

[2] Installation of handle escutcheon and latch plate

- Drill holes in the panel according to the panel cutout dimensions. Sandwich the panel between the handle escutcheon and latch plate and temporarily tighten using the supplied screws.
- Close the panel.
Make adjustment so that the gap between the handle assembly and handle escutcheon is even and the assembly is not inclined against the breaker.



Breaker mounting direction

The ON and OFF positions of the handle and the positions of drilled holes in the panel do not need to be changed depending on the breaker mounting direction. The upper power supply type is standard. If a non-standard type is required, state the type when ordering.

R : Right power supply type	U: Upper power supply type (standard)	L: Left power supply type

- For a change in mounting direction, see the Operating Instructions packaged with the product.

■ Panel lock mechanism

The external operating handle keeps the panel door locked when in the 'ON' position. There are two types, RESET, Open and OFF, Open.

(1) Reset, Open (Standard type)

The handle is turned to the 'RESET/OPEN COVER' position to open the panel door.

(2) OFF, Open

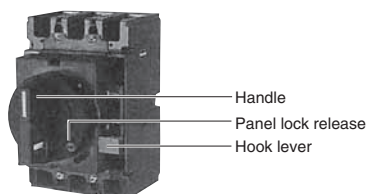
The handle is turned to the OFF position to open the panel door.

● Panel lock release knob

The release knob enables the panel door to be opened with the handle in the 'ON' position. To release: turn the release knob in the direction of anti-clockwise with a flat-bladed screwdriver.

● Safety interlock (Standard)

The safety interlock prevents the breaker from turning ON as long as the panel is open. This interlock can be released using the hook lever.



■ Toggle lock mechanism

● Padlock (Standard)

This mechanism allows the breaker to be padlocked in the ON or OFF position.

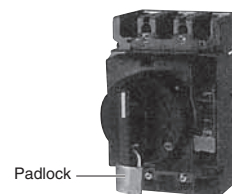
Padlocks are not supplied.

Up to three padlocks can be installed.



Padlock dimensions (mm)

Type of handle	A	Dia.
TFJ21B	13 min	ø3.5-6
TFJ38X	19 min	
T2HBX6		

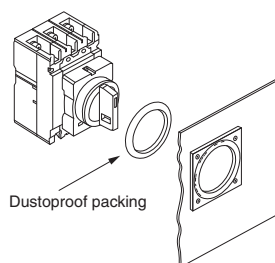
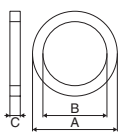


■ Protection degree (IEC 60529)

IP30	standard specification
IP50	optional, with a dust proof packing
IP55	special specification

Dustproof packing for IP50 (optional) mm

Type of handle	Type of dustproof packing	A	B	C
TFJ21B	Dustproof packing /2	93	73	7
TFJ38X	Dustproof packing /3	145	117	7
T2HBX6				



Possible combinations of breaker and external operating handle

Type of external operating handle	Type of breaker
TFJ21B	E50-SF, E50-CM
TFJ21XH	E100-SF
TFJ38X	TL-1000NE, TL-1200NE
T2HBX6	S1250-NE, S1250-GE, S1250-NN S1600-NE, S1600-NN

■ To be stated when ordering

Order code TFJ38X U R 3 B

Type of external operating handle	Breaker mounting direction	Panel lock	Protection degree	Colour
TFJ21B TFJ38X T2HBX6	U: Upper power supply type * R: Right power supply type L: Left power supply type	R : RESET open * F : OFF open	3 : IP30 * 5 : IP50 55: IP55 (special spec.)	B : Black handle (Black base) * R : Red handle (Yellow base)

*: standard specification

5. External operating handles

ASL: Arrangement Standard Line

HL: Handle Frame Centre Line

CL: Handle Centre Line

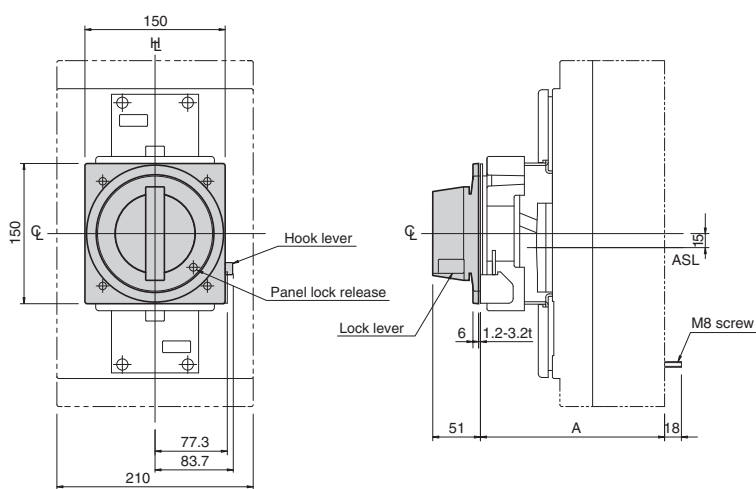
■ Outline dimensions

T2HBX6

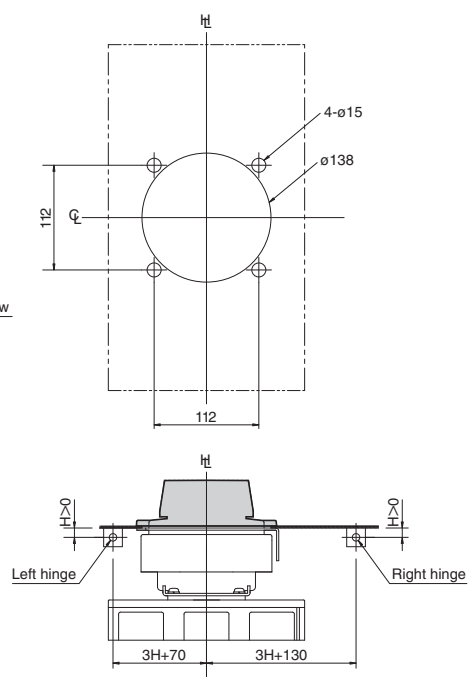
Applicable breaker types	A (mm)	Mounting screw *
S1250-NE, S1250-GE S1250-NN	197±2	M6×110, 4 pcs
S1600-NE, S1600-NN	217±2	

* Secured to breaker cover.

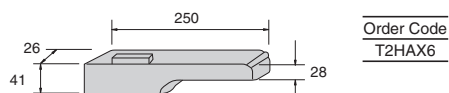
● Outline dimensions



● Panel cutout dimensions



Toggle extension for T2HBX6 (optional)



ASL: Arrangement Standard Line
 HL: Handle Frame Centre Line
 CL: Handle Centre Line

TFJ21B

Applicable breaker types	Mounting screw
E50-SF, E50-CM	M4×72, 2 pcs

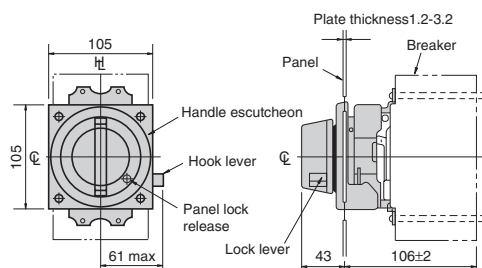
* Secured to backing plate.

TFJ21XH

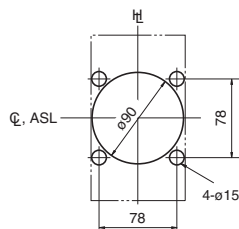
Applicable breaker types	Mounting screw
E100-SF	M4×75, 2 pcs

* Secured to backing plate.

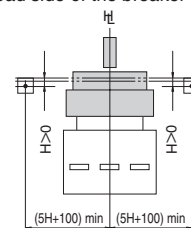
● Outline dimensions



● Panel cutout dimensions



● Relative positions of the hinge and handle as seen from the load side of the breaker



5. External operating handles

ASL: Arrangement Standard Line

HL: Handle Frame Centre Line

CL: Handle Centre Line

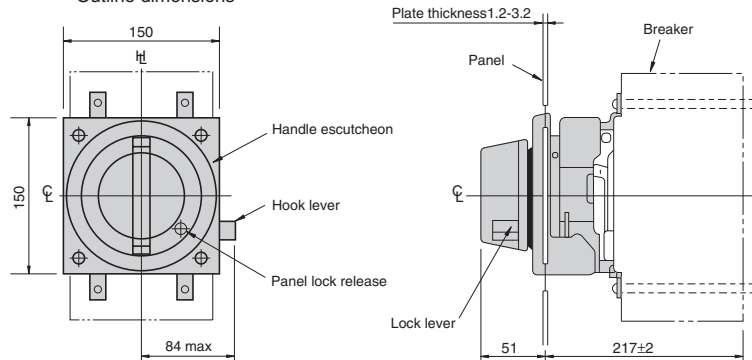
Outline dimensions

TFJ38X

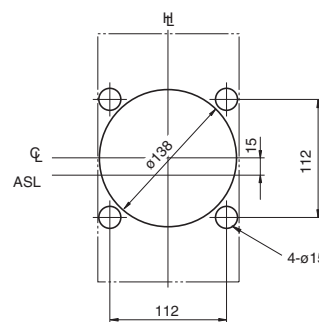
Applicable breaker types	Mounting screw *
TL-1000NE TL-1200NE	M6×110, 4 pcs

* Secured to breaker cover.

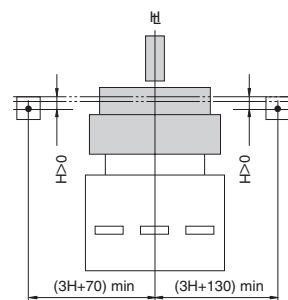
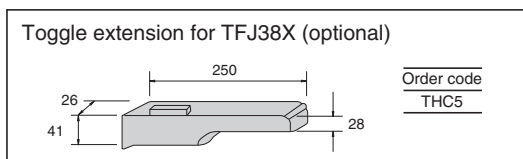
Outline dimensions



Panel cutout dimensions



Relative positions of the hinge and handle as seen from the load side of the breaker

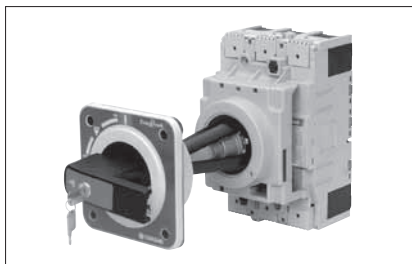


5-3. Door-mounted (depth adjustable) (HP)

Door-mounted type external operating handles allow breakers installed in control centers or switchboards to be manually operated from outside and complies with IEC 60204-1.

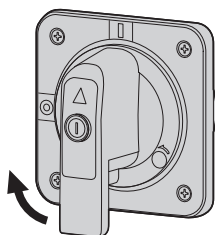
This handle assembly consists of an operation mechanism section which is to be installed in the breaker body, a handle section which is to be installed in a panel and a square shaft which couples both the sections.

■ Outer view



■ Operation direction of handles

Rotate the operating handle clockwise to turn the breaker on.



Rotate clockwise
to turn the breaker ON

■ Breaker mounting direction

The ON and OFF positions of the handle and the positions of drilled holes in the panel do not need to be changed depending on the breaker mounting direction.

Horizontal mounting / ON to move the breaker handle right	Vertical mounting / ON to move the breaker handle up	Horizontal mounting / ON to move the breaker handle left

6

Accessories

Molded Case Circuit Breakers

3 Externally mounted accessories

5. External operating handles

■ Panel lock mechanism

The external operating handle keeps the panel door locked when in the 'ON' position. There are two types, RESET, Open and OFF, Open.

(1) Reset, Open (Standard type)

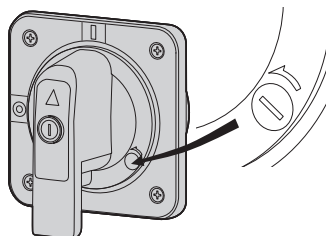
The handle is turned to the 'RESET/OPEN COVER' position to open the panel door.

(2) OFF, Open

The handle is turned to the OFF position to open the panel door.

● Panel lock release knob

The release knob enables the panel door to be opened with the handle in the 'ON' position. To release: turn the release knob in the direction of anti-clockwise with a flat-bladed screwdriver.



■ Toggle lock mechanism

● Padlock (Standard)

This mechanism allows the breaker to be padlocked in the OFF position.

Padlocks are not supplied.

Up to three padlocks can be installed.



Padlock dimensions (mm)

Type of handle	A	Dia.
T2HP	13 min	ø5.5-8

● Key lock (Optional)

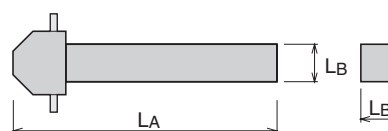
Key locking is possible in the OFF position.

■ Protection degree (IEC 60529)

IP54	standard specification
IP65	special specification

■ Dimensions of square shafts available

There are the following shaft dimensions available. Select an appropriate shaft depending on the mounting position of the breaker. Cut the shaft to an appropriate length if required. Coat the cut end faces of the shaft with an anti-corrosion paint.



Shafts order codes	LA (mm)	LB (mm)
T2PS251	121	8
T2PS252	221	
T2PS253	321	
T2PS254	421	
T2PS401	147.5	14
T2PS402	247.5	
T2PS403	347.5	
T2PS404	447.5	

■ To be stated when ordering

Order code T2HP25 R 5 B T

Type of external operating handle		Panel lock	Protection degree	Colour	Key lock
T2HP12 T2HP25 T2HP40 T2HP80 T2HPX6	T2HP16L T2HP25L T1HP05 T1HP10 T1HPX6	R : RESET open * F : OFF open	5 : IP54 * 6 : IP65	B : Black handle (Light gray base) * R : Red handle (Yellow base)	W : with key lock T : without key lock *

*: standard specification

Possible combinations of breaker and external operating handle

Frame size	Type of breaker	Type of external operating handle
50	E50-SF, E50-CM	T1HP05
	S50-SF	T2HP16L
	S50-GF	T2HP12
100	E100-SF	T1HP10X
	S100-NF	T2HP12
	S100-GF	
	H100-NF	T2HP25
	L100-NF	
	S100-NM	T2HP12
	S100-NN	
125	S125-SF	T2HP16L
	S125-NF	T2HP12
	S125-GF	
	H125-NF	T2HP25
	L125-NF	
	S125-SN	T2HP16L
225	S125-NN	T2HP12
	E225-NF	T2HP25
	S225-NF	
	S225-GF	
	S225-GE	
	H225-NF	
	L225-NF	
250	S225-NM	
	E250-SF	T2HP25L
	S250-SF	
	S250-NF	T2HP25
	S250-GF	
400	S250-SN	T2HP25L
	S400-CF	T2HP40
	S400-NF	
	S400-NE	
	S400-GF	
	S400-GE	
	S400-PF	
	S400-PE	
	H400-NE	
	L400-NE	
	S400-NN	
630	S630-CF	T2HP80
	S630-NF	
	S630-RF	
	S630-NE	
	S630-RE	
	H630-NE	
	L630-NE	
	S630-GN	
800	S800-CF	
	S800-NF	
	S800-RF	
	S800-NE	
	S800-RE	
	H800-NE	
	L800-NE	
	S800-NN	
1000	TL-1000NE	T1HPX6
1200	TL-1200NE	T1HPX6
1250	S1250-NE	T2HPX6
	S1250-GE	
	S1250-NN	
1600	S1600-NE	T2HPX6
	S1600-NN	

5. External operating handles

ASL: Arrangement Standard Line

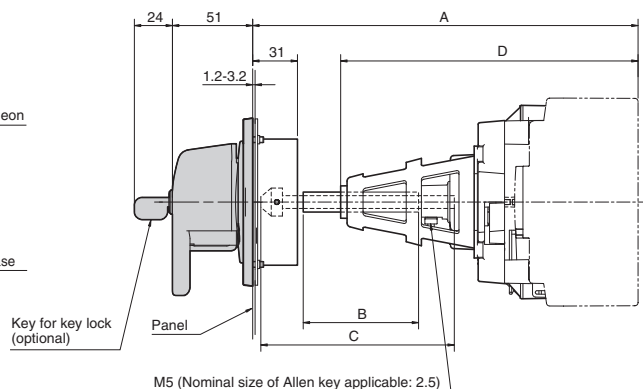
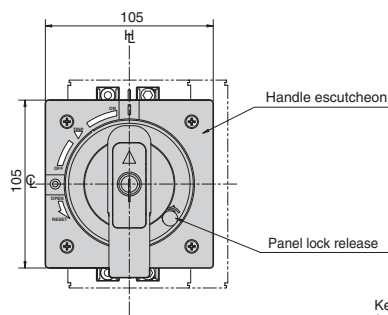
HL: Handle Frame Centre Line

CL: Handle Centre Line

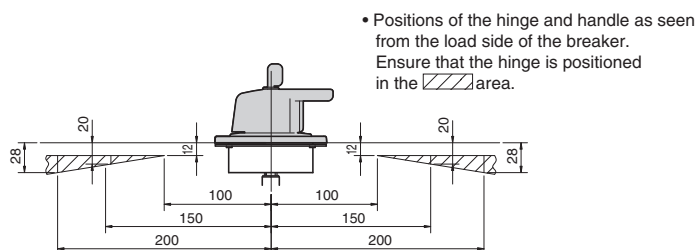
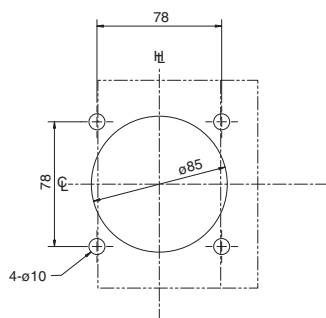
■ Outline dimensions

T2HP16L

● Outline dimensions



● Panel cutout dimensions



Applicable breaker types	A ①	B	C	D	Square shaft applicable	Shaft support
S50-SF	229 min.	56	107	186	T2PS251	Yes
S125-SF S125-SN	243 max.	70	121	186		Yes
	343 max.	170	221	186	T2PS252	Yes
	443 max.	270	321	186	T2PS253	Yes
	543 max.	370	421	186	T2PS254	

Note ①:

"Min (minimum)" means the minimum possible distance from the panel surface to the breaker mounting surface, which can be formed by cutting the square shaft.

"Max (maximum)" means the maximum distance of the same section, which is formed with no cutting of the square shaft.

A: Distance from the panel surface to the breaker mounting surface

B: Length of the tube used to cover the square shaft

C: Length of the square shaft used

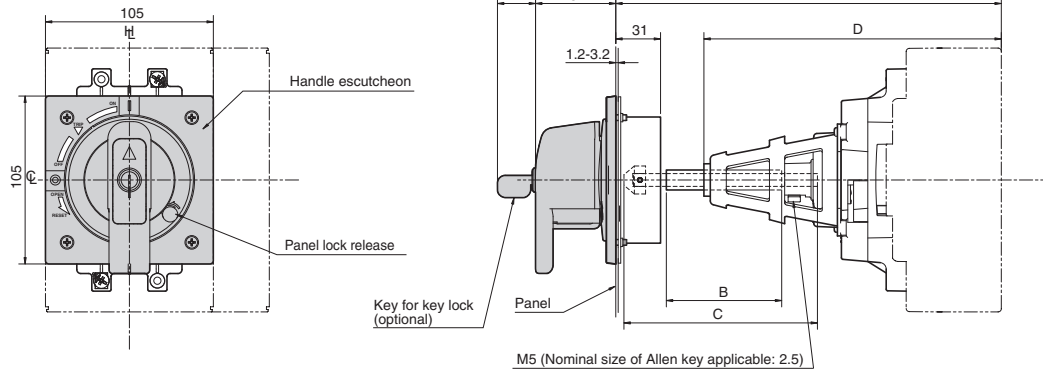
D: Distance from the tip of the shaft support to the breaker mounting surface

ASL: Arrangement Standard Line
 H: Handle Frame Centre Line
 C: Handle Centre Line

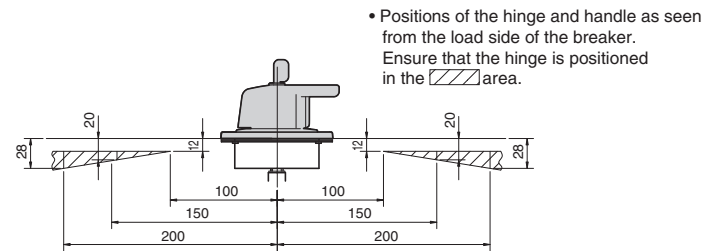
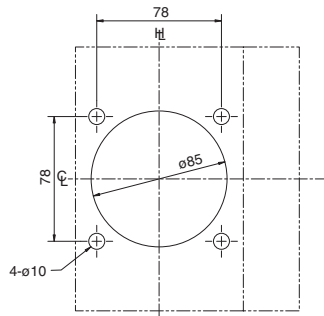
Outline dimensions

T2HP25L

Outline dimensions



Panel cutout dimensions



Applicable breaker types			A ①	B	C	D	Square shaft applicable	Shaft support
E250-SF	S250-SF	S250-SN	229 min.	56	107	186	T2PS251	Yes
			243 max.	70	121	186		Yes
			343 max.	170	221	186	T2PS252	Yes
			443 max.	270	321	186	T2PS253	Yes
			543 max.	370	421	186	T2PS254	

Note ①:

"Min (minimum)" means the minimum possible distance from the panel surface to the breaker mounting surface, which can be formed by cutting the square shaft.

"Max (maximum)" means the maximum distance of the same section, which is formed with no cutting of the square shaft.

A: Distance from the panel surface to the breaker mounting surface

B: Length of the tube used to cover the square shaft

C: Length of the square shaft used

D: Distance from the tip of the shaft support to the breaker mounting surface

5. External operating handles

ASL: Arrangement Standard Line

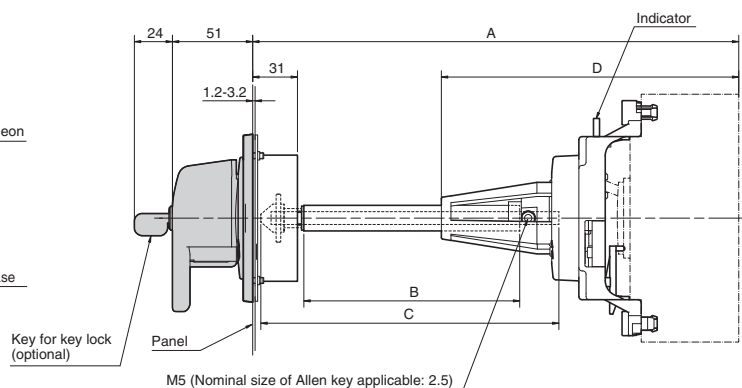
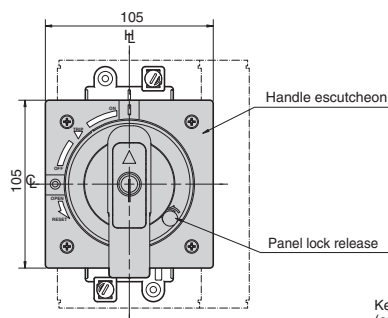
HL: Handle Frame Centre Line

CL: Handle Centre Line

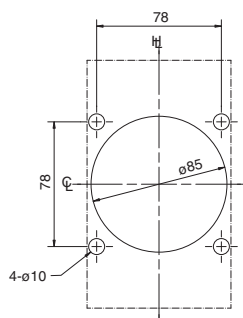
■ Outline dimensions

T2HP12

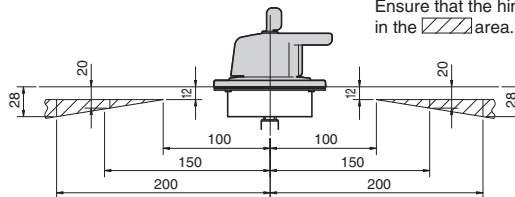
● Outline dimensions



● Panel cutout dimensions



- Positions of the hinge and handle as seen from the load side of the breaker. Ensure that the hinge is positioned in the area.



Applicable breaker types			A ①	B	C	D	Square shaft applicable	Shaft support
S50-GF			229 min.	56	107	186	T2PS251	Yes
S100-NF	S100-GF	S100-NM	243 max.	70	121	186		Yes
S100-NN	S125-NF	S125-GF	343 max.	170	221	186	T2PS252	Yes
S125-NN			443 max.	270	321	186	T2PS253	Yes
			543 max.	370	421	186	T2PS254	

Note ①:

"Min (minimum)" means the minimum possible distance from the panel surface to the breaker mounting surface, which can be formed by cutting the square shaft.

"Max (maximum)" means the maximum distance of the same section, which is formed with no cutting of the square shaft.

A: Distance from the panel surface to the breaker mounting surface

B: Length of the tube used to cover the square shaft

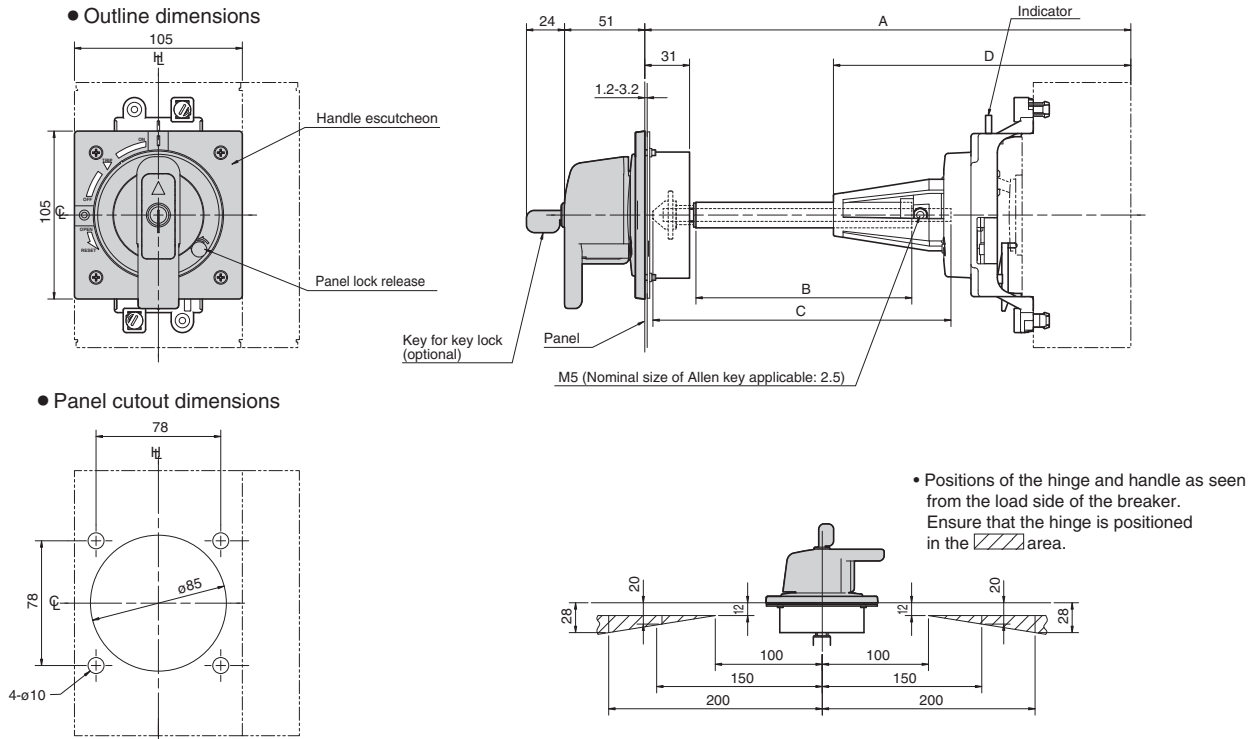
C: Length of the square shaft used

D: Distance from the tip of the shaft support to the breaker mounting surface

ASL: Arrangement Standard Line
 HL: Handle Frame Centre Line
 CL: Handle Centre Line

Outline dimensions

T2HP25



Applicable breaker types			A ①	B	C	D	Square shaft applicable	Shaft support
E225-NF S250-NF	S225-NF S250-GF	S225-GF	229 min.	56	107	186	T2PS251	Yes
			243 max.	70	121	186		Yes
			343 max.	170	221	186	T2PS252	Yes
			443 max.	270	321	186	T2PS253	Yes
S225-GE H100-NF H225-NF	L100-NF L225-NF	H125-NF L125-NF	543 max.	370	421	186	T2PS254	
			264 min.	56	107	221	T2PS251	Yes
			278 max.	70	121	221		Yes
			378 max.	170	221	221	T2PS252	Yes
			478 max.	270	321	221	T2PS253	Yes
			578 max.	370	421	221	T2PS254	

Note ①:

"Min (minimum)" means the minimum possible distance from the panel surface to the breaker mounting surface, which can be formed by cutting the square shaft.
 "Max (maximum)" means the maximum distance of the same section, which is formed with no cutting of the square shaft.

A: Distance from the panel surface to the breaker mounting surface
 B: Length of the tube used to cover the square shaft
 C: Length of the square shaft used
 D: Distance from the tip of the shaft support to the breaker mounting surface

6

Accessories

Molded Case Circuit Breakers

3 Externally mounted accessories

5. External operating handles

ASL: Arrangement Standard Line

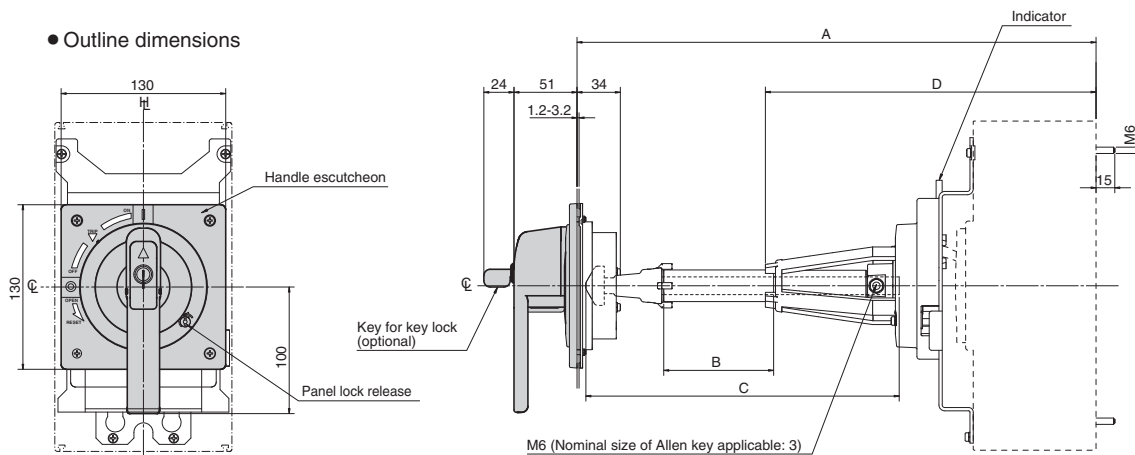
HL: Handle Frame Centre Line

CL: Handle Centre Line

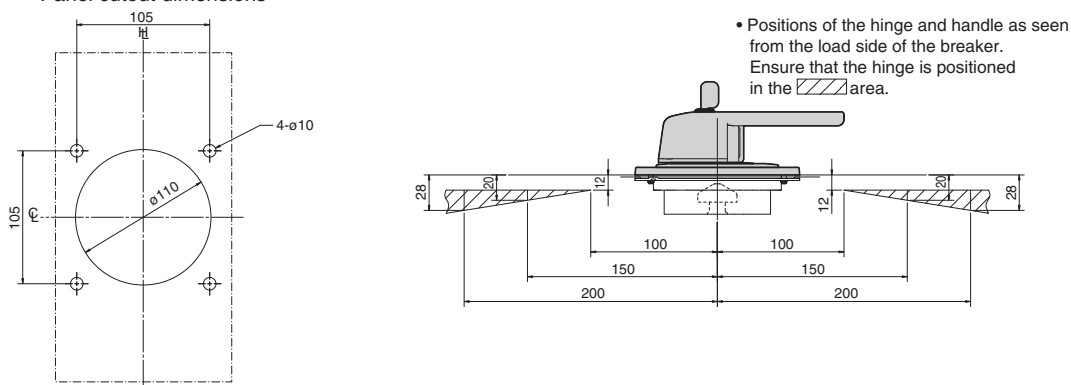
■ Outline dimensions

T2HP40

● Outline dimensions



● Panel cutout dimensions



Applicable breaker types			A ①	B	C	D	Square shaft applicable	Shaft support
S400-CF	S400-NF	S400-NE	270 min.	12	107.5	—	T2PS401	Non
S400-GF	S400-GE	S400-PF	310 max.②	52	147.5	—		
S400-PE	S400-NN		340 min.②	10	177.5	261	T2PS402	Yes
			410 max.	80	247.5	261		
			510 max.	180	347.5	261	T2PS403	Yes
			610 max.	280	447.5	261	T2PS404	Yes
H400-NE	L400-NE		307 min.	12	107.5	—	T2PS401	Non
347 max.③			52	147.5	—			
377 min.③		10	177.5	298	T2PS402	Yes		
447 max.		80	247.5	298				
547 max.		180	347.5	298	T2PS403	Yes		
647 max.	280	447.5	298	T2PS404	Yes			

Notes:

①. "Min (minimum)" means the minimum possible distance from the panel surface to the breaker mounting surface, which can be formed by cutting the square shaft.

"Max (maximum)" means the maximum distance of the same section, which is formed with no cutting of the square shaft.

②. When dimension A is in a range of 310 mm to 340 mm, cut square shaft T2PS402 to an appropriate length and use the shaft without shaft support.

③. When dimension A is in a range of 347mm to 377mm, cut square shaft T2PS402 to an appropriate length and use the shaft without shaft support.

A: Distance from the panel surface to the breaker mounting surface

B: Length of the tube used to cover the square shaft

C: Length of the square shaft used

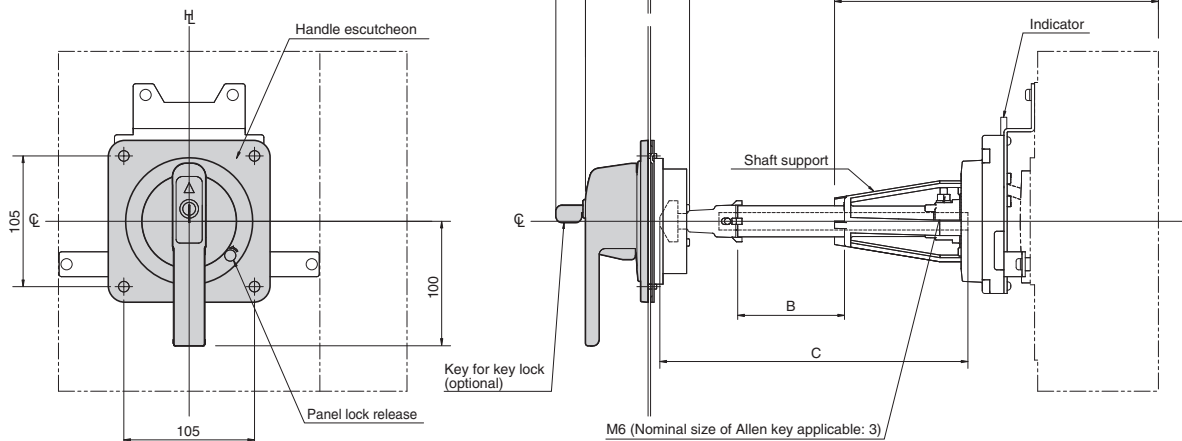
D: Distance from the tip of the shaft support to the breaker mounting surface

ASL: Arrangement Standard Line
 HL: Handle Frame Centre Line
 CL: Handle Centre Line

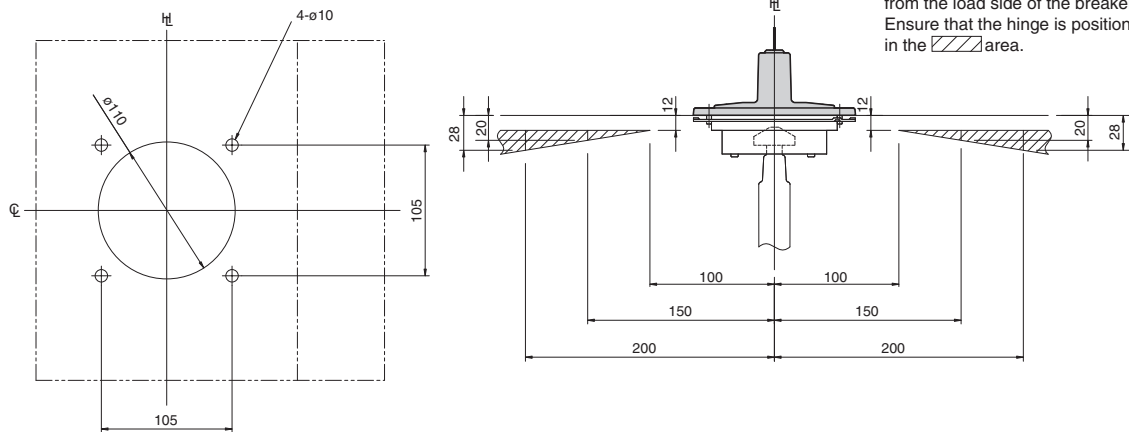
Outline dimensions

T2HP80

Outline dimensions



Panel cutout dimensions



Applicable breaker types			A ①	B	C	D	Square shaft applicable	Shaft support
S630-CF	S630-NF	S630-RF	270 min.	12	107.5	—	T2PS401	Non
S630-NE	S630-RE	S630-GN	310 max.②	52	147.5	—		
S800-CF	S800-NF	S800-RF	340 min.②	10	177.5	261	T2PS402	Yes
S800-NE	S800-RE	S800-NN	410 max.	80	247.5	261		
			510 max.	180	347.5	261		
			610 max.	280	447.5	261	T2PS404	
H630-NE	L630-NE		307 min.	12	107.5	—	T2PS401	Non
H800-NE	L800-NE		347 max.③	52	147.5	—		
			377 min.③	10	177.5	298	T2PS402	Yes
			447 max.	80	247.5	298		
			547 max.	180	347.5	298	T2PS403	
			647 max.	280	447.5	298	T2PS404	

Notes:

- ①. "Min (minimum)" means the minimum possible distance from the panel surface to the breaker mounting surface, which can be formed by cutting the square shaft. "Max (maximum)" means the maximum distance of the same section, which is formed with no cutting of the square shaft.
- ②. When dimension A is in a range of 310 mm to 340 mm, cut square shaft T2PS402 to an appropriate length and use the shaft without shaft support.
- ③. When dimension A is in a range of 347 mm to 377 mm, cut square shaft T2PS402 to an appropriate length and use the shaft without shaft support.

- A: Distance from the panel surface to the breaker mounting surface
 B: Length of the tube used to cover the square shaft
 C: Length of the square shaft used
 D: Distance from the tip of the shaft support to the breaker mounting surface

6

Accessories

Molded Case Circuit Breakers

3 Externally mounted accessories

5. External operating handles

ASL: Arrangement Standard Line

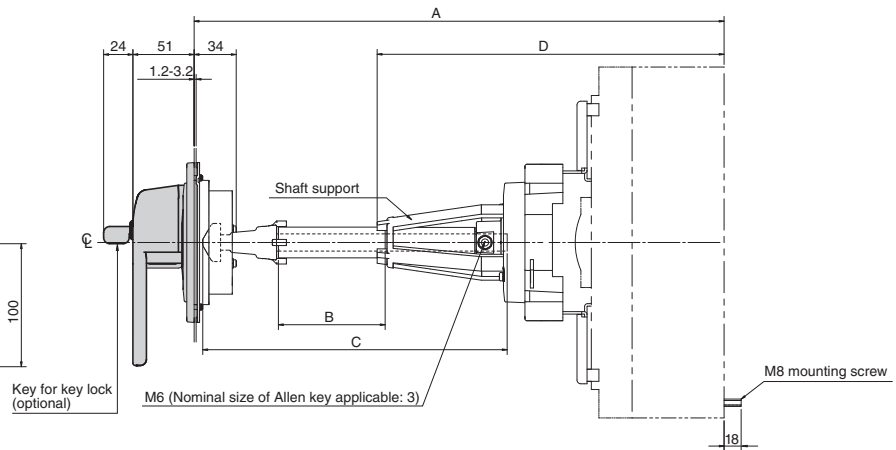
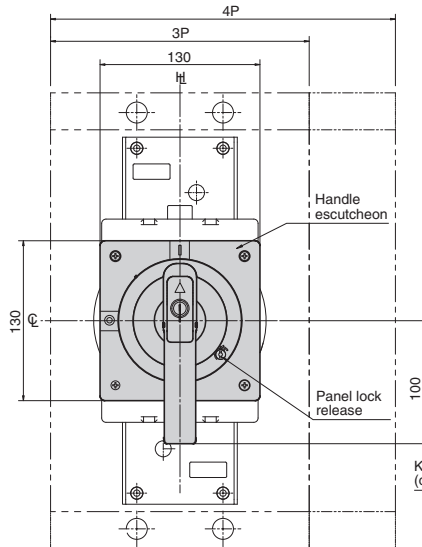
HL: Handle Frame Centre Line

CL: Handle Centre Line

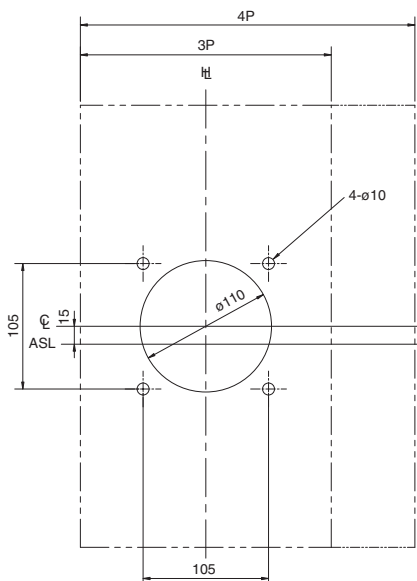
■ Outline dimensions

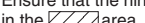
T2HPX6

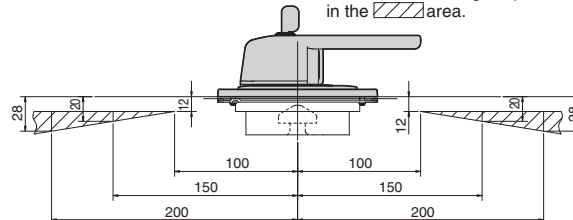
● Outline dimensions



● Panel cutout dimensions



- Positions of the hinge and handle as seen from the load side of the breaker. Ensure that the hinge is positioned in the  area.



Applicable breaker types			A ①	B	C	D	Square shaft applicable	Shaft support
S1250-NE	S1250-GE	S1250-NN	367min.	52	147.5	317	T2PS401	Non
			467max.	80	247.5	317	T2PS402	
			567max.	180	347.5	317	T2PS403	Yes
			667max.	280	447.5	317	T2PS404	
S1600-NE	S1600-NN		387min.	52	147.5	337	T2PS401	Non
			487max.	80	247.5	337	T2PS402	
			587max.	180	347.5	337	T2PS403	Yes
			687max.	280	447.5	337	T2PS404	

Note ①:

"Min (minimum)" means the minimum possible distance from the panel surface to the breaker mounting surface, which can be formed by cutting the square shaft.
 "Max (maximum)" means the maximum distance of the same section, which is formed with no cutting of the square shaft.

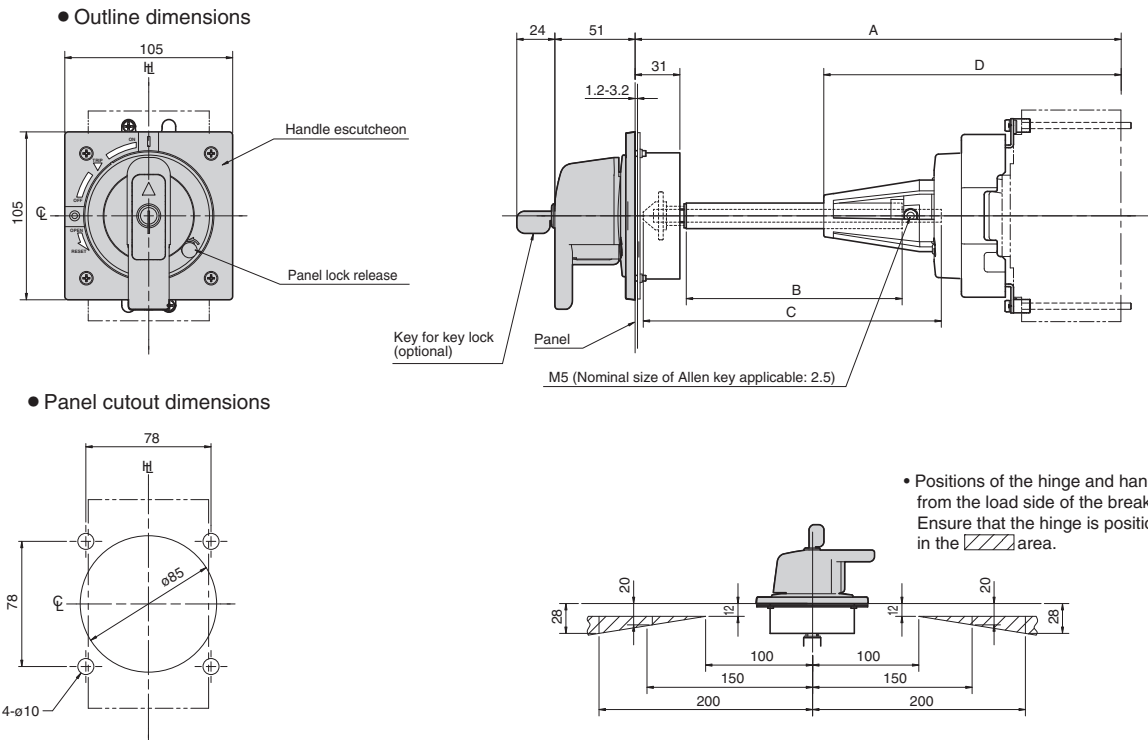
A: Distance from the panel surface to the breaker mounting surface
 C: Length of the square shaft used

B: Length of the tube used to cover the square shaft
 D: Distance from the tip of the shaft support to the breaker mounting surface

ASL: Arrangement Standard Line
 H: Handle Frame Centre Line
 C: Handle Centre Line

■ Outline dimensions

T1HP05, T1HP10X



Applicable breaker types	A ①	B	C	D	Square shaft applicable	Shaft support
E50-SF, E50-CM (T1HP05)	236min.	56	107	194	T2PS251	Yes
E100-SF (T1HP10X)	250max.	70	121	194		Yes
	350max.	170	221	194	T2PS252	Yes
	450max.	270	321	194	T2PS253	Yes
	550max.	370	421	194	T2PS254	Yes

Note ①:

"Min (minimum)" means the minimum possible distance from the panel surface to the breaker mounting surface, which can be formed by cutting the square shaft.
 "Max (maximum)" means the maximum distance of the same section, which is formed with no cutting of the square shaft.

A: Distance from the panel surface to the breaker mounting surface
 B: Length of the tube used to cover the square shaft
 C: Length of the square shaft used
 D: Distance from the tip of the shaft support to the breaker mounting surface

6

Accessories

Molded Case Circuit Breakers

3 Externally mounted accessories

5. External operating handles

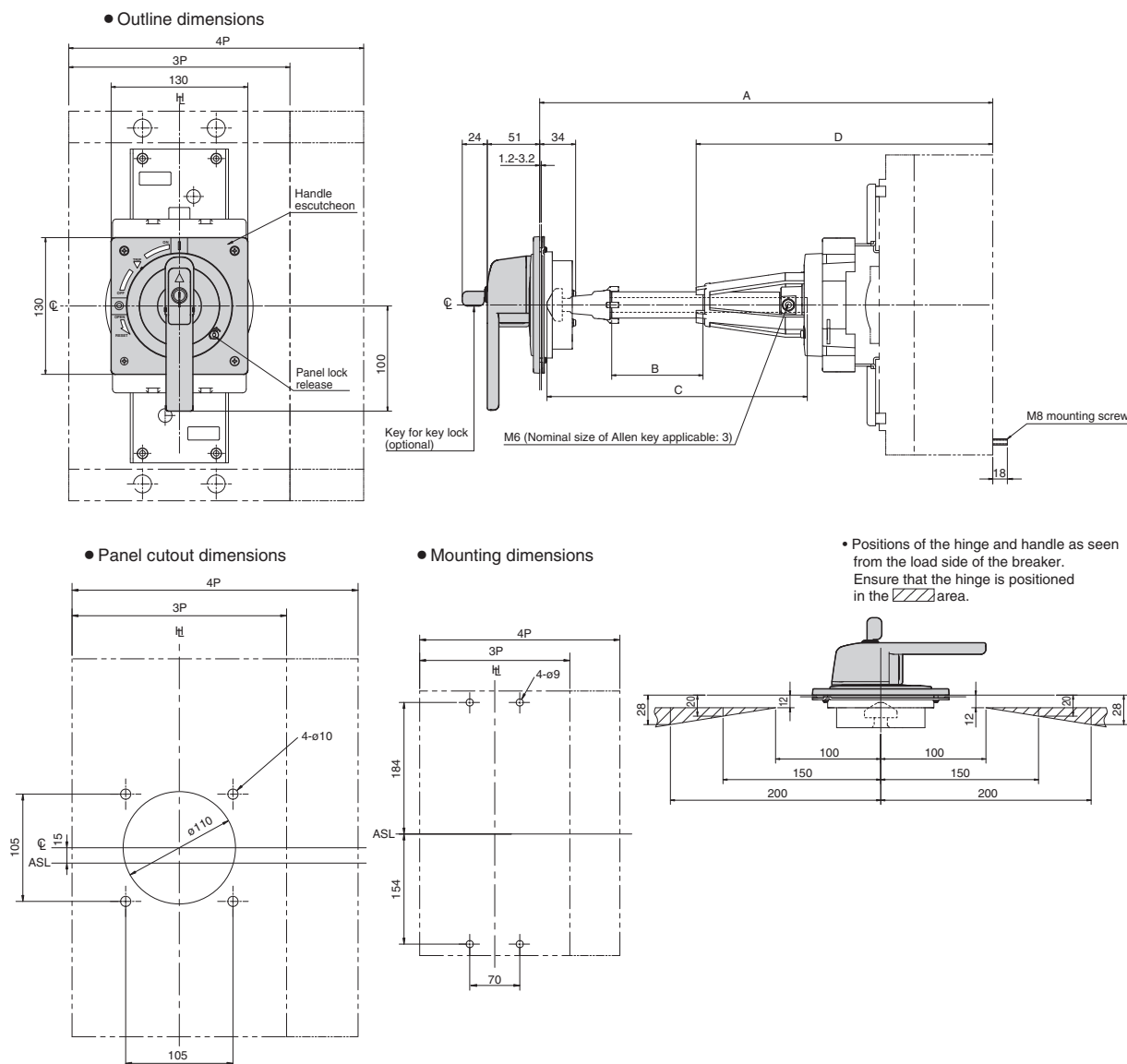
ASL: Arrangement Standard Line

HL: Handle Frame Centre Line

CL: Handle Centre Line

Outline dimensions

T1HPX6



Applicable breaker types		A ①	B	C	D	Square shaft applicable	Shaft support
TL-1000NE	TL-1200NE	387min.	52	147.5	337	T2PS401	Non
		487max.	80	247.5	337	T2PS402	Yes
		587max.	180	347.5	337	T2PS403	Yes
		687max.	280	447.5	337	T2PS404	Yes

Notes:

- ①. "Min (minimum)" means the minimum possible distance from the panel surface to the breaker mounting surface, which can be formed by cutting the square shaft.
 "Max (maximum)" means the maximum distance of the same section, which is formed with no cutting of the square shaft.

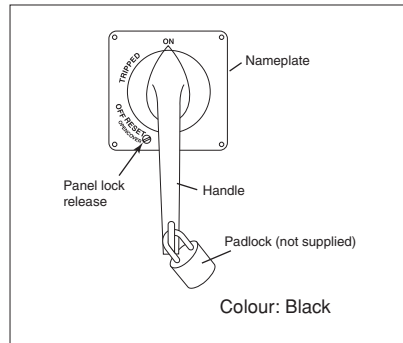
A: Distance from the panel surface to the breaker mounting surface
 C: Length of the square shaft used

B: Length of the tube used to cover the square shaft
 D: Distance from the tip of the shaft support to the breaker mounting surface

(4) Door-mounted (depth fixed) (HP)

Door-mounted type external operating handles allow breakers installed in control centers or switchboards to be manually operated from outside.

■ Outer view



■ Operation mechanism

ON

Turn the handle clockwise to the 'ON' position on the indication plate.

OFF

Turn the handle anti-clockwise to the 'OFF' position on the indication plate.

RESET

When the breaker trips, the handle indicates tripped turn the handle anti-clockwise to the RESET position. This will reset the breaker.

OPENING THE PANEL

Turn the handle anti-clockwise to 'OPEN COVER'. The lock is released and the panel can be opened.

■ Panel lock mechanism

The external operating handle keeps the panel door locked when in the 'ON', 'OFF' or 'TRIP' position.

Hook holder shown in the outline dimension drawing should be provided.

• Panel lock release knob

When the release knob is turned clockwise the panel door can be opened irrespective of the handle being in the 'ON', 'OFF' or 'TRIP' position.

■ Toggle lock mechanism

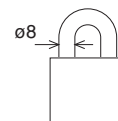
• Padlock (Standard)

This mechanism allows the breaker to be padlocked in the ON or OFF position.

Padlocks are not supplied.

Up to three padlocks can be installed.

Padlock dimensions



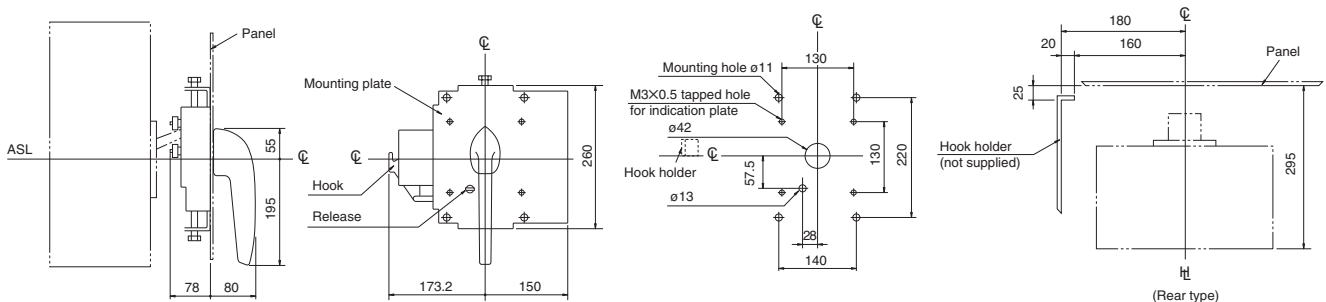
■ Outline dimensions

XFE10

Applicable breaker types

XS2000NE

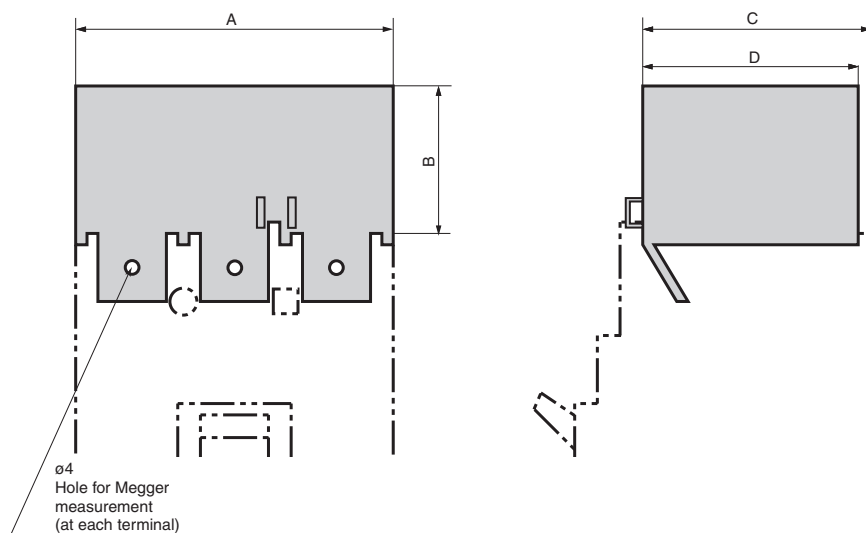
XS2000NN



6. Terminal covers CF/CR/CS

Terminal covers prevent live parts of the breaker from being exposed to the external environment. There are three types of terminal covers available: CF for front-connected breakers, CR for rear-connected and plug-in breakers, and CS for front-connected breakers with cable clamps. Select appropriate terminal covers depending on the type and application of the breaker.

(1) CF for front-connected breakers

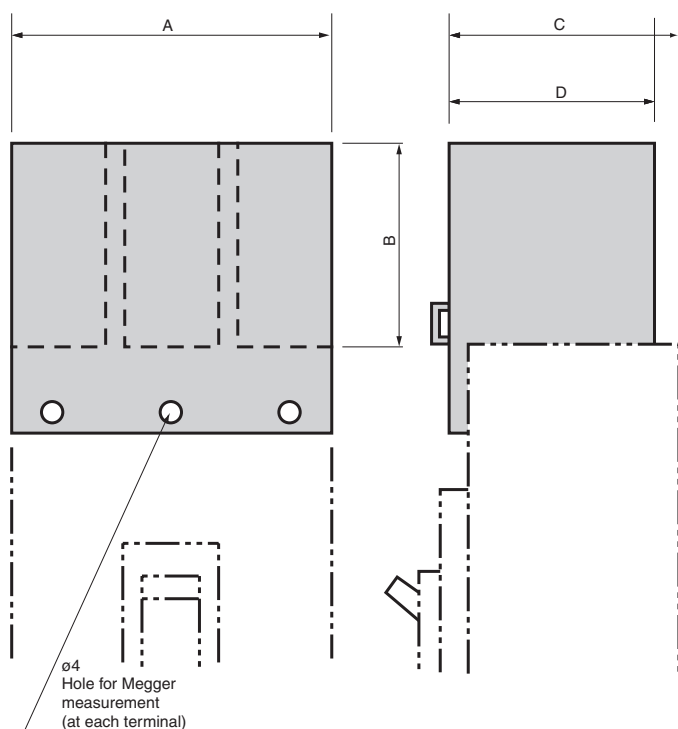


Plug-in mounted version

This version can be mounted simply by being plugged in the breaker body.

■ To be stated when ordering

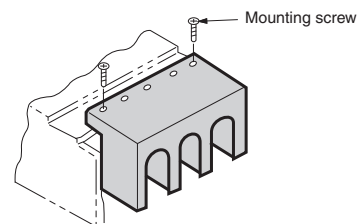
- Please state the order codes on the next page. One set includes one terminal cover for the ON side and one for the OFF side.
- For the terminal covers for 1250AF, please order with the breakers.



Screw-mounted version

The terminal covers for 630 to 800AF are mounted to the breakers using tapping screws.

The terminal cover for 1250AF is mounted to insert nuts of the breaker cover using screws. The insert nuts do not come standard with the breaker. Please be sure to state “with terminal cover (CF)” when ordering the breaker.



Types and dimensions of terminal covers, units in mm

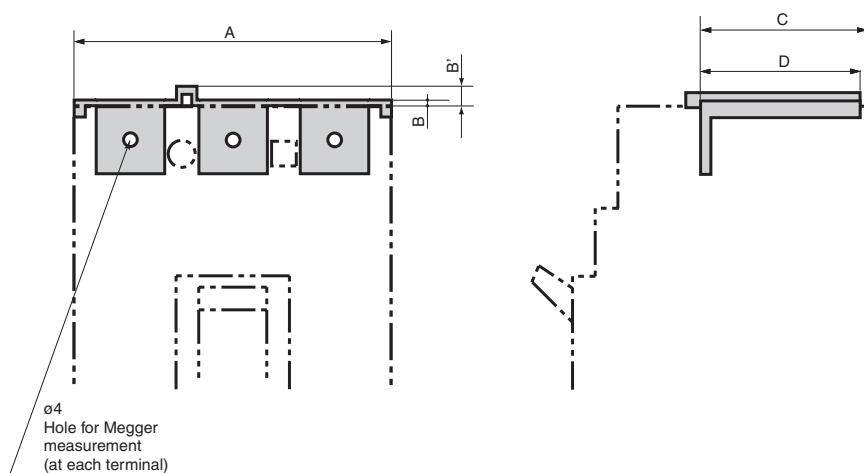
CF for front-connected breakers

Frame size (A)	Types of breakers	Terminal cover				A			B		C		D		Colour of cover	Mounting version	
		Size	Note:	Order codes ①	Marking codes	2 poles	3 poles	4 poles	2/3 poles	4 poles	2/3 poles	4 poles	2/3 poles	4 poles	G:Gray C':Clear	Plug-in mounted	Screw-mounted
50	E50-SF, E50-CM	Large		TPR1S * G	—	50	75	—	30	—	63	—	58.5	—	G	○	—
				TPR1S * C											C'		
	Small		TPT1S * G	—	50	75	—	2.5	—	63	—	61	—	G	○	—	
			TPT1S * C											C'			
	S50-SF	Large		T2CF12L * SLNG	—	50	75	—	50	—	61	—	60.3	—	G	○	—
				T2CF12L * SLNC											C'		
	Small		T2CF12L * SSNG	—	50	75	—	25	—	61	—	60.3	—	G	○	—	
			T2CF12L * SSNC											C'			
	S50-GF	Large		T2CF12 * SLNG	T2CF12 * SL	—	90	120	40	40	48	48	46	46	G	○	—
				T2CF12 * SLNC											C'		
Small		T2CF12 * SSNG	T2CF12 * SS	—	90	120	22	22	48	48	47	47	G	○	—		
		T2CF12 * SSNC											C'				
100	E100-SF	Large		XPRI * G	—	49	74	—	30	—	63	—	54	—	G	○	—
				XPRI * C											C'		
	Small		TPT1 * G	—	49	74	—	2	—	63	—	54	—	G	○	—	
			TPT1 * C											C'			
	S100-NF, S100-GF S100-NM, S100-NN	Large		T2CF12 * SLNG	T2CF12 * SL	60	90	120	40	40	48	48	46	46	G	○	—
				T2CF12 * SLNC											C'		
	Small		T2CF12 * SSNG	T2CF12 * SS	60	90	120	22	22	48	48	47	47	G	○	—	
			T2CF12 * SSNC											C'			
	H100-NF, L100-NF	Large	②	T2CF25 * LLNG	T2CF25 * LL	—	105	140	55	55	89	89	87	87	G	○	—
				T2CF25 * LLNC											C'		
125	S125-SF, S125-SN	Large	⑥	T2CF12L * SLNG	—	50	75	100	50	50	61	61	60.3	60.3	G	○	—
				T2CF12L * SLNC											C'		
	Small	⑥	T2CF12L * SSNG	—	50	75	100	25	25	61	61	60.3	60.3	G	○	—	
			T2CF12L * SSNC											C'			
	S125-NF, S125-GF S125-NN	Large		T2CF12 * SLNG	T2CF12 * SL	60	90	120	40	40	48	48	46	46	G	○	—
				T2CF12 * SLNC											C'		
	Small		T2CF12 * SSNG	T2CF12 * SS	60	90	120	22	22	48	48	47	47	G	○	—	
			T2CF12 * SSNC											C'			
	H125-NF, L125-NF	Large	②	T2CF25 * LLNG	T2CF25 * LL	—	105	140	55	55	89	89	87	87	G	○	—
				T2CF25 * LLNC											C'		
225 250	E225-NF, S225-NF S225-GF, S225-NM	Large	②	T2CF25 * SLNG	T2CF25 * SL	—	105	140	55	55	54	54	52	52	G	○	—
				T2CF25 * SLNC											C'		
	Small	②	T2CF25 * SSNG	T2CF25 * SS	—	105	140	29	29	54	54	53.5	53.5	G	○	—	
			T2CF25 * SSNC											C'			
	H225-NF, L225-NF S225-GE	Large	②	T2CF25 * LLNG	T2CF25 * LL	—	105	140	55	55	89	89	87	87	G	○	—
				T2CF25 * LLNC											C'		
	E250-SF	Small		T2CF25L * SSNG	T2CF25L * SS	105	105	—	29	—	59	—	57.5	—	G	○	—
				T2CF25L * SSNC											C'		
	Large	③	T2CF25L * SWNG	T2CF25L * SW	147.5	147.5	—	55	—	59	—	57.5	—	G	○	—	
			T2CF25L * SWNC											C'			
Large		T2CF25L * SLNG	T2CF25L * SL	105	105	—	55	—	59	—	57.5	—	G	○	—		
		T2CF25L * SLNC											C'				
S250-SF, S250-SN	Small		T2CF25L * SSNG	T2CF25L * SS	105	105	140	29	29	59	59	57.5	57.5	G	○	—	
			T2CF25L * SSNC											C'			
Large	③	T2CF25L * SWNG	T2CF25L * SW	147.5	147.5	196	55	55	59	59	57.5	57.5	G	○	—		
		T2CF25L * SWNC											C'				
Large		T2CF25L * SLNG	T2CF25L * SL	105	105	140	55	55	59	59	57.5	57.5	G	○	—		
		T2CF25L * SLNC											C'				
S250-NF, S250-GF	Large	②	T2CF25 * SLNG	T2CF25 * SL	—	105	140	55	55	54	54	52	52	G	○	—	
			T2CF25 * SLNC											C'			
Small	②	T2CF25 * SSNG	T2CF25 * SS	—	105	140	29	29	54	54	53.5	53.5	G	○	—		
		T2CF25 * SSNC											C'				
400	S400-CF, S400-NF S400-GF	Large	③ ⑥	T2CF40 * SWNG	T2CF40 * SW	—	180	240	110	114	97	98	96	98	G	○	—
				T2CF40 * SWNC											C'		
	S400-NE, S400-GE S400-PF, S400-PE S400-NN	Large		T2CF40 * SLNG	T2CF40 * SL	—	140	185	85	85	97	97	94.5	94.5	G	○	—
				T2CF40 * SLNC											C'		
H400-NE, L400-NE	Large	③ ④ ⑥	T2CF40 * SWNG	T2CF40 * SW	—	180	240	110	114	134	135	96	98	G	○	—	
			T2CF40 * SWNC											C'			
Large	④	T2CF40 * SLNG	T2CF40 * SL	—	140	185	85	85	134	134	94.5	94.5	G	○	—		
		T2CF40 * SLNC											C'				
630	S630-CF, S630-NF S630-RF, S630-NE S630-RE, S630-GN H630-NE, L630-NE	Large	⑤	T2CF80 * SLG	TPR-5BA	—	215	285	130	130	99.5 (102)	99.5 (102)	99 (101.5)	99 (101.5)	G	—	○
				T2CF80 * SLC											C'		
	Large	④ ⑤	T2CF80 * SLG	TPR-5BA	—	215	285	130	130	136.5 (139)	136.5 (139)	99 (101.5)	99 (101.5)	G	—	○	
		T2CF80 * SLC	C'														
800	S800-CF, S800-NF S800-RF, S800-NE S800-RE, S800-GN	Large	⑤	T2CF80 * SLG	TPR-5BA	—	215	285	130	130	99.5 (102)	99.5 (102)	99 (101.5)	99 (101.5)	G	—	○
				T2CF80 * SLC											C'		
	H800-NE, L800-NE	Large	④ ⑤	T2CF80 * SLG	TPR-5BA	—	215	285	130	130	136.5 (139)	136.5 (139)	99 (101.5)	99 (101.5)	G	—	○
			T2CF80 * SLC	C'													
1250	S1250-NE, S1250-GE	Large	⑤ ⑥	— —	TPR-5BA	—	215	285	130	130	115	115	99 (102.5)	99 (102.5)	G C'	—	○

6. Terminal covers CF/CR/CS

(2) CR for rear-connected and plug-in breakers

CS for front-connected breakers with cable clamps

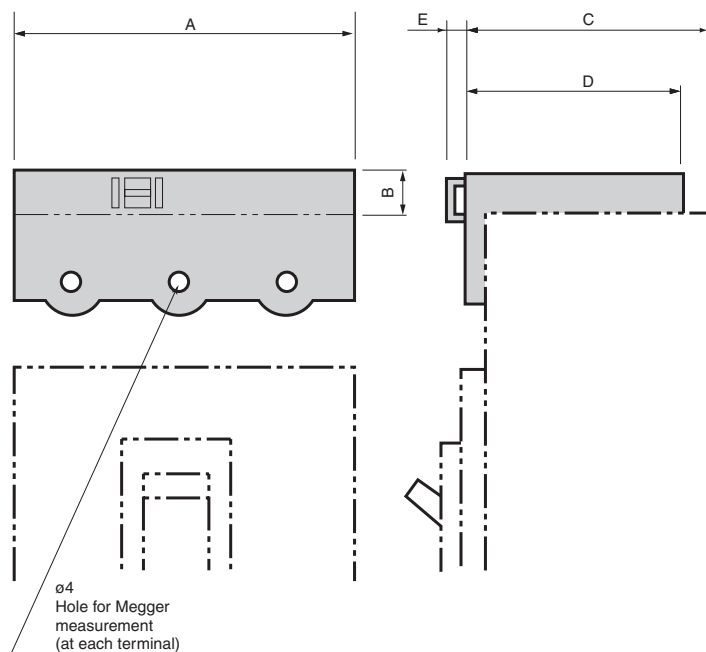


Plug-in mounted version

This version can be mounted simply by being plugged in the breaker body.

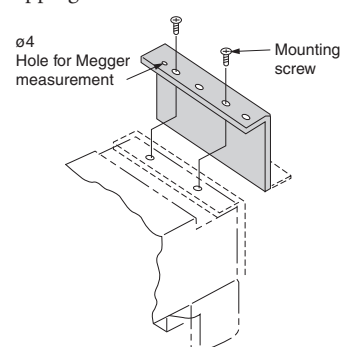
■ To be stated when ordering

- Please state "with CR" if ordering along with the breaker.
 - Please state the order codes on the next page if ordering separately from the breaker.
- One set includes one terminal cover for the ON side and one for the OFF side.



Screw-mounted version

The terminal covers for 630 to 800AF are mounted to the breakers using tapping screws.



Types and dimensions of terminal covers, units in mm

CR for rear-connected and plug-in breakers

Frame size (A)	Types of breakers	Terminal cover		A			B		B'	C		D		Colour of cover G: Gray	Mounting version	
		Order codes ①	Marking codes	2 poles	3 poles	4 poles	2/3 poles	4 poles		2/3 poles	4 poles	2/3 poles	4 poles		Plug-in mounted	Screw-mounted
50	S50-SF	T2CR12L * SG	—	50	75	—	5.5	—	—	61	—	60.3	—	G	○	—
	S50-GF	T2CR12 * SG	T2CR12 * S	—	90	120	2	2	6	41.5	41.5	40.5	40.5	G	○	—
100	S100-NF, S100-GF S100-NM, S100-NN	T2CR12 * SG	T2CR12 * S	60	90	120	2	2	6	41.5	41.5	40.5	40.5	G	○	—
	H100-NF, L100-NF	T2CR25 * SG	T2CR25 * S	—	105	140	2	2	6	77.5	77.5	39.5	39.5	G	○	—
125	S125-SF, S125-SN	T2CR12L * SG	—	50	75	100	5.5	5	—	61	61	60.3	60.3	G	○	—
	S125-NF, S125-GF	T2CR12 * SG	T2CR12 * S	60	90	120	2	2	6	41.5	41.5	40.5	40.5	G	○	—
	H125-NF, L125-NF	T2CR25 * SG	T2CR25 * S	—	105	140	2	2	6	77.5	77.5	39.5	39.5	G	○	—
225 250	E225-NF, S225-NF S225-GF, S225-NM	T2CR25 * SG	T2CR25 * S	—	105	140	2	2	6	42.5	42.5	39.5	39.5	G	○	—
	H225-NF, L225-NF S225-GE	T2CR25 * SG	T2CR25 * S	—	105	140	2	2	6	77.5	77.5	39.5	39.5	G	○	—
	E250-SF	T2CR25L * SG	T2CR25L	105	105	—	2.3	—	5.3	58.6	—	57.1	—	G	○	—
	S250-SF, S250-SN	T2CR25L * SG	T2CR25L	105	105	140	2.3	2.3	5.3	58.6	58.6	57.1	57.1	G	○	—
	S250-NF, S250-GF	T2CR25 * SG	T2CR25 * S	—	105	140	2	2	6	77.5	77.5	39.5	39.5	G	○	—
	S400-CF, S400-NF S400-GF S400-NE, S400-GE S400-PF, S400-PE S400-NN	T2CR40 * SG	T2CR40 * S	—	140	185	3	3	4.5	97	97	93	93	G	○	—
400	H400-NE, L400-NE	T2CR40 * SG ③	T2CR40 * S	—	140	185	3	3	4.5	134	134	93	93	G	○	—

Frame size (A)	Types of breakers	Terminal cover		A			B		E (To screw head)	C ②		D ②		Colour of cover G: Gray	Mounting version	
		Order codes ①	Marking codes	2 poles	3 poles	4 poles	2/3 poles	4 poles		2/3 poles	4 poles	2/3 poles	4 poles		Plug-in mounted	Screw-mounted
50	E50-SF, E50-CM	TPS1S * G	—	50	75	—	2	—	2.5	63	—	61	—	G	○	—
100	E100-SF	XPS1 * G	—	49	74	—	10	—	2.5	63	—	54	—	G	○	—
630	S630-CF, S630-NF S630-RF, S630-RE S630-NE, S630-NN	T2CR80 * SG	XPS6	—	206	280	15	18	(3.5)	101 (103.5)	99 (101.5)	100.5 (103)	98 (100.5)	G	—	○
	H630-NE, L630-NE	T2CR80 * LG	—	—	210	280	15	15	(3.5)	136 (138.5)	136 (138.5)	135 (137.5)	135 (137.5)	G	—	○
800	S800-CF, S800-NF S800-RF, S800-RE S800-NE, S800-NN	T2CR80 * SG	XPS6	—	206	280	15	18	(3.5)	101 (103.5)	99 (101.5)	100.5 (103)	98 (100.5)	G	—	○
	H800-NE, L800-NE	T2CR80 * LG	—	—	210	280	15	15	(3.5)	136 (138.5)	136 (138.5)	135 (137.5)	135 (137.5)	G	—	○

Notes:

- ①. The asterisk indicates the number of poles. Please state the number of poles at the asterisk position when ordering.
One set includes one terminal cover for the ON side and one for the OFF side.
- ②. Values in parentheses indicate the distance to the head of terminal cover mounting screws.
- ③. There will be an approx. 40 mm gap between the bottom of the terminal cover and the breaker mounting surface.

- (1) Terminal covers for motor protection breakers are 3-pole type only.
- (2) Terminal covers for switch-disconnectors are 3-pole and 4-pole type only.

CS for front-connected with cable clamps breakers

Frame size (A)	Types of breakers	Terminal cover		A		B	B'	C	D	Colour of cover G: Gray	Mounting version	
		Order codes ①	Marking codes	3 poles	4 poles						Plug-in mounted	Screw-mounted
50	S50-GF	T2CS12 * SG	T2CS12 * S	90	120	2.5	6	61	59.5	G	○	—
100	S100-NF, S100-GF S100-NM, S100-NN	T2CS12 * SG	T2CR12 * S	90	120	2.5	6	61	59.5	G	○	—
	H100-NF, L100-NF	T2CS25 * SG	T2CS25 * S	105	140	2.5	6	96	59.5	G	○	—
125	S125-NF, S125-GF S125-NN	T2CS12 * SG	T2CS12 * S	90	120	2.5	6	61	59.5	G	○	—
	H125-NF, L125-NF	T2CR25 * SG	T2CR25 * S	105	140	2.5	6	96	5.5	G	○	—
225	E225-NF, S225-NF S225-GF, S225-NM	T2CS25 * SG	T2CS25 * S	105	140	2.5	6	61	59.5	G	○	—
	H225-NF, L225-NF S225-GE	T2CS25 * SG	T2CS25 * S	105	140	2.5	6	96	59.5	G	○	—
250	S250-NF, S250-GF	T2CS25 * SG	T2CS25 * S	105	140	2.5	6	61	59.5	G	○	—
400	S400-CF, S400-NF S400-GF S400-NE, S400-GE S400-PF, S400-PE S400-NN	T2CS40 * SG	T2CS40 * S	140	185	3	5	97	93	G	○	—
	H400-NE, L400-NE	T2CS40 * SG	T2CS40 * S	140	185	3	5	134	93	G	○	—

Notes:

- ①. The asterisk indicates the number of poles. Please state the number of poles at the asterisk position when ordering.
One set includes one terminal cover for the ON side and one for the OFF side.
- (1) Terminal covers for motor protection breakers are 3-pole type only.

6

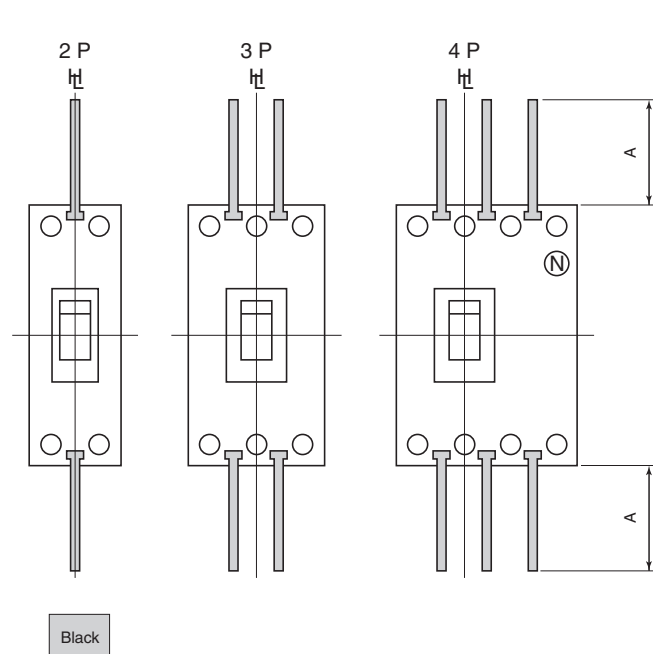
Accessories

Molded Case Circuit Breakers

3 Externally mounted accessories

7. Interpole barriers (BA)

Interpole barriers serve to enhance electrical insulation between poles and prevent short-circuit due to electrically conductive foreign matter. Combined use of interpole barriers and terminal covers (standard type) is not possible.

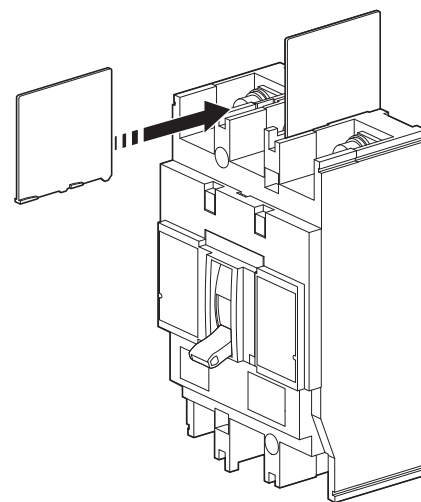


■ To be stated when ordering

Please state the type when ordering. One set contains two barriers.

Caution: Be sure to use the interpole barriers supplied with the breaker in order to prevent accidents.

- Slide interpole barriers into the grooves located on the breaker.



