

TemBreak PRO

New release



IoT with SMART MCCB

 **TERASAKI ELECTRIC CO., LTD.**
www.terasaki.co.jp

Catalogue No. '23-I68EJ

Key Points of Issuance

- We have newly developed thermal and electronic moulded case circuit breakers from 100 A frame to 630 A frame and have added them to our product lineup under the TemBreak PRO series.
- We have changed the mould for the previous TemBreak2 model from light grey to grey-blue and added the products to the TemBreak PRO series. (Excludes some models)

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General

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Ratings and
Specifications

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Selection

3

Special Breakers

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Mounting and
Connection

5

Accessories

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Characteristics and
Outline Dimensions

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Appendix

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Product warranty

Please confirm the following product warranty before purchasing and using the product.

1. Warranty period and warranty coverage

If any failure found to be the responsibility of Terasaki Electric occurs during use of the product within the warranty period, the product shall be repaired at no cost via the sales representative or Terasaki Electric sales office. However, if repairs are required on-site at domestic or overseas locations, expenses to send an engineer will be charged.

[Warranty period]

The warranty period of the product shall be for 12 months after the date of purchase or delivery to the designated place. However, the maximum free warranty period is 18 months from the date of manufacture, with a maximum distribution period of 6 months after shipment.

The free-of-charge warranty period of the repaired product will not be extended beyond the free-of-charge warranty period before the repair.

[Warranty coverage]

- 1) The primary failure diagnosis should be performed by users. However, if required by users, Terasaki Electric or Terasaki Electric Sales office may be able to perform the diagnosis for a fee.
- 2) The coverage shall be limited to ordinary use within the usage state, usage methods, usage environment, and other conditions which follow the instructions and precautions given in the instruction manual, user's manual, and caution labels on the product.
- 3) Even within the warranty period, repair cost shall be charged for the following cases.
 - ① Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by selection of hardware or software design on the user side.
 - ② Failure caused by modifications, etc. to the product by the user without any approvals from Terasaki Electric.
 - ③ In case Terasaki Electric product is assembled into a user's device, failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
 - ④ Failure that could have been avoided if the maintenance described in the user's manual has been performed.
 - ⑤ Failure caused by external irresistible forces such as fires or abnormal voltages, and failure caused by natural disasters such as earthquakes, lightning, wind and water damages.
 - ⑥ Failure caused by reasons unpredictable based on scientific technology standards at the time of shipment from Terasaki Electric.
 - ⑦ Any other failure found not to be the responsibility of Terasaki Electric or that admitted not to be so by the user.

*In addition, the warranty applies only to the product delivered. It does not apply to the any damage that is caused by the failure of the product.

2. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the warranty period, Terasaki Electric shall not be liable for compensation to:

- 1) Damages caused by any cause found not to be the responsibility of Terasaki Electric.
- 2) Loss in opportunity, lost profits incurred to the user by failures of Terasaki Electric product.
- 3) Damages whether foreseeable or not, secondary damages, compensation for accidents, and compensation for damages to products other than Terasaki Electric products, caused by exceptional situations.
- 4) Compensation for cost occurring secondarily from replacement work by the user, maintenance of on-site equipment and start-up test run and other operations.

3. Product applications

- 1) When using the products listed in this catalogue, the following conditions must be confirmed and obeyed. The product must be used so that a failure that occurs to the product does not lead to a serious accident. When a damage or failure occurs, the external backup function or fail-safe function must be executed systematically.
- 2) The products listed in this catalogue are designed and manufactured as general-purpose products for application to the general industry field. When considering the use of our products for special applications such as the following equipment and systems, please contact Terasaki Electric sales office to confirm the specifications.

- ① The use that has a significant influence on the public facilities such as nuclear power plants and other power plants of power companies.
- ② The use for railway companies, government offices, etc. that require to build the special quality assurance system.
- ③ The use for aerospace equipment, medical equipment, railway equipment, combustion and fuel equipment, passenger vehicles, manned transportation equipment, recreational equipment, safety equipment, and air conditioner for servers and the cooling facilities that are expected to have a significant influence on life, body, and property.

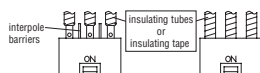
4. Safety notice

Be sure to read these Instructions and other associated documents accompanying the product thoroughly to be familiarize yourself with the product handling, safety information, and all other precautions before mounting, using, servicing, or inspecting the product.

■ Mounting precautions

⚠ Caution

- Electrical work should only be undertaken by suitably qualified persons.
- Do not place the product in an area that is subject to high temperature, high humidity, excessive dusty air, corrosive gas, strong vibration and shock, or other unusual conditions. Mounting in such areas could cause a fire or malfunction.
- Be careful to prevent foreign objects (debris, concrete powder, iron powder, etc.) and rainwater from entering product. These materials inside the product could cause a fire or malfunction.
- For 4-pole breakers, be sure to connect a neutral conductor to the N pole. Otherwise, an over-current may hinder the product from tripping, thus resulting in a fire.
- When connecting cable or busbar to the product, tighten terminal screws to the torque specified in this manual. Otherwise, a fire could result.
- For front-connected breakers, Insulate all bare conductors of the line side until the breaker end. If interpole barriers are packed, be sure to use the barriers; moreover, insulate all bare conductors by insulating tape or the like so that the tape overlaps with the barriers. Insufficient insulation may result in short-circuit.
- Do not block the arc gas vents of the product to ensure adequate arc space. Blocking these vents could result in failure of circuit interruption.



[Meaning of indication]

⚠ Warning

Warning notice with this symbol indicates that neglecting the suggested procedure or practice could result in lethal or serious personal injury.

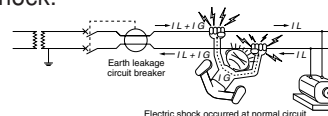
⚠ Caution

A caution notice with this symbol indicates that neglecting the suggested procedure or practice could result in moderate or slight personal injury and/or property damage.

■ Handling Precautions

⚠ Warning

- The earth leakage circuit breaker trips open just when the difference between outgoing current and incoming current exceeds a specified value. Never touch two or more bare live parts simultaneously. The breaker does not respond to electric shock.
- Never touch terminals. Otherwise, electric shock may result.



⚠ Caution

- When the breaker trips open automatically, remove the cause, then return the handle to the (ON) position. Should a fault be interrupted, the breaker must be inspected. Otherwise, a fire may result.

■ Maintenance Precautions

⚠ Caution

- Service and/or inspection of the product must be done by persons having expert knowledge.
- Prior to commencing any work on the product, open an upstream circuit breaker or isolator to ensure that no voltage is applied to the product. Otherwise, electrical shock may result.
- When connecting cable or busbar to the product, tighten terminal screws to the torque specified in this manual. Otherwise, a fire could result.

5. Ordering information

Products and specifications appearing in this catalogue are subject to change (including discontinued sales) due to product improvements and other reasons, therefore contact TERASAKI or your local dealer prior to using, considering or ordering the shown products to confirm that the information in this catalogue is the up-to-date.

1

General

Features	1-2
Selection Chart	1-8

Based Standards

JIS C 8201-2-1 Ann.1 Ann.2 JIS C 8201-2-2 Ann.2	Japanese Industrial Standard
IEC 60947-2	International Electrotechnical Commission
EN 60947-2	European Standard

Completely renewed electronic circuit breakers, ranging from

Among the industry's smallest breakers

Models sizing 100AF or 125AF are the industry's smallest, measuring just 90 mm width, 130 mm height, and 68 mm depth for 3-pole types. 630AF models are of the same dimensions as 400AF versions: 140 mm width, 260 mm height, and 103 mm depth for 3-pole types. Their compactness helps space-saving in distribution switchboards.



Smart MCCBs facilitating energy saving

Our new smart circuit breakers are capable of acquiring, displaying, and transmitting circuit information. They help consolidate and reduce devices needed for energy management systems used at buildings and factories.

★ Remote display of circuit information

The TemViewPRO Remote display (optional) can be connected to the smart circuit breakers using a single cable and easily attached to the switchboard panel. It has a back-lit LCD display that is highly visible even in dark places.

TemView PRO

Remote display



★ Centralized control of circuit information

The TemComPRO Communication Module (optional) allows network communication of circuit information. A system can be easily developed owing to the Modbus RTU communication protocol.

The TemComPRO can be mounted on a DIN rail with a snap-on mechanism and wired using connectors, so it is easy to install for additional installation.

With use of a support, the module can also be mounted on the side of the circuit breaker.

TemCom PRO

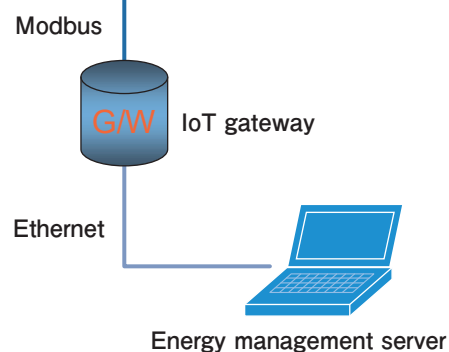
Communication module



Support to mount the module on the side of the breaker

★ Zone interlock function mitigates circuit damage

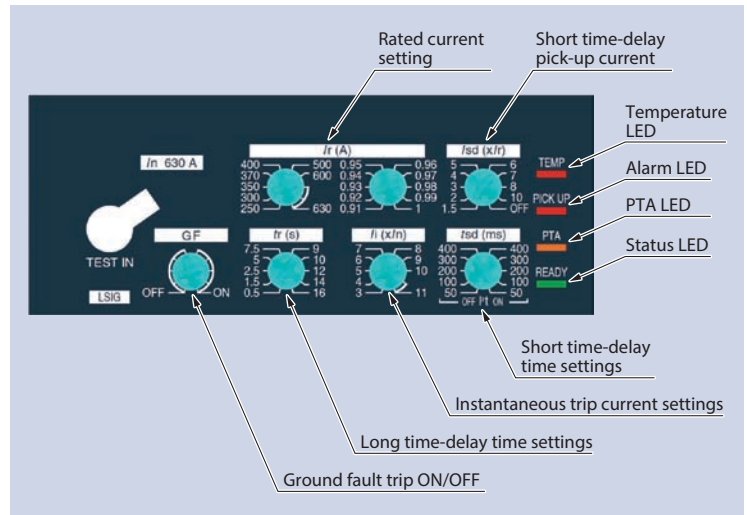
If a short circuit or ground fault occurs in a selective coordinated circuit with short time-delay protection and ground fault protection, the circuit breaker in the immediate upstream of the accident spot can be protected by an instantaneous trip triggered as a result of deactivation of time delay settings, consequently alleviating thermal and mechanical damage to the circuit at the time of accidental short circuiting. Linkage can be established among smart circuit breakers ranging from 100AF to 630AF, as well as between the smart circuit breaker and the TemPower2 air circuit breaker.



100AF to 630AF, provide much improved user convenience.

Advanced standard series electronic circuit breakers

- ★ Protection settings of standard series can be adjusted using multiple dials in place of conventional two dials, enabling flexible configuration of protection to meet a wide variety of needs.
- ★ The pre-trip alarm function, which was optional for the previous series, is now available as a standard feature. With this, the load current can be constantly monitored.
- ★ Settings for long time-delay can be configured by conventional rated current adjustment; in addition, it can be set to 91% to 100% of the rated current, in 1% increments. This allows fine tuning to suit the load conditions to be applied.
- ★ Also equipped with a temperature self-monitoring function.
When the temperature of the circuit board inside the over-current protective device exceeds 105°C, a LED lamp lights up in red to indicate an abnormal operating status of the breaker.



★Versatile measurement functions

The following types of circuit information can be acquired. There is no need to install in-panel instruments and incidental connecting wires in the energy management system.

- Current • Voltage • Wattage • Watt-hour • Power factor
- Frequency • Total harmonic distortion • Demand current
- Demand wattage

★Precision measurement

Rogowski coils are used for current sensors. Measurement is now possible with higher precision than previous series. Reading errors complying with the international standard IEC 61557-12 were adopted to realize enhanced measurement accuracy: $\pm 1\%$ for electric current, $\pm 0.5\%$ for voltage, and $\pm 2\%$ for wattage. This allows precise monitoring of energy use conditions.

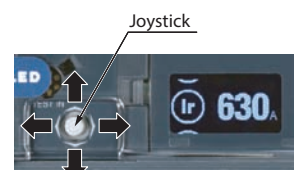
★Great visibility

An OLED display panel is used for the display to indicate measurement values. Also, high visibility is ensured by use of symbols representing the items to be displayed.



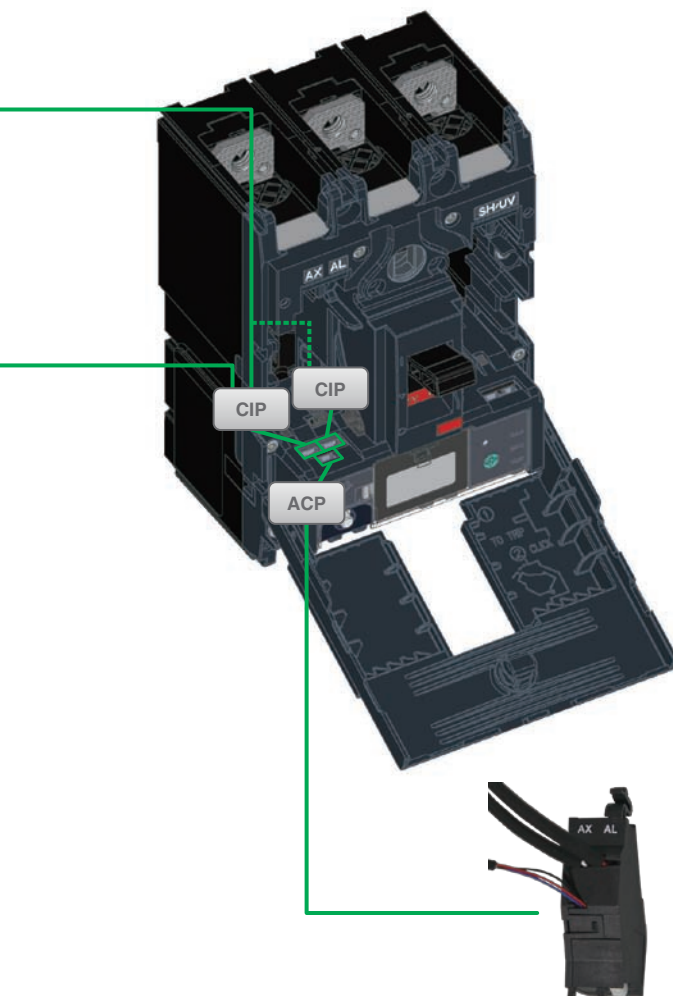
★Excellent operability

A joystick is used for switching display screens and configuring settings. User-friendliness improved in comparison with push-button operation adopted in conventional models.



★Status indication realized by smart AX/AL switch

With a special AX/AL switch installed, the number of times the auxiliary switch and alarm switch were activated can be indicated on the display of the circuit breaker, and it is also possible to transmit the activation count, along with the status of these switches, to the network including remote displays.

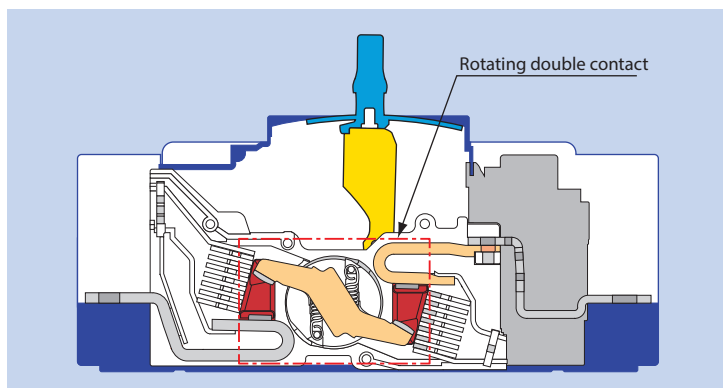


Smart AX/AL switch

Rated breaking capacity improved for 100AF - 630AF models

	TemBreak	TemBreak PRO
125AF 160AF	 S125-GJ 415V AC $I_{cu}/I_{cs}=65\text{kA}/33\text{kA}$	 P160H 415V AC $I_{cu}/I_{cs}=70\text{kA}/50\text{kA}$
250AF	 S250-GJ 415V AC $I_{cu}/I_{cs}=65\text{kA}/36\text{kA}$	 P250H 415V AC $I_{cu}/I_{cs}=70\text{kA}/50\text{kA}$
400AF	 S400-PJ 415V AC $I_{cu}/I_{cs}=85\text{kA}/85\text{kA}$	 P400S 415V AC $I_{cu}/I_{cs}=110\text{kA}/110\text{kA}$
630AF 800AF	 S800-RJ/630A 415V AC $I_{cu}/I_{cs}=70\text{kA}/50\text{kA}$	 P630S 415V AC $I_{cu}/I_{cs}=110\text{kA}/110\text{kA}$

The 400AF/630AF models feature a pressure trip mechanism that leverages internal pressure generated at the time of a short-circuit trip, and a rotating double contact structure that has evolved from the world's first current-limiting circuit breaker technology developed by Terasaki. Owing to smooth contact separation realized by the rotating double throw contact, as well as speedy cut-off by the pressure trip mechanism, these new circuit breakers have excellent breaking performance: $I_{cu}/I_{cs} = 110\text{kA}/110\text{kA}$ (415V AC).



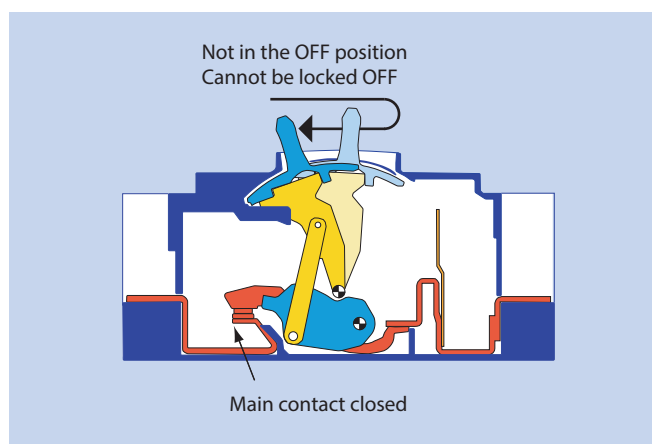


Safety inherited from *TemBreak2*

The safety-conscious functions and design features of the TemBreakPRO were taken over from the *TemBreak2* series.

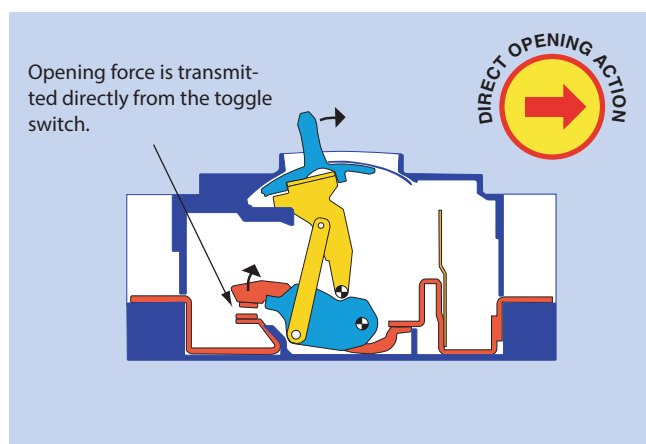
Isolation capability

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.



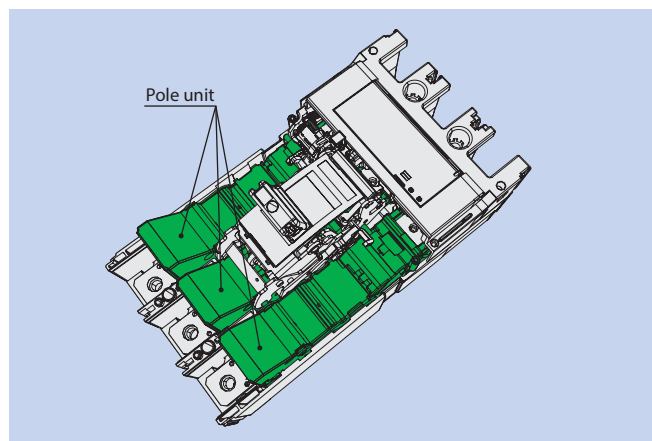
Direct Opening Action

As well as being a spring-based switching mechanism, with the forced OFF mechanism, the main contact is moved directly by the operating force from the toggle at the time of OFF operation. It can be used as an emergency stop switch for machines which comply with IEC60204-1. Even if the internal spring mechanism is damaged, the plug-in base can be turned OFF, meaning that it is safe.



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. Moreover, 400AF and 630AF models adopted a pole unit structure comprising contacts and arc chambers housed in plastic cases and allocated to each pole. This helped improve insulation performance between poles.



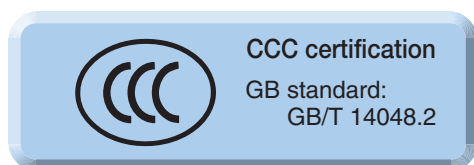
Easy-to-understand status indication

The indicator clearly shows Red when the circuit breaker is ON and Green when the breaker is OFF. No color indication means the device has tripped. This design prevents misperception of breaker status when seen from any angle, thus ensuring safety.



Obtained CCC certification

TemBreak PRO moulded case circuit breakers comply with GB standards and are CCC certified.