Types and dimensions of interpole barriers, units in mm

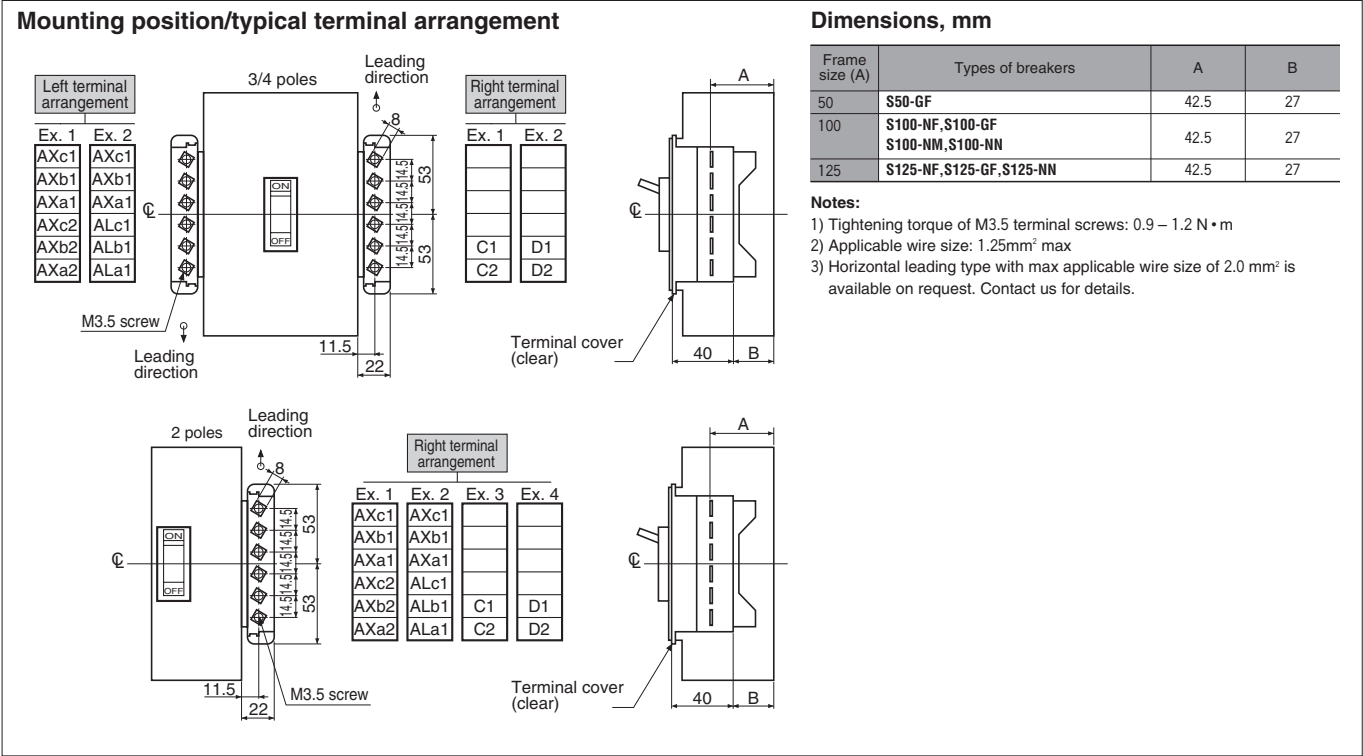
Frame size	Types of breakers	Interpole barrier		A	B
		Type	Code		
50	E50-SF, E50-CM	TQQ-2CC	—	36	50
	S50-SF	T2BA16L3SH	—	50	55
	S50-GF	T2BA123SH	T2BA12S	47	53
100	E100-SF	TQQ-2CC	—	36	50
	S100-NF, S100-GF	T2BA123SH	T2BA12S	47	53
	S100-NM, S100-NN				
125	H100-NF, L100-NF	T2BA253LH	T2BA25L	100	88
	S125-SF, S125-SN	T2BA16L3SH	—	50	55
	S125-NF, S125-GF	T2BA123SH	T2BA12S	47	53
225	H125-NF, L125-NF	T2BA253LH	T2BA25L	100	88
	E225-NF, S225-NF	T2BA253SH	T2BA25S	100	53
	S225-GF, S225-NM				
250	H225-NF, L225-NF	T2BA253LH	T2BA25L	100	88
	S225-GE				
	E250-SF, S250-SF	T2BA25L3SH	T2BA25LS	101	53
400	S250-SN				
	S250-NF, S250-GF	T2BA253SH	T2BA25S	100	53
	S400-CF, S400-NF	T2BA403SH	TQQ-5BA	110	95
630	S400-GF				
	S400-NE, S400-GE				
	S400-PF, S400-OE				
800	H400-NE, L400-NE				
	S630-CF, S630-NF	T2BA403SH	TQQ-5BA	110	95
	S630-RF, S630-NE				
1000	S630-RE, S630-GN				
	H630-NE, L630-NE				
	S800-CF, S800-NF	T2BA403SH	TQQ-5BA	110	95
1200	S800-RF, S800-NE				
	S800-RE, S800-GN				
	H800-NE, L800-NE				
1250	TL-1000NE	TQQ-5BA	TQQ-5BA	110	95
	TL-1200NE	TQQ-5BA	TQQ-5BA	110	95
	S1250-NE, S1250-GE	T2BA403SH	TQQ-5BA	110	95
1600	S1250-NN				
	S1600-NE, S1600-NN	T2BA403SH	TQQ-5BA	110	95

Note: Lime side interpole barriers are supplied as standard for all front connected breakers except E50-SF, E50-CM and E100-SF.

8. Terminal blocks (TF)

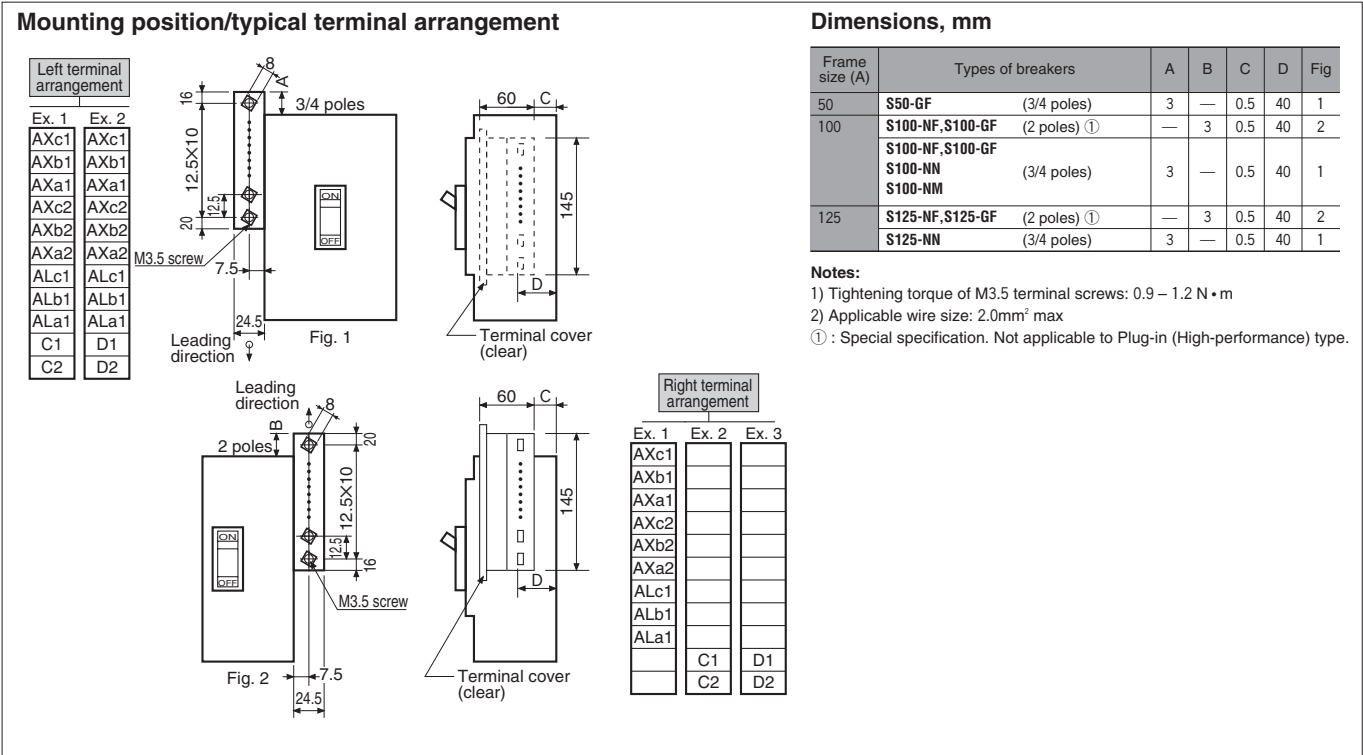
6 terminals

Vertical leading type with 50/100A frame



11 terminals

Vertical leading type with 50/100A frame

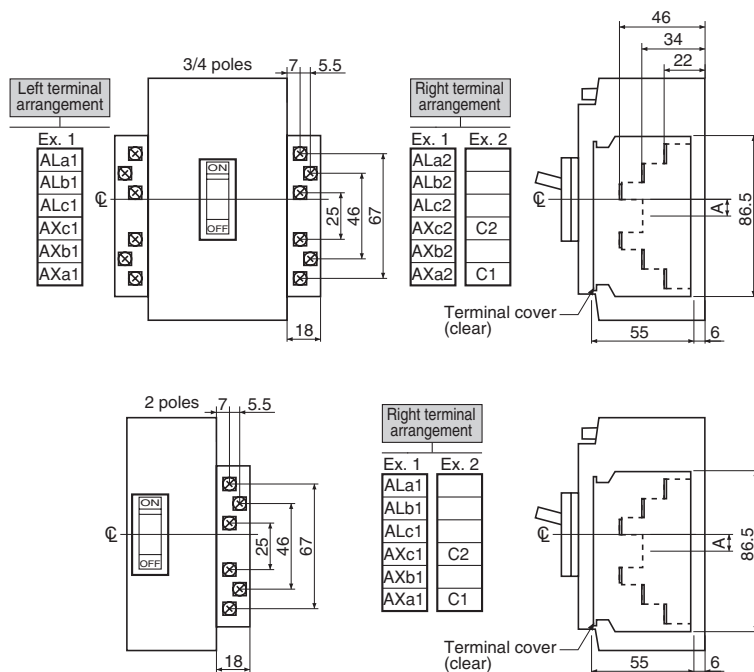


8. Terminal blocks (TF)

6 terminals

Vertical leading type with 50/125A frame

Mounting position/typical terminal arrangement



Dimensions, mm

Frame size (A)	Types of breakers	A
50	S50-SF (2/3 poles)	9
125	S125-SF (2/3/4 poles)	9

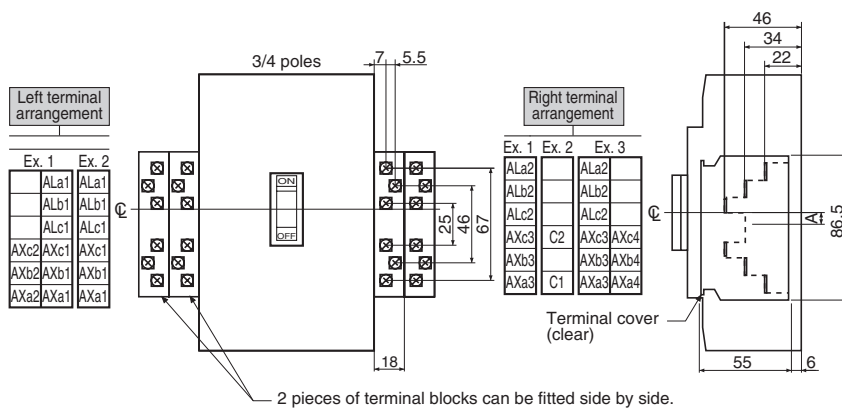
Notes:

- 1) Tightening torque of M3.5 terminal screws: 0.9 – 1.2 N • m
- 2) Applicable wire size: 2.0mm² max

6 terminals

Vertical leading type with 250A frame

Mounting position/typical terminal arrangement



Dimensions, mm

Frame size (A)	Types of breakers	A
250	E250-SF (3 poles)	7
	S250-SF, S250-SN (3/4 poles)	7

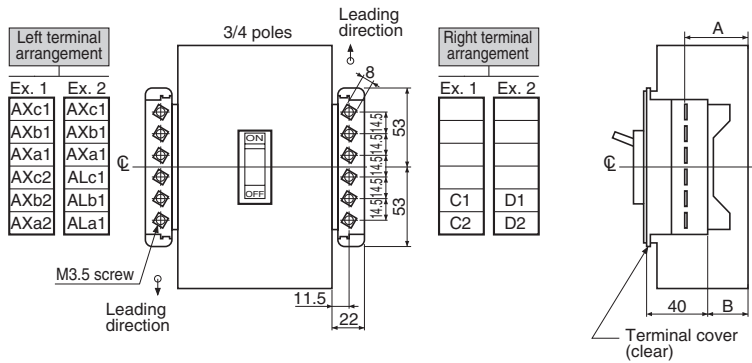
Notes:

- 1) Tightening torque of M3.5 terminal screws: 0.9 – 1.2 N • m
- 2) Applicable wire size: 2.0mm² max

6 terminals

Vertical leading type with 100/125/225/250A frame

Mounting position/typical terminal arrangement



Dimensions, mm

Frame size (A)	Types of breakers	A	B
100	H100-NF, L100-NF	77.5	62
125	H125-NF, L125-NF	77.5	62
225	E225-NF, S225-NF, S225-GF, S225-NM	42.5	27
250	S225-GE, H225-NF, L225-NF, S250-NF, S250-GF	42.5	27

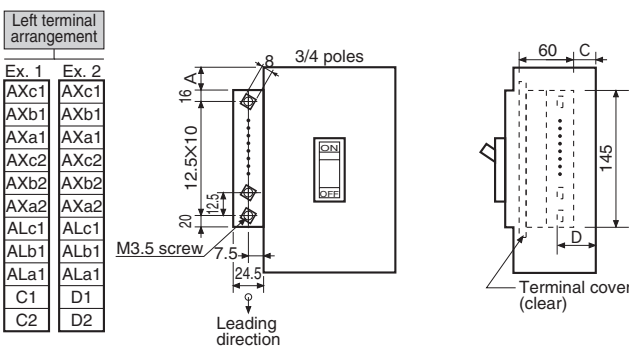
Notes:

- 1) Tightening torque of M3.5 terminal screws: 0.9 – 1.2 N • m
- 2) Applicable wire size: 1.25mm² max
- 3) Horizontal leading type with max applicable wire size of 2.0 mm² is available on request. Contact us for details.

11 terminals

Vertical leading type with 125/225/250A frame

Mounting position/typical terminal arrangement



Dimensions, mm

Frame size (A)	Types of breakers	A	C	D
100	H100-NF, L100-NF	2	35.5	75
125	H125-NF, L125-NF	2	35.5	75
225	E225-NF, S225-NF, S225-GF, S225-NM	2	0.5	40
250	S225-GE, H225-NF, L225-NF, S250-NF, S250-GF	2	0.5	40

Notes:

- 1) Tightening torque of M3.5 terminal screws: 0.9 – 1.2 N • m
- 2) Applicable wire size: 2.0mm² max

6

Accessories

Molded Case Circuit Breakers

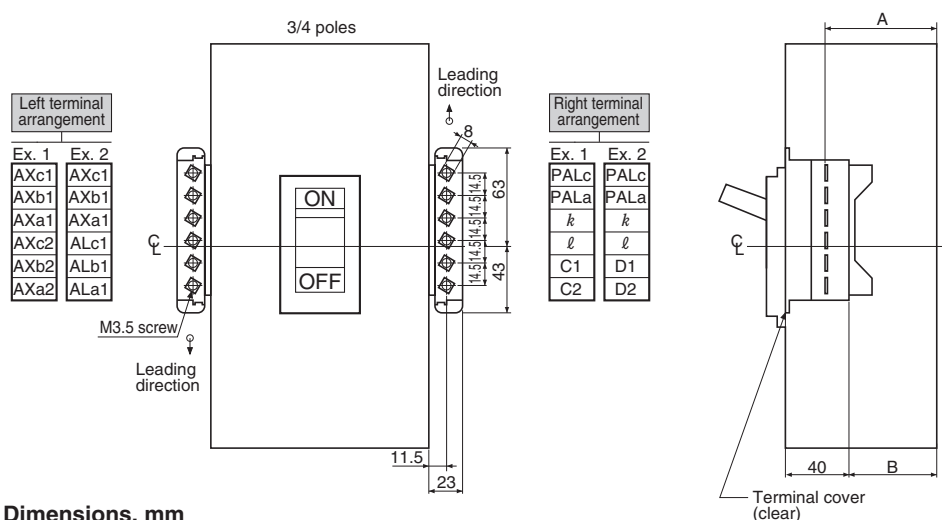
3 Externally mounted accessories

8. Terminal blocks (TF)

6 terminals

Vertical leading type with 400A frame

Mounting position/typical terminal arrangement



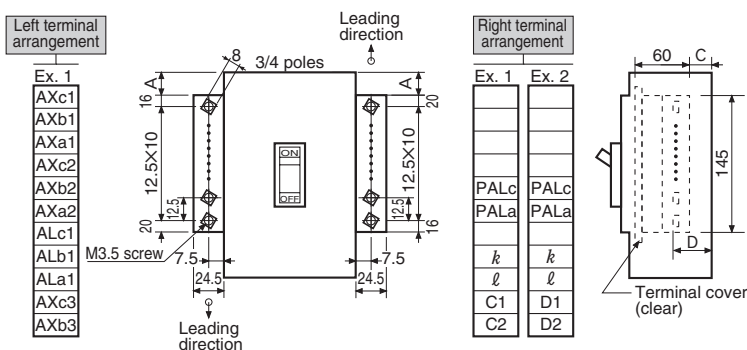
Notes:

- 1) Tightening torque of M3.5 terminal screws: 0.9 – 1.2 N • m
- 2) Applicable wire size: 1.25mm² max
- 3) Horizontal leading type with max applicable wire size of 2.0 mm² is available on request. Contact us for details.

11 terminals

Vertical leading type with 400A frame

Mounting position/typical terminal arrangement

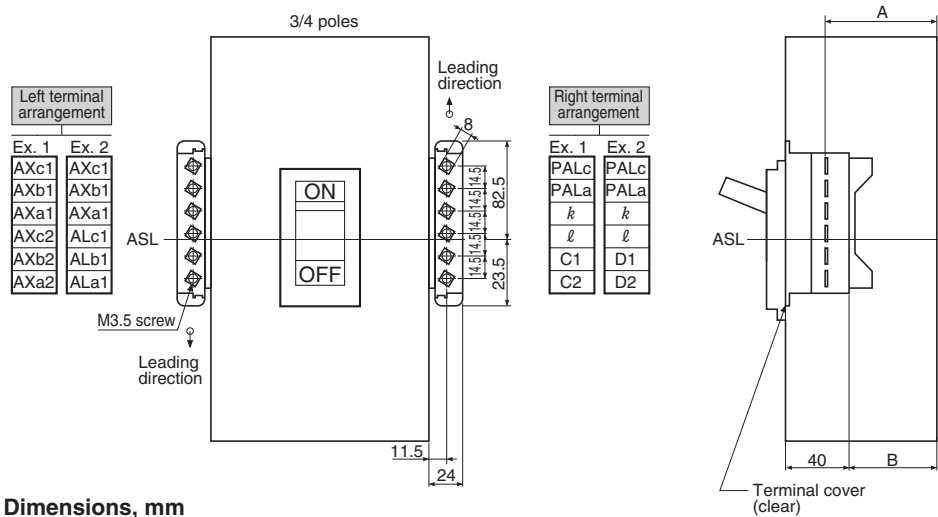


Notes:

- 1) Tightening torque of M3.5 terminal screws: 0.9 – 1.2 N • m
- 2) Applicable wire size: 2.0mm² max

Vertical leading type with 630/800A frame

Mounting position/typical terminal arrangement



Dimensions, mm

Frame size (A)	Types of breakers	A	B
630	S630-CF, S630-NF, S630-RF, S630-NE, S630-RE, S630-GN	72.5	57
	H630-NE, L630-NE	109.5	94
800	S800-CF, S800-NF, S800-RF, S800-NE, S800-RE, S800-NN	72.5	57
	H800-NE, L800-NE	109.5	94

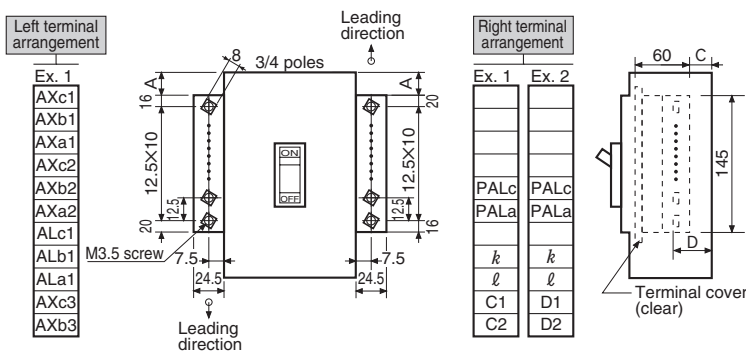
Notes:

- 1) Tightening torque of M3.5 terminal screws: 0.9 – 1.2 N • m
- 2) Applicable wire size: 1.25mm² max
- 3) Horizontal leading type with max applicable wire size of 2.0 mm² is available on request. Contact us for details.
- 4) Contact us for details if 2 alarm switches are required.

11 terminals

Vertical leading type with 630/800A frame

Mounting position/typical terminal arrangement



Dimensions, mm

Frame size (A)	Types of breakers	A	C	D
630	S630-CF, S630-NF, S630-RF, S630-NE, S630-RE, S630-GN	31	30.5	70
	H630-NE, L630-NE	31	67.5	107
800	S800-CF, S800-NF, S800-RF, S800-NE, S800-RE, S800-NN	31	30.5	70
	H800-NE, L800-NE	31	67.5	107

Notes:

- NOTES:
- 1) Tightening torque of M3.5 terminal screws: 0.9 – 1.2 N • m
 - 2) Applicable wire size: 2.0mm² max

6

Accessories

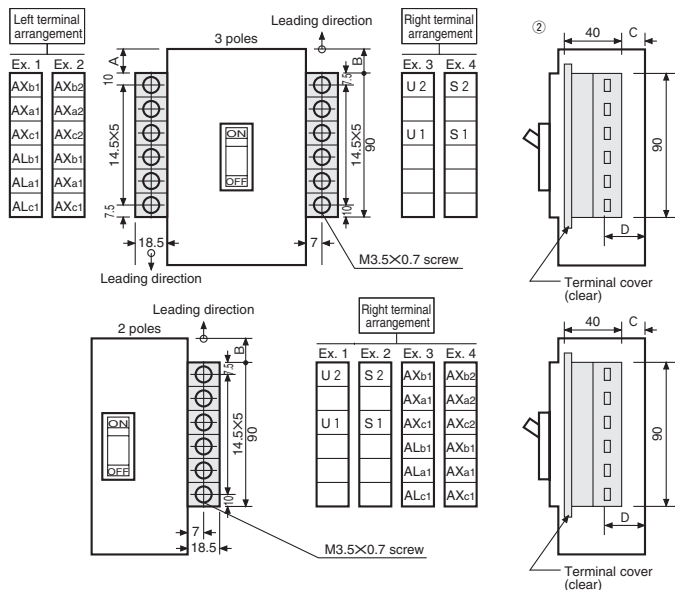
Molded Case Circuit Breakers

3 Externally mounted accessories

8. Terminal blocks (TF)

Vertical leading type with 50A frame

Mounting position/typical terminal arrangement



Dimensions, mm

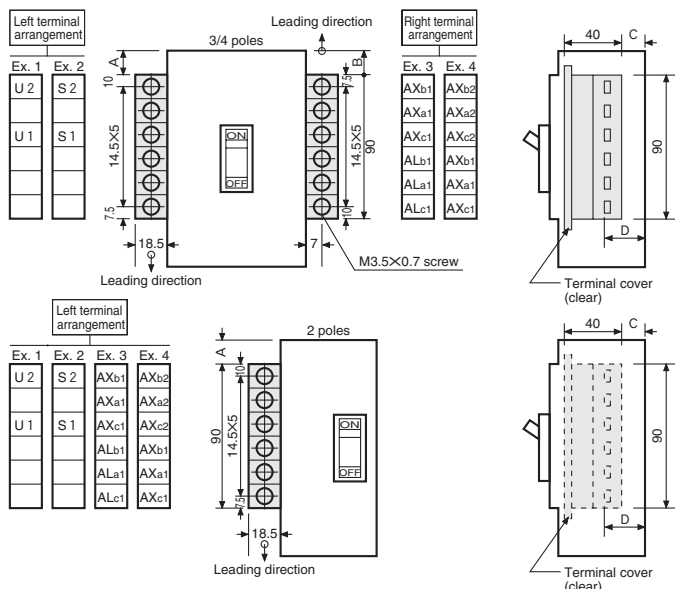
Frame size (A)	Types of breakers	A	B	C	D
50	E50-SF, E50-CM	16.5	16.5	21	36

Notes:

- 1) Tightening torque of M3.5 terminal screws: 0.9 – 1.2 N·m
- 2) Applicable wire size: 1.25mm² max (Vinyl-coated wire)

Vertical leading type with 100A frame

Mounting position/typical terminal arrangement



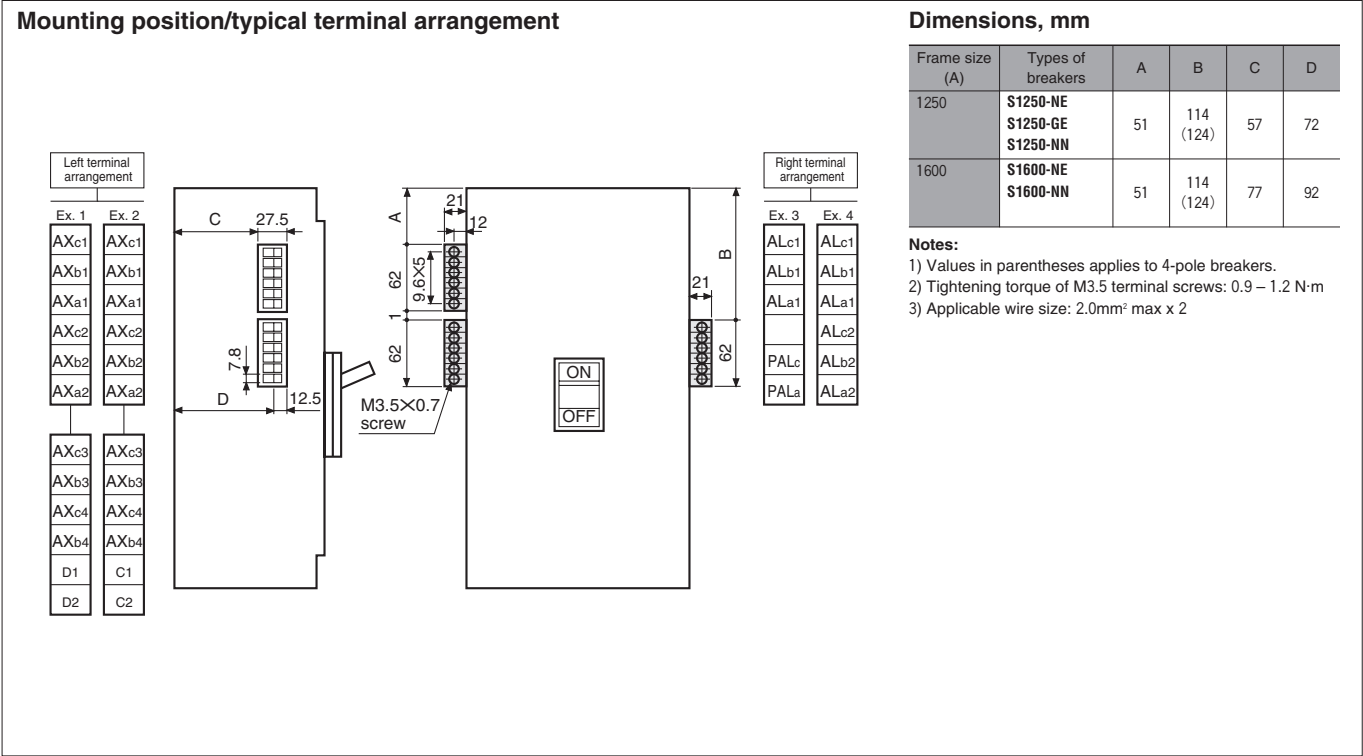
Dimensions, mm

Frame size (A)	Types of breakers	A	B	C	D
100	E100-SF ①	16.5	16.5	21	36

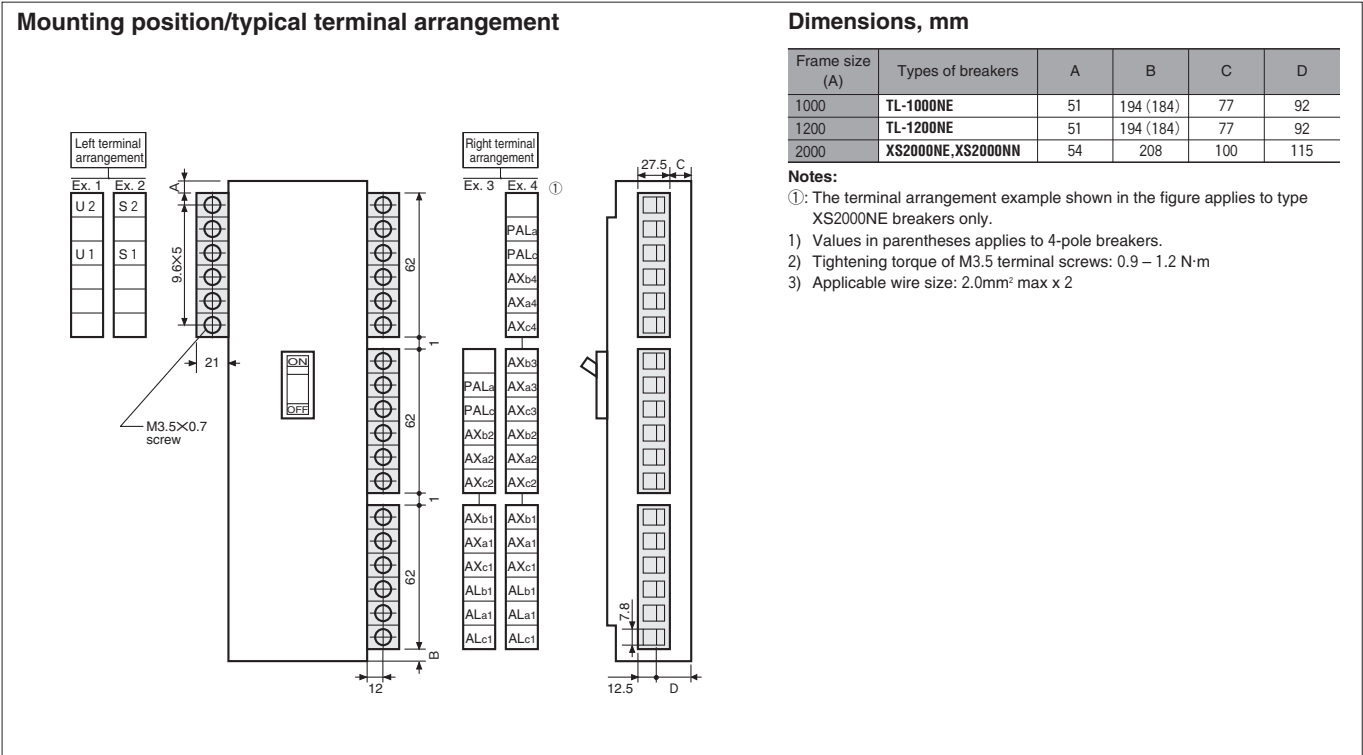
Notes:

- ①: Terminal block cannot be mounted on the breaker which is equipped with the motor operator.
- 1) Tightening torque of M3.5 terminal screws: 0.9 – 1.2 N·m
- 2) Applicable wire size: 1.25mm² max (Vinyl-coated wire)

Horizontal leading type with 1250/1600A frame



Horizontal leading type with 1000 to 2000A frame



9. Mechanical interlock

Slide interlock (MS)

The slide interlock provides a mechanical interlock between two breakers so that only one of the two can be closed. Moving the slide on the front of the breaker left and right allows activation or deactivation of the interlock.

ASL: Arrangement Standard Line

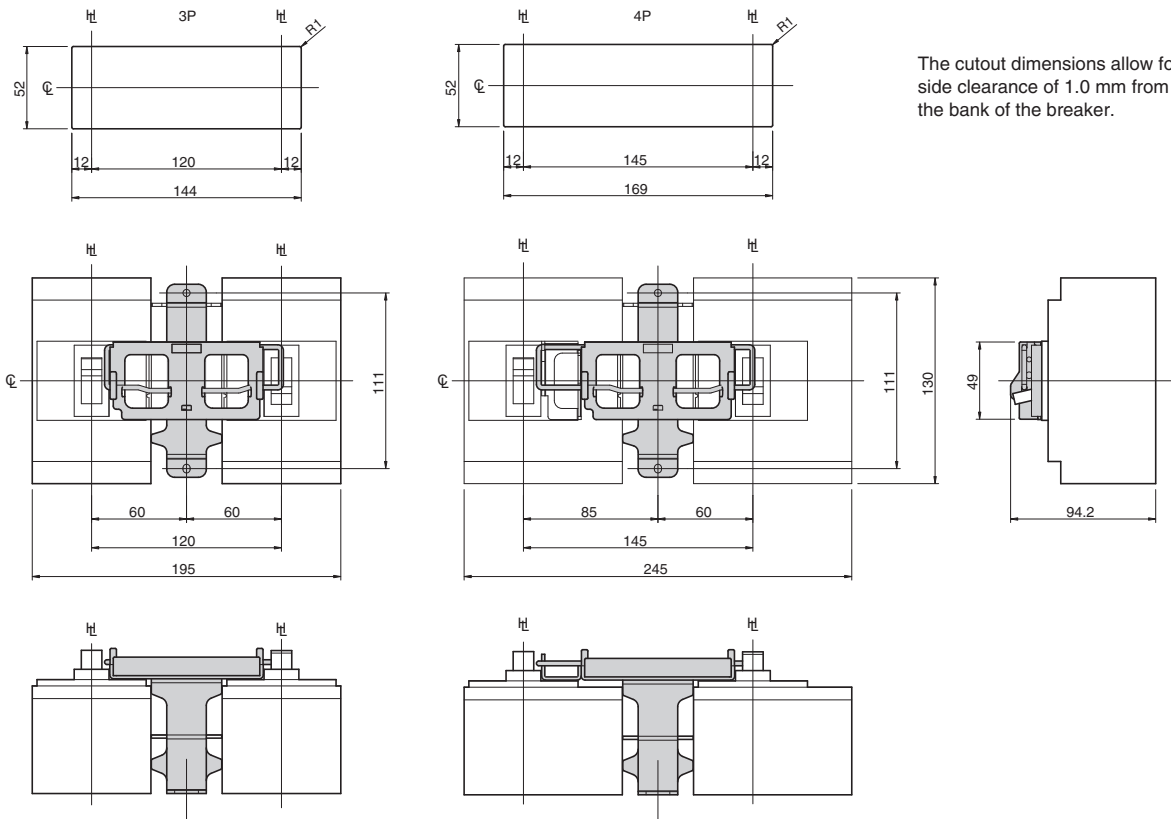
HL: Handle Frame Centre Line

CL: Handle Centre Line

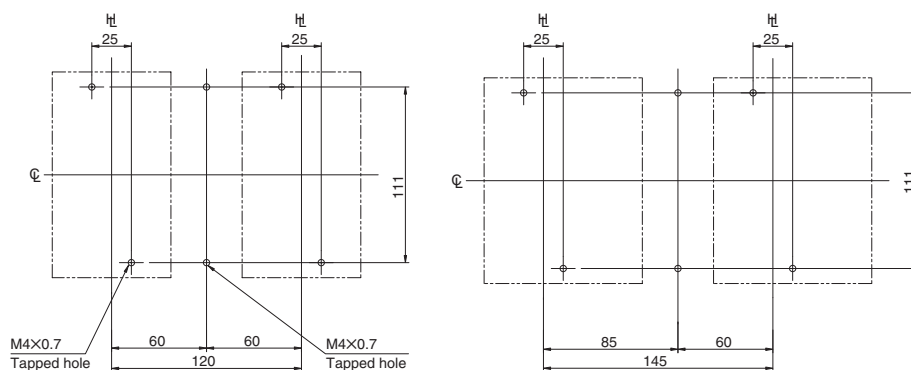
Dimensions mm

Frame size (A)	Types of breakers	Number of poles	Breaker connection method	Interlock Order codes
50	S50-SF	3	FC,RC	T2MS16L3SF
125	S125-SF,S125-SN	4	FC,RC	T2MS16L4SF

Panel cutout (front view)



Drilling plan (front view)

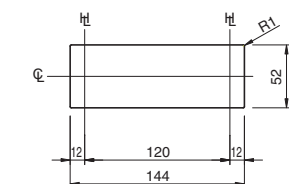


ASL: Arrangement Standard Line
 HL: Handle Frame Centre Line
 CL: Handle Centre Line

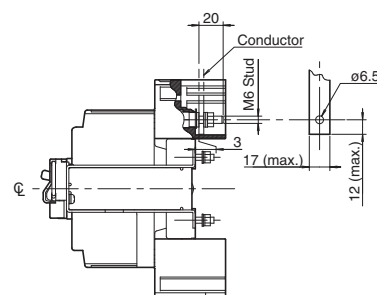
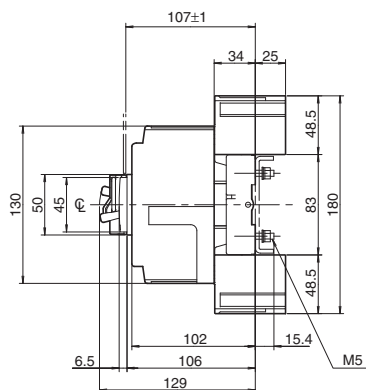
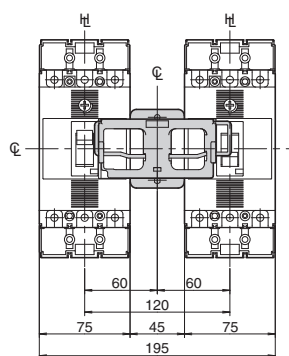
Dimensions mm

Frame size (A)	Types of breakers	Number of poles	Breaker connection method	Interlock Order codes
50 125	S50-SF S125-SF,S125-SN	3	PMC	T2MS16L3SC

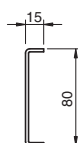
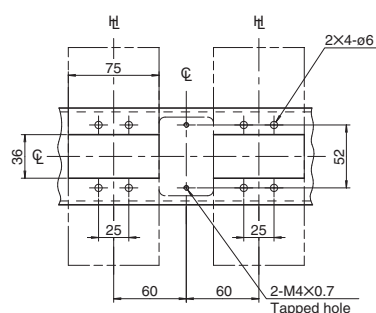
Panel cutout (front view)



The cutout dimensions allow for a side clearance of 1.0 mm from the bank of the breaker.



Drilling plan (front view)



3 Externally mounted accessories

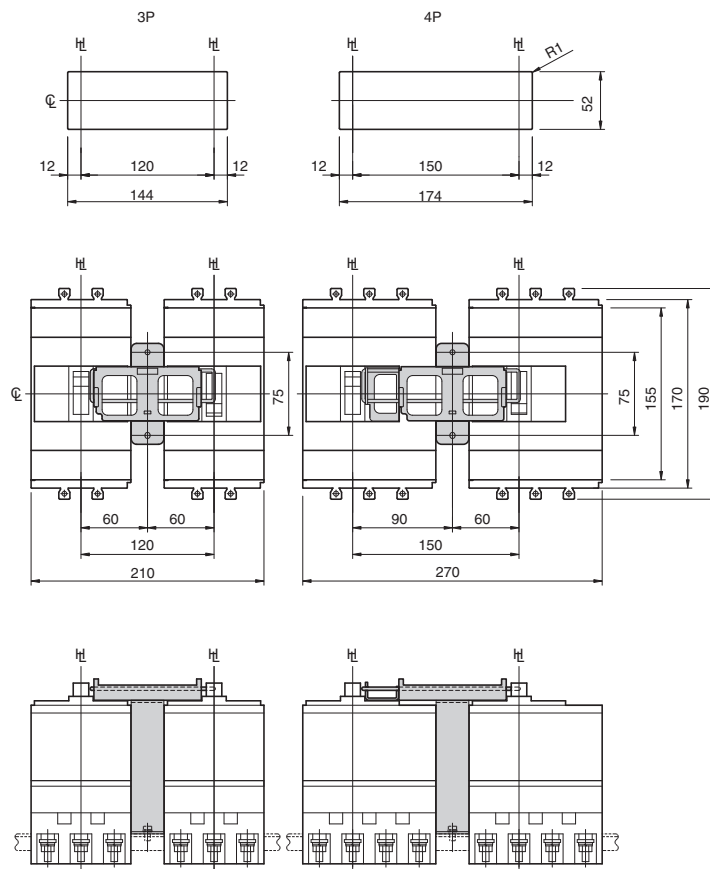
ASL: Arrangement Standard Line
 $\mathbb{H}$: Handle Frame Centre Line
 $\mathbb{C}$: Handle Centre Line

ASL: Arrangement Standard Line
 HL: Handle Frame Centre Line
 CL: Handle Centre Line

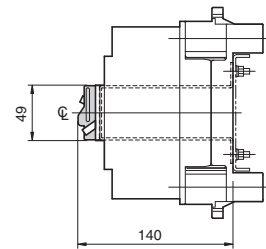
Dimensions mm

Frame size (A)	Types of breakers	Number of poles	Breaker connection method	Interlock Order codes
50 100 125	S50-GF S100-NF, S100-GF, S100-NN S125-NF, S125-GF, S125-NN	3	PMB	T2MS123SP
		4	PMB	T2MS124SP

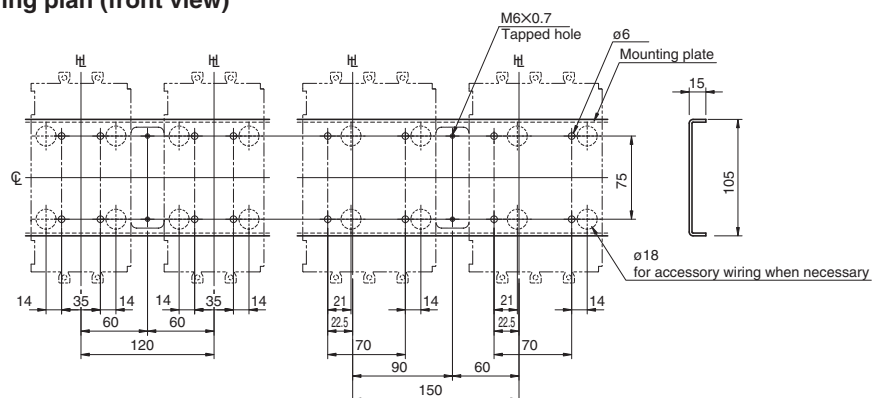
Panel cutout (front view)



The cutout dimensions allow for a side clearance of 1.0 mm from the bank of the breaker.



Drilling plan (front view)



9. Mechanical interlock

ASL: Arrangement Standard Line

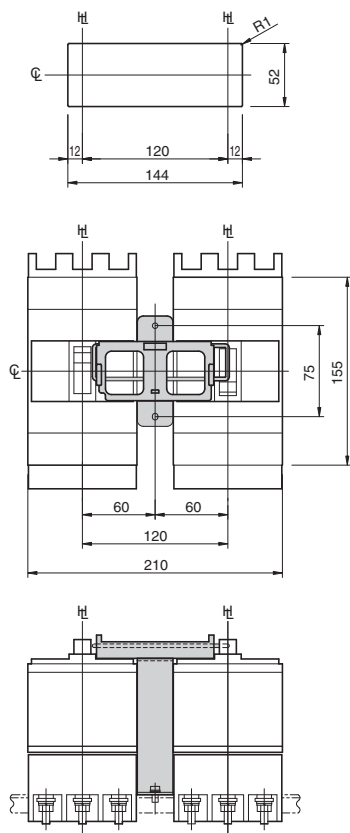
HL: Handle Frame Centre Line

CL: Handle Centre Line

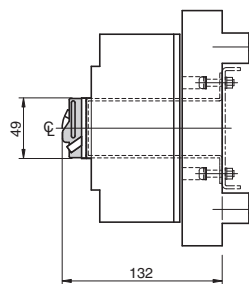
Dimensions mm

Frame size (A)	Types of breakers	Number of poles	Breaker connection method	Interlock Order codes
50	S50-GF	3	PMC	T2MS123SC
100	S100-NF, S100-GF, S100-NN			
125	S125-NF, S125-GF, S125-NN			

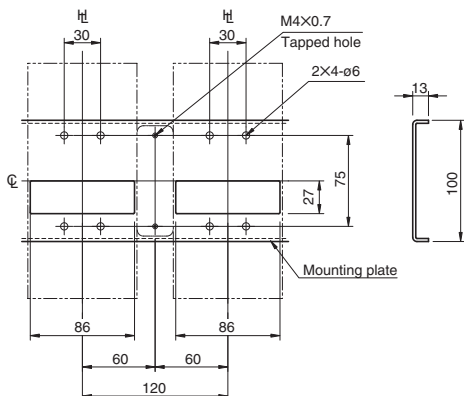
Panel cutout (front view)



The cutout dimensions allow for a side clearance of 1.0 mm from the bank of the breaker.



Drilling plan (front view)

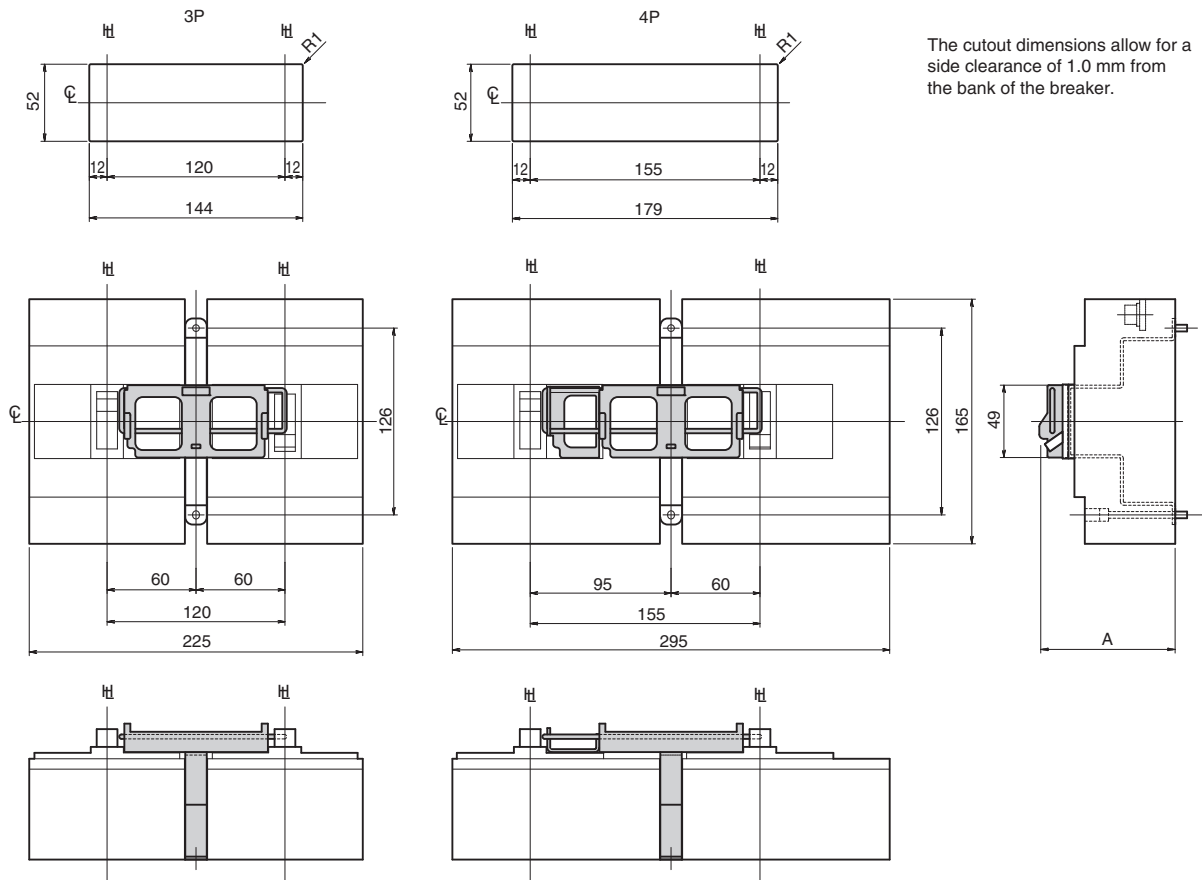


ASL: Arrangement Standard Line
 H: Handle Frame Centre Line
 C: Handle Centre Line

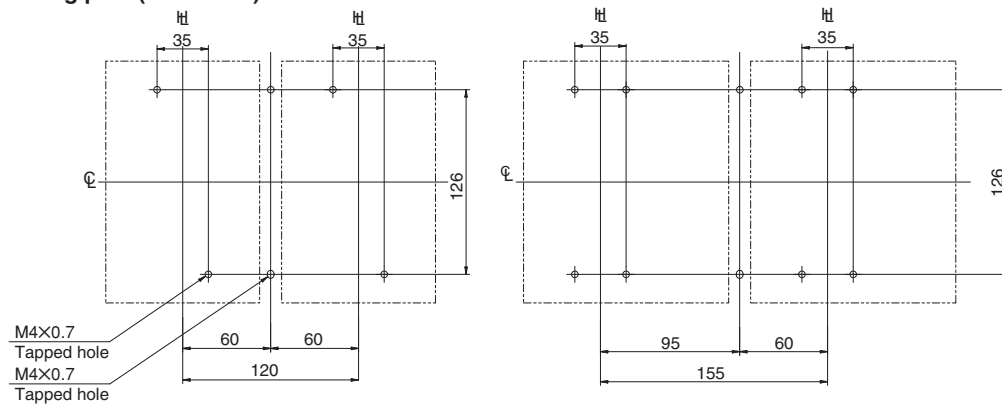
Dimensions mm

Frame size (A)	Types of breakers	Number of poles	Breaker connection method	Interlock Order codes	A
100	H100-NF, L100-NF	3	FC, RC	T2MS253LF	126.7
125	H125-NF, L125-NF	4	FC, RC	T2MS254LF	
225	S225-NF, S225-GF	3	FC, RC	T2MS253SF	91.7
250	S250-NF, S250-GF	4	FC, RC	T2MS254SF	
	H225-NF, L225-NF, S225-GE	3	FC, RC	T2MS253LF	126.7
		4	FC, RC	T2MS254LF	

Panel cutout (front view)



Drilling plan (front view)



9. Mechanical interlock

ASL: Arrangement Standard Line

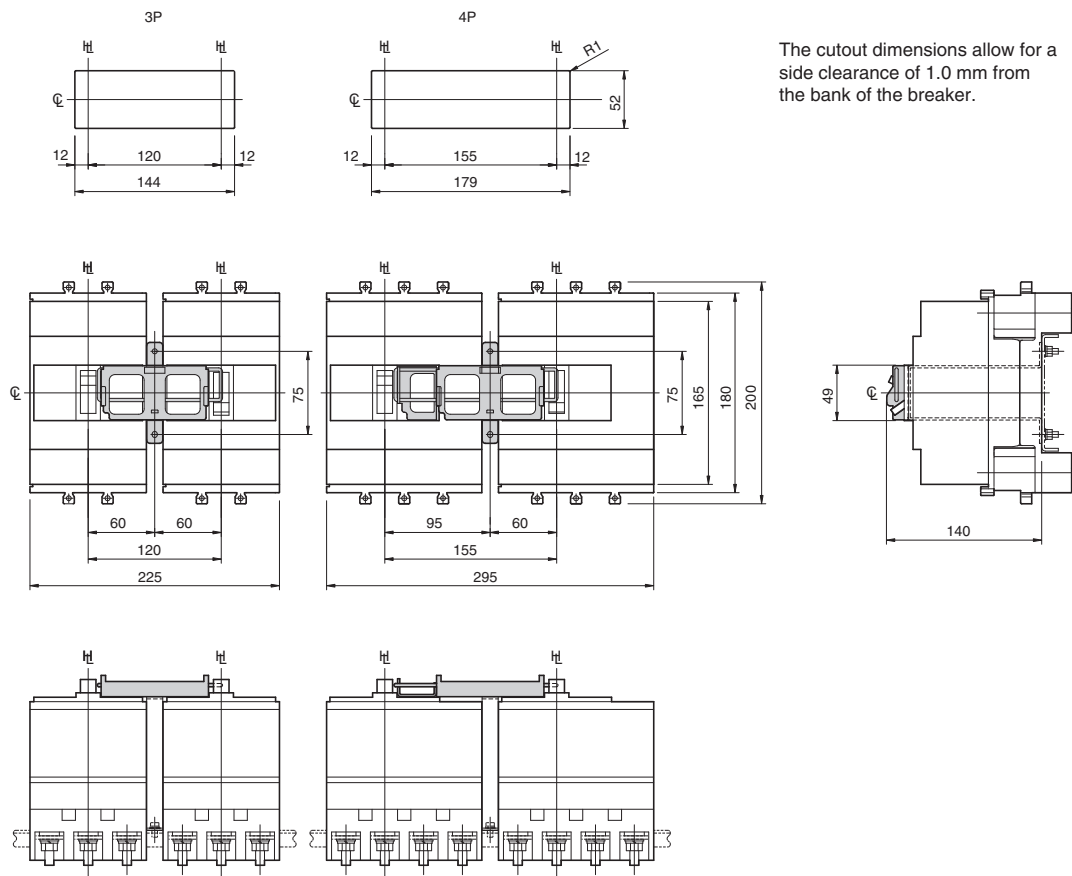
HL: Handle Frame Centre Line

CL: Handle Centre Line

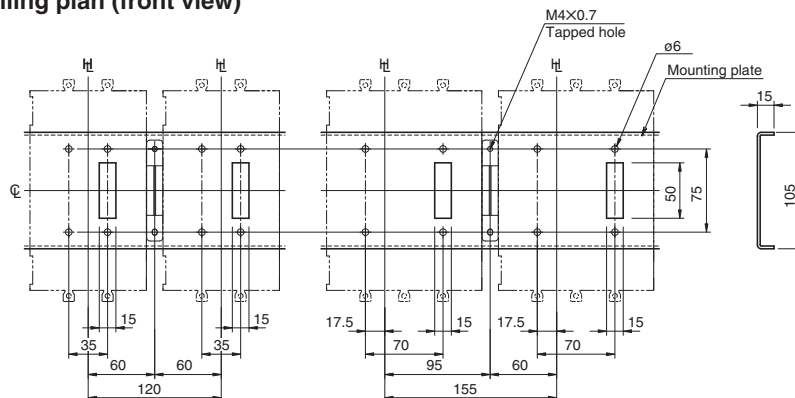
Dimensions mm

Frame size (A)	Types of breakers	Number of poles	Breaker connection method	Interlock Order codes	A
100	H100-NF, L100-NF	3	PMB	T2MS253LP	175
125	H125-NF, L125-NF	4	PMB	T2MS254LP	
225	S225-NF, S225-GF	3	PMB	T2MS253SP	140
250	S250-NF, S250-GF	4	PMB	T2MS254SP	
	H225-NF, L225-NF, S225-GE	3	PMB	T2MS253LP	175
		4	PMB	T2MS254LP	

Panel cutout (front view)



Drilling plan (front view)

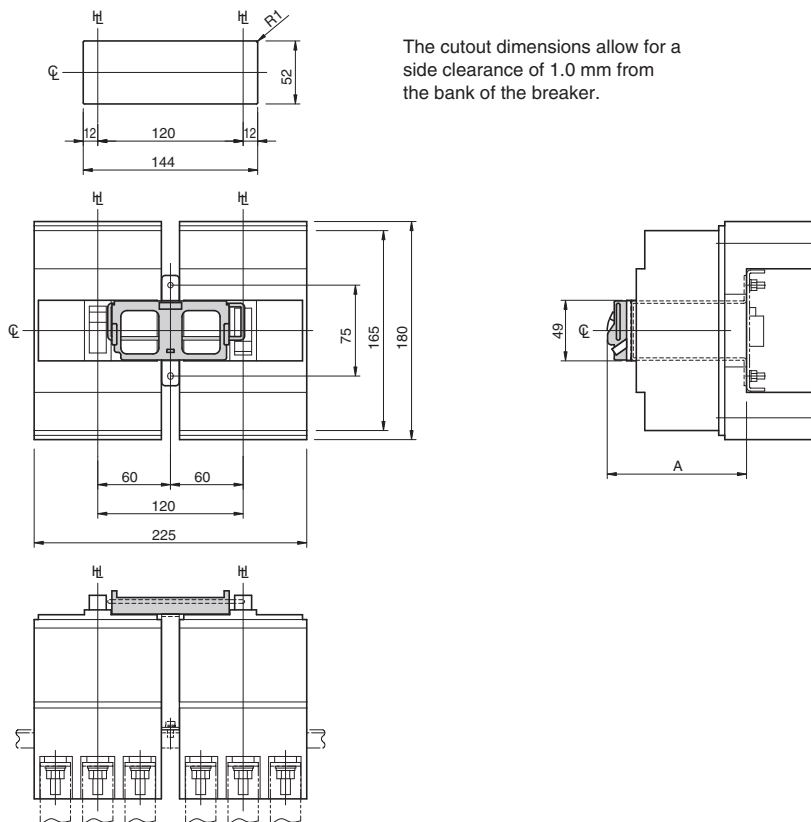


ASL: Arrangement Standard Line
 HL: Handle Frame Centre Line
 CL: Handle Centre Line

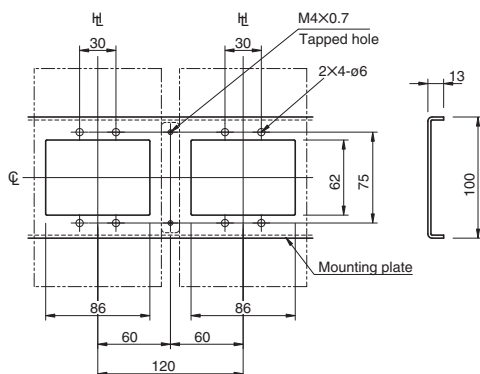
Dimensions mm

Frame size (A)	Types of breakers	Number of poles	Breaker connection method	Interlock Order codes	A
100 125	H100-NF, L100-NF H125-NF, L125-NF	3	PMC	T2MS253LC	150
225 250	S225-NF, S225-GF S250-NF, S250-GF	3	PMC	T2MS253SC	115
	H225-NF, L225-NF, S225-GE	3	PMC	T2MS253LC	150

Panel cutout (front view)



Drilling plan (front view)



9. Mechanical interlock

ASL: Arrangement Standard Line

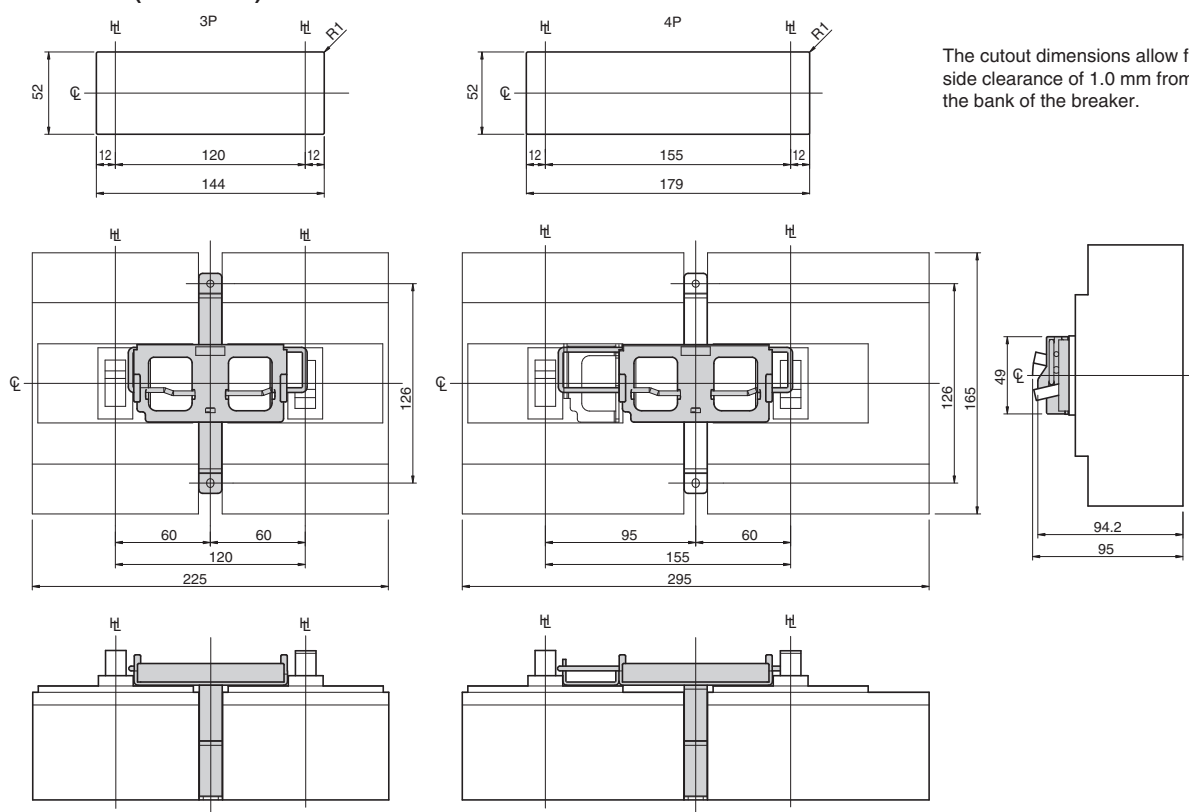
HL: Handle Frame Centre Line

CL: Handle Centre Line

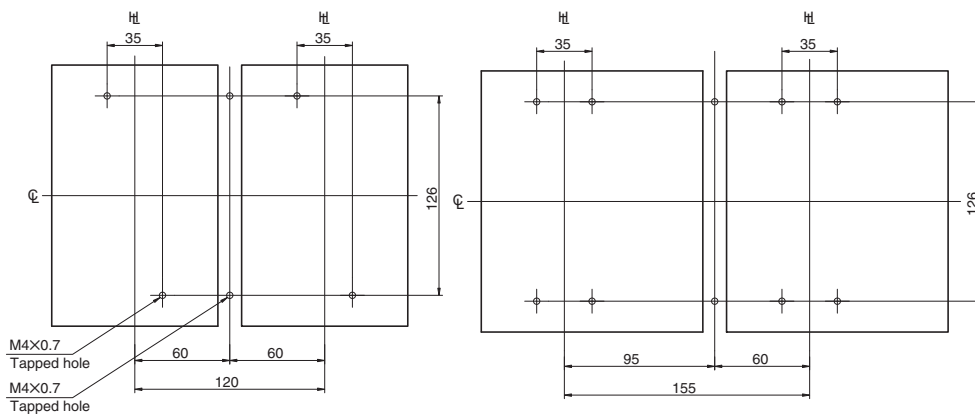
Dimensions mm

Frame size (A)	Types of breakers	Number of poles	Breaker connection method	Interlock Order codes
225	E250-SF, S250-SF	3	FC, RC	T2MS25L3SF
250	S250-SN	4	FC, RC	T2MS25L4SF

Panel cutout (front view)



Drilling plan (front view)

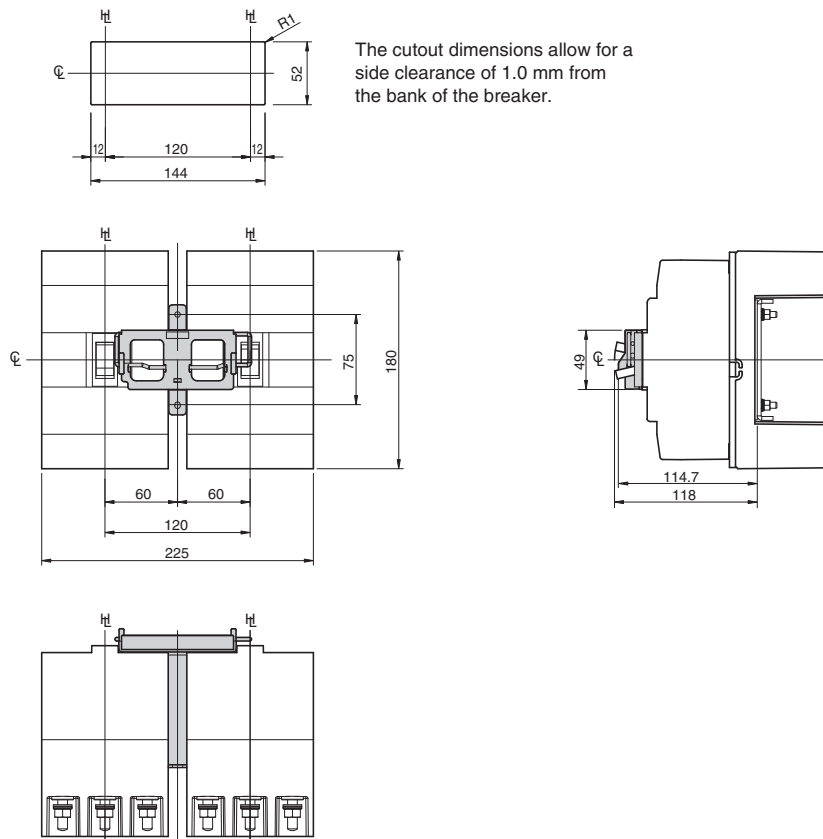


ASL: Arrangement Standard Line
 HL: Handle Frame Centre Line
 CL: Handle Centre Line

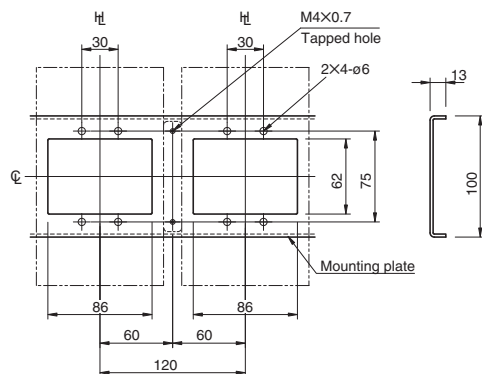
Dimensions mm

Frame size (A)	Types of breakers	Number of poles	Breaker connection method	Interlock Order codes
225 250	E250-SF, S250-SF S250-SN	3	PMC	T2MS25L3SC

Panel cutout (front view)



Drilling plan (front view)



9. Mechanical interlock

ASL: Arrangement Standard Line

HL: Handle Frame Centre Line

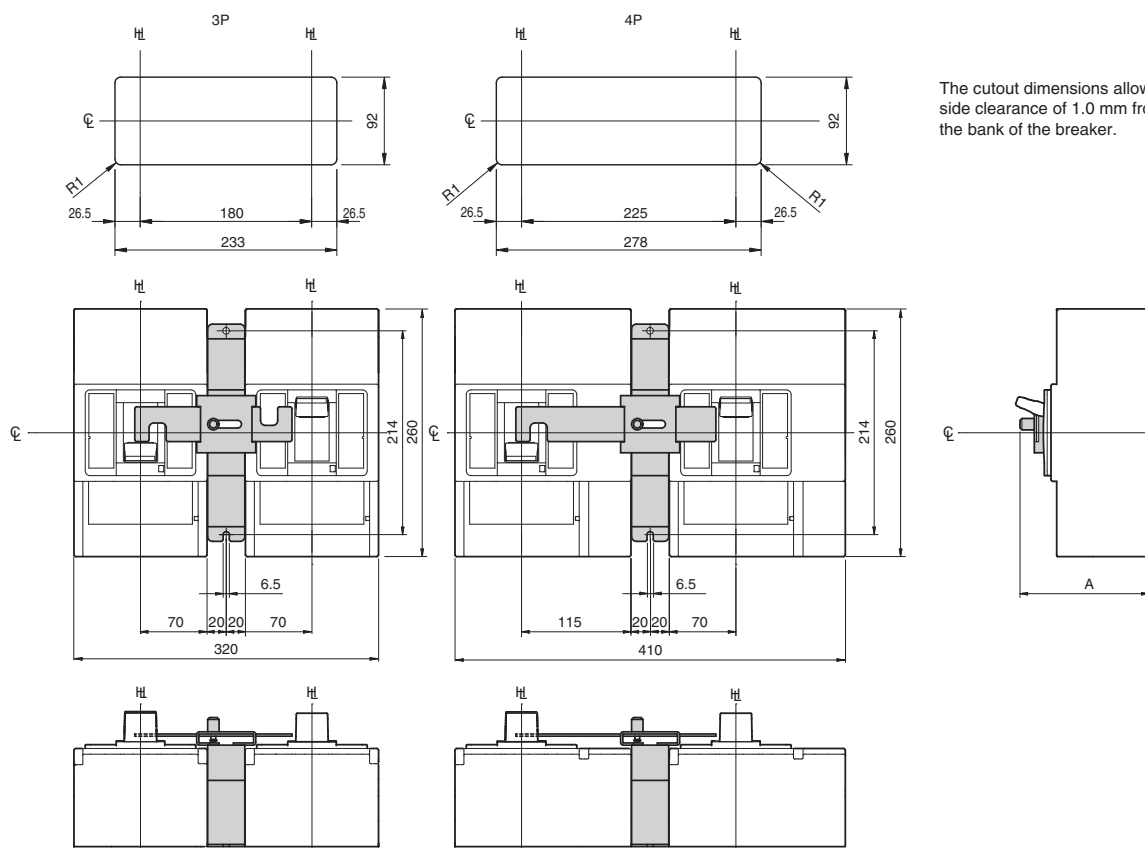
CL: Handle Centre Line

Dimensions mm

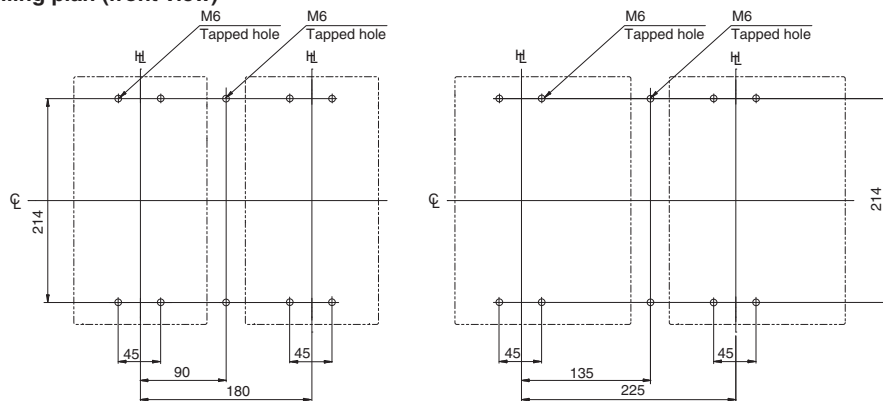
Frame size (A)	Types of breakers	Number of poles	Breaker connection method	Interlock Order codes	A
400	S400-CF, S400-NF, S400-NE S400-GF, S400-GE, S400-NN S400-PF, S400-PE	3	FC, RC	T2MS403SF	135.5
		4	FC, RC	T2MS404SF	
	H400-NE, L400-NE	3	FC, RC	T2MS403LF	172.5
		4	FC, RC	T2MS404LF	

Notes:

- (1) The interlock cannot be applied to breakers equipped with front extension bars due to the shortage of the insulating distance.
- (2) The interlock cannot be applied to breakers equipped with terminal block.
- (3) A terminal cover cannot be mounted.



Drilling plan (front view)

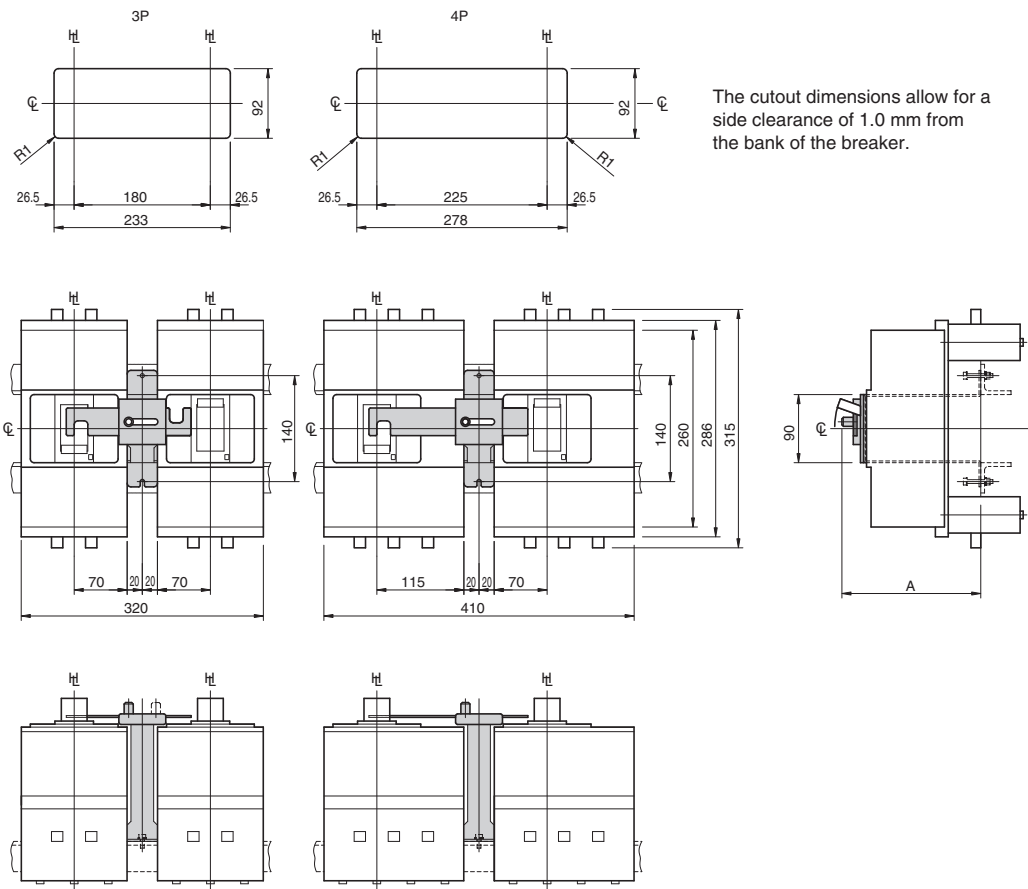


ASL: Arrangement Standard Line
 HL: Handle Frame Centre Line
 CL: Handle Centre Line

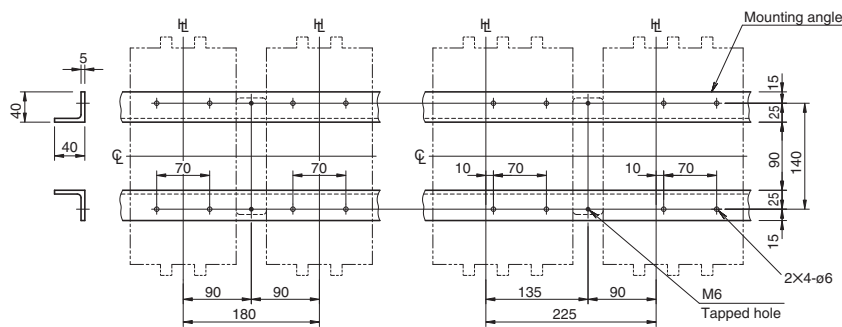
Dimensions mm

Frame size (A)	Types of breakers	Number of poles	Breaker connection method	Interlock Order codes	A
400	S400-CF, S400-NF, S400-NE S400-GF, S400-GE, S400-NN S400-PF, S400-PE	3	PMB	T2MS403SP	183.5
		4	PMB	T2MS404SP	
	H400-NE, L400-NE	3	PMB	T2MS403LP	220.5
		4	PMB	T2MS404LP	

Panel cutout (front view)



Drilling plan (front view)



9. Mechanical interlock

ASL: Arrangement Standard Line

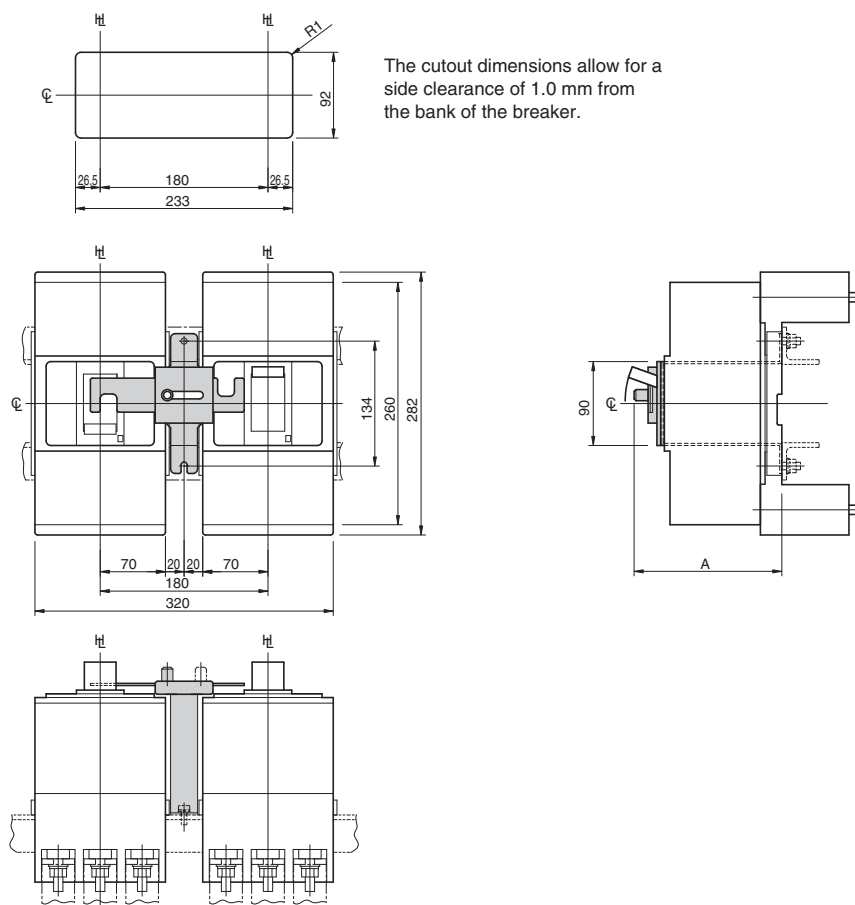
HL: Handle Frame Centre Line

CL: Handle Centre Line

Dimensions mm

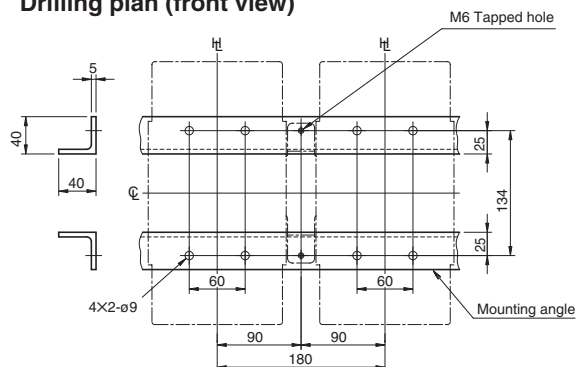
Frame size (A)	Types of breakers	Number of poles	Breaker connection method	Interlock Order codes	A
400	S400-CF, S400-NF, S400-NE S400-GF, S400-GE, S400-NN S400-PF, S400-PE	3	PMC	T2MS403SC	158.5
	H400-NE, L400-NE	3	PMC	T2MS403LC	195.5

Panel cutout (front view)



The cutout dimensions allow for a side clearance of 1.0 mm from the bank of the breaker.

Drilling plan (front view)



ASL: Arrangement Standard Line
 H: Handle Frame Centre Line
 C: Handle Centre Line

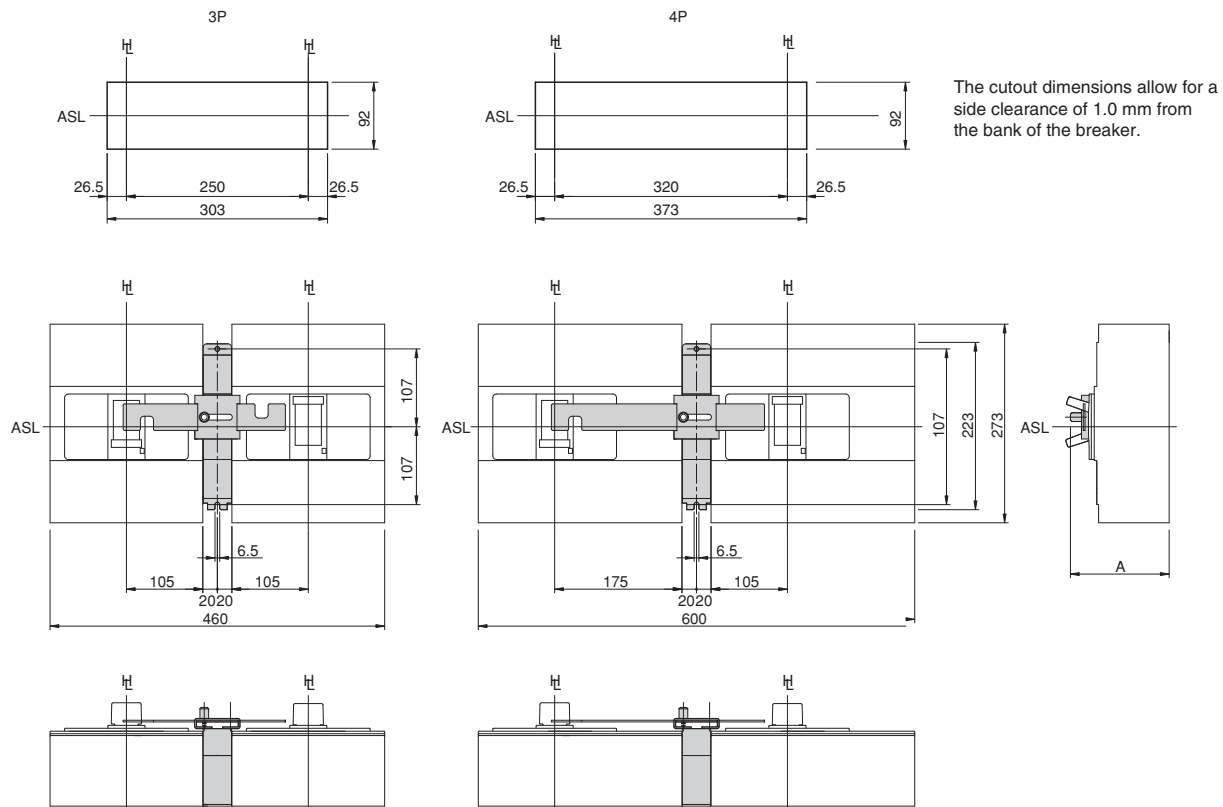
Dimensions mm

Frame size (A)	Types of breakers	Number of poles	Breaker connection method	Interlock Order codes	A
630 800	S630-CF, S630-NF, S630-RF S630-NE, S630-RE, S630-GN S800-CF, S800-NF, S800-RF S800-NE, S800-RE, S800-NN	3	FC, RC	T2MS803SF	135.5
		4	FC, RC	T2MS804SF	
	H630-NE, L630-NE H800-NE, L800-NE	3	FC, RC	T2MS803LF	172.5
		4	FC, RC	T2MS804LF	

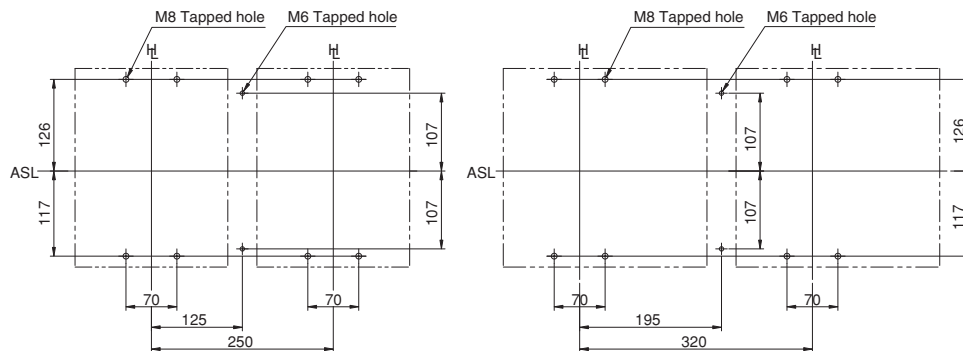
Notes:

(1) The interlock cannot be applied to breakers equipped with terminal block.

Panel cutout (front view)



Drilling plan (front view)



9. Mechanical interlock

ASL: Arrangement Standard Line

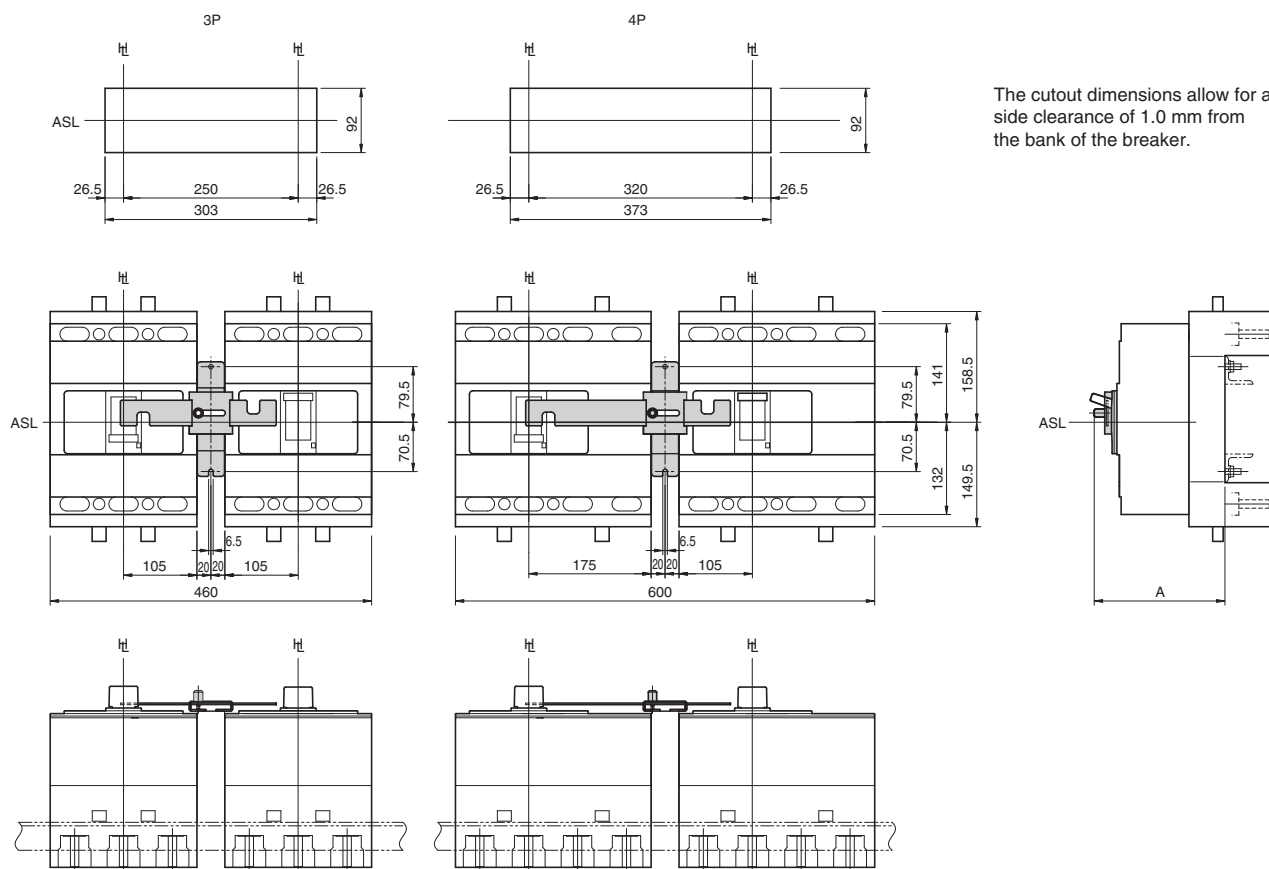
HL: Handle Frame Centre Line

CL: Handle Centre Line

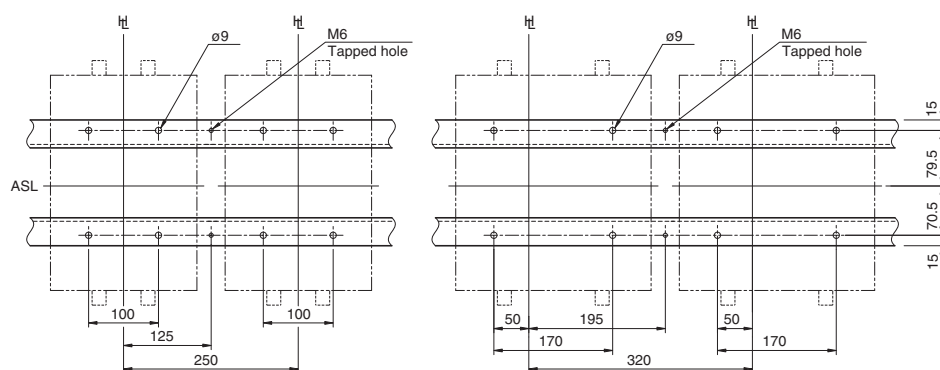
Dimensions mm

Frame size (A)	Types of breakers	Number of poles	Breaker connection method	Interlock Order codes	A
630 800	S630-CF, S630-NF, S630-RF S630-NE, S630-RE, S630-GN S800-CF, S800-NF, S800-RF S800-NE, S800-RE, S800-NN	3	PMB	T2MS803SP	187
		4	PMB	T2MS804SP	
	H630-NE, L630-NE H800-NE, L800-NE	3	PMB	T2MS803LP	224
		4	PMB	T2MS804LP	

Panel cutout (front view)



Drilling plan (front view)

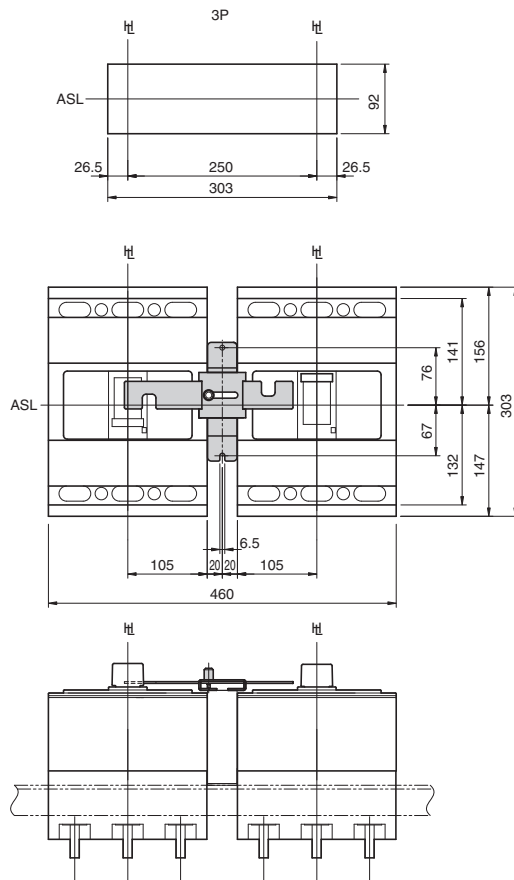


ASL: Arrangement Standard Line
 HL: Handle Frame Centre Line
 CL: Handle Centre Line

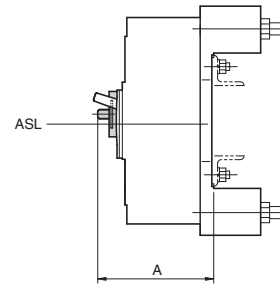
Dimensions mm

Frame size (A)	Types of breakers	Number of poles	Breaker connection method	Interlock Order codes	A
630 800	S630-CF, S630-NF, S630-RF S630-NE, S630-RE, S630-GN S800-CF, S800-NF, S800-RF S800-NE, S800-RE, S800-NN	3	PMC	T2MS803SC	153.5
	H630-NE, L630-NE H800-NE, L800-NE	3	PMC	T2MS803LC	190.5

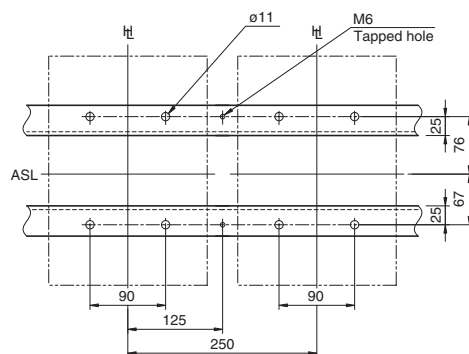
Panel cutout (front view)



The cutout dimensions allow for a side clearance of 1.0 mm from the bank of the breaker.



Drilling plan (front view)



6

Accessories

Molded Case Circuit Breakers

3 Externally mounted accessories

9. Mechanical interlock

ASL: Arrangement Standard Line

HL: Handle Frame Centre Line

CL: Handle Centre Line

Dimensions mm

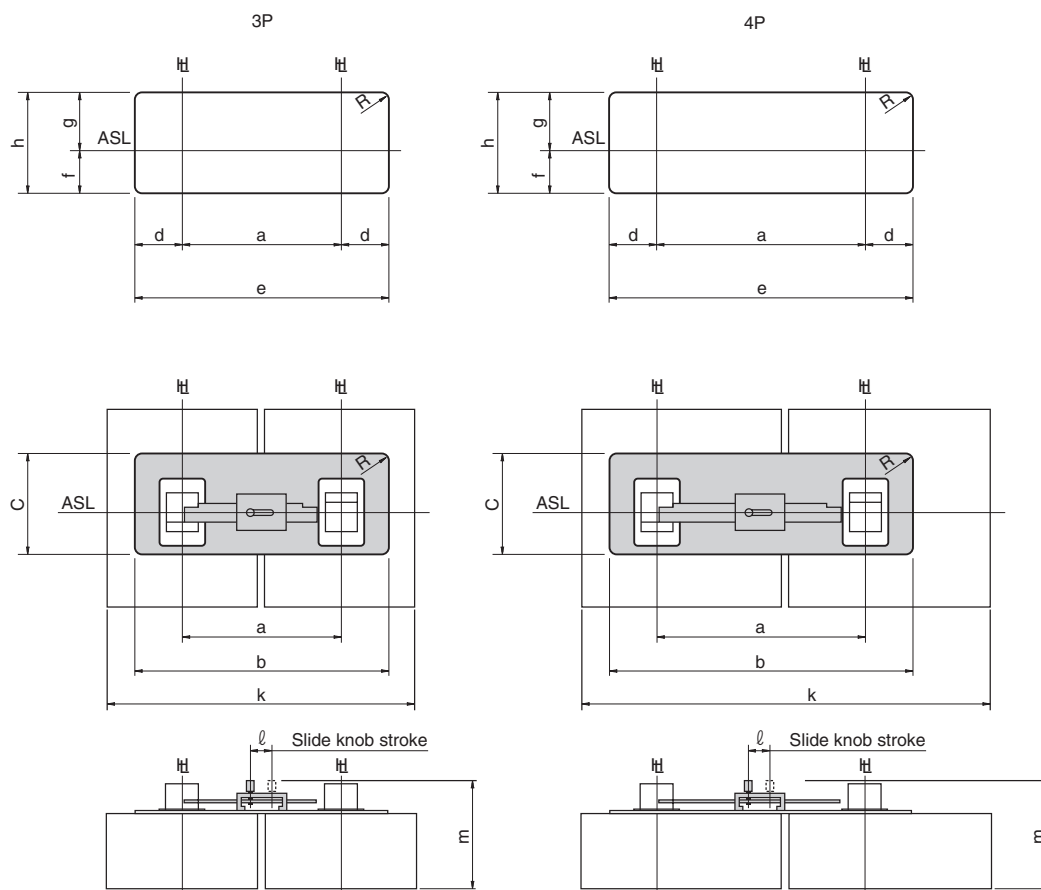
Frame size (A)	Types of molded case circuit breakers	Interlock Order codes	Number of poles	a	b	c	d	e	f	g	h	k	m	ℓ	R
50, 100	E50-SF, E50-CM, E100-SF	XLF1 ①	3	100	150	102	26.5	153	52.5	52.5	105	175	99.6	15	8.5
1000	TL-1000NE	XLF9 ①	3	220	340	129	61.5	343	58	74	132	430	179.6	30	8.5
			4	290	410	129	61.5	413	58	74	132	570	179.6	30	8.5
1200	TL-1200NE	XLF9 ①	3	220	340	129	61.5	343	58	74	132	430	179.6	30	8.5
			4	290	410	129	61.5	413	58	74	132	570	179.6	30	8.5
1250	S1250-NE, S1250-GE S1250-NN	T2MSX63SF	3	220	340	135	61.5	343	64	74	138	430	160.5	30	8.5
		T2MSX64SF	4	290	410	135	61.5	413	64	74	138	570	160.5	30	8.5
1600	S1600-NE, S1600-NN	T2MSX63SF	3	220	340	129	61.5	343	58	74	132	430	180.5	30	8.5
		T2MSX64SF	4	290	410	129	61.5	413	58	74	132	570	180.5	30	8.5
2000	XS2000NE	XLF10 ①	3	Contact us for the detailed dimensions.											
			4												

Notes:

① : Please order with the breakers.

(1) The interlock cannot be applied to breakers equipped with a terminal block, UVT controller or OCR controller.

(2) See the outline dimensions of the breaker for the drilling plan.



10. Door Flange (D.F)

Door flanges are recommended to be used to cover the cutout of a switchboard panel.

Fig. 1

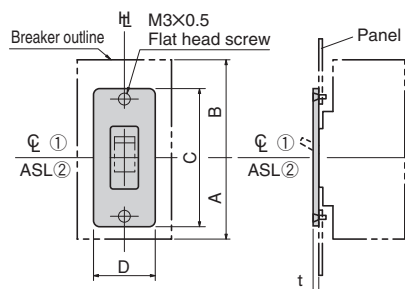
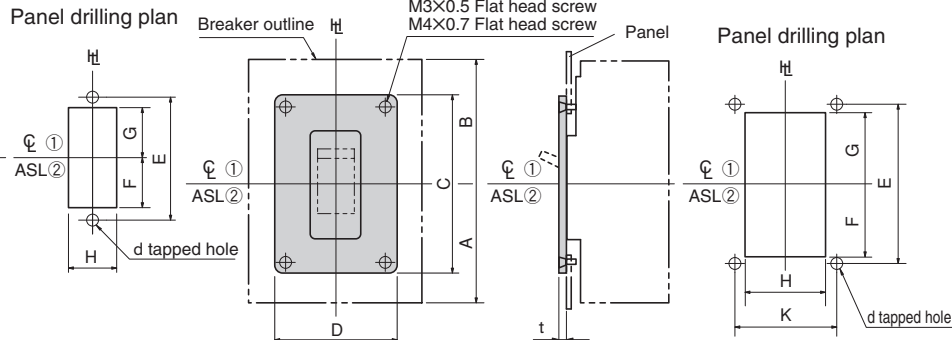


Fig. 2



Dimensions mm

Frame size (A)	Types of breakers	Order codes	Fig.	A	B	C	D	E	F		G		H		K	d	t
									Min	Max	Min	Max	Min	Max			
50	E50-SF, E50-CM	XAA1	1②	65	65	105	50	92	37	42	37	42	32	45	—	M3×0.5	3
	S50-SF	T2DF25	1①	65	65	105	50	92	37	42	37	42	32	45	—	M3×0.5	2
	S50-GF	T2DF25	1①	77.5	77.5	105	50	92	37	42	37	42	32	45	—	M3×0.5	2
100	E100-SF	XAA1	1②	65	65	105	50	92	37	42	37	42	32	45	—	M3×0.5	3
	S100-NF, S100-GF S100-NM, S100-NN	T2DF25	1①	77.5	77.5	105	50	92	37	42	37	42	32	45	—	M3×0.5	2
	H100-NF, L100-NF	T2DF25	1①	82.5	82.5	105	50	92	37	42	37	42	32	45	—	M3×0.5	2
125	S125-SF, S125-SN	T2DF25	1①	65	65	105	50	92	37	42	37	42	32	45	—	M3×0.5	2
	S125-NF, S125-GF S125-NN	T2DF25	1①	77.5	77.5	105	50	92	37	42	37	42	32	45	—	M3×0.5	2
	H125-NF, L125-NF	T2DF25	1①	82.5	82.5	105	50	92	37	42	37	42	32	45	—	M3×0.5	2
225	S225-NF, S225-GF S225-NN	T2DF25	1①	82.5	82.5	105	50	92	37	42	37	42	32	45	—	M3×0.5	2
	S225-GE H225-NF, L225-NF	T2DF25	1①	82.5	82.5	105	50	92	37	42	37	42	32	45	—	M3×0.5	2
	E250-SF, S250-SF S250-SN S250-NF, S250-GF	T2DF25	1①	82.5	82.5	105	50	92	37	42	37	42	32	45	—	M3×0.5	2
400	S400-CF, S400-NF S400-GF S400-NE, S400-GE S400-PF, S400-PE S400-NN	T2DF40	2①	130	130	135	95	120	48	56	48	56	57	90	80	M3×0.5	2
	H400-NE, L400-NE	T2DF40	2①	130	130	135	95	120	48	56	48	56	57	90	80	M3×0.5	2
	S630-CF, S630-NF S630-RF, S630-NE S630-RE, S630-GN	T2DF40	2②	132	141	135	95	120	48	56	48	56	57	90	80	M3×0.5	2
630	H630-NE, L630-NE	T2DF40	2②	132	141	135	95	120	48	56	48	56	57	90	80	M3×0.5	2
	S800-CF, S800-NF S800-RF, S800-NE S800-RE, S800-NN	T2DF40	2②	132	141	135	95	120	48	56	48	56	57	90	80	M3×0.5	2
	H800-NE, L800-NE	T2DF40	2②	132	141	135	95	120	48	56	48	56	57	90	80	M3×0.5	2
1000	TL-1000NE	TAA5	2②	170	200	150	120	135	51	63.5	51	63.5	85	115	80	M3×0.5	5
1200	TL-1200NE	TAA5	2②	170	200	150	120	135	51	63.5	51	63.5	85	115	80	M3×0.5	5
1250	S1250-NE, S1250-GE S1250-NN	T2DFX6	2②	170	200	150	120	135	51	63.5	51	63.5	85	115	80	M3×0.5	2
1600	S1600-NE, S1600-NN	T2DFX6	2②	170	200	150	120	135	51	63.5	51	63.5	85	115	80	M3×0.5	2
2000	XS2000NE, XS2000NN	TAA-10	2②	193	257	200	175	175	74	83.5	74	83.5	123	170	150	M4×0.7	5

Notes:

- ①: Φ Handle centre line is applied.
②: ASL Arrangement standard line is applied.

7

Characteristics and Outline Dimensions

Molded Case Circuit Breakers

● E50-SF.....	7-2	● S1250-NE, S1250-GE	7-46
● E100-SF	7-4	● S1600-NE	7-48
● S50-SF	7-6	● E50-CM	7-50
● S125-SF	7-8	● S100-NM	7-52
● S100-NF, S50-GF, S100-GF	7-10	● S225-NM	7-54
● S125-NF, S125-GF	7-12	● S100-NN	7-56
● S225-NF, S225-GF	7-14	● S125-SN	7-58
● E250-SF, S250-SF.....	7-16	● S125-NN	7-60
● S250-NF, S250-GF	7-18	● S250-SN	7-62
● S400-CF, S400-NF, S400-GF, S400-PF.....	7-20	● S400-NN	7-64
● H100-NF, L100-NF	7-22	● S630-GN	7-66
● H125-NF, L125-NF	7-24	● S800-NN	7-68
● H225-NF, L225-NF	7-26	● S1250-NN	7-70
● S225-GE	7-28	● S1600-NN	7-72
● S400-NE, S400-GE, S400-PE	7-30	● TL-1000NE, TL-1200NE	7-74
● H400-NE, L400-NE	7-32	● XS2000NE	7-76
● S630-CF, S630-NF, S630-RF	7-34	● XS2000NN.....	7-78
● S630-NE, S630-RE	7-36	● TB-5S	7-80
● H630-NE, L630-NE	7-38	● TB-5P	7-82
● S800-CF, S800-NF, S800-RF.....	7-40	● TB-5D	7-84
● S800-NE, S800-RE	7-42	■ Mounting bases, branching bars and other accessories	7-86
● H800-NE, L800-NE	7-44		

Motor operators

● S50-GF, S100, S125	7-88	● H630, H800, L630, L800	7-95
● S225, S250-NF, S250-GF	7-89	● TL-1000NE, TL-1200NE	7-96
● E250-SF, S250-SF, S250-SN	7-90	● S1250	7-97
● H100, H125, H225, L100, L125, L225	7-91	● S1600	7-98
● S400	7-92	● XS2000	7-99
● H400, L400	7-93	● E50-SF.....	7-100
● S630, S800	7-94	● E100-SF	7-101

7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(50A Frame)

E50-SF

Ratings and Specifications

Type	E50-SF				
Number of poles	2	3			
■ Ratings					
Rated current, A	10	40			
Calibrated at 45°C	15	50			
	20				
	30				
Rated insulation voltage [U_i] V			AC	690	
Rated impulse withstand voltage [U_{imp}] kV				6	
■ Rated breaking capacity, kA					
NK	AC	690V	—		
		450V	10/— ⑬		
		240V	25/— ⑭		
① DC	DC	250V	7.5/—		
		690V	—		
		500V	7.5/3.8		
IEC60947-2	AC	440V	10/5		
		415V	10/5		
		380V	16/8		
① DC	DC	240V	25/13		
		250V	7.5/3.8		
		125V	15/7.5		
■ Rated short time withstand current, kA					
Weight (● marked standard type) kg			0.48	0.74	
■ Connections and Mountings					
Front-connected (FC)	Terminal screws		●		
	With extension bars		—		
Rear-connected (RC)	Bolt studs		○		
	Flat bar studs		—		
Plug-in (PM)	For switchboards Standard (PMC)		○		
	High-performance (PMB)		—		
For distribution boards (PMC)			○		
Flush-mounted (FP)			○ Bolt studs		
Draw-out type (DR)			—		
TemPlug70 (PG)			—		
TemPlug45B (PG4)			—		
DIN rail mount			—		
Clip-in chassis mount			—		
■ Accessories (optional)		Symbol			
Externally mounted	Motor operator	M C	—	●	
	External operating handle	H B	—	●	
	Door-mounted (variable depth)	H P	—	●	
	Toggle extension	H A	—	—	
	Mechanical interlock	M S	—	●	
	Toggle holder	H H	—	●	
	Toggle lock	H L	—	●	
	Terminal cover For front-connected	C F	—	●	
	For rear-connected and plug-in	C R	—	●	
	Interpole barrier	B A	—	●	
Standard specifications	Overcurrent trip mechanism	Thermal-magnetic⑦			
	Trip button (color)	Yes (Red)			
	Handle position indication (ON: Red, OFF: Green)	Yes			
Suitability for isolation			Non		
CE marking			Non		

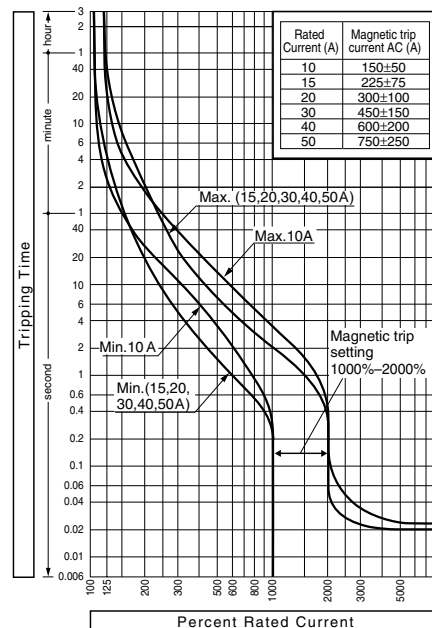
Notes:

● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.

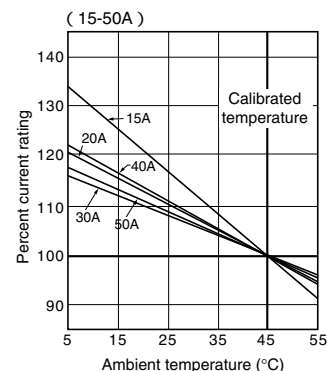
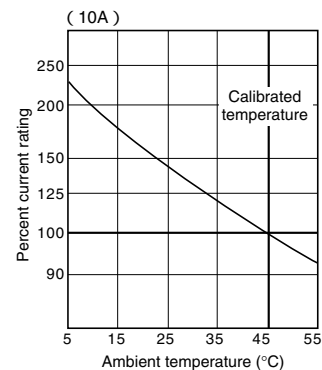
● : "yes" or "available". — : "no" or "not available". ① : DC rating available on request.

⑦ : Hydraulic-magnetic type for below 10A rating. ⑬ : at 500V AC. ⑭ : at 250V AC.

Time/Current characteristic curves



Ambient Compensating Curves



Combinations of Internally Mounted Accessories (Optional)

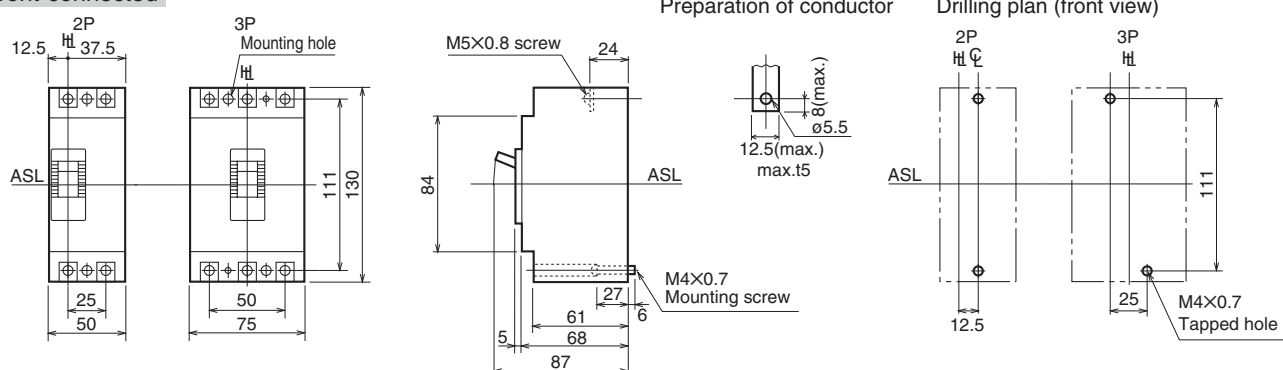
Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip *	AX	SH	UV	SH	UV	AX	AX
3											
	Left pole	Right pole	Left pole	Right pole	Left pole	Right pole	Left pole	Right pole	Left pole	Right pole	Left pole

NOTE: 2-pole type breaker may incorporate only one combination of [AX (max.2C)], [AL], [SH], [UV], [AX]-[AL] into the right pole.

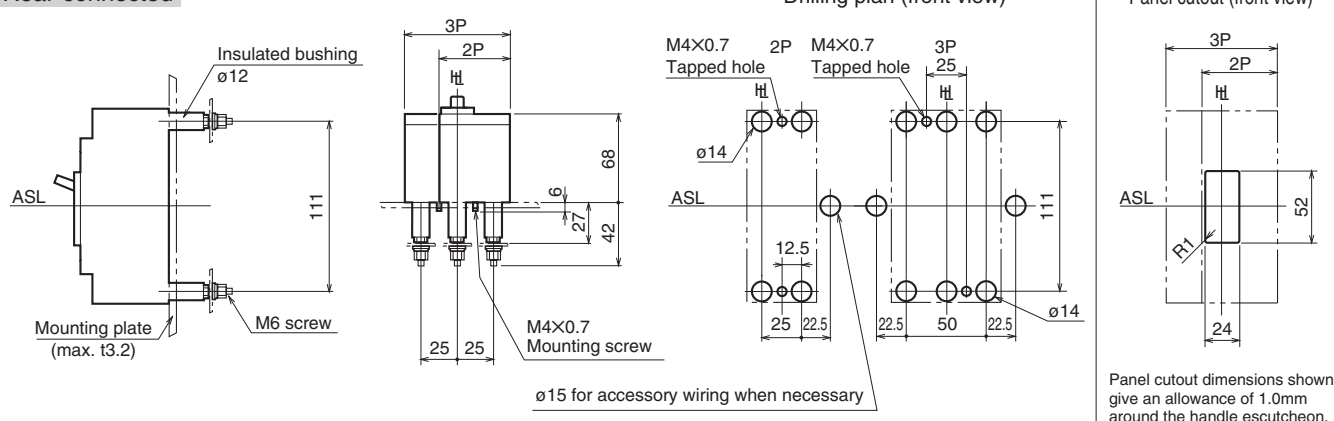
NOTE: * The UV Controller is installed externally when provided with AC UV.

E50-SF

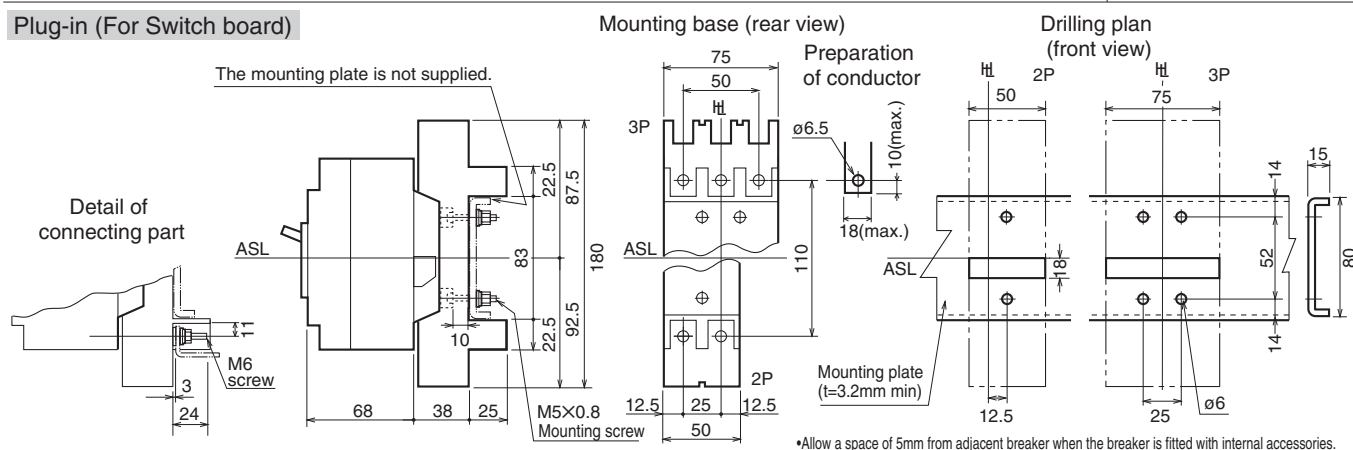
Front-connected



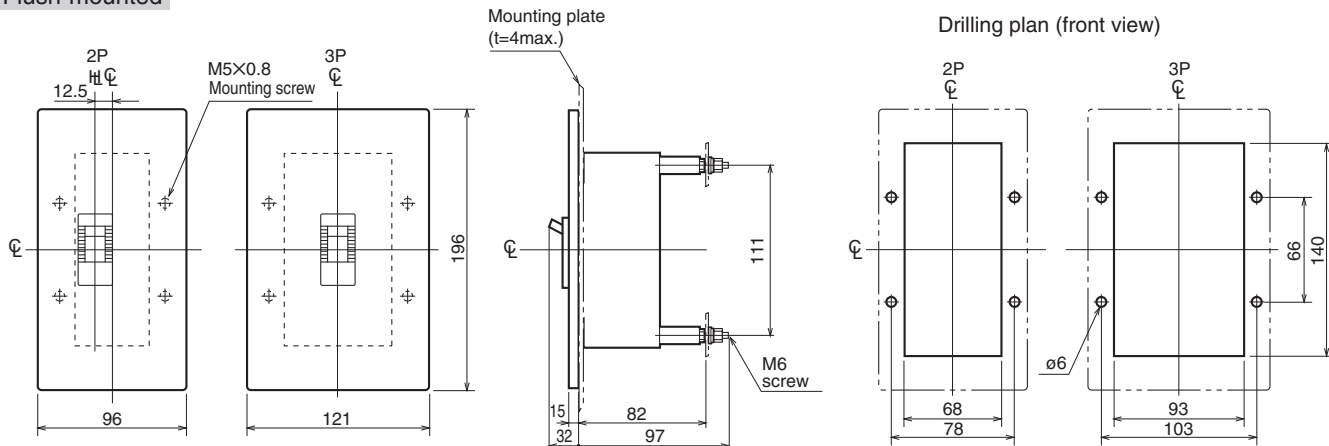
Rear-connected



Plug-in (For Switch board)



Flush-mounted





7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(100A Frame)

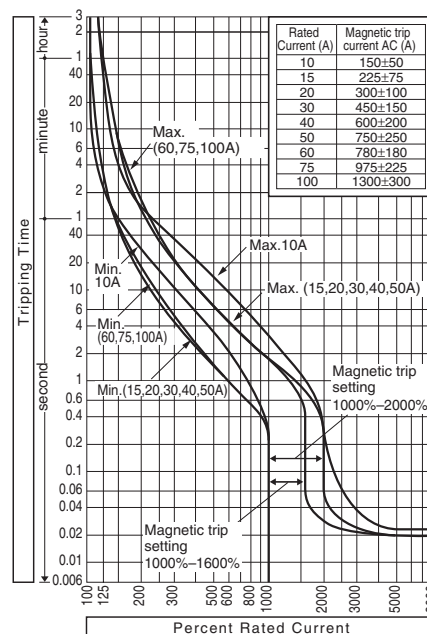
E100-SF

Ratings and Specifications

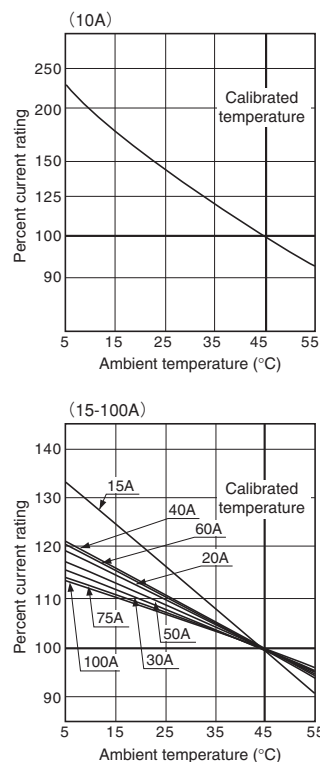
Type		E100-SF			
Number of poles		2	3		
Ratings					
Rated current, A		10	40	100	
Calibrated at 45°C		15	50		
		20	60		
		30	75		
Rated insulation voltage [U _i] V		AC	690		
Rated impulse withstand voltage [U _{imp}] kV			6		
Rated breaking capacity, kA					
NK	AC	690V	—		
		450V	10/— (13)		
		240V	25/— (14)		
	① DC	250V	7.5/—		
IEC60947-2		AC	690V		
I _{cu} /I _{cs} (sym)		500V	7.5/3.8		
		440V	10/5		
		415V	10/5		
		380V	16/8		
① DC		240V	25/13		
		250V	7.5/3.8		
		125V	15/7.5		
Rated short time withstand current, kA					
Weight (● marked standard type) kg		0.48	0.74		
Connections and Mountings					
Front-connected (FC)	Terminal screws	●			
	With extension bars	—			
Rear-connected (RC)	Bolt studs	○			
	Flat bar studs	—			
Plug-in (PM)	For switchboards Standard (PMC)	○			
	High-performance (PMB)	—			
For distribution boards (PMC)		○			
Flush-mounted (FP)		○ Bolt studs			
Draw-out type (DR)		—			
TemPlug70 (PG)		—			
TemPlug45B (PG4)		—			
DIN rail mount		—			
Clip-in chassis mount		—			
Accessories (optional)		Symbol			
Externally mounted	Motor operator	M C	—	●	
	External operating Breaker-mounted	H B	—	●	
	handle Door-mounted (variable depth)	H P	—	●	
	Toggle extension	H A	—	—	
	Mechanical interlock Slide type	M S	—	●	
	Toggle holder	H H	—	●	
	Toggle lock	H L	—	●	
	Terminal cover For front-connected	C F	—	●	
	For rear-connected and plug-in	C R	—	●	
	Interpole barrier	B A	—	●	
Standard specifications					
Overcurrent trip mechanism		Thermal-magnetic⑦			
Trip button (color)		Yes (Red)			
Handle position indication (ON: Red, OFF: Green)		Yes			
Suitability for isolation		Non			
CE marking		Non			

Notes:
 ● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.
 ● : "yes" or "available". — : "no" or "not available". ① : DC rating available on request.
 ⑦ : Hydraulic-magnetic type for below 10A rating. ⑬ : at 500V AC. ⑭ : at 250V AC.

Time/Current characteristic curves



Ambient Compensating Curves



Combinations of Internally Mounted Accessories (Optional)

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip #1	Under voltage trip #2	AX	SH	UV	SH	UV	AX	UV
3											

Left pole
Right pole
Toggle

NOTE: 2-pole type breaker may incorporate only one combination of [AX (max.2C)], [AL], [SH], [UV], [AX-AL] into the left pole.
NOTE: #1 Shunt trip is provided with anti-burnout switch.
NOTE: #2 The UV Controller is installed externally when provided with AC UV.



7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(50A Frame)

S50-SF

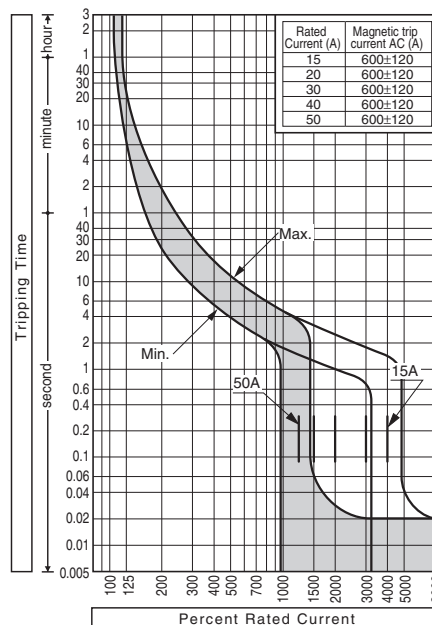
Ratings and Specifications

Type	S50-SF			
Number of poles	2	3		
■ Ratings				
Rated current, A	15			
Calibrated at 45°C	20			
	30			
	40			
	50			
Rated insulation voltage [U_i] V AC				
	690			
Rated impulse withstand voltage [U_{imp}] kV				
	8			
■ Rated breaking capacity, kA				
NK	AC	690V		
$I_{cu}/I_{cs}(\text{sym})$	AC	450V	25/13	
		240V	50/25	
① DC	DC	250V	25/13	
		690V	6/3	
IEC60947-2	AC	500V	12/6	
		440V	25/13	
$I_{cu}/I_{cs}(\text{sym})$	AC	415V	30/15	
		380V	30/15	
① DC	DC	240V	50/25	
		250V	25/13	
		125V	40/20	
■ Rated short time withstand current, kA				
Weight (● marked standard type) kg				
		0.6	0.8	
■ Connections and Mountings				
Front-connected (FC)	Terminal screws	●		
	With extension bars	○ (BAR)		
Rear-connected (RC)	Bolt studs			
	Flat bar studs	○		
Plug-in (PM)	For switchboards Standard (PMC)		○	
	High-performance (PMB)			
	For distribution boards (PMC)		○	
Flush-mounted (FP)	With flat bar studs		○	
Draw-out type (DR)				
TemPlug70 (PG)				
TemPlug45B (PG4)				
DIN rail mount			○ ①	
Clip-in chassis mount				
■ Accessories (optional) Symbol				
Motor operator	M C			
External operating handle	Breaker-mounted H B	●		
	Door-mounted (variable depth) H P	●		
Toggle extension	H A			
Mechanical interlock	Slide type M S	●		
Toggle holder	H H	●		
Toggle lock	H L	●		
Terminal cover	For front-connected C F	●		
	For rear-connected and plug-in C R	●		
Interpole barrier	B A	● ③		
Terminal block for lead	T F	●		
Door flange	D F	●		
■ Standard specifications				
Overcurrent trip mechanism	Thermal-magnetic			
Trip button (color)	Yes (Red)			
Handle position indication (ON: Red, OFF: Green)	Yes			
Suitability for isolation	Yes			
CE marking	Yes			

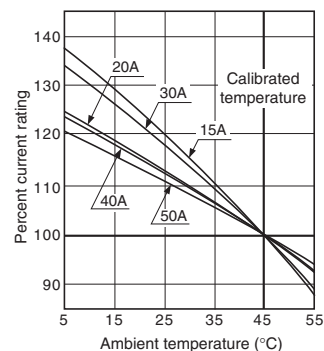
Notes:

- : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.
● : "yes" or "available". — : "no" or "not available". ① : DC rating available on request.
③ : Line side interpole barriers are supplied as standard. (Front connection only) ①① : Provided with DIN rail adaptor.

Time/Current characteristic curves



Ambient Compensating Curves



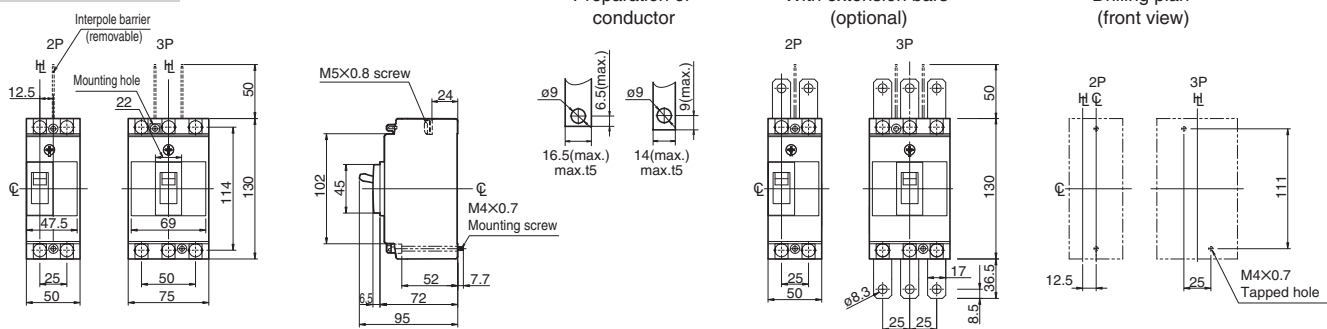
Combinations of Internally Mounted Accessories (Optional)

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX	SH	UV	SH	UV	AX	UV
2											
3											
	Toggle	Left pole	Right pole								

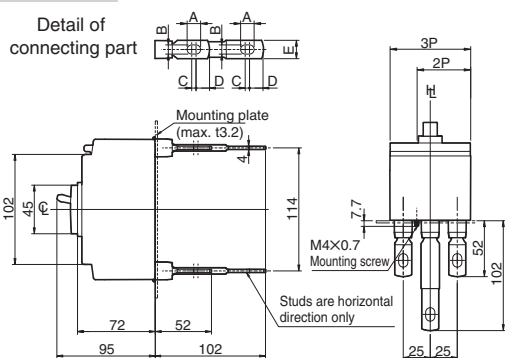
Outline dimensions (mm)

S50-SF

Front-connected

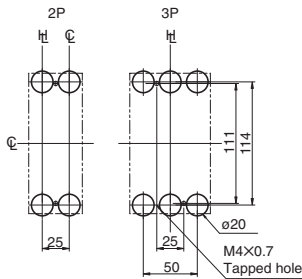


Rear-connected

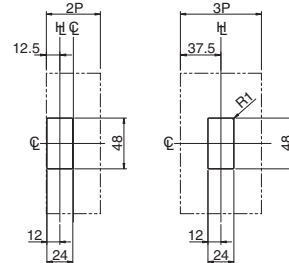


Rated current (A)	A	B	C	D	E
15-50	10.5	6.5	4	13	16

Drilling plan (front view)

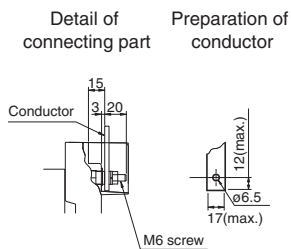


Panel cutout (front view)

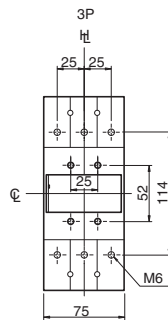


Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

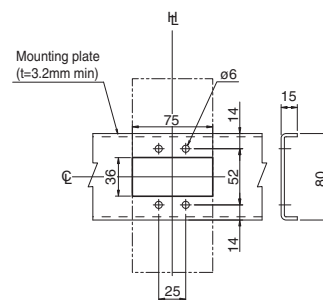
Plug-in (Standard)



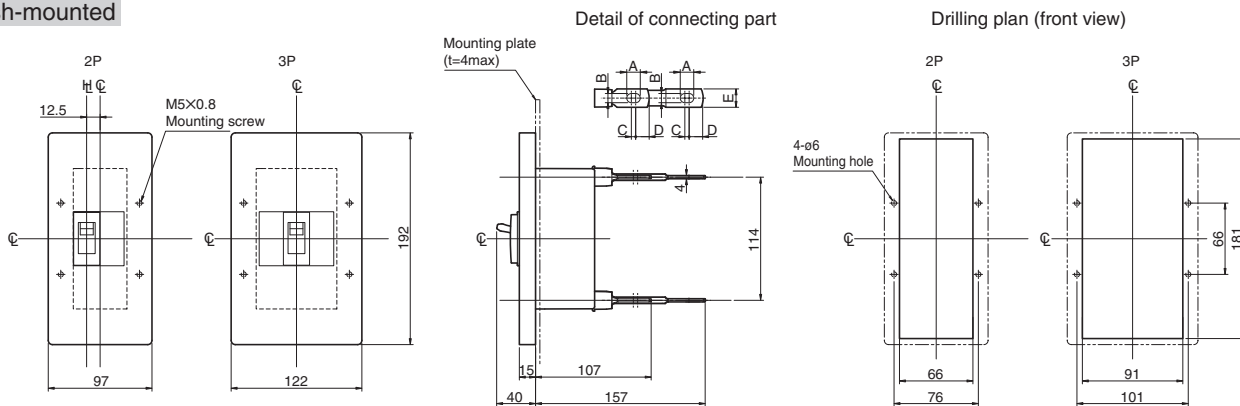
Mounting base
(rear view)



Drilling plan
(front view)



Flush-mounted



Rated current (A)	A	B	C	D	E
15-50	10.5	6.5	4	13	16



7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(125A Frame)

S125-SF

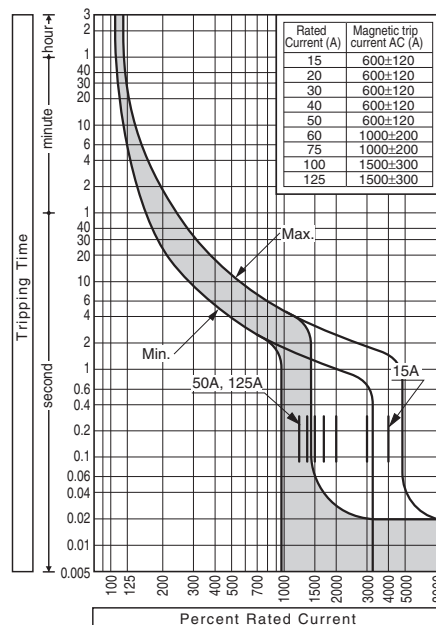
Ratings and Specifications

Type	S125-SF					
Number of poles	2	3	4	2	3	4
■ Ratings						
Rated current, A	15	50		125		
Calibrated at 45°C	20	60				
	30	75				
	40	100				
</						

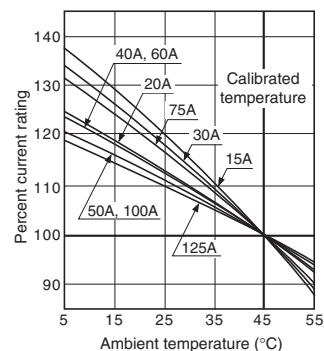
Notes:

- : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.
● : "yes" or "available". — : "no" or "not available". ① : DC rating available on request.
③ : Line side interpole barriers are supplied as standard. (Front connection only) ①① : Provided with DIN rail adaptor.

Time/Current characteristic curves



Ambient Compensating Curves



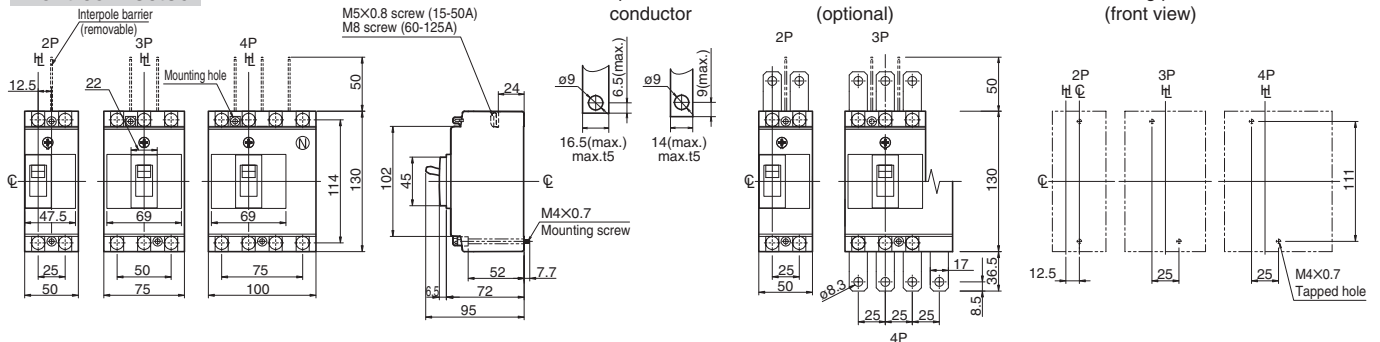
Combinations of Internally Mounted Accessories (Optional)

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX	SH	UV	SH	UV	AX	UV
2											
3											
4											
		Left pole		Right pole							

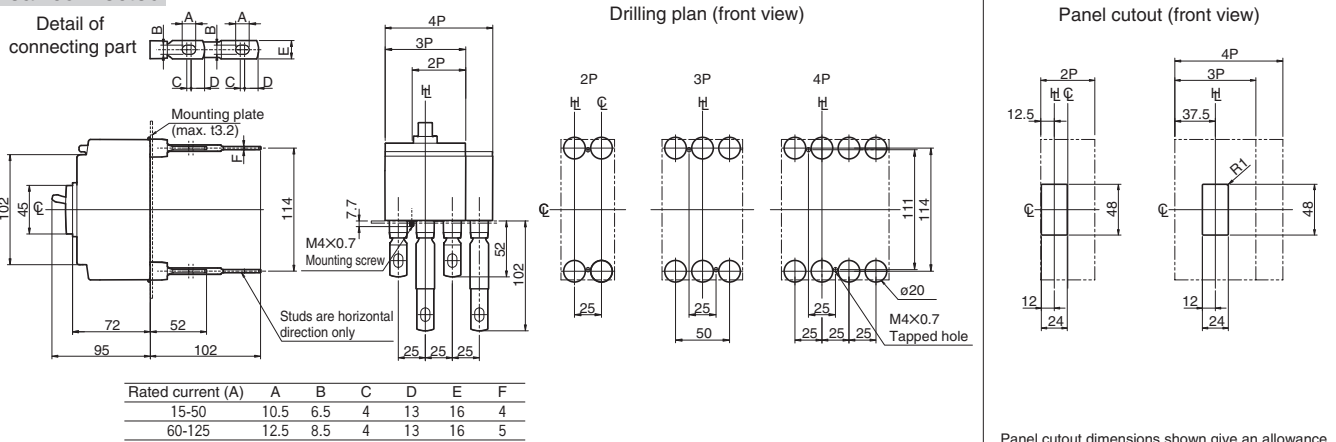
Outline dimensions (mm)

S125-SF

Front-connected

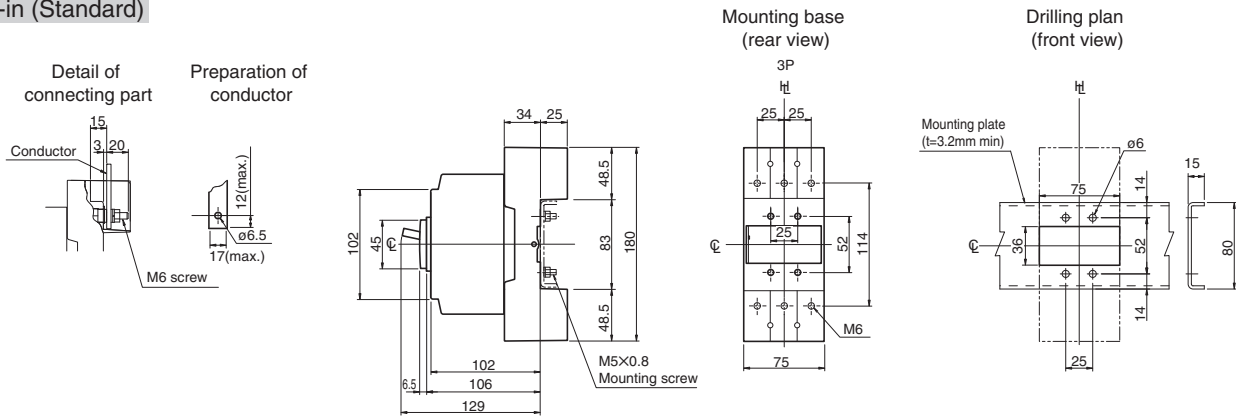


Rear-connected

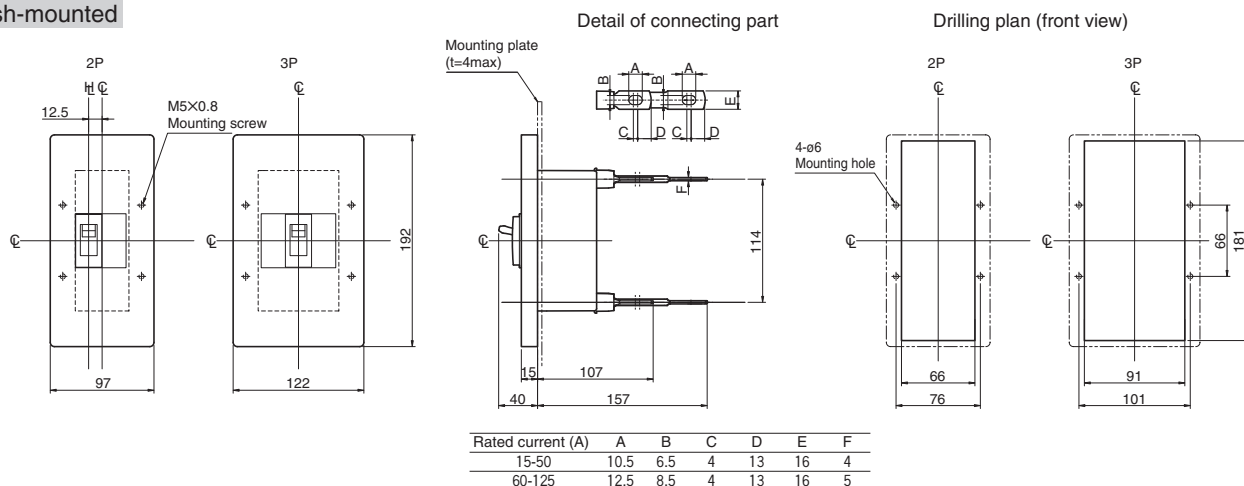


Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

Plug-in (Standard)



Flush-mounted





7 Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers (100A • 50A Frame)

S100-NF, S50-GF, S100-GF

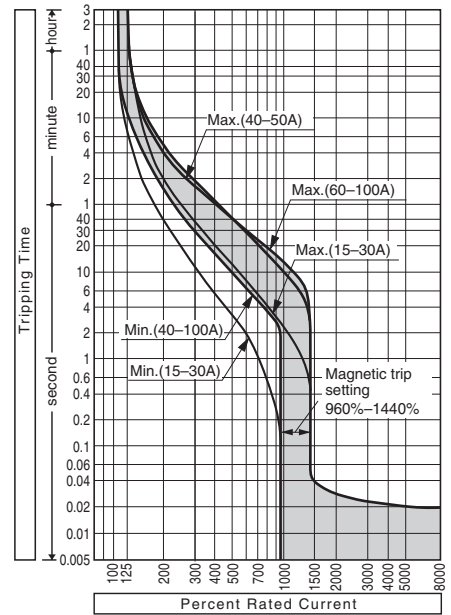
Ratings and Specifications

Type	S100-NF	S50-GF	S100-GF
Number of poles	2 3 4	3 4	2 3 4
■ Ratings			
Rated current, A	15 50	15	15 60
Calibrated at 45°C	20 60	20	20 75
	30 75	30	30 100
	40 100	40	40
		50	50
Rated insulation voltage [U_i] V AC			
Rated impulse withstand voltage [U _{imp}] kV	690	690	690
■ Rated breaking capacity, kA			
NK	6/6	6/6	6/6
I _{cu} /I _{cs} (sym)	AC 690V	6/6	6/6
	450V	25/25	50/25
	240V	50/50	85/85
	① DC 250V	25/19	40/40
IEC60947-2			
I _{cu} /I _{cs} (sym)	AC 690V	6/6	6/6
	500V	22/22	25/22
	440V	25/25	50/25
	415V	30/30	65/33
① DC	380V	30/30	65/33
	240V	50/50	85/85
	250V	25/19	40/40
	125V	40/30	40/40
■ Rated short time withstand current, kA			
Weight (● marked standard type) kg	0.7 1.1 1.4	1.1 1.4	0.7 1.1 1.4
■ Connections and Mountings			
Front-connected (FC)	Terminal screws	●	●
	With extension bars	○ (BAR)	○ (BAR)
Rear-connected (RC)	Bolt studs	○	○
	Flat bar studs	○	○
Plug-in (PM)	For switchboards Standard (PMC)	— ○ —	— ○ —
	High-performance (PMB)	○	○
	For distribution boards (PMC)	— ○ —	— ○ —
Flush-mounted (FP)	With flat bar studs	○	○
Draw-out type (DR)		—	—
TemPlug70 (PG)		— ○ —	— ○ —
TemPlug45B (PG4)		—	—
DIN rail mount		— ○ ①	— ○ ①
Clip-in chassis mount		—	—
■ Accessories (optional)			
Externally mounted	Motor operator	M C	●
	External operating handle	H B	●
	Door-mounted (variable depth)	H P	●
	Toggle extension	H A	—
	Mechanical interlock Slide type	M S	●
	Toggle holder	H H	●
	Toggle lock	H L	●
	Terminal cover For front-connected	C F	●
	For rear-connected and plug-in	C R	●
	Interpole barrier	B A	● ③
Standard specifications	Overcurrent trip mechanism	Thermal-magnetic	Thermal-magnetic
	Trip button (color)	Yes (Red)	Yes (Red)
	Handle position indication (ON: Red, OFF: Green)	Yes	Yes
	Suitability for isolation	Yes	Yes
CE marking			
Yes			

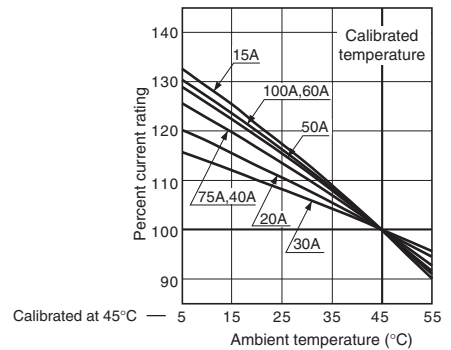
Notes:

● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.
● : "yes" or "available". — : "no" or "not available". ① : DC rating available on request. ③ : Line side interpole barriers are supplied as standard. (Front connection only) ①① : Provided with DIN rail adaptor.

Time/Current characteristic curves



Ambient Compensating Curves



Combinations of Internally Mounted Accessories (Optional)

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AL	SH	UV	SH	UV	AL	UV
2											
3											
4											

NOTE: 2-pole type breaker may incorporate only one combination of [AX (max.2C)], [AL], [SH], [UV], [AX (max.2C)] [AL] into the right pole.

S100-NF, S50-GF, S100-GF



7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(125A Frame)

S125-NF, S125-GF

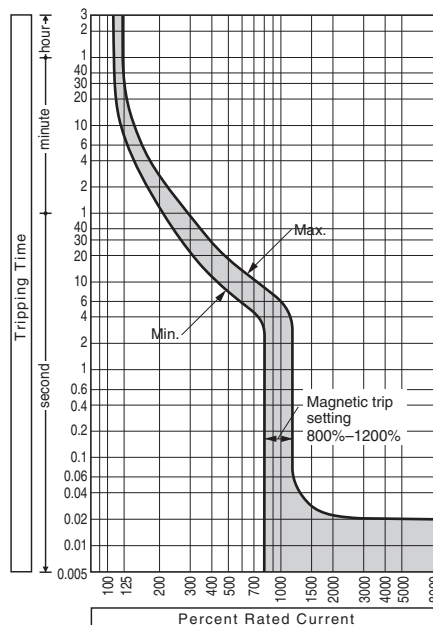
Ratings and Specifications

Type	\$125-NF			\$125-GF				
Number of poles	2	3	4	2	3	4		
■ Ratings								
Rated current, A	125			125				
Calibrated at 45°C								

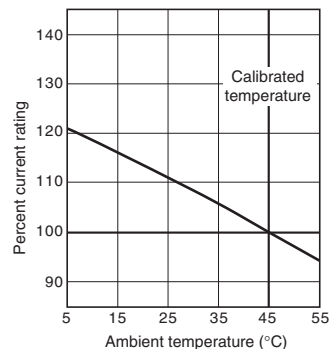
Notes:

● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.
 ● : "yes" or "available". — : "no" or "not available". ① : DC rating available on request. ③ : Line side interpole barriers are supplied as standard. (Front connection only) ① : Provided with DIN rail adaptor.

Time/Current characteristic curves



Ambient Compensating Curves



Combinations of Internally Mounted Accessories (Optional)

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AL	SH	UV	SH	UV	AL	UV
2											
3											
4											

NOTE: 2-pole type breaker may incorporate only one combination of [AX (max.2C)], [AL], [SH], [UV], [AX (max.2C)] [AL] into the right pole.

S125-NF, S125-GF

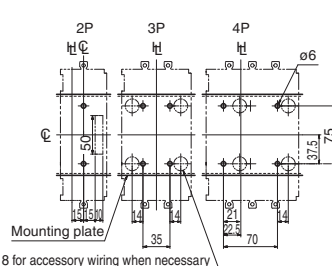
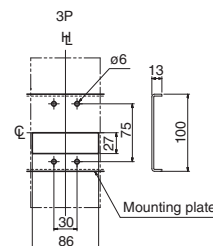
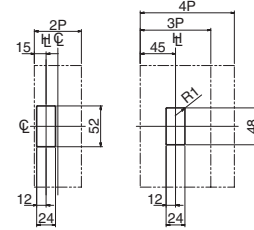
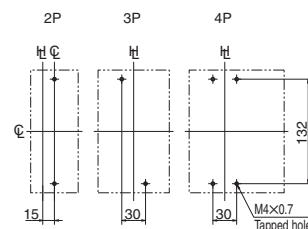


Figure 1: Panel cutout (front view) showing three panels labeled 2P, 3P, and 4P. Each panel has a central mounting hole. Dimensions are provided for each panel: 2P (91x101), 3P (126x136), and 4P (161x171). A 4-6 mounting hole is indicated on the left side of the 2P panel.



Molded Case Circuit Breakers

(225A Frame)

S225-NF, S225-GF

Time/Current characteristic curves

Figure 1 is a graph showing the typical magnetic trip curves for a 100A MCCB. The Y-axis represents Tripping Time on a logarithmic scale, ranging from 0.005 to 3 hours. The X-axis represents Percent Rated Current on a logarithmic scale, ranging from 100 to 5000%. The graph shows a shaded region representing the trip range, bounded by a 'Min.' curve and a 'Max.' curve. A vertical line at 1000% current indicates the magnetic trip setting range of 1040% to 1560%.

Ambient temperature (°C)	175A (%)	200A (%)	225A, 125A (%)	150A (%)
5	135	130	125	120
15	128	123	118	113
25	121	116	111	106
35	114	109	104	99
45	107	102	100	97
55	100	95	93	90

Poles	AX	AL	SH	UV	AX AL	AX SH	AX UV	AL SH	AL UV	AX AL SH	AX AL UV
Auxiliary switch											
4-w											

S225-NF, S225-GF

Figure 1 shows the dimensions of the 3P and 4P models. The 3P model has a width of 105 and a height of 144. The 4P model has a width of 140 and a height of 165. Both models have a central slot width of 22 and a slot height of 70. The 4P model has a mounting hole diameter of 100 and a mounting hole offset of 35. The 3P model has a removable interpose barrier.

With extension bars (optional)

120
97
23
23
11.5
33
30.5
ø11
22
19
30.5
11.5
35
35
35
ø11
28
4
28
4
28

Conductor overlap, max

Mounting plate
(max. t3.2)

Conductor
22 overlap, max

Stud can be turned
45° or 90°

Dimensions: 106, 72, 22, 9.8, 15, 15, 144

Note: Studs are factory installed in horizontal direction both on the line and load sides.

Panel cutout dimensions shown give an allowance of 1.0mm or more around the handle escutcheon.

Detail of connecting pa

15
16.5(max.)
Conductor width, max.25
M8 screw

Detail of connecting part

(rear view)

3P 4P

70 105 35 52.5 17.5 75 140

HL M

[illegible]

Mounting plate
(max. t4)

Conductor
22 overlap, max

144

20

6

ø9

15

15

Stud can be turned
45° or 90°

37

38

Note: Studs are factory installed in horizontal direction both on the line and load sides.



7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

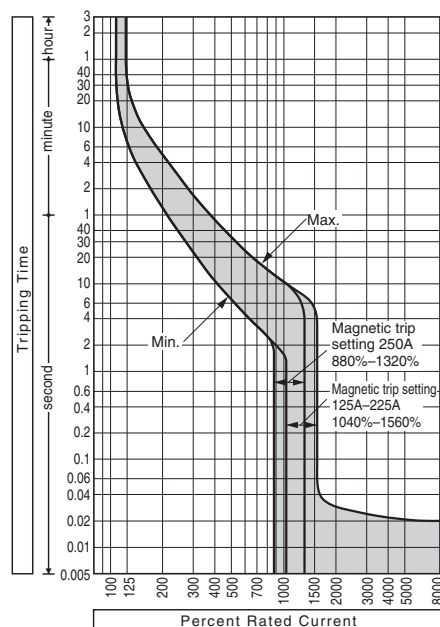
(250A Frame)

E250-SF, S250-SF

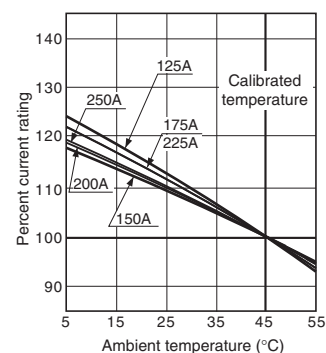
Ratings and Specifications

Type	E250-SF				S250-SF						
Number of poles	2 *	3	2 *	3	2 *	3	4	2 *	3	4	
■ Ratings											
Rated current, A	125				250				125		250
Calibrated at 45°C	150								150		
	175								175		
	200								200		
	225								225		
* center pole omitted											
Rated insulation voltage [U _i] V	AC 690				690				690		690
Rated impulse withstand voltage [U _{imp}] kV	8				8				8		8
■ Rated breaking capacity, kA											
NK	AC	690V	—		—		—		—		
I _{cu} /I _{cs} (sym)		450V	15/12		15/12		30/15		30/15		
		240V	35/27		35/27		85/43		85/43		
	① DC	250V	—		—		25/13		25/13		
IEC60947-2	AC	690V	—		—		4/4		4/4		
I _{cu} /I _{cs} (sym)		500V	10/7.5		10/7.5		25/13		25/13		
		440V	15/12		15/12		30/15		30/15		
		415V	25/19		25/19		40/20		40/20		
		380V	25/19		25/19		40/20		40/20		
		240V	35/27		35/27		85/43		85/43		
① DC	DC	250V	15/12		15/12		25/13		25/13		
		125V	25/19		25/19		40/20		40/20		
■ Rated short time withstand current, kA											
Weight (● marked standard type) kg	1.5		1.5		1.5		1.5		1.5		
■ Connections and Mountings											
Front-connected (FC)	Terminal screws		●		●		●		●		
	With extension bars		○ (BAR)		○ (BAR)		○ (BAR)		○ (BAR)		
Rear-connected (RC)	Bolt studs		—		—		—		—		
	Flat bar studs		○		○		○		○		
Plug-in (PM)	For switchboards Standard (PMC)		— ○		— ○		— ○ —		— ○ —		
	High-performance (PMB)		—		—		—		—		
	For distribution boards (PMC)		—		—		—		—		
Flush-mounted (FP)	With flat bar studs		○		○		○		○		
Draw-out type (DR)	—		—		—		—		—		
TemPlug70 (PG)	— ○		— ○		— ○ —		— ○ —		— ○ —		
TemPlug45B (PG4)	—		—		—		—		—		
DIN rail mount	—		—		—		—		—		
Clip-in chassis mount	—		—		—		—		—		
■ Accessories (optional) Symbol											
Motor operator	M C		●		●		●		●		
External operating handle	Breaker-mounted		●		●		●		●		
	Door-mounted (variable depth)		●		●		●		●		
Toggle extension	H A		—		—		—		—		
Mechanical interlock	Slide type		●		●		●		●		
Toggle holder	H H		●		●		●		●		
Toggle lock	H L		●		●		●		●		
Terminal cover	For front-connected		●		●		●		●		
	For rear-connected and plug-in		●		●		●		●		
Interpole barrier	B A		● ③		● ③		● ③		● ③		
Terminal block for lead	T F		●		●		●		●		
Door flange	D F		●		●		●		●		
■ Standard specifications											
Overcurrent trip mechanism	Thermal-magnetic		Thermal-magnetic		Thermal-magnetic		Thermal-magnetic		Thermal-magnetic		
Trip button (color)	Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		
Handle position indication (ON: Red, OFF: Green)	Yes		Yes		Yes		Yes		Yes		
Suitability for isolation	Yes		Yes		Yes		Yes		Yes		
CE marking	Yes		Yes		Yes		Yes		Yes		

Time/Current characteristic curves



Ambient Compensating Curves

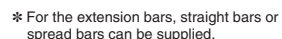


Combinations of Internally Mounted Accessories (Optional)

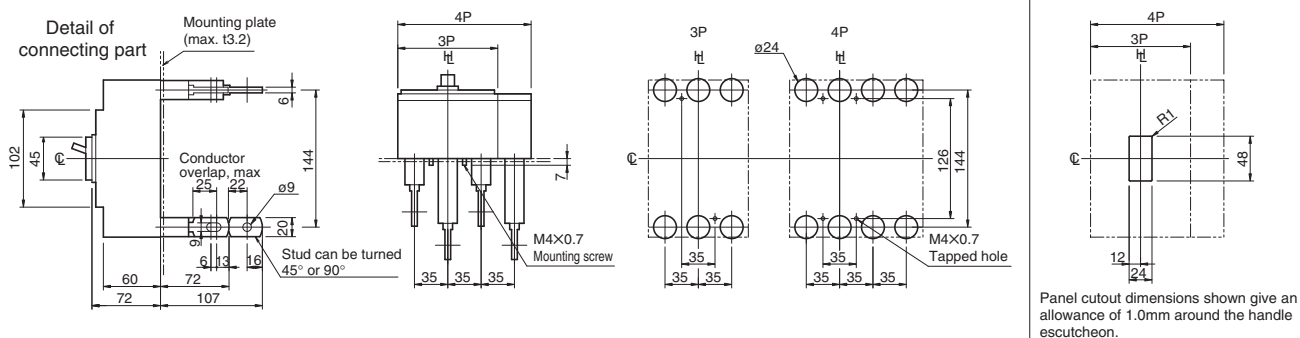
Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX	SH	UV	SH	UV	AX	AX
Δ	AX	AL	SH	UV	AX	SH	UV	SH	UV	AX	AX
Left pole	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle
Right pole	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle

E250-SF, S250-SF

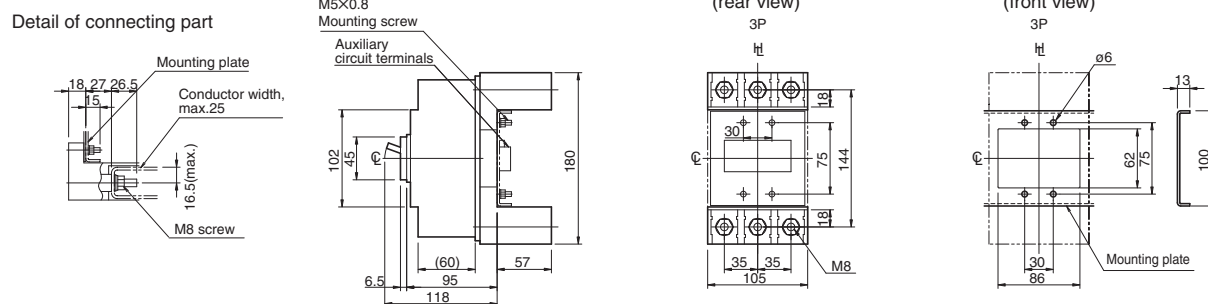
Drilling plan
(front view)



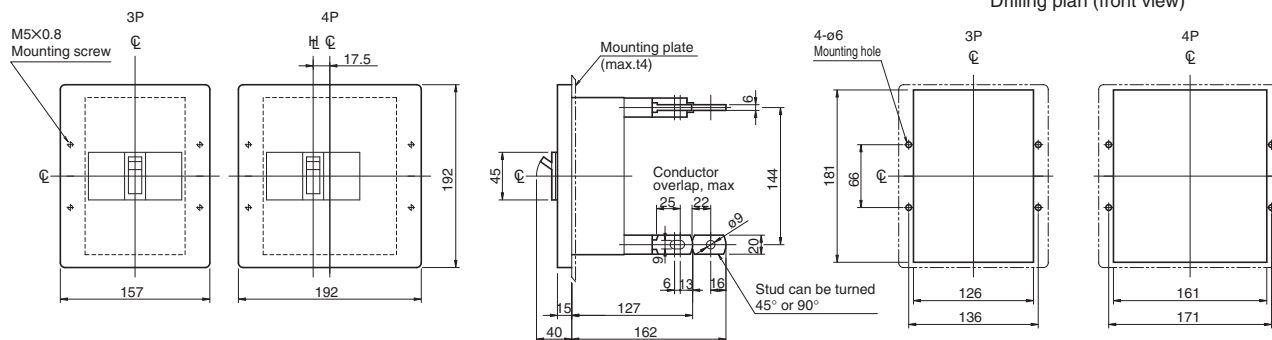
Panel cutout (front view)



Drilling plan
(front view)



Drilling plan (front view)





Molded Case Circuit Breakers

(250A Frame)

S250-NF, S250-GF

Time/Current characteristic curves

Figure 1 is a graph showing the typical inverse time-overcurrent characteristic curve. The vertical axis represents Tripping Time, ranging from 0.005 to 3 hours. The horizontal axis represents Percent Rated Current, ranging from 100 to 5000%. The curve shows that tripping time decreases as the percent rated current increases. A shaded region between two curves indicates the range of settings, with labels 'Max.' and 'Min.' indicating the upper and lower bounds. A vertical line at 1000% current is labeled 'Magnetic trip setting 800%~1200%'.