●CCC certification system

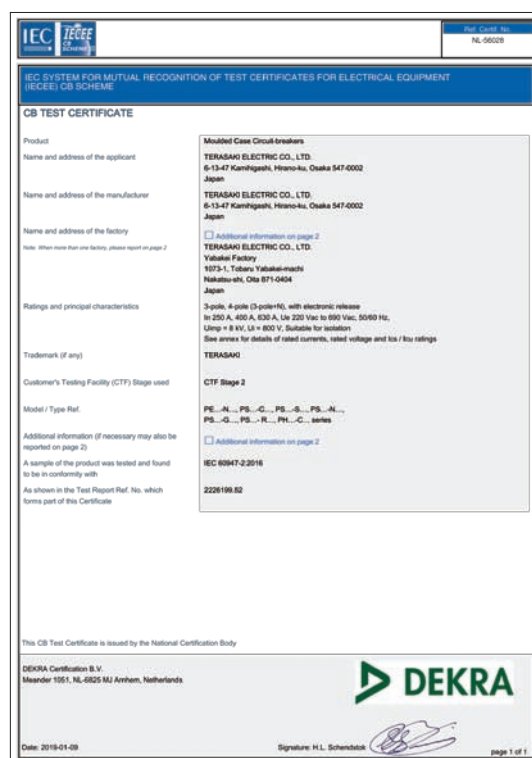
The Chinese government enforces compulsory product certification covering areas such as safety and EMC for products that are distributed in China. It is prohibited to ship products that have not obtained CCC certification within China, import them into China, or sell them. TemBreak PRO products comply with GB/T 14048.2, the Chinese national standard, which is the technical standard for the CCC certification system.



Obtained DEKRA certification

TemBreak PRO moulded case circuit breakers have obtained certification from DEKRA in Germany, an international certification body. We passed short circuit breaking test with DEKRA as a witness. DEKRA certification is recognised for its reliability not only in Europe but all over the world.

●KEMA, the Dutch standards association for electrical equipment, came under the umbrella of DEKRA in 2011. As such, the former KEMA certification is now called DEKRA certification.





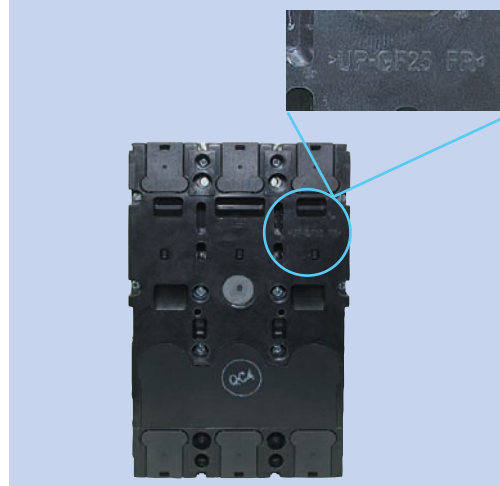
Conforms to the RoHS2 Directive

We use environmentally-friendly materials and do not use harmful substances.

We use recyclable thermoplastic resin for plastic parts and indicate the names of the materials used on the main plastic parts.

(Excludes some models)

● Indication of material name



Selection Chart

Moulded Case Circuit Breakers	Frame size (A)							
	125 / 160		250		400		630	
Economical series	TM FIX E160-SF 1P 25kA ☆		TM FIX E250-SCF 16kA	TM ADJ E250-SCJ 16kA	TM ADJ P400E 25kA		TM ADJ P630E 25kA	
	TM FIX E160-SF 2,3,4P 16kA	TM ADJ E160-SJ 16kA	TM FIX E250-SF 25kA	TM ADJ E250-SJ 25 / 19				
Standard series	TM FIX S160-NF 1P 25kA ☆		TM ADJ P250F 36kA	ELE P250F 36kA	TM ADJ P400F 36kA	ELE P400F 36kA	TM ADJ P630F 36kA	ELE P630F 36kA
	TM FIX S160-SCF 2,3,4P 25kA	TM ADJ S160-SCJ 25kA	TM ADJ P250N 50kA	ELE P250N 50kA	TM ADJ P400N 50kA	ELE P400N 50kA	TM ADJ P630N 50kA	ELE P630N 50kA
	TM FIX S160-SF 40kA	TM ADJ S160-SJ 40kA	TM ADJ P250H 70kA	ELE P250H 70kA	TM ADJ P400H 70kA	ELE P400H 70kA	TM ADJ P630H 70kA	ELE P630H 70kA
	TM ADJ P160F 36kA	ELE P160F 36kA						
	TM ADJ P160N 50kA	ELE P160N 50kA						
	TM ADJ P160H 70kA	ELE P160H 70kA						
High-fault series	TM ADJ H125-NJ 125kA	ELE H160-NJ 125kA	TM ADJ H250-NJ 125kA	ELE H250-NE 125kA	TM ADJ P400S 110kA	ELE P400S 110kA	TM ADJ P630S 110kA	ELE P630S 110kA
						ELE H400-NE 125kA		
Current Limiting series	TM ADJ L125-NJ 200kA	TM ADJ L160-NJ 200kA	TM ADJ L250-NJ 200kA			ELE L400-NE 200kA		
Switch Disconnecter	S160-SN	P160D	S250-SN	P250D	P400D		P630D	
Non-automatic trip breakers								

800	1000	1250	1600	2000	2500	3200	
TM ADJ S800-CJ 36kA		ELE S1000-SE 50kA	ELE S1250-SE 50kA	ELE S1600-SE 50kA	ELE XS2000NE 85kA	ELE XS2500NE 85kA	ELE XS3200NE 85kA
TM ADJ S800-NJ 50kA	ELE S800-NE 50kA	ELE S1000-NE 70kA	ELE S1250-NE 70kA	ELE S1600-NE 85kA			
TM ADJ S800-RJ 70kA	ELE S800-RE 70kA	ELE S1250-GE 85kA					
TM ADJ S800-PJ 100kA	ELE S800-PE 100kA						
ELE H800-NE 125kA							
ELE L800-NE 200kA							
S800-NN		S1000-NN	S1250-NN	S1600-NN			
					XS2000NN	XS2500NN	XS3200NN

TM ADJ
P160F
36kA — 415V AC I_{cu} (IEC 60947-2)

TM FIX: Thermal Fixed type
 TM ADJ: Thermal Adjustable type
 ELE: Electronic type
 ☆: 240V AC

Selection Chart

Special Breakers	Frame size (A)					
	125	250	400	630	800	1250
Special Mounting Dimensions Circuit Breakers			TM FIX E400-SCF 25kA/415V			
			TM FIX E400-SF 36kA/415V			
690V AC Circuit Breakers	TM ADJ L125-PJ 70kA/690V		ELE L400-PE 70kA/690V		ELE L800-PE 70kA/690V	
800V, 1000V, 1100V AC Circuit Breakers ☆☆☆	TM ADJ VS125-NJ 6kA/1100V ☆	TM ADJ VS250-NJ 6kA/1100V	ELE VE400-NE 30kA/800V	ELE VS630-NE 18kA/1100V	ELE VS800-NE 18kA/1100V	ELE VS1250-NE 30kA/1100V
	TM ADJ VS125-GJ 10kA/1000V	TM ADJ VS250-GJ 10kA/1000V	ELE VS400-NE 12.5kA/1100V		ELE VS800-GE 30kA/1100V	
800V AC Switch ☆☆☆ Disconnectors			VE400-NN			

TM FIX E400-SCF 25kA/415V	I_{cu} (IEC 60947-2)
---------------------------------	------------------------

TM FIX: Thermal Fixed type
 TM ADJ: Thermal Adjustable type
 ELE: Electronic type
 ☆: 4kA/20-32A 6kA/50-125A
 ☆☆☆: Light Grey for colour of cover

2

Ratings and Specifications

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Moulded Case Circuit Breakers

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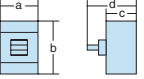
Ratings and Specifications

2

Ratings and Specifications

Moulded Case Circuit Breakers

1 Economical series

Frame size (A)		E160-SF				E160-SJ		E250-SCF		E250-SCJ			
Type		1				3		3		3			
Number of poles		2				4		4		4			
Ratings													
Rated current, A		16	63	15	75	16	63	25	160	125		100	
		20	80	20	100	20	80	40		150		125	
		25	100	30	125	25	100	63		175		160	
		32	125	40	160	32	125	80		200		200	
		40		50		40	160	100		225		250	
		50		60		50		125		250			
Calibrated at		50°C				50°C		50°C		50°C			
Rated insulation voltage [U_i] V AC		690				690		690		690			
Rated impulse withstand voltage [U_{imp}] kV		8				8		8		8			
Rated short time withstand current [I_{cw}] kA		—				—		—		—			
Utilization Category		A				A		A		A			
Rated breaking capacity, kA													
IEC 60947-2		AC 690V				—		—		—			
$I_{cu}/I_{cs}(sym)$		525V				—		6/3		6/3			
		480V				—		6/3		6/3			
		440V				—		10/5		10/5			
		415V				—		16/8		16/8			
		240V				25/13		25/13		25/13			
		DC 250V				10/5 (125V)		13/7		13/7			
External dimensions, mm													
		a				25		50		75		100	
		b				130		130		130			
		c				68		68		68			
		d				95		95		95			
Weight (● marked standard type) kg		0.3				0.6		0.8		1.0			
Connections and Mountings													
Front-connected	Terminal screws (FC)	—				●		●		●			
	With extension bars (FB)	—				○		○		○			
	Cable clamp (FW)	● 25				—		○		○			
Rear-connected	Flat bar studs (RC)	—				○		○		○			
	For switchboards (PMB)	—				—		—		—			
Draw-out type (DR)		—				—		—		—			
DIN rail mount (DA)		—				—		○ 4		—			
Overcurrent trip mechanism		OCR type											
Thermal magnetic	Adjustable thermal ADJ	—				—		●		—			
	Fixed thermal FIX	●				●		—		●			
Electronic	TPOT	—				—		—		—			
	TPOP	—				—		—		—			
	XOU	—				—		—		—			
	XOS	—				—		—		—			
Accessories (optional)		Symbol											
Externally mounted	Auxiliary switch A X	—				●		●		●			
	Alarm switch A L	—				●		●		●			
	Shunt trips S H	—				●		●		●			
Internally mounted	Undervoltage trips U V	—				●		●		●			
	Motor operator M C	—				—		●		●			
	External operating handle H B	—				—		●		●			
Externally mounted	Door-mounted (variable depth) H P	—				—		●		●			
	Toggle extension H A	—				—		—		—			
	Mechanical interlock M S	—				—		●		●			
Externally mounted	Link type M L	—				—		—		●			
	Wire type MW	—				—		—		●			
	Toggle holder H H	●				●		●		●			
Externally mounted	Toggle lock H L	●				●		●		●			
	Terminal cover For front-connected C F	●				●		●		●			
	For rear-connected and plug-in C R	—				●		●		●			
Externally mounted	For cable clamps C S	—				—		●		●			
	Terminal block for lead T F	—				—		●		●			
	Door flange D F	●				●		●		●			
CE marking		Yes				Yes		Yes		Yes			
Colour of cover		Grey Blue				Grey Blue		Grey Blue		Grey Blue			
Trip button (Colour)		Yes (Red)				Yes (Red)		Yes (Red)		Yes (Red)			
Suitability for isolation		Yes				Yes		Yes		Yes			
Reverse connection		Yes				Yes		Yes		Yes			
Endurance	Electrical 415V	10,000				10,000 ⑦		10,000 ⑦		6,000		6,000	
	Mechanical	20,000				20,000		20,000		18,000		18,000	

Notes:

● : Standard. This configuration used unless otherwise specified.

○ : Optional standard. Specify when ordering.

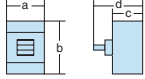
● : "yes" or "available".

— : "no" or "not available".

④ : Please order the DIN rail adapter separately.

⑦ : 14,000 for less than 125A

⊕ : Factory-installed.

Frame size (A)			E250-SF		E250-SJ		P400E		P630E					
Type			3	4	3	4	3	4	3	4				
Number of poles														
Ratings														
Rated current, A			125		100		250		630 ③					
			150		125		400							
			175		160									
			200		200									
			225		250									
			250											
Calibrated at			50°C		50°C		50°C		30°C					
Rated insulation voltage [U_i] V AC			690		690		800		800					
Rated impulse withstand voltage [U_{imp}] kV			8		8		8		8					
Rated short time withstand current [I_{cw}] kA			—		—		—		—					
Utilization Category			A		A		A		A					
Rated breaking capacity, kA														
IEC 60947-2			AC	690V	—	—	—	—	—	—				
I_{cu}/I_{cs} (sym)			525V	7.5/6	7.5/6		15/15		15/15					
			480V	10/7.5	10/7.5		20/20		20/20					
			440V	15/12	15/12		22/22		22/22					
			415V	25/19	25/19		25/25		25/25					
			240V	35/27	35/27		35/35		35/35					
DC			250V	15/12	15/12		25/25		25/25					
External dimensions, mm														
				a	105	140	105	140	140	185	140	185		
				b	165		165		260		260			
				c	68		68		103		103			
				d	95		95		151		151			
Weight (● marked standard type) kg				1.5	1.9		1.5	1.9	5.5	7.3	5.9	7.8		
Connections and Mountings														
Front-connected			Terminal screws (FC)	●	●		●		●					
			With extension bars (FB)	○ ⑤	○ ⑤		○		○					
			Cable clamp (FW)	○	○		○		○					
Rear-connected			Flat bar studs (RC)	○	○		○		○					
Plug-in (PM)			For switchboards (PMB)	—	—		○ ②③		—					
Draw-out type			(DR)	—	—		▲		—					
DIN rail mount			(DA)	—	—		—		—					
Overcurrent trip mechanism			OCR type											
Thermal magnetic			Adjustable thermal ADJ	—	●		●		●					
			Fixed thermal FIX	●	—		—		—					
Electronic			TPOT	—	—		—		—					
			TPOP	—	—		—		—					
			XOU	—	—		—		—					
			XOS	—	—		—		—					
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	—	—		●		●					
			Mechanical interlock ①⑨											
			Slide type M S	●	●		●		●					
			Link type M L	●	●		●		●					
			Wire type M W	●	●		●		●					
			Toggle holder H H	●	●		●		●					
			Toggle lock H L	●	●		●		●					
			Terminal cover For front-connected C F	●	●		●		●					
			For rear-connected and plug-in C R	●	●		●		●					
			For cable clamps C S	●	●		●		●					
			Terminal block for lead T F	●	●		●		●					
			Door flange D F	●	●		●		●					
CE marking				Yes	Yes		Yes		Yes					
Colour of cover				Grey Blue	Grey Blue		Grey Blue		Grey Blue					
Trip button (Colour)				Yes (Red)	Yes (Red)		Yes (Red)		Yes (Red)					
Suitability for isolation				Yes	Yes		Yes		Yes					
Reverse connection				Yes	Yes		Yes		Yes					
Endurance			Electrical 415V	6,000	6,000		6,000		4,000					
			Mechanical	18,000	18,000		15,000		15,000					

Notes:

● : Standard. This configuration used unless otherwise specified.

○ : Optional standard. Specify when ordering. ▲ : Semi-standard.

● : "yes" or "available".

— : "no" or "not available".

⑤ : For the extension bars, please place the order separately in parts.

①⑨ : Mechanical interlocks cannot be applied to draw-out type (DR).

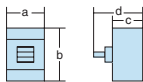
②③ : A safety trip function is provided.

③ : Max. rating 560A at 50°C

2 Standard series

Notes:

- : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering. ● : “yes” or “available”. — : “no” or “not available”.
- ④ : Please order the DIN rail adapter separately. ⑤ : For the extension bars, please place the order separately in parts. ⑦ : 14,000 for less than 125A
- ②③ : A safety trip function is provided. ②⑨ : Not available for Plug-in
- ③① : Adjustable range (I_p)=0.8-0.9-1.0×(I_n) ③⑤ : Max. rating 125A at 50°C for Plug-in.
- ③⑧ : For (I_p) rated current settings (A) please refer to Section 7.
- ③⑨ : MCCB cannot be used in IT systems at this voltage.

Frame size (A)				P160N				P160H				P250F				P250N			
Type				3	4	3	4	3	4	3	4	3	4	3	4	3	4		
Number of poles																			
■ Ratings																			
Rated current, A				20	160 ②	$I_n=40$		20	160 ②	$I_n=40$		50	250	$I_n=40$		50	250	$I_n=40$	
				32		$I_n=100$		32		$I_n=100$		63		$I_n=100$		63		$I_n=100$	
				50		$I_n=160$ ③		50		$I_n=160$ ③		100		$I_n=160$ ④		100		$I_n=160$ ④	
				63 ③				63 ③				125		$I_n=250$ ⑤		125		$I_n=250$ ⑤	
				100			③	100			③	160				160			
				125				125				200		③		200		③	
Calibrated at				50°C	—			50°C	—			50°C	—			50°C	—		
Rated insulation voltage [U_i] V AC				800	800			800	800			800	800			800	800		
Rated impulse withstand voltage [U_{imp}] kV				8	8			8	8			8	8			8	8		
Rated short time withstand current [I_{cw}] kA				—	—			—	—			—	—			—	—		
Utilization Category				A	A			A	A			A	A			A	A		
■ Rated breaking capacity, kA																			
IEC 60947-2	AC	690V	6/6	6/6 ③	6/6	6/6 ③	6/6	6/6 ③	6/6	6/6 ③	6/6	6/6 ③	6/6	6/6 ③	6/6	6/6 ③	6/6	6/6 ③	
		525V	22/18	22/18	25/18	25/18	22/22	22/22	25/25	25/25	25/25	25/25	25/25	25/25	25/25	25/25	25/25		
		480V	35/22	35/22	50/22	50/22	25/22	25/22	36/25	36/25	36/25	36/25	36/25	36/25	36/25	36/25	36/25		
		440V	35/35	35/35	50/35	50/35	25/25	25/25	36/36	36/36	36/36	36/36	36/36	36/36	36/36	36/36	36/36		
		415V	50/50	50/50	70/50	70/50	36/36	36/36	50/50	50/50	50/50	50/50	50/50	50/50	50/50	50/50	50/50		
		240V	85/85	85/85	85/85	85/85	50/50	50/50	85/85	85/85	85/85	85/85	85/85	85/85	85/85	85/85	85/85		
	DC	250V	40/40	—			40/40	—			25/19	—			40/40	—			
■ External dimensions, mm																			
	a	90	120	90	120	90	120	90	120	105	140	105	140	105	140	105	140		
	b	130	130			130	130			165	165			165	165				
	c	68	68			68	68			68	68			68	68				
	d	95.5	95.5			95.5	95.5			95.5	95.5			95.5	95.5				
Weight (● marked standard type) kg				1.0	1.3	1.0	1.3	1.0	1.3	1.0	1.3	1.5	2.0	1.5	2.0	1.5	2.0		
■ Connections and Mountings																			
Front-connected	Terminal screws	(FC)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	With extension bars	(FB)	○ ⑤	○ ⑤	○ ⑤	○ ⑤	○ ⑤	○ ⑤	○ ⑤	○ ⑤	○ ⑤	○ ⑤	○ ⑤	○ ⑤	○ ⑤	○ ⑤	○ ⑤		
	Cable clamp	(FW)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
Rear-connected	Flat bar studs	(RC)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
Plug-in (PM)	For switchboards	(PMB)	○ ②	○ ②	○ ②	○ ②	○ ②	○ ②	○ ②	○ ②	○ ②	○ ②	○ ②	○ ②	○ ②	○ ②	○ ②		
Draw-out type		(DR)	—	—	—	—	—	—	—	▲	▲	▲	▲	▲	▲	▲	▲		
DIN rail mount		(DA)	○ ④	○ ④	○ ④	○ ④	○ ④	○ ④	○ ④	—	—	—	—	—	—	—	—		
■ Overcurrent trip mechanism				OCR type															
Thermal magnetic	Adjustable thermal	ADJ	●	—	●	—	—	—	—	●	—	—	—	●	—	—	—		
	Fixed thermal	FIX	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Electronic		TPOT	—	●	—	●	—	—	—	—	●	—	—	—	●	—	—		
		TPOP	—	●	—	●	—	—	—	—	●	—	—	—	●	—	—		
		XOU	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
		XOS	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
■ 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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
External operating handle	Breaker-mounted	H B	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	Door-mounted (variable depth)	H P	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Toggle extension		H A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Externally mounted	Mechanical interlock ⑱	Slide type	M S	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
		Link type	M L	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
		Wire type	MW	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	Toggle holder		H H	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Toggle lock		H L	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Terminal cover	For front-connected	C F	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	For rear-connected and plug-in	C R	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	For cable clamps	C S	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Terminal block for lead		T F	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Door flange		D F	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
CE marking				Yes	Yes			Yes	Yes			Yes	Yes			Yes	Yes		
Colour of cover				Grey Blue	Grey Blue			Grey Blue	Grey Blue			Grey Blue	Grey Blue			Grey Blue	Grey Blue		
Trip button (Colour)				Yes (Red)	Yes (Red)			Yes (Red)	Yes (Red)			Yes (Red)	Yes (Red)			Yes (Red)	Yes (Red)		
Suitability for isolation				Yes	Yes			Yes	Yes			Yes	Yes			Yes	Yes		
Reverse connection				Yes	Yes			Yes	Yes			Yes	Yes			Yes	Yes		
Endurance	Electrical	415V	30,000	30,000	30,000	30,000	30,000	30,000	30,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000		
	Mechanical		50,000	50,000	50,000	50,000	50,000	50,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000		

Notes:

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

④ : Please order the DIN rail adapter separately. ⑤ : For the extension bars, please place the order separately in parts.