Ambient temperature (°C)	Percent current rating
5	120
15	115
25	110
35	105
45	100
55	95

Combinations of Internally Mounted Accessories (Optional)

7-18

S250-NF, S250-GF

Technical drawing of a 12-core cable. The drawing shows a cross-section of the cable with 12 individual conductors arranged in two rows of six. The overall diameter is 120 mm. The distance between the centers of the conductors in a row is 11.5 mm. The distance between the centers of the conductors in adjacent rows is 19 mm. The diameter of each individual conductor is 11.5 mm. The diameter of the central void is 11.5 mm. The drawing also shows the cable with extension bars (optional) and the conductor overlap, maximum.

Drilling plan (front view)

3P 4P

35 35 126

M4x0.7 Tapped hole

Technical drawing of the rear view of a 22-pin D-sub connector. The drawing shows a rectangular housing with a mounting plate on top. Dimensions include a total width of 106mm, a mounting plate width of 72mm, and a total height of 144mm. The mounting plate has a maximum thickness of t3.2. The connector has 22 pins, with a maximum overlap of 2.2mm. The pins are arranged in two rows of 11. The mounting plate has a hole for a stud, which can be turned 45° or 90°. The drawing is labeled "Rear view".

Note: Studs are factory installed in horizontal direction both on the line and load sides.

Panel cutout dimensions shown give an allowance of 1.0mm or more around the handle escutcheon.

Detail of connecting pa

Technical drawing of the terminal block showing dimensions and components:

- Conductor width, max. 25
- M8 screw
- Auxiliary circuit terminals
- M5X0.8 Mounting screw
- Dimensions: 15, 16.5(max.), 95, 115, 57, 180

Technical drawing of a rectangular plate. The overall width is 105, divided into two 35 segments. The overall height is 144, divided into a central 75 segment and two 18 segments. The top and bottom segments contain three circular features each, labeled '3P' and 'H'. The central segment contains a rectangular feature labeled 'F'. The bottom right corner is labeled 'M8'.

Detail of connecting part

Mounting plate
(max. t4)

6

144

Conductor
22 overlap, max

30

15 15

22

22

15

15

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

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88

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90

91

92

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94

95

96

97

98

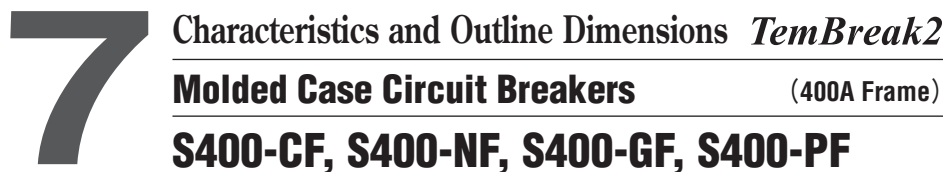
99

100

Stud can be turned
45° or 90°

15 Left and right poles 16
37 Center pole. Neutral pole 16

Note: Studs are factory installed in horizontal direction both on the line and load sides.



Time/Current characteristic curves

Rated insulation voltage [U_i] V		AC	690	690	690	690
Rated impulse withstand voltage [U_{imp}] kV			8	8	8	8
■ Rated breaking capacity, kA						
NK	AC	690V	15/15	20/15	20/15	20/15
$I_{cu}/I_{cs}(sym)$		450V	30/30	45/45	65/50	80/80
		240V	50/50	85/85	100/85	100/85
	① DC	250V	40/40	—	—	—
IEC60947-2	AC	690V	15/15	20/15	20/15	20/15
$I_{cu}/I_{cs}(sym)$		500V	22/22	30/30	30/30	30/30
		440V	30/30	45/45	65/50	80/80
		415V	36/36	50/50	70/50	85/85
		380V	36/36	50/50	70/50	85/85
		240V	50/50	85/85	100/85	100/85
	① DC	250V	40/40	40/40	40/40	40/40
		125V	40/40	40/40	40/40	40/40
■ Rated short time withstand current, kA						
Weight (● marked standard type) kg			4.2	5.6	4.2	5.6

Figure 1 is a line graph showing the relationship between ambient temperature (°C) and percent current rating for various current ratings. The x-axis represents ambient temperature from 5°C to 55°C, and the y-axis represents percent current rating from 90% to 140%. The graph shows that as ambient temperature increases, the percent current rating decreases for all current ratings. The lines for different current ratings converge at 100% current rating at 45°C. The area above the lines is labeled 'Calibrated temperature'.

Ambient temperature (°C)	125A (%)	175A (%)	300A (%)	200A (%)	350A (%)	225A (%)	400A (%)	250A (%)	150A (%)
5	138	132	128	125	122	120	118	116	114
15	135	128	124	121	118	116	114	112	110
25	132	124	120	117	114	112	110	108	106
35	129	120	116	113	110	108	106	104	102
45	100	100	100	100	100	100	100	100	100
55	88	90	92	94	96	98	100	102	104

Rated current (A)	Magnetic trip pickup current						
	Adjustable range (A)						
$I_n \times$	12	11	10	9	8	7	6
125	1500	1375	1250	1125	1000	875	750
150	1800	1650	1500	1350	1200	1050	900
175	2100	1925	1750	1575	1400	1225	1050
200	2400	2200	2000	1800	1600	1400	1200
225	2700	2475	2250	2025	1800	1575	1350
250	3000	2750	2500	2250	2000	1750	1500
300	3600	3300	3000	2700	2400	2100	1800
350	4200	3850	3500	3150	2800	2450	2100
400	4800	4400	4000	3600	3200	2800	2400

Notes:

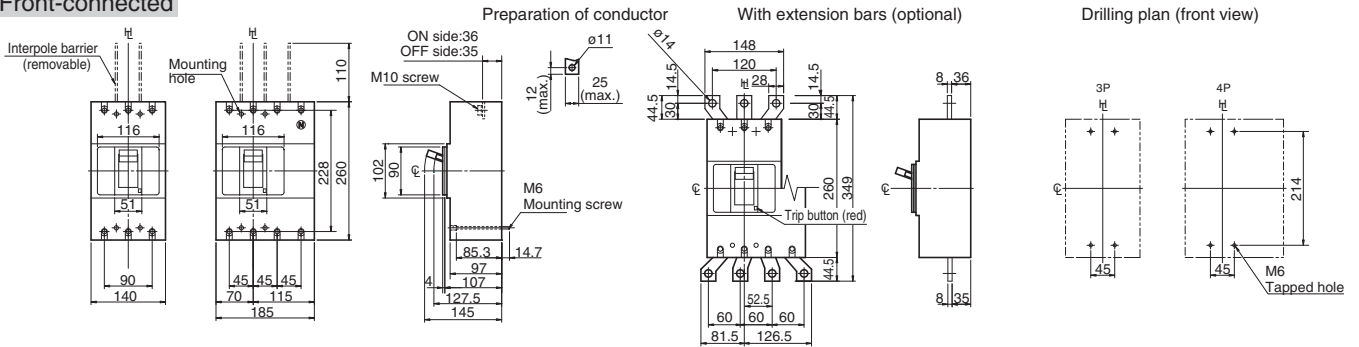
1. Setting tolerance: $\pm 20\%$.
2. The protection characteristic curves assume that the magnetic trip current is adjustable.
3. Unless otherwise stated when ordering, the selector dial is factory set to position "12".
4. The trip pickup current of DC models is not adjustable; the dial position corresponding to the trip pickup current is marked with a white point.

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX AL	AX SH	AX UV	AL SH	AL UV	AX AL SH	AX AL UV
4-1-0											

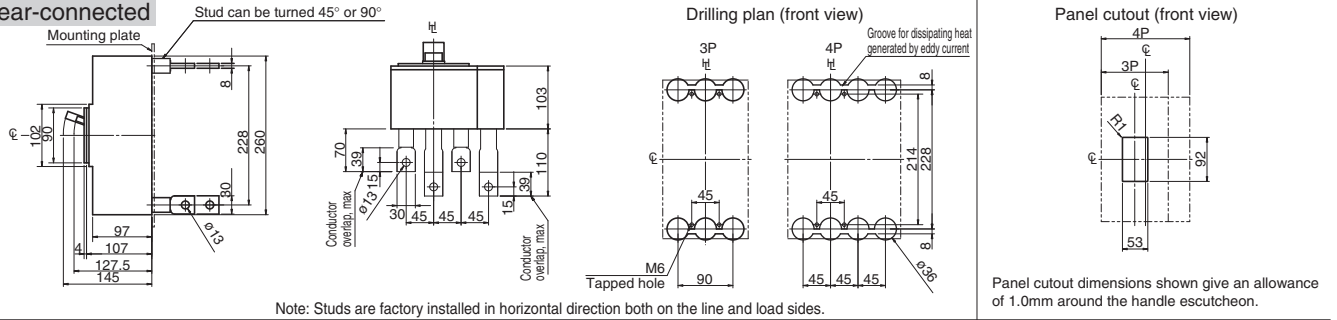
Outline dimensions (mm)

S400-CF, S400-NF, S400-GF, S400-PF

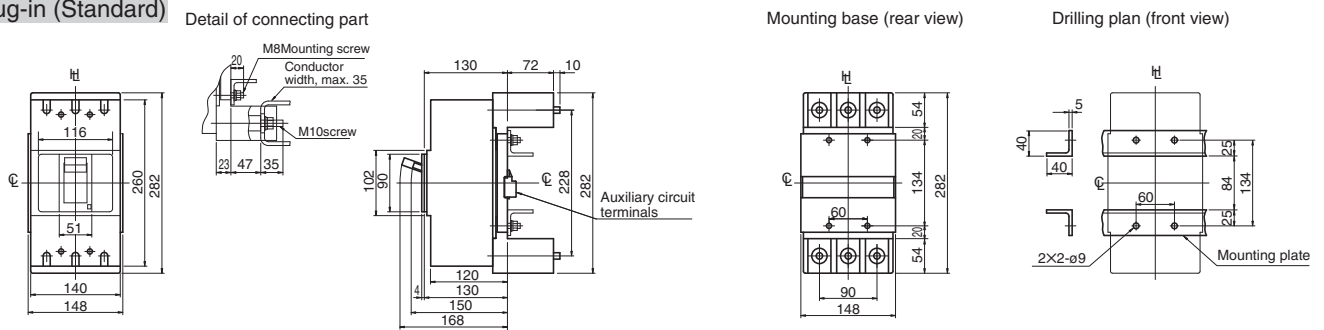
Front-connected



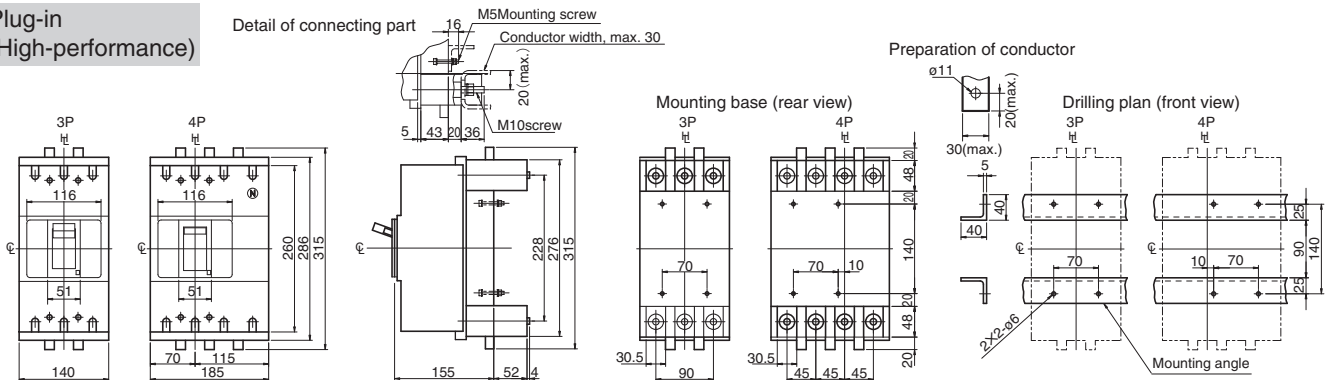
Rear-connected



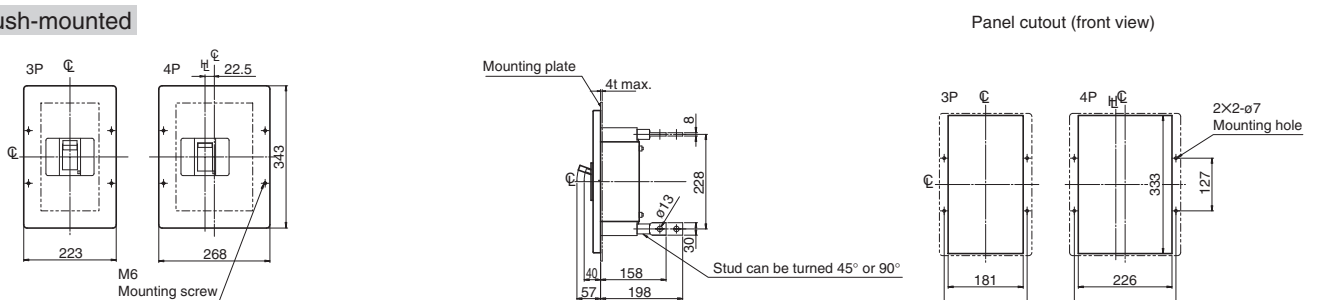
Plug-in (Standard)



Plug-in (High-performance)



Flush-mounted



Note: Studs are factory installed in horizontal direction both on the line and load sides.



7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(100A Frame)

H100-NF, L100-NF

Ratings and Specifications

Type	H100-NF		L100-NF			
Number of poles	3	4	3	4		
■ Ratings						
Rated current, A	15	50	15	50		
Calibrated at 45°C	20	60	20	60		
	30	75	30	75		
	40	100	40	100		

Notes:

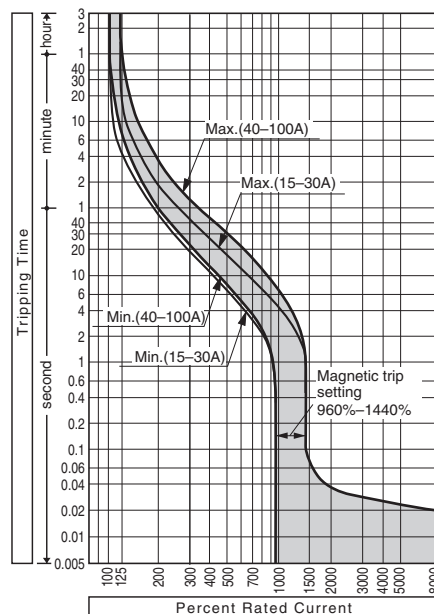
● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.

▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available". ① : DC rating available on request.

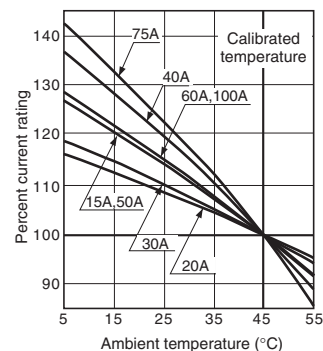
③ : Line side interpole barriers are supplied as standard. (Front connection only)

③① : Also applicable to AC415V.

Time/Current characteristic curves



Ambient Compensating Curves



Combinations of Internally Mounted Accessories (Optional)

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX	SH	UV	SH	UV	AX	UV
Left pole	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle
Right pole	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle

H100-NF, L100-NF

Technical drawing of the rear view of the device. Dimensions include 102, 46, 59, 80, 96, 107, 127, 8, 25(max.), max.17, 10(max.), 09, and 8. Labels include "M8 screw", "M4X0.7 Mounting screw", and "Rear view".

Technical drawing of the rear view of a 22kV cable joint. The drawing shows the following dimensions and components:

- Mounting plate (max. t3.2)**: The top plate of the joint.
- Conductor 22 overlap, max**: The overlapping section of the conductor.
- Stud can be turned 45° or 90°**: A note indicating the orientation of the stud.
- Dimensions**:
 - Overall width: 102
 - Distance from left edge to center of mounting plate: 45
 - Distance from left edge to center of conductor: 96
 - Distance from left edge to center of stud: 107
 - Distance from center of mounting plate to center of conductor: 71
 - Distance from center of conductor to center of stud: 106
 - Distance from center of stud to right edge: 127
 - Distance from center of mounting plate to right edge: 144
 - Distance from center of conductor to right edge: 144
 - Distance from center of stud to right edge: 144
 - Distance from center of mounting plate to center of stud: 106
 - Distance from center of conductor to center of stud: 106
 - Distance from center of stud to right edge: 127
 - Distance from center of mounting plate to right edge: 144
 - Distance from center of conductor to right edge: 144
 - Distance from center of stud to right edge: 144

[illegible]

Panel cutout dimensions shown give an allowance of 1.0mm or more around the handle escutcheon.

Technical drawing of the mounting bracket showing dimensions and component labels:

- Conductor width, max. 22
- M8 screw
- 155 (max)
- 24
- 108
- 180
- 27
- 155
- 175
- M5x0.8 Mounting screw

09
 22(max.)
 15.5(max.)

(front view)

3P 4P

Ø6

15 35 17.5 70 15 12 50 7.5 12

Mounting plate

Technical drawing of the rear view of the PCB. It shows two main mounting areas, 3P and 4P, with dimensions and mounting hole locations. The overall width is 157 and the height is 122. The mounting hole diameter is M5x0.8. The distance between the mounting holes is 17.5. The mounting hole is located at a distance of 17.5 from the center of the mounting area.

Note: Studs are factory installed in horizontal direction both on the line and load sides.



Molded Case Circuit Breakers

(125A Frame)

H125-NF, L125-NF

Time/Current characteristic curves

Figure 1 is a graph showing typical magnetic trip curves for a 100A circuit breaker. The Y-axis represents Tripping Time on a logarithmic scale, ranging from 0.005 to 3 hours. The X-axis represents Percent Rated Current on a logarithmic scale, ranging from 100 to 5000%. The graph displays two curves, labeled 'Max.' and 'Min.', which define the range of tripping times for a given current. The area between these curves is shaded. A vertical line is drawn at 1000% current, indicating the magnetic trip setting range, which is specified as 960% to 1440%.

Ambient temperature (°C)	Percent current rating
5	125
15	120
25	115
35	110
45	100
55	92

Notes:
 ● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.
 ▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available". ① : DC rating available on request.
 ③ : Line side interpolate barriers are supplied as standard. (Front connection only)

Poles	AX		AL		SH		UV		AX		AX		AX		AL		AL		AX		AX	
	Auxiliary switch		Alarm switch		Shunt trip		Under voltage trip		AX		AL		SH		UV		SH		AX		UV	
4+3																						



7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(225A Frame)

H225-NF, L225-NF

Ratings and Specifications

Type	H225-NF	L225-NF		
Number of poles	3	4	3	4
■ Ratings				
Rated current, A	125	125		
Calibrated at 45°C	150	150		
	175	175		
	200	200		
	225	225		
Rated insulation voltage [U_i] V AC				
	690	690		
Rated impulse withstand voltage [U_{imp}] kV				
	8	8		
■ Rated breaking capacity, kA				
NK	20/15	25/20		
$I_{cu}/I_{cs}(sym)$	450V	180/135		
	240V	200/150③		
	250V	—		
IEC60947-2	AC 690V	20/15		
	500V	45/45		
	440V	120/80		
$I_{cu}/I_{cs}(sym)$	415V	125/85		
	380V	125/85		
	240V	150/150		
① DC	250V	40/40		
	125V	40/40		
■ Rated short time withstand current, kA				
Weight (● marked standard type) kg	2.4	3.2	2.4	3.2
■ Connections and Mountings				
Front-connected (FC)	Terminal screws	●	●	
	With extension bars	○ (BAR)	○ (BAR)	
Rear-connected (RC)	Bolt studs	—	—	
	Flat bar studs	○	○	
Plug-in (PM)	For switchboards Standard (PMC)	○	—	
	High-performance (PMB)	○	○	
	For distribution boards (PMC)	—	—	
Flush-mounted (FP)	With flat bar studs	○	○	
Draw-out type (DR)		—	—	
TemPlug70 (PG)		▲	—	
TemPlug45B (PG4)		—	—	
DIN rail mount		—	—	
Clip-in chassis mount		—	—	
■ Accessories (optional)				
Externally mounted	Motor operator	M C	●	●
	External operating handle	H B	●	●
	Door-mounted (variable depth)	H P	●	●
	Toggle extension	H A	—	—
	Mechanical interlock Slide type	M S	●	●
	Toggle holder	H H	●	●
	Toggle lock	H L	●	●
	Terminal cover For front-connected	C F	●	●
	For rear-connected and plug-in	C R	●	●
	Interpole barrier	B A	●③	●③
Standard specifications	Overcurrent trip mechanism	Thermal-magnetic	Thermal-magnetic	
	Trip button (color)	Yes (Red)	Yes (Red)	
	Handle position indication (ON: Red, OFF: Green)	Yes	Yes	
	Suitability for isolation	Yes	Yes	
	CE marking	Yes	Yes	

Notes:

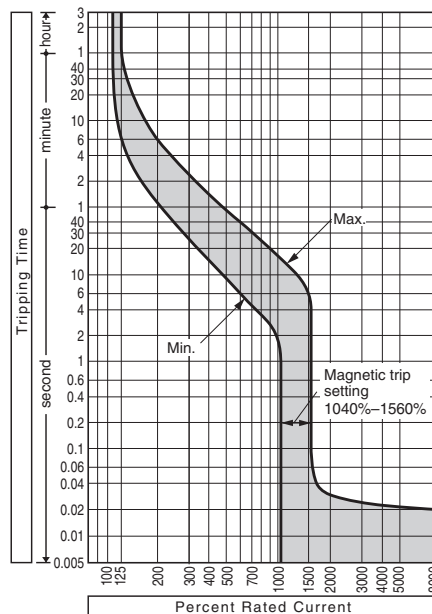
● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.

▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available". ① : DC rating available on request.

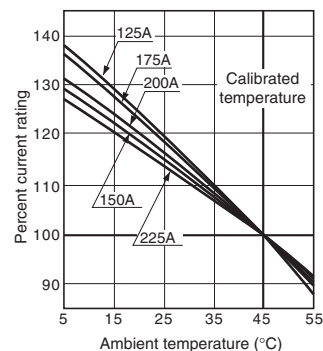
③ : Line side interpole barriers are supplied as standard. (Front connection only)

③① : Also applicable to AC415V.

Time/Current characteristic curves



Ambient Compensating Curves



Combinations of Internally Mounted Accessories (Optional)

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX	SH	UV	SH	UV	AX	UV
▲	Left pole	Right pole	Left pole	Right pole	Left pole	Right pole	Left pole	Right pole	Left pole	Right pole	Left pole
Toggle	Left pole	Right pole	Left pole	Right pole	Left pole	Right pole	Left pole	Right pole	Left pole	Right pole	Left pole



Molded Case Circuit Breakers

(225A Frame)

S225-GE

Ratings and Specifications

Time/Current characteristic curves

Overcurrent tripping characteristics

Characteristics No.		1	2	3	4	5
Long time-delay pick-up current (A) : (I_{ln})		CT rated current : (I_{cn}) = 250A 125, 150, 175, 200, 225				
Long time-delay time settings (s) : (t_{sd})		11	21	21	5	7.5
		at 200% $\times(I_{ln})$			at 600% $\times(I_{ln})$	
		Setting tolerance $\pm 20\%$				
Short time-delay (I_{th}) $\times$ pick-up current (A) : (I_{sd})		2.5	2.5	5	10	10
		Setting tolerance $\pm 15\%$				
		0.1	0.1	0.1	0.1	0.2
Short time-delay time settings (s) : (t_{sd})		Total clearing time +50ms, resettable time -20ms				
Instantaneous trip pick-up current (A) : (I_l)		(I_{tr}) $\times$ 1400% Setting tolerance $\pm 20\%$				
Option	Preferential trip alarm					
	Pick-up current (A) : (I_p)	(I_{tr}) $\times$ 80% Setting tolerance $\pm 10\%$				
	Time-settings (s) : (t_p)	Definite time-delay characteristic, 40sec. Setting tolerance $\pm 10\%$				
	Neutral protection					
	Pick-up current (A) : (I_{ln})	(I_{tr}) $\times$ 100%				
	Time-settings (s) : (t_{sd})	(t_{tr}) = (t_{sd}) Same as Long time-delay time settings				

Note: Characteristic No.4 will be applied as standard setting unless otherwise specified.

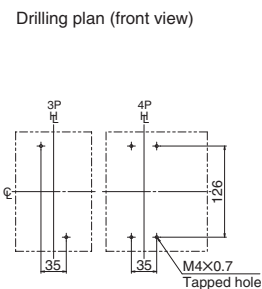
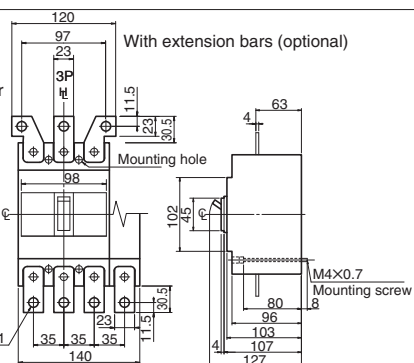
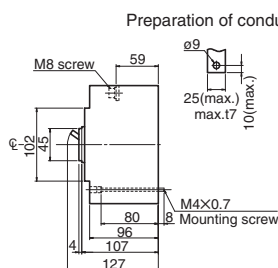
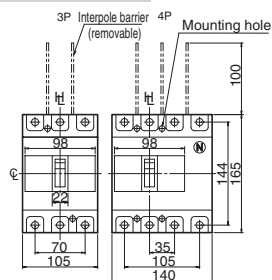
Combinations of Internally Mounted Accessories (Optional)

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX AL	AX SH	AX UV	AL SH	AL UV	AX AL SH	AX AL UV
4 x 1											

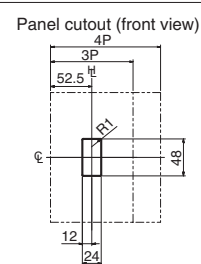
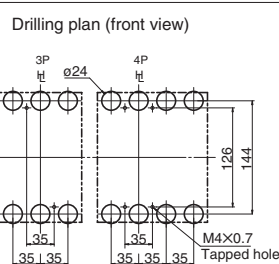
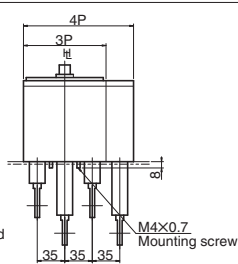
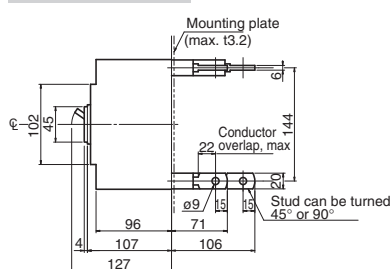
Outline dimensions (mm)

S225-GE

Front-connected



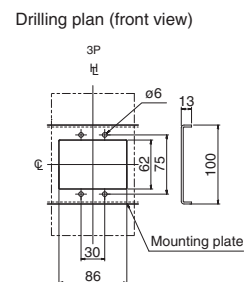
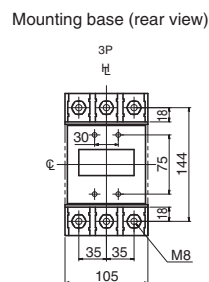
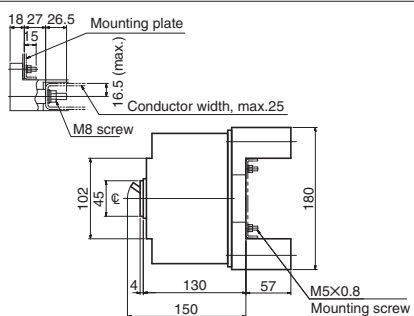
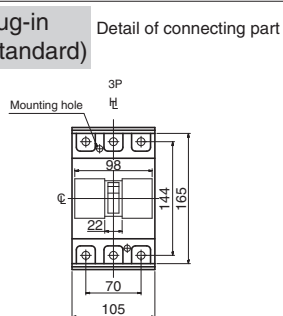
Rear-connected



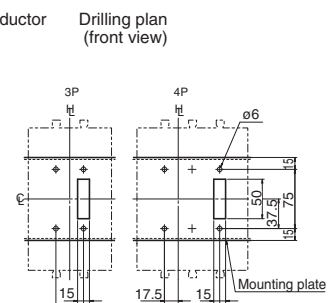
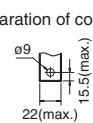
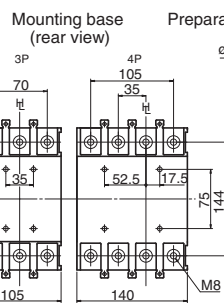
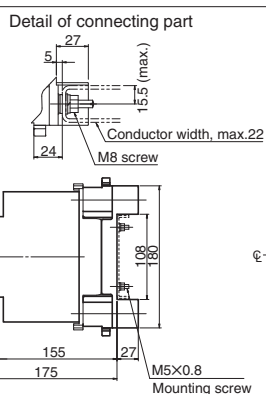
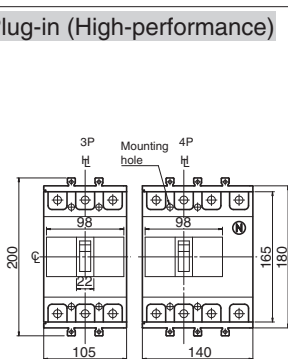
Note: Studs are factory installed in horizontal direction both on the line and load sides.

Panel cutout dimensions shown give an allowance of 1.0mm or more around the handle escutcheon.

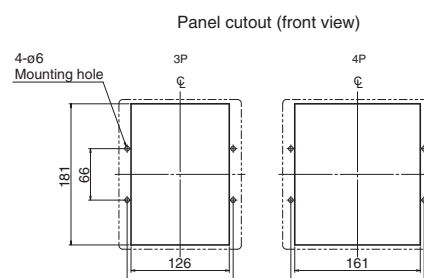
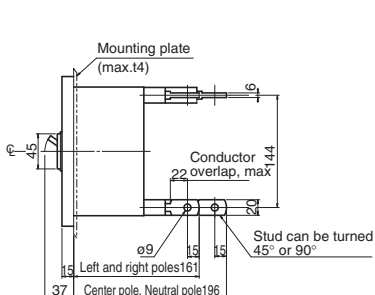
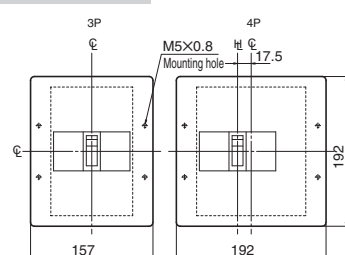
Plug-in (Standard)



Plug-in (High-performance)



Flush-mounted



Note: Studs are factory installed in horizontal direction both on the line and load sides.



Molded Case Circuit Breakers

(400A Frame)

S400-NE, S400-GE, S400-PE

Ratings and Specifications

Time/Current characteristic curves

Overcurrent tripping characteristics

Characteristics No.		1	2	3	4	5	6	7
Long time-delay pickup current (A) : (I_n)	CT rated current : (I_{CT}) = 250A 125, 150, 175, 200, 225							
	CT rated current : (I_{CT}) = 400A 175, 200, 225, 250, 300, 350, 400							
Long time-delay time settings (s) : (t_n)	11 21 21	5	10	19	29			
	at $200\% \times (I_n)$	at $600\% \times (I_n)$						
	Setting tolerance $\pm 20\%$							
Short time-delay pickup current (A) : (I_{sd})	$(I_n) \times$ pickup current (A) : (I_{sd})	2.5	2.5	5	10	10	10	10
	Setting tolerance $\pm 15\%$							
Short time-delay time settings (s) : (t_{sd})	0.1 0.1 0.1 0.1 0.2 0.2 0.2							
	Total clearing time +50ms, resettable time ~20ms							
Instantaneous trip pickup current (A) : (I_l)	$(I_n) \times 1400\%$ Setting tolerance $\pm 20\%$							
	Max: (I_{CT}) $\times 1300\%$							
Option	Preferential trip alarm							
	Pick-up current (A) : (I_p)	$(I_n) \times 80\%$ Setting tolerance $\pm 10\%$						
	Time-settings (s) : (t_p)	Definite time-delay characteristic, 40sec. Setting tolerance $\pm 10\%$						
	Ground fault trip							
	Pick-up current (A) : (I_g)	$(I_{CT}) \times 20\%$ Setting tolerance $\pm 15\%$ ①						
	Time-settings (s) : (t_g)	Definite time-delay characteristic, 0.2sec. Total tripping time +50ms, resettable time ~20ms.						
	Neutral protection							
	Pick-up current (A) : (I_h)	$(I_n) \times 100\%$ or 50% selectable ②						
Time-settings (s) : (t_h)	$(I_h) = (I_n)$ Same as Long time-delay time settings							

Note:

- ①. Ground fault trip is not available when (I_{CT}) is 250A.
- ②. In case of ($I_P < (I_{CT})$), the setting tolerance becomes big when (I_N) is set at (I_P) $\times$ 50%.

Characteristic No.4 will be applied as standard setting unless otherwise specified.

Combinations of Internally Mounted Accessories (Optional)

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX └─┬─ AL	AX └─┬─ SH	AX └─┬─ UV	AL └─┬─ SH	AL └─┬─ UV	AX └─┬─ AL └─┬─ SH	AX └─┬─ AL └─┬─ UV
4+3											

Toggle

Left pole

Right pole

S400-NE, S400-GE, S400-PE

Front-connected

Interpole barrier (removable)

Mounting hole

116

228

260

51

90

140

45

45

45

70

115

185

ON side:36
OFF side:35

M10 screw

12 (max.)

25 (max.)

11

M6 Mounting screw

14.7

85.3

97

107

127.5

145

148

120

28

14.5

30

14.5

260

349

8

36

35

60

60

60

81.5

126.5

52.5

44.5

30

14.5

44.5

Trip button (red)

Drilling plan (front view)

3P

4P

45

214

45

45

3P

4P

45

214

45

M6 Tapped hole

Rear-connected

Mounting plate

Stud can be turned 45° or 90°

Drilling plan (front view)

Panel cutout (front view)

Note: Studs are factory installed in horizontal direction both on the line and load sides.

Note: Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

Note: Studs are factory installed in horizontal direction both on the line and load sides

Plug-in (Standard)

Detail of connecting part

M8 Mounting screw
Conductor width, max. 35
M10 screw

Mounting base (rear view)

Drilling plan (front view)

Mounting base (front view)

Plug-in (High-performance)

Detail of connecting part

Preparation of conductor

Mounting base (rear view)

Drilling plan (front view)

Mounting angle

Flush-mounted

The image contains three technical drawings. The leftmost drawing shows the front view of the device for flush mounting, with dimensions 223mm width and 343mm height. It includes a 3P terminal block and a 4P terminal block. The middle drawing is a side view showing the mounting plate, mounting screws (4t max.), and the device's profile. It includes dimensions for the mounting plate (40mm, 57mm, 158mm, 198mm), the device (228mm, 30mm), and the terminal block (8mm). A note indicates the stud can be turned 45° or 90°. The rightmost drawing shows the front view of the panel cutout, with dimensions 181mm width and 226mm height. It includes a 3P terminal block and a 4P terminal block. A note indicates the mounting holes are 2X2-ø7.

Panel cutout (front view)

Note: Studs are factory installed in horizontal direction both on the line and load sides.



7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(400A Frame)

H400-NE, L400-NE

Ratings and Specifications

Type			H400-NE		L400-NE			
Number of poles			3	4	3	4		
■ Ratings								
Rated current, A			(Adjustable)	(Adjustable)	(Adjustable)	(Adjustable)		
Calibrated at 45°C			125	175	125	175		
			150	200	150	200		
			175	225	175	225		
			200	250	200	250		
			225	300	225	300		
				350		350		
				400		400		
Rated insulation voltage [U_i] V			AC 690		690			
Rated impulse withstand voltage [U_{imp}] kV			8		8			
■ Rated breaking capacity, kA								
NK	AC	690V	35/35		50/50			
I_{cu}/I_{cs} (sym)		450V	120/80		180/135			
		240V	150/150		200/150 ③			
	DC	250V	—		—			
IEC60947-2	AC	690V	35/35		50/50			
I_{cu}/I_{cs} (sym)		500V	45/45		65/65			
		440V	120/80		180/135			
		415V	125/85		200/150			
		380V	125/85		200/150			
		240V	150/150		200/150			
	DC	250V	—		—			
		125V	—		—			
■ Rated short time withstand current, kA			5 (0.3sec)		5 (0.3sec)			
Weight (● marked standard type) kg			7.1	9.4	7.1	9.4		
■ Connections and Mountings								
Front-connected (FC) Terminal screws			●		●			
With extension bars			○ (BAR)		○ (BAR)			
Rear-connected (RC) Bolt studs			—		—			
Flat bar studs			○		○			
Plug-in (PM) For switchboards Standard (PMC)			○		○			
High-performance (PMB)			○		○			
For distribution boards (PMC)			—		—			
Flush-mounted (FP) With flat bar studs			○		○			
Draw-out type (DR)			▲		▲			
TemPlug70 (PG)			—		—			
TemPlug45B (PG4)			—		—			
DIN rail mount			—		—			
Clip-in chassis mount			—		—			
■ Accessories (optional) Symbol								
Motor operator			M C ●		●			
External operating handle Breaker-mounted			H B ●		●			
Door-mounted (variable depth)			H P ●		●			
Toggle extension			H A —		—			
Mechanical interlock⑨ Slide type			M S ●		●			
Toggle holder			H H ●		●			
Toggle lock			H L ●		●			
Terminal cover For front-connected			C F ●		●			
For rear-connected and plug-in			C R ●		●			
Interpole barrier			B A ● ③		● ③			
Terminal block for lead			T F ●		●			
Door flange			D F ●		●			
■ Standard specifications								
Overcurrent trip mechanism			Electronic ⑩		Electronic ⑩			
Trip button (color)			Yes (Red)		Yes (Red)			
Handle position indication (ON: Red, OFF: Green)			Yes		Yes			
Suitability for isolation			Yes		Yes			
CE marking			Yes		Yes			

Notes:
● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.
▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available".

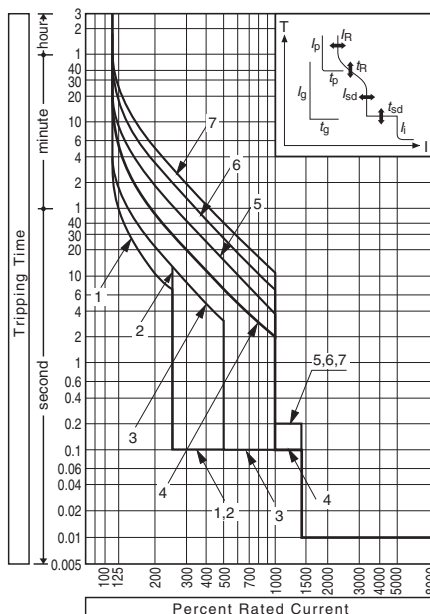
③ : Line side interpole barriers are supplied as standard. (Front connection only)

⑨ : The mechanical interlock is not applicable to the draw-out type (DR).

⑩ : Optional pretrip alarm or ground fault trip function available on request.

⑪ : Also applicable to AC415V.

Time/Current characteristic curves



Overcurrent tripping characteristics

Characteristics No.		1	2	3	4	5	6	7
Long time-delay pick-up current (A) : (I_R)	CT rated current : (I_{CT}) = 250A 125, 150, 175, 200, 225							
	CT rated current : (I_{CT}) = 400A 175, 200, 225, 250, 300, 350, 400							
Long time-delay time settings (s) : (t_R)	11		21	21	5	10	19	29
	at 200%×(I_R)		at 600%×(I_R)					
Setting tolerance ±20%								
Short time-delay (I_R)× pick-up current (A) : (I_{sd})	2.5	2.5	5	10	10	10	10	10
	Setting tolerance ±15%							
Short time-delay time settings (s) : (t_{sd})	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
	Total clearing time +50ms, resettable time ~20ms							
Instantaneous trip pick-up current (A) : (I_I)	(I_R)×1400%				Max: (I_{CT})×1300%			
	Setting tolerance ±20%							
Option	Preferential trip alarm							
	Pick-up current (A) : (I_P)	(I_R)×80% Setting tolerance ±10%						
	Time-settings (s) : (t_P)	Definite time-delay characteristic, 40sec. Setting tolerance ±10%						
	Ground fault trip							
	Pick-up current (A) : (I_g)	(I_{CT})×20% Setting tolerance ±15% ①						
	Time-settings (s) : (t_g)	Definite time-delay characteristic, 0.2sec. Total tripping time +50ms, resettable time ~20ms.						
Neutral protection								
Pick-up current (A) : (I_h)	(I_R)×100% or 50% selectable ②							
Time-settings (s) : (t_h)	(t_h)=(t_P) Same as Long time-delay time settings							

Note:

①: Ground fault trip is not available when (I_{CT}) is 250A.

②: In case of (I_p) < (I_{CT}), the setting tolerance becomes big when (I_h) is set at (I_p)×50%.

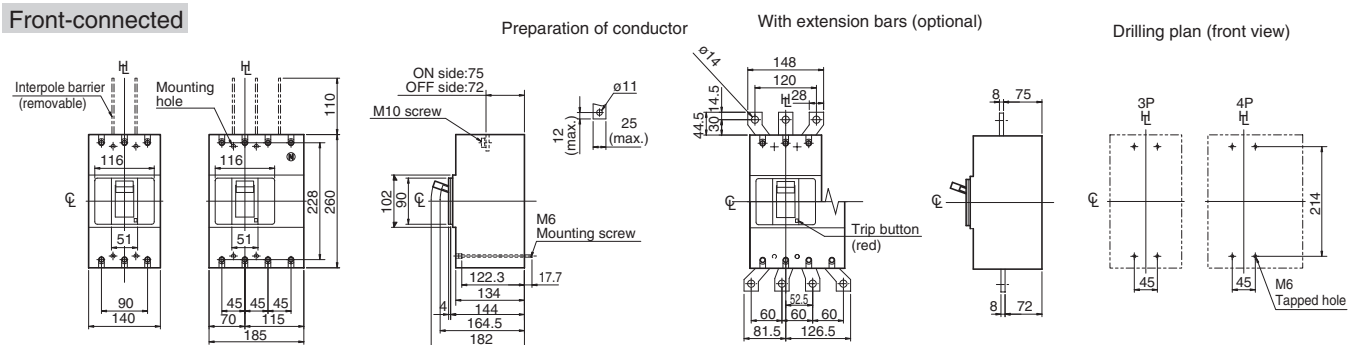
Characteristic No.4 will be applied as standard setting unless otherwise specified.

Combinations of Internally Mounted Accessories (Optional)

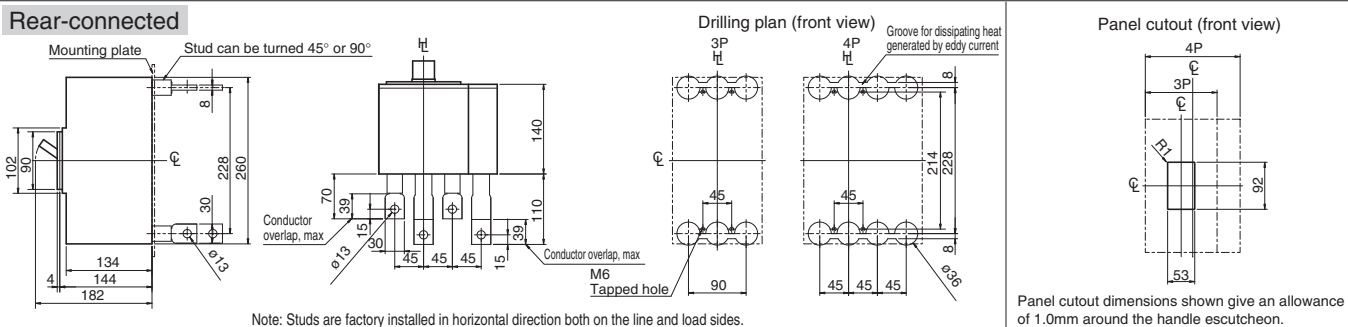
Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX	SH	UV	SH	UV	AX	UV
▲	Left pole	Right pole	Left pole	Right pole	Left pole	Right pole	Left pole	Right pole	Left pole	Right pole	Left pole
▲	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle

H400-NE, L400-NE

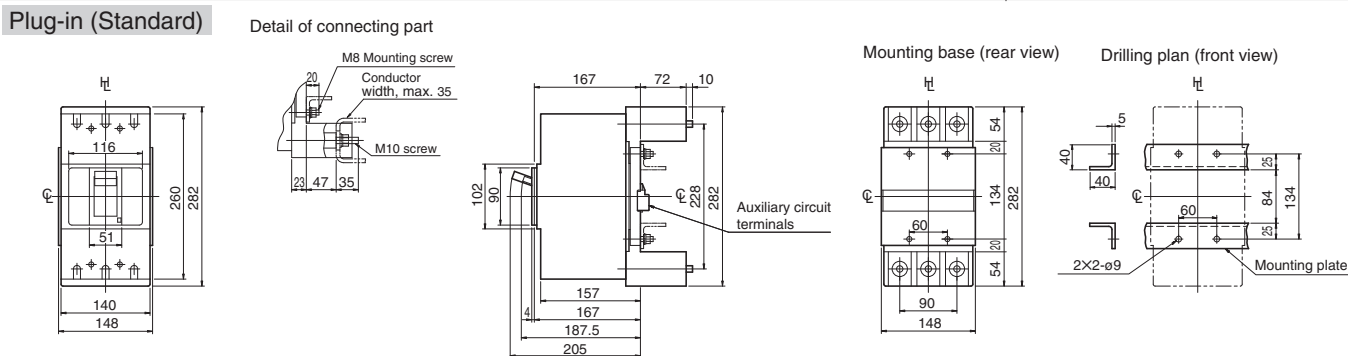
Front-connected



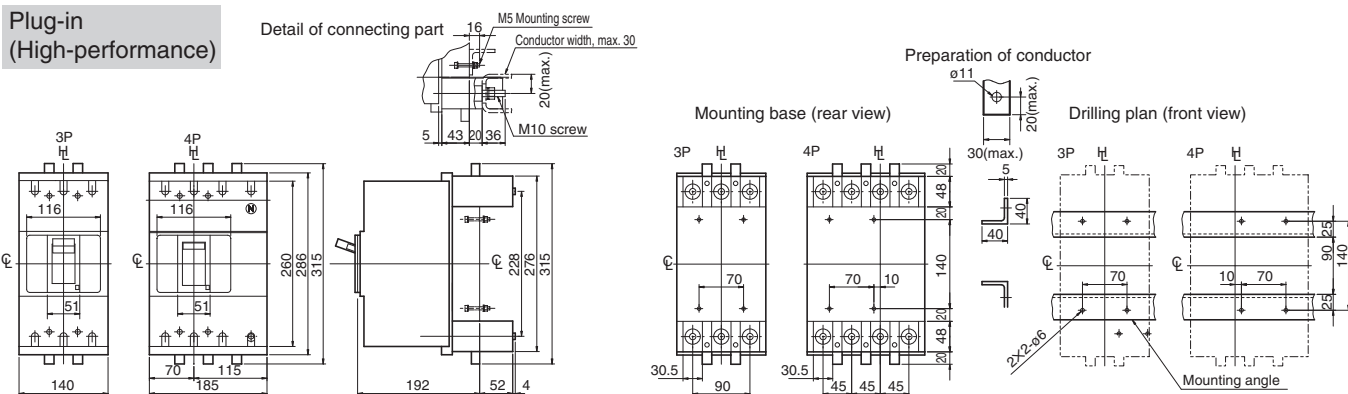
Rear-connected



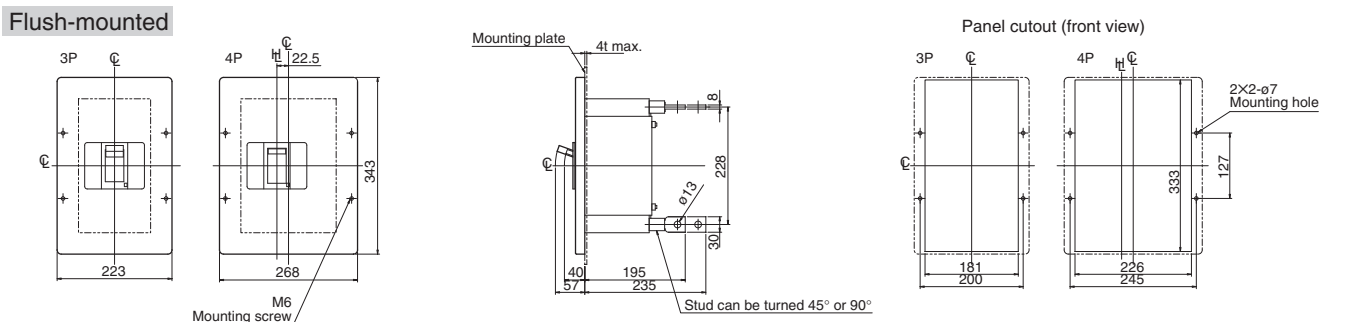
Plug-in (Standard)

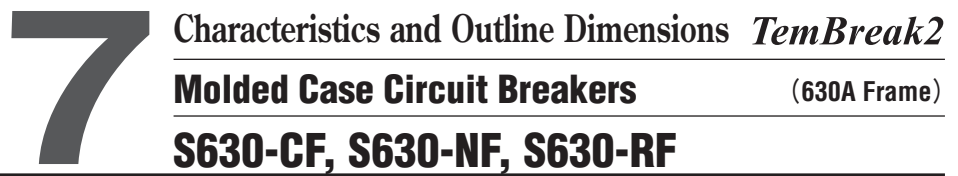


Plug-in (High-performance)



Flush-mounted





Time/Current characteristic curves

Rated insulation voltage $[U_i]$ V	AC	690	690	690	
Rated impulse withstand voltage $[U_{imp}]$ kV		8	8	8	
■ Rated breaking capacity, kA					
NK	AC	690V	10/10	20/20	25/20 ⑫
$I_{cu}/I_{cs}(sym)$		450V	30/30	50/50	65/50 ⑫
		240V	50/50	85/85	100/75 ⑫
	① DC	250V	—	—	—
IEC60947-2	AC	690V	10/10	20/20	25/20
$I_{cu}/I_{cs}(sym)$		500V	15/15	30/30	45/34
		440V	30/30	50/50	65/50
		415V	36/36	50/50	70/50
		380V	36/36	50/50	70/50
		240V	50/50	85/85	100/75
	① DC	250V	50/50	50/50	50/50
		125V	50/50	50/50	50/50

■ Connections and Mountings					
Front-connected (FC)	Terminal screws				
	With extension bars				
Rear-connected (RC)	Bolt studs				
	Flat bar studs				
Plug-in (PM)	For switchboards				
	Standard (PMC)				
	High-performance (PMB)				
	For distribution boards (PMC)				
Flush-mounted (FP)	With flat bar studs				
Draw-out type (DR)					
TempPlug70 (PG)					
TempPlug45B (PG4)					
DIN rail mount					
Clip-in chassis mount					

■ Standard specifications			
Overcurrent trip mechanism	Thermal-magnetic (adjustable)	Thermal-magnetic (adjustable)	Thermal-magnetic
Trip button (color)	Yes (Red)	Yes (Red)	Yes (Red)
Handle position indication (ON: Red, OFF: Green)	Yes	Yes	Yes
Suitability for isolation	Yes	Yes	Yes
CE marking	Yes	Yes	Yes

Figure 1 is a graph showing the relationship between Tripping Time (Y-axis, logarithmic scale from 0.005 to 3 hours) and Percent Rated Current (X-axis, logarithmic scale from 100 to 8000). The graph illustrates the adjustable setting range of magnetic trip, showing the range between the 'Max.' and 'Min.' curves. The graph also indicates the 'Setting tolerance (X5)' and 'Setting tolerance (X10)' ranges, and the 'Adjustable setting range of magnetic trip'.

Calibrated at 45°C — 5 15 25 35 45 55

Percent current rating

500A

600A

630A

Calibrated temperature

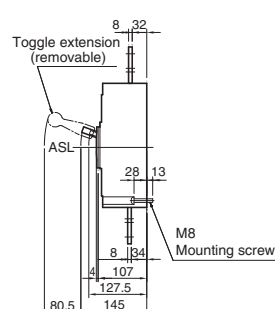
Ambient temperature (°C)

Rated current (A)	Magnetic trip pickup current					
	$I_n \times 10$	9	8	7	6	5
500	5000	4500	4000	3500	3000	2500
600	6000	5400	4800	4200	3600	3000
630	6300	5670	5040	4410	3780	3150

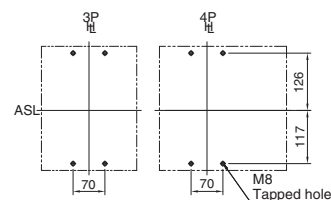
Combinations of Internally Mounted Accessories (Optional)

7-34

S630-CF, S630-NF, S630-RF



Drilling plan (front view)



Rear-connected

Toggle extension (removable)

Stud can be turned 90°

ASL

80.5

4

107

127.5

145

28

13

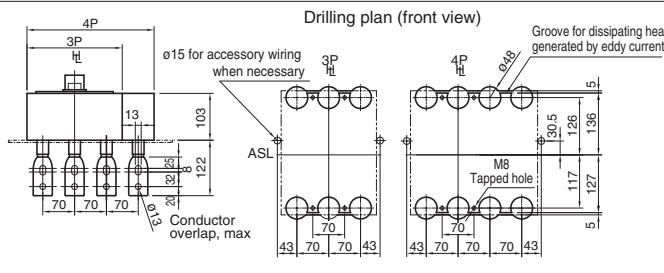
42

117

126

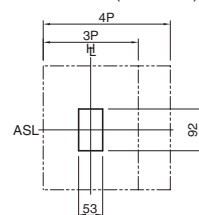
10

M8 Mounting screw



Drilling plan (front view)

Panel cutout (front view)



Note: Studs are factory installed in horizontal direction both on the line and load sides.

Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

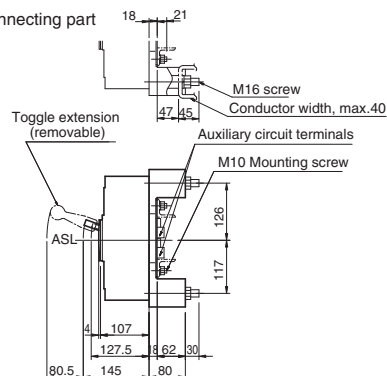
Plug-in (Standard)

Detail of the plug-in connection is shown in the following diagram:

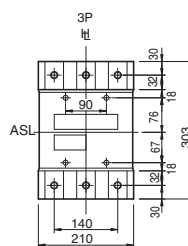
The diagram illustrates the plug-in connection with the following dimensions and labels:

- 3P (Three-phase power supply)
- 170 (Width of the main body)
- ASL (Automatic Switching Lever)
- 51 (Width of the ASL)
- 210 (Total width)
- 90 (Height of the main body)
- 141 (Height of the main body)
- 156 (Total height)
- 132 (Height of the ASL)
- 147 (Height of the ASL)
- Trip button (red)

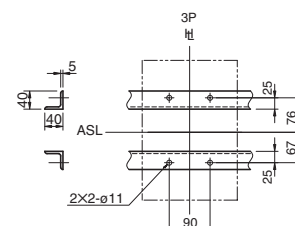
Detail of connecting part



Mounting base
(rear view)



Drilling plan
(front view)



Plug-in (High-performance)

Detail of connecting part and Preparation of conductor

Mounting hole

M12 screw

M8 Mounting screw

Toggle extension (removable)

ASL

3P

4P

170

210

51

105

175

280

158.5

149.5

132

213

141

90

46.5

155.5

23

40

27

71.5

43.5

26.5

117

126

117

51.6

127.5

107

4

80.5

145

116

40.5

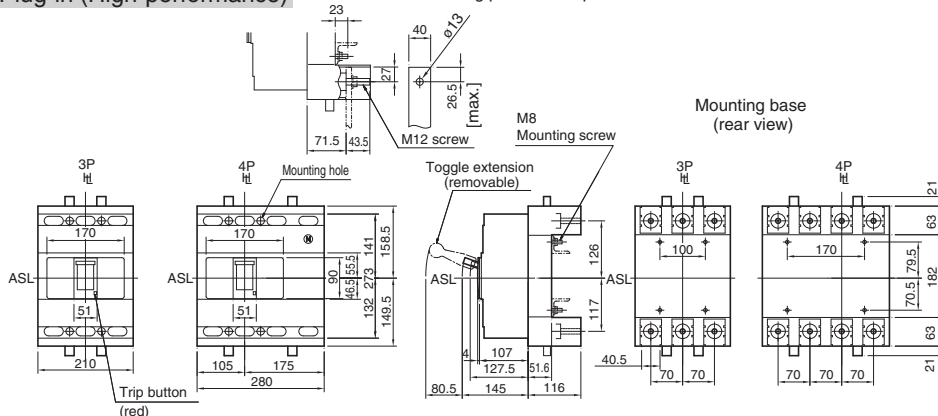
70

70

100

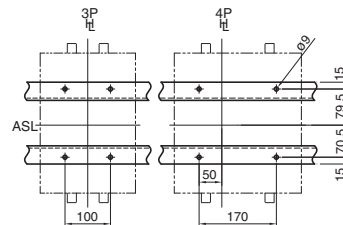
Trip button (red)

Detail of connecting part and Preparation of conductor



Mounting base
(rear view)

Drilling plan
(front view)



Flush-mounted

3P

4P

Mounting hole

Toggle extension (removable)

Stud can be turned 90°

10

121.5

121.5

42

18

80.5

57

210

268

338

343

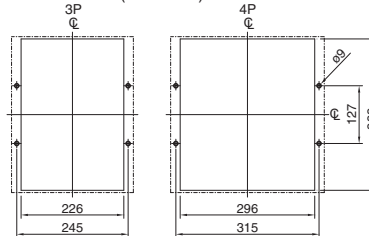
35

4.5

ASL

Trip button (red)

Drilling plan
(front view)



Note: Studs are factory installed in horizontal direction both on the line and load sides.



7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(630A Frame)

S630-NE, S630-RE

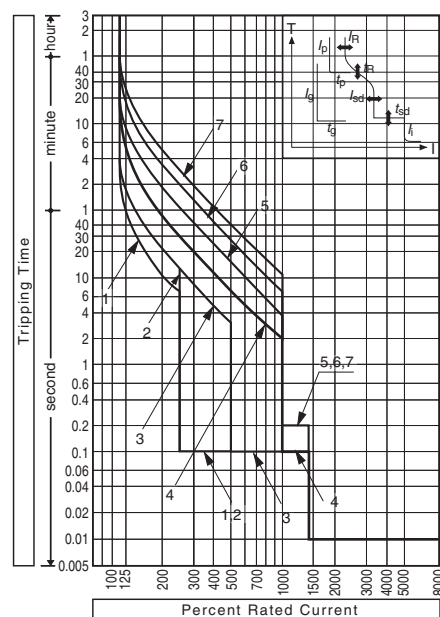
Ratings and Specifications

Type	S630-NE		S630-RE			
Number of poles	3	4	3	4		
■ Ratings						
Rated current, A	(Adjustable)		(Adjustable)			
Calibrated at 45°C	250	500	250	500		
	300	600	300	600		
	350	630	350	630		
	400		400			
Rated insulation voltage [U_i] V	AC 690V		690			
Rated impulse withstand voltage [U_{imp}] kV	8		8			
■ Rated breaking capacity, kA						
NK	AC	690V	20/20	25/20 ⑫		
$I_{cu}/I_{cs}(sym)$		450V	50/50	65/50 ⑫		
		240V	85/85	100/75 ⑫		
	DC	250V	—	—		
IEC60947-2	AC	690V	20/20	25/20		
$I_{cu}/I_{cs}(sym)$		500V	30/30	45/34		
		440V	50/50	65/50		
		415V	50/50	70/50		
		380V	50/50	70/50		
		240V	85/85	100/75		
	DC	250V	—	—		
		125V	—	—		
■ Rated short time withstand current, kA			10 (0.3sec)	10 (0.3sec)		
Weight (● marked standard type) kg			8.7	11.9		
■ Connections and Mountings						
Front-connected (FC)	Terminal screws		—	—		
	With extension bars		●	●		
Rear-connected (RC)	Bolt studs		—	—		
	Flat bar studs		○	○		
Plug-in (PM)	For switchboards Standard (PMC)		○	—	○	—
	High-performance (PMB)		○	—	○	—
	For distribution boards (PMC)		—	—	—	—
Flush-mounted (FP)	With flat bar studs		○	○		
Draw-out type (DR)			▲	▲		
TemPlug70 (PG)			○	—	○	—
TemPlug45B (PG4)			—	—		
DIN rail mount			—	—		
Clip-in chassis mount			—	—		
■ Accessories (optional)	Symbol					
Motor operator	M C	●	●			
External operating handle	Breaker-mounted H B	●	●			
Door-mounted (variable depth)	H P	●	●			
Toggle extension	H A	●	●			
Mechanical interlock⑨ Slide type	M S	●	●			
Toggle holder	H H	●	●			
Toggle lock	H L	●	●			
Terminal cover	For front-connected C F	●	●			
	For rear-connected and plug-in C R	●	●			
Interpole barrier	B A	● ③	● ③			
Terminal block for lead	T F	●	●			
Door flange	D F	●	●			
■ Standard specifications						
Overcurrent trip mechanism			Electronic ⑩	Electronic ⑩		
Trip button (color)			Yes (Red)	Yes (Red)		
Handle position indication (ON: Red, OFF: Green)			Yes	Yes		
Suitability for isolation			Yes	Yes		
CE marking			Yes	Yes		

Notes:

● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.
 ▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available". ③ : Line side interpole barriers are supplied as standard. (Front connection only) ⑨ : The mechanical interlock is not applicable to the draw-out type (DR).
 ⑫ : Being or will be applied. ⑩ : Optional pretrip alarm or ground fault trip function available on request.

Time/Current characteristic curves



Overcurrent tripping characteristics

Characteristics No.		1	2	3	4	5	6	7
Long time-delay pick-up current (A) : (I_p)		CT rated current : (I_{CT}) = 630A 250, 300, 350, 400, 500, 600, 630						
Long time-delay time settings (s) : (t_p)		11	21	21	5	10	19	29
		at 200% $\times(I_p)$			at 600% $\times(I_p)$			
		Setting tolerance $\pm 20\%$						
Short time-delay pick-up current (A) : (I_{sd})		2.5	2.5	5	10	10	10	10
		Setting tolerance $\pm 15\%$						
Short time-delay time settings (s) : (t_{sd})		0.1	0.1	0.1	0.1	0.2	0.2	0.2
		Total clearing time +50ms, resettable time -20ms						
Instantaneous trip pick-up current (A) : (I_l)		$(I_p) \times 1400\%$			Max: (I_{CT}) $\times 1200\%$			
		Setting tolerance $\pm 20\%$						
Option	Preferential trip alarm							
	Pick-up current (A) : (I_p)	$(I_p) \times 80\%$ Setting tolerance $\pm 10\%$						
	Time-settings (s) : (t_p)	Definite time-delay characteristic, 40sec. Setting tolerance $\pm 10\%$						
	Ground fault trip							
	Pick-up current (A) : (I_p)	$(I_{CT}) \times 20\%$ Setting tolerance $\pm 15\%$						
	Time-settings (s) : (t_p)	Definite time-delay characteristic, 0.2sec. Total tripping time +50ms, resettable time -20ms.						
	Neutral protection							
	Pick-up current (A) : (I_n)	$(I_p) \times 100\%$ or 50% selectable ②						
	Time-settings (s) : (t_n)	$(t_p) = (t_p)$ Same as Long time-delay time settings						

Characteristic No.4 will be applied as standard setting unless otherwise specified.

Note:

②. In case of (I_p) < (I_{CT}), the setting tolerance becomes big when (I_n) is set at (I_p)×50%.

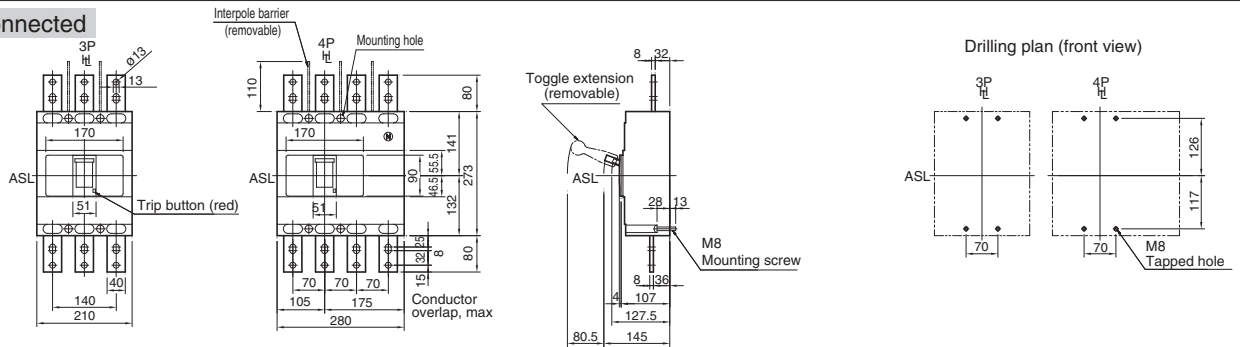
Combinations of Internally Mounted Accessories (Optional)

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX	SH	UV	SH	UV	AX	UV
▲	Left pole	Right pole									
▲	Toggle										

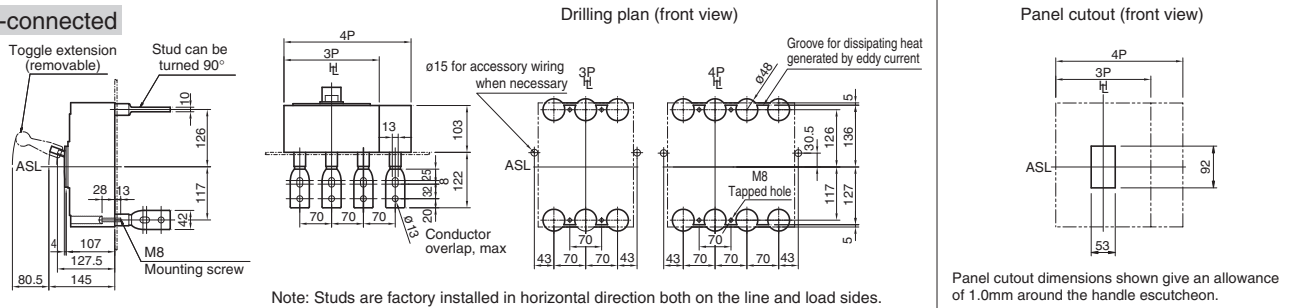
Outline dimensions (mm)

S630-NE, S630-RE

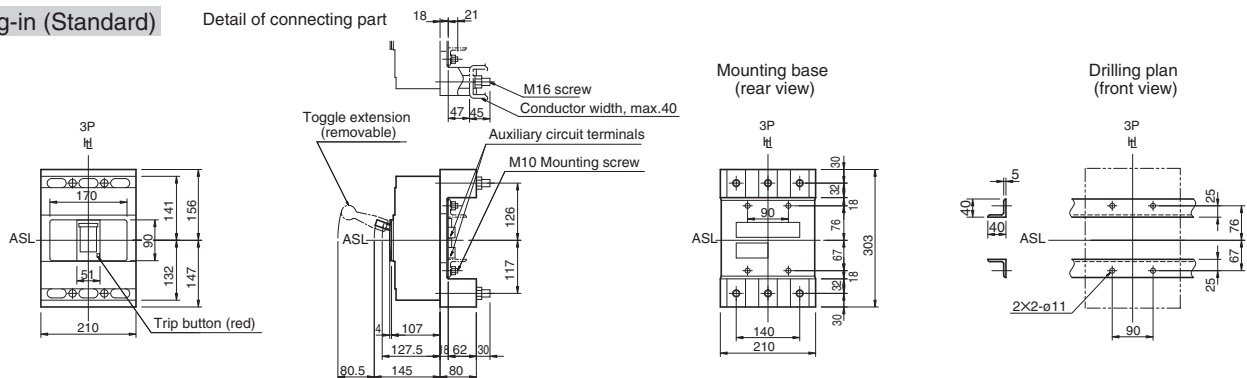
Front-connected



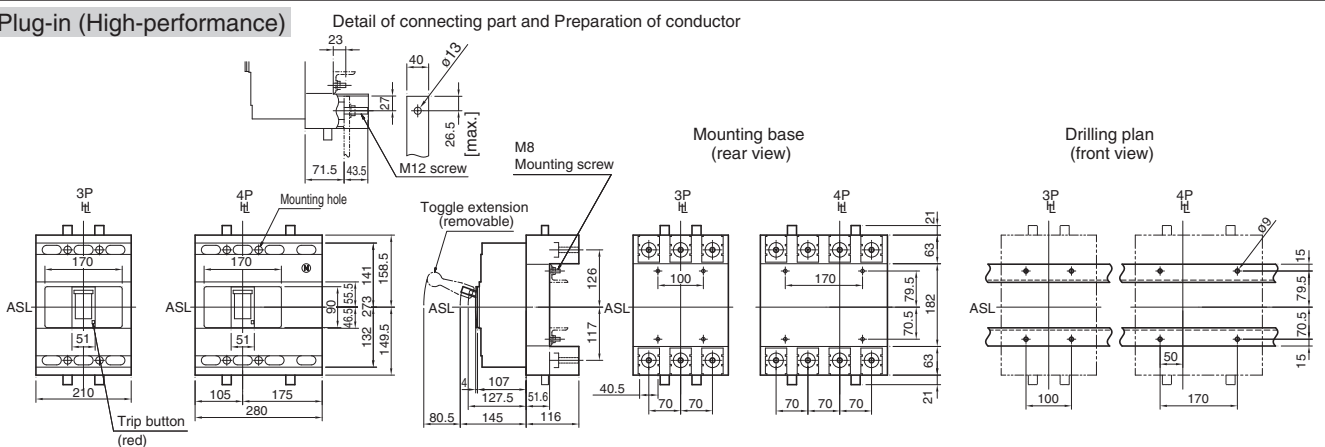
Rear-connected



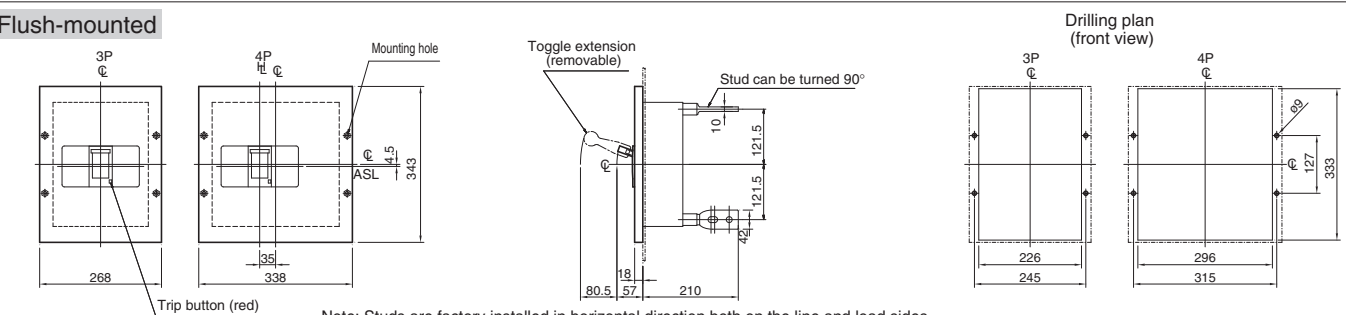
Plug-in (Standard)



Plug-in (High-performance)



Flush-mounted





7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(630A Frame)

H630-NE, L630-NE

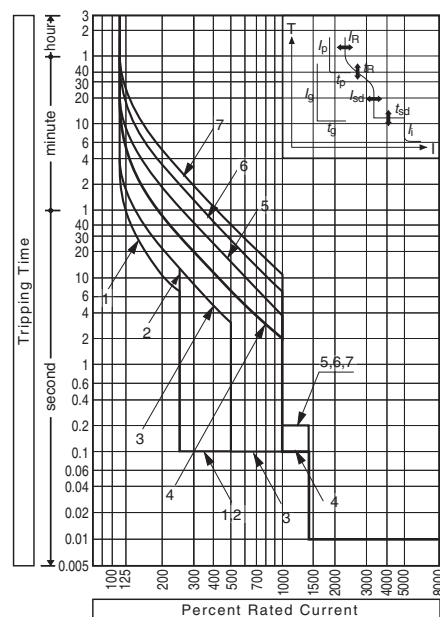
Ratings and Specifications

Type			H630-NE		L630-NE			
Number of poles			3	4	3	4		
■ Ratings								
Rated current, A			(Adjustable)		(Adjustable)			
Calibrated at 45°C			250	500	250	500		
			300	600	300	600		
			350	630	350	630		
			400		400			
Rated insulation voltage [U_i] V			690		690			
Rated impulse withstand voltage [U_{imp}] kV			8		8			
■ Rated breaking capacity, kA								
NK	AC	690V	25/20		25/20			
$I_{cu}/I_{cs}(sym)$		450V	125/94		180/135			
		240V	150/150		200/150			
	DC	250V	—		—			
IEC60947-2	AC	690V	25/20		25/20			
$I_{cu}/I_{cs}(sym)$		500V	45/34		45/34			
		440V	125/94		180/135			
		415V	125/94		200/150			
		380V	125/94		200/150			
		240V	150/150		200/150			
	DC	250V	—		—			
		125V	—		—			
■ Rated short time withstand current, kA			10 (0.3sec)		10 (0.3sec)			
Weight (● marked standard type) kg			13.5 19.6		13.5 19.6			
■ Connections and Mountings								
Front-connected (FC) Terminal screws			—		—			
		With extension bars	●		●			
Rear-connected (RC) Bolt studs			—		—			
		Flat bar studs	○		○			
Plug-in (PM) For switchboards Standard (PMC)			○ —		○ —			
		High-performance (PMB)	○		○			
		For distribution boards (PMC)	—		—			
Flush-mounted (FP) With flat bar studs			○		○			
Draw-out type (DR)			▲		▲			
TemPlug70 (PG)			—		—			
TemPlug45B (PG4)			—		—			
DIN rail mount			—		—			
Clip-in chassis mount			—		—			
■ Accessories (optional) Symbol								
Externally mounted	Motor operator		M C		●			
	External operating handle	Breaker-mounted	H B		●			
		Door-mounted (variable depth)	H P		●			
	Toggle extension		H A		●			
	Mechanical interlock⑨ Slide type		M S		●			
	Toggle holder		H H		●			
	Toggle lock		H L		●			
	Terminal cover	For front-connected	C F		●			
		For rear-connected and plug-in	C R		●			
		Interpole barrier	B A		● ③			
	Terminal block for lead	T F		●				
	Door flange	D F		●				
■ Standard specifications								
Overcurrent trip mechanism			Electronic ⑩		Electronic ⑩			
Trip button (color)			Yes (Red)		Yes (Red)			
Handle position indication (ON: Red, OFF: Green)			Yes		Yes			
Suitability for isolation			Yes		Yes			
CE marking			Yes		Yes			

Notes:

- : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.
▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available". ③ : Line side interpole barriers are supplied as standard. (Front connection only) ⑨ : The mechanical interlock is not applicable to the draw-out type (DR).
⑩ : Optional pretrip alarm or ground fault trip function available on request.

Time/Current characteristic curves



Overcurrent tripping characteristics

Characteristics No.		1	2	3	4	5	6	7
Long time-delay pick-up current (A) : (I_p)		CT rated current : (I_{CT}) = 630A 250, 300, 350, 400, 500, 600, 630						
Long time-delay time settings (s) : (t_p)		11	21	21	5	10	19	29
		at 200% $\times(I_p)$			at 600% $\times(I_p)$			
		Setting tolerance $\pm 20\%$						
Short time-delay pick-up current (A) : (I_{sd})		2.5	2.5	5	10	10	10	10
		Setting tolerance $\pm 15\%$						
Short time-delay time settings (s) : (t_{sd})		0.1	0.1	0.1	0.1	0.2	0.2	0.2
		Total clearing time +50ms, resettable time ~20ms						
Instantaneous trip pick-up current (A) : (I_i)		$(I_p) \times 1400\%$			Max: (I_{CT}) $\times 1200\%$			
		Setting tolerance $\pm 20\%$						
Option	Preferential trip alarm							
	Pick-up current (A) : (I_p)	$(I_p) \times 80\%$ Setting tolerance $\pm 10\%$						
	Time-settings (s) : (t_p)	Definite time-delay characteristic, 40sec. Setting tolerance $\pm 10\%$						
	Ground fault trip							
	Pick-up current (A) : (I_p)	$(I_{CT}) \times 20\%$ Setting tolerance $\pm 15\%$						
	Time-settings (s) : (t_p)	Definite time-delay characteristic, 0.2sec. Total tripping time +50ms, resettable time ~20ms.						
	Neutral protection							
	Pick-up current (A) : (I_n)	$(I_p) \times 100\%$ or 50% selectable ②						
Time-settings (s) : (t_n)		$(t_n) = (t_p)$ Same as Long time-delay time settings						

Characteristic No.4 will be applied as standard setting unless otherwise specified.

Note:

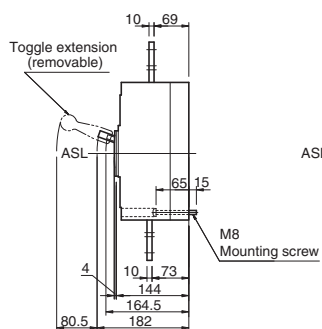
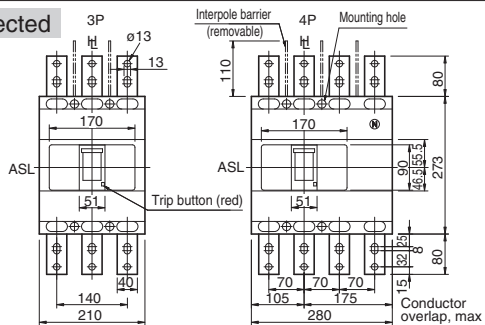
- ② : In case of $(I_p) < (I_{CT})$, the setting tolerance becomes big when (I_n) is set at $(I_p) \times 50\%$.

Combinations of Internally Mounted Accessories (Optional)

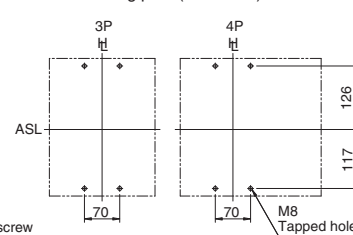
Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
Auxiliary switch	□	□	□	□	□	□	□	□	□	□	□
Alarm switch	□	□	□	□	□	□	□	□	□	□	□
Shunt trip	□	□	□	□	□	□	□	□	□	□	□
Under voltage trip	□	□	□	□	□	□	□	□	□	□	□
Toggle	□	□	□	□	□	□	□	□	□	□	□
Left pole	□	□	□	□	□	□	□	□	□	□	□
Right pole	□	□	□	□	□	□	□	□	□	□	□

H630-NE, L630-NE

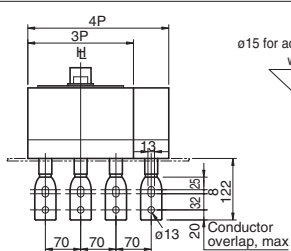
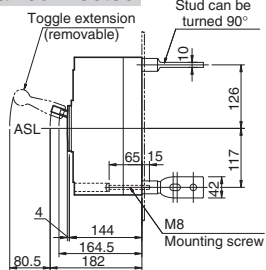
Front-connected



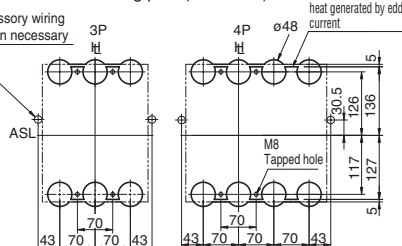
Drilling plan (front view)



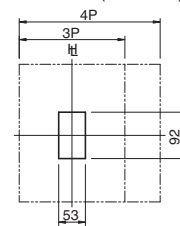
Rear-connected



Drilling plan (front view)



Panel cutout (front view)

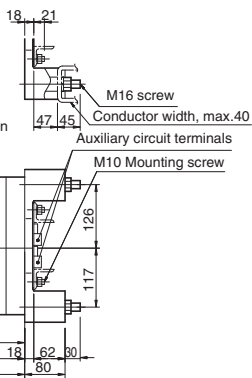


Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

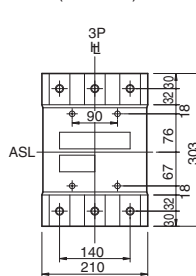
Note: Studs are factory installed in horizontal direction both on the line and load sides.

Plug-in (Standard)

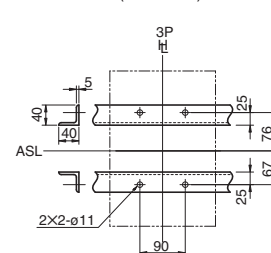
Detail of connecting part



Mounting base
(rear view)

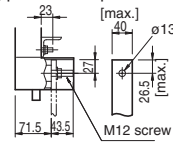


Drilling plan
(front view)

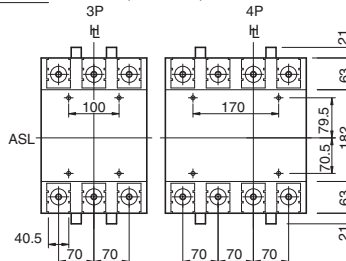


Plug-in (High-performance)

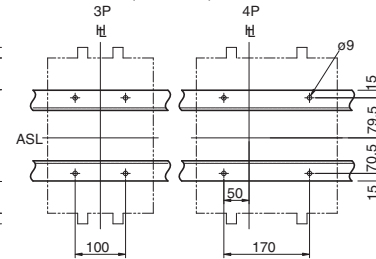
Detail of connecting part and Preparation of conductor



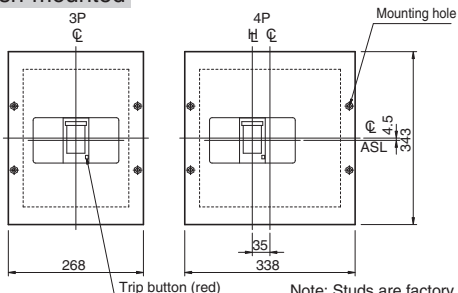
Mounting base
(rear view)



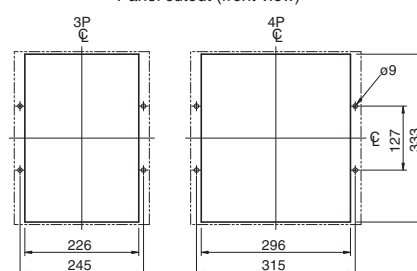
Drilling plan
(front view)



Flush-mounted



Panel cutout (front view)



Note: Studs are factory installed in horizontal direction both on the line and load sides.



7 Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers (800A Frame)

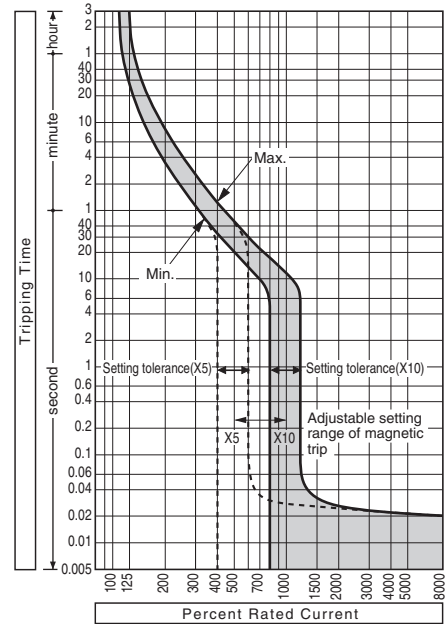
S800-CF, S800-NF, S800-RF

Ratings and Specifications

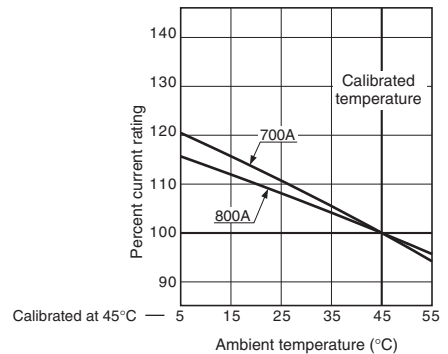
Type	\$800-CF		\$800-NF		\$800-RF		
Number of poles	3	4	3	4	3	4	
■ Ratings							
Rated current, A	700		700		700		
Calibrated at 45°C	800		800		800		

Notes:
 ● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.
 ▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available". ① : DC rating available on request.
 ③ : Line side interpole barriers are supplied as standard. (Front connection only) ⑨ : The mechanical interlock is not applicable to the draw-out type (DR). ⑫ : Being or will be applied.

Time/Current characteristic curves



Ambient Compensating Curves



Magnetic trip pickup current

Rated current (A)	Magnetic trip pickup current Adjustable range (A)				
	$I_n \times 10$	9	8	7	6
700	7000	6300	5600	4900	4200
800	8000	7200	6400	5600	4800

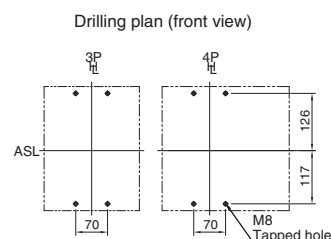
- Notes:**
 1. Setting tolerance: $\pm 20\%$.
 2. Unless otherwise stated when ordering, the selector dial is factory set to position "10".
 3. The trip pickup current of DC models is not adjustable; the dial position corresponding to the trip pickup current is marked with a white point.

Combinations of Internally Mounted Accessories (Optional)

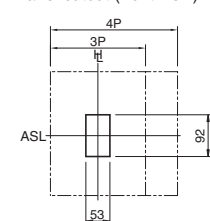
Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX	SH	UV	SH	UV	AX	UV
Left pole	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle
Right pole	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle

S800-CF, S800-NF, S800-RF

Front-connected

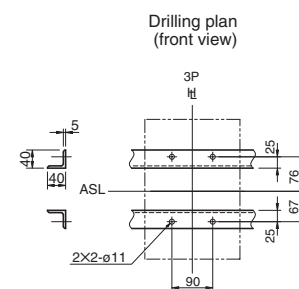


Rear-connected



Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

Plug-in (Standard)



Plug-in (High-performance)



Flush-mounted



7



7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(800A Frame)

S800-NE, S800-RE

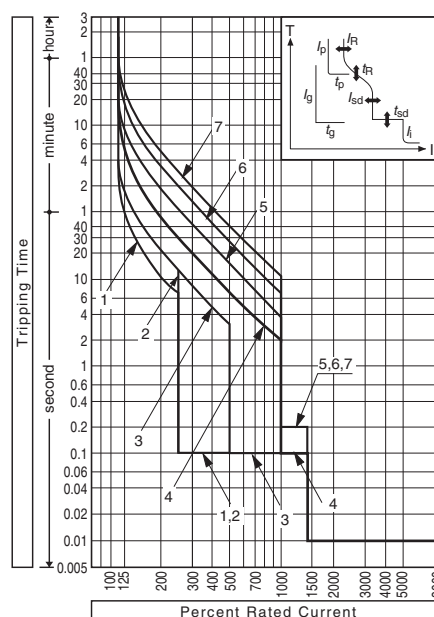
Ratings and Specifications

Type			S800-NE		S800-RE			
Number of poles			3	4	3	4		
■ Ratings								
Rated current, A			(Adjustable)		(Adjustable)			
Calibrated at 45°C			350	600	350	600		
			400	700	400	700		
			450	800	450	800		
			500		500			

Notes:

- : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.
▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available". ③ : Line side interpole barriers are supplied as standard. (Front connection only) ⑨ : The mechanical interlock is not applicable to the draw-out type (DR).
⑫ : Being or will be applied. ⑩ : Optional pretrip alarm or ground fault trip function available on request.

Time/Current characteristic curves



Overcurrent tripping characteristics

Characteristics No.		1	2	3	4	5	6	7
Long time-delay pick-up current (A) : (I_p)		CT rated current : (I_{CT}) = 800A 350, 400, 450, 500, 600, 700, 800						
Long time-delay time settings (s) : (t_p)		11	21	21	5	10	19	29
		at 200%×(I_p)			at 600%×(I_p)			
		Setting tolerance ±20%						
Short time-delay (I_p)× pick-up current (A) : (I_{sd})		2.5	2.5	5	10	10	10	10
		Setting tolerance ±15%						
Short time-delay time settings (s) : (t_{sd})		0.1	0.1	0.1	0.1	0.2	0.2	0.2
		Total clearing time +50ms, resettable time ~20ms						
Instantaneous trip pick-up current (A) : (I_l)		(I_p)×1400%			Max: (I_{CT})×1200%			
		Setting tolerance ±20%						
Option	Preferential trip alarm							
	Pick-up current (A) : (I_p)	(I_p)×80% Setting tolerance ±10%						
	Time-settings (s) : (t_p)	Definite time-delay characteristic, 40sec. Setting tolerance ±10%						
	Ground fault trip							
	Pick-up current (A) : (I_g)	(I_{CT})×20% Setting tolerance ±15%						
	Time-settings (s) : (t_g)	Definite time-delay characteristic, 0.2sec. Total tripping time +50ms, resettable time ~20ms.						
Neutral protection								
Pick-up current (A) : (I_n)		(I_p)×100% or 50% selectable ②						
Time-settings (s) : (t_n)		(t_n)=(t_p) Same as Long time-delay time settings						

Characteristic No.4 will be applied as standard setting unless otherwise specified.

Note:

- ②: In case of (I_p)<(I_{CT}), the setting tolerance becomes big when (I_n) is set at (I_p)×50%.

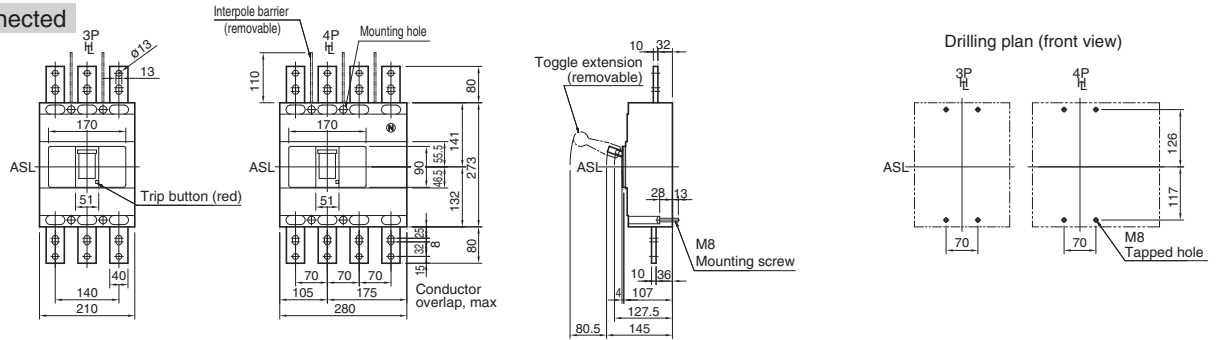
Combinations of Internally Mounted Accessories (Optional)

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
Auxiliary switch	□	□	□	□	□	□	□	□	□	□	□
Alarm switch	□	□	□	□	□	□	□	□	□	□	□
Shunt trip	□	□	□	□	□	□	□	□	□	□	□
Under voltage trip	□	□	□	□	□	□	□	□	□	□	□
Toggle	□	□	□	□	□	□	□	□	□	□	□
Left pole	□	□	□	□	□	□	□	□	□	□	□
Right pole	□	□	□	□	□	□	□	□	□	□	□

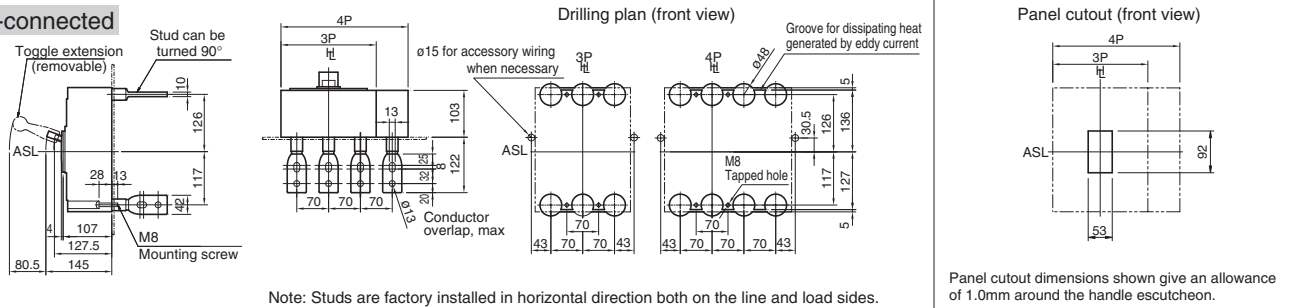
Outline dimensions (mm)

S800-NE, S800-RE

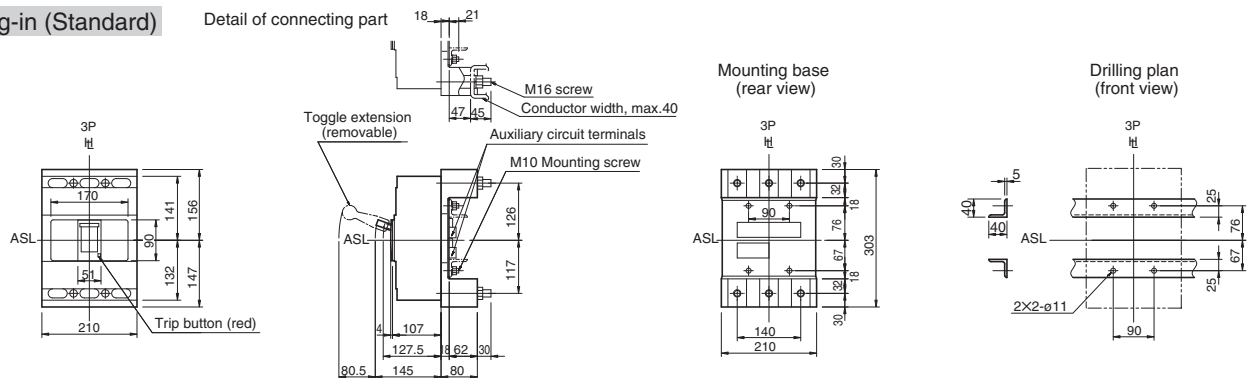
Front-connected



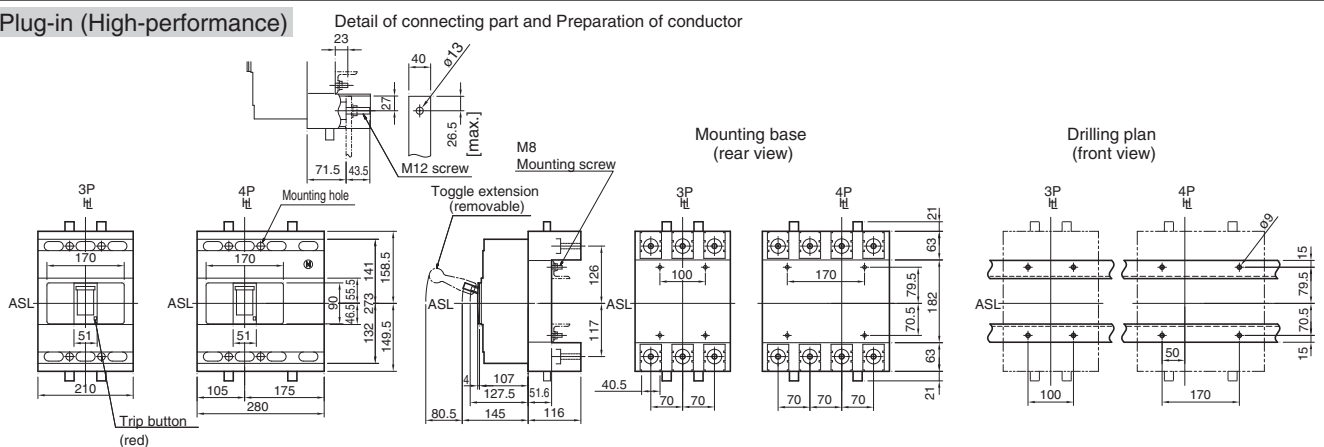
Rear-connected



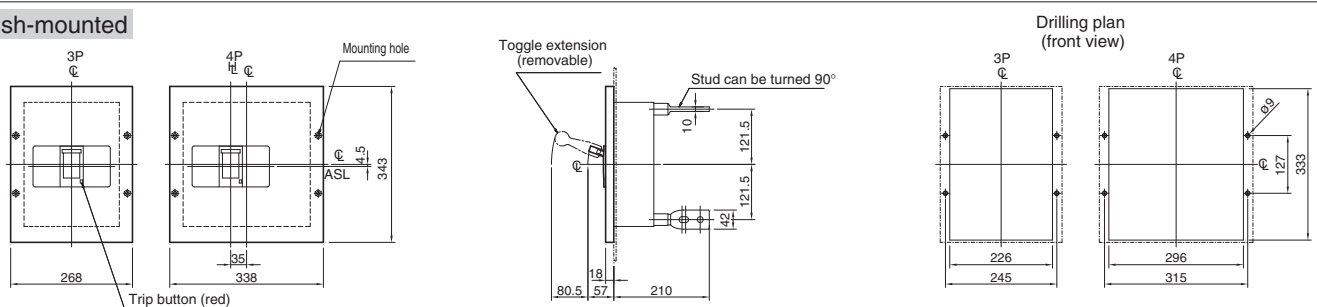
Plug-in (Standard)



Plug-in (High-performance)



Flush-mounted





7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(800A Frame)

H800-NE, L800-NE

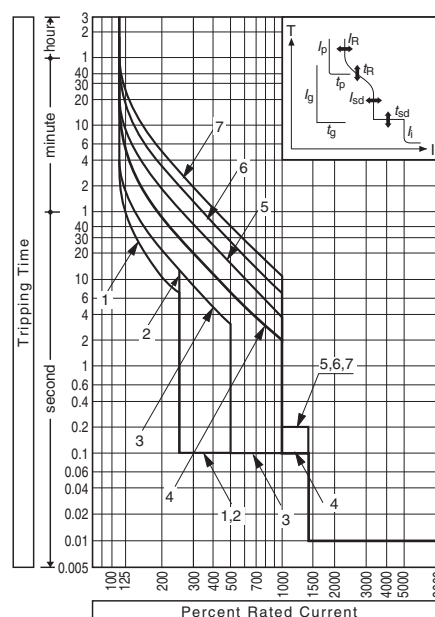
Ratings and Specifications

Type	H800-NE		L800-NE			
Number of poles	3	4	3	4		
■ Ratings						
Rated current, A	(Adjustable)		(Adjustable)			
Calibrated at 45°C	350	600	350	600		
	400	700	400	700		
	450	800	450	800		
	500		500			

Notes:

● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.
 ▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available". ③ : Line side interpole barriers are supplied as standard. (Front connection only) ⑨ : The mechanical interlock is not applicable to the draw-out type (DR).
 ⑩ : Optional pretrip alarm or ground fault trip function available on request.

Time/Current characteristic curves



Overcurrent tripping characteristics

Characteristics No.		1	2	3	4	5	6	7
Long time-delay pick-up current (A) : (I_p)		CT rated current : (I_{CT}) = 800A 350, 400, 450, 500, 600, 700, 800						
Long time-delay time settings (s) : (t_p)		11	21	21	5	10	19	29
		at 200%×(I_p)			at 600%×(I_p)			
		Setting tolerance ±20%						
Short time-delay (I_p)× pick-up current (A) : (I_{sd})		2.5	2.5	5	10	10	10	10
		Setting tolerance ±15%						
Short time-delay time settings (s) : (t_{sd})		0.1	0.1	0.1	0.1	0.2	0.2	0.2
		Total clearing time +50ms, resettable time ~20ms						
Instantaneous trip pick-up current (A) : (I_l)		(I_p)×1400%			Max: (I_{CT})×1200%			
		Setting tolerance ±20%						
Option	Preferential trip alarm							
	Pick-up current (A) : (I_p)	(I_p)×80% Setting tolerance ±10%						
	Time-settings (s) : (t_p)	Definite time-delay characteristic, 40sec. Setting tolerance ±10%						
	Ground fault trip							
	Pick-up current (A) : (I_g)	(I_{CT})×20% Setting tolerance ±15%						
	Time-settings (s) : (t_g)	Definite time-delay characteristic, 0.2sec. Total tripping time +50ms, resettable time ~20ms.						
	Neutral protection							
	Pick-up current (A) : (I_n)	(I_p)×100% or 50% selectable ②						
Time-settings (s) : (t_n)		(t_n)=(t_p) Same as Long time-delay time settings						

Characteristic No.4 will be applied as standard setting unless otherwise specified.

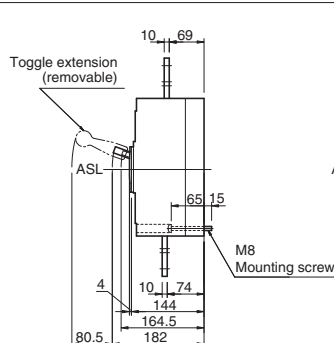
Note:

②: In case of $(I_p) < (I_{CT})$, the setting tolerance becomes big when (I_p) is set at $(I_p) \times 50\%$.

Combinations of Internally Mounted Accessories (Optional)

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX	SH	UV	SH	UV	AX	UV
▲	Left pole	Right pole	Left pole	Right pole	Left pole	Right pole	Left pole	Right pole	Left pole	Right pole	Left pole
▲	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle

H800-NE, L800-NE



ASL 6000

Toggle extension (removable)

Stud can be turned 90°

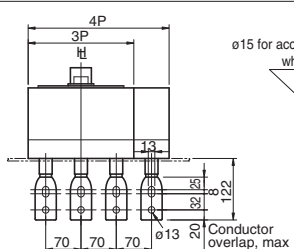
ASL

M8

Mounting screw

Dimensions:

- 10
- 126
- 117
- 65
- 15
- 42
- 3
- 4
- 144
- 164,5
- 182
- 80,5

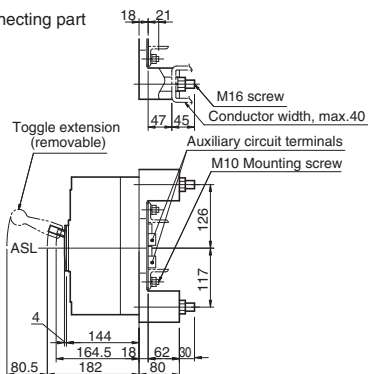


The technical drawings show two cross-sections of cable trays. The left drawing shows a tray with three positions labeled '3P' and a dimension of 70 between them. A label points to the top edge: 'ø15 for accessory wiring when necessary'. A vertical dimension of 122 is shown on the left. The right drawing shows a similar tray but with four positions labeled '4P' and a dimension of 70 between them. It includes additional labels: 'heat generated by eddy current' pointing to the top surface, 'ASL' at the bottom center, 'M8 Tapped hole' on the side wall, and various vertical dimensions: 5, 126, 136, 117, 127, and 5.

Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

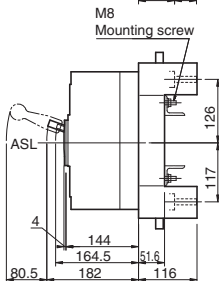
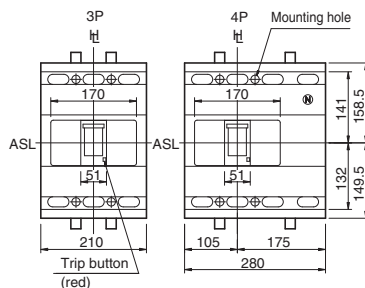
Note: Studs are factory installed in horizontal direction both on the line and load sides.

Technical drawing of the ASL 3P standard switch. The drawing shows a front view of the switch with dimensions in millimeters. The overall width is 210mm and the overall height is 156mm. The mounting plate has a width of 170mm and a height of 141mm. The switch mechanism has a width of 90mm and a height of 132mm. The trip button (red) is located at the bottom right. The ASL logo is on the left. The 3P label is at the top center.



Technical drawing of a 3P ASL (Assemblage de Support Latéral). The drawing shows a side view of the assembly with dimensions in millimeters. Key dimensions include: overall width 210, internal width 140, and a central width of 90. Vertical dimensions include 30, 18, 76, 67, 18, and 30. The drawing also shows three vertical slots, each with a diameter of 3P, and a central rectangular cutout. The label 'ASL' is present on the left side.

Technical drawing of a beam-column joint (ASL) showing dimensions and reinforcement details. The drawing includes a cross-section and a longitudinal section. Key dimensions include 40, 40, 76, 25, 67, 90, and 3P. Reinforcement is labeled as 2X2-ø11.

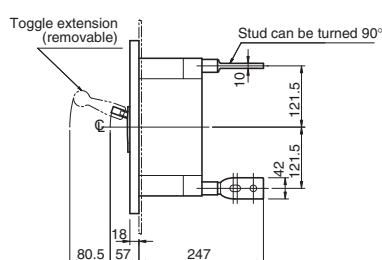
[illegible]

Technical drawings of two types of mounting plates, 3P and 4P.

3P: A square plate with a central hole and four mounting holes. The overall width is 268. The central hole has a diameter of 3P. The mounting holes are located at the corners of a square with a side length of 134.

4P: A square plate with a central hole and four mounting holes. The overall width is 338. The central hole has a diameter of 4P. The mounting holes are located at the corners of a square with a side length of 169. The distance from the center of the plate to the center of each mounting hole is 84.5. The distance from the center of the plate to the center of the central hole is 35.

Note: Studs are fact...



Note: Studs are factory installed in horizontal direction both on the line and load sides.



7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(1250A Frame)

S1250-NE, S1250-GE

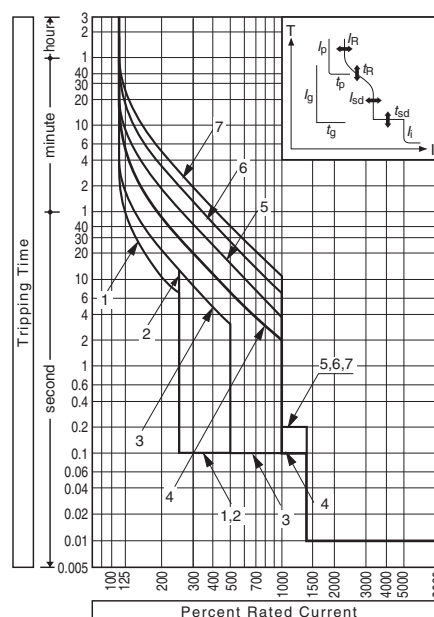
Ratings and Specifications

Type	\$1250-NE		\$1250-GE			
Number of poles	3	4	3	4		
■ Ratings						
Rated current, A	(Adjustable)		(Adjustable)			
Calibrated at 45°C	500	1000	500	1000		
	600	1200	600	1200		
	700	1250	700	1250		
	800		800			
Rated insulation voltage [U_i] V	AC 690		690			
Rated impulse withstand voltage [U_{imp}] kV	8		8			
■ Rated breaking capacity, kA						
NK	AC	690V	25/20 ⑫	45/34 ⑫		
$I_{cu}/I_{cs}(sym)$		450V	65/50 ⑫	85/65 ⑫		
		240V	100/75 ⑫	125/94 ⑫		
	DC	250V	—	—		
IEC60947-2	AC	690V	25/20	45/34		
$I_{cu}/I_{cs}(sym)$		500V	45/34	65/50		
		440V	65/50	85/65		
		415V	70/50	85/65		
		380V	85/65	100/75		
		240V	100/75	125/94		
	DC	250V	—	—		
		125V	—	—		
■ Rated short time withstand current, kA						
Weight (● marked standard type) kg	19.8 25.0		19.8 25.0			
■ Connections and Mountings						
Front-connected (FC)	Terminal screws					
	With extension bars		●			
Rear-connected (RC)	Bolt studs		○			
	Flat bar studs		○			
Plug-in (PM)	For switchboards Standard (PMC)		○			
	High-performance (PMB)		—			
	For distribution boards (PMC)		—			
Flush-mounted (FP)	With flat bar studs		○			
Draw-out type (DR)			▲			
TemPlug70 (PG)			—			
TemPlug45B (PG4)			—			
DIN rail mount			—			
Clip-in chassis mount			—			
■ Accessories (optional)	Symbol					
Externally mounted	Motor operator		●			
	External operating handle	Breaker-mounted	●			
		Door-mounted (variable depth)	●			
	Toggle extension		● ②④			
	Mechanical interlock⑨ Slide type		●			
	Toggle holder		●			
	Toggle lock		●			
	Terminal cover	For front-connected	●			
		For rear-connected and plug-in	—			
	Interpole barrier		● ③			
		●				
	Terminal block for lead	●				
	Door flange	●				
■ Standard specifications						
Overcurrent trip mechanism	Electronic ⑩		Electronic ⑩			
Trip button (color)	Yes (Red)		Yes (Red)			
Handle position indication (ON: Red, OFF: Green)	Yes		Yes			
Suitability for isolation	Yes		Yes			
CE marking	Yes		Yes			

Notes:

- : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.
▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available". ③ : Line side interpole barriers are supplied as standard. (Front connection only) ⑨ : The mechanical interlock is not applicable to the draw-out type (DR).
⑫ : Being or will be applied. ⑩ : Optional pretrip alarm or ground fault trip function available on request.
②④ : One is supplied with every five breakers. Please specify if more are required.

Time/Current characteristic curves



Overcurrent tripping characteristics

Characteristics No.		1	2	3	4	5	6	7
Long time-delay pick-up current (A) : (I_R)		CT rated current : (I_{CT}) = 1250A 500, 600, 700, 800, 1000, 1200, 1250						
Long time-delay time settings (s) : (t_R)		11	21	21	5	10	19	29
		at 200%×(I_R)			at 600%×(I_R)			
		Setting tolerance ±20%						
Short time-delay pick-up current (A) : (I_{sd})		2.5	2.5	5	10	10	10	10
		Setting tolerance ±15%						
Short time-delay time settings (s) : (t_{sd})		0.1	0.1	0.1	0.1	0.2	0.2	0.2
		Total clearing time +50ms, resettable time ~20ms						
Instantaneous trip pick-up current (A) : (I_I)		(I_R)×1400%				Max: (I_{CT})×1200%		
		Setting tolerance ±20%						
Option	Preferential trip alarm							
	Pick-up current (A) : (I_p)	(I_R)×80% Setting tolerance ±10%						
	Time-settings (s) : (t_p)	Definite time-delay characteristic, 40sec. Setting tolerance ±10%						
	Ground fault trip							
	Pick-up current (A) : (I_g)	(I_{CT})×20% Setting tolerance ±15%						
	Time-settings (s) : (t_g)	Definite time-delay characteristic, 0.2sec. Total tripping time +50ms, resettable time ~20ms.						
	Neutral protection							
	Pick-up current (A) : (I_h)	(I_R)×100% or 50% selectable ②						
Time-settings (s) : (t_h)		(I_h)=(I_R) Same as Long time-delay time settings						

Characteristic No.4 will be applied as standard setting unless otherwise specified.

Note:

- ②: In case of $(I_R) < (I_{CT})$, the setting tolerance becomes big when (I_h) is set at $(I_R) \times 50\%$.

Combinations of Internally Mounted Accessories (Optional)

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
Auxiliary switch	□	□	□	□	□	□	□	□	□	□	□
Alarm switch	□	□	□	□	□	□	□	□	□	□	□
Shunt trip	□	□	□	□	□	□	□	□	□	□	□
Under voltage trip	□	□	□	□	□	□	□	□	□	□	□
Left pole	□	□	□	□	□	□	□	□	□	□	□
Right pole	□	□	□	□	□	□	□	□	□	□	□
Toggle	□	□	□	□	□	□	□	□	□	□	□

S1250-NE, S1250-GE

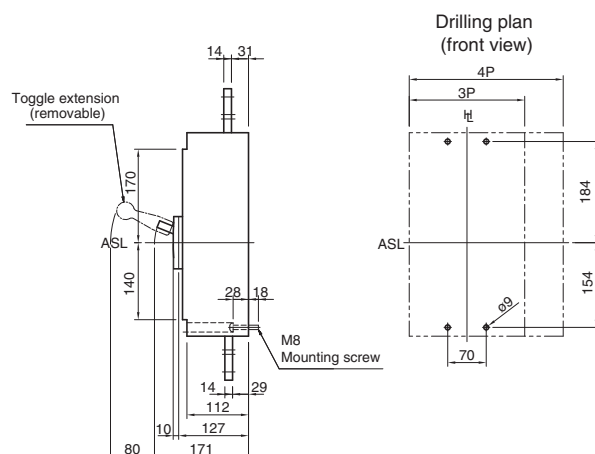
Technical drawings of the ASL 1000 circuit breaker, showing the 3P and 4P versions.

3P Version Dimensions:

- Overall width: 210 mm
- Overall height: 370 mm
- Mounting hole diameter: $\varnothing 13$
- Interpole barrier (removable)
- ASL (Automatic Switching Limit)
- Trip button (red)
- Conductor overlap, max: 15 mm

4P Version Dimensions:

- Overall width: 280 mm
- Overall height: 370 mm
- Mounting hole diameter: $\varnothing 13$
- Interpole barrier (removable)
- ASL (Automatic Switching Limit)
- Trip button (red)
- Conductor overlap, max: 15 mm



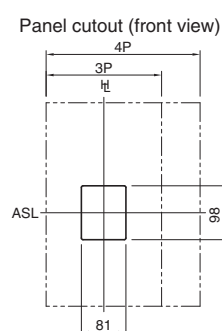
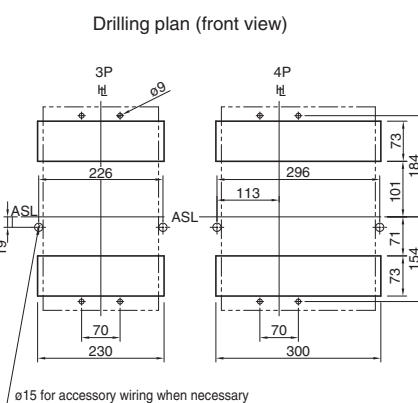
Rear-connected

Mounting plate
M8 Mounting screw
Insulating plate
Toggle extension (removable)
ASL

Dimensions:
Side view: 80, 10, 171, 28, 18, 127, 21, 140, 114, 144, 258.
Front view: 4P, 3P, 120, 127, 13, 20, 111, 8, 15, 70, 70, 70, 45, 32, 13, 12.

Soft plastic tubing ø50 to be provided on center pole and neutral pole of vertical terminal type for insulation.

Conductor overlap, max



Panel cutout dimensions shown give an allowance of 1.5mm around the handle escutcheon.

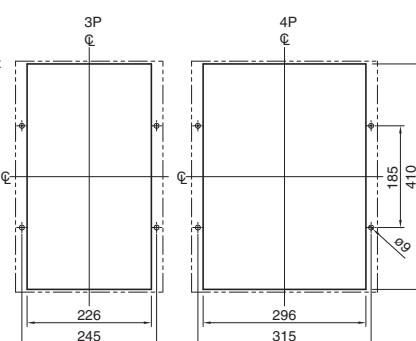
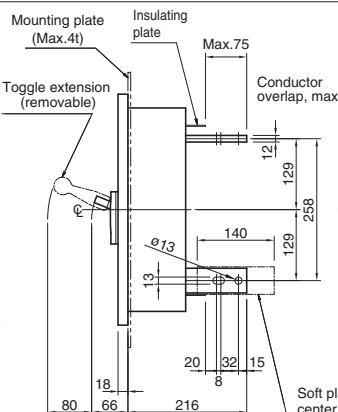
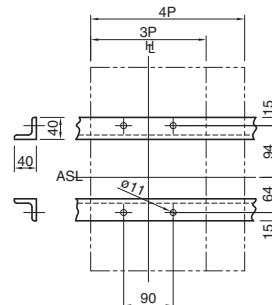
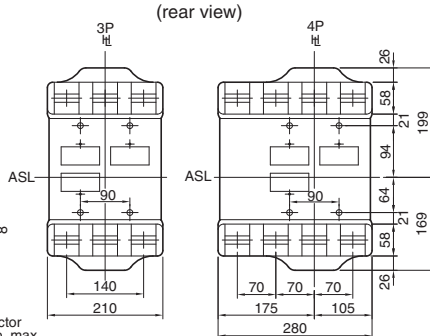
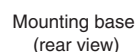
Technical drawing of the 1000 Series terminal block, showing side and front views with dimensions and labels.

Side View Dimensions:

- Toggle extension (removable)
- ASL
- 145
- 21
- 62
- 85
- 189
- 80
- 15
- 144
- 114
- M10 Mounting screw
- Auxiliary circuit terminals

Front View Dimensions:

- Mounting angle
- 4P
- 3P
- 16
- 147
- 13
- ASL
- 30
- 8
- 15
- 32
- 45
- 70
- 70
- 70
- Conductor overlap, max
- $\phi 1.3$



Soft plastic tubing $\phi 50$ to be provided on center pole and neutral pole of vertical terminal type for insulation.



7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(1600A Frame)

S1600-NE

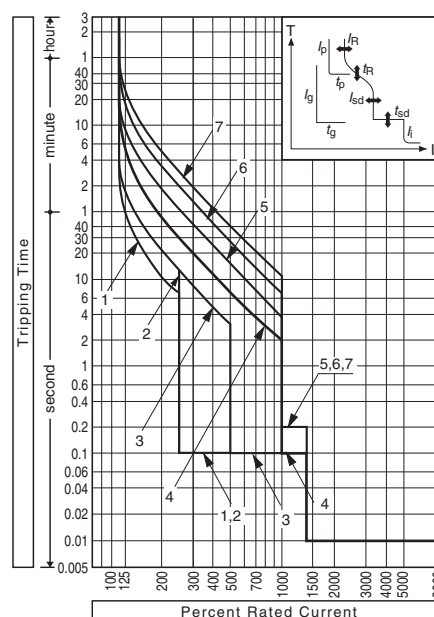
Ratings and Specifications

Type			S1600-NE				
Number of poles			3	4			
■ Ratings							
Rated current, A			(Adjustable)				
Calibrated at 45°C			700	1200			
			800	1400			
			900	1500			
			1000	1600			
Rated insulation voltage [U_i] V	AC		690				
Rated impulse withstand voltage [U_{imp}] kV			8				
■ Rated breaking capacity, kA							
NK	AC	690V	45/34 ⑫				
$I_{cu}/I_{cs}(sym)$		450V	85/65 ⑫				
		240V	125/94 ⑫				
	DC	250V	—				
IEC60947-2	AC	690V	45/34				
$I_{cu}/I_{cs}(sym)$		500V	65/50				
		440V	85/65				
		415V	85/65				
		380V	100/75				
		240V	125/94				
	DC	250V	—				
		125V	—				
■ Rated short time withstand current, kA			20 (0.3sec)				
Weight (● marked standard type) kg			27.0	35.0			
■ Connections and Mountings							
Front-connected (FC)	Terminal screws		—				
	With extension bars		○				
Rear-connected (RC)	Bolt studs		—				
	Flat bar studs		●				
Plug-in (PM)	For switchboards Standard (PMC)		—				
	High-performance (PMB)		—				
For distribution boards (PMC)			—				
Flush-mounted (FP)	With flat bar studs		○				
Draw-out type (DR)			○				
TemPlug70 (PG)			—				
TemPlug45B (PG4)			—				
DIN rail mount			—				
Clip-in chassis mount			—				
■ Accessories (optional)	Symbol						
Motor operator	M C		●				
External operating handle	Breaker-mounted	H B	●				
	Door-mounted (variable depth)	H P	●				
Toggle extension		H A	● ②④				
Mechanical interlock⑨ Slide type		M S	●				
Toggle holder		H H	●				
Toggle lock		H L	—				
Terminal cover	For front-connected	C F	—				
	For rear-connected and plug-in	C R	—				
Interpole barrier		B A	● ③				
Terminal block for lead		T F	●				
Door flange		D F	●				
■ Standard specifications							
Overcurrent trip mechanism			Electronic ⑩				
Trip button (color)			Yes (Red)				
Handle position indication (ON: Red, OFF: Green)			Yes				
Suitability for isolation			Yes				
CE marking			Yes				

Notes:

- : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.
 ● : "yes" or "available". — : "no" or "not available". ③ : Line side interpole barriers are supplied as standard. (Front connection only) ⑨ : The mechanical interlock is not applicable to the draw-out type (DR). ⑫ : Being or will be applied.
 ⑩ : Optional pretrip alarm or ground fault trip function available on request.
 ②④ : One is supplied with every five breakers. Please specify if more are required.

Time/Current characteristic curves



Overcurrent tripping characteristics

Characteristics No.		1	2	3	4	5	6	7
Long time-delay pick-up current (A) : (I_R)		CT rated current : (I_{CT}) = 1600A 700, 800, 900, 1000, 1200, 1400, 1500, 1600						
Long time-delay time settings (s) : (t_R)		11	21	21	5	10	19	29
		at 200%×(I_R)			at 600%×(I_R)			
		Setting tolerance ±20%						
Short time-delay (I_R)× pick-up current (A) : (I_{SD})		2.5	2.5	5	10	10	10	10
		Setting tolerance ±15%						
Short time-delay time settings (s) : (t_{SD})		0.1	0.1	0.1	0.1	0.2	0.2	0.2
		Total clearing time +50ms, resettable time -20ms						
Instantaneous trip pick-up current (A) : (I_I)		(I_R)×1400%			Max: (I_{CT})×1200%			
		Setting tolerance ±20%						
Option	Preferential trip alarm							
	Pick-up current (A) : (I_p)	(I_R)×80% Setting tolerance ±10%						
	Time-settings (s) : (t_p)	Definite time-delay characteristic, 40sec. Setting tolerance ±10%						
	Ground fault trip							
	Pick-up current (A) : (I_g)	(I_{CT})×20% Setting tolerance ±15%						
	Time-settings (s) : (t_g)	Definite time-delay characteristic, 0.2sec. Total tripping time +50ms, resettable time -20ms.						
	Neutral protection							
	Pick-up current (A) : (I_N)	(I_R)×100% or 50% selectable ②						
	Time-settings (s) : (t_N)	(I_N)=(I_R) Same as Long time-delay time settings						

Characteristic No.4 will be applied as standard setting unless otherwise specified.

Note:

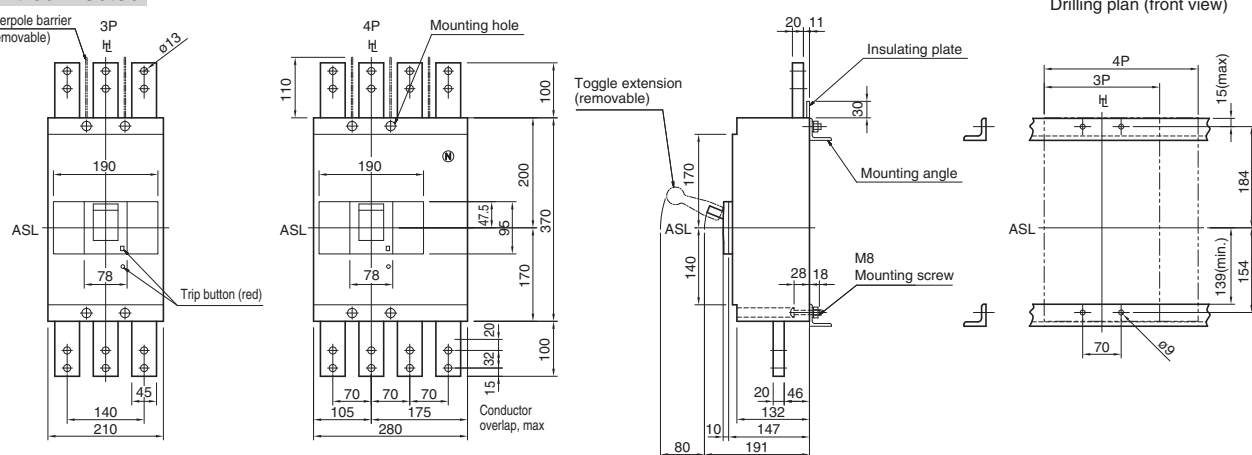
- ② : In case of (I_R) < (I_{CT}), the setting tolerance becomes big when (I_N) is set at (I_R)×50%.

Combinations of Internally Mounted Accessories (Optional)

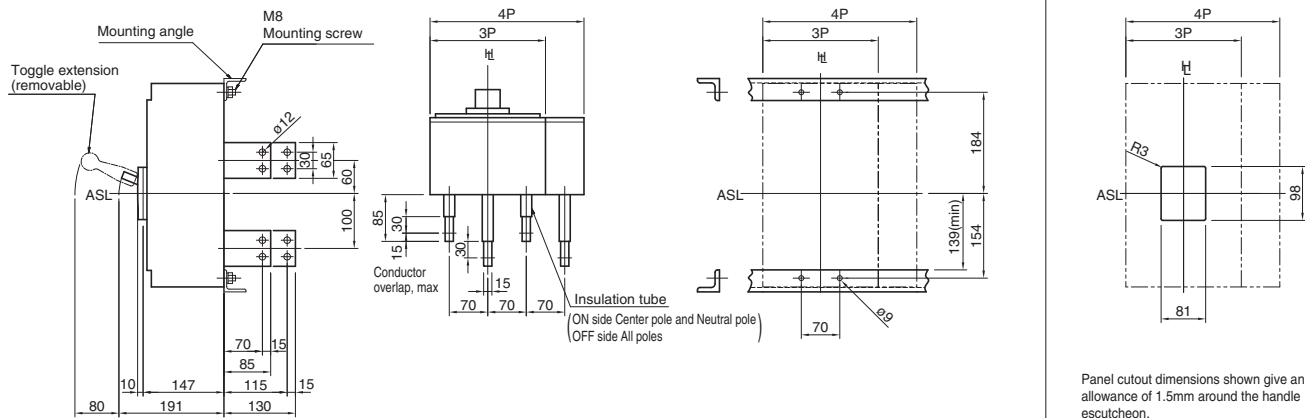
Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX	SH	UV	SH	UV	AX	UV
Left pole	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle
Right pole	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle	Toggle

S1600-NE

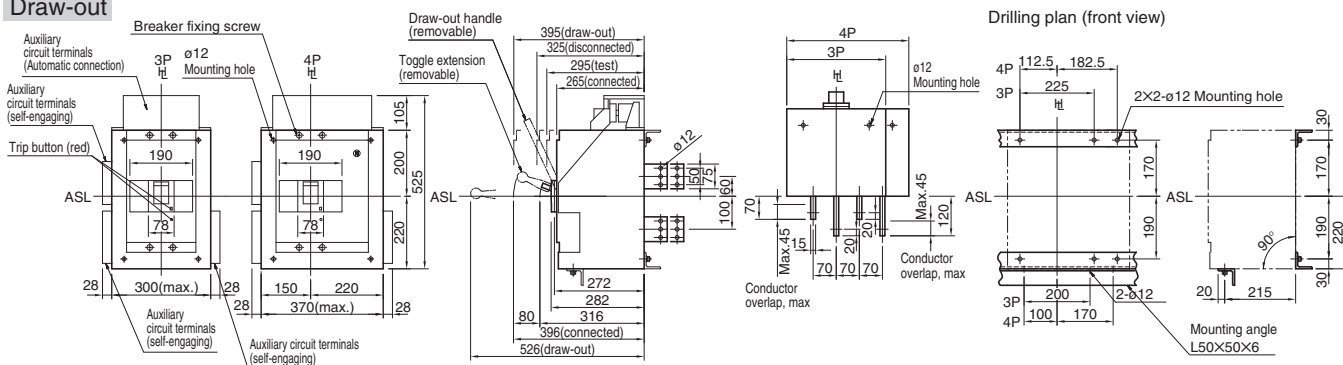
Front-connected



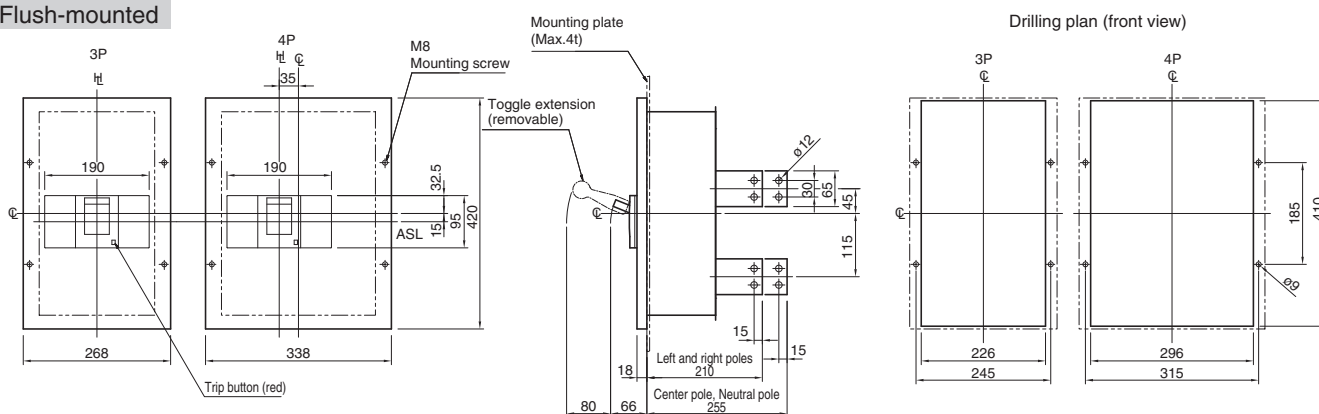
Rear-connected



Draw-out



Flush-mounted



7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(50A Frame)

E50-CM

Ratings and Specifications

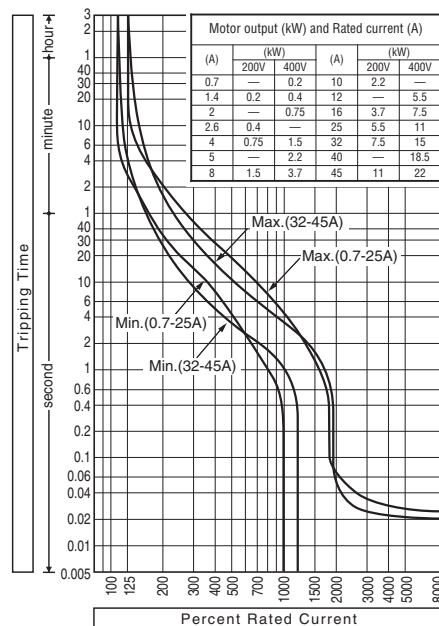
Type		E50-CM	
Number of poles		3	
Ratings			
Motor rated capacity (kW)			
and breaker rated current (A)			
Calibrated at 45°C			
		(A)	(kW)
		200/220V	400/440V
		0.7	— 0.2
		1.4	0.2 0.4
		2	— 0.75
		2.6	0.4 —
		4	0.75 1.5
		5	— 2.2
		8	1.5 3.7
		10	2.2 —
		12	— 5.5
		16	3.7 7.5
		25	5.5 11
		32	7.5 15
		40	— 18.5
		45	11 22
Note: Select an appropriate one depending on the total load current of the motor operator.			
Rated insulation voltage [U_i] V		AC	690
Rated impulse withstand voltage [U_{imp}] kV			6
Rated breaking capacity, kA			
NK		AC	690V
$I_{cu}/I_{cs}(sym)$		450V	2.5/— ⑬
		240V	5/— ⑭
		DC	250V
IEC 60947-2		AC	440V
$I_{cu}/I_{cs}(sym)$		415V	2.5/1.3
		380V	2.5/1.3
		240V	5/2.5
		DC	250V
Weight (● marked standard type) kg			0.74
Connections and Mountings			
Front-connected (FC)		Terminal screws	●
		With extension bars	—
Rear-connected (RC)		Bolt studs	○
		Flat bar studs	—
Plug-in (PM)		For switchboards Standard (PMC)	○
		High-performance (PMB)	—
		For distribution boards (PMC)	○
Flush-mounted (FP)		With flat bar studs	○ Bolt studs
Draw-out type (DR)			—
TemPlug70 (PG)			—
TemPlug45B (PG4)			—
DIN rail mount			—
Clip-in chassis mount			—
Accessories (optional)		Symbol	
Motor operator		M C	—
Externally mounted			
External operating handle		H B	●
Door-mounted (variable depth)		H P	●
Toggle extension		H A	—
Mechanical interlock Slide type		M S	●
Toggle holder		H H	●
Toggle lock		H L	●
Terminal cover		C F	●
For front-connected		C F	●
For rear-connected and plug-in		C R	●
Interpole barrier		B A	●
Terminal block for lead		T F	●
Door flange		D F	●
Standard specifications			
Overcurrent trip mechanism		Thermal-magnetic⑳	—
Trip button (color)		Yes (Red)	—
Handle position indication (ON: Red, OFF: Green)		Yes	—
Suitability for isolation		Non	—
CE marking		Non	—

Notes:

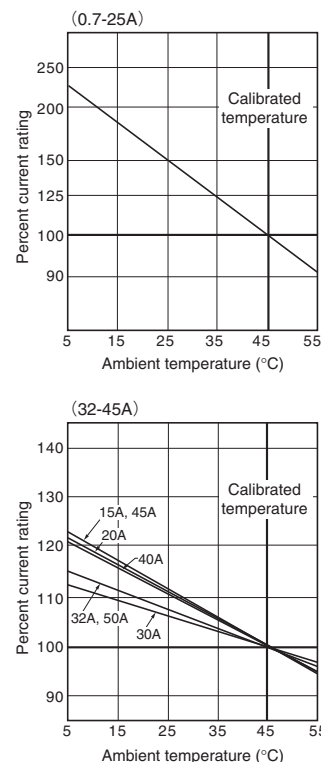
● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.

● : "yes" or "available". — : "no" or "not available". ⑬ : at 500V AC. ⑭ : at 250V AC. ⑳ : Hydraulic-magnetic type for below 5A rating.

Time/Current characteristic curves



Ambient Compensating Curves



Combinations of Internally Mounted Accessories (Optional)

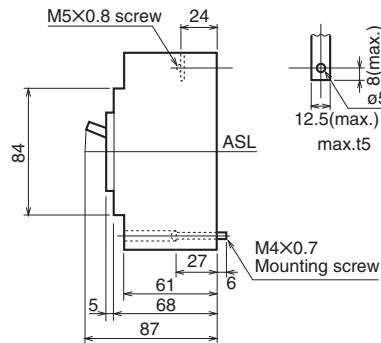
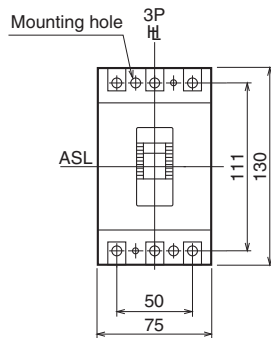
Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip #1	Under voltage trip	AX	SH	UV	SH	UV	AX	AX
3				—			—		—		
	Left pole										
	Right pole										

NOTE: #1 Shunt trip is provided with anti-burnout switch.

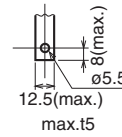
Outline dimensions (mm)

E50-CM

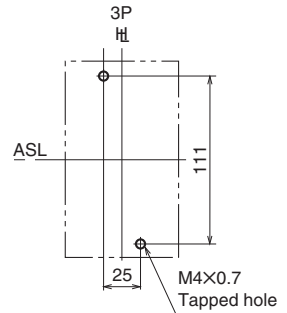
Front-connected



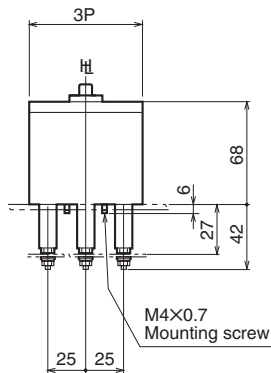
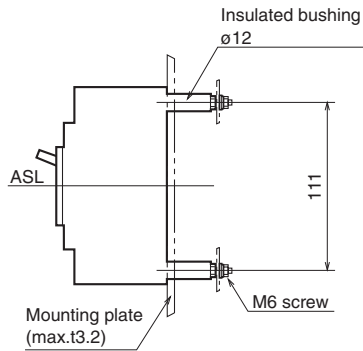
Preparation of conductor



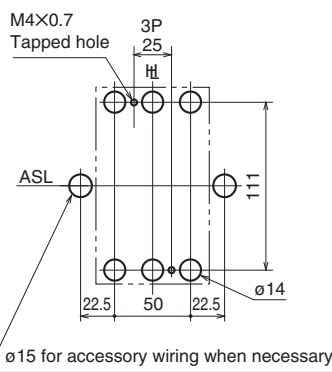
Drilling plan (front view)



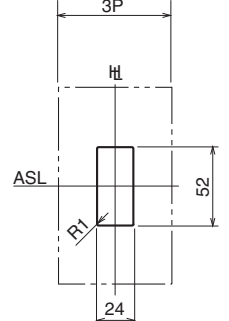
Rear-connected



Drilling plan (front view)



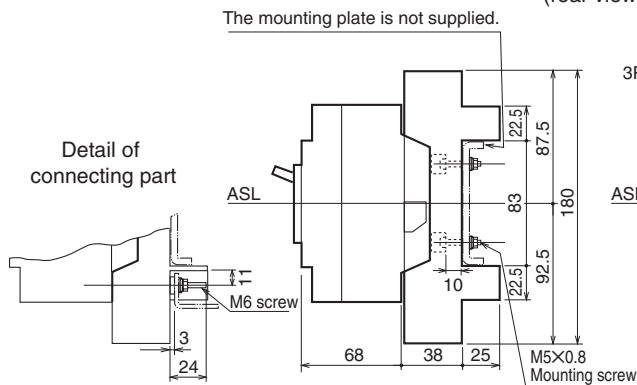
Panel cutout (front view)



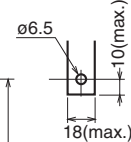
Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

Plug-in (For Switch board 3P)

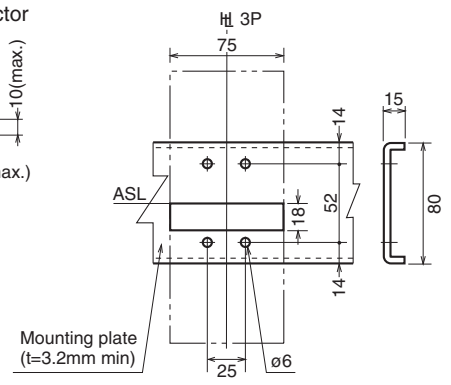
Mounting base (rear view)



Preparation of conductor

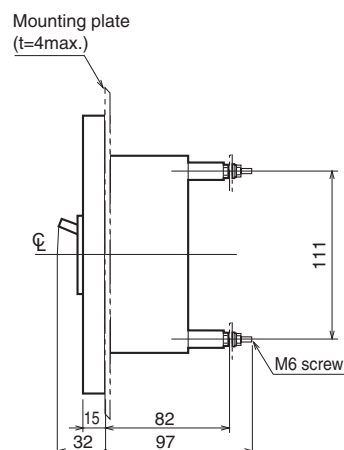
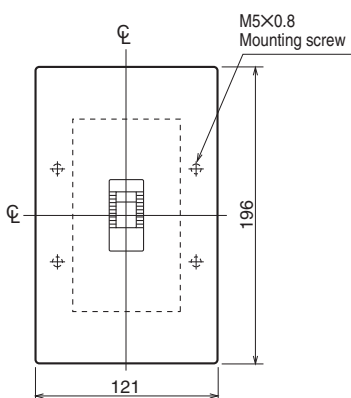


Drilling plan (front view)

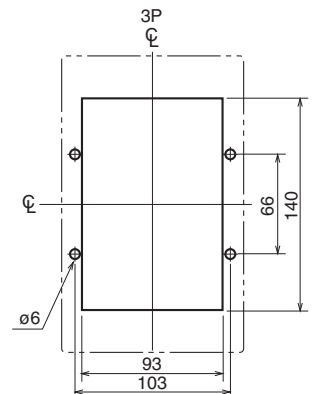


*Allow a space of 5mm from adjacent breaker when the breaker is fitted with internal accessories.

Flush-mounted



Drilling plan (front view)



7

Characteristics and Outline Dimensions



7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(100A Frame)

S100-NM

Ratings and Specifications

Type

Number of poles

Ratings

Motor rated capacity (kW)

and breaker rated current (A)

Calibrated at 40 °C

S100-NM

3

(A)	(kW)	
	200/220V	400/440V
16	3.7	7.5
24	5.5	11
32	7.5	15
40	—	18.5
45	11	22
60	15	30
75	18.5	37
90	22	45
100	—	55

Note: Select an appropriate one depending on the total load current of the motor operator.

Rated insulation voltage [U_i] V ACRated impulse withstand voltage [U_{imp}] kV

Rated breaking capacity, kA

NK AC 690V

 $I_{cu}/I_{cs}(sym)$ 450V 25/25

240V 50/50

DC 250V

IEC 60947-2 AC 440V 25/25

 $I_{cu}/I_{cs}(sym)$ 415V 30/30

380V 30/30

240V 50/50

DC 250V

Weight (● marked standard type) kg 1.1

Connections and Mountings

Front-connected (FC) Terminal screws ●

With extension bars ○ (BAR)

Rear-connected (RC) Bolt studs —

Flat bar studs ○

Plug-in (PM) For switchboards Standard (PMC) —

High-performance (PMB) —

For distribution boards (PMC) —

Flush-mounted (FP) With flat bar studs ○

Draw-out type (DR) —

TemPlug70 (PG) ○

TemPlug45B (PG4) —

DIN rail mount ○

Clip-in chassis mount —

Accessories (optional) Symbol

Motor operator M C ●

External operating Breaker-mounted H B ●

handle Door-mounted (variable depth) H P ●

Toggle extension H A —

Mechanical interlock Slide type M S ●

Toggle holder H H ●

Toggle lock H L ●

Terminal cover For front-connected C F ●

For rear-connected and plug-in C R ●

Interpole barrier B A ● ③

Terminal block for lead T F ●

Door flange D F ●

Standard specifications

Overcurrent trip mechanism Thermal-magnetic

Trip button (color) Yes (Red)

Handle position indication (ON: Red, OFF: Green) Yes

Suitability for isolation Yes

CE marking Yes

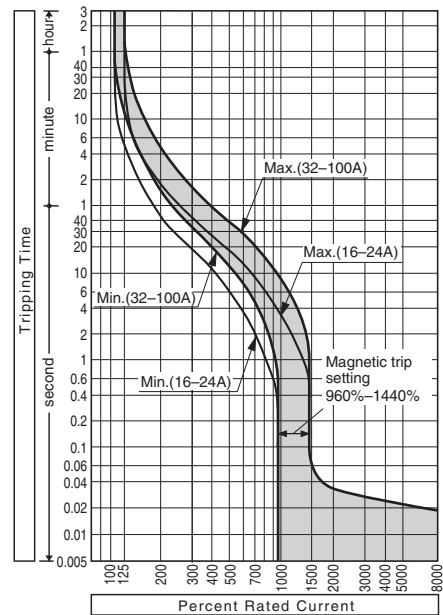
Notes:

● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.

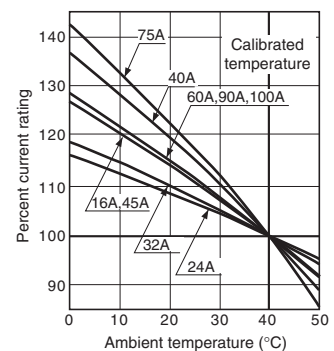
● : "yes" or "available". — : "no" or "not available".

③ : Line side interpole barriers are supplied as standard. (Front connection only)

Time/Current characteristic curves



Ambient Compensating Curves

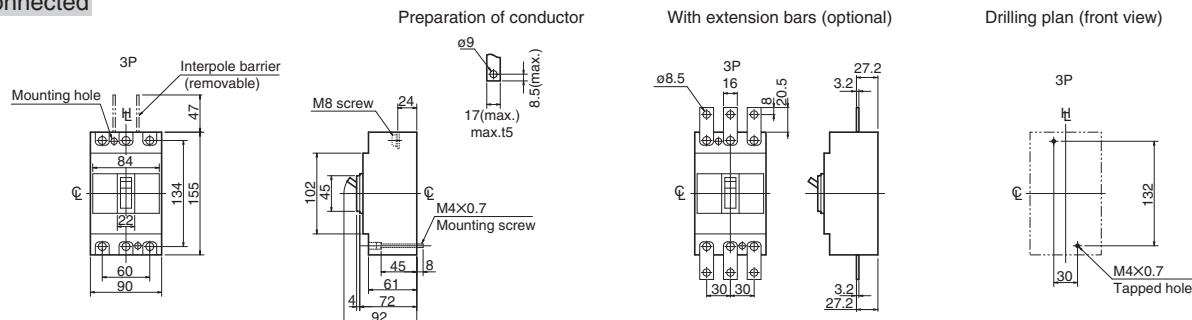


Combinations of Internally Mounted Accessories (Optional)

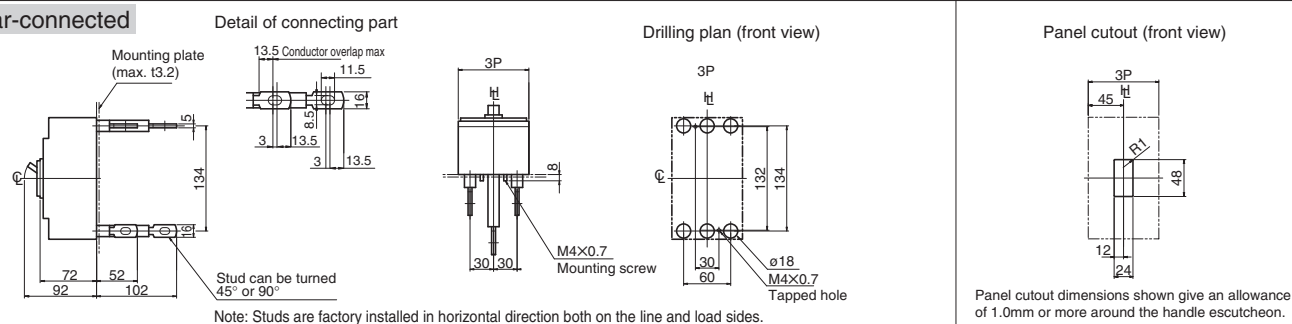
Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX	SH	UV	SH	UV	AX	UV
3											
	Left pole										
	Right pole										

S100-NM

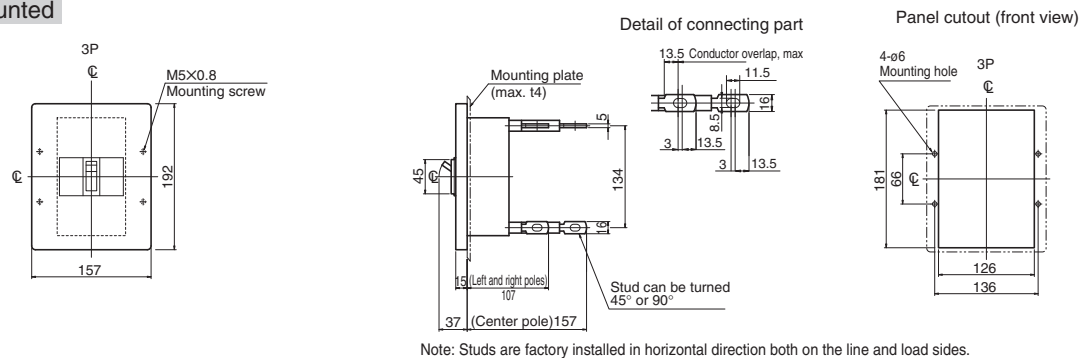
Front-connected



Rear-connected



Flush-mounted





7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(225A Frame)

S225-NM

Ratings and Specifications

Type

Number of poles

Ratings

Motor rated capacity (kW)

and breaker rated current (A)

Calibrated at 40 °C

S225-NM

3

(A)	(kW)	
	200/220V	400/440V
125	30	—
150	37	75
175	45	90
225	55	110

Note: Select an appropriate one depending on the total load current of the motor operator.

Rated insulation voltage [U_i] V AC

690

Rated impulse withstand voltage [U_{imp}] kV

8

Rated breaking capacity, kA

NK AC 690V

 $I_{cu}/I_{cs}(sym)$ 450V

25/25

240V

65/65

DC 250V

IEC 60947-2 AC 440V

25/25

 $I_{cu}/I_{cs}(sym)$ 415V

35/35

380V

35/35

240V

65/65

DC 250V

Weight (● marked standard type) kg

1.5

Connections and Mountings

Front-connected (FC) Terminal screws

●

With extension bars

○ (BAR)

Rear-connected (RC) Bolt studs

—

Flat bar studs

○

Plug-in (PM) For switchboards Standard (PMC)

—

High-performance (PMB)

—

For distribution boards (PMC)

—

Flush-mounted (FP) With flat bar studs

○

Draw-out type (DR)

—

TemPlug70 (PG)

○

TemPlug45B (PG4)

—

DIN rail mount

—

Clip-in chassis mount

—

Accessories (optional) Symbol

Motor operator M C ●

External operating Breaker-mounted H B ●

handle Door-mounted (variable depth) H P ●

Toggle extension H A —

Mechanical interlock Slide type M S ●

Toggle holder H H ●

Toggle lock H L ●

Terminal cover For front-connected C F ●

For rear-connected and plug-in C R ●

Interpole barrier B A ● ③

Terminal block for lead T F ●

Door flange D F ●

Standard specifications

Overcurrent trip mechanism

Thermal-magnetic

Trip button (color)

Yes (Red)

Handle position indication (ON: Red, OFF: Green)

Yes

Suitability for isolation

Yes

CE marking

Yes

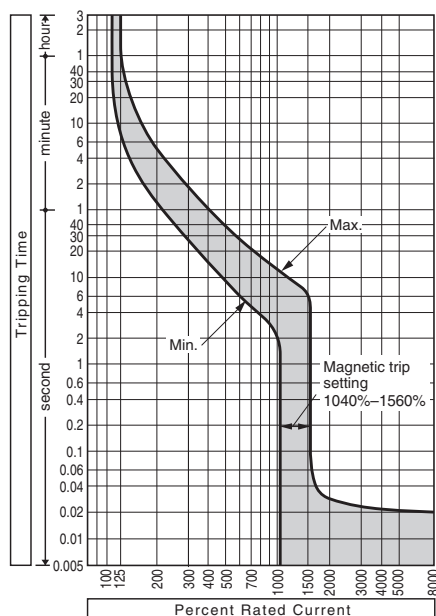
Notes:

● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.

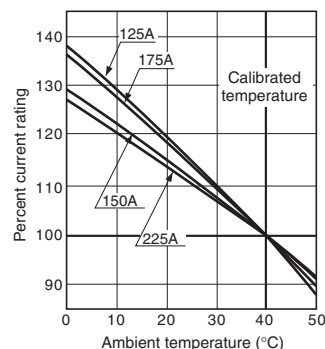
● : "yes" or "available". — : "no" or "not available".

③ : Line side interpole barriers are supplied as standard. (Front connection only)

Time/Current characteristic curves



Ambient Compensating Curves



Combinations of Internally Mounted Accessories (Optional)

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX	SH	UV	SH	UV	AX	UV
3											



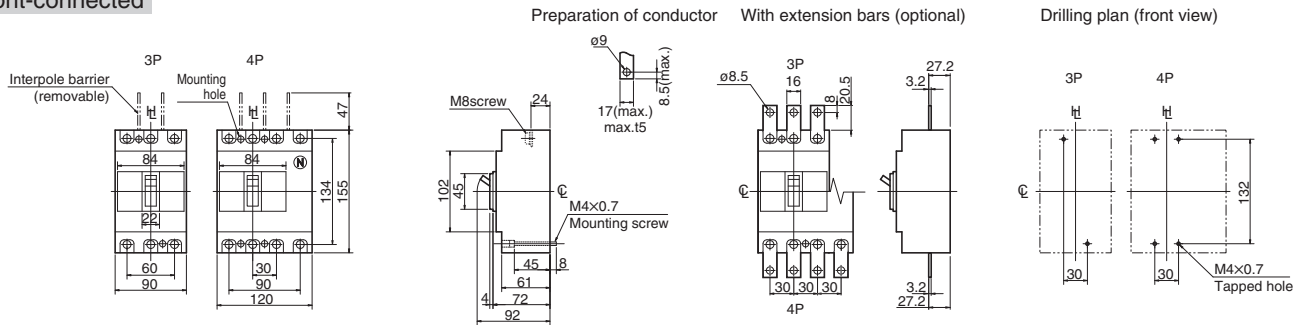
Molded Case Circuit Breakers

S100-NN

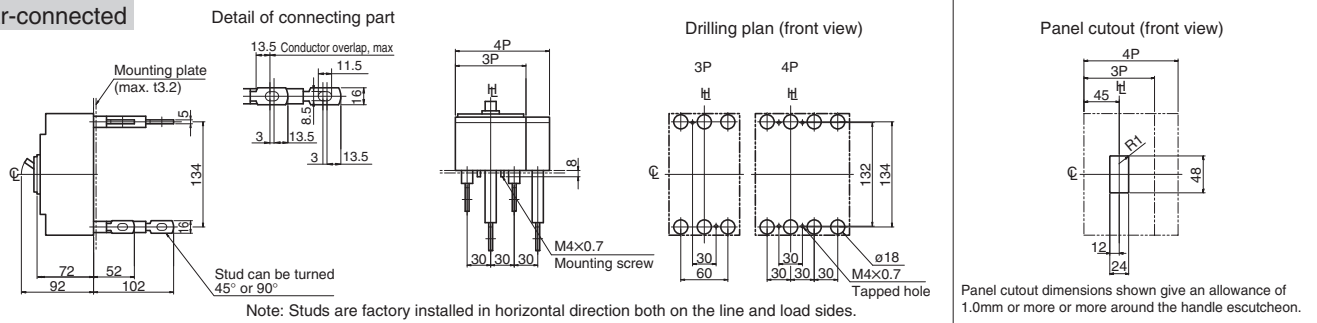
Outline dimensions (mm)

S100-NN

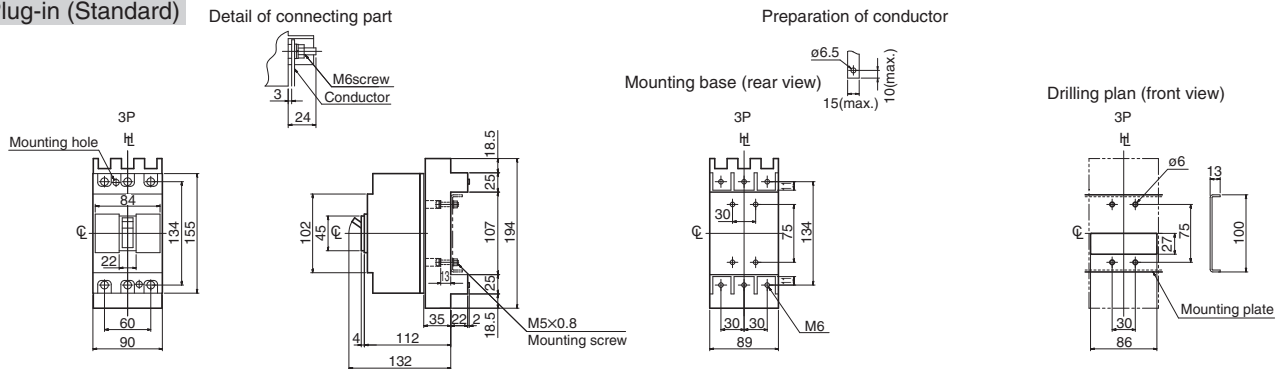
Front-connected



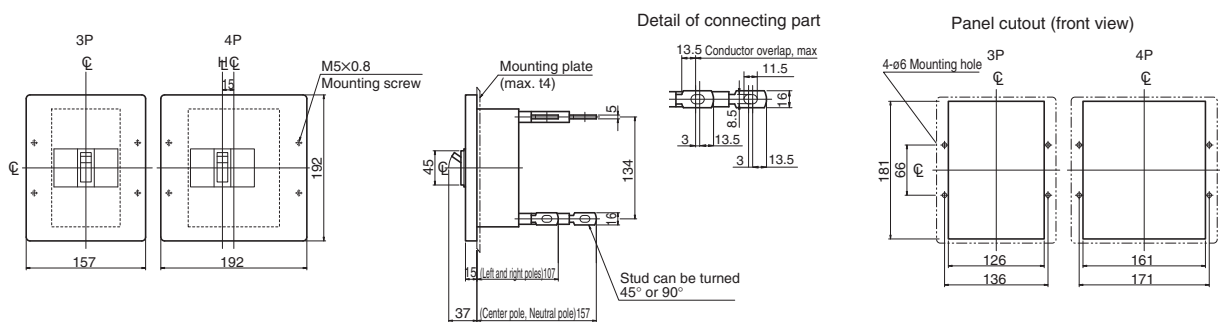
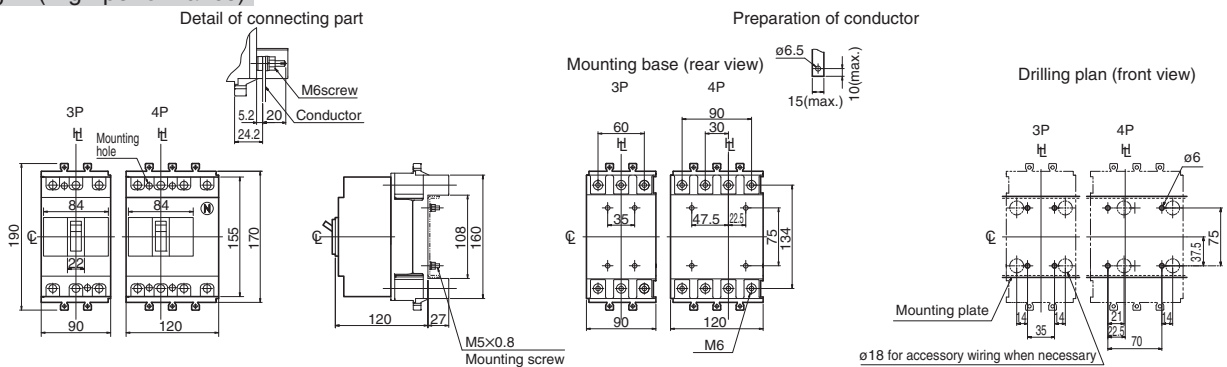
Rear-connected



Plug-in (Standard)



Plug-in (High-performance)

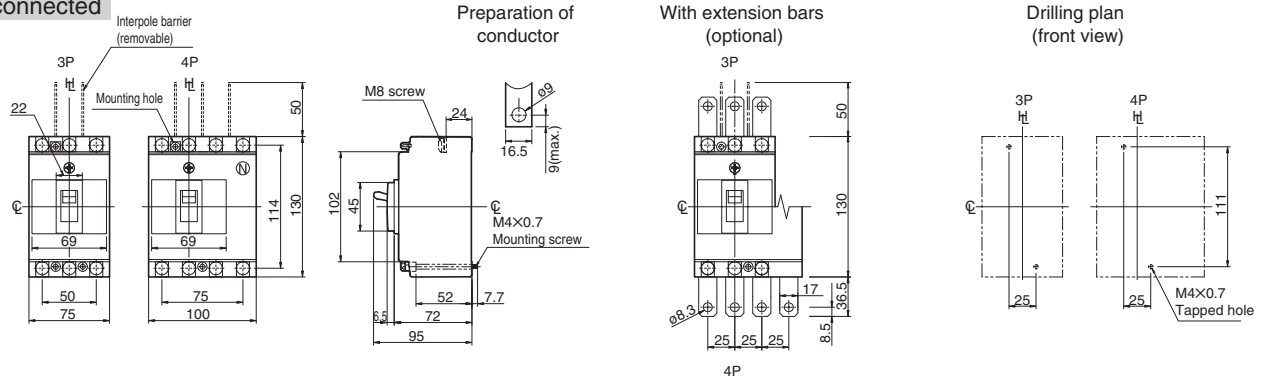


S125-SN

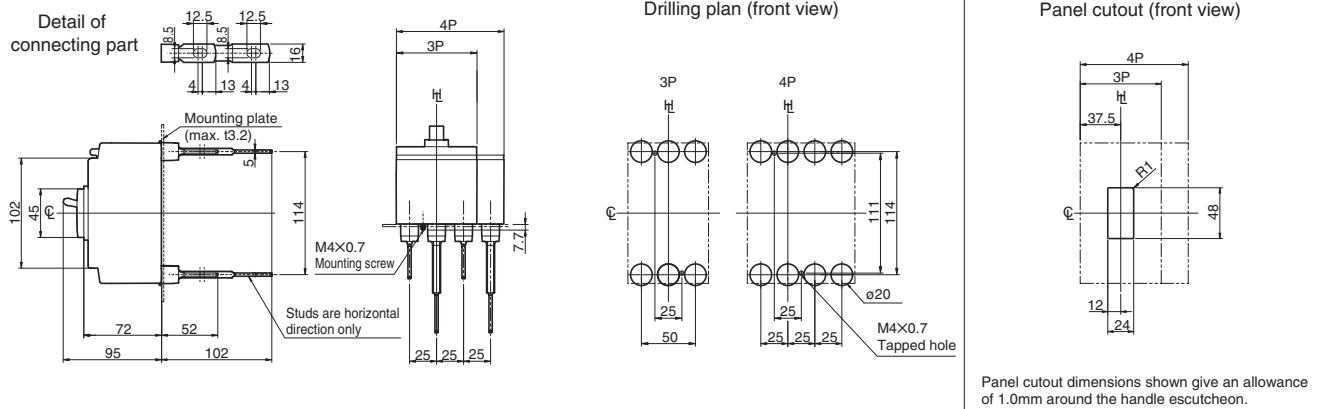
Outline dimensions (mm)

S125-SN

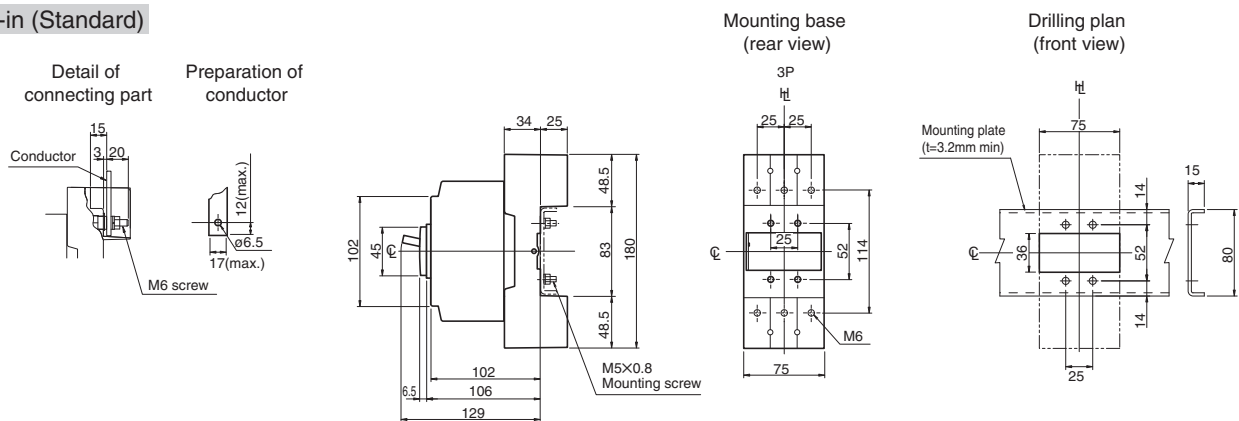
Front-connected



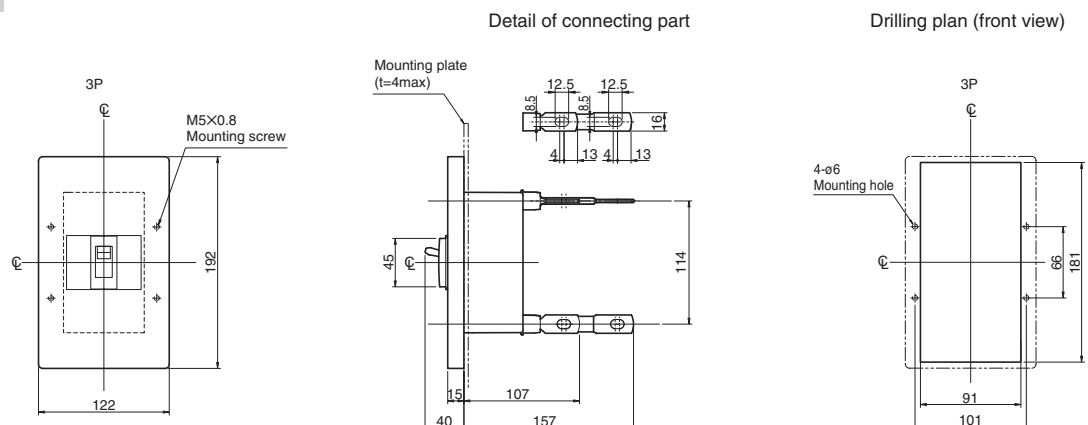
Rear-connected



Plug-in (Standard)



Flush-mounted





Molded Case Circuit Breakers

(125A Frame)

S125-NN

Ratings and Specifications

Externally mounted

Notes:

- : Standard. This configuration used unless otherwise specified.
- : Optional standard. Specify when ordering.
- : "yes" or "available".
- : "no" or "not available".
- ③ : Line side interpolate barriers are supplied as standard. (Front connection only)
- ②③ : Required for overcurrent protection. Rated conditional short-circuit current I_{sc} will be the same as Rated short-circuit breaking capacity of upstream breaker.