⑩ : Mechanical interlocks cannot be applied to draw-out type (DR).

② : A safety trip function is provided. ③ : Not available for Plug-in

③ : Adjustable range (I_b)=0.8-0.9-1.0(I_n) ⑤ : Max. rating 125A at 50°C for Plug-in.

③ : For (I_b) rated current settings (A) please refer to Section 7. ③ : MCCB cannot be used in IT systems at this voltage.

④ : Max. rating 140A at 50°C for Plug-in.

⑤ : Max. rating 214A at 50°C for Plug-in.

2

Ratings and Specifications

Moulded Case Circuit Breakers

2 Standard series

Frame size (A)		P250H				P400F				P400N				P400H			
Type		3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4
Number of poles		3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4
Rated current, A		50	250	$I_n=40$		250		$I_n=250$		250		$I_n=250$		250		$I_n=250$	
		63		$I_n=100$		400		$I_n=400$		400		$I_n=400$		400		$I_n=400$	
		100		$I_n=160$ ④													
		125		$I_n=250$ ⑤				③				③				③	
		160															
		200		③													
Calibrated at		50°C		—		50°C		—		50°C		—		50°C		—	
Rated insulation voltage [U_i] V AC		800		800		800		800		800		800		800		800	
Rated impulse withstand voltage [U_{imp}] kV		8		8		8		8		8		8		8		8	
Rated short time withstand current [I_{cw}] kA		—		—		—		5.0 (0.4sec.)		—		5.0 (0.4sec.)		—		5.0 (0.4sec.)	
Utilization Category		A		A		A		B		A		B		A		B	
Rated breaking capacity, kA																	
IEC 60947-2	AC	690V	6/6	6/6 ③	7/7	7/7 ③	12/12	12/12 ③	12/12	12/12 ③	12/12	12/12 ③	12/12	12/12 ③	12/12	12/12 ③	12/12
$I_{cu}/I_{cs}(sym)$		525V	30/25	30/25	20/20	20/20	22/22	22/22	35/35	35/35	35/35	35/35	35/35	35/35	35/35	35/35	35/35
		480V	50/25	50/25	25/25	25/25	30/30	30/30	50/50	50/50	50/50	50/50	50/50	50/50	50/50	50/50	50/50
		440V	50/40	50/40	30/30	30/30	45/45	45/45	65/65	65/65	65/65	65/65	65/65	65/65	65/65	65/65	65/65
		415V	70/50	70/50	36/36	36/36	50/50	50/50	70/70	70/70	70/70	70/70	70/70	70/70	70/70	70/70	70/70
		240V	85/85	85/85	50/50	50/50	85/85	85/85	100/100	100/100	100/100	100/100	100/100	100/100	100/100	100/100	100/100
	DC	250V	40/40	—	25/25	—	50/50	—	50/50	—	50/50	—	50/50	—	50/50	—	50/50
External dimensions, mm																	
		a	105	140	105	140	140	185	140	185	140	185	140	185	140	185	140
		b	165		165		260		260		260		260		260		260
		c	68		68		103		103		103		103		103		103
		d	95.5		95.5		151		151		151		151		151		151
Weight (● marked standard type) kg			1.5	2.0	1.5	2.0	5.5	7.3	5.7	7.5	5.5	7.3	5.7	7.5	5.5	7.3	5.7
Connections and Mountings																	
Front-connected	Terminal screws (FC)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	With extension bars (FB)	○ ⑤	○ ⑤	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Cable clamp (FW)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Rear-connected	Flat bar studs (RC)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Plug-in (PM)	For switchboards (PMB)	○ ②③	○ ②③	○ ②③	○ ②③	○ ②③	○ ②③	○ ②③	○ ②③	○ ②③	○ ②③	○ ②③	○ ②③	○ ②③	○ ②③	○ ②③	○ ②③
Draw-out type	(DR)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
DIN rail mount	(DA)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Overcurrent trip mechanism	OCR type																
Thermal magnetic	Adjustable thermal ADJ	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Fixed thermal FIX	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Electronic	TPOT	—	●	—	—	●	—	—	●	—	—	—	—	—	—	●	—
	TPOP	—	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	XOU	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	XOS	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Accessories (optional)	Symbol																
Auxiliary switch	A X	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Alarm switch	A L	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Shunt trips	S H	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Undervoltage trips	U V	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Motor operator	M C	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
External operating handle	Breaker-mounted H B	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Door-mounted (variable depth) H P	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Toggle extension	H A	—	—	●	—	●	—	—	●	—	—	—	●	—	—	●	—
Mechanical interlock ①⑨	Slide type M S	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Link type M L	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Wire type MW	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Toggle holder	H H	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Toggle lock	H L	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Terminal cover	For front-connected C F	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	For rear-connected and plug-in C R	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	For cable clamps C S	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Terminal block for lead	T F	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Door flange	D F	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
CE marking		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Colour of cover		Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue
Trip button (Colour)		Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)
Suitability for isolation		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reverse connection		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Endurance	Electrical	415V	10,000	10,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
	Mechanical		30,000	30,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000

Notes:

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

● : "yes" or "available". — : "no" or "not available". ▲ : Semi-standard.

⑤ : For the extension bars, please place the order separately in parts.

①⑨ : Mechanical interlocks cannot be applied to draw-out type (DR).

②③ : A safety trip function is provided.

③ : For (I_n) rated current settings (A) please refer to Section 7.

③ : MCCB cannot be used in IT systems at this voltage.

④ : Max. rating 140A at 50°C for Plug-in.

⑤ : Max. rating 214A at 50°C for Plug-in.

Frame size (A)				P630F				P630N				P630H							
Type																			
Number of poles				3	4	3	4	3	4	3	4	3	4	3	4				
Ratings																			
Rated current, A				630 ③①		I _n =630		630 ③①		I _n =630		630 ③①		I _n =630					
						③⑧				③⑧				③⑧					

Notes:

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

● : "yes" or "available". — : "no" or "not available". ▲ : Semi-standard.

①⑨ : Mechanical interlocks cannot be applied to draw-out type (DR).

②③ : A safety trip function is provided.

③① : Max. rating 560A at 50°C

③② : Max. rating 546A at 50°C for Plug-in/Draw-out

③⑧ : For (I_n) rated current settings (A) please refer to Section 7.

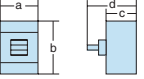
③⑨ : MCCB cannot be used in IT systems at this voltage.

2

Ratings and Specifications

Moulded Case Circuit Breakers

2 Standard series

Frame size (A)		S800-CJ		S800-NJ		S800-NE		S800-RJ		S800-RE		S800-PJ		S800-PE	
Type		3	4	3	4	3	4	3	4	3	4	3	4	3	4
Number of poles															
Ratings															
Rated current, A		630 800		630 800		$I_n=630$ $I_n=800$ 48		630 800		$I_n=630$ $I_n=800$ 48		630 800		$I_n=630$ $I_n=800$ 48	
						39				39				39	
Calibrated at		50°C		50°C		—		50°C		—		50°C		—	
Rated insulation voltage [U_i] V AC		800		800		800		800		800		800		800	
Rated impulse withstand voltage [U_{imp}] kV		8		8		8		8		8		8		8	
Rated short time withstand current [I_{cw}] kA		—		—		10 (0.3sec.)		—		10 (0.3sec.)		—		10 (0.3sec.)	
Utilization Category		A		A		B		A		B		A		B	
Rated breaking capacity, kA															
IEC 60947-2	AC	690V	10/10 39	20/20 39		20/20 39		25/20 39		25/20 39		25/20 39		25/20 39	
$I_{cu}/I_{cs}(sym)$		525V	15/15 39	30/30		30/30		45/34		45/34		45/34		45/34	
		480V	15/15	30/30		30/30		45/34		45/34		45/34		45/34	
		440V	30/30	50/50		50/50		65/50		65/50		85/50		85/50	
		415V	36/36	50/50		50/50		70/50		70/50		100/50		100/50	
		240V	50/50	85/85		85/85		100/75		100/75		125/125		125/125	
	DC	250V	50/50	50/50		—		50/50		—		50/50		—	
External dimensions, mm															
	a	210	280	210	280	210	280	210	280	210	280	210	280	210	280
	b	273		273		273		273		273		273		273	
	c	103		103		103		103		103		103		103	
	d	145		145		145		145		145		145		145	
		8.5	11.5	8.5	11.5	9.1 16	12.3 17	8.5	11.5	9.1 16	12.3 17	8.5	11.5	9.1 16	12.3 17
Weight (● marked standard type) kg															
Connections and Mountings															
Front-connected	Terminal screws (FC)	—		—		—		—		—		—		—	
	With extension bars (FB)	●		●		●		●		●		●		●	
	Cable clamp (FW)	○ 10		○ 10		○ 10		○ 10		○ 10		○ 10		○ 10	
Rear-connected	Flat bar studs (RC)	○		○		○		○		○		○		○	
Plug-in (PM)	For switchboards (PMB)	○ 24		○ 24		○ 24		○ 24		○ 24		○ 24		○ 24	
Draw-out type	(DR)	▲		▲		▲		▲		▲		▲		▲	
DIN rail mount	(DA)	—		—		—		—		—		—		—	
Overcurrent trip mechanism															
Thermal magnetic	Adjustable thermal ADJ	●		●		—		●		—		●		—	
	Fixed thermal FIX	—		—		—		—		—		—		—	
Electronic	TPOT	—		—		—		—		—		—		—	
	TPOP	—		—		—		—		—		—		—	
	XOU	—		—		● 20		—		● 20		—		● 20	
	XOS	—		—		—		—		—		—		—	
	—	—		—		—		—		—		—		—	
Accessories (optional)															
Externally mounted	Auxiliary switch	●		●		●		●		●		●		●	
	Alarm switch	●		●		●		●		●		●		●	
	Shunt trips	●		●		●		●		●		●		●	
Internally mounted	Undervoltage trips	●		●		●		●		●		●		●	
	Motor operator	●		●		●		●		●		●		●	
	External operating handle	●		●		●		●		●		●		●	
Externally mounted	Breaker-mounted	●		●		●		●		●		●		●	
	Door-mounted (variable depth)	●		●		●		●		●		●		●	
	Toggle extension	●		●		●		●		●		●		●	
	Mechanical interlock 19	●		●		●		●		●		●		●	
	Slide type	●		●		●		●		●		●		●	
	Link type	●		●		●		●		●		●		●	
	Wire type	●		●		●		●		●		●		●	
	MW	●		●		●		●		●		●		●	
	Toggle holder	●		●		●		●		●		●		●	
	Toggle lock	●		●		●		●		●		●		●	
Externally mounted	Terminal cover	●		●		●		●		●		●		●	
	For front-connected	●		●		●		●		●		●		●	
	For rear-connected and plug-in	●		●		●		●		●		●		●	
	For cable clamps	●		●		●		●		●		●		●	
Externally mounted	Terminal block for lead	●		●		●		●		●		●		●	
	Door flange	●		●		●		●		●		●		●	
	D F	●		●		●		●		●		●		●	
CE marking		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Colour of cover		Grey Blue		Grey Blue		Grey Blue		Grey Blue		Grey Blue		Grey Blue		Grey Blue	
Trip button (Colour)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)	
Suitability for isolation		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Reverse connection		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Endurance	Electrical	415V	4,000	4,000		4,000		4,000		4,000		4,000		4,000	
	Mechanical		10,000	10,000		10,000		10,000		10,000		10,000		10,000	

Notes:

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

● : "yes" or "available". — : "no" or "not available". ▲ : Semi-standard.

10 : 630A only 16 : 8.7kg/630A, 9.1kg/800A 17 : 11.9kg/630A, 12.3kg/800A

19 : Mechanical interlocks cannot be applied to draw-out type (DR).

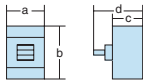
20 : Optional preferential alarm or ground fault trip function available on request.

24 : A safety lock function is provided.

39 : For (I_n) rated current settings (A) please refer to Section 7.

39 : MCCB cannot be used in IT systems at this voltage.

48 : Max. rating 760A at 50°C for Rear/Plug-in/Draw-out.

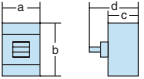
Frame size (A)			S1000-SE		S1000-NE		S1250-SE		S1250-NE		S1250-GE		S1600-SE		S1600-NE			
Type			3	4	3	4	3	4	3	4	3	4	3	4	3	4		
Number of poles																		
■ Ratings																		
Rated current, A			$I_n=1000$ ④①		$I_n=1000$ ④①		$I_n=800$ $I_n=1250$ ④①		$I_n=800$ $I_n=1250$ ④①		$I_n=800$ $I_n=1250$ ④①		$I_n=1600$ ④②		$I_n=1600$ ④②			
			③⑧		③⑧		③⑧		③⑧		③⑧		③⑧		③⑧			
Calibrated at			—		—		—		—		—		—		—			
Rated insulation voltage [U_i] V AC			800		800		800		800		800		800		800			
Rated impulse withstand voltage [U_{imp}] kV			8		8		8		8		8		8		8			
Rated short time withstand current [I_{cw}] kA			—		—		15 (0.3sec.)		15 (0.3sec.)		15 (0.3sec.)		20 (0.3sec.)		20 (0.3sec.)			
Utilization Category			A		A		B		B		B		B		B			
■ Rated breaking capacity, kA																		
IEC 60947-2	AC	690V	20/15 ③⑧		25/20 ③⑧		20/15 ③⑧		25/20 ③⑧		45/34 ③⑧		20/15 ③⑧		45/34 ③⑧			
I_{cu}/I_{cs} (sym)		525V	30/23		45/34		30/23		45/34		65/50		30/23		65/50			
		480V	30/23		45/34		30/23		45/34		65/50		30/23		65/50			
		440V	45/34		65/50		45/34		65/50		85/65		45/34		85/65			
		415V	50/38		70/50		50/38		70/50		85/65 ⑧		50/38		85/65 ⑧			
		240V	85/65		100/75		85/65		100/75		125/94		85/65		125/94			
DC		250V	—		—		—		—		—		—		—			
■ External dimensions, mm																		
	a	210	280	210	280	210	280	210	280	210	280	210	280	210	280	210	280	
	b	273		273		370		370		370		370		370		370		
	c	103		103		120		120		120		140		140		140		
	d	145		145		171		171		171		191		191		191		
Weight (● marked standard type) kg			11.0		14.8	11.0	14.8	19.8	25.0	19.8	25.0	19.8	25.0	27.0	35.0	27.0	35.0	
■ Connections and Mountings																		
Front-connected	Terminal screws	(FC)	—		—		—		—		—		—		—			
	With extension bars	(FB)	●		●		●		●		●		○		○			
	Cable clamp	(FW)	—		—		—		—		—		—		—			
Rear-connected	Flat bar studs	(RC)	○		○		○		○		○		●		●			
Plug-in (PM)	For switchboards	(PMC)	—		—		○		○		○		—		—			
Draw-out type		(DR)	—		—		▲		▲		▲		○		○			
DIN rail mount		(DA)	—		—		—		—		—		—		—			
■ Overcurrent trip mechanism	OCR type																	
Thermal magnetic	Adjustable thermal	ADJ	—		—		—		—		—		—		—			
	Fixed thermal	FIX	—		—		—		—		—		—		—			
	Electronic	TPOT	—		—		—		—		—		—		—			
	TPOP	—		—		—		—		—		—		—		—		
	XOU	● ②①		● ②①		● ②①		● ②①		● ②①		● ②①		● ②①		● ②①		
	XOS	—		—		—		—		—		—		—		—		
■ 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	●		●		▲		▲		▲		▲		▲			
		Door-mounted (variable depth)	●		●		●		●		●		●		●			
	Toggle extension	H A	●		●		● ②		● ②		● ②		● ②		● ②			
	Mechanical interlock ①⑨	Slide type	M S	●		●		●		●		●		●		●		
		Link type	M L	●		●		—		—		—		—		—		
		Wire type	M W	●		●		●		●		●		●		●		
		Rear-connected type	M B	—		—		●		●		●		●		●		
	Toggle holder	H H	●		●		●		●		●		●		●			
	Toggle lock	H L	—		—		—		—		—		—		—		—	
	Terminal cover	For front-connected	C F	●		●		●		●		●		—		—		
For rear-connected and plug-in		C R	●		●		—		—		—		—		—			
For cable clamps		C S	—		—		—		—		—		—		—			
Terminal block for lead	T F	●		●		●		●		●		●		●		●		
Door flange	D F	●		●		●		●		●		●		●		●		
CE marking			Yes		Yes		Yes		Yes		Yes		Yes		Yes			
Colour of cover			Grey Blue		Grey Blue		Grey Blue		Grey Blue		Grey Blue		Grey Blue		Grey Blue			
Trip button (Colour)			Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)			
Suitability for isolation			Yes		Yes		Yes		Yes		Yes		Yes		Yes			
Reverse connection			Yes		Yes		Yes		Yes		Yes		Yes		Yes			
Endurance	Electrical	415V	4,000		4,000		4,000		4,000		4,000		2,000		2,000			
	Mechanical		10,000		10,000		5,000		5,000		5,000		5,000		5,000			

2

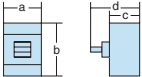
Ratings and Specifications

Moulded Case Circuit Breakers

2 Standard series

Frame size (A)																
Type			XS2000NE		XS2500NE		XS3200NE									
Number of poles			3		4		3									
Ratings																
Rated current, A			I_n =2000		I_n =2500 ④③		I_n =3200									
			③⑧		③⑧		③⑧									
Calibrated at			—		—		—									
Rated insulation voltage [U_i] V AC			690		690		690									
Rated impulse withstand voltage [U_{imp}] kV			8		8		8									
Rated short time withstand current [I_{cw}] kA			42 (0.3sec.)		42 (0.3sec.)		38 (0.5sec.)									
Utilization Category			B		B		B									
Rated breaking capacity, kA																
IEC 60947-2			AC		690V		45/42 ③⑧		45/42 ③⑧		45/42 ③⑧					
$I_{cu}/I_{cs}(sym)$					525V		65/50		65/50		65/50					
					480V		85/65		85/65		85/65					
					440V		85/65		85/65		85/65					
					415V		85/65 ⑧		85/65 ⑧		85/65 ⑧					
					240V		125/94		125/94		125/94					
			DC		250V		—		—		—					
External dimensions, mm																
			a		320		320		320							
			b		450		450		450							
			c		185		185		185							
			d		245		245		245							
Weight (● marked standard type) kg			54		67		64		78.2		65					
Connections and Mountings																
Front-connected	Terminal screws (FC)		—		—		—									
	With extension bars (FB)		○		—		—									
	Cable clamp (FW)		—		—		—									
Rear-connected	Flat bar studs (RC)		●		●		●									
Plug-in (PM)	For switchboards (PMC)		—		—		—									
Draw-out type	(DR)		○		—		—									
DIN rail mount	(DA)		—		—		—									
Overcurrent trip mechanism			OCR type													
Thermal magnetic	Adjustable thermal ADJ		—		—		—									
	Fixed thermal FIX		—		—		—									
Electronic	TPOT		—		—		—									
	TPOP		—		—		—									
	XOU		—		—		—									
	XOS		● ②⑩		● ②⑩		● ②⑩									
Accessories (optional)			Symbol													
Internally mounted	Auxiliary switch A X		●		●		●									
	Alarm switch A L		●		●		●									
	Shunt trips S H		●		●		●									
Externally mounted	Undervoltage trips U V		● ⑱		● ⑱		● ⑱									
	Toggle extension H A		● ①		● ①		● ①									
	Mechanical interlock ⑲	Rear-connected type	M B		●		●		●							
Terminal cover		C F		—		—		—								
For rear-connected and plug-in		C R		—		—										
For cable clamps		C S		—		—										
Terminal block for lead	T F		●		●		●									
	Door flange		D F		●		●		●							
CE marking			Yes		Yes		Yes									
Colour of cover			Grey Blue		Grey Blue		Grey Blue									
Trip button (Colour)			Yes (Red)		Yes (Red)		Yes (Red)									
Suitability for isolation			Non		Non		Non									
Reverse connection			Yes		Yes		Yes									
Endurance	Electrical		415V		500		500		500							
	Mechanical				3,000		3,000		2,000							

- Notes:**
- : Standard. This configuration used unless otherwise

Frame size (A)				H125-NJ		H160-NJ		H250-NJ		H250-NE		P400S				H400-NE									
Type				3		4		3		4		3		4		3		4							
Number of poles																									
Ratings																									
Rated current, A				20		160		160		$I_n=40$ $I_n=125$ $I_n=160$ $I_n=250$ ④⑦		250 400		$I_n=250$ $I_n=400$ ③⑧		$I_n=250$ $I_n=400$ ③⑧									
				32				250																	
				50																					
				63																					
				100																					
				125						③⑧															
Calibrated at				50°C		50°C		50°C ③⑥		—		50°C		—		—									
Rated insulation voltage [U_i] V AC				800		800		800		800		800		800		800									
Rated impulse withstand voltage [U_{imp}] kV				8		8		8		8		8		8		8									
Rated short time withstand current [I_{cw}] kA				—		—		—		—		—		5.0 (0.4sec.)		5.0 (0.3sec.)									
Utilization Category				A		A		A		A		A		B		B									
Rated breaking capacity, kA																									
IEC 60947-2				AC		690V		20/15		20/15		20/15		12/12		12/12 ③⑨		35/35							
I_{cu}/I_{cs} (sym)				525V		45/45		45/45		45/45		45/45		50/50		50/50		45/45							
				480V		45/45		45/45		45/45		45/45		65/65		65/65		45/45							
				440V		120/80		120/80		120/80		120/80		100/100		100/100		120/80							
				415V		125/85		125/85		125/85		125/85		110/110		110/110		125/85							
				240V		150/150		150/150		150/150		150/150		125/125		125/125		150/150							
DC				250V		40/40		40/40		40/40		—		50/50		—									
External dimensions, mm																									
				a		105		140		105		140		105		140		140		185					
				b		165		165		165		165		260		260		260							
				c		103		103		103		103		103		103		140							
				d		127		127		127		127		151		151		182							
						2.4		3.2		2.4		3.2		2.4		3.3		5.5		7.3		5.7		7.5	
Weight (● marked standard type) kg																									
Connections and Mountings																									
Front-connected				Terminal screws (FC)		●		●		●		●		●		●		●							
				With extension bars (FB)		○ ⑤		○ ⑤		○ ⑤		○ ⑤		○		○		○							
				Cable clamp (FW)		○		○		○		○		○		○		○							
Rear-connected				Flat bar studs (RC)		○		○		○		○		○		○		○							
Plug-in (PM)				For switchboards (PMB)		○ ②④		○ ②④		○ ②④ ③③		—		○ ②③		○ ②③		○ ②④							
Draw-out type				(DR)		—		—		—		—		▲		▲		—							
DIN rail mount				(DA)		—		—		—		—		—		—		—							
Overcurrent trip mechanism				OCR type																					
Thermal magnetic				Adjustable thermal ADJ		●		●		●		—		●		—		—							
				Fixed thermal FIX		—		—		—		—		—		—		—							
				Electronic		TPOT		—		—		—		—		●		—							
						TPOP		—		—		—		—		●		—							
						XOU		—		—		—		● ②①		—		—							
				XOS		—		—		—		—		—		—		● ②①							
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 H B		●		●		●		●		●		●		●							
				Door-mounted (variable depth) H P		●		●		●		●		●		●		●							
				Toggle extension H A		—		—		—		—		●		●		●							
				Mechanical Slide type M S		●		●		●		●		●		●		●							
				interlock ①⑨ Link type M L		●		●		●		●		●		●		●							
				Wire type MW		●		●		●		●		●		●									
				Toggle holder H H		●		●		●		●		●		●									
				Toggle lock H L		●		●		●		●		●		●									
Terminal cover				For front-connected C F		●		●		●		●		●		●		●							
				For rear-connected and plug-in C R		●		●		●		●		●		●		●							
				For cable clamps C S		●		●		●		●		●		●		●							
				Terminal block for lead T F		●		●		●		●		●		●		●							
				Door flange D F		●		●		●		●		●		●		●							
CE marking				Yes		Yes		Yes		Yes		Yes		Yes		Yes									
Colour of cover				Grey Blue		Grey Blue		Grey Blue		Grey Blue		Grey Blue		Grey Blue		Grey Blue									
Trip button (Colour)				Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)									
Suitability for isolation				Yes		Yes		Yes		Yes		Yes		Yes		Yes									
Reverse connection				Yes ⑥		Yes ⑥		Yes ⑥		Yes ⑥		Yes		Yes		Yes									
Endurance				Electrical 415V		30,000		20,000		10,000		10,000		6,000		6,000		4,500							
				Mechanical		30,000		30,000		30,000		30,000		15,000		15,000		15,000							

Notes:

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

⑤ : For the extension bars, please place the order separately in parts. ⑥ : Available up to 525V AC

①⑨ : Mechanical interlocks cannot be applied to draw-out type (DR). ②① : Optional preferential alarm or ground fault trip function available on request.

②① : Optional preferential trip alarm function available on request. ②③ : A safety trip function is provided.

②④ : A safety lock function is provided. ③③ : Max. rating 219A at 50°C for Plug-in

③⑥ : Calibrated at 30°C for Plug-in 250A ③⑧ : For (I_n) rated current settings (A) please refer to Section 7.

③⑨ : MCCB cannot be used in IT systems at this voltage.

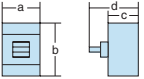
④⑦ : Max. rating 237.5A at 50°C.

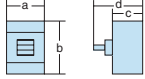
2

Ratings and Specifications

Moulded Case Circuit Breakers

3 High-fault level series

Frame size (A)			P630S			H800-NE								
Type														
Number of poles			3		4	3		4	3		4			
Ratings														
Rated current, A			630 ①			$I_n=630$			$I_n=630$		$I_n=800$ ③			
						③			③					
Calibrated at			30°C		—	—			—					
Rated insulation voltage [U_i] V AC			800		800	800			800					
Rated impulse withstand voltage [U_{imp}] kV			8		8	8			8					
Rated short time withstand current [I_{cw}] kA			—		—	10 (0.3sec.)			10 (0.3sec.)					
Utilization Category			A		A	B			B					
Rated breaking capacity, kA														
IEC 60947-2			AC		690V	12/12		12/12 ③	25/20 ③					
$I_{cu}/I_{cs}(sym)$					525V	50/50		50/50	45/34					
					480V	65/65		65/65	45/34					
					440V	100/100		100/100	125/94					
					415V	110/110		110/110	125/94					
					240V	125/125		125/125	150/150					
DC					250V	50/50		—	—					
External dimensions, mm														
					a	140		185	140		185	210		280
					b	260		260	260		273			
					c	103		103	103		140			
					d	151		151	182					
Weight (● marked standard type) kg					5.9	7.8		6.0	8.0		14.8①	18.8②		
Connections and Mountings														
Front-connected	Terminal screws	(FC)	●		●	—		—		—				
	With extension bars	(FB)	○		○	—		●		—				
	Cable clamp	(FW)	○		○	—		—		—				
Rear-connected	Flat bar studs	(RC)	○		○	—		○		—				
Plug-in (PM)	For switchboards	(PMB)	—		○ ②③ ③	○ ②④		—		—				
Draw-out type		(DR)	—		▲ ③	—		—		—				
DIN rail mount		(DA)	—		—	—		—		—				
Overcurrent trip mechanism			OCR type											
Thermal magnetic	Adjustable thermal	ADJ	●		—	—		—		—				
	Fixed thermal	FIX	—		—	—		—		—				
Electronic		TPOT	—		●	—		—		—				
		TPOP	—		●	—		—		—				
		XOU	—		—	● ②⑤		—		—				
		XOS	—		—	—		—		—				
Accessories (optional)			Symbol											
Internally mounted	Auxiliary switch	A X	●		●	●		●		●		●		
	Alarm switch	A L	●		●	●		●		●		●		
	Shunt trips	S H	●		●	●		●		●		●		
Externally mounted	Undervoltage trips	U V	●		●	●		●		●		●		
	Motor operator	M C	●		●	●		●		●		●		
	External operating handle	Breaker-mounted H B Door-mounted (variable depth) H P	●		●	●		●		●		●		
Toggle extension		H A	●		●	●		●		●		●		
	Mechanical interlock ①⑨	Slide type M S Link type M L Wire type MW	●		●	●		●		●		●		
	Toggle holder	H H	●		●	●		●		●		●		
Toggle lock		H L	●		●	●		●		●		●		
	Terminal cover	For front-connected C F For rear-connected and plug-in C R For cable clamps C S	●		●	●		●		●		●		
	Terminal block for lead	T F	●		●	●		●		●		●		
Door flange		D F	●		●	●		●		●		●		
	CE marking		Yes		Yes	Yes		Yes		Yes		Yes		
Colour of cover			Grey Blue		Grey Blue	Grey Blue		Grey Blue		Grey Blue		Grey Blue		
	Trip button (Colour)		Yes (Red)		Yes (Red)	Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		
Suitability for isolation			Yes		Yes	Yes		Yes		Yes		Yes		
	Reverse connection		Yes		Yes	Yes		Yes		Yes		Yes		
Endurance	Electrical	415V	4,000		4,000	4,000		4,000		4,000		4,000		
	Mechanical		15,000		15,000	15,000		15,000		15,000		15,000		

Frame size (A)			L125-NJ		L160-NJ		L250-NJ		L400-NE		L800-NE					
Type			3	4	3	4	3	4	3	4	3	4				
Number of poles																
Ratings																
Rated current, A			20		160		160		$I_n=250$		$I_n=630$					
			32				250		$I_n=400$		$I_n=800$ ③④					
			50													
			63						③⑤		③⑤					
			100													
			125													
Calibrated at			50°C		50°C		50°C ③⑥		—		—					
Rated insulation voltage [U_i] V AC			800		800		800		800		800					
Rated impulse withstand voltage [U_{imp}] kV			8		8		8		8		8					
Rated short time withstand current [I_{cw}] kA			—		—		—		5.0 (0.3sec.)		10 (0.3sec.)					
Utilization Category			A		A		A		B		B					
Rated breaking capacity, kA																
IEC 60947-2			AC	690V	25/20	25/20	25/20		50/50		25/20 ③⑦					
I_{cu}/I_{cs} (sym)				525V	65/65	65/65	65/65		65/65		45/34					
				480V	65/65	65/65	65/65		65/65		45/34					
				440V	180/135	180/135	180/135		180/135		180/135					
				415V	200/150	200/150	200/150		200/150		200/150					
				240V	200/150	200/150	200/150		200/150		200/150					
			DC	250V	40/40	40/40	40/40		—		—					
External dimensions, mm																
				a	105	140	105	140	105	140	140	185	210	280		
				b	165		165		165		260		273			
				c	103		103		103		140		140			
				d	127		127		127		182		182			
Weight (● marked standard type) kg				2.4	3.2	2.4	3.2	2.4	3.2	7.1	9.4	14.8①	18.8②			
Connections and Mountings																
Front-connected			Terminal screws (FC)	●	●	●	●	●	●	●	—	—	—	—	—	—
			With extension bars (FB)	○ ⑤	○ ⑤	○ ⑤	○ ⑤	○ ⑤	○	○	●	—	—	—	—	—
			Cable clamp (FW)	○	○	○	○	○	○	○	—	—	—	—	—	—
Rear-connected			Flat bar studs (RC)	○	○	○	○	○	○	○	○	○	○	○	○	○
Plug-in (PM)			For switchboards (PMB)	○ ②④	○ ②④	○ ②④	○ ②④ ③③	○ ②④	○ ②④	○ ②④	○ ②④	○ ②④	○ ②④	○ ②④	○ ②④	○ ②④
Draw-out type			(DR)	—	—	—	—	—	—	—	—	—	—	—	—	—
DIN rail mount			(DA)	—	—	—	—	—	—	—	—	—	—	—	—	—
Overcurrent trip mechanism			OCR type													
Thermal magnetic			Adjustable thermal ADJ	●	●	●	●	●	—	—	—	—	—	—	—	—
			Fixed thermal FIX	—	—	—	—	—	—	—	—	—	—	—	—	—
Electronic			TPOT	—	—	—	—	—	—	—	—	—	—	—	—	—
			TPOP	—	—	—	—	—	—	—	—	—	—	—	—	—
			XOU	—	—	—	—	—	● ②①	● ②①	—	—	—	—	—	—
			XOS	—	—	—	—	—	—	—	—	—	—	—	—	—
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	●	●	●	●	●	●	●	●	●	●	●	●	●
			External operating handle H B	●	●	●	●	●	●	●	●	●	●	●	●	●
			Door-mounted (variable depth) H P	●	●	●	●	●	●	●	●	●	●	●	●	●
			Toggle extension H A	—	—	—	—	—	●	●	●	●	●	●	●	●
Externally mounted			Mechanical Slide type M S	●	●	●	●	●	●	●	●	●	●	●	●	●
			interlock Link type M L	●	●	●	●	●	●	●	●	●	●	●	●	●
			Wire type MW	●	●	●	●	●	●	●	●	●	●	●	●	●
			Toggle holder H H	●	●	●	●	●	●	●	●	●	●	●	●	●
			Toggle lock H L	●	●	●	●	●	●	●	●	●	●	●	●	●
			Terminal cover For front-connected C F	●	●	●	●	●	●	●	●	●	●	●	●	●
			For rear-connected and plug-in C R	●	●	●	●	●	●	●	●	●	●	●	●	●
			For cable clamps C S	●	●	●	●	●	●	●	—	—	—	—	—	—
			Terminal block for lead T F	●	●	●	●	●	●	●	●	●	●	●	●	●
			Door flange D F	●	●	●	●	●	●	●	●	●	●	●	●	●
CE marking				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Colour of cover				Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue	Grey Blue
Trip button (Colour)				Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)
Suitability for isolation				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reverse connection				Yes ⑥	Yes ⑥	Yes ⑥	Yes ⑥	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Endurance			Electrical 415V	30,000	20,000	10,000	4,500	4,000	10,000	15,000	10,000	10,000	10,000	10,000	10,000	10,000
			Mechanical	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000

Notes:

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

⑤ : For the extension bars, please place the order separately in parts.

⑥ : Available up to 525V AC ① : 13.3kg/630A, 14.8kg/800A ② : 16.8kg/630A, 18.8kg/800A

②① : Optional preferential alarm or ground fault trip function available on request.

②④ : A safety lock function is provided. ③③ : Max. rating 219A at 50°C for Plug-in

③④ : Max. rating 720A at 50°C ③⑤ : Calibrated at 30°C for Plug-in 250A

③⑥ : For (I_n) rated current settings (A) please refer to Section 7.

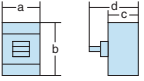
③⑦ : MCCB cannot be used in IT systems at this voltage.

2

Ratings and Specifications

Moulded Case Circuit Breakers

5 Switch-disconnectors

Frame size (A)																		
Type		S160-SN		P160D		S250-SN		P250D		P400D		P630D		S800-NN		S1000-NN		
Number of poles		3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	
Ratings																		
Rated current, A		160		160 ⑤		250		250 ④⑥		400		630		630 800		1000		
Rating at		50°C		50°C		50°C		50°C		50°C		50°C		50°C		50°C		
Rated insulation voltage $[U_i]$ V AC		690		800		800		800		800		800		800		800		
Rated operational voltage $[U_e]$ V		AC		690		690		690		690		690		690		690		
		DC		250		250		250		250		250		250		250		
Rated impulse withstand voltage $[U_{imp}]$ kV		8		8		8		8		8		8		8		8		
Rated short circuit making capacity $[I_{cm}]$ kA peak		2.8		2.8		6		5		7.6		13		17		17		
Rated short time withstand current $[I_{cw}]$ kA		2 (0.3sec.)		2 (1sec.)		3 (0.3sec.)		3.6 (1sec.)		5 (1sec.)		7.6 (1sec.)		10 (0.3sec.)		10 (0.3sec.)		
Performance																		
Utilization category		AC		AC-23A		AC-23A		AC-23A		AC-23A		AC-23A ⑦		AC-23A		AC-23A		
IEC 60947-3		DC		DC-22A		DC-22A		DC-22A		DC-22A		DC-22A		DC-22A		DC-22A		
Upstream breaker (OCPD) ②		E160-SJ		P160F		E250-SJ		P250F		P400N		P630N		S800-NJ		S1000-NE		
External dimensions, mm																		
		a		75 100		90 120		105 140		105 140		140 185		140 185		210 280		
		b		130		130		165		165		260		260		273		
		c		68		68		68		68		103		103		103		
		d		95		95.5		95		95.5		151		151		145		
Weight (● marked standard type) kg		0.7 0.9		1.0 1.3		1.5 1.9		1.5 2.0		5.4 7.2		5.7 7.7		8.5⑬ 11.5⑭		10.4 14.0		
Connections and Mountings																		
Front-connected	Terminal screws (FC)	●		●		●		●		●		●		—		—		
	With extension bars (FB)	○ ⑤		○ ⑤		○ ⑤		○ ⑤		○		○		●		●		
	Cable clamp (FW)	○		○		○		○		○		○		—		—		
Rear-connected	Flat bar studs (RC)	○		○		○		○		○		○		○		○		
Plug-in (PM)	For switchboards (PMB)	—		—		—		▲ ②③		▲ ②③		—		▲ ②④		—		
Draw-out type	(DR)	—		—		—		▲		▲		—		▲		—		
DIN rail mount	(DA)	○ ④		○ ④		—		—		—		—		—		—		
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 ⑩	Slide type	M S		●		●		●		●		●		●		●	
		Link type	M L		—		●		●		●		●		●		●	
		Wire type	M W		—		●		●		●		●		●		●	
	Toggle holder	H H		●		●		●		●		●		●		●		
	Toggle lock	H L		●		●		●		●		●		●		●		
	Terminal cover	For front-connected	C F		●		●		●		●		●		●		●	
		For rear-connected and plug-in	C R		●		●		●		●		●		●		●	
		For cable clamps	C S		●		●		●		●		●		—		—	
	Terminal block for lead	T F		●		●		●		●		●		●		●		
	Door flange	D F		●		●		●		●		●		●		●		
	CE marking		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Colour of cover		Grey Blue		Grey Blue		Grey Blue		Grey Blue		Grey Blue		Grey Blue		Grey Blue		Grey Blue		
Trip button (Colour)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		
Suitability for isolation		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		
Reverse connection		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		
Endurance	Electrical	415V		10,000 ⑦		30,000		6,000		10,000		6,000		4,000		4,000		
	Mechanical			20,000		50,000		18,000		30,000		15,000		15,000		10,000		

5 Switch-disconnectors

Notes:

● : Standard. This configuration used unless otherwise specified

○ : Optional standard. Specify when ordering. ▲ : Semi-standard.

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

②: One is supplied with every five breakers. Please specify if more are required.

⑱ : Mechanical interlocks cannot be applied to draw-out type (DR).

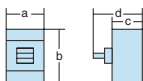
②: Please use upstream breaker for overcurrent protection. Rated conditional short-circuit current [Icc] will be the same as Rated short-circuit breaking capacity of upstream breaker.

2

Ratings and Specifications

Moulded Case Circuit Breakers

6 Non-automatic trip breakers

Frame size (A)																	
Type		XS2000NN		XS2500NN		XS3200NN											
Number of poles		3 4		3 4		3											
Ratings																	
Rated current, A		2000		2500		3200											
Rating at		50°C		50°C		50°C											
Rated insulation voltage [U_i] V AC		690		690		690											
Rated operational voltage [U_e] V		AC		690		690											
		DC		250		250											
Rated impulse withstand voltage [U_{imp}] kV		8		8		8											
Rated short circuit making capacity [I_{cm}] kA peak		90		90		90											
Rated short time withstand current [I_{cw}] kA		35 (0.3sec.)		35 (0.3sec.)		38 (0.5sec.)											
Performance																	
Max. switching current A		AC		12000		15000		15000									
IEC 60947-2		DC		5000		6250		6250									
Ann. L CBI-Y																	
Upstream breaker (OCPD) ②		XS2000NE		XS2500NE		XS3200NE											
External dimensions, mm																	
		a		320 429		320 429		320									
		b		450		450		450									
		c		185		185		185									
		d		245		245		245									
Weight (● marked standard type) kg		51.8 64.8		60 75.7		60											
Connections and Mountings																	
Front-connected	Terminal screws (FC)	—		—		—											
	With extension bars (FB)	○		—		—											
	Cable clamp (FW)	—		—		—											
Rear-connected	Flat bar studs (RC)	●		●		●											
Plug-in (PM)	For switchboards (PMC)	—		—		—											
Draw-out type	(DR)	○		—		—											
DIN rail mount	(DA)	—		—		—											
Accessories (optional)		Symbol															
Internally mounted	Auxiliary switch A X	●		●		●											
	Alarm switch A L	●		●		●											
	Shunt trips S H	●		●		●											
	Undervoltage trips U V	● ⑩		● ⑩		● ⑩											
Externally mounted	Toggle extension H A	● ①		● ①		● ①											
	Mechanical Rear-connected type interlock ⑩	●		●		●											
	Terminal cover For front-connected C F	—		—		—											
	For rear-connected and plug-in C R	—		—		—											
Externally mounted	For cable clamps C S	—		—		—											
	Terminal block for lead T F	●		●		●											
	Door flange D F	●		●		●											
CE marking		Yes		Yes		Yes											
Colour of cover		Grey Blue		Grey Blue		Grey Blue											
Trip button (Colour)		Yes (Red)		Yes (Red)		Yes (Red)											
Suitability for isolation		Non		Non		Non											
Reverse connection		Yes		Yes		Yes											
Endurance	Electrical 415V	500		500		500											
	Mechanical	3,000		3,000		2,000											

Notes:

● : Standard. This configuration used unless otherwise specified.

○ : Optional standard. Specify when ordering.

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

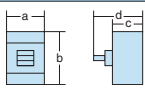
① : Supplied as standard.

⑩ : With AC UVT, the UVT controller is externally mounted.

⑪ : Mechanical interlocks cannot be applied to draw-out type (DR).

⑫ : Please use upstream breaker 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.