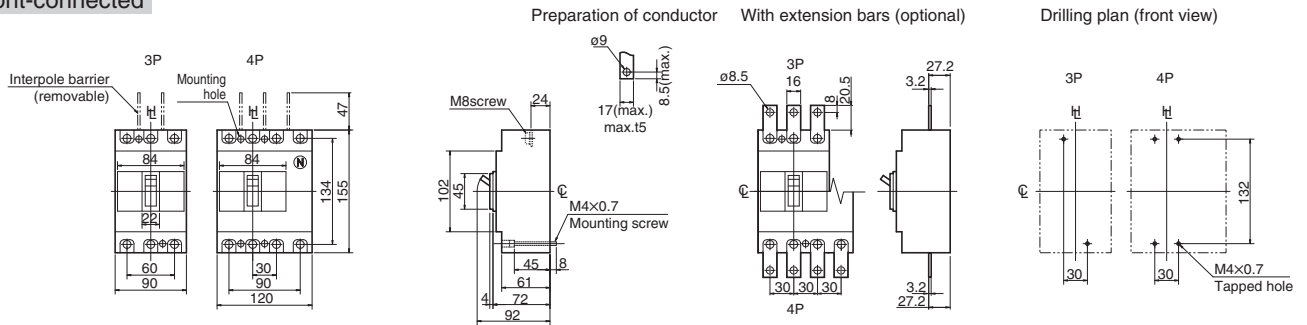
Combinations of Internally Mounted Accessories (Optional)

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX AL	AX SH	AX UV	AL SH	AL UV	AX AL SH	AX AL UV
4+0											

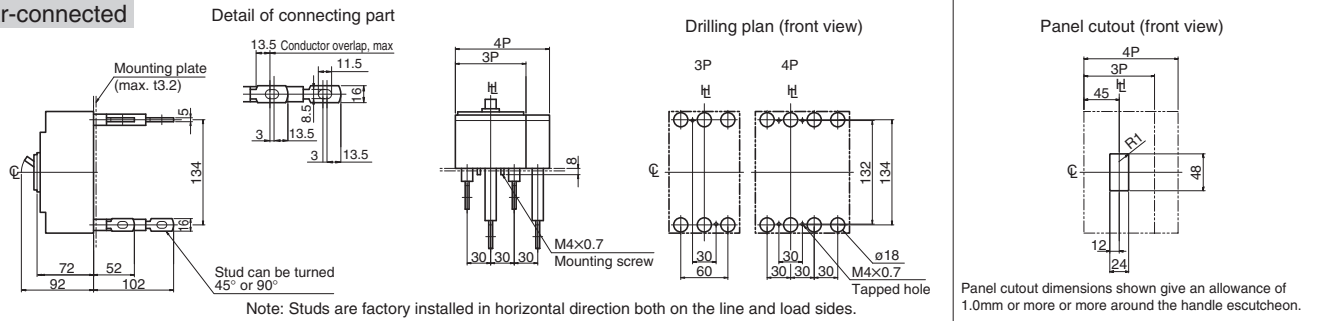
Outline dimensions (mm)

S125-NN

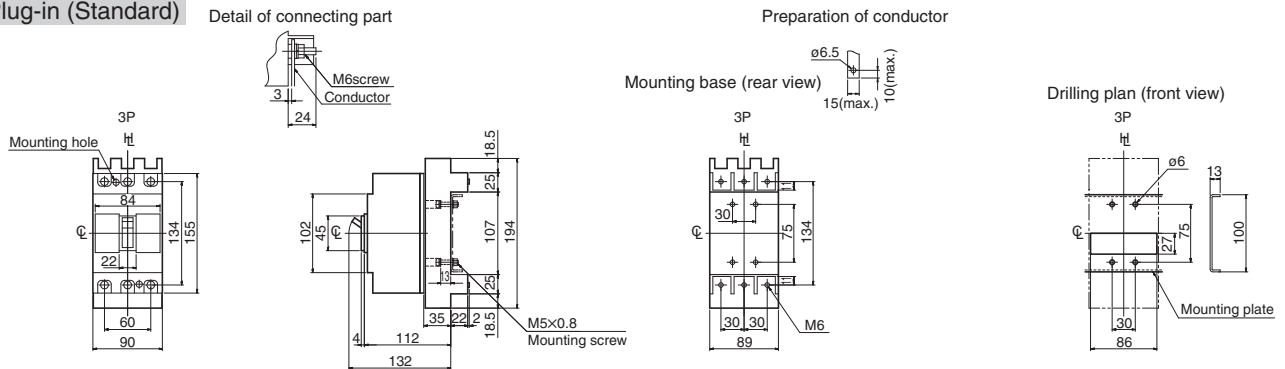
Front-connected



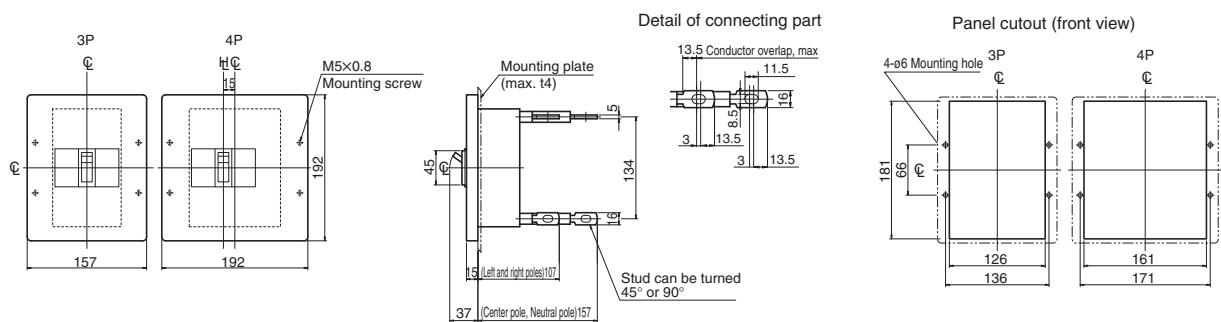
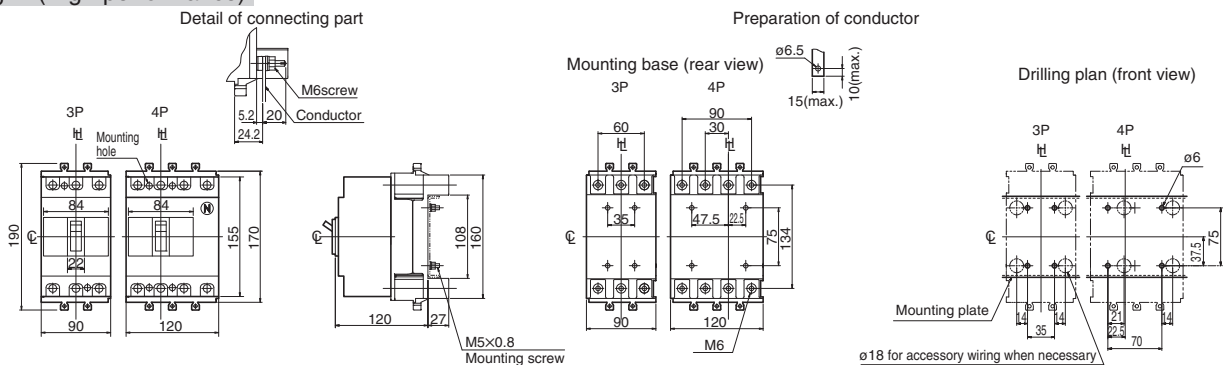
Rear-connected



Plug-in (Standard)



Plug-in (High-performance)



7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(250A Frame)

S250-SN

Ratings and Specifications

Type	S250-SN							
Number of poles	3	4	3	4				
■ Ratings								
Rated current, A	225		250					
Rated insulation voltage [U _i] V	AC 690		690					
Rated operational voltage V	AC 690		690					
	DC 250		250					
Rated short circuit making capacity, kA peak	6		6					
Rated short time withstand current, kA	3 (0.3sec)		3 (0.3sec)					
Rated impulse withstand voltage [U _{imp}] kV	8		8					
■ Performance								
Utilization category	AC	AC-23A	AC-23A					
IEC 60947-3	DC	DC-22A	DC-22A					
Upstream breaker ²⁹		S250-SF	S250-SF					
Weight (● marked standard type) kg	1.5	1.9	1.5	1.9				
■ Connections and Mountings								
Front-connected (FC)	Terminal screws	●	●					
	With extension bars	○ (BAR)	○ (BAR)					
Rear-connected (RC)	Bolt studs	—	—					
	Flat bar studs	○	○					
Plug-in (PM)	For switchboards	○	—	○	—			
	Standard (PMC)	—	—	—	—			
	High-performance (PMB)	—	—	—	—			
For distribution boards (PMC)		—	—	—	—			
Flush-mounted (FP)	With flat bar studs	○	○					
Draw-out type (DR)		—	—					
TemPlug70 (PG)		○	—	○	—			
TemPlug45B (PG4)		—	—					
DIN rail mount		—	—					
Clip-in chassis mount		—	—					
■ Accessories (optional)	Symbol							
Externally mounted	Motor operator	M C	●	●				
	External operating handle	H B	●	●				
	Door-mounted (variable depth)	H P	●	●				
	Toggle extension	H A	—	—				
	Mechanical interlock Slide type	M S	●	●				
	Toggle holder	H H	●	●				
	Toggle lock	H L	●	●				
	Terminal cover	For front-connected	C F	●	●			
		For rear-connected and plug-in	C R	●	●			
	Interpole barrier	B A	● ③	● ③				
	Terminal block for lead	T F	●	●				
	Door flange	D F	●	●				
■ Standard specifications								
Trip button (color)	Yes (Red)	Yes (Red)						
Handle position indication (ON: Red, OFF: Green)	Yes	Yes						
Suitability for isolation	Yes	Yes						

Notes:

● : Standard. This configuration used unless otherwise specified.

○ : Optional standard. Specify when ordering.

● : "yes" or "available".

— : "no" or "not available".

③ : Line side interpole barriers are supplied as standard. (Front connection only)

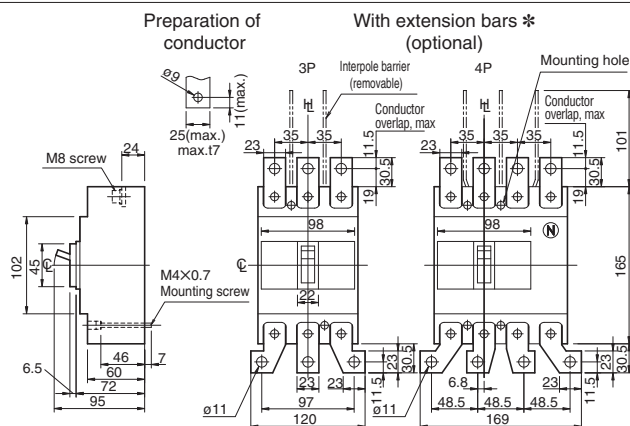
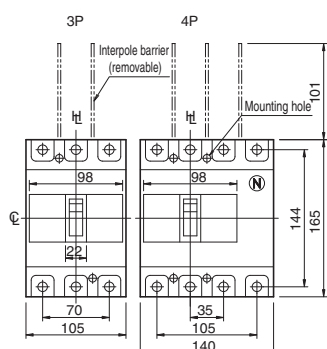
²⁹ : Required for overcurrent protection. Rated conditional short-circuit current [I_{cc}] will be the same as Rated short-circuit breaking capacity of upstream breaker.

Combinations of Internally Mounted Accessories (Optional)

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX	SH	UV	SH	UV	AX	UV
Left pole	☐	▬	☐	■	☐	☐	☐	☐	☐	☐	☐
Right pole	☐	▬	☐	■	☐	☐	☐	☐	☐	☐	☐
Toggle	☐	▬	☐	■	☐	☐	☐	☐	☐	☐	☐

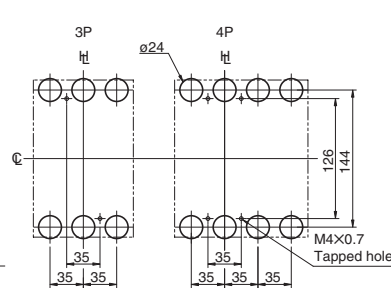
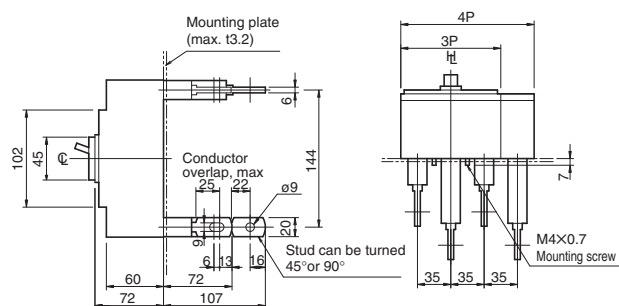
S250-SN

Preparation of

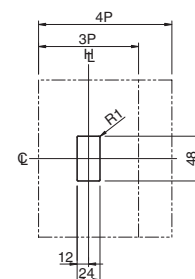


* For the extension bars, straight bars or spread bars can be supplied.

Drilling plan (front view)

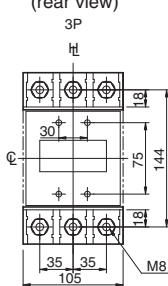
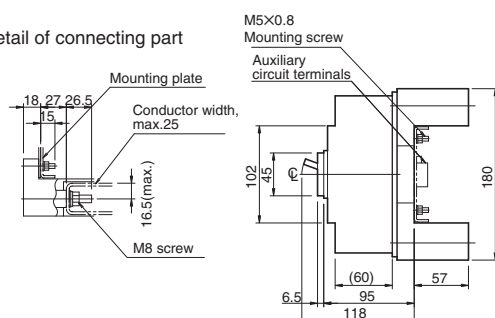


Panel cutout (front view)

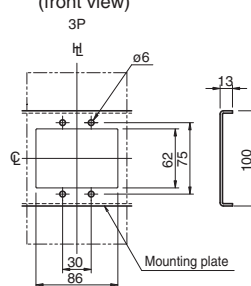


Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

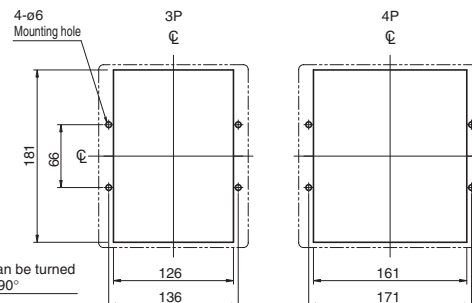
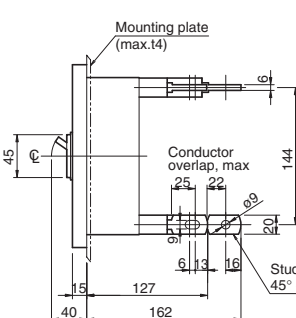
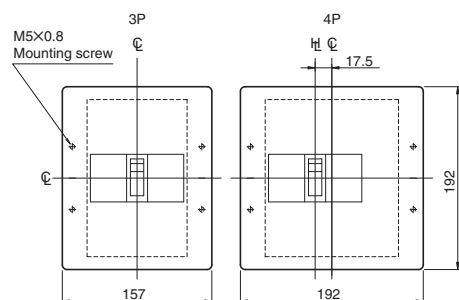
Mounting base
(rear view)



Drilling plan
(front view)



Drilling plan (front view)





7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(400A Frame)

S400-NN

Ratings and Specifications

Type		S400-NN				
Number of poles		3	4			
Ratings						
Rated current, A		400				
Rated insulation voltage [U_i] V		AC 690				
Rated operational voltage V		AC 690				
		DC 250				
Rated short circuit making capacity, kA peak		9				
Rated short time withstand current, kA		5 (0.3sec)				
Rated impulse withstand voltage [U_{imp}] kV		8				
Performance						
Utilization category		AC AC-23A				
IEC 60947-3		DC DC-22A				
Upstream breaker ②		S400-NF				
Weight (● marked standard type) kg		4.2	5.6			
Connections and Mountings						
Front-connected (FC)	Terminal screws	●				
	With extension bars	○ (BAR)				
Rear-connected (RC)	Bolt studs	—				
	Flat bar studs	○				
Plug-in (PM)	For switchboards	○	—			
	Standard (PMC)	○				
	High-performance (PMB)	○				
	For distribution boards (PMC)	—				
Flush-mounted (FP)	With flat bar studs	○				
Draw-out type (DR)		▲				
TemPlug70 (PG)		○	—			
TemPlug45B (PG4)		—				
DIN rail mount		—				
Clip-in chassis mount		—				
Accessories (optional)		Symbol				
Externally mounted	Motor operator	M C	●			
	External operating handle	H B	●			
	Breaker-mounted					
	Door-mounted (variable depth)	H P	●			
	Toggle extension	H A	—			
	Mechanical interlock ⑨ Slide type	M S	●			
	Toggle holder	H H	●			
	Toggle lock	H L	●			
	Terminal cover	For front-connected	C F	●		
		For rear-connected and plug-in	C R	●		
	Interpole barrier	B A	● ③			
	Terminal block for lead	T F	●			
	Door flange	D F	●			
Standard specifications						
Trip button (color)		Yes (Red)				
Handle position indication (ON: Red, OFF: Green)		Yes				
Suitability for isolation		Yes				
CE marking		Yes				

Notes:

● : Standard. This configuration used unless otherwise specified.

○ : Optional standard. Specify when ordering.

▲ : Semi-standard.

● : "yes" or "available".

— : "no" or "not available".

③ : Line side interpole barriers are supplied as standard. (Front connection only)

⑨ : The mechanical interlock is not applicable to the draw-out type (DR).

② : Required for overcurrent protection. Rated conditional short-circuit current [I_{cc}] will be the same as Rated short-circuit breaking capacity of upstream breaker.

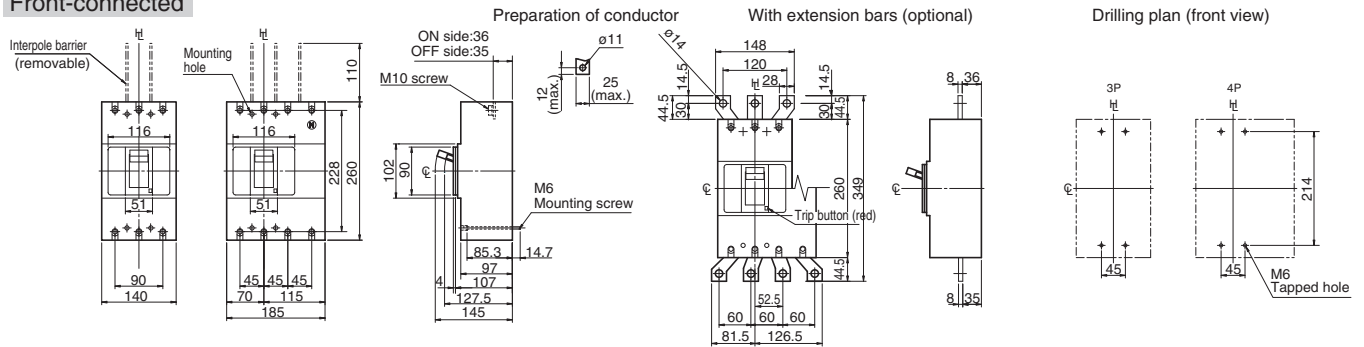
Combinations of Internally Mounted Accessories (Optional)

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX	SH	UV	SH	UV	AX	UV
	AL				AL					AL	AL
										SH	SH
Δ+U											
	Left pole										
	Toggle										
	Right pole										

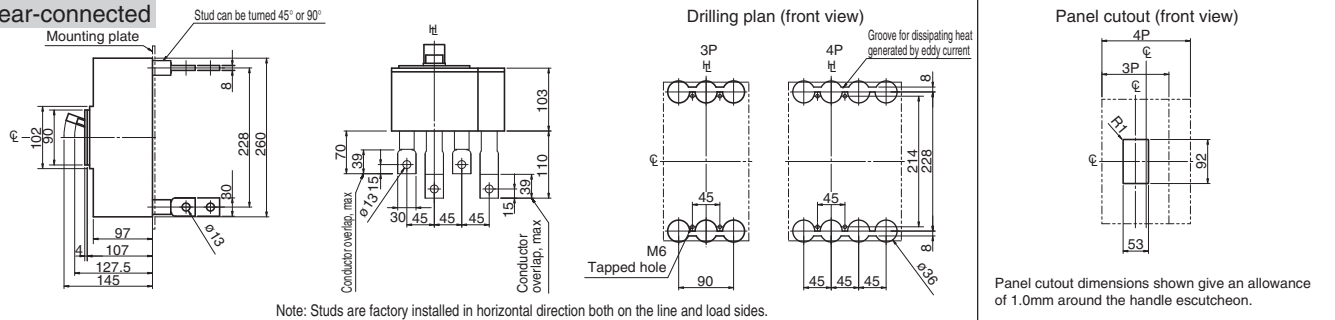
Outline dimensions (mm)

S400-NN

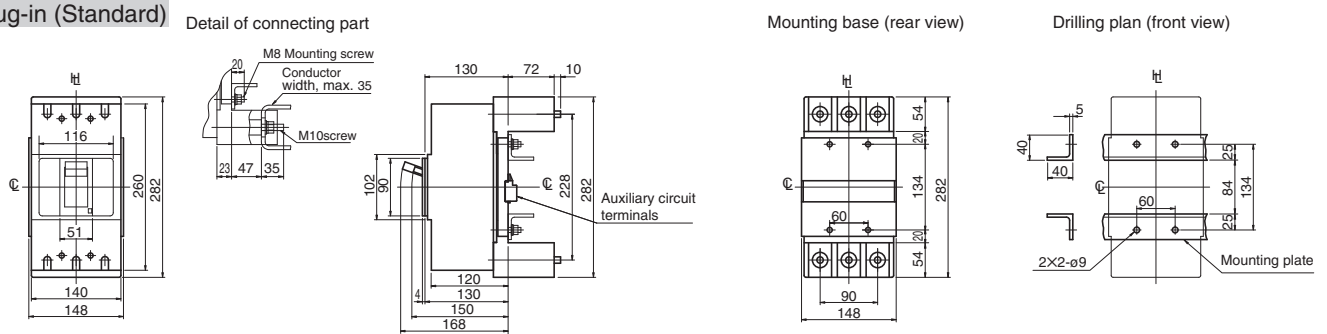
Front-connected



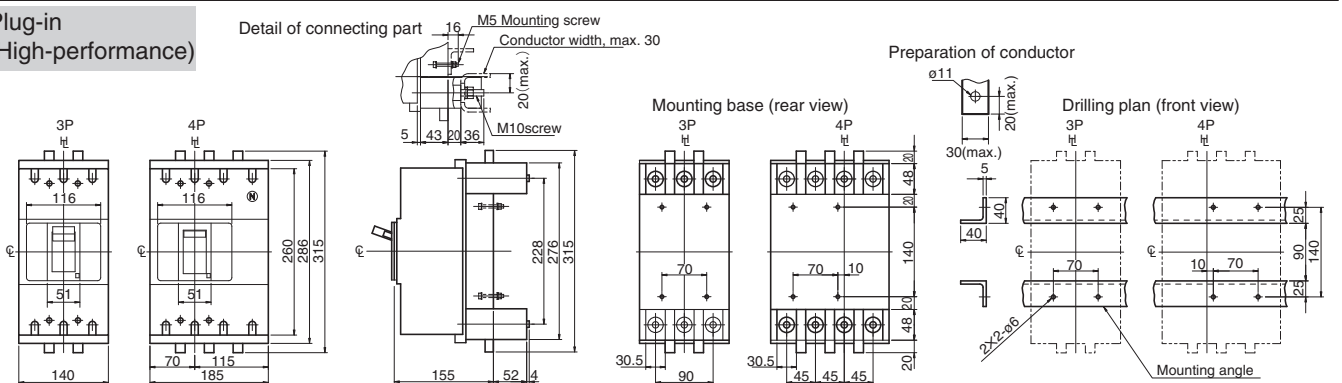
Rear-connected



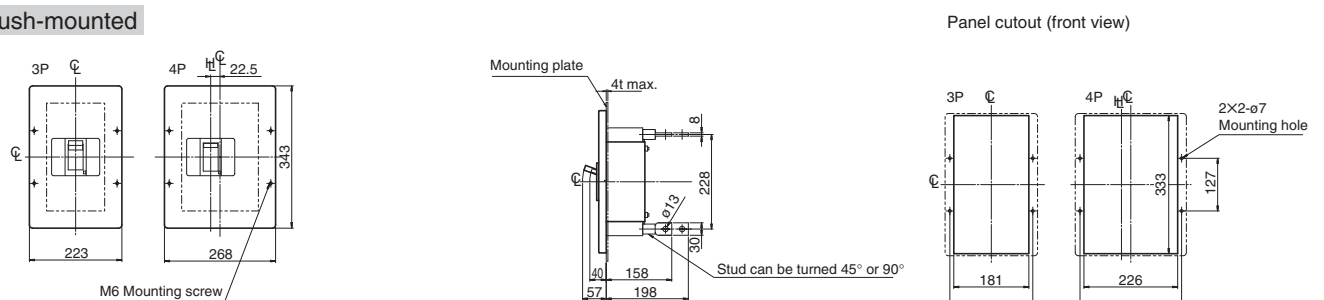
Plug-in (Standard)



Plug-in (High-performance)



Flush-mounted



Note: Studs are factory installed in horizontal direction both on the line and load sides.

7

Characteristics and Outline Dimensions



7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(630A Frame)

S630-GN

Ratings and Specifications

Type	S630-GN					
Number of poles	3	4				
■ Ratings						
Rated current, A	630					
Rated insulation voltage [U_i] V	AC 690					
Rated operational voltage V	AC 690					
	DC 250					
Rated short circuit making capacity, kA peak	17					
Rated short time withstand current, kA	10 (0.3sec)					
Rated impulse withstand voltage [U_{imp}] kV	8					
■ Performance						
Utilization category	AC AC-23A					
IEC 60947-3	DC DC-22A					
Upstream breaker ②	S630-NF					
Weight (● marked standard type) kg	8.0	11.0				
■ Connections and Mountings						
Front-connected (FC)	Terminal screws	—				
	With extension bars	●				
Rear-connected (RC)	Bolt studs	—				
	Flat bar studs	○				
Plug-in (PM)	For switchboards	○	—			
		○				
	High-performance (PMB)	○				
		For distribution boards (PMC)	—			
Flush-mounted (FP)	With flat bar studs	○				
Draw-out type (DR)		▲				
TemPlug70 (PG)		○	—			
TemPlug45B (PG4)		—				
DIN rail mount		—				
Clip-in chassis mount		—				
■ Accessories (optional)		Symbol				
Externally mounted	Motor operator	M C	●			
	External operating handle	Breaker-mounted	H B	●		
		Door-mounted (variable depth)	H P	●		
	Toggle extension	H A	●			
	Mechanical interlock⑨ Slide type	M S	●			
	Toggle holder	H H	●			
	Toggle lock	H L				
	Terminal cover	For front-connected	C F	●		
		For rear-connected and plug-in	C R	●		
	Interpole barrier	B A	● ③			
	Terminal block for lead	T F	●			
	Door flange	D F	●			
	■ Standard specifications					
	Trip button (color)		Yes (Red)			
	Handle position indication (ON: Red, OFF: Green)		Yes			
Suitability for isolation		Yes				

Notes:

● : Standard. This configuration used unless otherwise specified.

○ : Optional standard. Specify when ordering.

▲ : Semi-standard.

● : "yes" or "available".

— : "no" or "not available".

③ : Line side interpole barriers are supplied as standard. (Front connection only)

⑤ : The mechanical interlock is not applicable to the draw-out type (DR).

② : Required for overcurrent protection. Rated conditional short-circuit current [I_{cc}] will be the same as Rated short-circuit breaking capacity of upstream breaker.

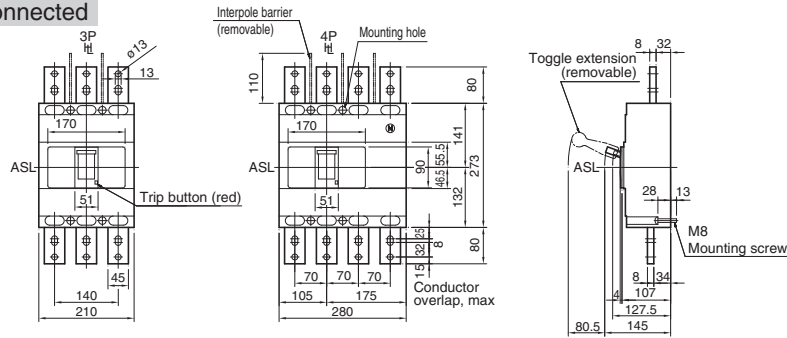
Combinations of Internally Mounted Accessories

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX	SH	UV	SH	UV	AX	AL
Δ+U											
Toggle		Left pole Right pole									

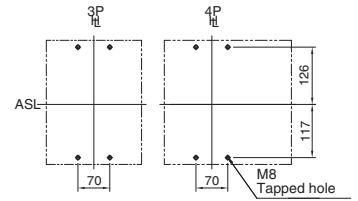
Outline dimensions (mm)

S630-GN

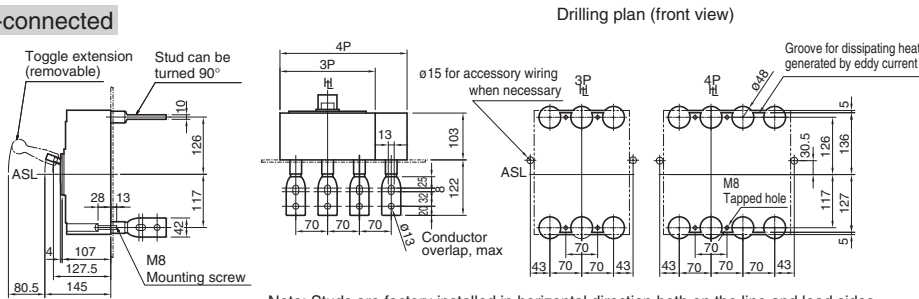
Front-connected



Drilling plan (front view)

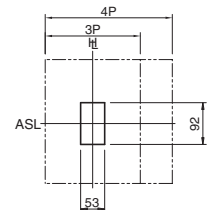


Rear-connected



Drilling plan (front view)

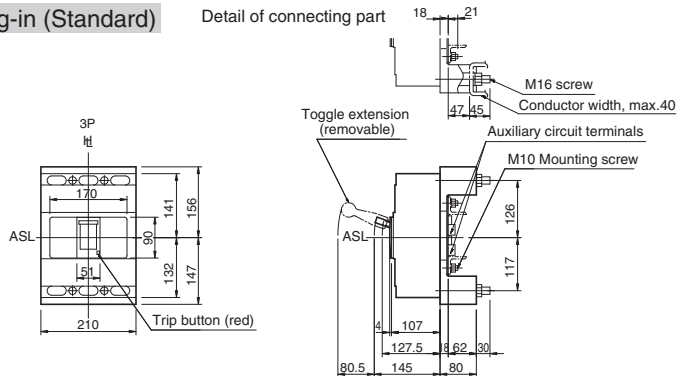
Panel cutout (front view)



Note: Studs are factory installed in horizontal direction both on the line and load sides.

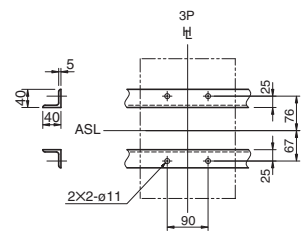
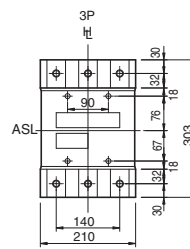
Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

Plug-in (Standard)



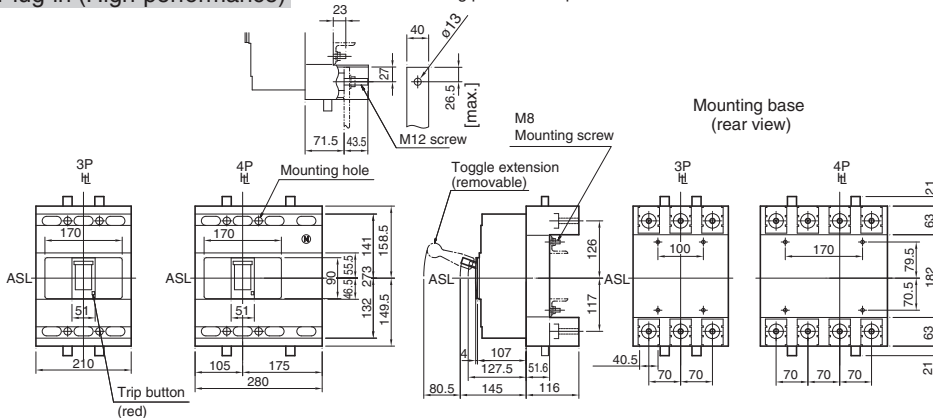
Mounting base (rear view)

Drilling plan (front view)



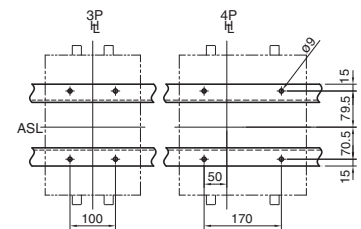
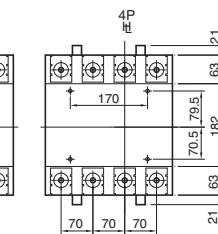
Plug-in (High-performance)

Detail of connecting part and Preparation of conductor

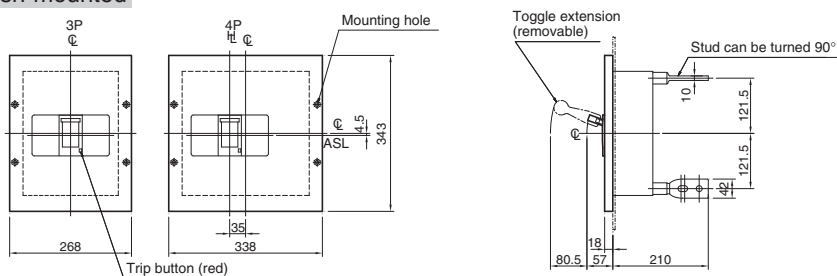


Mounting base (rear view)

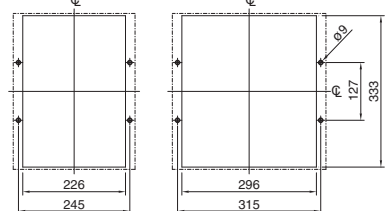
Drilling plan (front view)



Flush-mounted



Drilling plan (front view)



Note: Studs are factory installed in horizontal direction both on the line and load sides.



7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(800A Frame)

S800-NN

Ratings and Specifications

Type		S800-NN			
Number of poles		3	4		
Ratings					
Rated current, A		800			
Rated insulation voltage [U_i] V		AC 690			
Rated operational voltage V		AC 690			
		DC 250			
Rated short circuit making capacity, kA peak		17			
Rated short time withstand current, kA		10 (0.3sec)			
Rated impulse withstand voltage [U_{imp}] kV		8			
Performance					
Utilization category		AC AC-23A			
IEC 60947-3		DC DC-22A			
Upstream breaker ²⁹		S800-NF			
Weight (● marked standard type) kg		8.0	11.5		
Connections and Mountings					
Front-connected (FC)	Terminal screws	—			
	With extension bars	●			
Rear-connected (RC)	Bolt studs	—			
	Flat bar studs	○			
Plug-in (PM)	For switchboards	○	—		
	Standard (PMC)	○			
	High-performance (PMB)	○			
	For distribution boards (PMC)	—			
Flush-mounted (FP) With flat bar studs		○			
Draw-out type (DR)		▲			
TemPlug70 (PG)		—			
TemPlug45B (PG4)		—			
DIN rail mount		—			
Clip-in chassis mount		—			
Accessories (optional)		Symbol			
Externally mounted	Motor operator	M C	●		
	External operating handle	H B	●		
	Breaker-mounted Door-mounted (variable depth)	H P	●		
	Toggle extension	H A	●		
	Mechanical interlock ⁹ Slide type	M S	●		
	Toggle holder	H H	●		
	Toggle lock	H L	●		
	Terminal cover For front-connected	C F	●		
	For rear-connected and plug-in	C R	●		
	Interpole barrier	B A	● ③		
	Terminal block for lead	T F	●		
	Door flange	D F	●		
Standard specifications					
Trip button (color)		Yes (Red)			
Handle position indication (ON: Red, OFF: Green)		Yes			
Suitability for isolation		Yes			

Notes:

● : Standard. This configuration used unless otherwise specified.

○ : Optional standard. Specify when ordering.

▲ : Semi-standard.

● : "yes" or "available".

— : "no" or "not available".

③ : Line side interpole barriers are supplied as standard. (Front connection only)

⑨ : The mechanical interlock is not applicable to the draw-out type (DR).

²⁹ : Required for overcurrent protection. Rated conditional short-circuit current [I_{cc}] will be the same as Rated short-circuit breaking capacity of upstream breaker.

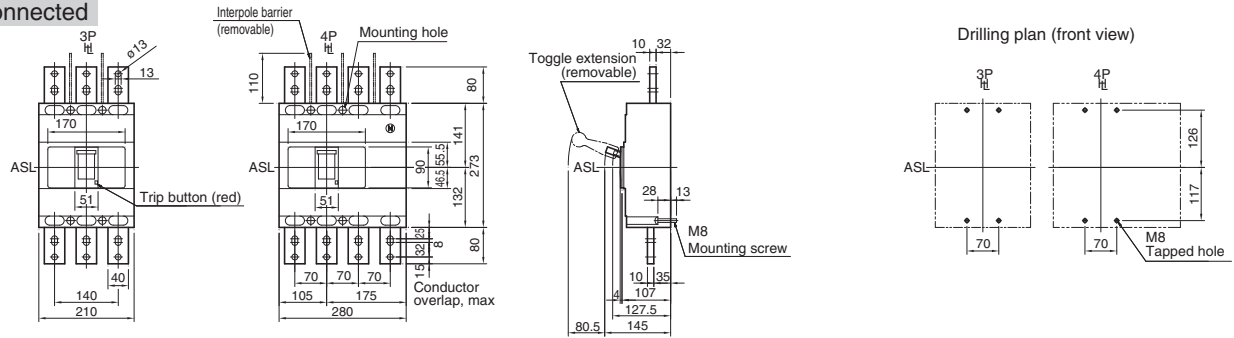
Combinations of Internally Mounted Accessories

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip	AX	SH	UV	SH	UV	AX	AL
	AL				AL					SH	UV
Δ+U											
	Toggle										

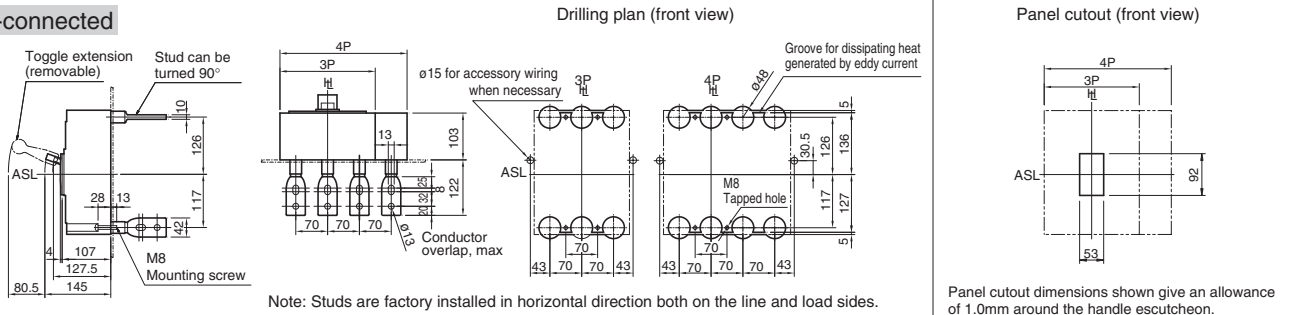
Outline dimensions (mm)

S800-NN

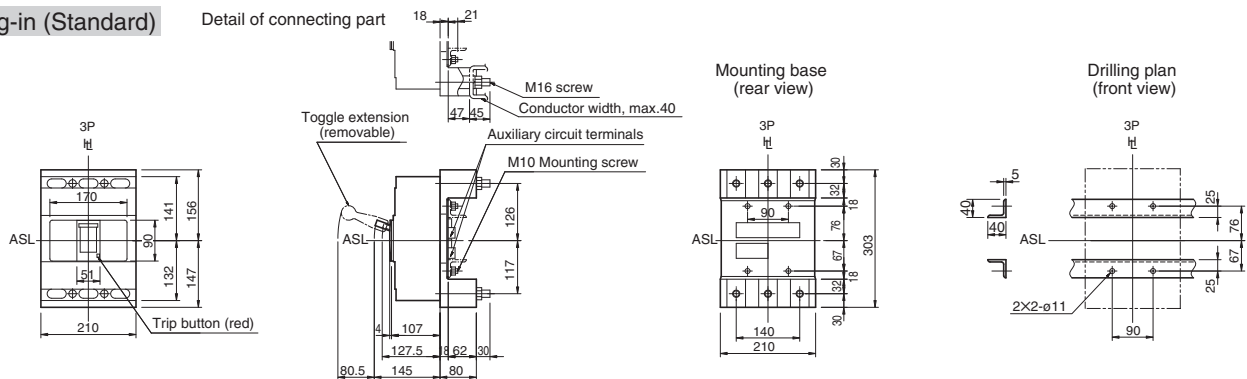
Front-connected



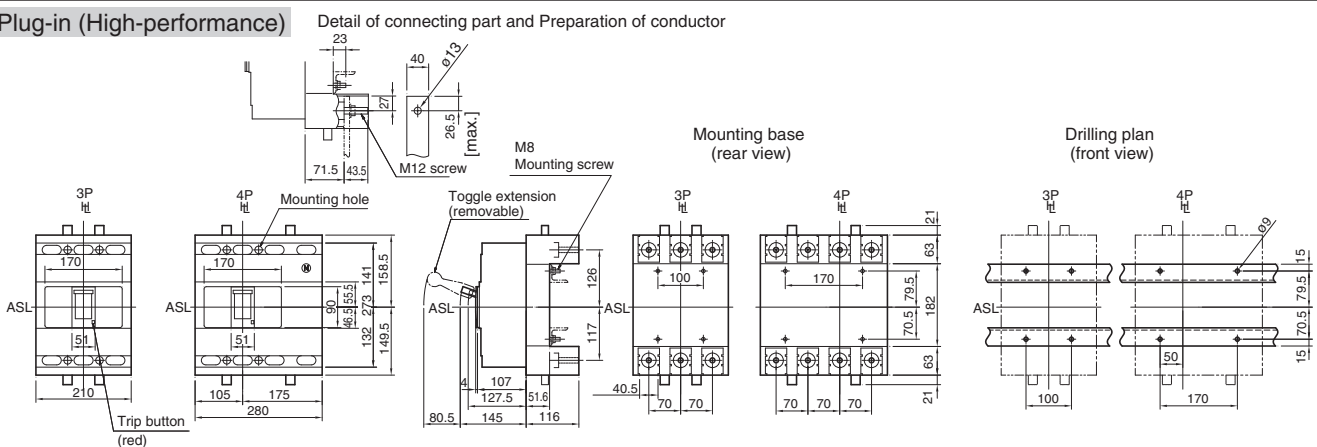
Rear-connected



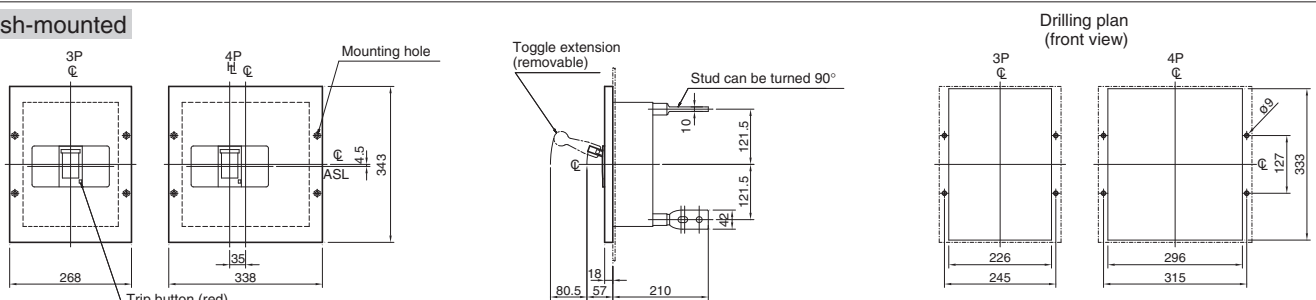
Plug-in (Standard)



Plug-in (High-performance)



Flush-mounted





7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(1250A Frame)

S1250-NN

Ratings and Specifications

Type		S1250-NN				
Number of poles		3	4			
Ratings						
Rated current, A		1250				
Rated insulation voltage [U_i] V		AC 690				
Rated operational voltage V		AC 690				
		DC 250				
Rated short circuit making capacity, kA peak		32				
Rated short time withstand current, kA		15 (0.3sec)				
Rated impulse withstand voltage [U_{imp}] kV		8				
Performance						
Utilization category		AC AC-23A				
IEC 60947-3		DC DC-22A				
Upstream breaker ²⁹		S1250-NE				
Weight (● marked standard type) kg		18.2	23.4			
Connections and Mountings						
Front-connected (FC)	Terminal screws	—				
	With extension bars	●				
Rear-connected (RC)	Bolt studs	—				
	Flat bar studs	○				
Plug-in (PM)	For switchboards	○				
	Standard (PMC)	—				
	High-performance (PMB)	—				
	For distribution boards (PMC)	—				
Flush-mounted (FP)	With flat bar studs	○				
Draw-out type (DR)		▲				
TemPlug70 (PG)		—				
TemPlug45B (PG4)		—				
DIN rail mount		—				
Clip-in chassis mount		—				
Accessories (optional)		Symbol				
Externally mounted	Motor operator	M C	●			
	External operating handle	H B	●			
	Breaker-mounted					
	Door-mounted (variable depth)	H P	●			
	Toggle extension	H A	● ²⁴			
	Mechanical interlock ⁹ Slide type	M S	●			
	Toggle holder	H H	●			
	Toggle lock	H L	●			
	Terminal cover	For front-connected	C F	●		
		For rear-connected and plug-in	C R	—		
	Interpole barrier	B A	● ³			
	Terminal block for lead	T F	●			
	Door flange	D F	●			
Standard specifications						
Trip button (color)		Yes (Red)				
Handle position indication (ON: Red, OFF: Green)		Yes				
Suitability for isolation		Yes				

Notes:

● : Standard. This configuration used unless otherwise specified.

○ : Optional standard. Specify when ordering.

▲ : Semi-standard.

● : "yes" or "available".

— : "no" or "not available".

³ : Line side interpole barriers are supplied as standard. (Front connection only)⁹ : The mechanical interlock is not applicable to the draw-out type (DR).²⁴ : One is supplied with every five breakers. Please specify if more are required.²⁹ : Required for overcurrent protection.

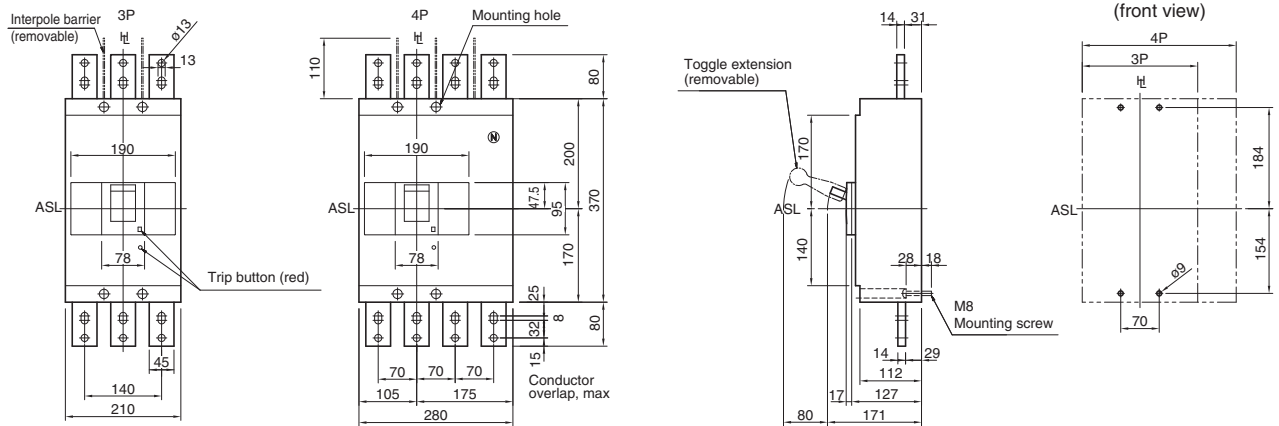
Combinations of Internally Mounted Accessories

Poles	3 Poles				4 Poles				5 Poles			
	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX	AX
Internally mounted accessories												
Auxiliary switch												
Alarm switch												
Shunt trip												
Under voltage trip												
Toggle												
Left pole												
Right pole												

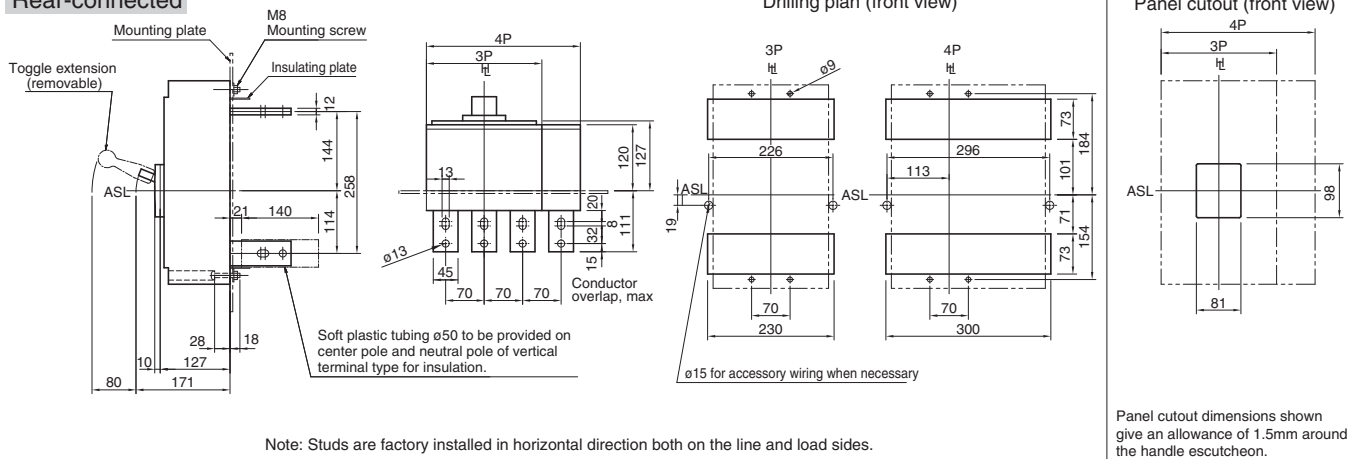
Outline dimensions (mm)

S1250-NN

Front-connected

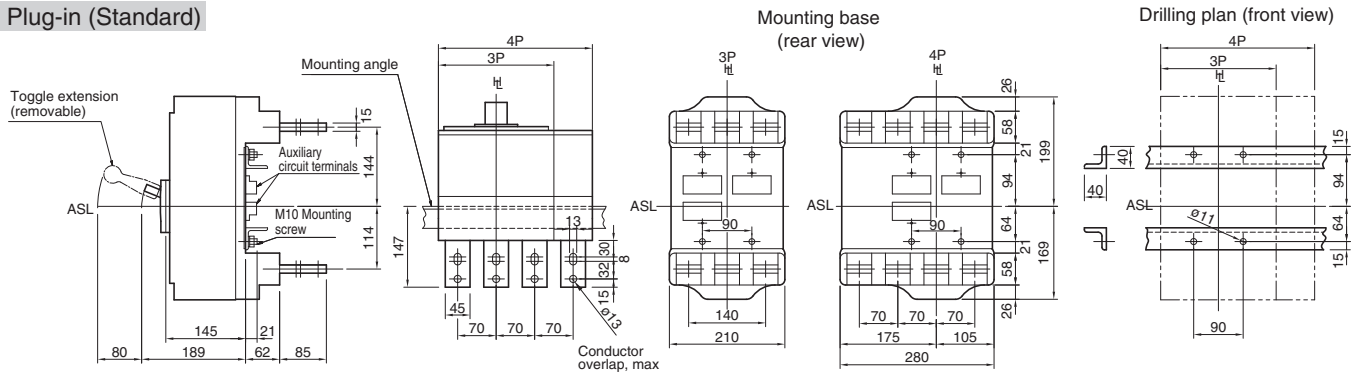


Rear-connected

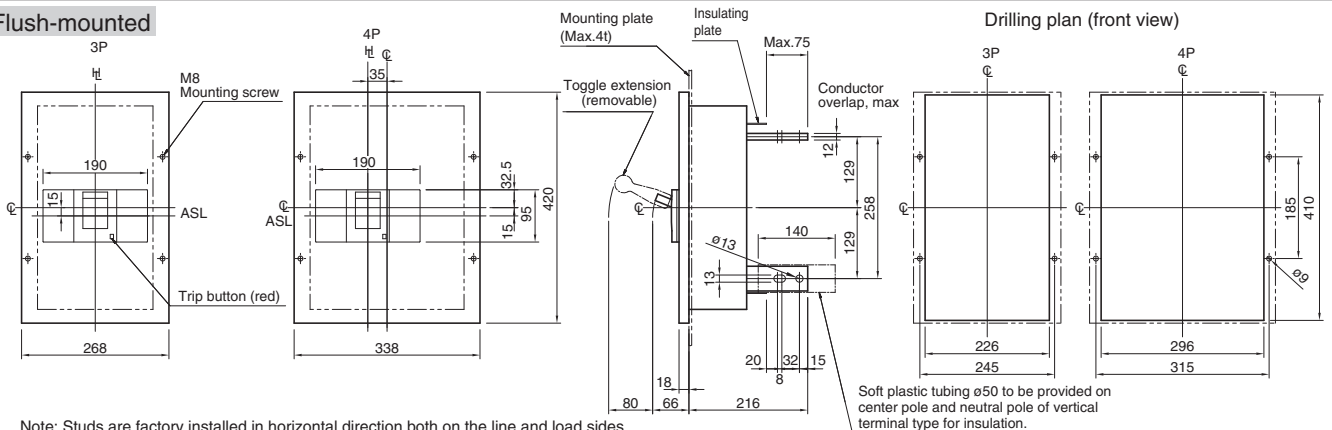


Note: Studs are factory installed in horizontal direction both on the line and load sides.

Plug-in (Standard)



Flush-mounted



Note: Studs are factory installed in horizontal direction both on the line and load sides.



7

Characteristics and Outline Dimensions *TemBreak2*

Molded Case Circuit Breakers

(1600A Frame)

S1600-NN

Ratings and Specifications

Type		S1600-NN				
Number of poles		3	4			
Ratings						
Rated current, A		1250				
Rated insulation voltage [U _i] V		AC 690				
Rated operational voltage V		AC 690				
		DC 250				
Rated short circuit making capacity, kA peak		45				
Rated short time withstand current, kA		20 (0.3sec)				
Rated impulse withstand voltage [U _{imp}] kV		8				
Performance						
Utilization category		AC AC-23A				
IEC 60947-3		DC DC-22A				
Upstream breaker ²³		S1600-NE				
Weight (● marked standard type) kg		24.9	32.9			
Connections and Mountings						
Front-connected (FC)	Terminal screws	—				
	With extension bars	○				
Rear-connected (RC)	Bolt studs	—				
	Flat bar studs	●				
Plug-in (PM)	For switchboards	—				
	Standard (PMC)	—				
	High-performance (PMB)	—				
	For distribution boards (PMC)	—				
Flush-mounted (FP)	With flat bar studs	○				
Draw-out type (DR)		○				
TemPlug70 (PG)		—				
TemPlug45B (PG4)		—				
DIN rail mount		—				
Clip-in chassis mount		—				
Accessories (optional)		Symbol				
Externally mounted	Motor operator	M C	●			
	External operating handle	H B	●			
	Breaker-mounted					
	Door-mounted (variable depth)	H P	●			
	Toggle extension	H A	● ²⁴			
	Mechanical interlock ⁹ Slide type	M S	●			
	Toggle holder	H H	●			
	Toggle lock	H L	●			
	Terminal cover	For front-connected	C F	—		
		For rear-connected and plug-in	C R	—		
	Interpole barrier	B A	● ³			
	Terminal block for lead	T F	●			
	Door flange	D F	●			
Standard specifications						
Trip button (color)		Yes (Red)				
Handle position indication (ON: Red, OFF: Green)		Yes				
Suitability for isolation		Yes				

Notes:

● : Standard. This configuration used unless otherwise specified.

○ : Optional standard. Specify when ordering.

● : "yes" or "available".

— : "no" or "not available".

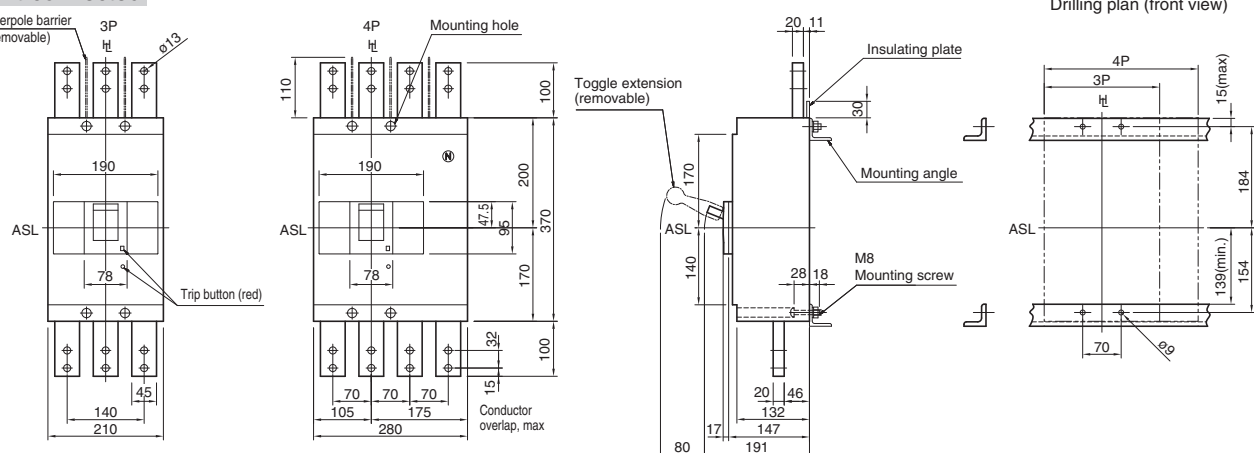
³ : Line side interpole barriers are supplied as standard. (Front connection only)⁹ : The mechanical interlock is not applicable to the draw-out type (DR).²⁴ : One is supplied with every five breakers. Please specify if more are required.²³ : Required for overcurrent protection.

Combinations of Internally Mounted Accessories

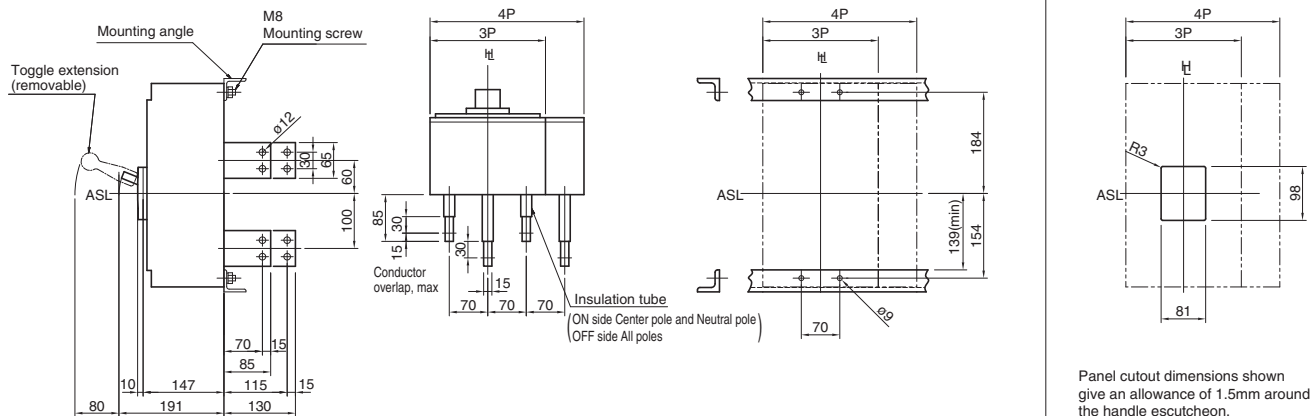
Poles	3 Poles				4 Poles				5 Poles			
	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX	AX
Internally mounted accessories												
Auxiliary switch												
Alarm switch												
Shunt trip												
Under voltage trip												
Toggle												
Left pole												
Right pole												

S1600-NN

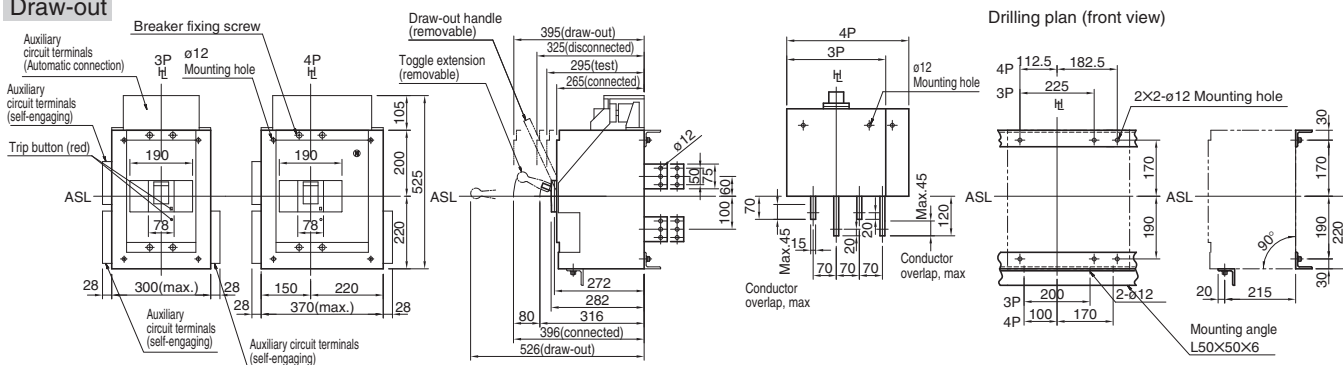
Front-connected



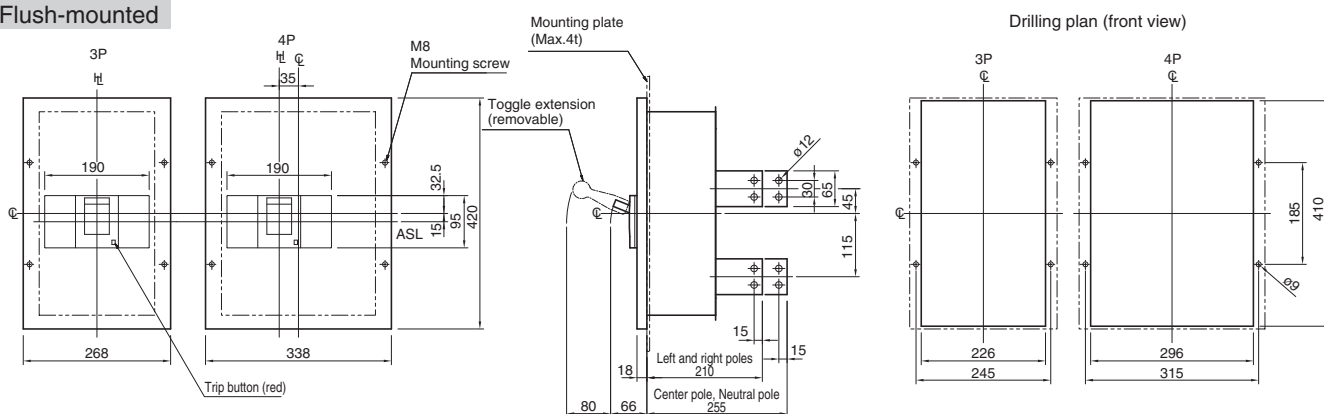
Rear-connected



Draw-out



Flush-mounted





7

Characteristics and Outline Dimensions **TemBreak**

Molded Case Circuit Breakers **Electronic** (1000A · 1200A Frame)

TL-1000NE, TL-1200NE

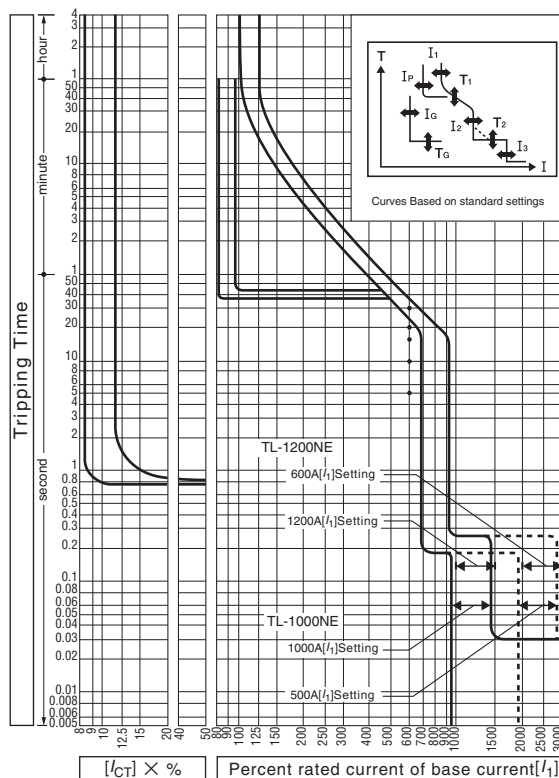
Ratings and Specifications

Type			TL-1000NE		TL-1200NE	
Number of poles			3	4	3	4
■ Ratings						
Rated current, A			(Adjustable)		(Adjustable)	
Calibrated at 45°C			500	800	600	1000
			600	900	700	1200
			700	1000	800	
Rated insulation voltage [U_i] V			AC 690		690	
Rated impulse withstand voltage [U_{imp}] kV			8		8	
■ Rated breaking capacity, kA						
NK	AC	690V	—		—	
$I_{cu}/I_{cs}(sym)$		450V	125/— ²³		125/— ²³	
		240V	—		—	
	DC	250V	—		—	
IEC60947-2	AC	690V	45/34		45/34	
$I_{cu}/I_{cs}(sym)$		500V	75/57		75/57	
		440V	125/65		125/65	
		415V	125/65		125/65	
		380V	125/65		125/65	
		240V	150/113		150/113	
	DC	250V	—		—	
		125V	—		—	
■ Rated short time withstand current, kA			15 (0.3sec)		15 (0.3sec)	
Weight (● marked standard type) kg			26.0	33.7	26.0	33.7
■ Connections and Mountings						
Front-connected (FC)	Terminal screws		—		—	
	With extension bars		●		●	
Rear-connected (RC)	Bolt studs		—		—	
	Flat bar studs		○		○	
Plug-in (PM)	For switchboards Standard (PMC)		○		○	
	High-performance (PMB)		—		—	
For distribution boards (PMC)			—		—	
Flush-mounted (FP) With flat bar studs			○		○	
Draw-out type (DR)			▲		▲	
TemPlug70 (PG)			—		—	
TemPlug45B (PG4)			—		—	
DIN rail mount			—		—	
Clip-in chassis mount			—		—	
■ Accessories (optional)			Symbol			
Externally mounted	Motor operator		M C		●	
	External operating handle	Breaker-mounted	H B		●	
		Door-mounted (variable depth)	H P		●	
	Toggle extension		H A		● ²⁴	
	Mechanical interlock ⁹ Slide type		M S		●	
	Toggle holder		H H		—	
	Toggle lock		H L		●	
	Terminal cover	For front-connected	C F		—	
		For rear-connected and plug-in	C R		—	
	Interpole barrier		B A		● ³	
	Terminal block for lead		T F		●	
	Door flange		D F		●	
■ Standard specifications						
Overcurrent trip mechanism			Electronic ¹⁶		Electronic ¹⁶	
Trip button (color)			Yes (Brown)		Yes (Brown)	
Handle position indication (ON: Red, OFF: Green)			Yes		Yes	
Suitability for isolation			Non		Non	
CE marking			Non		Non	

Notes:

● : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering. ▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available". ③ : Line side interpole barriers are supplied as standard. (Front connection only) ⑨ : The mechanical interlock is not applicable to the draw-out type (DR). ①⑥ : Optional pretrip alarm or ground fault trip function available on request. ②③ : at 460V AC. ②④ : One is supplied with every five breakers. Please specify if more are required. ⑥④ : Ground fault trip can not be equipped with Pre-trip alarm.

Time/Current characteristic curves



Overcurrent tripping characteristics

Type	TL-1000NE	TL-1200NE
CT rated current (A) (I_{CT})	1000	1250
Long time-delay pick-up current (A) (I_1)	500, 600, 700, 800, 900, 1000	600, 700, 800, 1000, 1200
Long time-delay time settings (S) (T_1)	(5–10–15–20–30) at (I_1) x 600% current Setting tolerance $\pm 20\%$	
Short time-delay pick-up current (A) (I_2)	(I_1) x 200, 400, 600, 800, 1000% Setting tolerance $\pm 15\%$	
Short time-delay time settings (S) (T_2)	Opening time (0.1, 0.15, 0.2, 0.25, 0.3) in the definite time-delay. Total clearing time is +50ms and resettable time –20ms for the time-delay settings	
Instantaneous trip pick-up current (A) (I_3)	Continuously adjustable from (I_{CT}) x 300 ~ 1200%. Setting tolerance $\pm 20\%$	
Pre-trip alarm pick-up current (A) (I_P) (optional)	(I_1) x 70, 80, 90, 100% Setting tolerance $\pm 10\%$	
Pre-trip alarm time setting (S) (T_P) (optional)	40 fixed definite time-delay. Setting tolerance $\pm 10\%$	
Ground fault trip pick-up current (A) (I_G) (optional) ⑥④	Continuously adjustable from (I_{CT}) x 10 ~ 40% Setting tolerance $\pm 15\%$	
Ground fault trip-time setting (S) (T_G) (optional) ⑥④	Opening time (0.1, 0.2, 0.3, 0.4, 0.8) in the definite time-delay. Total clearing time is +50ms and resettable time –20ms for the time-delay settings	

NOTE: The underlined values will be applied as standard ratings unless otherwise specified when ordering

Combinations of Internally Mounted Accessories

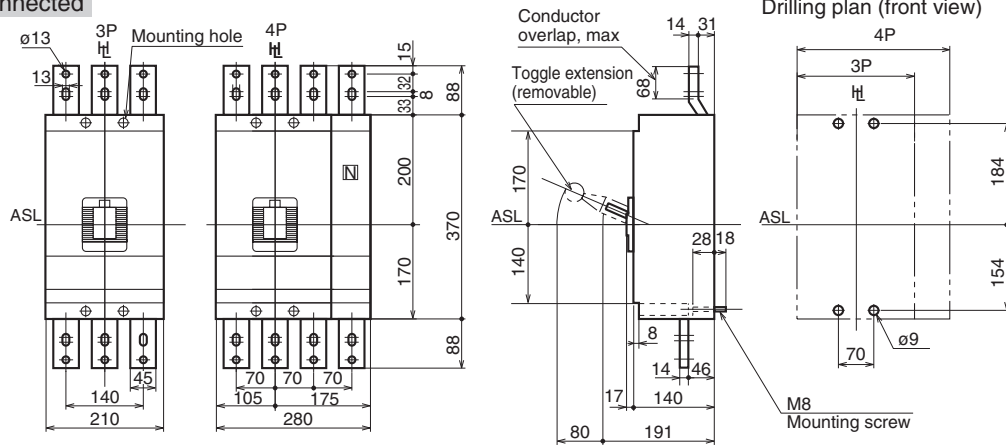
Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
Auxiliary switch	□	□	□	□	□	□	□	□	□	□	□
Alarm switch	□	□	□	□	□	□	□	□	□	□	□
Shunt trip	□	□	□	□	□	□	□	□	□	□	□
Under voltage trip *	□	□	□	□	□	□	□	□	□	□	□
Toggle	□	□	□	□	□	□	□	□	□	□	□

NOTE: * The UV Controller is installed externally when provided with AC UV.