Frame size (A)									
Type	L125-PJ	L400-PE	L800-PE						
Number of poles	3 4	3	3						
■ Ratings									
Rated current, A	20 32 50 63 100 125	$I_n=250$ $I_n=400$	$I_n=630$ $I_n=800$ ③④						
		③⑧	③⑧						
Calibrated at	50°C	—	—						
Rated insulation voltage [U_i] V AC	800	800	800						
Rated impulse withstand voltage [U_{imp}] kV	8	8	8						
Rated short time withstand current [I_{cw}] kA	—	5 (0.3sec.)	10 (0.3sec.)						
Utilization Category	A	B	B						
■ Rated breaking capacity, kA									
IEC 60947-2 AC 690V	70/33	70/50	70/50						
I_{cu}/I_{cs} (Sym)									
■ External dimensions, mm									
	a 105 140 b 165 260 c 103 140 d 127 182	140 210 260 303 140 140 182 182							
Weight (● marked standard type) kg	2.4 3.2	8.9	15.6 ⑮						
■ Connections and Mountings									
Front-connected	Terminal screws (FC) ● With extension bars (FB) ○ ⑤ Cable clamp (FW) —	— — —	— — —						
Rear-connected	Flat bar studs (RC) ○ Plug-in (PM) For switchboards (PMB) ○ ②④ Draw-out type (DR) — DIN rail mount (DA) —	● ○ ②④ — —	● ○ ②④ — —						
■ Overcurrent trip mechanism OCR type									
Thermal magnetic	Adjustable thermal ADJ ● Fixed thermal FIX —	— —	— —						
Electronic	TPOT — TPOP — XOU — XOS —	— — ● ②⑩ —	— — ● ②⑩ —						
■ 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 ● Link type M L ● Wire type MW ● Toggle holder H H ● Toggle lock H L ● Terminal cover For front-connected C F ● For rear-connected and plug-in C R ● ③ For cable clamps C S — Terminal block for lead T F ● Door flange D F ●	● ● ● — ● ● ● ● ● ● ● ③ — ● ●	● ● ● ● — ● ● ● ● ● ● ③ — ● ●						
CE marking	Yes	Yes	Yes						
Colour of cover	Grey Blue	Grey Blue	Grey Blue						
Trip button (Colour)	Yes (Red)	Yes (Red)	Yes (Red)						
Suitability for isolation	Yes	Yes	Yes						
Reverse connection	Non	Non	Non						
Endurance Electrical 690V	30,000	4,500	4,000						
Mechanical	30,000	15,000	10,000						

Notes:

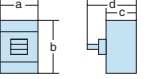
- : Standard. This configuration used unless otherwise specified.
- : Optional standard. Specify when ordering.
- : "yes" or "available".
- : "no" or "not available".
- ③ : Terminal covers are provided as standard on the line side and load side.
- ⑤ : For the extension bars, please place the order separately in parts.
- ⑮ : 14.1kg/630A, 15.6kg/800A
- ⑩ : Optional preferential alarm or ground fault trip function available on request.
- ②④ : A safety lock function is provided.
- ④ : Max. rating 720A at 50°C
- ③⑧ : For (I_f) rated current settings (A) please refer to Section 7.

2

Ratings and Specifications

Moulded Case Circuit Breakers

8 Special Mounting Dimensions 400 A Frame Circuit Breakers (Refer to the catalogue P64E for the detailed specifications.)

Frame size (A)									
Type			E400-SCF	E400-SF					
Number of poles			3	3					
Ratings									
Rated current, A			250	250					
			300	300					
			320	320					
			350	350					
			400	400					
Calibrated at			50°C	50°C					
Rated insulation voltage [U_i] V AC			690	690					
Rated impulse withstand voltage [U_{imp}] kV			8	8					
Rated short time withstand current [I_{cw}] kA			—	—					
Utilization Category			A	A					
Rated breaking capacity, kA									
IEC 60947-2			AC 690V	—					
$I_{cu}/I_{cs}(sym)$			500V	15/15	15/15				
			440V	22/22	25/22				
			415V	25/25	36/25				
			240V	50/35	50/35				
			DC 250V	25/19	25/19				
External dimensions, mm									
			a	140	140				
			b	257	257				
			c	103	103				
			d	145	145				
Weight (● marked standard type) kg				4.1	4.1				
Connections and Mountings									
Front-connected	Terminal screws	(FC)	●	●					
	With extension bars	(FB)	○	○					
	Cable clamp	(FW)	○	○					
Rear-connected	Flat bar studs	(RC)	○	○					
Plug-in (PM)	For switchboards	(PMB)	—	—					
Draw-out type		(DR)	—	—					
DIN rail mount		(DA)	—	—					
Overcurrent trip mechanism			OCR type						
Thermal magnetic	Adjustable thermal	ADJ	—	—					
	Fixed thermal	FIX	●	●					
			—	—					
Electronic		TPOT	—	—					
		TPOP	—	—					
		XOU	—	—					
		XOS	—	—					
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	●	●					
		Link type M L	—	—					
		Wire type M W	—	—					
	Toggle holder	H H	●	●					
	Toggle lock	H L	●	●					
	Terminal cover	For front-connected C F	●	●					
Externally mounted		For rear-connected and plug-in C R	●	●					
		For cable clamps C S	●	●					
	Terminal block for lead	T F	●	●					
Door flange			D F	●	●				
CE marking			Yes	Yes					
Colour of cover			Grey Blue	Grey Blue					
Trip button (Colour)			Yes (Red)	Yes (Red)					
Suitability for isolation			Yes	Yes					
Reverse connection			Yes	Yes					
Endurance	Electrical	415V	2000	2000					
	Mechanical		6800	6800					

Notes:

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

Frame size (A)												
Type			VS125-NJ		VS125-GJ		VS250-NJ		VS250-GJ			
Number of poles			3		3		3		3			
Ratings												
Rated current, A			20		50		160		160			
			32		63		250		250			
					100							
					125							
Calibrated at			50°C		50°C		50°C		50°C			
Rated insulation voltage [U_i] V AC			1100		1100		1100		1100			
Rated impulse withstand voltage [U_{imp}] kV			8		8		8		8			
Rated short time withstand current [I_{cw}] kA			—		—		—		—			
Utilization Category			A		A		A		A			
Rated breaking capacity, kA												
IEC 60947-2			AC		AC		AC		AC			
I_{cu}/I_{cs} (sym)			1100V		1100V		1100V		1100V			
			4/4		6/4		6/4		6/4			
			1000V		10/5		—		10/5			
			800V		—		—		—			
External dimensions, mm												
			a		90		105		105			
			b		155		165		165			
			c		68		68		68			
			d		92		92		92			
Weight (● marked standard type) kg			1.1		1.1		1.5		1.5			
Connections and Mountings												
Front-connected	Terminal screws	(FC)	●		●		●		●			
	With extension bars	(FB)	○ ⑤		○ ⑤		○ ⑤		○ ⑤			
	Cable clamp	(FW)	—		—		—		—			
Rear-connected	Flat bar studs	(RC)	○		○		○		○			
Plug-in (PM)	For switchboards	(PMB)	○ ②④		○ ②④		○ ②④		○ ②④			
Draw-out type		(DR)	—		—		—		—			
DIN rail mount		(DA)	—		—		—		—			
Overcurrent trip mechanism			OCR type									
Thermal magnetic	Adjustable thermal	ADJ	●		●		●		●			
	Fixed thermal	FIX	—		—		—		—			
			—		—		—		—			
Electronic		TPOT	—		—		—		—			
		TPOP	—		—		—		—			
		XOU	—		—		—		—			
		XOS	—		—		—		—			
			—		—		—		—			
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		●		●		●			
		Link type	M L		●		●		●			
		Wire type	M W		●		●		●			
	Toggle holder	H H	●		●		●		●			
	Toggle lock	H L	●		●		●		●			
	Terminal cover	For front-connected	C F		●		●		●			
		For rear-connected and plug-in	C R		●		●		●			
		For cable clamps	C S		—		—		—			
	Terminal block for lead	T F	●		●		●		●			
	Door flange	D F	●		●		●		●			
CE marking			Yes		Yes		Yes		Yes			
Colour of cover			Light Grey		Light Grey		Light Grey		Light Grey			
Trip button (Colour)			Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)			
Suitability for isolation			Yes		Yes		Yes		Yes			
Reverse connection			Non		Non		Non		Non			
Endurance	Electrical	1100V	10,000		10,000		10,000		10,000			
	Mechanical		30,000		30,000		30,000		30,000			

Notes:

● : Standard. This configuration used unless otherwise specified.

○ : Optional standard. Specify when ordering.

● : "yes" or "available".

— : "no" or "not available".

⑤ : For the extension bars, please place the order separately in parts.

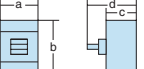
②④ : A safety lock function is provided.

2

Ratings and Specifications

Moulded Case Circuit Breakers

9 Mining Circuit Breakers (Refer to the catalogue P67E for the detailed specifications.)

Frame size (A)								
Type		VE400-NE	VS400-NE	VS630-NE	VS800-NE	VS800-GE	VS1250-NE	
Number of poles		3	3	3	3	3	3	
Ratings								
Rated current, A		$I_n=250$	$I_n=63$ $I_n=125$ $I_n=250$ $I_n=400$	$I_n=630$	$I_n=800$	$I_n=800$	$I_n=1250$	
Calibrated at								
Rated insulation voltage [U_i] V AC		800	1100	1100	1100	1100	1100	
Rated impulse withstand voltage [U_{imp}] kV		8	8	8	8	8	8	
Rated short time withstand current [I_{cw}] kA		5 (0.3sec.)	—	—	—	—	15 (0.3sec.)	
Utilization Category		B	A	A	A	A	B	
Rated breaking capacity, kA								
IEC 60947-2 AC 1100V		—	12.5/6.3	18/13.5	18/13.5	30/20	30/20	
I_{cu}/I_{cs} (sym) 1000V		—	18/13.5	20/15	20/15	30/20	30/20	
800V		30/15	—	—	—	—	—	
External dimensions, mm								
	a	140	140	210	210	210	210	
	b	260	260	273	273	370	370	
	c	140	103	103	103	120	120	
	d	182	144.5	145	145	171	171	
Weight (● marked standard type) kg		14.5	4.9	9.6	9.7	19.8	19.8	
Connections and Mountings								
Front-connected	Terminal screws (FC)	—	●	—	—	—	—	
	With extension bars (FB)	●	○	●	●	●	●	
	Cable clamp (FW)	—	—	—	—	—	—	
Rear-connected	Flat bar studs (RC)	—	○	○	○	○	○	
Plug-in (PM)	(PMC)	—	○	○	○	○	○	
Draw-out type	(DR)	—	—	—	—	—	—	
DIN rail mount	(DA)	—	—	—	—	—	—	
Overcurrent trip mechanism OCR type								
Thermal magnetic	Adjustable thermal ADJ	—	—	—	—	—	—	
	Fixed thermal FIX	—	—	—	—	—	—	
Electronic	TPOT	—	—	—	—	—	—	
	TPOP	—	—	—	—	—	—	
	XOU	● ②①	—	—	—	● ②①	● ②①	
	XOS	—	● ②①	● ②①	● ②①	—	—	
	—	—	—	—	—	—	—	
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	●	●	●	●	●	
		Link type M L	●	—	—	—	—	
		Wire type M W	●	—	—	—	—	
	Toggle holder H H	●	●	●	●	●	●	
	Toggle lock H L	—	—	—	—	—	—	
	Terminal cover	For front-connected C F	—	●	●	●	●	
		For rear-connected and plug-in C R	—	●	●	●	●	
		For cable clamps C S	—	—	—	—	—	
	Terminal block for lead T F	●	●	●	●	●	●	
	Door flange D F	●	●	●	●	●	●	
CE marking		Yes	Yes	Yes	Yes	Yes	Yes	
Colour of cover		Light Grey	Light Grey	Light Grey	Light Grey	Light Grey	Light Grey	
Trip button (Colour)		Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	
Suitability for isolation		Yes	Yes	Yes	Yes	Yes	Yes	
Reverse connection		Non	Non	Non	Non	Non	Non	
Endurance	Electrical 1100V	4,500 ⑨	1,000	1,000	500	4,000	4,000	
	Mechanical	15,000	5,000	5,000	3,000	5,000	5,000	

Notes:

● : Standard. This configuration used unless otherwise specified.

○ : Optional standard. Specify when ordering.

● : "yes" or "available".

— : "no" or "not available".

⑨ : at 800V

②① : Optional preferential alarm or ground fault trip function available on request.

10 Mining Switch-disconnectors (Refer to the catalogue P67E for the detailed specifications.)

Notes:

- : Standard. This configuration used unless otherwise specified.
- : Optional standard. Specify when ordering.
- : “yes” or “available”. — : “no” or “not available”.

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

3

Selection

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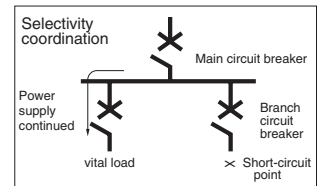
3

Selection

Moulded Case Circuit Breakers

1 Selection of circuit 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 I_{cu} sym. (kA) of each combination at the points where the branch circuit breaker is installed.



Breaker combination table for selectivity coordination for 415V AC circuit

Main circuit breaker (MCCBs)			P250F ELE	P250N ELE	P250H ELE	P400F ELE	P400N ELE	P400H ELE	P400S ELE	H400-NE	L400-NE	P630F ELE	P630N ELE	P630H ELE	
Branch circuit breaker (MCCBs)		Rated current I_n (A)	250	250	250	400	400	400	400	400	400	630	630	630	
		Rated breaking capacity I_{cu} sym. (kA)	36	50	70	36	50	70	110	125	200	36	50	70	
P160F TM P160F ELE	20-125	36	30	30	30	36	36	36	36	36	36	36	36	36	
	160	36	20	20	20	36	36	36	36	36	36	36	36	36	
P160N TM P160N ELE	20-125	50	30	30	30	36	50	50	50	50	50	36	50	50	
	160	50	20	20	20	36	50	50	50	50	50	36	50	50	
P160H TM P160H ELE	20-125	70	30	30	30	36	50	50	50	50	50	36	50	70	
	160	70	20	20	20	36	50	50	50	50	50	36	50	70	
E160-SJ E160-SF	16-125	16	16	16	16	16	16	16	16	16	16	16	16	16	
	160	16	16	16	16	16	16	16	16	16	16	16	16	16	
S160-SCJ S160-SF	15-125	25	25	25	25	25	25	25	25	17	17	25	25	25	
	160	25	20	20	20	25	25	25	25	17	17	25	25	25	
S160-SJ S160-SF	16-125	40	30	30	30	25	25	25	25	17	17	36	36	36	
	160	40	20	20	20	25	25	25	25	17	17	36	36	36	
H125-NJ	20-125	125	—	—	—	25	25	25	25	125	125	25	25	25	
H160-NJ	160	125	—	—	—	5	5	5	5	125	125	25	25	25	
H250-NJ	160-250	125	—	—	—	5	5	5	5	125	125	25	25	25	
H250-NE	40-160	125	—	—	—	5	5	5	5	125	125	25	25	25	
	250	125	—	—	—	5	5	5	5	125	125	25	25	25	
P250F TM P250F ELE	40-160	36	25	25	25	25	25	25	25	10	10	36	36	36	
	200-250	36	—	—	—	10	10	10	10	10	10	36	36	36	
P250N TM P250N ELE	40-160	50	25	25	25	25	25	25	25	10	10	36	50	50	
	200-250	50	—	—	—	10	10	10	10	10	10	36	50	50	
P250H TM P250H ELE	40-160	70	25	25	25	25	25	25	25	10	10	36	50	70	
	200-250	70	—	—	—	10	10	10	10	10	10	36	50	70	
E250-SCJ E250-SF	100-160	16	10	10	10	10	10	10	10	5	5	16	16	16	
	175-250	16	—	—	—	5	5	5	5	5	5	16	16	16	
E250-SJ E250-SF	100-160	25	10	10	10	10	10	10	10	5	5	25	25	25	
	175-250	25	—	—	—	5	5	5	5	5	5	25	25	25	
P400E TM	250	25	—	—	—	—	—	—	—	—	—	10	10	10	
	400	25	—	—	—	—	—	—	—	—	—	—	—	—	
P400F TM P400F ELE	250	36	—	—	—	—	—	—	—	—	—	10	10	10	
	400	36	—	—	—	—	—	—	—	—	—	—	—	—	
P400N TM P400N ELE	250	50	—	—	—	—	—	—	—	—	—	10	10	10	
	400	50	—	—	—	—	—	—	—	—	—	—	—	—	
P400H TM P400H ELE	250	70	—	—	—	—	—	—	—	—	—	10	10	10	
	400	70	—	—	—	—	—	—	—	—	—	—	—	—	
P400S TM P400S ELE	250	110	—	—	—	—	—	—	—	—	—	10	10	10	
	400	110	—	—	—	—	—	—	—	—	—	—	—	—	
H400-NE	250	125	—	—	—	—	—	—	—	—	—	—	—	—	
	400	125	—	—	—	—	—	—	—	—	—	—	—	—	
P630E TM	630	25	—	—	—	—	—	—	—	—	—	—	—	—	
P630F TM P630F ELE	630	36	—	—	—	—	—	—	—	—	—	—	—	—	
P630N TM P630N ELE	630	50	—	—	—	—	—	—	—	—	—	—	—	—	
P630H TM P630H ELE	630	70	—	—	—	—	—	—	—	—	—	—	—	—	
P630S TM P630S ELE	630	110	—	—	—	—	—	—	—	—	—	—	—	—	
S800-CJ	630-800	36	—	—	—	—	—	—	—	—	—	—	—	—	
S800-NJ S800-NE	630-800	50	—	—	—	—	—	—	—	—	—	—	—	—	
S800-RJ S800-RE	630-800	70	—	—	—	—	—	—	—	—	—	—	—	—	

Note: All pick-up current and time delay settings are to be set at maximum for main circuit breakers. TM: Thermal type. ELE: Electronic type.

MAIN CIRCUIT BREAKERS : TemBreakPRO MCCBs
BRANCH CIRCUIT BREAKERS : TemBreakPRO MCCBs

	P630S ELE	S800-NE	S800-RE	S800-PE	H800-NE	L800-NE	S1000-SE	S1000-NE	S1250-SE	S1250-NE	S1250-GE	S1600-SE	S1600-NE	Main circuit breaker (MCCBs)		
	630	800	800	800	800	800	1000	1000	1250	1250	1250	1600	1600	Rated current I_n (A)	Branch circuit breaker (MCCBs)	
	110	50	70	100	125	200	50	70	50	70	85	50	85	Rated breaking capacity I_{cu} sym. (kA)	Rated current I_n (A)	
	36	36	36	36	36	36	36	36	36	36	36	36	36	36	20-125	P160F TM P160F ELE
	36	36	36	36	36	36	36	36	36	36	36	36	36	36	160	
	50	50	50	50	50	50	50	50	50	50	50	50	50	50	20-125	P160N TM P160N ELE
	50	50	50	50	50	50	50	50	50	50	50	50	50	50	160	
	70	50	70	70	50	50	50	70	50	70	70	50	70	70	20-125	P160H TM P160H ELE
	70	50	50	50	50	50	50	70	50	70	70	50	70	70	160	
	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16-125	E160-SJ E160-SF
	16	16	16	16	16	16	16	16	16	16	16	16	16	16	160	
	25	25	25	25	25	25	25	25	25	25	25	25	25	25	15-125	S160-SCJ S160-SCF
	25	25	25	25	25	25	25	25	25	25	25	25	25	25	160	
	36	30	30	30	30	30	40	40	40	40	40	40	40	40	16-125	S160-SJ S160-SF
	36	30	30	30	30	30	40	40	40	40	40	40	40	40	160	
	25	50	50	50	125	125	50	70	50	70	70	50	85	125	20-125	H125-NJ
	25	50	50	50	125	125	50	70	50	70	70	50	85	125	160	H160-NJ
	25	50	50	50	125	125	50	70	50	70	70	50	85	125	160-250	H250-NJ
	25	36	36	36	125	125	50	50	50	70	70	50	85	125	40-160	H250-NE
	25	36	36	36	125	125	50	50	50	70	70	50	85	125	250	
	36	36	36	36	25	25	36	36	36	36	36	36	36	36	40-160	P250F TM P250F ELE
	36	36	36	36	25	25	36	36	36	36	36	36	36	36	200-250	
	50	36	36	36	25	25	50	50	50	50	50	50	50	50	40-160	P250N TM P250N ELE
	50	36	36	36	25	25	50	50	50	50	50	50	50	50	200-250	
	70	36	36	36	25	25	50	70	50	70	70	50	70	70	40-160	P250H TM P250H ELE
	70	36	36	36	25	25	50	70	50	70	70	50	70	70	200-250	
	16	16	16	16	16	16	16	16	16	16	16	16	16	16	100-160	E250-SCJ E250-SCF
	16	16	16	16	16	16	16	16	16	16	16	16	16	16	175-250	
	25	25	25	25	25	25	25	25	25	25	25	25	25	25	100-160	E250-SJ E250-SF
	25	25	25	25	25	25	25	25	25	25	25	25	25	25	175-250	
	10	25	25	25	25	25	25	25	25	25	25	25	25	25	250	P400E TM
	—	25	25	25	25	25	25	25	25	25	25	25	25	25	400	
	10	25	25	25	25	25	30	30	36	36	36	36	36	36	250	P400F TM P400F ELE
	—	25	25	25	25	25	30	30	36	36	36	36	36	36	400	
	10	25	25	25	25	25	30	30	36	36	36	50	50	50	250	P400N TM P400N ELE
	—	25	25	25	25	25	30	30	36	36	36	50	50	50	400	
	10	25	25	25	25	25	30	30	36	36	36	50	50	70	250	P400H TM P400H ELE
	—	25	25	25	25	25	30	30	36	36	36	50	50	70	400	
	10	25	25	25	25	25	30	30	36	36	36	50	50	110	250	P400S TM P400S ELE
	—	25	25	25	25	25	30	30	36	36	36	50	50	110	400	
	—	36	36	36	25	25	50	50	50	70	70	50	50	125	250	H400-NE
	—	36	36	36	25	25	50	50	50	70	70	50	50	125	400	
	—	—	—	—	—	—	—	—	25	25	25	25	25	25	630	P630E TM
	—	—	—	—	—	—	—	—	36	36	36	36	36	36	630	P630F TM P630F ELE
	—	—	—	—	—	—	—	—	36	36	36	50	50	50	630	P630N TM P630N ELE
	—	—	—	—	—	—	—	—	36	36	36	50	70	70	630	P630H TM P630H ELE
	—	—	—	—	—	—	—	—	—	—	—	50	85	110	630	P630S TM P630S ELE
	—	—	—	—	—	—	—	—	—	—	—	20	20	36	630-800	S800-CJ
	—	—	—	—	—	—	—	—	—	—	—	20	20	50	630-800	S800-NJ S800-NE
	—	—	—	—	—	—	—	—	—	—	—	20	20	70	630-800	S800-RJ S800-RE

3

Selection

Moulded Case Circuit Breakers

1 Selection of circuit breakers for selectivity coordination

MAIN CIRCUIT BREAKERS : TemPower2 ACBs
BRANCH CIRCUIT BREAKERS : TemBreakPRO MCCBs

Breaker combination table for selectivity coordination for 415V AC circuit

Frame (A)		800	1250			1600			2000				2500		3200		4000		5000	6300	
	Main circuit breaker (ACBs)	AR20BS	AR212S	AR212H	AR216S	AR216H	AR316H	AR220S	AR220H	AR320H	AR420H	AR325S	AR325H	AR332S	AR332H	AR440SB	AR440H	AR650S	AR663S	AR663H	
	Rated breaking capacity I_{cu} sym. (kA) Branch circuit breaker (MCCBs)	65	65	80	65	80	100	65	80	100	120	85	100	85	100	100	120	120	120	135	
125	H125-NJ	125	65	65	80	65	80	100	65	80	100	120	85	100	85	100	100	120	120	120	125
	L125-NJ	200	65	65	80	65	80	100	65	80	100	120	85	100	85	100	100	120	120	120	135
160	E160-SJ, E160-SF	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
	S160-SCJ, S160-SCF	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	
	P160F TM, P160F ELE	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	
	S160-SJ, S160-SF	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	
	P160N TM, P160N ELE	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	
	P160H TM, P160H ELE	70	65	65	70	65	70	70	65	70	70	70	70	70	70	70	70	70	70	70	
	H160-NJ	125	65	65	80	65	80	100	65	80	100	120	85	100	85	100	100	120	120	120	125
	L160-NJ	200	65	65	80	65	80	100	65	80	100	120	85	100	85	100	100	120	120	120	135
250	E250-SCJ, E250-SCF	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
	E250-SJ, E250-SF	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	
	P250F TM, P250F ELE	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	
	P250N TM, P250N ELE	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	
	P250H TM, P250H ELE	70	65	65	70	65	70	70	65	70	70	70	70	70	70	70	70	70	70	70	
	H250-NJ	125	65	65	80	65	80	100	65	80	100	120	85	100	85	100	100	120	120	120	125
	H250-NE	125	65	65	80	65	80	100	65	80	100	120	85	100	85	100	100	120	120	120	125
	L250-NJ	200	65	65	80	65	80	100	65	80	100	120	85	100	85	100	100	120	120	120	135
400	P400E TM	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	
	P400F TM, P400F ELE	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	
	P400N TM, P400N ELE	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	
	P400H TM, P400H ELE	70	65	65	70	65	70	70	65	70	70	70	70	70	70	70	70	70	70	70	
	P400S TM, P400S ELE	110	65	65	80	65	80	100	65	80	100	110	85	100	85	100	100	110	110	110	110
	H400-NE	125	65	65	80	65	80	100	65	80	100	120	85	100	85	100	100	120	120	120	125
	L400-NE	200	65	65	80	65	80	100	65	80	100	120	85	100	85	100	100	120	120	120	135
630	P630E TM	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	
	P630F TM, P630F ELE	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	
	P630N TM, P630N ELE	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	
	P630H TM, P630H ELE	70	65	65	70	65	70	70	65	70	70	70	70	70	70	70	70	70	70	70	
	P630S TM, P630S ELE	110	65	65	80	65	80	100	65	80	100	110	85	100	85	100	100	110	110	110	110
800	S800-CJ	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	
	S800-NJ, S800-NE	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	
	S800-RJ, S800-RE	70	65	65	70	65	70	70	65	70	70	70	70	70	70	70	70	70	70	70	
	S800-PJ, S800-PE	100	65	65	80	65	80	100	65	80	100	100	85	100	85	100	100	100	100	100	100
	H800-NE	125	65	65	80	65	80	100	65	80	100	120	85	100	85	100	100	120	120	120	125
	L800-NE	200	65	65	80	65	80	100	65	80	100	120	85	100	85	100	100	120	120	120	135
1000	S1000-SE	50	—	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	
	S1000-NE	70	—	65	70	65	70	70	65	70	70	70	70	70	70	70	70	70	70	70	
1250	S1250-SE	50	—	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	
	S1250-NE	70	—	65	70	65	70	70	65	70	70	70	70	70	70	70	70	70	70	70	
	S1250-GE	85	—	65	80	65	80	85	65	80	85	85	85	85	85	85	85	85	85	85	
1600	S1600-SE	50	—	—	—	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	
	S1600-NE	85	—	—	—	65	80	85	65	80	85	85	85	85	85	85	85	85	85	85	

Notes:

1. All ACB's have I_t set at NON, MCR ON.

2. Assuming ACB time settings are greater than MCCB.

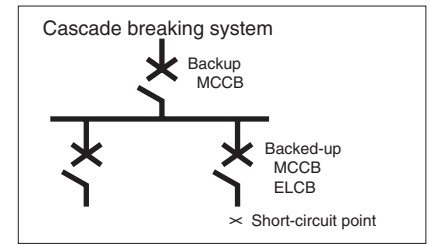
3. The above table is in accordance with IEC 60947-2, Annex A.

4. External relay can be used - Contact Terasaki for further details.

5. All values shown at 415V AC.

TM: Thermal type. ELE: Electronic type.

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



Breaker combination table for cascade breaking for 415V AC circuit

Main circuit breaker (MCCBs)		P160F TM P160F ELE	P160N TM P160N ELE	P160H TM P160H ELE	P250F TM P250F ELE	P250N TM P250N ELE	P250H TM P250H ELE	L125-NJ	L160-NJ	L250-NJ	P400E TM	P400F TM P400F ELE	P400N TM P400N ELE	P400H TM P400H ELE	P400S TM P400S ELE
Rated breaking capacity I_{cu} sym. (kA)		36	50	70	36	50	70	200	200	200	25	36	50	70	110
Branch circuit breaker (MCCBs)															
E160-SF, E160-SJ	16	25	25	25	25	25	25	—	50	50	25	25	25	25	25
S160-SCF, S160-SCJ	25	36	36	36	36	36	36	—	70	70	—	36	36	36	36
S160-SF, S160-SJ	40	—	50	70	—	50	70	—	85	85	—	—	50	50	50
P160F TM, P160F ELE	36	—	50	50	—	50	50	—	70	70	—	—	50	50	50
P160N TM, P160N ELE	50	—	—	70	—	—	70	—	85	85	—	—	—	70	70
P160H TM, P160H ELE	70	—	—	—	—	—	—	—	110	110	—	—	—	—	85
H125-NJ	125	—	—	—	—	—	—	200	200	200	—	—	—	—	—
H160-NJ	125	—	—	—	—	—	—	—	200	200	—	—	—	—	—
H250-NJ	125	—	—	—	—	—	—	—	—	200	—	—	—	—	—
E250-SF, E250-SJ	25	—	—	—	36	50	70	—	—	85	—	36	50	70	70
P250F TM, P250F ELE	36	—	—	—	—	50	50	—	—	85	—	—	50	50	50
P250N TM, P250N ELE	50	—	—	—	—	—	70	—	—	110	—	—	—	70	70
P250H TM, P250H ELE	70	—	—	—	—	—	—	—	—	130	—	—	—	—	85
P400E TM	25	—	—	—	—	—	—	—	—	—	—	36	36	36	36
P400F TM, P400F ELE	36	—	—	—	—	—	—	—	—	—	—	—	50	50	50
P400N TM, P400N ELE	50	—	—	—	—	—	—	—	—	—	—	—	—	70	70
P400H TM, P400H ELE	70	—	—	—	—	—	—	—	—	—	—	—	—	—	110
P400S TM, P400S ELE	110	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Main circuit breaker (MCCBs)		L400-NE	P630E TM	P630F TM P630F ELE	P630N TM P630N ELE	P630H TM P630H ELE	P630S TM P630S ELE	S800-RJ S800-RE	S800-PJ S800-PE	L800-NE	S1000-NE	S1250-GE	S1600-NE
Rated breaking capacity I_{cu} sym. (kA)		200	25	36	50	70	110	70	100	200	70	85	85
Branch circuit breaker (MCCBs)													
E160-SF, E160-SJ	16	25	25	25	25	25	25	—	—	—	—	—	—
S160-SCF, S160-SCJ	25	36	—	36	36	36	36	—	—	—	—	—	—
S160-SF, S160-SJ	40	70	—	—	50	50	50	—	—	—	—	—	—
P160F TM, P160F ELE	36	70	—	—	50	50	50	—	—	—	—	—	—
P160N TM, P160N ELE	50	85	—	—	—	70	70	—	—	—	—	—	—
P160H TM, P160H ELE	70	110	—	—	—	—	85	—	—	—	—	—	—
H125-NJ	125	200	—	—	—	—	—	—	—	—	—	—	—
H160-NJ	125	200	—	—	—	—	—	—	—	—	—	—	—
H250-NJ	125	200	—	—	—	—	—	—	—	150	—	—	—
E250-SF, E250-SJ	25	70	—	36	50	70	70	50	50	50	50	—	—
P250F TM, P250F ELE	36	70	—	—	50	50	50	50	50	50	50	—	—
P250N TM, P250N ELE	50	85	—	—	—	70	70	70	70	70	70	—	—
P250H TM, P250H ELE	70	110	—	—	—	—	85	—	85	—	—	—	—
P400E TM	25	36	—	36	36	36	36	36	36	36	36	36	36
P400F TM, P400F ELE	36	50	—	—	50	50	50	50	50	50	50	50	50
P400N TM, P400N ELE	50	70	—	—	—	70	70	70	70	70	70	70	70
P400H TM, P400H ELE	70	110	—	—	—	—	110	—	—	110	—	—	—
P400S TM, P400S ELE	110	150	—	—	—	—	—	—	—	125	—	—	—

TM: Thermal type. ELE: Electronic type.

3

Selection

Moulded Case Circuit Breakers

3 Selection for Type 2 Coordination 50kA at 415V AC

For direct on line motor starting

Circuit breaker	Terasaki TemBreak PRO
Contactor	Sprecher+Schuh CA7 / CA9
Overload relay	Sprecher+Schuh CEP7 Electronic
Rated operational voltage	400 / 415V AC
Motor types	Premium Efficiency class: IE3
Rated conditional AC current (I_Q) :	50 kA (rms symmetrical)
Coordination type (IEC 60947-4-1:2018)	Type 2 coordination

Component selection table

Motor		Circuit breaker	Contactor	Overload relay		C/B instant trip amps and motor FLC	
Motor kW	Motor amp ratings at 400/415V	Moulded case circuit breaker	Contactor type	Overload relay (electronic)	Ampere setting range	C/B instant trip amps ($\pm 20\%$)	Minimum trip amp multiple of motor FLC
0.18	0.6	P160N / 20A TM	CA7-30	CEP 7 EEBB *	0.2 – 1.0	240	320
0.25	0.85	P160N / 20A TM	CA7-30	CEP 7 EEBB *	0.2 – 1.0	240	225
0.37	1.1	P160N / 20A TM	CA7-30	CEP 7 EECB *	1.0 – 5.0	240	174
0.55	1.5	P160N / 20A TM	CA7-30	CEP 7 EECB *	1.0 – 5.0	240	128
0.75	1.9	P160N / 20A TM	CA7-30	CEP 7 EECB *	1.0 – 5.0	240	101
1.1	2.7	P160N / 20A TM	CA7-30	CEP 7 EECB *	1.0 – 5.0	240	71.1
1.5	3.6	P160N / 20A TM	CA7-30	CEP 7 EECB *	1.0 – 5.0	240	53.3
2.2	4.9	P160N / 20A TM	CA7-30	CEP 7 EEDB *	3.2 – 16	240	39.2
3	6.5	P160N / 20A TM	CA7-30	CEP 7 EEED	5.4 – 27	240	29.5
4	8.5	P160N / 20A TM	CA7-30	CEP 7 EEED	5.4 – 27	240	22.6
5.5	11.5	P160N / 20A TM	CA7-30	CEP 7 EEED	5.4 – 27	240	16.7
7.5	15.5	P160N / 32A TM	CA7-30	CEP 7 EEED	5.4 – 27	384	19.8
11	22	P160N / 32A TM	CA7-30	CEP 7 EEED	5.4 – 27	384	14.0
15	29	P160N / 50A TM	CA7-43	CEP 7 EEFD	9 – 45	600	16.6
18.5	35	P160N / 63A TM	CA7-43	CEP 7 EEFD	9 – 45	756	17.3
22	41	P160N / 63A TM	CA7-55	CEP 7 EEFD	9 – 45	756	14.8
30	55	P160N / 100A TM	CA7-72	CEP 7 EEGE	18 – 90	1200	17.5
37	66	P160N / 100A TM	CA7-85	CEP 7 EEGE	18 – 90	1200	14.5
45	80	P160N / 160A TM	CA9-116	CEP 7 EEHJ	30 – 150	1600	16.0
55	97	P250N / 160A TM	CA9-146	CEP 7 EEHJ	30 – 150	2080	17.2
75	132	P250N / 250A TM	CA9-190	CEP 7 EEJJ	40 – 200	2500	15.2
90	160	P400N / 250A ELE	CA9-265	CEP 7 EEJJ *	40 – 200	3000	15.0
110	195	P400N / 400A ELE	CA9-265	CEP 7 EEJJ *	40 – 200	4800	20.9
132	230	P400N / 400A ELE	CA9-305	CTKIT400A	80 – 400	4800	17.7
150	260	P630N / 630A ELE	CA9-400	CTKIT400A	80 – 400	6930	22.7
160	280	P630N / 630A ELE	CA9-400	CTKIT400A	80 – 400	6930	21.0
185	325	P630N / 630A ELE	CA9-400	CTKIT400A	80 – 400	6930	18.1
200	350	P630N / 630A ELE	CA9-460	CTKIT400A	80 – 400	6930	16.8
220	385	S800-NE / 630A	CA9-580	CTKIT400A	80 – 400	7560	15.7
250	430	S800-NE / 630A	CA9-580	CTKIT600A	120 – 600	7560	14.1
315	540	S800-NE / 800A	CA9-750	CTKIT600A	120 – 600	9600	14.2
355	610	S1000-SE / 1000A	CA9-750	CTKIT800A	160 – 800	10000	13.1
400	690	S1250-SE / 1250A	CA9-860	CTKIT1000A	200 – 1000	15000	17.4
450	770	S1250-SE / 1250A	CA9-1060	CTKIT1000A	200 – 1000	15000	15.6
500	850	S1250-SE / 1250A	CA9-1060	CTKIT1000A	200 – 1000	15000	14.1

Notes: TM: Thermal type ELE: Electronic type

A) Recommended circuit breaker size based on the following starting conditions:

Starting currents approx. 7.5...8 x motor FLC. Start time approx. 5 sec.

Premium efficiency motors include a current spike ranging 15 - 22 x FLC for 3 - 10ms, that will vary by motor make.

Motor Starters 132kW and above, Kit utilises separate 5P10-5A Current Transformers with CEP7-EE * Z overload.

* Overload relay separately mounted from contactor - 90 and 110kW starters, may use the CTKIT400A.

B) Other

1) CEP7-EE overload add-on modules are available for: Profibus, DeviceNet, Ethernet, Ground Fault, Remote reset, Jam protection, Thermistor protection.

Only one module can be fitted at any one time on a CEP7-EE overload.

C) Note

1) Set circuit breaker I_r to 1 ($=I_n$), and Overload relay is set to motor FLC.

For direct on line motor starting

Circuit breaker	Terasaki TemBreak PRO
Contactora	Allen-Bradley 100-C/100-E
Overload relay	Allen-Bradley 193-EE Electronic
Rated operational voltage	400 / 415V AC
Motor types	Premium Efficiency class: IE3
Rated conditional AC current (I_q) :	50 kA (rms symmetrical)
Coordination type (IEC 60947-4-1:2018)	Type 2 coordination

Component selection table

Motor		Circuit breaker	Contactora	Overload relay		C/B instant trip amps and motor FLC	
Motor kW	Motor amp ratings at 400/415V	Moulded case circuit breaker	Contactora type	Overload relay (electronic)	Ampere setting range	C/B instant trip amps ($\pm 20\%$)	Minimum trip amp multiple of motor FLC
0.18	0.6	P160N / 20A TM	100-C30	193-EEBB *	0.2 – 1.0	240	320
0.25	0.85	P160N / 20A TM	100-C30	193-EEBB *	0.2 – 1.0	240	225
0.37	1.1	P160N / 20A TM	100-C30	193-EECB *	1.0 – 5.0	240	174
0.55	1.5	P160N / 20A TM	100-C30	193-EECB *	1.0 – 5.0	240	128
0.75	1.9	P160N / 20A TM	100-C30	193-EECB *	1.0 – 5.0	240	101
1.1	2.7	P160N / 20A TM	100-C30	193-EECB *	1.0 – 5.0	240	71.1
1.5	3.6	P160N / 20A TM	100-C30	193-EECB *	1.0 – 5.0	240	53.3
2.2	4.9	P160N / 20A TM	100-C30	193-EEDB *	3.2 – 16	240	39.2
3	6.5	P160N / 20A TM	100-C30	193-EEED	5.4 – 27	240	29.5
4	8.5	P160N / 20A TM	100-C30	193-EEED	5.4 – 27	240	22.6
5.5	11.5	P160N / 20A TM	100-C30	193-EEED	5.4 – 27	240	16.7
7.5	15.5	P160N / 32A TM	100-C30	193-EEED	5.4 – 27	384	19.8
11	22	P160N / 32A TM	100-C30	193-EEED	5.4 – 27	384	14.0
15	29	P160N / 50A TM	100-C43	193-EEFD	9 – 45	600	16.6
18.5	35	P160N / 63A TM	100-C43	193-EEFD	9 – 45	756	17.3
22	41	P160N / 63A TM	100-C55	193-EEFD	9 – 45	756	14.8
30	55	P160N / 100A TM	100-C72	193-EEGE	18 – 90	1200	17.5
37	66	P160N / 100A TM	100-C85	193-EEGE	18 – 90	1200	14.5
45	80	P160N / 160A TM	100-E116	193-EEHJ	30 – 150	1600	16.0
55	97	P250N / 160A TM	100-E146	193-EEHJ	30 – 150	2080	17.2
75	132	P250N / 250A TM	100-E190	193-EEJJ	40 – 200	2500	15.2
90	160	P400N / 250A ELE	100-E265	193-EEJJ *	40 – 200	3000	15.0
110	195	P400N / 400A ELE	100-E265	193-EEJJ *	40 – 200	4800	20.9
132	230	P400N / 400A ELE	100-E305	CTKIT400A	80 – 400	4800	17.7
150	260	P630N / 630A ELE	100-E400	CTKIT400A	80 – 400	6930	22.7
160	280	P630N / 630A ELE	100-E400	CTKIT400A	80 – 400	6930	21.0
185	325	P630N / 630A ELE	100-E400	CTKIT400A	80 – 400	6930	18.1
200	350	P630N / 630A ELE	100-E460	CTKIT400A	80 – 400	6930	16.8
220	385	S800-NE / 630A	100-E580	CTKIT400A	80 – 400	7560	15.7
250	430	S800-NE / 630A	100-E580	CTKIT600A	120 – 600	7560	14.1
315	540	S800-NE / 800A	100-E750	CTKIT600A	120 – 600	9600	14.2
355	610	S1000-SE / 1000A	100-E750	CTKIT800A	160 – 800	10000	13.1
400	690	S1250-SE / 1250A	100-E860	CTKIT1000A	200 – 1000	15000	17.4
450	770	S1250-SE / 1250A	100-E1060	CTKIT1000A	200 – 1000	15000	15.6
500	850	S1250-SE / 1250A	100-E1060	CTKIT1000A	200 – 1000	15000	14.1

Notes:

TM: Thermal type ELE: Electronic type

A) Recommended circuit breaker size based on the following starting conditions:

Starting currents approx. 7.5...8 x motor FLC. Start time approx. 5 sec.

Premium efficiency motors include a current spike ranging 15 - 22 x FLC for 3 - 10ms, that will vary by motor make.

Motor Starters 132kW and above, Kit utilises separate 5P10-5A Current Transformers with 193-EE * Z overload.

* Overload relay separately mounted from contactor - 90 and 110kW starters, may use the CTKIT400A.

B) Other

1) 193-EE overload add-on modules are available for: Profibus, DeviceNet, Ethernet, Ground Fault, Remote reset, Jam protection, Thermistor protection.

Only one module can be fitted at any one time on a 193-EE overload.