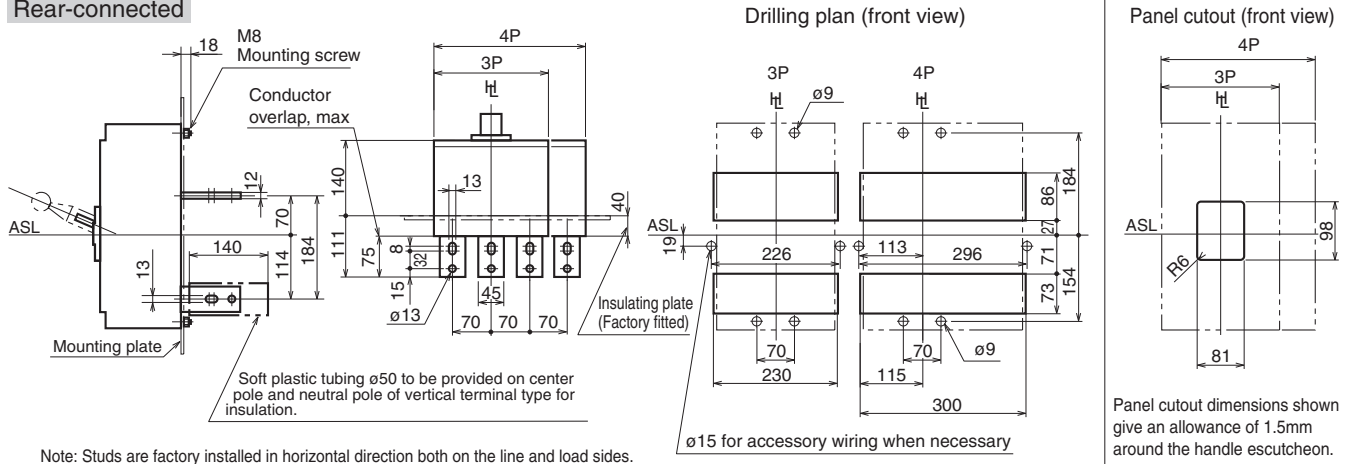
Outline dimensions (mm)

TL-1000NE, TL-1200NE

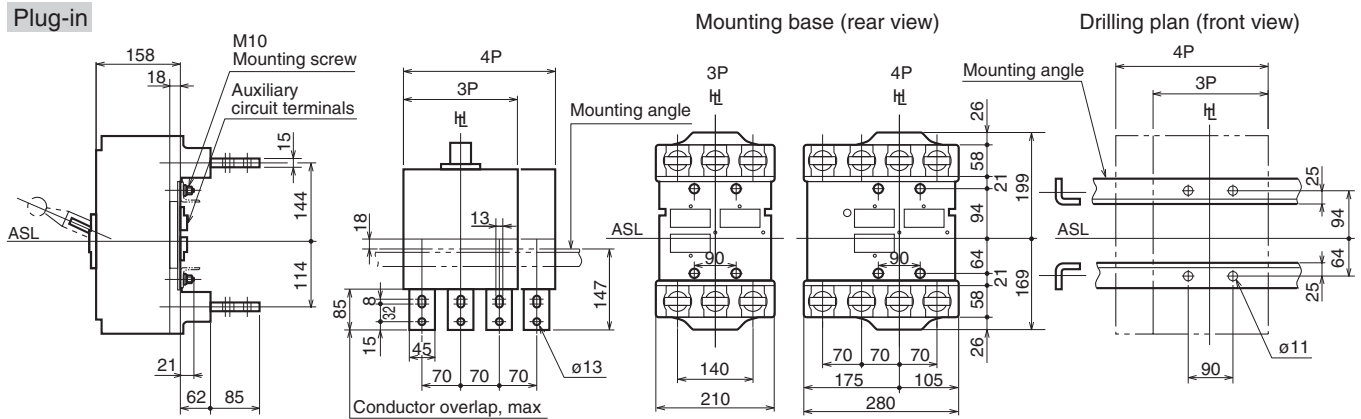
Front-connected



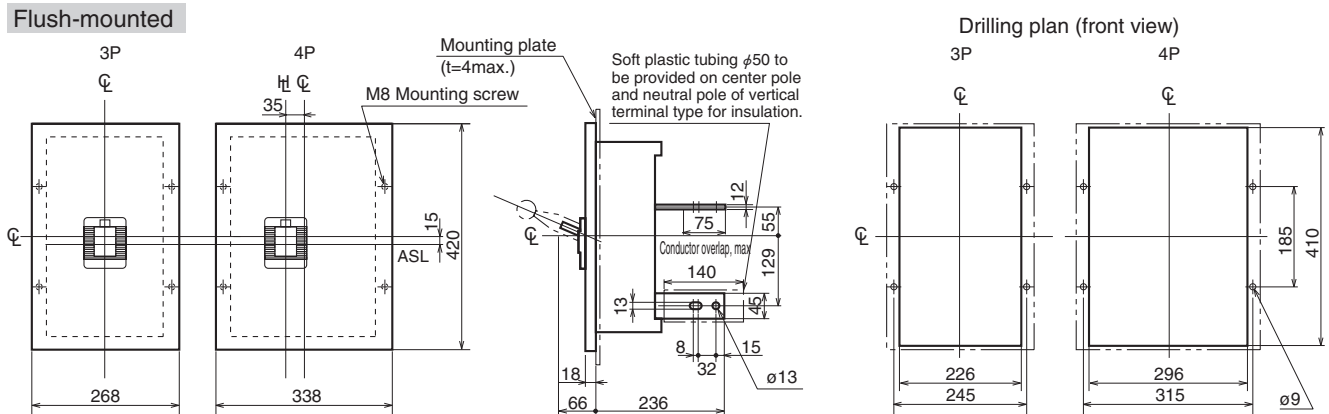
Rear-connected



Plug-in



Flush-mounted



Note: Studs are factory installed in horizontal direction both on the line and load sides.



Molded Case Circuit Breakers **Electronic** (2000A Frame)

XS2000NE

Time/Current characteristic curves

Figure 1 is a graph showing Tripping Time (Y-axis, logarithmic scale from 0.005 to 4 hours) versus Percent rated current of base current (I/I_b) (X-axis, linear scale from 50 to 3000%). The graph includes curves for standard settings and curves based on standard settings. An inset diagram shows the tripping sequence: $I_1, T_1, I_2, T_2, I_3, T_3, I_4, T_4, I_5, T_5, I_6, T_6, I_7, T_7, I_8, T_8, I_9, T_9, I_{10}, T_{10}, I_{11}, T_{11}, I_{12}, T_{12}, I_{13}, T_{13}, I_{14}, T_{14}, I_{15}, T_{15}, I_{16}, T_{16}, I_{17}, T_{17}, I_{18}, T_{18}, I_{19}, T_{19}, I_{20}, T_{20}, I_{21}, T_{21}, I_{22}, T_{22}, I_{23}, T_{23}, I_{24}, T_{24}, I_{25}, T_{25}, I_{26}, T_{26}, I_{27}, T_{27}, I_{28}, T_{28}, I_{29}, T_{29}, I_{30}, T_{30}, I_{31}, T_{31}, I_{32}, T_{32}, I_{33}, T_{33}, I_{34}, T_{34}, I_{35}, T_{35}, I_{36}, T_{36}, I_{37}, T_{37}, I_{38}, T_{38}, I_{39}, T_{39}, I_{40}, T_{40}, I_{41}, T_{41}, I_{42}, T_{42}, I_{43}, T_{43}, I_{44}, T_{44}, I_{45}, T_{45}, I_{46}, T_{46}, I_{47}, T_{47}, I_{48}, T_{48}, I_{49}, T_{49}, I_{50}, T_{50}, I_{51}, T_{51}, I_{52}, T_{52}, I_{53}, T_{53}, I_{54}, T_{54}, I_{55}, T_{55}, I_{56}, T_{56}, I_{57}, T_{57}, I_{58}, T_{58}, I_{59}, T_{59}, I_{60}, T_{60}, I_{61}, T_{61}, I_{62}, T_{62}, I_{63}, T_{63}, I_{64}, T_{64}, I_{65}, T_{65}, I_{66}, T_{66}, I_{67}, T_{67}, I_{68}, T_{68}, I_{69}, T_{69}, I_{70}, T_{70}, I_{71}, T_{71}, I_{72}, T_{72}, I_{73}, T_{73}, I_{74}, T_{74}, I_{75}, T_{75}, I_{76}, T_{76}, I_{77}, T_{77}, I_{78}, T_{78}, I_{79}, T_{79}, I_{80}, T_{80}, I_{81}, T_{81}, I_{82}, T_{82}, I_{83}, T_{83}, I_{84}, T_{84}, I_{85}, T_{85}, I_{86}, T_{86}, I_{87}, T_{87}, I_{88}, T_{88}, I_{89}, T_{89}, I_{90}, T_{90}, I_{91}, T_{91}, I_{92}, T_{92}, I_{93}, T_{93}, I_{94}, T_{94}, I_{95}, T_{95}, I_{96}, T_{96}, I_{97}, T_{97}, I_{98}, T_{98}, I_{99}, T_{99}, I_{100}, T_{100}.$

CT rated current (A) (I_{CT})	2000
Long time-delay pick-up current (A) (I_1)	1000, 1200, 1400, 1600, 1800, 2000
Long time-delay time settings (S) (T_1)	(5–10–15–20–30) at (I_1) x 600% current Setting tolerance $\pm 20\%$
Short time-delay pick-up current (A) (I_2)	(I_1) x 200, 400, 600, 800, 1000% Setting tolerance $\pm 15\%$
Short time-delay time settings (S) (T_2)	Opening time (0.1, 0.15, <u>0.2</u> , 0.25, 0.3) in the definite time-delay. Total clearing time is +50ms and resettable time –20ms for the time-delay settings
Instantaneous trip pick-up current (A) (I_3)	Continuously adjustable from (I_{CT}) x 300 ~ 1200%. Setting tolerance $\pm 20\%$
Pre-trip alarm pick-up current (A) (I_P) (optional)	(I_1) x 70, 80, <u>90</u> , 100% Setting tolerance $\pm 10\%$
Pre-trip alarm time setting (S) (T_P) (optional)	40 fixed definite time-delay. Setting tolerance $\pm 10\%$
Ground fault trip pick-up current (A) (I_G) (optional) ⑥4	Continuously adjustable from (I_{CT}) x <u>10</u> ~ 40% Setting tolerance $\pm 15\%$
Ground fault trip-time setting (S) (T_G) (optional) ⑥4	Opening time (0.1, 0.2, 0.3, 0.4, <u>0.8</u>) in the definite time-delay. Total clearing time is +50ms and resettable time –20ms for the time-delay settings

Notes:

- ① : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering. ● : "yes" or "available". — : "no" or "not available". ② : Supplied as standard.
- ⑨ : The mechanical interlock is not applicable to the draw-out type (DR). ⑬ : at 500V AC.
- ⑯ : Optional pretrip alarm or ground fault trip function available on request.
- ⑳ : Ground fault trip can not be equipped with Pre-trip alarm.

Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX AL SH	AX AL UV
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip *							
4+3											

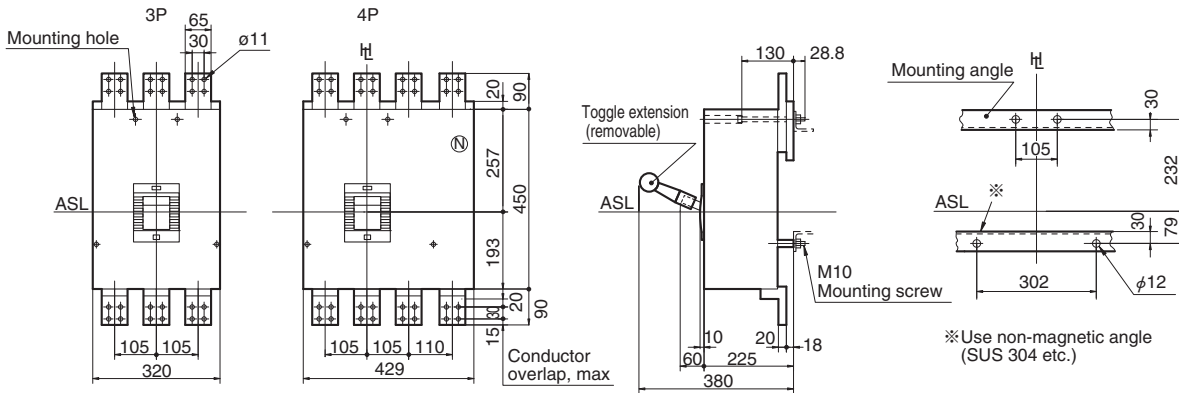
Toggle Left pole
 Right pole

NOTE: * The UV Controller is installed externally when provided with AC UV.

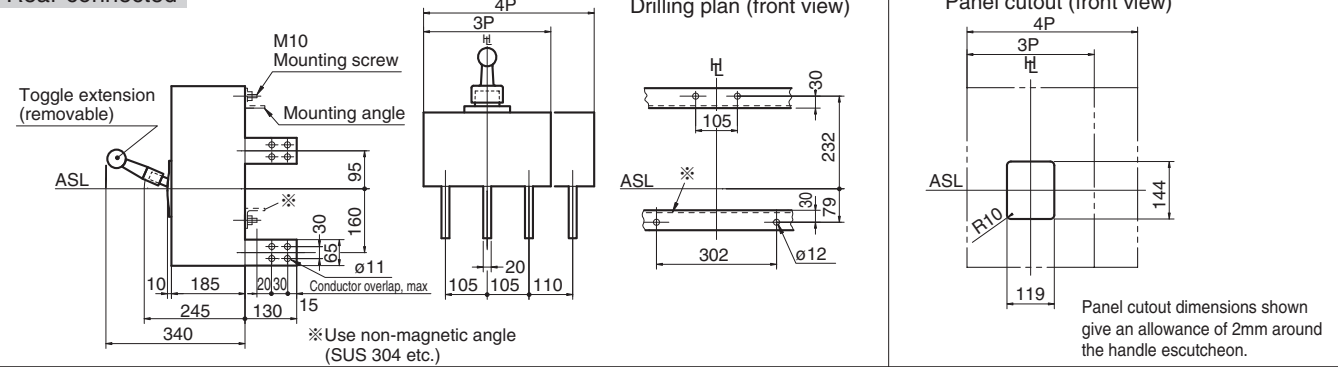
Outline dimensions (mm)

XS2000NE

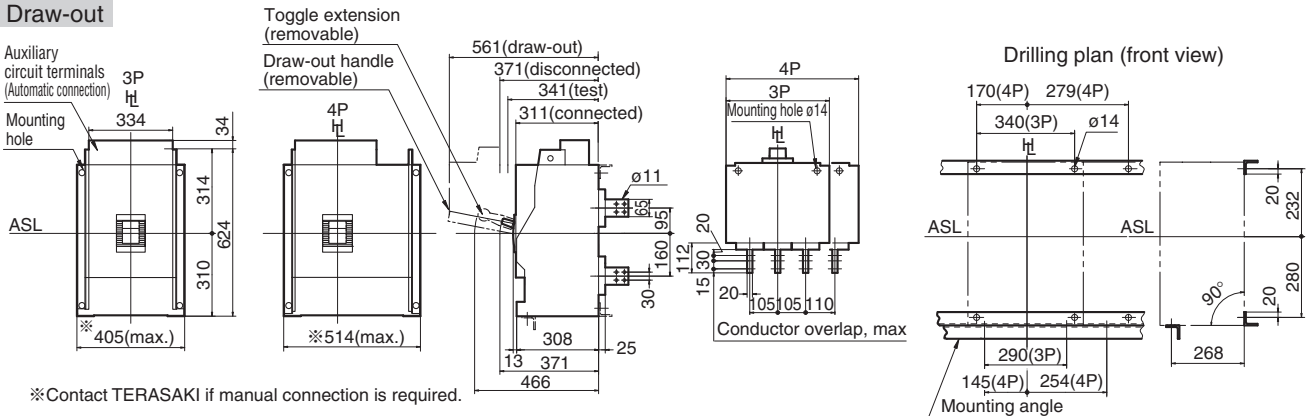
Front-connected



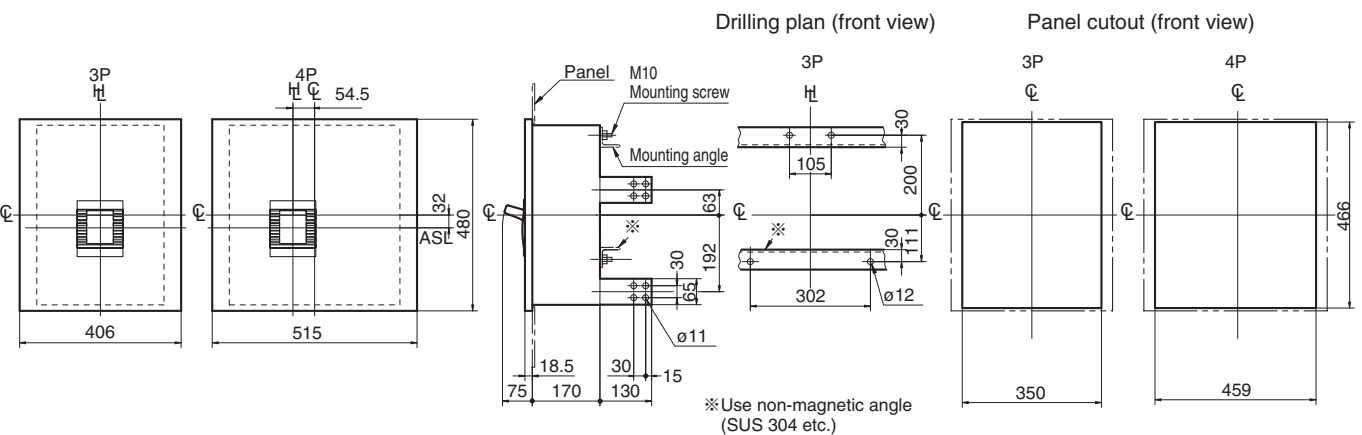
Rear-connected



Draw-out



Flush-mounted


7
Characteristics and Outline Dimensions



7

Characteristics and Outline Dimensions **TemBreak**

Molded Case Circuit Breakers

(2000A Frame)

XS2000NN

Ratings and Specifications

Type		XS2000NN				
Number of poles		3	4			
■ Ratings						
Rated current, A		2000				
Rated insulation voltage [U_i] V		AC 690				
Rated operational voltage V		AC 690				
		DC 250				
Rated short circuit making capacity, kA peak		90				
Rated short time withstand current, kA		35 (0.3sec)				
Rated impulse withstand voltage [U_{imp}] kV		8				
■ Performance						
Max switching current A		AC 12000				
IEC 60947-2 Ann.L CBI-Y		DC 5000				
Endurance Number of operating cycles with current		500				
Number of operating cycles without current		2500				
Upstream breaker (OCPD) ②		XS2000NE				
Weight (● marked standard type) kg		51.8 64.8				
■ Connections and Mountings						
Front-connected (FC)	Terminal screws	—				
	With extension bars	○				
Rear-connected (RC)	Bolt studs	—				
	Flat bar studs	●				
Plug-in (PM)	For switchboards	—				
	Standard (PMC)	—				
	High-performance (PMB)	—				
For distribution boards (PMC)		—				
Flush-mounted (FP) With bolt studs		○				
Draw-out type (DR)		○				
TemPlug70 (PG)		—				
TemPlug45B (PG4)		—				
DIN rail mount		—				
Clip-in chassis mount		—				
■ Accessories (optional)		Symbol				
Externally mounted	Motor operator	M C	●			
	External operating handle	Breaker-mounted H B	—			
	Door-mounted (variable depth) H P	● ⑬				
	Toggle extension	H A	● ②			
	Mechanical interlock⑨ Slide type	M S	●			
	Toggle holder	H H	●			
	Toggle lock	H L	—			
	Terminal cover	For front-connected	—			
		For rear-connected and plug-in	C R			
	Interpole barrier	B A	—			
	Terminal block for lead	T F	●			
	Door flange	D F	●			
■ Standard specifications						
Trip button (color)		Yes (Red)				
Handle position indication (ON: Red, OFF: Green)		Yes				
Suitability for isolation		Non				
CE marking		Non				

Notes:

- : Standard. This configuration used unless otherwise specified.
- : Optional standard. Specify when ordering.
- : "yes" or "available".
- : "no" or "not available".
- ② : Supplied as standard.
- ⑨ : The mechanical interlock is not applicable to the draw-out type (DR).
- ②⑨ : Required for overcurrent protection.
- ⑬ : Fixed depth, not adjustable.

Combinations of Internally Mounted Accessories

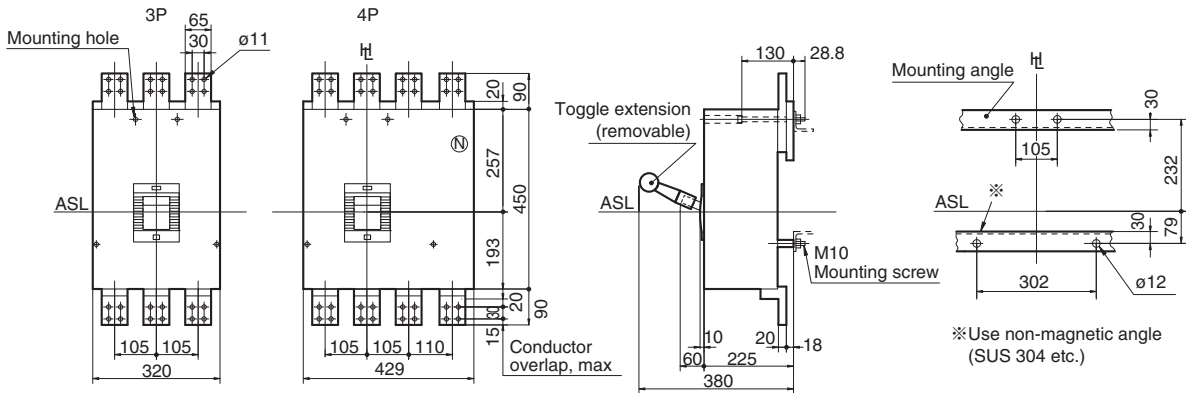
Poles	AX	AL	SH	UV	AX	AX	AX	AL	AL	AX	AX
	Auxiliary switch	Alarm switch	Shunt trip	Under voltage trip *	AX	SH	UV	SH	UV	AX	AL
	AL				SH	UV				SH	UV
Draw-out											
Toggle	Left pole	Right pole									

NOTE: * The UV Controller is installed externally when provided with AC UV.

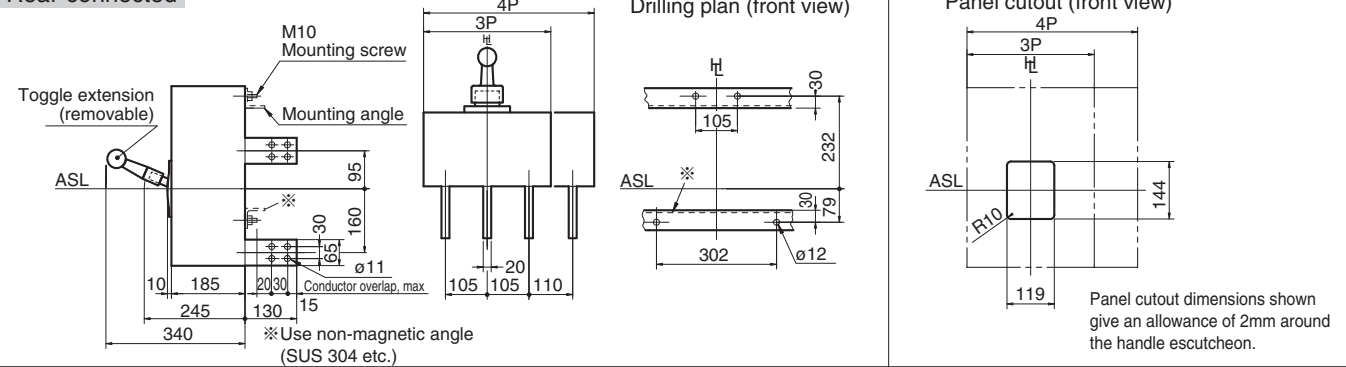
Outline dimensions (mm)

XS2000NN

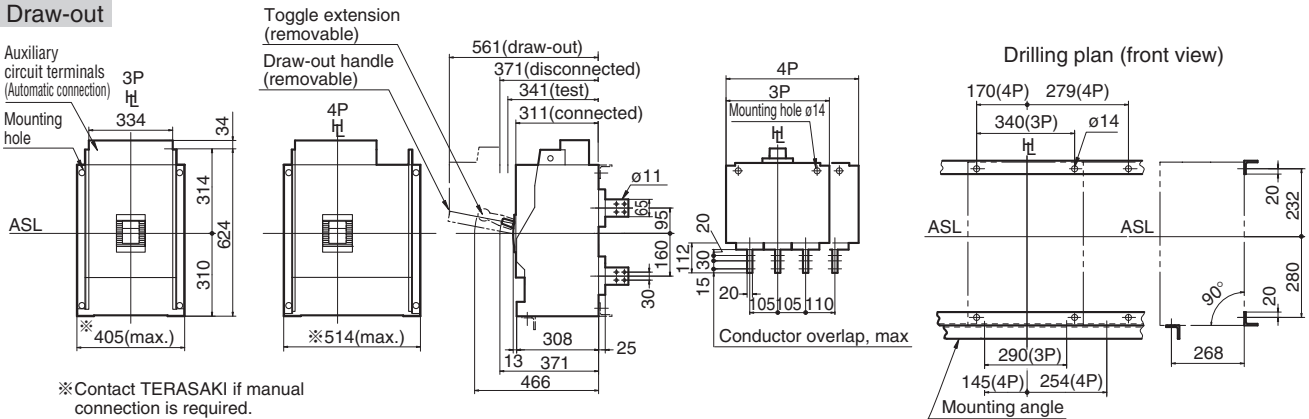
Front-connected



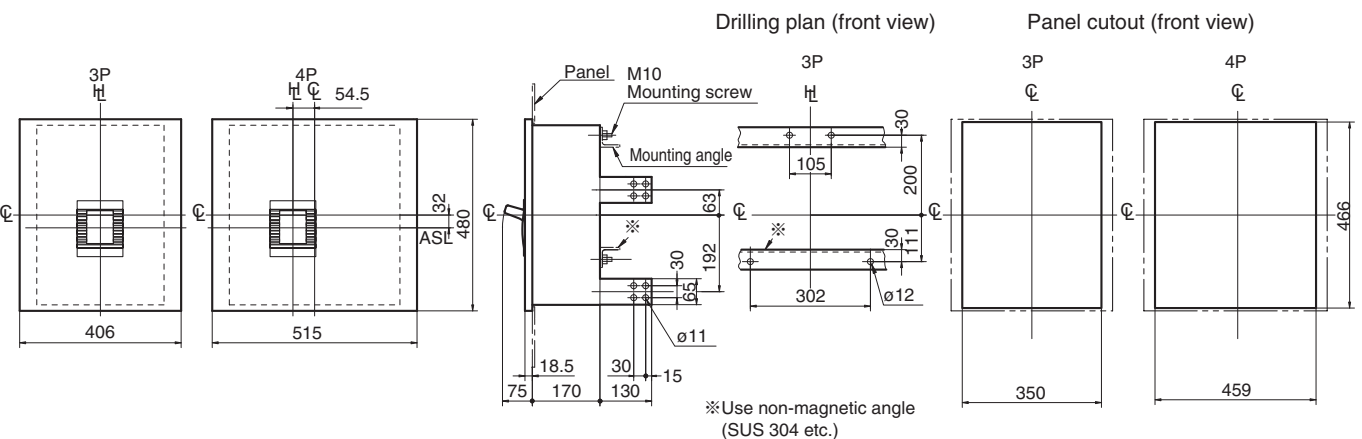
Rear-connected



Draw-out



Flush-mounted





7

Characteristics and Outline Dimensions

Molded Case Circuit Breakers

(50A Frame)

TB-5S

Ratings and Specifications

Type

Number of poles

■ Ratings

Rated current, A

Calibrated at 45°C

Rated voltage V

AC

DC

■ Rated breaking capacity, kA

NK AC 250 V

(sym) 125 V

DC 125 V

Weight kg

■ Connecting scheme

Front-connected both on the line and load sides

Plug-in on the line side and front-connected on the load side

Plug-in both on the line and load sides

■ Mounting scheme (optional)

Clip-in chassis

Mounting base for single-row installation

Mounting base for branched-into-dual-rows installation

■ Accessories (optional)

Symbol

Toggle holder

H H

Toggle lock

H L

Toggle cap

H C

Interpole barrier

B A

■ Standard specifications

Overcurrent trip mechanism

Trip button (color)

Handle position indication (ON: Red, OFF: Green)

Suitability for isolation

CE marking

Notes:

● : "yes" or "available".

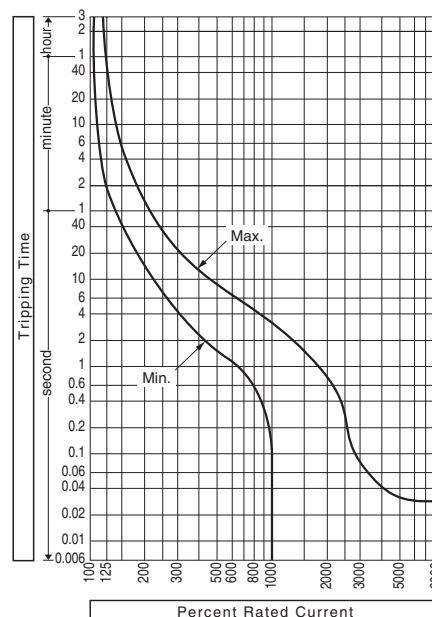
— : "no" or "not available".

④ : 2.5kA for 10A.

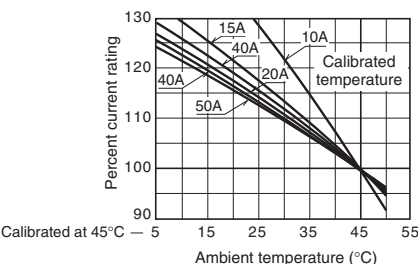
TB-5S

1	2	3	4
10	30		30
15	40		50
20	50		
265	460	460	460
125	125	—	—
—	5 ④	—	—
—	42	—	—
—	5	—	—
0.16	0.34	0.5	0.66

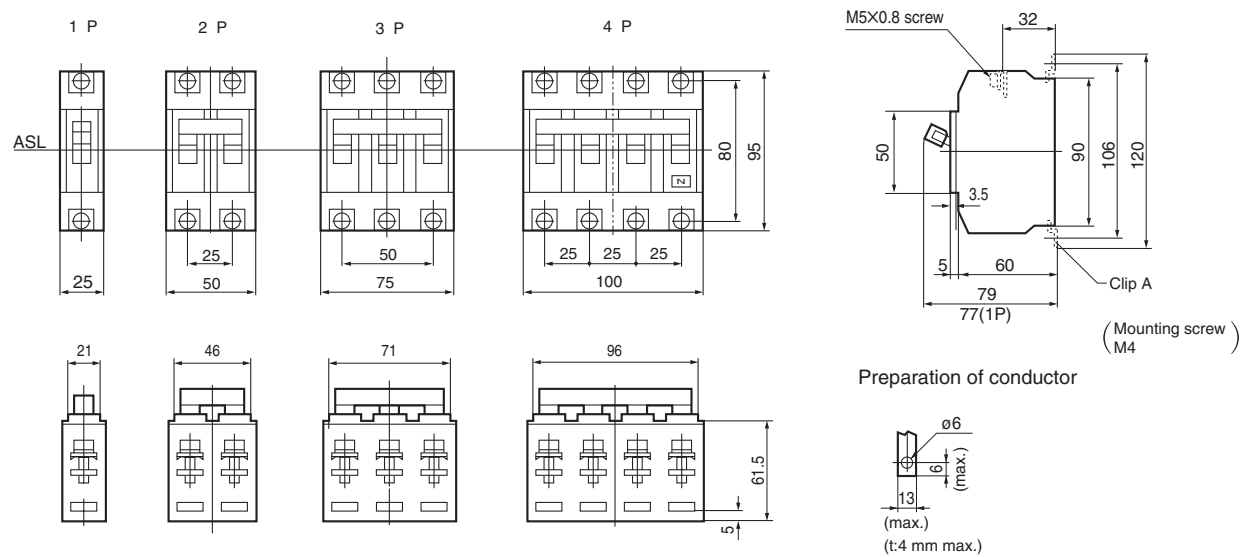
Time/Current characteristic curves



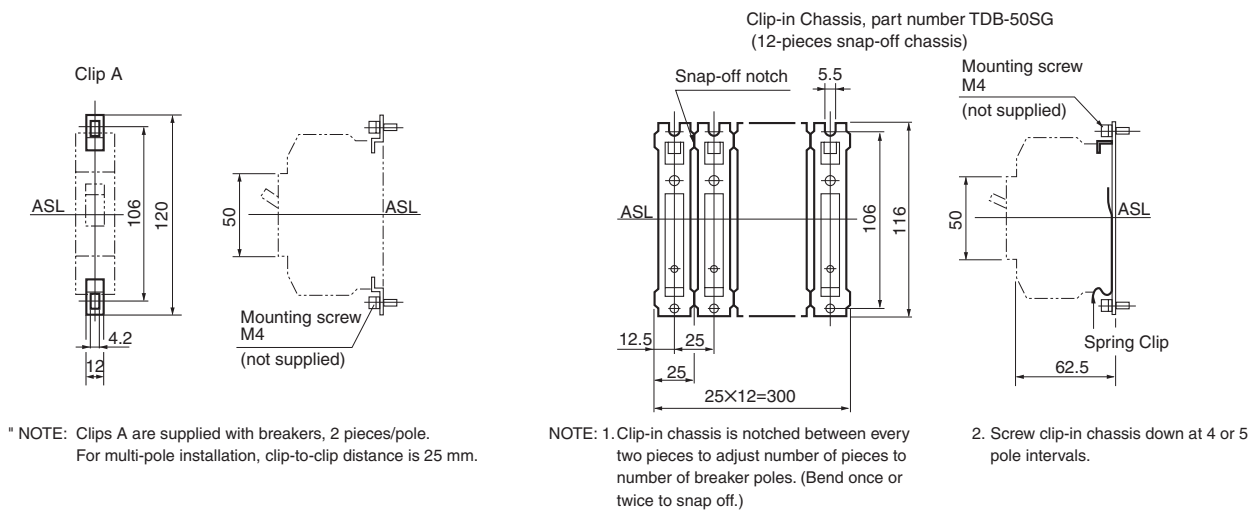
Ambient Compensating Curves



Outline dimensions (mm) TB-5S



Clip and Clip-in chassis





7

Characteristics and Outline Dimensions

Molded Case Circuit Breakers

(50A Frame)

TB-5P

Ratings and Specifications

Type		TB-5P				
Number of poles		1	2			
Ratings						
Rated current, A		10	30			
Calibrated at 45°C		15	40			
		20	50			
Rated voltage V		265	460			
		—	125			
AC						
DC						
Rated breaking capacity, kA						
NK		—	5 (44)			
(sym)		—	42			
AC 250 V		—	5			
DC 125 V		—	—			
Weight kg		0.13	0.28			
Connecting scheme						
Front-connected both on the line and load sides		—				
Plug-in on the line side and front-connected on the load side		●				
Plug-in both on the line and load sides		—				
Mounting scheme (optional)						
Clip-in chassis		—				
Mounting base for single-row installation		● (47)				
Mounting base for branched-into-dual-rows installation		● (47)				
Accessories (optional)		Symbol				
Toggle holder		H H	●			
Toggle lock		H L	●	—		
Toggle cap		H C	●	—		
Interpole barrier		B A	—	●		
Standard specifications						
Overcurrent trip mechanism		Thermal-magnetic				
Trip button (color)		Non				
Handle position indication (ON: Red, OFF: Green)		Non				
Suitability for isolation		Non				
CE marking		Non				

Notes:

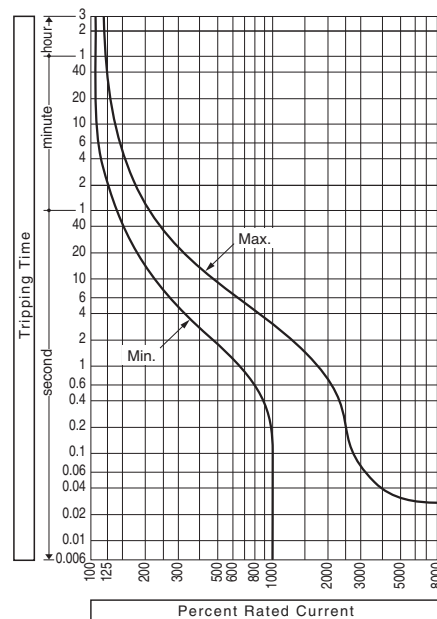
● : "yes" or "available".

— : "no" or "not available".

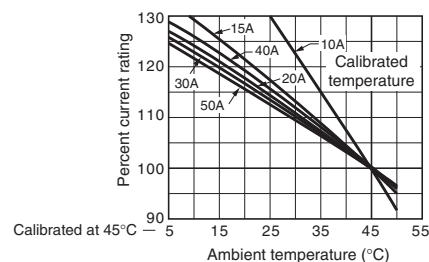
(44) : 2.5kA for 10A.

(47) : Specify the branch bars when ordering. See page 7-86, 87 for details.

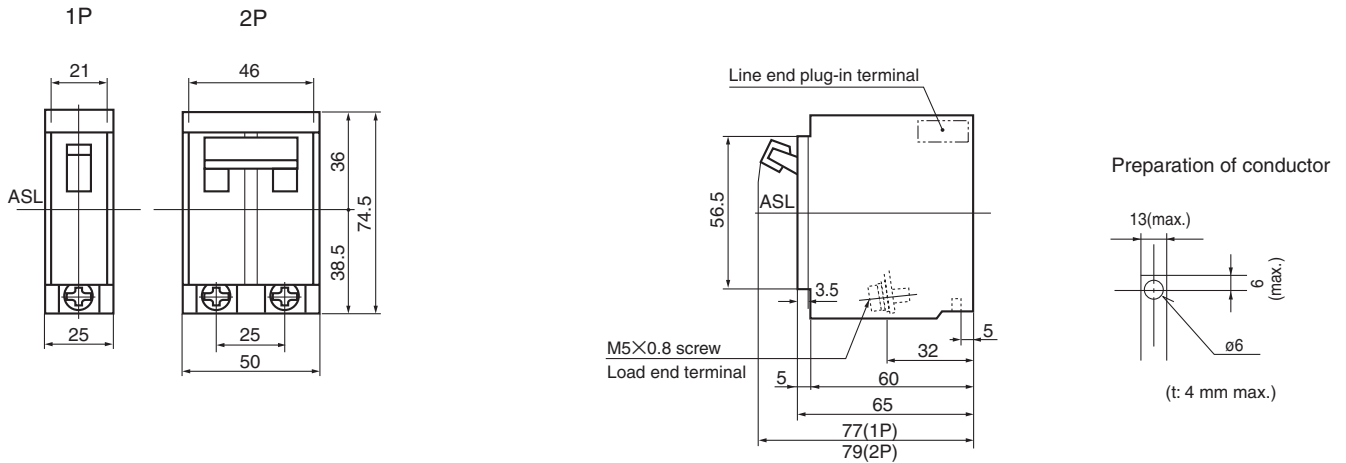
Time/Current characteristic curves



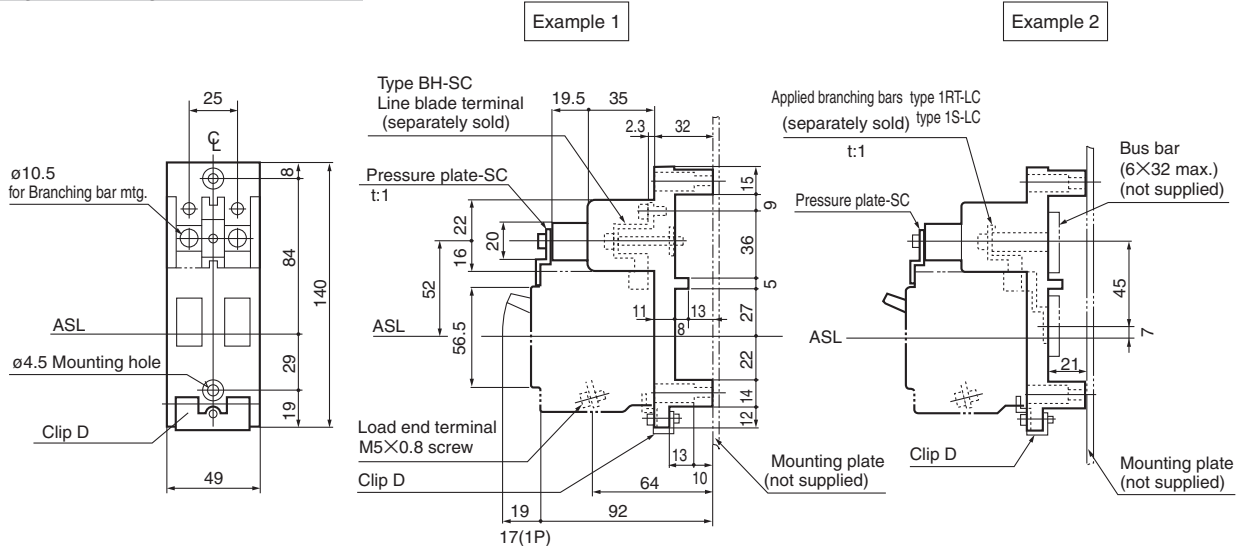
Ambient Compensating Curves



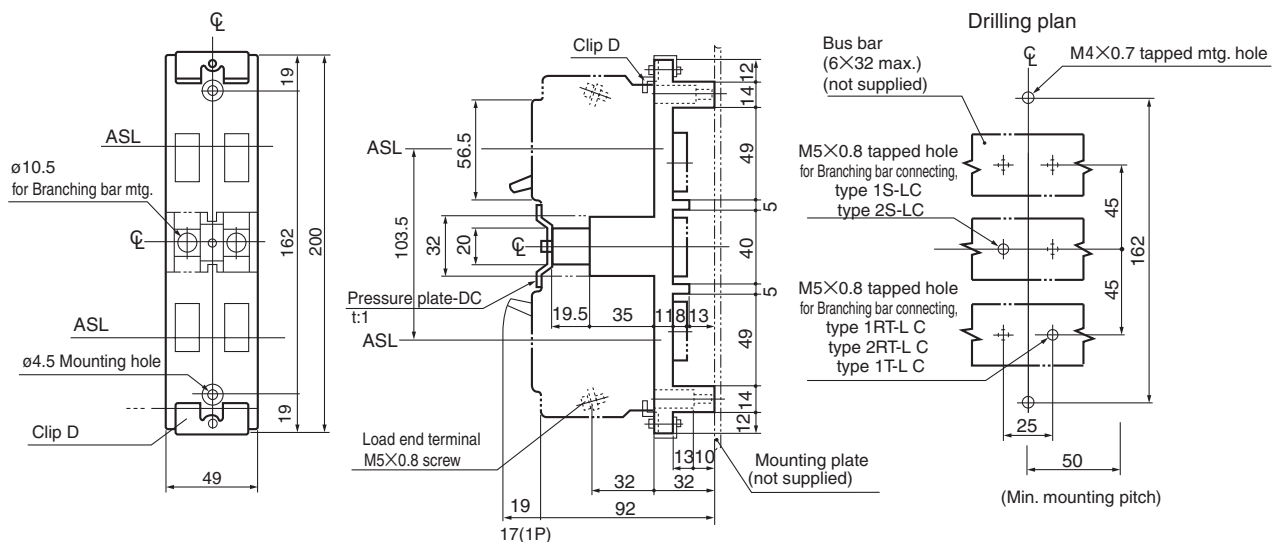
Outline dimensions (mm)

TB-5P


Single mounting base-TDB-50PC



Double mounting base-TDA-50PC





7

Characteristics and Outline Dimensions

Molded Case Circuit Breakers

(50A Frame)

TB-5D

Ratings and Specifications

Type		TB-5D			
Number of poles		2			
Ratings					
Rated current, A		10 30			
Calibrated at 45°C		15 40			
		20 50			
Rated voltage V		250			
		125			
AC					
DC					
Rated breaking capacity, kA					
NK		5 ④④			
(sym)		42			
AC 250 V		5			
125 V		0.28			
DC 125 V					
Weight kg					
Connecting scheme					
Front-connected both on the line and load sides		—			
Plug-in on the line side and front-connected on the load side		—			
Plug-in both on the line and load sides		●			
Mounting scheme (optional)					
Clip-in chassis		—			
Mounting base for single-row installation		● ④⑦			
Mounting base for branched-into-dual-rows installation		● ④⑦			
Accessories (optional)		Symbol			
Toggle holder		H H	●		
Toggle lock		H L	—		
Toggle cap		H C	—		
Interpole barrier		B A	●		
Standard specifications					
Overcurrent trip mechanism		Thermal-magnetic			
Trip button (color)		Non			
Handle position indication (ON: Red, OFF: Green)		Non			
Suitability for isolation		Non			
CE marking		Non			

Notes:

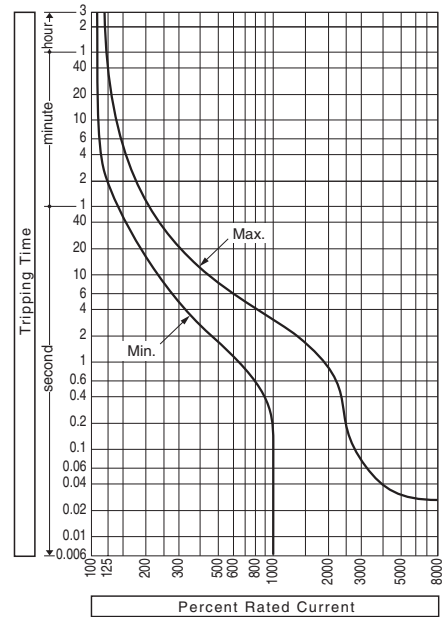
● : "yes" or "available".

— : "no" or "not available".

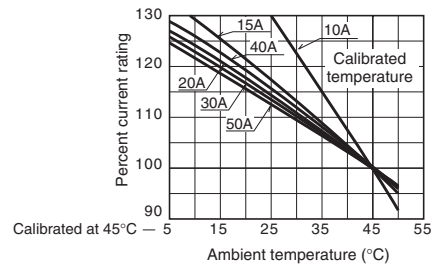
④④ : 2.5kA for 10A.

④⑦ : Specify the branch bars when ordering. See page 7-86, 87 for details.

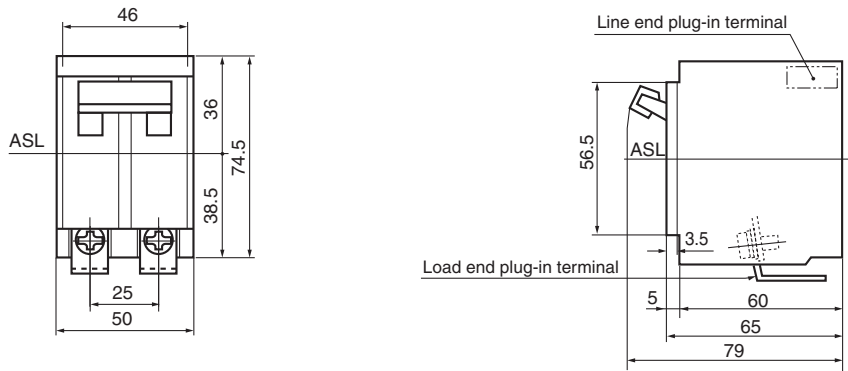
Time/Current characteristic curves



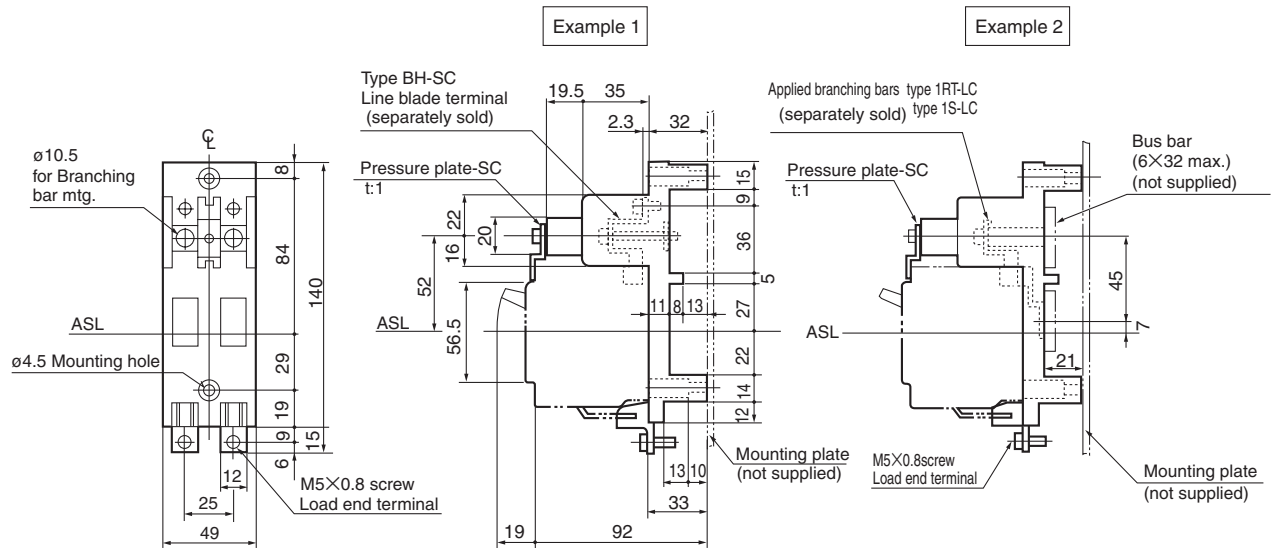
Ambient Compensating Curves



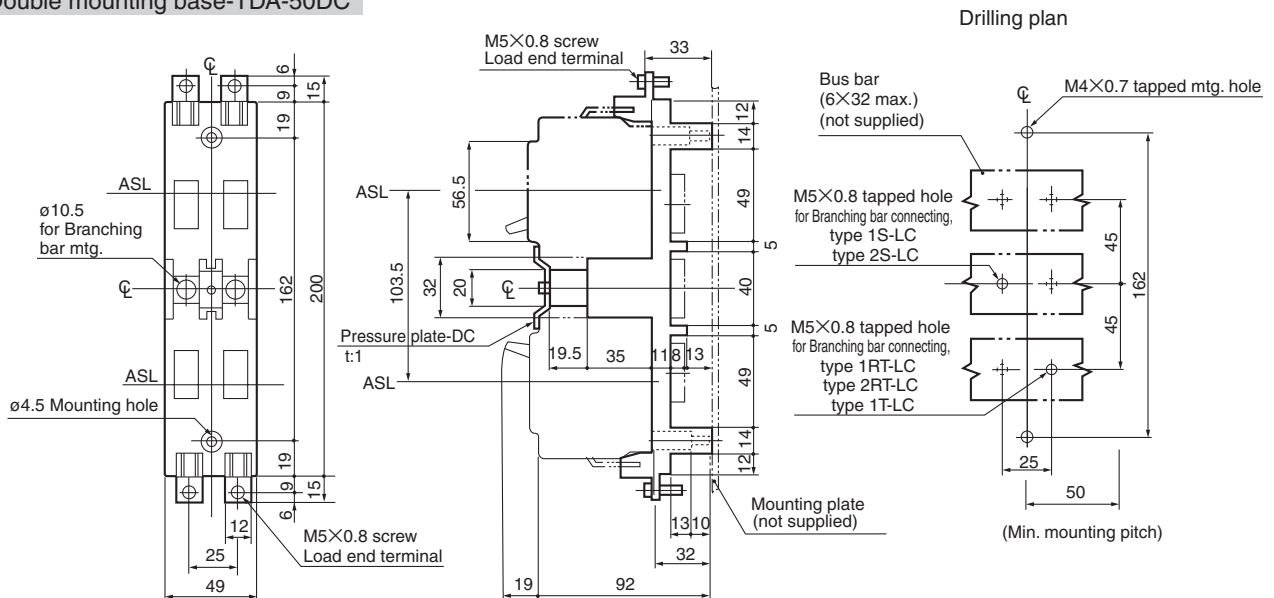
Outline dimensions (mm)

TB-5D


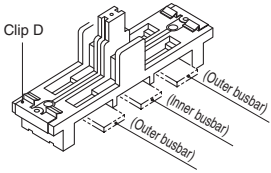
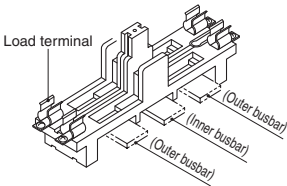
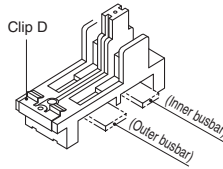
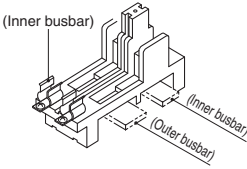
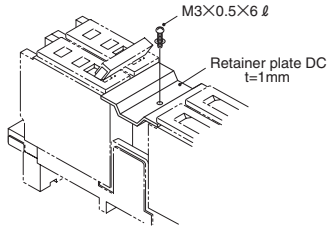
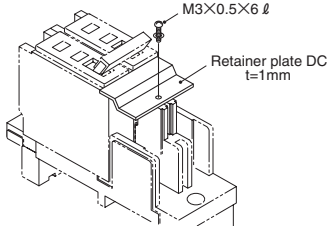
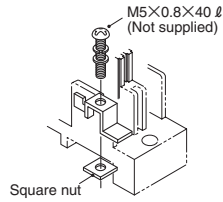
Single mounting base-TDB-50DC



Double mounting base-TDA-50DC



■ Mounting bases, branching bars and other accessories

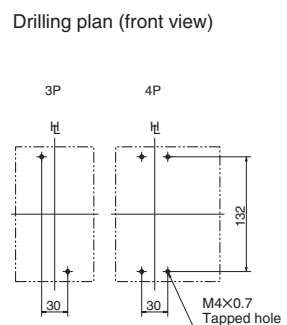
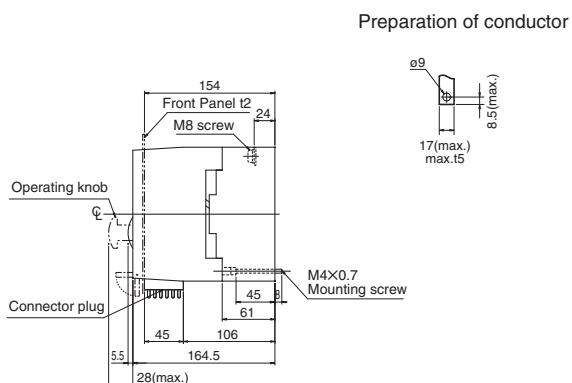
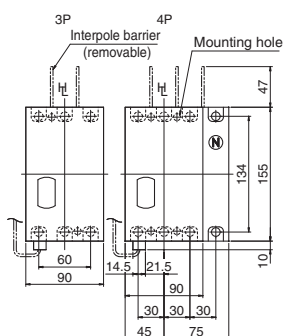
Mounting bases for dual-row installation (for four circuits)		
Type	Applicable breaker	Outline
TDA-50PC	TB-5P	
TDA-50DC	TB-5D	
Mounting bases for single-row installation (for two circuits)		
Type	Applicable breaker	Outline
TDB-50PC	TB-5P	
TDB-50DC	TB-5D	
Accessories		
Name	Outline	
Retainer plate DC		
Retainer plate SC		
Braided line terminal BH-SC		

Branching bars		
Application	Type	Arrangement
Two branches from outer busbar	2RT-LC	
Two branches from inner busbar	2S-LC	
One branch from inner busbar	1S-LC	
One branch from outer busbar	1RT-LC	
One branch from outer busbar in opposite direction	1T-LC	

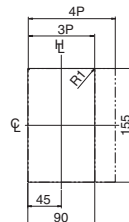
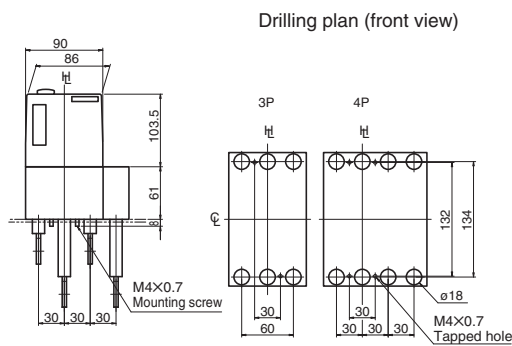
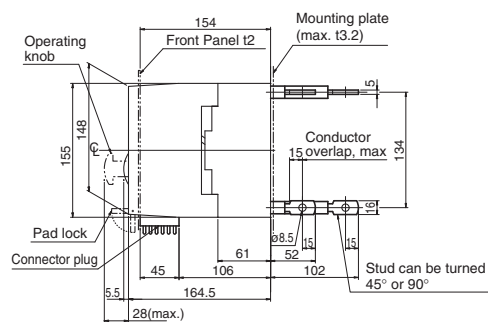
Motor operators

Outline dimensions (mm) (Type T2MC12) S50-GF, S100-NF, S100-GF, S100-NM, S100-NN, S125-NF, S125-GF, S125-NN

Front-connected

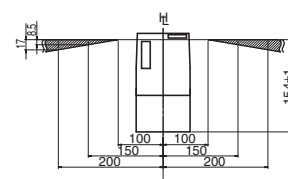
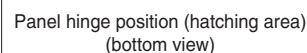
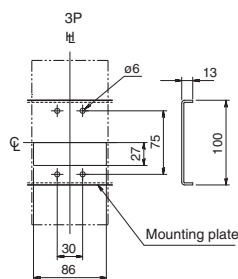
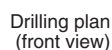
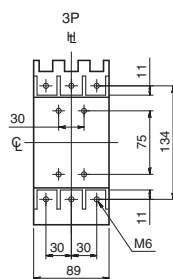
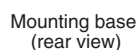
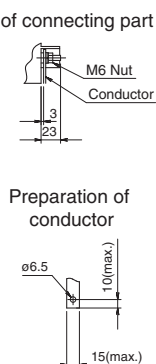
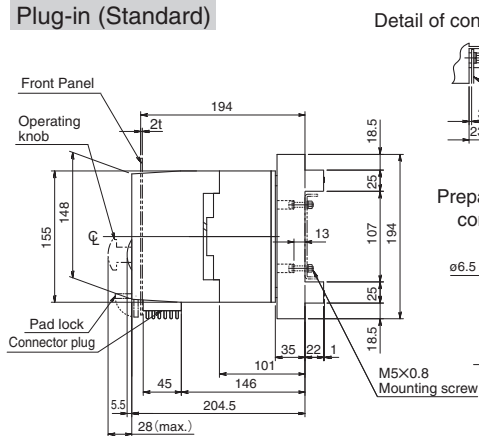


Rear-connected

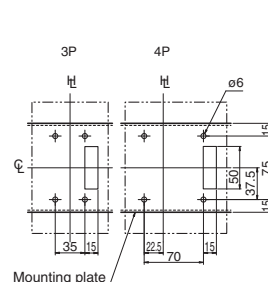
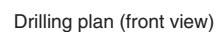
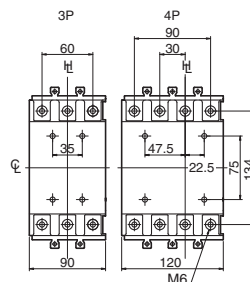
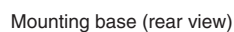
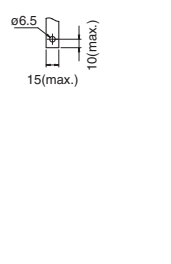
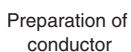
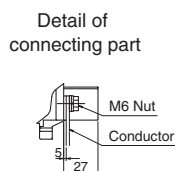
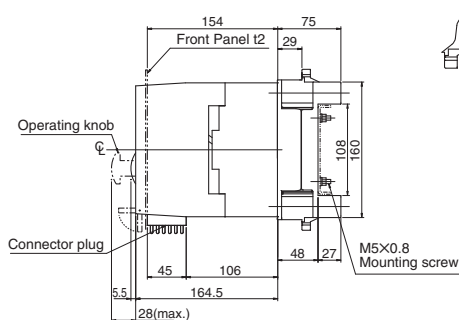


Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

Plug-in (Standard)



Plug-in (High-performance)



S225-NF, S225-GF, S225-NM, S250-NF, S250-GF

25(max.)
 max.t7
 10(max.)
 9
 Mounting screw

This technical drawing shows the front view of a connector assembly. It features a central rectangular body with three circular ports labeled "Operating knob" at the top. Below these are three smaller circular ports labeled "Connector plug". The drawing includes various dimensions such as 120, 97, 23, 11.5, 30.5, 28, 4, 35, 52.5, 87.5, 90, 21.5, 14.5, 11.5, 35.5, and 30.5. A note indicates "Conductor overlap, max" with a dimension of 28. There are also labels for "g hole" and "ø11".

The technical drawing illustrates the M4000-1000 lock assembly from two perspectives: a front view (left) and a side view (right).

Front View Dimensions:

- Overall width: 164.5
- Mounting plate width: 154
- Front Panel height: 12
- Operating knob diameter: 155
- Pad lock mounting hole offset: 148
- Connector plug offset: 155
- Bottom flange width: 28(max.)
- Internal components: Front Panel 12, Mounting plate (max. t3.2), Conductor 22 overlap_max, Pad lock, Connector plug.
- Other dimensions: 45, 106, 61, 71, 106, 144, 6, 9, 15, 15, 5.5.

Side View Dimensions:

- Top flange width: 90
- Top flange thickness: h_t
- Total height: 103.5
- Base height: 61
- Base width: 8
- Mounting screw holes: 35, 35, 35
- Mounting screw: M4x0.7

Additional Notes:

- Stud can be turned 45° or 90°

Technical drawing of a plate with 6 holes. The plate has a total width of 144 and a total height of 126. The holes are arranged in two rows of three. The top row is labeled '3P' and the bottom row is labeled '4P'. The holes are spaced 35 units apart horizontally. The vertical distance between the centerlines of the two rows is 126. The diameter of the holes is $\varnothing 24$. The holes are labeled 'M4X0.7 Tapped hole'.

Technical drawing of a rectangular plate. The overall width is $4P$ and the overall height is $15S$. The inner rectangular area has a width of $3P$ and a height of H . A fillet with radius $R1$ is shown at the bottom right corner of the inner rectangle. The bottom edge of the inner rectangle is offset from the bottom edge of the outer rectangle by 45 . The bottom edge of the outer rectangle is labeled 90 .

Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

Figure 1: Dimensions of the mounting plate. The diagram shows a side view of the mounting plate with an M8 nut and a conductor. Dimensions include a total width of 26.5, a mounting hole diameter of 18, a hole offset of 27, a hole diameter of 15, a mounting hole offset of 16.5 (max.), and a conductor width of max. 25.

Technical drawing of the front panel of the device, showing dimensions and components. The drawing includes the following labels and dimensions:

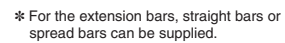
- Operating knob**: Indicated by a dashed line and a circle with a center point.
- Connector plug**: Indicated by a dashed line pointing to the bottom left corner.
- Front Panel t2**: Label for the front panel.
- M5X0.8 Mounting screw**: Indicated by a dashed line pointing to the bottom right corner.
- Dimensions**:
 - Top width: 154 (total), 75 (right section).
 - Right section width: 29 (top), 48 (bottom).
 - Right section height: 108.
 - Bottom width: 45 (left section), 106 (right section).
 - Bottom left corner: 5.5 (height), 28(max.) (width).
 - Bottom right corner: 164.5 (width).

Technical drawing of the rear view of the terminal block. Dimensions shown include a total width of 27, a mounting hole diameter of 5, a mounting hole spacing of 24, and a maximum conductor width of 15.5 (max.). A label points to the 'Conductor width, max.22' and another label points to the 'M8 screw'.

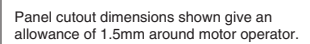
Motor operators

E250-SF, S250-SF, S250-SN

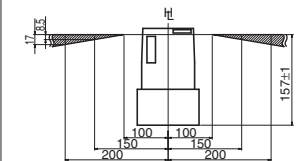
Drilling plan (front view)



Panel cutout (front view)



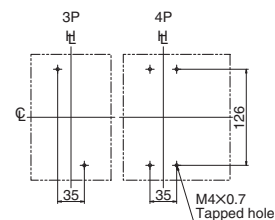
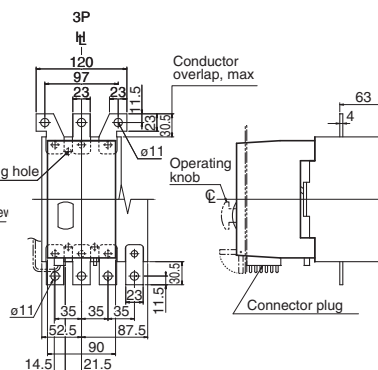
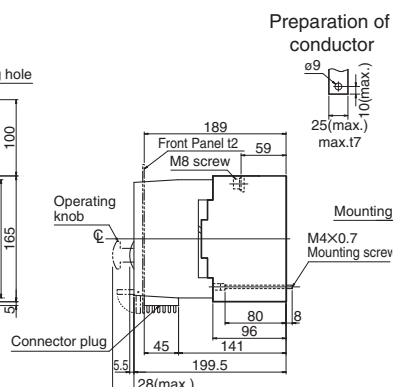
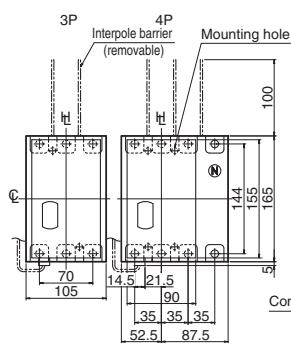
Panel hinge position (hatching area)
(bottom view)



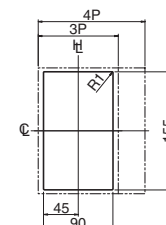
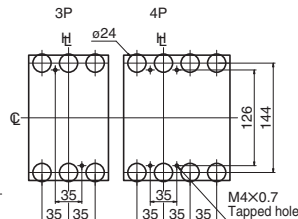
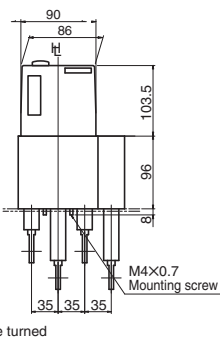
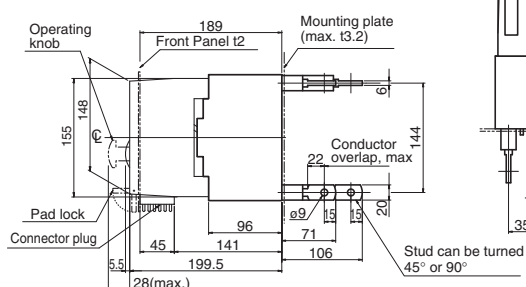
Outline dimensions (mm) (Type T2MC12, T2MC25)

H100, H125, H225, L100, L125, L225

Front-connected

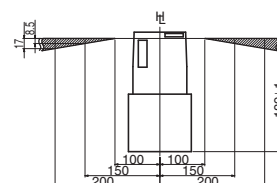
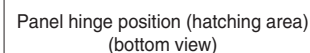
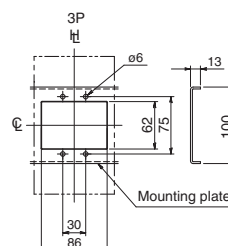
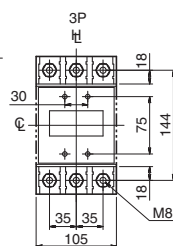
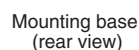
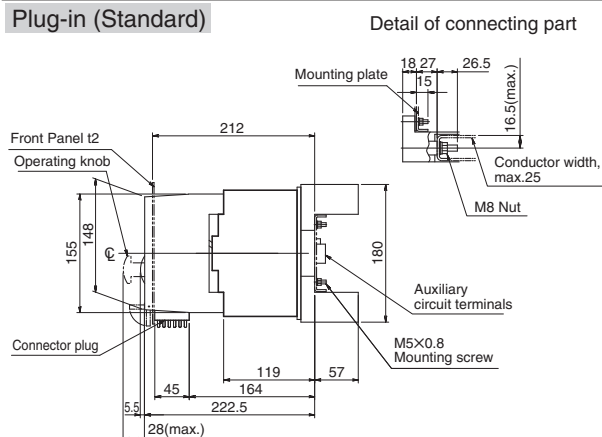


Rear-connected

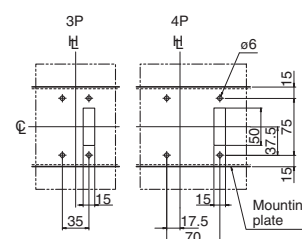
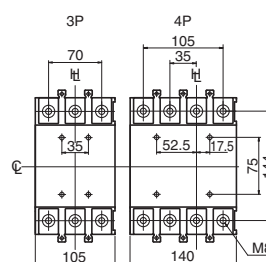
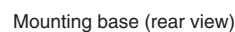
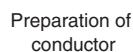
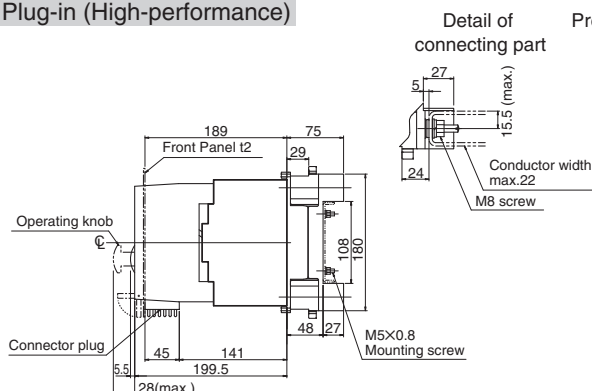


Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

Plug-in (Standard)



Plug-in (High-performance)



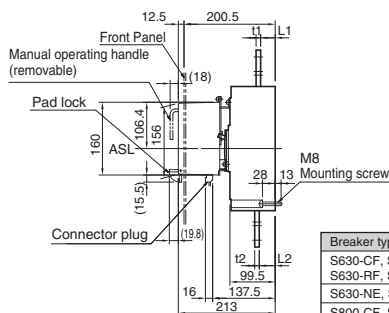
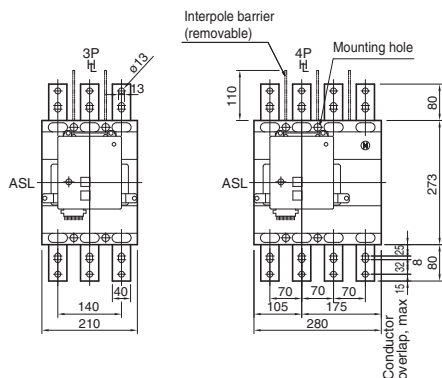
7 Characteristics and Outline Dimensions

Motor operators

Outline dimensions (mm) (Type T2MC80)

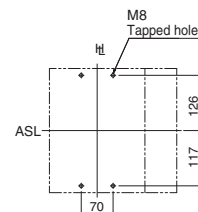
S630, S800

Front-connected

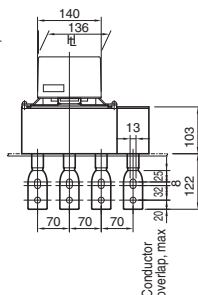
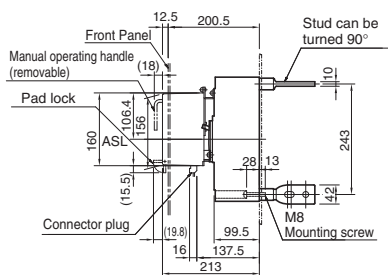


Breaker type	t1	t2	L1	L2
S630-CF, S630-NF	8	8	32	34
S630-RF, S630-GN	8	8	32	36
S630-NE, S630-RE	8	8	32	36
S800-CF, S800-NF	10	10	32	35
S800-RF, S800-NN	10	10	32	36
S800-NE, S800-RE	10	10	32	36

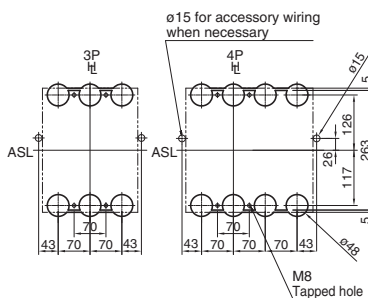
Drilling plan (front view)



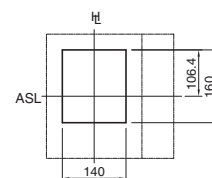
Rear-connected



Drilling plan (front view)



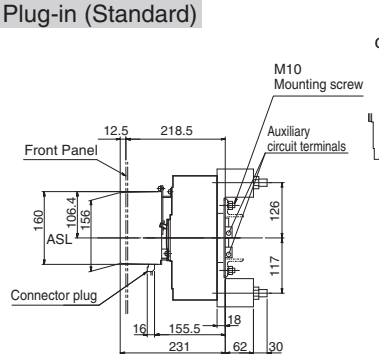
Panel cutout (front view)



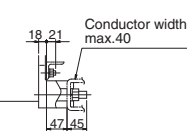
Note: Studs are factory installed in horizontal direction both on the line and load sides.

Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

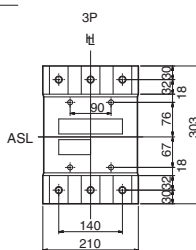
Plug-in (Standard)



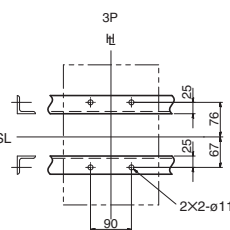
Detail of connecting part



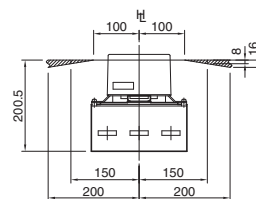
Mounting base (rear view)



Drilling plan (front view)

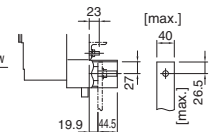
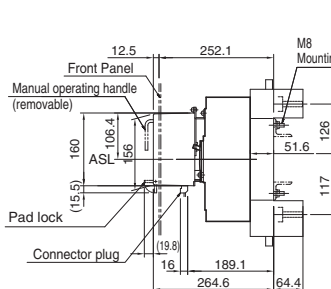


Panel hinge position (hatching area) (bottom view)

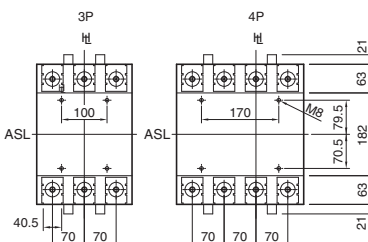


Plug-in (High-performance)

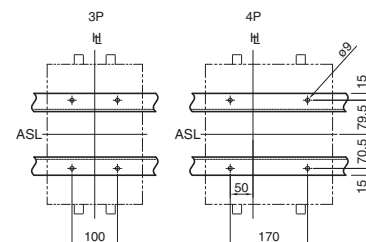
Detail of connecting part and Preparation of conductor



Mounting base (rear view)

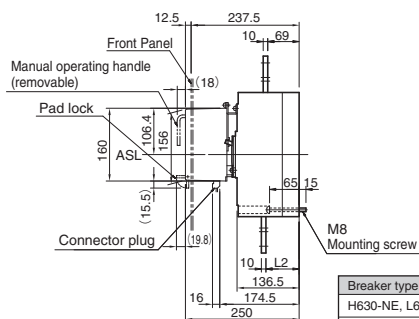
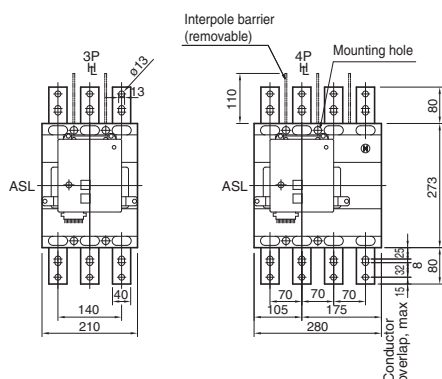


Drilling plan (front view)

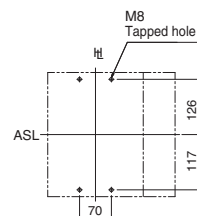


H630, H800, L630, L800

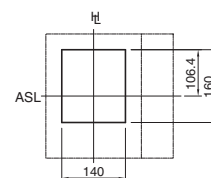
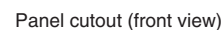
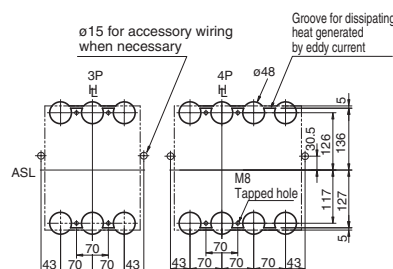
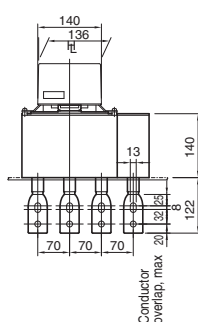
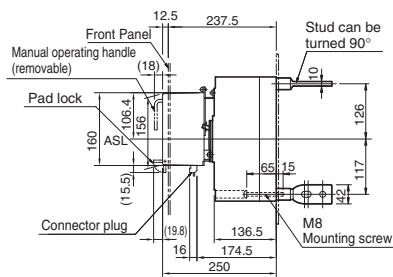
Drilling plan (front view)



Breaker type	L2
H630-NE, L630-NE	73
H800-NE, L800-NE	74



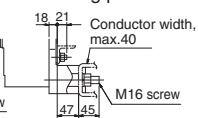
Drilling plan (front view)



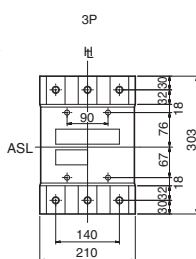
Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

Note: Studs are factory installed in horizontal direction both on the line and load sides.