C) Note

1) Set circuit breaker I_t to 1 ($=I_n$), and Overload relay is set to motor FLC.

3

Selection

Moulded Case Circuit Breakers

3 Selection for Type 2 Coordination 50kA at 415V AC

For direct on line motor starting

Circuit breaker	Terasaki TemBreak PRO
Contactor	Allen-Bradley 100-C/100-E
Overload relay	Allen-Bradley 193-E3 Electronic E300 w-Ethernet/IP
Rated operational voltage	400 / 415V AC
Motor types	Premium Efficiency class: IE3
Rated conditional AC current (I_q) :	50 kA (rms symmetrical)
Coordination type (IEC 60947-4-1:2018)	Type 2 coordination

Component selection table

Motor		Circuit breaker	Contactor	Overload relay		C/B instant trip amps and motor FLC	
Motor kW	Motor amp ratings at 400/415V	Moulded case circuit breaker	Contactor type	Overload relay (electronic)	Earth Leakage	C/B instant trip amps (± 20%)	Minimum trip amp multiple of motor FLC
0.18	0.6	P160N / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	320
0.25	0.85	P160N / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	225
0.37	1.1	P160N / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	174
0.55	1.5	P160N / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	128
0.75	1.9	P160N / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	101
1.1	2.7	P160N / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	71.1
1.5	3.6	P160N / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	53.3
2.2	4.9	P160N / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	39.2
3	6.5	P160N / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	29.5
4	8.5	P160N / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	22.6
5.5	11.5	P160N / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	16.7
7.5	15.5	P160N / 32A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	384	19.8
11	22	P160N / 32A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	384	14.0
15	29	P160N / 50A TM	100-C43	193 E3-63-24D-IG-60A - # -ETR	Int.	600	16.6
18.5	35	P160N / 63A TM	100-C43	193 E3-63-24D-IG-60A - # -ETR	Int.	756	17.3
22	41	P160N / 63A TM	100-C55	193 E3-63-24D-IG-60A - # -ETR	Int.	756	14.8
30	55	P160N / 100A TM	100-C72	193 E3-63-24D-IG-100A - # -ETR	Int.	1200	17.5
37	66	P160N / 100A TM	100-C85	193 E3-63-24D-IG-100A - # -ETR	Int.	1200	14.5
45	80	P160N / 160A TM	100-E116	193 E3-63-24D-IG-200A - # -ETR	Int.	1600	16.0
55	97	P250N / 160A TM	100-E146	193 E3-63-24D-IG-200A - # -ETR	Int.	2080	17.2
75	132	P250N / 250A TM	100-E190	193 E3-63-24D-IG-200A - # -ETR	Ext.	2500	15.2
90	160	P400N / 250A ELE	100-E265	193 E3-63-24D-IG-200A - # -ETR	Ext.	3000	15.0
110	195	P400N / 400A ELE	100-E265	193 E3-63-24D-IG-200A - # -ETR	Ext.	4800	20.9
132	230	P400N / 400A ELE	100-E305	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	4800	17.7
150	260	P630N / 630A ELE	100-E400	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	6930	22.7
160	280	P630N / 630A ELE	100-E400	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	6930	21.0
185	325	P630N / 630A ELE	100-E400	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	6930	18.1
200	350	P630N / 630A ELE	100-E460	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	6930	16.8
220	385	S800-NE / 630A	100-E580	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	7560	15.7
250	430	S800-NE / 630A	100-E580	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	7560	14.1
315	540	S800-NE / 800A	100-E750	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	9600	14.2
355	610	S1000-SE / 1000A	100-E750	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	10000	13.1
400	690	S1250-SE / 1250A	100-E860	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	15000	17.4
450	770	S1250-SE / 1250A	100-E1060	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	15000	15.6
500	850	S1250-SE / 1250A	100-E1060	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	15000	14.1

Notes: TM: Thermal type ELE: Electronic type

A) Recommended circuit breaker size based on the following starting conditions:

Starting currents approx. 7.5...8 x motor FLC. Start time approx. 5 sec.

Premium efficiency motors include a current spike ranging 15 - 22 x FLC for 3 - 10ms, that will vary by motor make.

Motor Starters 132kW and above, require external 5P10-5A Current Transformers.

B) E/L

– Int- Internal Ground Fault torroid in Sensing module – 500mA to 5 Amp

To use External torroid, and/or Thermistor protection, -GP42- Control module is required.

– Ext- External Ground Fault torroid via 193-CBCT – 20mA to 5 Amp

C) Other

2) 24D denotes 24V DC control voltage.

– # – Specify Contactor mount, or E3T / T for separate DIN mount, or P for Pass Thru

If Power and Voltage monitoring is required, change Sensing module to VIG versions.

D) Note

1) Set circuit breaker I_r to 1 ($=I_n$), and Overload relay is set to motor FLC.

For direct on line motor starting

Circuit breaker	Terasaki TemBreak PRO
Contactors	Sprecher+Schuh CA7 / CA9
Overload relay	Sprecher+Schuh CEP7 Electronic
Rated operational voltage	400 / 415V AC
Motor types	Premium Efficiency class: IE3
Rated conditional AC current (I_q) :	70 kA (rms symmetrical)
Coordination type (IEC 60947-4-1:2018)	Type 2 coordination

Component selection table

Motor		Circuit breaker	Contactors	Overload relay		C/B instant trip amps and motor FLC	
Motor kW	Motor amp ratings at 400/415V	Moulded case circuit breaker	Contactors type	Overload relay (electronic)	Ampere setting range	C/B instant trip amps ($\pm 20\%$)	Minimum trip amp multiple of motor FLC
0.18	0.6	P160H / 20A TM	CA7-30	CEP 7 EEBC *	0.2 – 1.0	240	320
0.25	0.85	P160H / 20A TM	CA7-30	CEP 7 EEBC *	0.2 – 1.0	240	225
0.37	1.1	P160H / 20A TM	CA7-30	CEP 7 EEBC *	1.0 – 5.0	240	174
0.55	1.5	P160H / 20A TM	CA7-30	CEP 7 EEBC *	1.0 – 5.0	240	128
0.75	1.9	P160H / 20A TM	CA7-30	CEP 7 EEBC *	1.0 – 5.0	240	101
1.1	2.7	P160H / 20A TM	CA7-30	CEP 7 EEBC *	1.0 – 5.0	240	71.1
1.5	3.6	P160H / 20A TM	CA7-30	CEP 7 EEBC *	1.0 – 5.0	240	53.3
2.2	4.9	P160H / 20A TM	CA7-30	CEP 7 EEBC *	3.2 – 16	240	39.2
3	6.5	P160H / 20A TM	CA7-30	CEP 7 EEBC *	5.4 – 27	240	29.5
4	8.5	P160H / 20A TM	CA7-30	CEP 7 EEBC *	5.4 – 27	240	22.6
5.5	11.5	P160H / 20A TM	CA7-30	CEP 7 EEBC *	5.4 – 27	240	16.7
7.5	15.5	P160H / 32A TM	CA7-30	CEP 7 EEBC *	5.4 – 27	384	19.8
11	22	P160H / 32A TM	CA7-30	CEP 7 EEBC *	5.4 – 27	384	14.0
15	29	P160H / 50A TM	CA7-43	CEP 7 EEBC *	9 – 45	600	16.6
18.5	35	P160H / 63A TM	CA7-43	CEP 7 EEBC *	9 – 45	756	17.3
22	41	P160H / 63A TM	CA7-55	CEP 7 EEBC *	9 – 45	756	14.8
30	55	P160H / 100A TM	CA7-72	CEP 7 EEBC *	18 – 90	1200	17.5
37	66	P160H / 100A TM	CA7-85	CEP 7 EEBC *	18 – 90	1200	14.5
45	80	P160H / 160A TM	CA9-116	CEP 7 EEBC *	30 – 150	1600	16.0
55	97	P250H / 160A TM	CA9-146	CEP 7 EEBC *	30 – 150	2080	17.2
75	132	P250H / 250A TM	CA9-190	CEP 7 EEBC *	40 – 200	2500	15.2
90	160	P400H / 250A ELE	CA9-265	CEP 7 EEBC *	40 – 200	3000	15.0
110	195	P400H / 400A ELE	CA9-265	CEP 7 EEBC *	40 – 200	4800	20.9
132	230	P400H / 400A ELE	CA9-305	CTKIT400A	80 – 400	4800	17.7
150	260	P630H / 630A ELE	CA9-400	CTKIT400A	80 – 400	6930	22.7
160	280	P630H / 630A ELE	CA9-400	CTKIT400A	80 – 400	6930	21.0
185	325	P630H / 630A ELE	CA9-400	CTKIT400A	80 – 400	6930	18.1
200	350	P630H / 630A ELE	CA9-460	CTKIT400A	80 – 400	6930	16.8
220	385	S800-RE / 630A	CA9-580	CTKIT400A	80 – 400	7560	15.7
250	430	S800-RE / 630A	CA9-580	CTKIT600A	120 – 600	7560	14.1
315	540	S800-RE / 800A	CA9-750	CTKIT600A	120 – 600	9600	14.2
355	610	S1000-NE / 1000A	CA9-750	CTKIT800A	160 – 800	10000	13.1
400	690	S1250-NE / 1250A	CA9-860	CTKIT1000A	200 – 1000	15000	17.4
450	770	S1250-NE / 1250A	CA9-1060	CTKIT1000A	200 – 1000	15000	15.6
500	850	S1250-NE / 1250A	CA9-1060	CTKIT1000A	200 – 1000	15000	14.1

Notes:

TM: Thermal type ELE: Electronic type

A) Recommended circuit breaker size based on the following starting conditions:

Starting currents approx. 7.5...8 x motor FLC. Start time approx. 5 sec.

Premium efficiency motors include a current spike ranging 15 - 22 x FLC for 3 - 10ms, that will vary by motor make.

Motor Starters 132kW and above, Kit utilises separate 5P10-5A Current Transformers with CEP7-EE * Z overload.

* Overload relay separately mounted from contactor - 90 and 110kW starters, may use the CTKIT400A.

B) Other

1) CEP7-EE overload add-on modules are available for: Profibus, DeviceNet, Ethernet, Ground Fault, Remote reset, Jam protection, Thermistor protection.

Only one module can be fitted at any one time on a CEP7-EE overload.

C) Note

1) Set circuit breaker I_n to 1 ($=I_n$), and Overload relay is set to motor FLC.

3

Selection

Moulded Case Circuit Breakers

4 Selection for Type 2 Coordination 70kA at 415V AC

For direct on line motor starting

Circuit breaker	Terasaki TemBreak PRO
Contactors	Allen-Bradley 100-C/100-E
Overload relay	Allen-Bradley 193-EE Electronic
Rated operational voltage	400 / 415V AC
Motor types	Premium Efficiency class: IE3
Rated conditional AC current (I_q) :	70 kA (rms symmetrical)
Coordination type (IEC 60947-4-1:2018)	Type 2 coordination

Component selection table

Motor		Circuit breaker	Contactors	Overload relay		C/B instant trip amps and motor FLC	
Motor kW	Motor amp ratings at 400/415V	Moulded case circuit breaker	Contactors type	Overload relay (electronic)	Ampere setting range	C/B instant trip amps ($\pm 20\%$)	Minimum trip amp multiple of motor FLC
0.18	0.6	P160H / 20A TM	100-C30	193-EEBB *	0.2 – 1.0	240	320
0.25	0.85	P160H / 20A TM	100-C30	193-EEBB *	0.2 – 1.0	240	225
0.37	1.1	P160H / 20A TM	100-C30	193-EECB *	1.0 – 5.0	240	174
0.55	1.5	P160H / 20A TM	100-C30	193-EECB *	1.0 – 5.0	240	128
0.75	1.9	P160H / 20A TM	100-C30	193-EECB *	1.0 – 5.0	240	101
1.1	2.7	P160H / 20A TM	100-C30	193-EECB *	1.0 – 5.0	240	71.1
1.5	3.6	P160H / 20A TM	100-C30	193-EECB *	1.0 – 5.0	240	53.3
2.2	4.9	P160H / 20A TM	100-C30	193-EECB *	3.2 – 16	240	39.2
3	6.5	P160H / 20A TM	100-C30	193-EEED	5.4 – 27	240	29.5
4	8.5	P160H / 20A TM	100-C30	193-EEED	5.4 – 27	240	22.6
5.5	11.5	P160H / 20A TM	100-C30	193-EEED	5.4 – 27	240	16.7
7.5	15.5	P160H / 32A TM	100-C30	193-EEED	5.4 – 27	384	19.8
11	22	P160H / 32A TM	100-C30	193-EEED	5.4 – 27	384	14.0
15	29	P160H / 50A TM	100-C43	193-EEFD	9 – 45	600	16.6
18.5	35	P160H / 63A TM	100-C43	193-EEFD	9 – 45	756	17.3
22	41	P160H / 63A TM	100-C55	193-EEFD	9 – 45	756	14.8
30	55	P160H / 100A TM	100-C72	193-EEGE	18 – 90	1200	17.5
37	66	P160H / 100A TM	100-C85	193-EEGE	18 – 90	1200	14.5
45	80	P160H / 160A TM	100-E116	193-EEHJ	30 – 150	1600	16.0
55	97	P250H / 160A TM	100-E146	193-EEHJ	30 – 150	2080	17.2
75	132	P250H / 250A TM	100-E190	193-EEJJ	40 – 200	2500	15.2
90	160	P400H / 250A ELE	100-E265	193-EEJJ *	40 – 200	3000	15.0
110	195	P400H / 400A ELE	100-E265	193-EEJJ *	40 – 200	4800	20.9
132	230	P400H / 400A ELE	100-E305	CTKIT400A	80 – 400	4800	17.7
150	260	P630H / 630A ELE	100-E400	CTKIT400A	80 – 400	6930	22.7
160	280	P630H / 630A ELE	100-E400	CTKIT400A	80 – 400	6930	21.0
185	325	P630H / 630A ELE	100-E400	CTKIT400A	80 – 400	6930	18.1
200	350	P630H / 630A ELE	100-E460	CTKIT400A	80 – 400	6930	16.8
220	385	S800-RE / 630A	100-E580	CTKIT400A	80 – 400	7560	15.7
250	430	S800-RE / 630A	100-E580	CTKIT600A	120 – 600	7560	14.1
315	540	S800-RE / 800A	100-E750	CTKIT600A	120 – 600	9600	14.2
355	610	S1000-NE / 1000A	100-E750	CTKIT800A	160 – 800	10000	13.1
400	690	S1250-NE / 1250A	100-E860	CTKIT1000A	200 – 1000	15000	17.4
450	770	S1250-NE / 1250A	100-E1060	CTKIT1000A	200 – 1000	15000	15.6
500	850	S1250-NE / 1250A	100-E1060	CTKIT1000A	200 – 1000	15000	14.1

Notes: TM: Thermal type ELE: Electronic type

A) Recommended circuit breaker size based on the following starting conditions:

Starting currents approx. 7.5–8 x motor FLC. Start time approx. 5 sec.

Premium efficiency motors include a current spike ranging 15 – 22 x FLC for 3 – 10ms, that will vary by motor make.

Motor Starters 132kW and above, Kit utilises separate 5P10-5A Current Transformers with 193-EE * Z overload.

* Overload relay separately mounted from contactor - 90 and 110kW starters, may use the CTKIT400A.

B) Other

1) 193-EE overload add-on modules are available for: Profibus, DeviceNet, Ethernet, Ground Fault, Remote reset, Jam protection, Thermistor protection.

Only one module can be fitted at any one time on a 193-EE overload.

C) Note

1) Set circuit breaker I_r to 1 ($=I_n$), and Overload relay is set to motor FLC.

For direct on line motor starting

Circuit breaker	Terasaki TemBreak PRO
Contactor	Allen-Bradley 100-C/100-E
Overload relay	Allen-Bradley 193-E3 Electronic E300 w-Ethernet/IP
Rated operational voltage	400 / 415V AC
Motor types	Premium Efficiency class: IE3
Rated conditional AC current (I_q) :	70 kA (rms symmetrical)
Coordination type (IEC 60947-4-1:2018)	Type 2 coordination

Component selection table

Motor		Circuit breaker	Contactor	Overload relay		C/B instant trip amps and motor FLC	
Motor kW	Motor amp ratings at 400/415V	Moulded case circuit breaker	Contactor type	Overload relay (electronic)	Earth Leakage	C/B instant trip amps ($\pm 20\%$)	Minimum trip amp multiple of motor FLC
0.18	0.6	P160H / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	320
0.25	0.85	P160H / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	225
0.37	1.1	P160H / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	174
0.55	1.5	P160H / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	128
0.75	1.9	P160H / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	101
1.1	2.7	P160H / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	71.1
1.5	3.6	P160H / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	53.3
2.2	4.9	P160H / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	39.2
3	6.5	P160H / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	29.5
4	8.5	P160H / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	22.6
5.5	11.5	P160H / 20A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	240	16.7
7.5	15.5	P160H / 32A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	384	19.8
11	22	P160H / 32A TM	100-C30	193 E3-63-24D-IG-30A - # -ETR	Int.	384	14.0
15	29	P160H / 50A TM	100-C43	193 E3-63-24D-IG-60A - # -ETR	Int.	600	16.6
18.5	35	P160H / 63A TM	100-C43	193 E3-63-24D-IG-60A - # -ETR	Int.	756	17.3
22	41	P160H / 63A TM	100-C55	193 E3-63-24D-IG-60A - # -ETR	Int.	756	14.8
30	55	P160H / 100A TM	100-C72	193 E3-63-24D-IG-100A - # -ETR	Int.	1200	17.5
37	66	P160H / 100A TM	100-C85	193 E3-63-24D-IG-100A - # -ETR	Int.	1200	14.5
45	80	P160H / 160A TM	100-E116	193 E3-63-24D-IG-200A - # -ETR	Int.	1600	16.0
55	97	P250H / 160A TM	100-E146	193 E3-63-24D-IG-200A - # -ETR	Int.	2080	17.2
75	132	P250H / 250A TM	100-E190	193 E3-63-24D-IG-200A - # -ETR	Ext.	2500	15.2
90	160	P400H / 250A ELE	100-E265	193 E3-63-24D-IG-200A - # -ETR	Ext.	3000	15.0
110	195	P400H / 400A ELE	100-E265	193 E3-63-24D-IG-200A - # -ETR	Ext.	4800	20.9
132	230	P400H / 400A ELE	100-E305	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	4800	17.7
150	260	P630H / 630A ELE	100-E400	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	6930	22.7
160	280	P630H / 630A ELE	100-E400	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	6930	21.0
185	325	P630H / 630A ELE	100-E400	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	6930	18.1
200	350	P630H / 630A ELE	100-E460	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	6930	16.8
220	385	S800-RE / 630A	100-E580	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	7560	15.7
250	430	S800-RE / 630A	100-E580	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	7560	14.1
315	540	S800-RE / 800A	100-E750	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	9600	14.2
355	610	S1000-NE / 1000A	100-E750	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	10000	13.1
400	690	S1250-NE / 1250A	100-E860	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	15000	17.4
450	770	S1250-NE / 1250A	100-E1060	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	15000	15.6
500	850	S1250-NE / 1250A	100-E1060	193 E3-GP42-24D-I-30A -E3T -ETR	Ext.	15000	14.1

Notes:

TM: Thermal type ELE: Electronic type

A) Recommended circuit breaker size based on the following starting conditions:

Starting currents approx. 7.5...8 x motor FLC. Start time approx. 5 sec.

Premium efficiency motors include a current spike ranging 15 - 22 x FLC for 3 - 10ms, that will vary by motor make.

Motor Starters 132kW and above, require external 5P10-5A Current Transformers.

B) E/L

– Int- Internal Ground Fault torroid in Sensing module – 500mA to 5 Amp

To use External torroid, and/or Thermistor protection, -GP42- Control module is required.

– Ext- External Ground Fault torroid via 193-CBCT – 20mA to 5 Amp

C) Other

2) 24D denotes 24V DC control voltage.

– # – Specify Contactor mount, or E3T / T for separate DIN mount, or P for Pass Thru

If Power and Voltage monitoring is required, change Sensing module to VIG versions.

D) Note

1) Set circuit breaker I_r to 1 ($=I_n$), and Overload relay is set to motor FLC.

4

Special Breakers

- 1 High-Performance Electronic Smart Circuit Breaker
(TPOU type OCR) 4-2
- 2 High-Performance Electronic Circuit Breaker
(XOW type OCR) 4-11

4

Special Breakers

Moulded Case Circuit Breakers

1 High-Performance Electronic Smart Circuit Breaker (TPOU type OCR)

The TPOU-type high-performance electronic OCR has the functions of long time-delay trip, short time-delay trip, instantaneous trip, preferential trip alarm, ground fault trip, zone interlock, and HOT characteristics/COLD characteristic selection. Additionally, the built-in VT and CT measure the current, voltage, instantaneous power, integrated electric energy, and power factor of the electric circuit, and display them on the OLED display mounted on the front of the circuit breaker. For the setting values of each function, set the values displayed on the OLED display with the joystick.