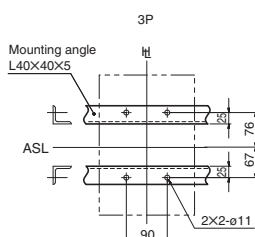
Detail of
connecting part



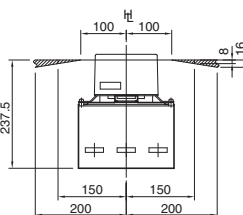
Mounting base
(rear view)



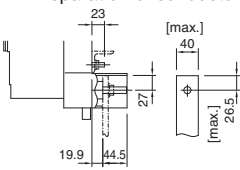
Drilling plan
(front view)



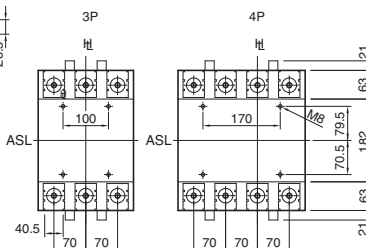
Panel hinge position (hatching area)
(bottom view)



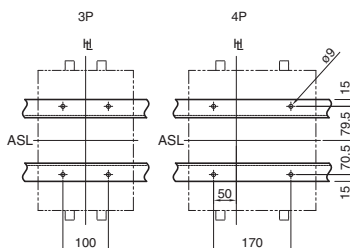
Detail of connecting part and Preparation of conductor



Mounting base (rear view)



Drilling plan (front view)



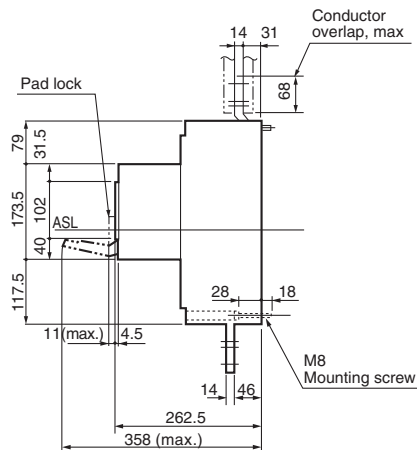
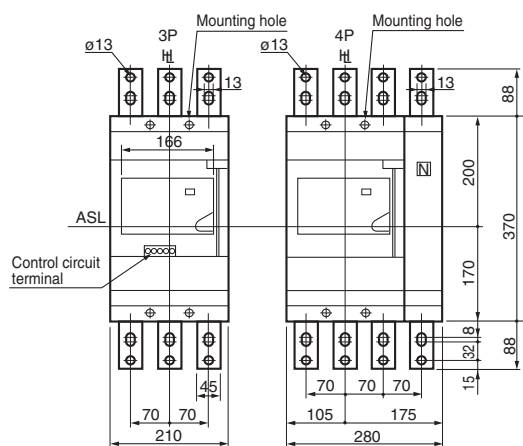
7 Characteristics and Outline Dimensions

Motor operators

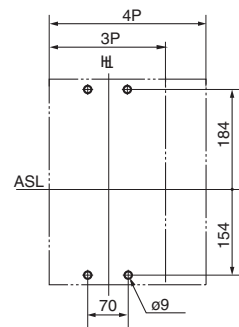
Outline dimensions (mm) (Type XMD9)

TL-1000NE, TL-1200NE

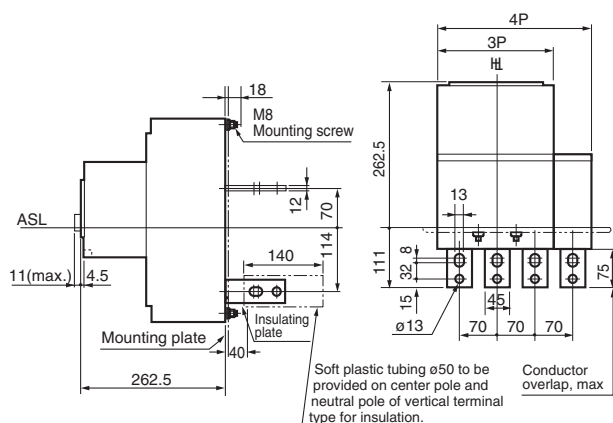
Front-connected



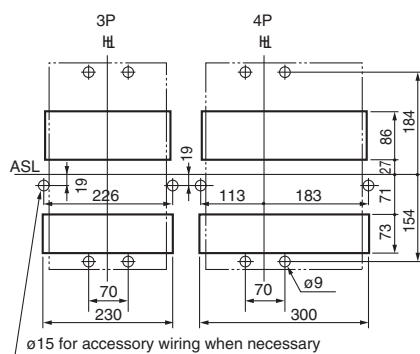
Drilling plan (front view)



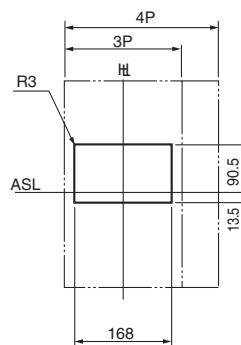
Rear-connected



Drilling plan (front view)



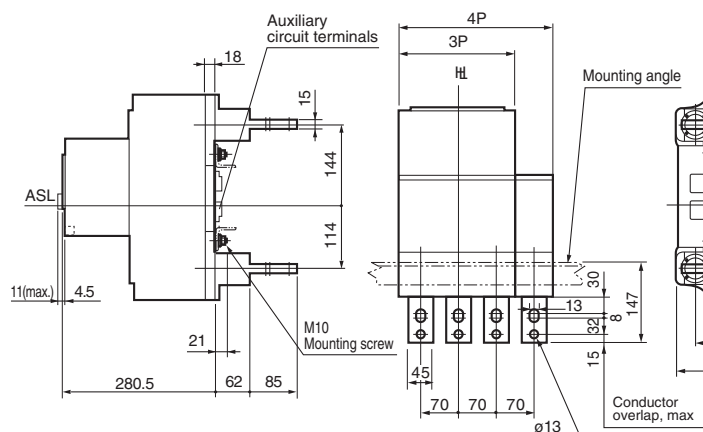
Panel cutout (front view)



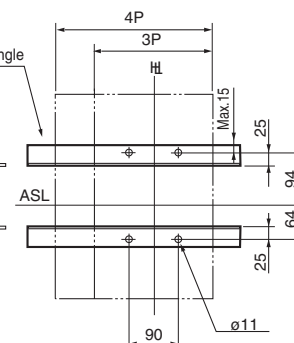
Note: Studs are factory installed in horizontal direction both on the line and load sides.

Plug-in (Standard)

Mounting base (XDM8)



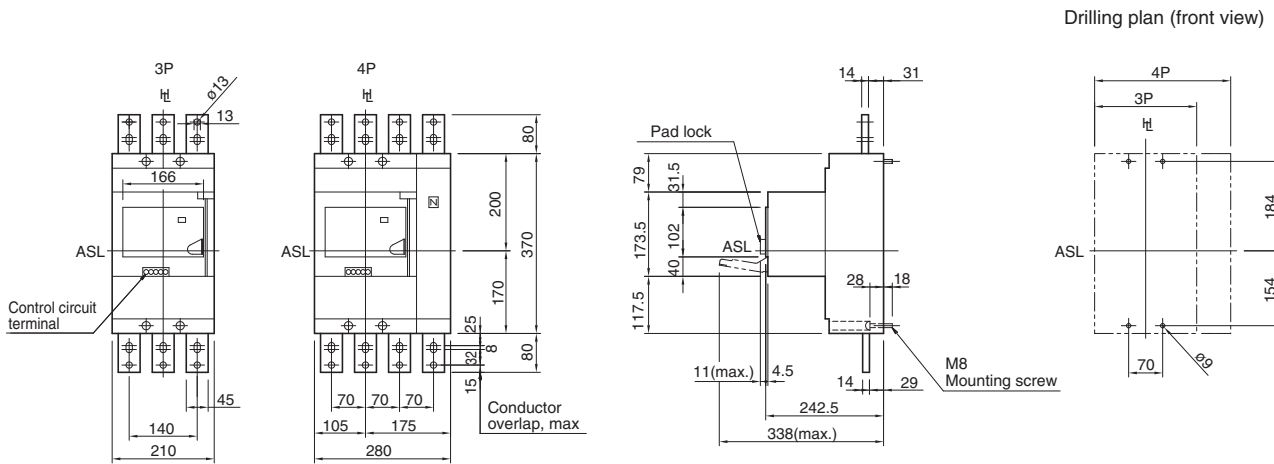
Drilling plan (front view)



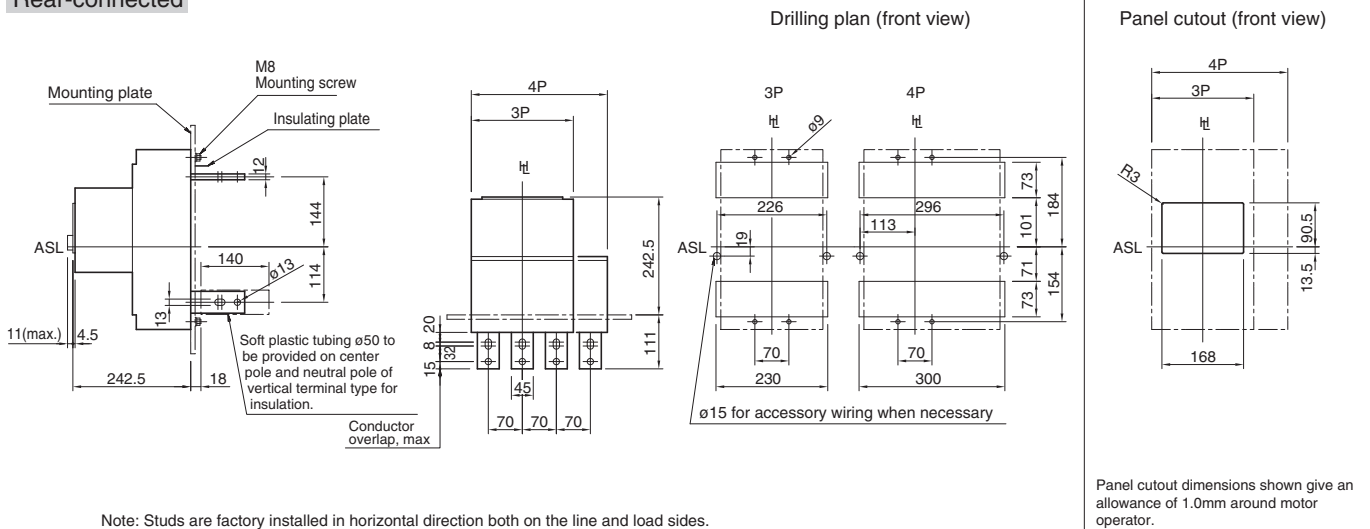
Outline dimensions (mm) (Type T2MCX6)

S1250-NE, S1250-GE, S1250-NN

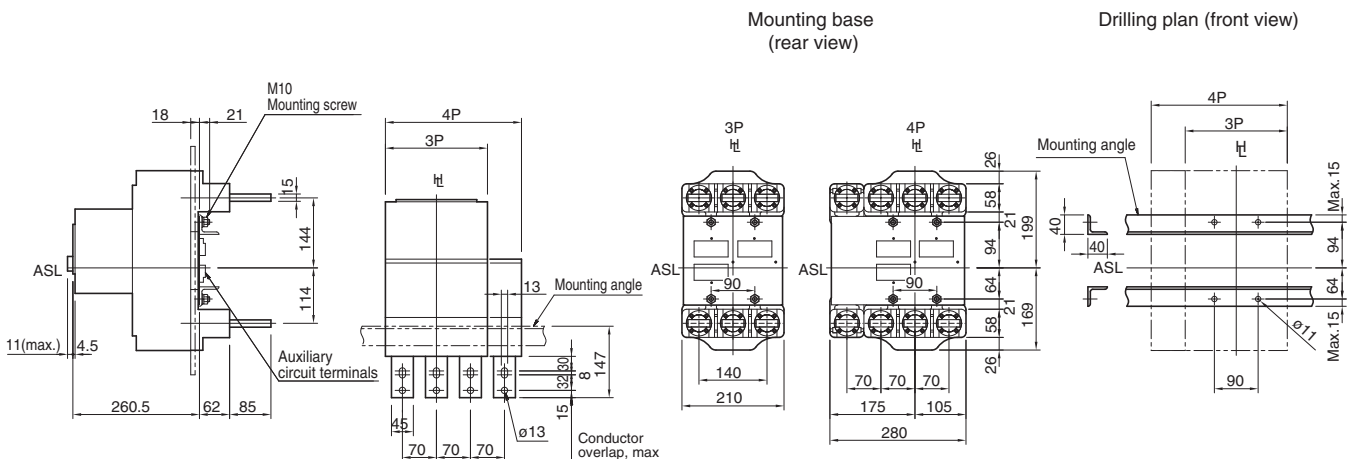
Front-connected



Rear-connected



Plug-in (Standard)



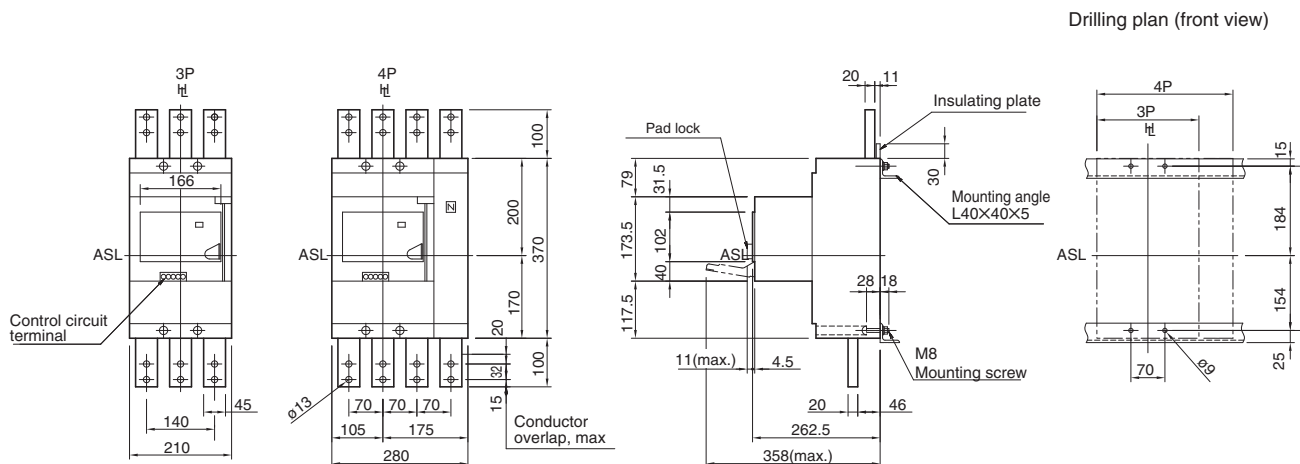
7 Characteristics and Outline Dimensions

Motor operators

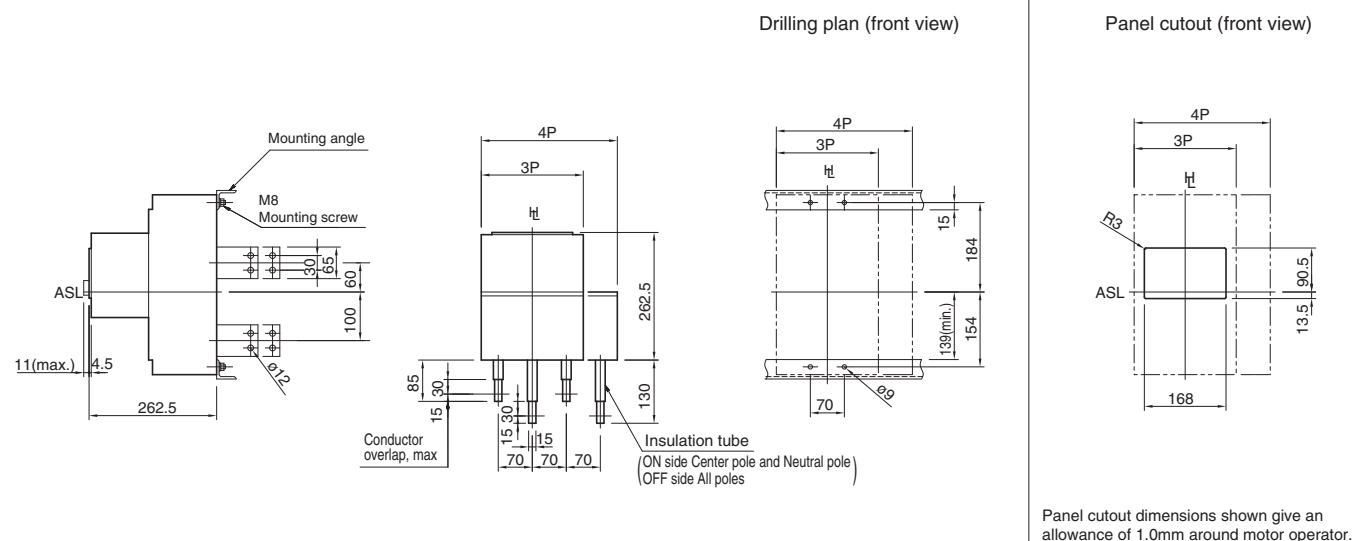
Outline dimensions (mm) (Type T2MCX6)

S1600-NE, S1600-NN

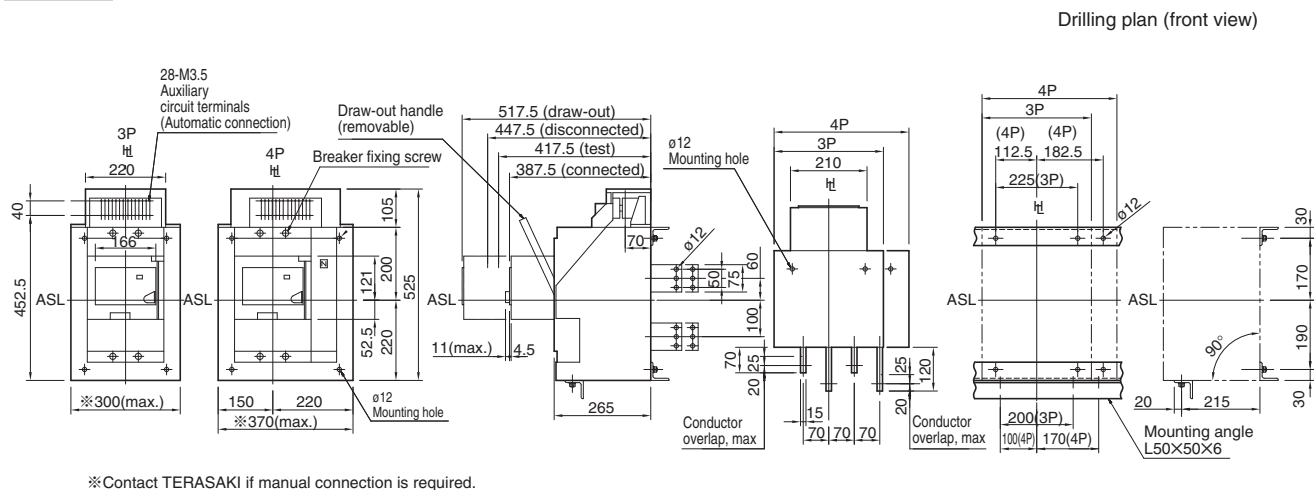
Front-connected



Rear-connected



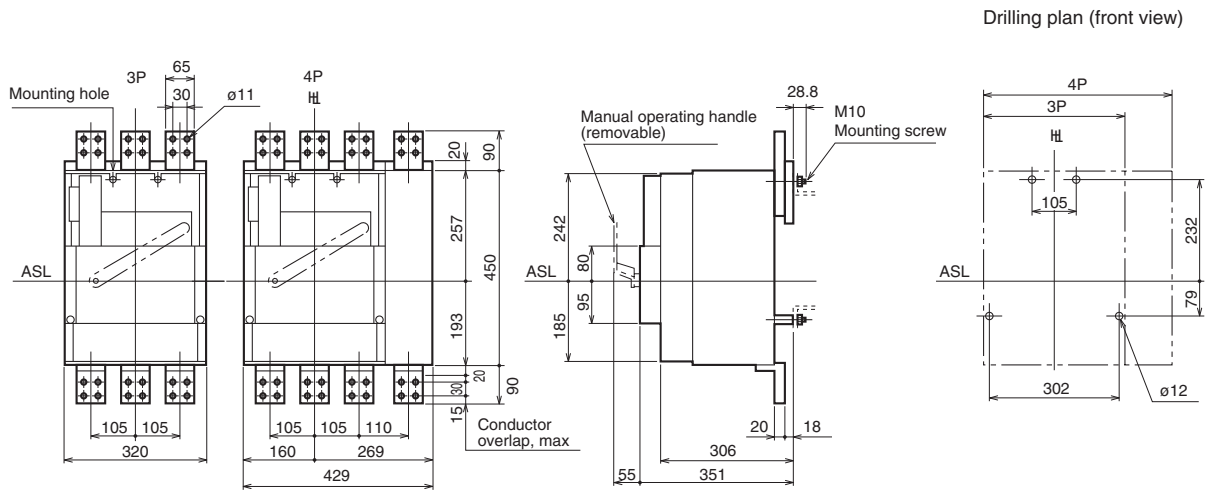
Draw-out



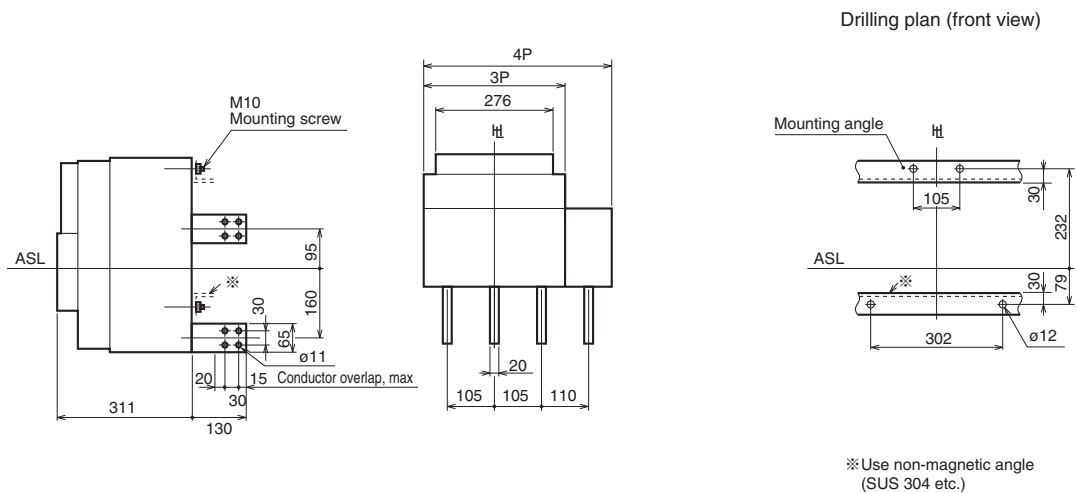
Outline dimensions (mm) (Type XMB10)

XS2000NE, XS2000NN

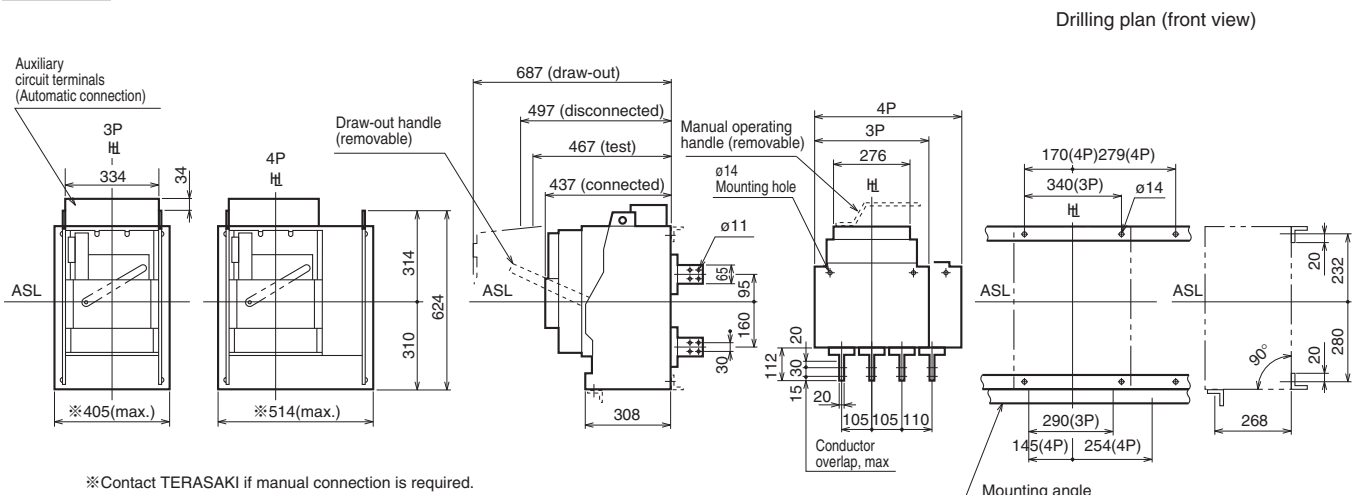
Front-connected



Rear-connected



Draw-out



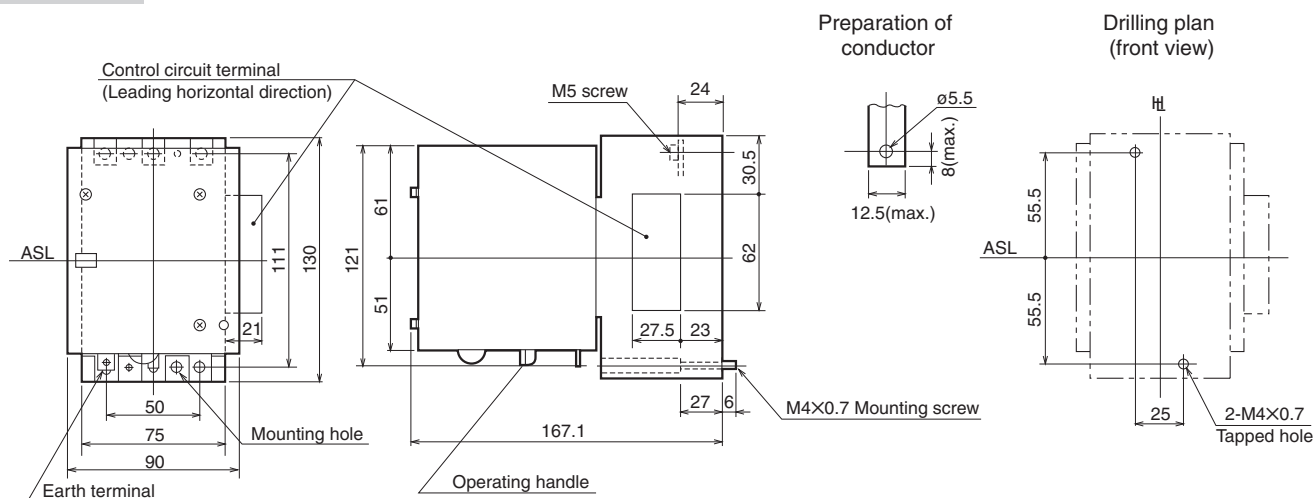
7 Characteristics and Outline Dimensions

Motor operators

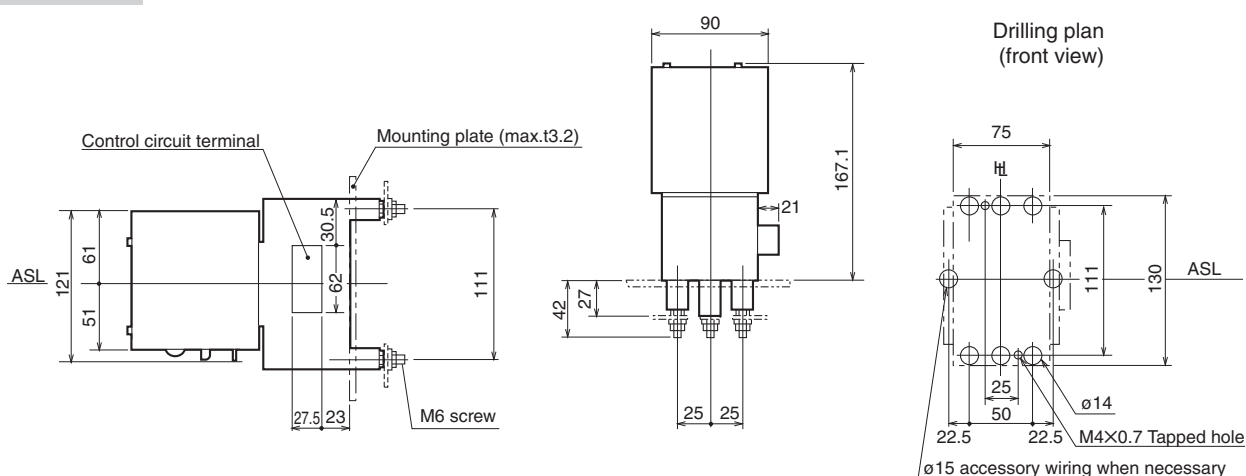
Outline dimensions (mm) (Type XMB1)

E50-SF

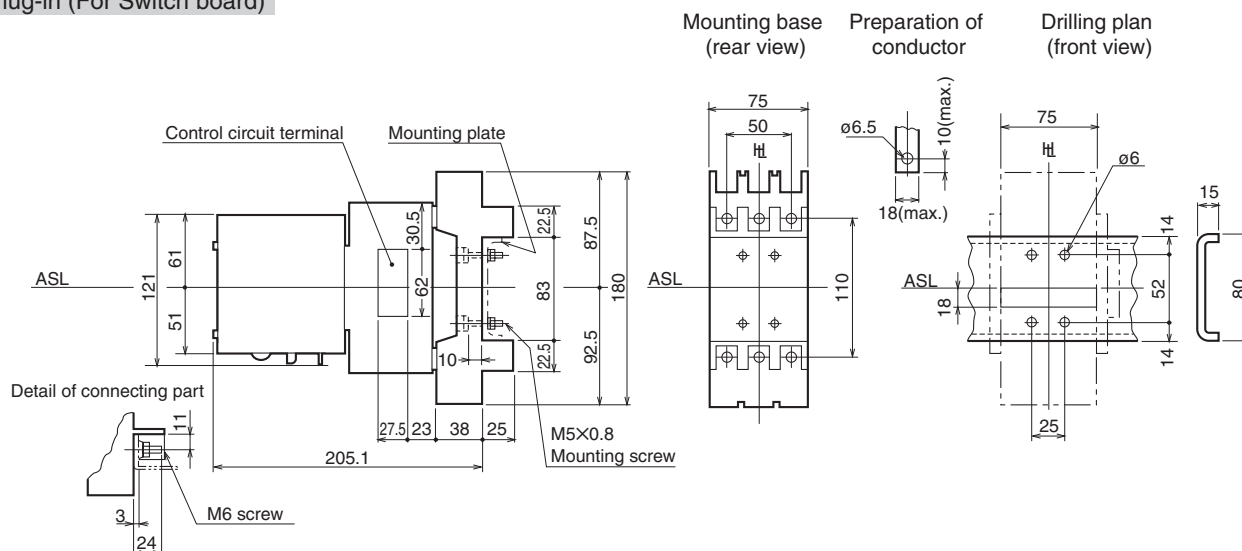
Front-connected



Rear-connected



Plug-in (For Switch board)

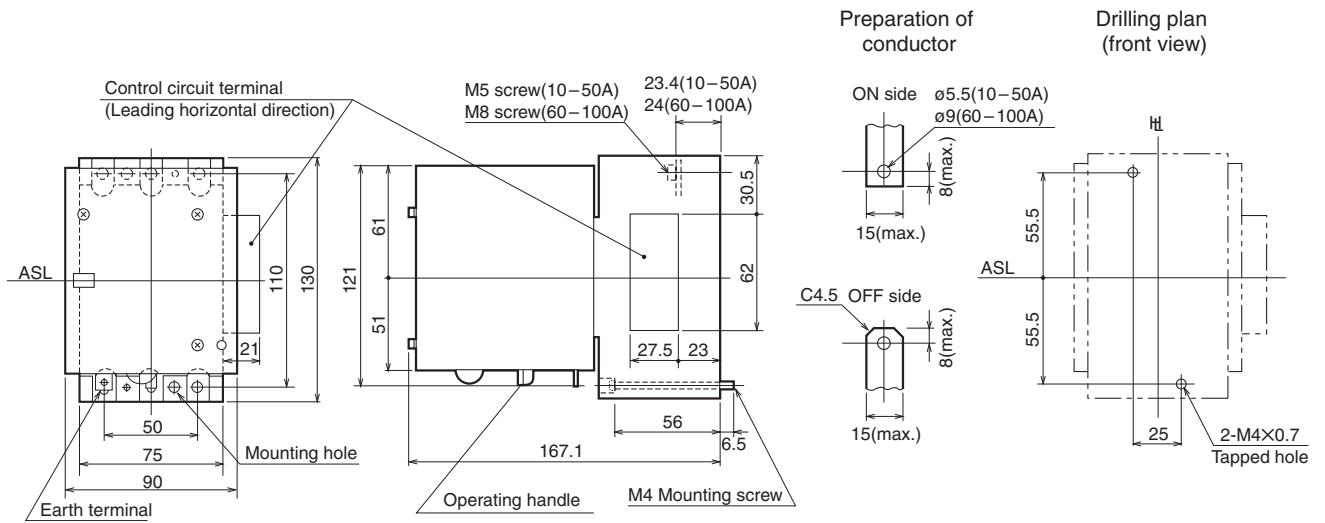


Note: Above outline dimensions are for AC operated Motor operators. For DC Motor, contact us for details.

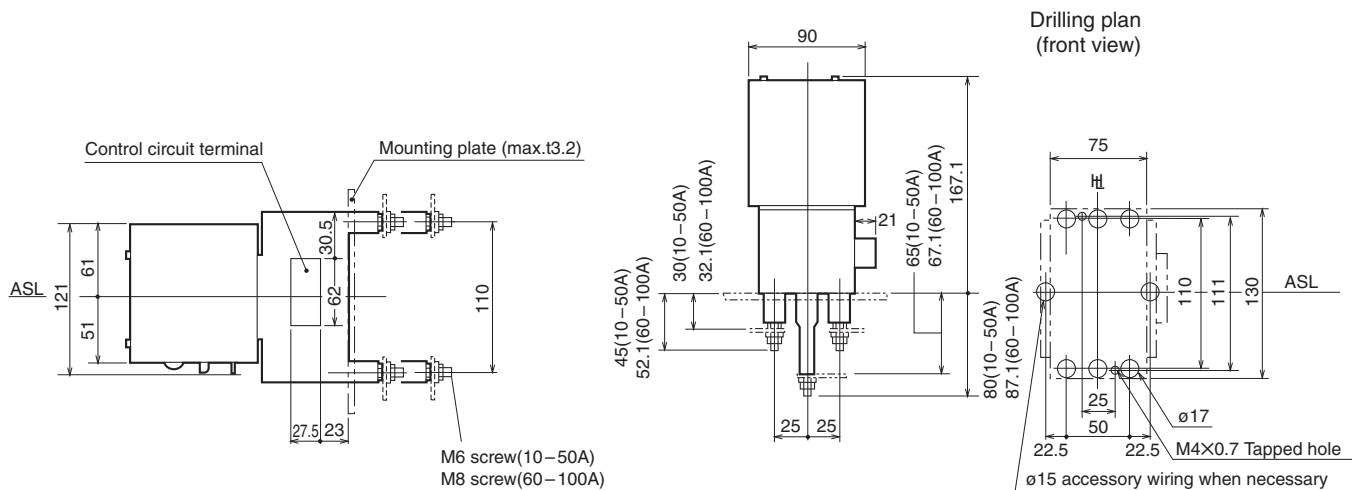
Outline dimensions (mm) (Type XMB1)

E100-SF

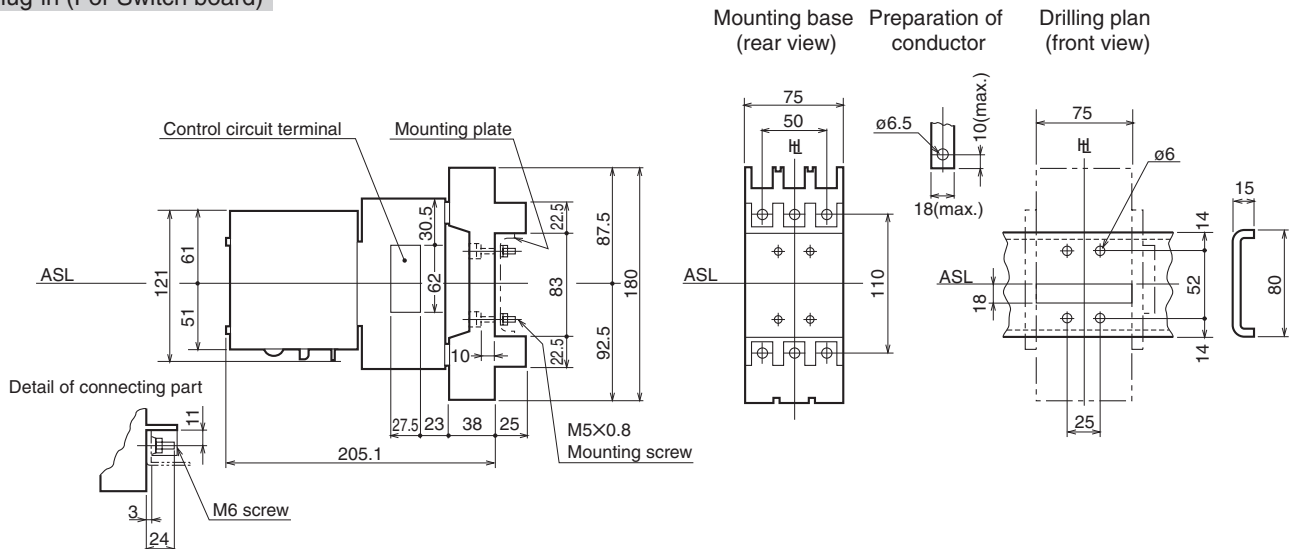
Front-connected



Rear-connected



Plug-in (For Switch board)



Note: Above outline dimensions are for AC operated Motor operators. For DC Motor, contact us for details.

8

Handling and maintenance

1	Transportation and storage	8-2
2	Environmental operating conditions	8-2
3	Installation and connection	8-2
4	Maintenance and inspection	8-4

8

Handling and maintenance

- 1 Transportation and storage
- 2 Environmental operating conditions
- 3 Installation and connection

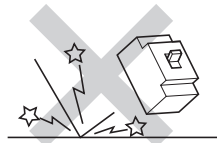
1 Transportation and storage

■ Storage Precautions

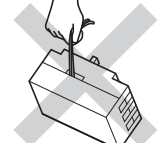
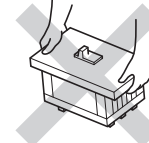
- Avoid corrosive gases:
Do not leave the breakers in an atmosphere of hydrogen sulfide or ammonia gas.
- Avoid humidity:
Do not leave the breakers in high humidity for a long period.
- Avoid direct sunlight:
Do not expose the breakers to direct sunlight for a long period.
- Avoid dust:
Keep the breakers in the ON position and covered against dust during storage.
- Storage temperature: -20 to $+60^{\circ}\text{C}$

■ Transportation Precautions

- Handle and transport with care:
- Hold by the breaker body:



Do not drop the breakers during transportation. Carefully pack the breakers before transportation. Take due measures against moisture and gas absorption of the breakers during long transportation.



Be sure to hold the breaker by its body during handling and transportation. Holding the breaker by a lead wire, terminal cover, stud or flash plate may result in the breaker being dropped, damaged and/or failed.

2 Environmental operating conditions

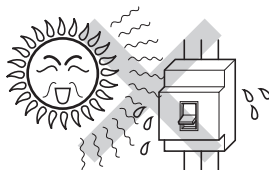
Use the breakers in the following environmental conditions:

Ambient temperature	-5°C to $+45^{\circ}\text{C}$. The average ambient temperature over a period of 24 hours must not exceed 35°C .
Humidity	45 to 85% RH
Vibration/Shock	No unusual vibration and mechanical shock
Altitude	2,000 m max
Atmosphere	No excessive water vapor, oil vapor, dust, salt or corrosive substances. No sudden change in temperature. Non-condensing

3 Installation and connection

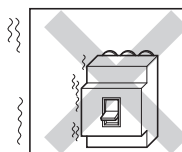
■ Installation Precautions

- Avoid direct sunlight:



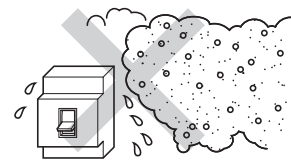
Install the breakers in an area that is not exposed to direct sunlight. Otherwise, the breakers may malfunction due to a temperature rise.

- Avoid vibration and shock:



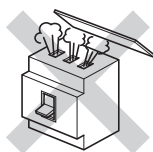
If installing the breakers in an area that is exposed to vibration or shock, use cushions to relieve vibration or shock applied to the breakers.

- Avoid dust and chippings:



Take measures so that the breakers are not directly exposed to rainwater, oil, dust or chippings. Pay special attention to electrically conductive particles such as iron chippings that can enter the breakers. House the breakers in enclosures during use.

- Do not block the arc gas exhaust ports:



Do not block the arc gas exhaust ports. Doing so may deteriorate the breaking capacity. Ensure due insulation distance (arc space) between current carrying parts and grounded metal members in the vicinity of the exhaust ports. See page 5-20 for instructions regarding insulation distance.

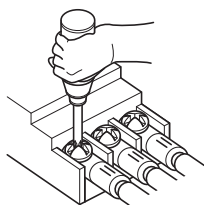
- Do not remove the back cover:



Do not remove the base back cover or thread locking compound.

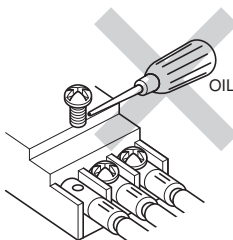
■ Connection Precautions

• Tighten to a proper torque:



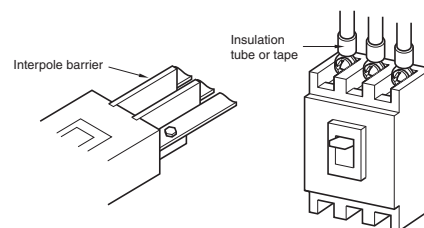
Undertightening terminal screws may result in overheat or malfunction and overtightening in damage to the mold. Tighten the screws to the specified torques. See pages 5-16 to 5-19 for proper tightening torques. Use screwdrivers suited to the size and type of screws.

• Never lubricate threads:



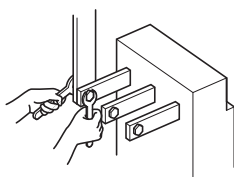
Do not lubricate screw threads. Doing so will decrease the frictional resistance, resulting in looseness and overheat.

• Insulate exposed live parts:



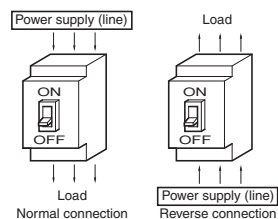
Electrically and positively insulate bare live parts of front-connected breakers using interpole barriers, terminal covers, insulation tube and/or insulation tape.

• Do not deform studs:



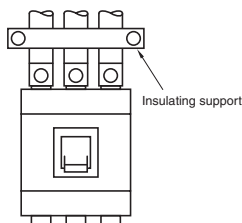
Tighten the conductor connections of rear-connected or plug-in breakers so that the studs do not suffer deformation due to excessive force.

• Normal connection of power supply and load is preferable:



It is preferable in principle that the breaker is in normal connection. If reverse connection is necessary, refer to page 5-22.

• Firmly secure pole conductors in parallel with each other:



Install connecting conductors so that they are in parallel with each other. Firmly secure or tie the conductors by insulating support in case they are acted upon by an electromagnetic force, the strength of which depends on the magnitude of fault current. See the table to the right.

Electromagnetic force acted per meter of conductor

Conventional rated current kA (Power factor)	Electromagnetic force (three-phase short-circuit)	
	N	
	Conductor clearance: 10 cm	Conductor clearance: 20 cm
10 (0.4)	490	245
18 (0.3)	1880	940
25 (0.2)	4430	2215
35 (0.2)	8690	4345
42 (0.2)	12520	6260
50 (0.2)	17740	8870
65 (0.2)	29980	14990
85 (0.2)	51270	25635
100 (0.2)	70960	35480
125 (0.2)	110870	55435

1. Initial inspection

After installing the breakers, inspect them according to the table shown below before energizing them for the first time. Make sure that the breakers are not energized before starting the inspection.

Check item	Criterion
1. Packing material debris, iron chippings, electrical wire debris or other electrically conductive foreign matter	Must have been completely removed.
2. Cracks of or damage to the cover and base	Must not have occurred.
3. Terminal screws and conductor clamping screws	Must have been tightened to the torques specified on pages 5-16 to 5-19.
4. Insulation resistance	Must be 5 megohms or higher when measured with a 500V megger.
5. Rated voltage and circuit voltage	Must be identical or within the permitted range.

■ Caution on dielectric withstand test voltage

Perform the dielectric withstand test according to the table shown below. Make sure that the test voltage does not exceed the upper limits specified in the table.

(Units in voltage)			
Main circuit	Auxiliary or control circuit (Note 1)		
Rated insulation voltage	Test voltage (ac rms)	Rated insulation voltage of operating circuit	Test voltage (ac rms)
$U_i \leq 300$	2000	$U_{is} \leq 60$	1000 (Note 2)
$300 < U_i \leq 690$	2500	$60 < U_{is} \leq 600$	$2 U_{is} + 1000$ (1500 min)

Notes: 1. Between terminal group and ground only

2. Isolate DC 24 V motors from the control circuit. Dielectric withstand voltage: AC 500 V.

2. Periodic Inspection

Periodic inspection is needed to maintain the optimum performance of the breakers and prevent malfunctions. Perform the first inspection one month after the system is put into commission and subsequently, at periodic intervals depending on the operating conditions.

■ Guidelines for inspection intervals

Operating conditions	Installation location	Examples	Guidelines for inspection intervals
Typical	1 Where the ambient air is always clean and dry.	Dustproof and air-conditioned electrical installation rooms	Every 2 or 3 years before 10 years since installation
			Every year after 10 years since installation
			Every 6 months after 15 years since installation
	2 Indoors where dust is low and corrosive gases are not present.	Switchboards or enclosures in electrical installation rooms not dustproof nor air-conditioned	Every year before 10 years since installation Every 6 months after 10 years since installation Every month after 15 years since installation
Harsh	1 Where sulfur dioxide, hydrogen sulfide, chloride and/or high-humidity gases are present and dust is low.	Geothermal power plants sewage treatment plants, steelmaking plants, papermaking plants or pulp making plants	Every 6 months before 5 years since installation Every month after 5 years since installation
	2 Where dust and/or corrosive gases are severe, making it impossible for people to stay in for a long time.	Chemical plants, quarries or mines.	Every month

■ Check items

Make sure that the breakers are not energized before starting the inspection.

Check item	Criterion	Remedy
1. Terminal screws	Must not be loosened.	If loosened, retighten to the torque specified on pages 5-16 to 5-19.
2. Terminals and their vicinities	Must be free of dust and oil.	If not, clean with a cleaner. Wipe with a clean cloth.
3. Cracks of or damage to the cover and base	Must not have occurred.	If cracks or damage is found, replace.
4. Operating mechanism	Must work smoothly.	If not, replace or contact us.
5. Discoloration or overheat signs of terminals and/or base	Must not be present by visual inspection.	If present, replace. (Discoloration of silver coating to a certain degree proves no problem).
6. Insulation resistance	Must be 5 megohms or higher when measured with a 500V megger.	If not, replace.

3. Inspection and action after interruption of fault current

When a breaker trips to interrupt a fault current, check the breaker to determine if it can be reused or must be replaced.

1. If arc gas exhaust ports are kept clean and no anomaly is found, the breaker can be reused.
2. If arc gas exhaust ports are blackened by soot, the breaker may be reused provided that the insulation resistance is 5 MΩ or higher, live parts including terminals are not overheated during energization and no other anomaly is found.
If the insulation resistance is lower than 5 megohms, perform the dielectric withstand test of the breaker. If the test shows that the breaker still has the specified dielectric strength, the breaker may be reused provided that live parts including terminals are not overheated. It is strongly recommended, however, that the breaker be reused for a limited duration of time and be replaced with new one as early as possible.
 - The dielectric withstand test is to be done according to the description on page 8-4.
3. If the handle and arc gas exhaust ports are heavily blackened by soot and molten metal grains are found around the ports, replace the breaker with new one.

4. Operation durability

The operation durability of breakers depends on their frame size. Larger the frame size is, the lower the operation durability is. IEC 60947-2 specifies the operation durability of breakers as shown in the table blow. Breakers are a protection tool and unlike electromagnetic relays, are originally inappropriate for frequent switching operation.

Admissible number of operation cycles of molded case circuit breakers

1	2	3	4	5
Rated current, A (Note 1)	Number of operation cycles per hour (Note 2)	Number of operation cycles		
		Not energized	Energized (Note 3)	Total
$I_n \leq 100$	120	8500	1500	10000
$100 < I_n \leq 315$	120	7000	1000	8000
$315 < I_n \leq 630$	60	4000	1000	5000
$630 < I_n \leq 2500$	20	2500	500	3000
$2500 < I_n$	10	1500	500	2000

Notes: 1. Max value applicable to respective frame size
 2. Min value. This may be increased by agreement. If the value is increased, the test report must state so specifically.
 3. The breakers must be kept closed at each operation cycle for a duration of time sufficient for the current to be established. The duration, however, does not need to be longer than two seconds.

5. Troubleshooting guide

Take an appropriate action according to the following table when a trouble occurs:

■ Troubles in breakers

Category	Symptom	Possible cause	Remedy/Action
Overheat	☐ Overheat of terminals	☐ Looseness of terminal screws or conductor clamping screws	☐ Retighten.
	☐ Burnout of terminal insulation	☐ Increase in contact resistance of contactors	☐ Replace.
		☐ Contact failure between stud conductor and terminal (due to looseness of screws or foreign matter)	
	☐ Overheat (exceeding 70°C) of breaker molded case	☐ Increase in contact resistance of contactors	☐ Replace.
		☐ Looseness of interior parts	
		☐ Increase in current density due to disconnection of braided wire	
		☐ High-frequency distortion of load current	☐ Improve distortion factor.
Continuity failure	☐ Abnormal voltage on load side	☐ Excessive wear of contactors	☐ Replace.
Inoperativeness		☐ Foreign matter between contactors	
		☐ Damage to current carrying parts (due to excessively frequent switching or corrosive gases)	
	☐ Closing not allowed	☐ Breaker is kept in tripped state, i.e., is not reset.	☐ Reset.
	☐ Resetting not allowed	☐ UVT is not excited.	☐ Energize.
		☐ Bimetal is not enough cooled after tripping due to overcurrent.	☐ Cool down before resetting.
		☐ Bimetal is deformed e.g. by corrosion.	☐ Replace.
		☐ Admissible number of operation cycles is exceeded and service life has expired. (SHT or UVT was frequently used for tripping).	
		☐ Mechanical failure	
	☐ Tripping occurring while rated current is still not reached	☐ Ambient temperature too high (exceeding 40°C)	☐ Reduce ambient temperature e.g. through ventilation.
		☐ Overheat due to looseness of terminal screws	☐ Retighten.
Nuisance tripping		☐ Overheat of interior parts	☐ Replace.
		☐ Vibration and/or shock	☐ Use cushions or the like to dampen vibration and shock.
		☐ Incompatible frequency (for thermal-magnetic breakers with CT)	☐ Replace to match frequency.
		☐ High-frequency distortion of load current	☐ Reduce load current or change current rating.
		☐ Conductor size smaller than specified	☐ Use larger size conductors or change current rating.
		☐ Electromagnetic-induced noise (for electronic breakers)	☐ Isolate noise source.
		☐ Excessive surge (for electronic breakers)	☐ Isolate surge source.
	☐ Tripping due to starting current	☐ Inrush starting current	☐ Change instantaneous trip pickup current or replace with breaker having larger current rating.
		☐ Switching operation of star-delta starter	
		☐ Start of inching (resulting in instantaneous tripping)	
		☐ Starting current too high (resulting in long-delayed tripping)	☐ Replace with breaker having larger current rating.
		☐ Starting time too long (resulting in long-delayed tripping)	
No response to overcurrent	☐ No tripping at trip pickup current	☐ Short-circuit in motor	☐ Repair or replace motor.
		☐ Erroneous connection of control circuit for SHT or UVT	☐ Check connection.
		☐ Failure in coordination with an upstream current-limiting fuse or breaker	☐ Review coordination.
		☐ Ambient temperature too low	☐ Check compensation current.
		☐ Incompatible frequency	☐ Match frequency.

■ Troubles in accessories

Category	Symptom	Possible cause	Remedy/Action
Failure of accessories	○Failure of motor operator	○Wiring mistakes in control circuit	○Check and correct wiring.
		○Continuous on/off operations due to wiring mistakes in control circuit	
		○Voltage drop due to insufficient capacity of power supply cable	○Use larger size cable.
		○Insufficient power supply capacity of control circuit	○Increase power supply capacity.
		○Closing/opening/resetting not allowed due to improper stroke adjustment of operation mechanism	○Return to Terasaki for stroke readjustment.
	○Failure of SHT	○Supply-voltage drop due to insufficient current carrying capacity of control circuit	○Increase current carrying capacity.
		○Supply-voltage drop due to insufficient current carrying capacity	○Increase power supply capacity.
		○Coil burnout due to continuous excitations, improper coil ratings, failure or fusion of anti-burnout contacts, etc.	○Return to Terasaki or replace.
	○Failure of UVT	○Remanence	○Repair or replace.
		○Improper stroke adjustment	
	○Failure of auxiliary and/or alarm switches	○Fusion or burnout of microswitch contacts due to their improper ratings	○Return to Terasaki or replace. Load to microswitch contacts will be relieved e.g through auxiliary relays.
		○Improper adjustment of microswitches	○Return to Terasaki for repair.

9

Appendix

1	Handle operation and dimensions	9-2
2	Mounting positions for trip button	9-3
3	Standard arrangement for plug-in type auxiliary circuit terminals (for high-performance type)	9-4
4	Standard arrangement for plug-in type auxiliary circuit terminals (for standard type)	9-5
5	Internal resistance and power consumptions of breakers	9-8

1 Handle operation and dimensions

Molded Case Circuit Breakers

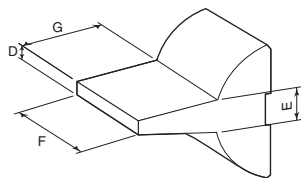


Fig. 1

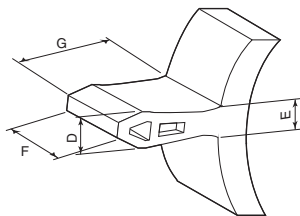


Fig. 2

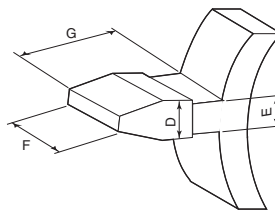
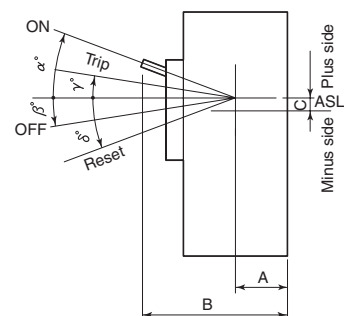


Fig. 3



Frame (A)	Breaker	Ref. figure	Operation angle				Dimensions							Operation effort N			
			ON	OFF	Trip	Reset								OFF	ON	Trip	Radius of rotation
			α°	β°	γ°	δ°	A	B	C	D	E	F	G	↓ ON	↓ OFF	↓ Reset	(mm)
50	E50-SF, E50-CM	1	17	7	6.5	12	32.8	87	+3	6	7	10	15.5	19.6	9.8	39.2	54.2
	S50-SF	2	12.7	10.4	2	13.2	40.6	95	-2	7.4	7.8	13	22.8	44.1	37.2	78.4	54.5
	S50-GF	2	19.2	16.5	4.1	19	26	92	0	6.8	9.3	13	20.4	22.0	28.0	68.0	66.0
100	E100-SF	1	17	7	6.5	12	32.8	87	+3	6	7	10	15.5	19.6	9.8	39.2	54.2
	S100-NF, S100-GF S100-NM, S100-NN	2	19.2	16.5	4.1	19	26	92	0	6.8	9.3	13	20.4	22.0	28.0	68.0	66.0
	H100-NF, L100-NF	2	19.2	16.5	4.1	19	61	127	0	6.8	9.3	13	20.4	25.0	36.0	76.0	66.0
125	S125-SF, S125-SN	2	12.7	10.4	2	13.2	40.6	95	-2	7.4	7.8	13	22.8	44.1	37.2	78.4	54.5
	S125-NF, S125-GF, S125-NN	2	19.2	16.5	4.1	19	26	92	0	6.8	9.3	13	20.4	22.0	28.0	68.0	66.0
	H125-NF, L125-NF	2	19.2	16.5	4.1	19	61	127	0	6.8	9.3	13	20.4	25.0	36.0	76.0	66.0
225 250	S225-NF, S225-GF, S225-NN	2	19.2	16.5	4.1	19	26	92	0	6.8	9.3	13	20.4	25.0	36.0	76.0	66.0
	S225-GE, H225-NF, L225-NF	2	19.2	16.5	4.1	19	61	127	0	6.8	9.3	13	20.4	25.0	36.0	76.0	66.0
	E250-SF, S250-SF, S250-SN	2	11.8	13.2	3.8	16.2	40.5	95	0	7.4	7.2	13	21.1	53.0	57.0	91.0	54.4
400	S250-NF, S250-GF	2	19.2	16.5	4.1	19	26	92	0	6.8	9.3	13	20.4	25.0	36.0	76.0	66.0
	S400-CF, S400-NF S400-NE, S400-NN S400-GF, S400-GE S400-PF, S400-PE	3	19.8	19.3	-3.5	22.5	53.6	145	+2.8	14	9	34	39.5	110	115	125	91.4
	H400-NE, L400-NE	3	19.8	19.3	-3.5	22.5	90.6	182	+2.8	14	9	34	39.5	110	115	125	91.4
630	S630-CF, S630-NF, S630-RF S630-NE, S630-RE, S630-GN	3	20	18	2	22	53.7	145	+5	13	11	40	39.5	140	140	170	91.3
	H630-NE, L630-NE	3	20	18	2	22	90.7	145	+5	13	11	40	39.5	140	140	170	91.3
	S800-CF, S800-NF, S800-RF S800-NE, S800-RE, S800-GN	3	20	18	2	22	53.7	145	+5	13	11	40	39.5	140	140	170	91.3
800	H800-NE, L800-NE	3	20	18	2	22	90.7	145	+5	13	11	40	39.5	140	140	170	91.3
	TL-1000NE	1	22	4	3	9	93.5	191	-2.8	11	12.5	40	30	157	118	343	98.3
	TL-1200NE	1	22	4	3	9	93.5	191	-2.8	11	12.5	40	30	157	118	343	98.3
1250	S1250-NE, S1250-GE, S1250-NN	2	22	4	12	9	73.5	171	-2.8	11	12.5	40	30	157	294	343	98.3
1600	S1600-NE, S1600-NN	2	22	4	12	9	93.5	191	-2.8	11	12.5	40	30	157	294	343	98.3
2000	XS2000NE, XS2000NN	1	18.3	10	7.7	15.3	100	245	+2	20.5	24	60	42.5	382	322	559	146

Unit Operation effort : N

1N $\approx$ 1/9.8kgf

2 Mounting positions for trip button

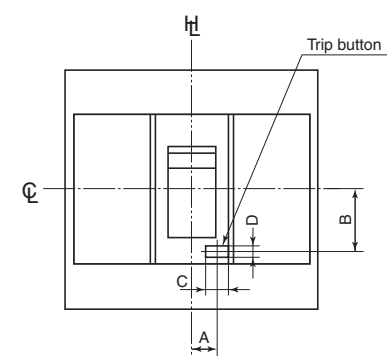


Fig. 1

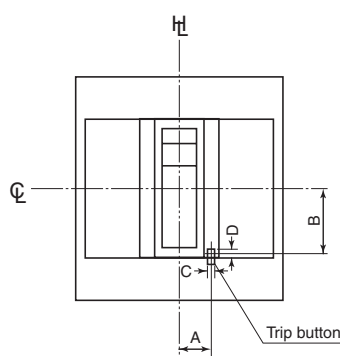


Fig. 2

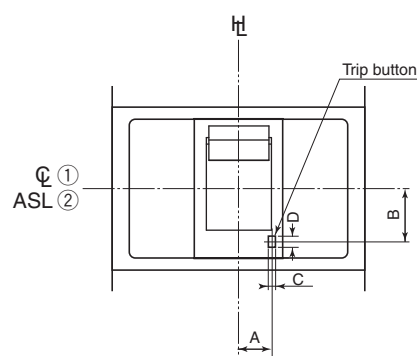


Fig. 3

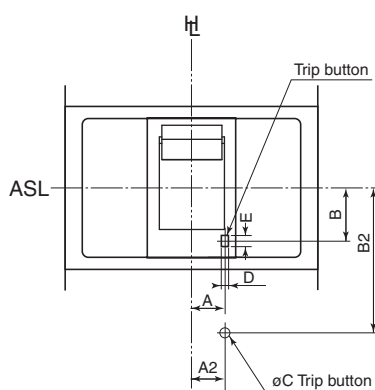


Fig. 4

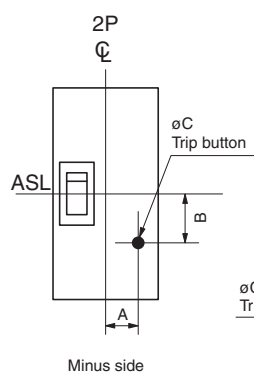


Fig. 5

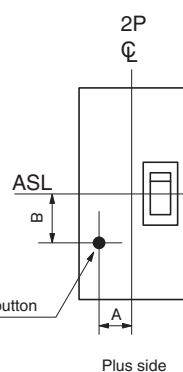


Fig. 6

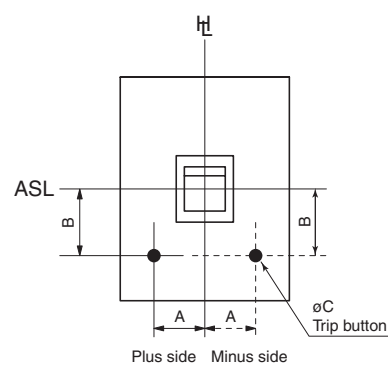


Fig. 7

HL : Handle Frame Centre Line CL : Handle Centre Line ASL : Arrangement Standard Line

Frame	Breaker	Ref. figure	Trip button				
			A	B	C	D	
50	S50-SF	1	7.6	18.8	6.9	3.4	
	S50-GF	2	13.8	20.4	3.3	4.3	
100	S100-NF, S100-GF	2	13.8	20.4	3.3	4.3	
	S100-NM, S100-NN						
	H100-NF, L100-NF	2	17.2	20.4	3.3	4.3	
125	S125-SF, S125-SN	1	7.6	18.8	6.9	3.4	
	S125-NF, S125-GF, S125-NN	2	13.8	20.4	3.3	4.3	
	H125-NF, L125-NF	2	17.2	20.4	3.3	4.3	
225	S225-NF, S225-GF, S225-NM	2	17.2	20.4	3.3	4.3	
250	H225-NF, L225-NF, S225-GE	2	17.2	20.4	3.3	4.3	
	E250-SF, S250-SF, S250-SN	1	10.9	18.6	6.4	4.8	
	S250-NF, S250-GF	2	17.2	20.4	3.3	4.3	
400	S400-CF, S400-NF	3①	21.6	37.2	5.3	6.6	
	S400-NE, S400-NN						
	S400-GF, S400-GE						
	S400-PF, S400-PE						
	H400-NE, L400-NE	3①	21.6	37.2	5.3	6.6	
630	S630-CF, S630-NF, S630-RF	3②	21.8	33	5.3	6.6	
	S630-NE, S630-RE, S630-GN						
	H630-NE, L630-NE	3②	21.8	33	5.3	6.6	
800	S800-CF, S800-NF, S800-RF	3②	21.8	33	5.3	6.6	
	S800-NE, S800-RE, S800-GN						
	H800-NE, L800-NE	3②	21.8	33	5.3	6.6	

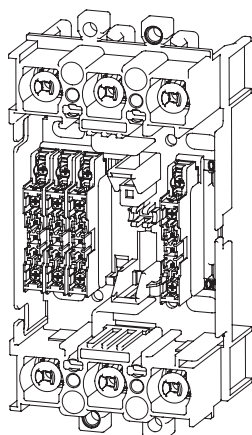
Frame	Breaker	Ref. figure	Trip button						
			A	B	A2	B2	C	D	E
1250③	S1250-NE, S1250-GE, S1250-NN	4	30	37.5	31	70.5	6	6	8
1600③	S1600-NE, S1600-NN	4	30	37.5	31	70.5	6	6	8

Notes: 1. 400AF apply CL Handle Centre Line.
 2. 630AF and 800AF apply ASL Arrangement Standard Line.
 3. 2 trip buttons are equipped.

Frame	Breaker	Ref. figure	Trip button		
			A	B	C
50	E50-SF, E50-CM	2P	5	-19	28
		3P	7	-31.5	28
100	E100-SF	2P	6	+20	28
		3P	7	-31.5	28
1000	TL-1000NE	7	0	72.5	6
1200	TL-1200NE	7	0	72.5	6
2000	XS2000NE, XS2000NN	7	+39	126	6

9 Appendix

3 Standard arrangement for plug-in type auxiliary circuit terminals (for high-performance type)



Auxiliary circuit terminals are of self-engaging type.

Shown in the table below are standard terminal arrangements as seen from the front of the plug-in base for high-performance type.

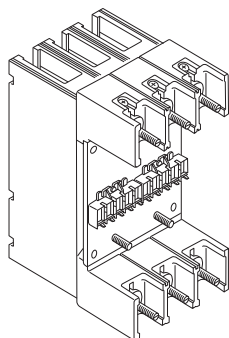
Contact us for non-standard arrangements.

Terminal screw M3.5

Suitable compression terminal R1.25–3.5

Breaker	S100-NF S100-GF S125-NF S125-GF	S50-GF S100-NF, S100-GF, S100-NN S125-NF, S125-GF	H100-NF, L100-NF H125-NF, L125-NF S225-NF, S225-GF, H225-NF L225-NF, S225-GE S250-NF, S250-GF	S400-CF, S400-NF, S400-NE S400-GF, S400-GE, S400-NN S400-PF, S400-PE, H400-NE, L400-NE S630-CF, S630-NF, S630-RF S630-NE, S630-RE, S630-GN S800-CF, S800-NF, S800-RF S800-NE, S800-RE, S800-NN H630-NE, L630NE, H800-NE, L800NE
	2P	3P, 4P	3P, 4P	3P, 4P
Number of auxiliary circuit terminals (Max allowable)				
Arrangement 1				
Arrangement 2				
Arrangement 3				
Arrangement 4				

4 Standard arrangement for plug-in type auxiliary circuit terminals (for standard type)



Five auxiliary circuit terminals (self-engaging) constitute a terminal block.

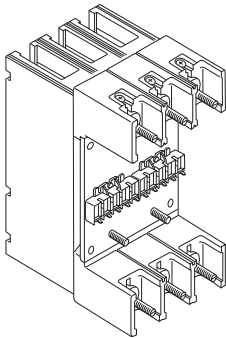
Shown in the table below are standard terminal arrangements as seen from the rear of the plug-in base for standard type.

Contact us for non-standard arrangements.

Breaker	S50-SF, S125-SF	S50-SF, S125-SF S125-SN	E250-SF, S250-SF S250-SN
	2P	3P	3P
Number of auxiliary circuit terminals (Max allowable)			
Arrangement 1	C1 C2	AXc1AXa1AXb1C1C2	AXc1AXa1AXb1C1C2
		ALc1ALa1ALb1C1C2	ALc1ALa1ALb1C1C2
Arrangement 2	D1 D2	AXc1AXa1AXb1D1D2	AXc1AXa1AXb1D1D2
		ALc1ALa1ALb1D1D2	ALc1ALa1ALb1D1D2
Arrangement 3	AXc1AXa1AXb1	AXc1AXa1AXb1ALc1ALa1	AXc1AXa1AXb1ALc1ALa1
	ALc1ALa1ALb1		
Arrangement 4			

9 Appendix

4 Standard arrangement for plug-in type auxiliary circuit terminals (for standard type)



Five auxiliary circuit terminals (self-engaging) constitute a terminal block.

Shown in the table below are standard terminal arrangements as seen from the rear of the plug-in base for standard type.

Contact us for non-standard arrangements.

* If the number of auxiliary circuit terminals (self-engaging) is insufficient for E50-SF, E50-CM and E100-SF lead wires are to be used along with the auxiliary circuit terminals. Please state the accessories for which lead wires are used, when ordering.

Breaker	E50-SF E100-SF	E50-SF E50-CM E100-SF	S50-GF, S100-NF S100-GF, S100-NN H100-NF, L100-NF S125-NF, S125-GF S125-NN, H125-NF L125-NF, S225-NF S225-GF, H225-NF L225-NF, S225-GE S250-NF, S250-GF	S400-CF, S400-NF, S400-GF, S400-NN S400-NE, S400-GE, S400-PF, S400-PE H400-NE, L400-NE	
	2P	3P	3P	3P	
Number of auxiliary circuit terminals (Max allowable)					
Arrangement 1	AXc1 AXa1 AXb1	AXc1 AXa1 AXb1 U1 U2	AXc1 AXa1 AXb1 C1 C2	AXc1 AXa1 AXb1 AXc2 AXa2 AXb2  C1 C2	
	ALc1 ALa1 ALb1	ALc1 ALa1 ALb1 U1 U2	ALc1 ALa1 ALb1 C1 C2	AXc2 AXa2 AXb2 ALc1 ALa1 ALb1  C1 C2	
Arrangement 2	 U1 U2	AXc1 AXa1 AXb1 P1 P2 *2	AXc1 AXa1 AXb1 D1 D2	AXc1 AXa1 AXb1 AXc2 AXa2 AXb2  D1 D2	
	 P1 P2	ALc1 AXa1 AXb1 P1 P2 *2	ALc1 ALa1 ALb1 D1 D2	AXc1 AXa1 AXb1 ALc1 ALa1 ALb1  D1 D2	
Arrangement 3	 S1 S2	AXc1 AXa1 AXb1 S1 S2	AXc1 AXa1 AXb1 ALc1 ALa1	AXc1 AXa1 AXb1 PALa PALb  OP1 OP2 C1 C2	
		ALc1 ALa1 ALb1 S1 S2		AXc1 AXa1 AXb1 PALa PALb  OP1 OP2 C1 C2	

	S630-CF, S630-NF, S630-RF, S630-NE S630-RE, S630-GN, S800-CF, S800-NF S800-RF, S800-NE, S800-RE, S800-NN H630-NE, L630-NE, H800-NE, L800-NE S1250-NE, S1250-GE, S1250-NN	TL-1000NE, TL-1200NE
	3P	3P, 4P
	AXc1 AXa1 AXb1 ALc1 ALa1 ALb1 OP1 OP2 D1 D2 *1 AXc2 AXa2 AXb2 PALc PALa	AXc1 AXa1 AXb1 ALc1 ALa1 ALb1 OP1 OP2 U1 U2 *1 AXc2 AXa2 AXb2 PALc PALa
	AXc1 AXa1 AXb1 ALc1 ALa1 ALb1 OP1 OP2 C1 C2 *1 AXc2 AXa2 AXb2 PALc PALa	AXc1 AXa1 AXb1 ALc1 ALa1 ALb1 OP1 OP2 P1 P2 *1 *2 AXc2 AXa2 AXb2 PALc PALa
		AXc1 AXa1 AXb1 ALc1 ALa1 ALb1 OP1 OP2 S1 S2 *1 *2 AXc2 AXa2 AXb2 PALc PALa

*1 : If the OCR controller is installed separately, substitute OS1 and OS2 for OP1 and OP2 and connect these terminals to the controller terminals having the same numbers.

*2 : If the UVT controller is installed separately, substitute UC1 and UC2 for P1 and P2 and connect these terminals to the controller terminals having the same numbers.

5 Internal resistance and power consumptions of breakers

Molded Case Circuit Breakers

Frame (A)	Breaker	Rated current, A	Internal resistance, MΩ (Note 1) • Per pole		Power consumption, W (Note 2) • Per pole	
			Front-connected	Plug-in	Front-connected	Plug-in
50	E50-SF	10	15.9	16.2	1.6	1.6
		15	5.7	6	1.3	1.4
		20	4.7	5	1.9	2
		30	3.5	3.8	3.2	3.4
		40	2	2.3	3.2	3.7
	S50-SF	50	1.6	1.9	4	4.8
		15	8.63	8.75	1.94	1.97
		20	8.63	8.75	3.45	3.5
		30	3.18	3.3	2.86	2.97
		40	2.72	2.84	4.35	4.54
	S50-GF	50	2.69	2.81	6.73	7.03
		15	15	15.3	3.38	3.44
		20	15	15.3	6.0	6.12
		30	8	8.27	7.2	7.44
		40	1.8	2.07	2.88	3.31
100	E100-SF	50	1.8	2.07	4.5	5.18
		10	15.9	16.2	1.6	1.6
		15	5.7	6	1.3	1.4
		20	4.7	5	1.9	2
		30	3.5	3.8	3.2	3.4
		40	2	2.3	3.2	3.7
		50	1.6	1.9	4	4.8
		60	1.2	1.5	4.3	5.4
		75	1.1	1.4	6.2	7.9
		100	1	1.3	10	13
	S100-NF, S100-GF	15	15	15.3	3.38	3.44
		20	15	15.3	6	6.12
		30	8.0	8.27	7.2	7.44
		40	1.8	2.07	2.88	3.31
		50	1.8	2.07	4.5	5.18
	H100-NF, L100-NF	60	1.3	1.57	4.68	5.18
		75	0.8	1.07	4.5	5.65
		100	0.8	1.07	8	6.02
		15	23.5	23.6	5.29	5.31
		20	23.5	23.6	9.4	9.44
		30	11.9	12	10.7	10.8
		40	1.99	2.13	3.18	3.41
		50	1.99	2.13	4.98	5.33
		60	1.62	1.76	5.83	6.34
		75	0.97	1.11	9.7	6.24
	S100-NM	100	0.97	1.11	9.7	11.1
125	S125-SF	16	15	—	3.84	—
		24	8	—	4.61	—
		32	1.8	—	1.84	—
		40	1.8	—	2.88	—
		50	1.8	—	3.65	—
		60	1.3	—	4.68	—
		75	0.8	—	4.5	—
		90	0.8	—	6.48	—
		100	0.8	—	8	—
		15	8.63	8.75	1.94	1.97
		20	8.63	8.75	3.45	3.5
		30	3.18	3.3	2.86	2.97
		40	2.72	2.84	4.35	4.54
		50	2.69	2.81	6.73	7.03
		60	2.14	2.26	7.70	8.14
		75	1.42	1.54	7.99	8.66
		100	0.93	1.05	9.3	10.5
		125	0.84	0.96	13.13	15
	S125-NF, S125-GF	125	0.8	1.07	12.5	16.7
	H125-NF, L125-NF	125	0.97	1.11	15.2	17.3
225	S225-NF, S225-GF	125	0.47	0.61	7.34	9.53
		150	0.47	0.61	10.58	13.73
		175	0.26	0.4	7.96	12.25
		200	0.26	0.4	10.4	16
		225	0.26	0.4	13.16	20.25
		125	0.35	0.49	5.47	7.66
		150	0.35	0.49	7.88	11
		175	0.35	0.49	10.7	15
		200	0.35	0.49	14	19.6
		225	0.35	0.49	17.7	24.8
	H225-NF, L225-NF	125	0.57	0.71	8.91	11.09
		150	0.57	0.71	12.83	15.98
		175	0.36	0.5	11.03	15.31
		200	0.36	0.5	14.4	20
		225	0.36	0.5	18.23	25.31
	S225-NM	125	0.47	—	7.34	—
		150	0.47	—	10.58	—
		175	0.26	—	7.96	—
		225	0.26	—	13.16	—
250	E250-SF	125	0.45	0.59	7.03	9.22
		150	0.45	0.59	10.13	13.28
		175	0.35	0.49	10.72	15.01
		200	0.35	0.49	14.00	19.60
		225	0.26	0.4	13.16	20.25
		250	0.26	0.4	16.25	25.00
	S250-SF	125	0.45	0.59	7.03	9.22
		150	0.45	0.59	10.13	13.28
		175	0.35	0.49	10.72	15.01
		200	0.35	0.49	14.00	19.60
		225	0.26	0.4	13.16	20.25
		250	0.26	0.4	16.25	25.00
	S250-NF, S250-GF	250	0.26	0.4	16.3	25

Frame (A)	Breaker	Rated current, A	Internal resistance, mΩ (Note 1) • Per pole		Power consumption, W (Note 2) • Per pole			
			Front- connected	Plug-in	Front- connected	Plug-in		
400	S400-CF, S400-NF S400-GF	125	0.49	0.54	7.66	8.44		
		150	0.49	0.54	11.03	12.15		
		175	0.24	0.29	7.35	8.88		
		200	0.24	0.29	9.6	11.6		
		225	0.24	0.29	12.15	14.68		
		250	0.24	0.29	15	18.13		
		300	0.14	0.19	12.6	17.1		
		350	0.14	0.19	17.15	23.28		
		400	0.14	0.19	22.4	30.4		
	S400-PF	250	0.24	0.29	15	18.13		
		300	0.14	0.19	12.6	17.1		
		350	0.14	0.19	17.15	23.28		
		400	0.14	0.19	22.4	30.4		
		S400-NE, S400-GE S400-PE	125	0.13	0.18	2.03	2.8	
	150		0.13	0.18	2.93	4.1		
	175		0.13	0.18	3.98	5.5		
	200		0.13	0.18	5.2	7.2		
	225		0.13	0.18	6.58	9.1		
	250		0.13	0.18	8.13	11.3		
	300		0.13	0.18	11.7	16.2		
	350		0.13	0.18	15.93	22.1		
	400		0.13	0.18	20.8	28.8		
	H400-NE, L400-NE	250	0.19	0.23	11.9	14.4		
		300	0.19	0.23	17.1	20.7		
		350	0.19	0.23	23.2	28.2		
		400	0.19	0.23	30.4	36.8		
		500	0.11	0.12	27.5	30		
630	S630-CF, S630-NF, S630-RF	500	0.11	0.12	27.5	30		
		600	0.11	0.12	39.6	43.2		
		630	0.11	0.12	43.7	47.6		
		S630-NE, S630-RE	250	0.08	0.09	5	5.63	
			300	0.08	0.09	7.2	8.1	
	350		0.08	0.09	9.8	11		
	400		0.08	0.09	12.8	14.4		
	500		0.08	0.09	20	22.5		
	H630-NE, L630-NE	600	0.08	0.09	28.8	32.4		
		630	0.08	0.09	31.8	35.7		
		250	0.1	0.12	6.3	7.5		
		300	0.1	0.12	9	10.8		
		350	0.1	0.12	12.3	14.7		
	800	S800-CF, S800-NF, S800-RF	400	0.1	0.12	16	19.2	
			500	0.1	0.12	25	30.0	
			600	0.1	0.12	36	43.2	
			630	0.1	0.12	39.69	47.6	
			700	0.09	0.11	44.1	53.9	
			800	0.09	0.11	57.6	70.4	
			S800-NE, S800-RE	350	0.08	0.1	9.8	12.3
				400	0.08	0.1	12.8	16
				450	0.08	0.1	16.2	20.3
		H800-NE, L800-NE	500	0.08	0.1	20	25	
			600	0.08	0.1	28.8	36	
			700	0.08	0.1	39.2	49	
	800		0.08	0.1	51.2	64		
	350		0.1	0.12	12.3	14.7		
400	0.1		0.12	16	19.2			
450	0.1		0.12	20.3	24.3			
500	0.1		0.12	25	30			
600	0.1		0.12	36	43.2			
1000	TL-1000NE	700	0.1	0.12	49	58.8		
		800	0.1	0.12	64	76.8		
		500	0.045	0.06	11.3	15		
		600	0.045	0.06	16.2	21.6		
		700	0.045	0.06	22.1	29.4		
		800	0.045	0.06	28.8	38.4		
		900	0.045	0.06	36.5	48.6		
		1000	0.045	0.06	45	60		
		TL-1200NE	600	0.045	0.06	16.2	21.6	
	700		0.045	0.06	22.1	29.4		
	800		0.045	0.06	28.8	38.4		
	1250	S1250-NE, S1250-GE	1000	0.045	0.06	45	60	
1200			0.045	0.06	64.8	86.4		
500			0.04	0.053	10	13.3		
600			0.04	0.053	14.4	19.1		
700			0.04	0.053	19.6	26		
800			0.04	0.053	25.6	33.9		
1000			0.04	0.053	40	53		
1200			0.04	0.053	57.6	76.3		
1250			0.04	0.053	62.5	82.8		
S1600-NE		700	0.022	0.039 (Note 3)	10.8	19.1 (Note 3)		
		800	0.022	0.039 (Note 3)	14.1	25 (Note 3)		
		900	0.022	0.039 (Note 3)	17.8	31.6 (Note 3)		
	1000	0.022	0.039 (Note 3)	22	39 (Note 3)			
	1200	0.022	0.039 (Note 3)	31.7	56.2 (Note 3)			
	1400	0.022	0.039 (Note 3)	43.1	76.4 (Note 3)			
2000	XS2000NE	1600	0.022	0.039 (Note 3)	56.3	99.8 (Note 3)		
		1000	0.017	0.022 (Note 3)	17	22 (Note 3)		
		1200	0.017	0.022 (Note 3)	24.5	31.7 (Note 3)		
		1400	0.017	0.022 (Note 3)	33.3	43.1 (Note 3)		
		1600	0.017	0.022 (Note 3)	43.5	56.3 (Note 3)		
		1800	0.017	0.022 (Note 3)	55.1	74.5 (Note 3)		
		2000	0.017	0.022 (Note 3)	68	92 (Note 3)		
		XS2000NE	1000	0.017	0.022 (Note 3)	17	22 (Note 3)	
			1200	0.017	0.022 (Note 3)	24.5	31.7 (Note 3)	
	1400		0.017	0.022 (Note 3)	33.3	43.1 (Note 3)		



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Safety Notice

Carefully read instruction manual to ensure proper installation, connection, operation, handling and maintenance of the product.

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