Outer view

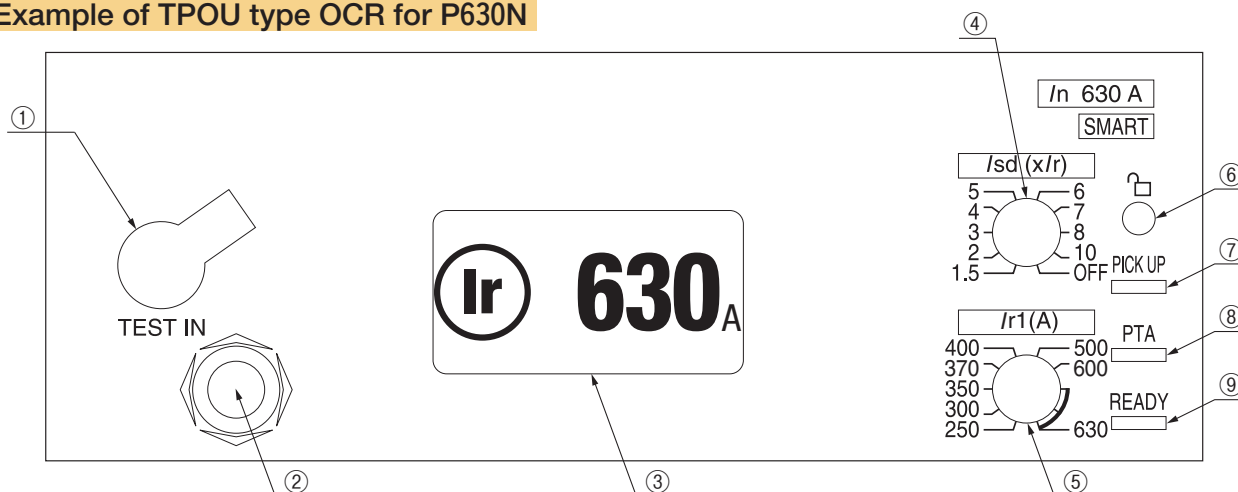


TPOU type OCR applicable model

Breaker type	Rated current (I_n) (A)
P160F, P160N, P160H	40, 100, 160
P250F, P250N, P250H	40, 100, 160, 250
P400F, P400N, P400H, P400S	250, 400
P630F, P630N, P630H, P630S	630

- The display of the smart circuit breaker uses an OLED. As a result, the viewing angle is much wider than that of LCD, it is self-luminous and has excellent visibility. The display unit can be easily replaced by the customer.
- Since the OCR uses an r.m.s. value control method, the effects of harmonics do not cause any malfunction.
- Smart circuit breakers can be reversely connected.

Example of TPOU type OCR for P630N



① A terminal for connecting the OCR checker.

② Joystick for OCR operation

Use the joystick to select and confirm the various setting values shown on the display.

③ OLED display

The OCR display uses an ultra-high definition built-in OLED display, so no backlight is required and the brightness can be adjusted. The display can be rotated by 90 degrees according to the installation position of the circuit breaker main unit. Symbols are shown on the display to enable easy and clear operation.

④ Short time-delay trip set current dial

You can fine-tune between the selected current value and magnification $+0.5$ one level below in additional $0.5 \times$ steps on the display.

⑤ Rated current setting dial

You can fine-tune between the selected current value and the current value one level below in additional 1A steps on the display.

⑥ Set value lock release button

You can unlock this button to change the setting on the display.

⑦ Alarm LED

Lights red during long time-delay pickup.

⑧ PTA LED

The preferential trip alarm flashes orange during pickup and lights when it is output.

⑨ Status LED

Lights green when the OCR is operating normally. Flashes orange if there is an error.

■ Measurement/monitoring of electric circuits and preventive maintenance with TPOU type OCR

The TPOU-type OCR human-machine interface flexibly responds to various user system requirements such as various measurement and status display, system and network protection, and alarm management.

• Data transmission of various types of information

Compatible with Modbus open network to connect the communication module, it transmits all kinds of data such as circuit status, circuit breaker settings, measurement data and event history information.

• Custom alarm

OCR can make a wide range of measurements such as voltage, current, power, electric energy, power factor, frequency, demand current, demand power, total harmonic distortion, trip history, and alarm history. The user can set an alarm for any 12 items among these measurements.

• Preventive maintenance with temperature monitoring

If the board temperature inside the circuit breaker exceeds 105°C, the “TEMP” symbol is shown on the display to indicate the abnormal. Please use this function for preventive maintenance to prevent problems caused by contact and terminal connections. Since the OCR requires high reliability, we use CPUs and ICs with an upper limit operating ambient temperature above +105°C.

• Zone interlock reduces damage to electric circuits

By setting a zone interlock between TemBreak PRO circuit breakers equipped with OCR, it is possible to trip the upstream circuit breaker closest to the accident location in the shortest time without waiting for the short time-delay setting time. This means that in the event of a short circuit accident, thermal and mechanical damage to the electric circuit can be reduced. Up to 7 circuit breakers can be linked between upstream and downstream breakers.

However, the number of upstream circuit breaker is multiple, control power supply is needed for all of them.

Zone-selective interlocks are possible not only between circuit breakers but also between TemPower2 air circuit breakers. Ground fault protection coordination is also possible with zone selective interlocks.

• Reliable maintenance work with built-in clock function

The OCR has two built-in clock functions: a user-set clock and a clock that measures the cumulative operating time of the OCR. The user-set clock allows the user to set the date and time as desired. The clock that measures the cumulative operating time of the OCR calculates the cumulative operating that the OCR has actually been energized.

In the event of power loss, the events prior to the power loss are stored in memory as a time-stamped event history, for both the user-set clock and the clock that measures the cumulative operating time of the OCR.

Using these clock functions, reliable maintenance work can be performed.

• Uses multi-feed control power supply

A multi-feed control power supply is adopted. In case Smart circuit breakers are connected with communication module and remote display, if the control power is supplied to the communication module, there is no need to additionally supply the control power to the OCR or the remote display.

• Supports hot start

For long time-delay trip, you can switch between cold start and hot start. Hot start can function even without a control power supply.

4

Special Breakers

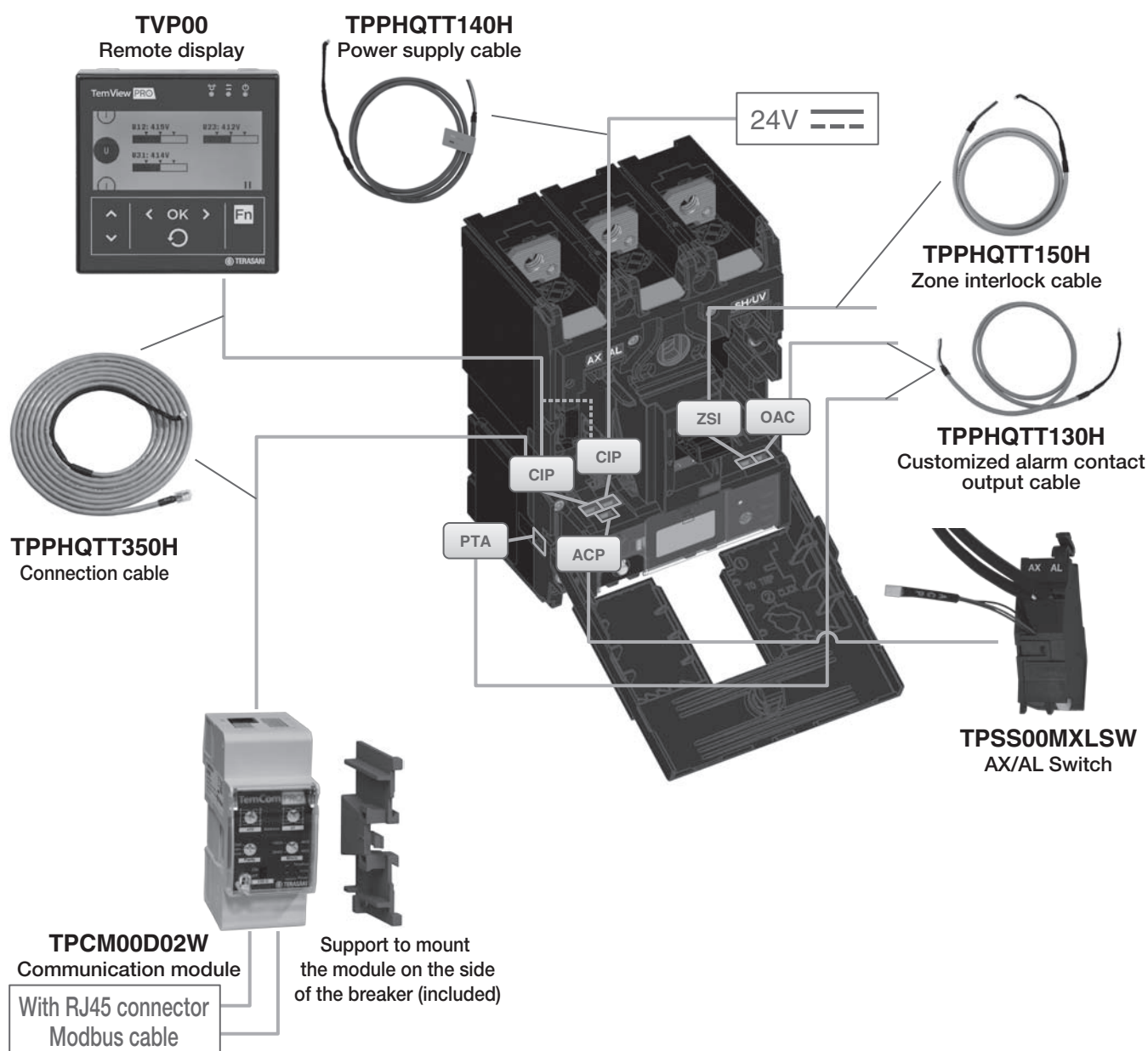
Moulded Case Circuit Breakers

1 High-Performance Electronic Smart Circuit Breaker (TPOU type OCR)

Types of TPOU type overcurrent trip device (OCR)

Rated current I_n (A)	Poles	Protection code	Protection function ②				Alarm function ②		
			Long time-delay, Short time-delay, Instantaneous L, S, I ④	Ground fault trip GF	N-phase protection NP	Zone interlock ZSI ⑤	Preferential trip alarm PTA	Alarm contact output OAC ⑥	
40 100 160 250 400 630	3	SMART ①	●	●	—	●	●	●	
	4	SMART	●	●	●	●	●	●	

● : Supplied as standard. ○ : Optional. — : “no” or “not available”.



	Display ③	Measurement/display function ③		
	OLED display (built into OCR)	Line voltage U, phase voltage V ⑦, current I, power P, electric energy E, Power factor PF, frequency F, demand D, total harmonic distortion THD	Trip history	Alarm history
	●	●	●	●
	●	●	●	●

Optional		
Communication module	Remote display	AX/AL switch
TPCM ⑧	TPED ⑨	TPSS ⑩
○	○	○
○	○	○

Accessory order type	Accessory
TPCM00D02N	TPCM communication module (without contact input/output terminals)
TPCM00D02W	TPCM communication module (with contact input/output terminals)
TVP00	TVP remort display
TPPHQTT130H	PTA preferential trip alarm/OAC customized alarm contact output cable 1.2m
TPPHQTT140H (For PS125,250)	24V DC power supply cable 1.2m
TPPHQTT160H (For PS/PH400,630)	
TPPHQTT150H	ZSI zone interlock cable 1.2m
TPPHQTT330H (For PS125,250)	CIP remort display/ communication module Connection cable 0.5m
TPPHQTT430H (For PS/PH400,630)	
TPPHQTT340H (For PS125,250)	CIP remort display/ communication module Connection cable 1.5m
TPPHQTT440H (For PS/PH400,630)	
TPPHQTT350H (For PS125,250)	CIP remort display/ communication module Connection cable 3m
TPPHQTT450H (For PS/PH400,630)	
TPPHQTT360H (For PS125,250)	CIP remort display/ communication module Connection cable 5m
TPPHQTT460H (For PS/PH400,630)	
TPPHQTT370H (For PS125,250)	CIP remort display/ communication module Connection cable 10m
TPPHQTT470H (For PS/PH400,630)	
TPPHQTT500H	NSP cable 1.2m ①
TPSS00N	AX/AL switch * (ACP output only)
TPSS00MXLSW	AX/AL switch * (ACP output + contact output)
TPSS00MXLRW	AX/AL switch * (ACP output + microload contact output)

* : See page 4-18 for the specifications of the AX/AL switch.

Note ① : Not compatible with 3-phase 4-wire systems. Select the NSP cable (TPPHQTT500H) if using a 3 pole smart circuit breaker for 3-phase 4-wire power distribution.

Note ② : Control power supply is not required.

Note ③ : By supplying the control power of 24 V DC to the OCR with the optional cable (order type TPPHQTT140H), the value is displayed even when the circuit breaker is OFF and when the internal power supply is not established due to the small main circuit current.

If a communication module supplied with control power is connected to the OCR, that control power is supplied to the OCR. This means that there is no need to supply additional control power to the OCR.

OCR control power supply

Voltage : 24V DC $\pm$ 30%

Consumption current : 60mA

Note ④ : You can select not only general cold start characteristics, but also hot start characteristics that take into consideration the thermal characteristics of load equipment such as electric wires and electric motors.

Note ⑤ : An optional cable (order type TPPHQTT150H) is required for the input/output of the zone interlock. For PS125-NE/PE circuit breakers, the zone interlock is output only.

Note ⑥ : By connecting the optional cable (order type TPPHQTT130H), data can be contact output from only one of the following items.

- System (OCR operation) error alarm
- OCR abnormal temperature alarm
- Preferential trip alarm PTA
- 1 output of 12 custom alarms

Contact rating

Non-contact output 1a

Contact capacity
24V AC/DC 100mA

Note ⑦ : Phase voltage is displayed only for 4-pole circuit breakers.

Note ⑧ : Supply 24 V DC control power to the control power terminal of the communication module. The control power supplied to the communication module is also supplied to the OCR.

Note ⑨ : Supply the 24 V DC control power to the OCR with the optional cable (order type TPPHQTT140H). Then, connect the optional cable (order type TPPHQTT330H to 470H) between the OCR and the remort display. This allows the OCR to supply control power to the remort display. However, if a communication module supplied with control power is connected to the OCR, it is not necessary to supply control power to the OCR.

Note ⑩ : ON/OFF information for auxiliary switch 1c and alarm switch 1c is read by the OCR and output to the remort display and communication module.

4

Special Breakers

Moulded Case Circuit Breakers

1 High-Performance Electronic Smart Circuit Breaker (TPOU type OCR)

TPOU type OCR measurement/display function specifications

Measurement/display items		IEC 61557-12 Prescribed Class	Display ○ : With display × : No display	Remote display ○ : With display × : No display	Modbus ○ : With communication × : No communication
Current	Phase current	1	○	○	○
	Ground fault current	1	○	○	○
Voltage	Line voltage	0.5	○	○	○
	Phase voltage	0.5	○	○	○
Frequency		0.2	○	○	○
Electric power	Active power	2	○	○	○
	Reactive power	2	○	○	○
	Apparent power	2	○	○	○
Electric energy	Active electric energy	2	○	○	○
	Reactive electric energy	2	○	○	○
	Apparent electric energy	2	○	○	○
Demand	Electric power	2	×	○	○
	Current	1	×	○	○
Power factor		2	○	○	○
Total harmonic distortion	Current	2	×	○	○
	Voltage	2	×	○	○
Trip history	Accident current	—	○	○	○
	Cause of accident	—	○	○	○
	Accident occurrence phase	—	○	○	○
Alarm history	Alarm cause	—	○	○	○

Note: Electric energy, trip history, and alarm history are stored in the non-volatile memory when a trip occurs.

Specifications of communication module

The communication module TPCM can communicate all the data recorded by the OCR to the Modbus RTU monitoring system. Modbus parameters are adjusted with the dial on the whole surface of the communication module. The communication module can be mounted on the side of the circuit breaker by using the included support.

Item	Modbus specifications
Transmission signal	RS-485
Communication method	2-wire half duplex
Topology	Multi-drop bus connection
Transmission speed	Max. 38.4kbps
Transmission distance	Max. 1.2km (at 38.4kbps)
Data type	Modbus-RTU
Maximum number of nodes	1~99

AX/AL switch specifications

The TPSS00N AX/AL switch is connected to the ACP (Auxiliary Connection Port) of the OCR and the OCR displays the ON/OFF status of the AX/AL switch. The OCR also displays the number of ON/OFF operations during OCR energization.

The TPSS00MXLSW standard AX/AL switch adds a standard contact output to the above TPSS00N AX/AL switch.

The TPSS00MXLRW microload AX/AL switch adds a contact output for microloads to the above TPSS00N AX/AL switch.

The table below shows the contact ratings of the TPSS00MXLSW standard switch and the TPSS00MXLRW microload switch.

TPSS00MXLSW standard switch contact output

AC				DC			Minimum load
Voltage (V)	Current (A)			Voltage (V)	Current (A)		
	Resistive load	Inductive load power factor 0.7 or more	Inductive load power factor 0.3 or more		Resistive load	Inductive load time constant 15ms or less	
250	3	3	1	125	0.4	0.02	30mA at 10V DC
125	3	3	2	30	3	0.3	

TPSS00MXLRW microload switch contact output

DC		Minimum load
Voltage (V)	Current (A) Resistive load	
30	0.1	1mA at 5V DC

■ Remote display

The remote display TVP00 can be easily mounted to a panel, etc. of a switchboard by connecting it from the OCR with a single cable. The backlit LCD display has good visibility even in dark places. Display is possible in 8 languages: Japanese, English, French, German, Italian, Spanish, Portuguese, and Chinese.

Display items
Circuit breaker protection setting value
Measured value of electric circuit
Alarm information
Event history information
Breaker identification information

Settings/change items
Circuit breaker protection setting value
Measured value parameters
Output contact parameters
Alarm management setting values



■ TTP00 type OCR checker

The OCR checker is to easily check the OCR's long time-delay, short time-delay, instantaneous trip, ground fault trip and preferential trip alarm functions in the field. See section 8 for details.

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Special Breakers

Moulded Case Circuit Breakers

1 High-Performance Electronic Smart Circuit Breaker (TPOU type OCR)

Overcurrent tripping characteristics

Rated current (I_n) : 40A, 100A, 160A

Rated current settings (A) : (I_r) ①	In the case of (I_n)=40 A Adjustable to (I_r)(A)=16, 18, 20, 22, 25, 28, 32, 34, 37, 40 In the case of (I_n)=100 A Adjustable to (I_r)(A)=40, 45, 50, 57, 63, 72, 80, 87, 93, 100 In the case of (I_n)=160 A Adjustable to (I_r)(A)=63, 70, 80, 90, 100, 110, 125, 135, 150, 160 Select (I_r) with the dial. Adjustable in 1 A steps between the selected (I_r) and the level below (I_r). However, the minimum is 16 A when (I_n)=40A, 40A when (I_n)=100A and 63 A when (I_n)=160 A. ②
Long time-delay time settings (s) : (t_r)	0.5, 1.5, 2.5, 5, 7.5, 9, 10, 12, 14, 16 adjustable at (I_r) $\times$ 600% Time-delay setting tolerance -20% -20ms or more +0% +30ms or less
Short time-delay pick-up current (A) : (I_{sd})	(I_r) $\times$ 1.5 to 10 (0.5 steps) or OFF ⑥ Current setting tolerance within $\pm$ 10%
Short time-delay time settings (ms) : (t_{sd})	50, 100, 200, 300, 400 adjustable Ramp characteristics I ^t : ON or OFF However, definite time-delay characteristics with (I_r) $\times$ 10 or more When (t_{sd}) = 50ms Time-delay setting tolerance -30 ms or more +30 ms or less When (t_{sd}) = 100ms to 400ms Time-delay setting tolerance -20 ms or more +50 ms or less
Instantaneous trip pick-up current (A) : (I_i)	When (I_n) = 40A or 100A, (I_n) $\times$ 3 to 15 (0.5 step) When (I_n) = 160A, (I_n) $\times$ 3 to 11 (0.5 step) Current setting tolerance within $\pm$ 15%
N-phase protection pick-up current (A) : (I_N)	For 4P (I_r) $\times$ 50%, 100% or OFF ⑧
N-phase protection time settings (s) : (t_N)	Operates with long time-delay time setting (t_r) and short time-delay time setting (t_{sd}) and also operates with instantaneous trip ⑨
Ground fault trip pick-up current (A) : (I_g)	3P for 3 ϕ 3W, 4P for 3 ϕ 4W (3P 3 ϕ 4W not supported ④) When (I_n) = 40A, (I_n) $\times$ 40% to 100% (5% steps) or OFF When (I_n) = 100A or 160A, (I_n) $\times$ 20% to 100% (5% steps) or OFF Current setting tolerance within $\pm$ 10%
Ground fault trip time settings (ms) : (t_g)	50, 100, 200, 300, 400, 500 adjustable Ramp characteristics I ^t : ON or OFF ⑤ However, definite time-delay characteristics with (I_n) $\times$ 1 or more Time-delay setting tolerance -20 ms or more +50 ms or less
Preferential trip alarm pick-up current (A) : (I_p)	(I_r) $\times$ 60% to 80% to 95% (5% steps) or OFF Current setting tolerance within $\pm$ 10%
Preferential trip alarm time settings (s) : (t_p)	(t_r) $\times$ 5% to 50% to 80% (5% steps) at (I_p) $\times$ 600% Time-delay setting tolerance -20% -20ms or more +0% +30ms or less
ZSI Zone interlock	STD Short time-delay GF Ground fault trip
Start operating characteristics	Hot start/cold start (selectable)

Rated current (I_n) : 40A, 100A, 160A, 250A

Rated current settings (A) : (I_r) ①	In the case of (I_n)=40 A Adjustable to (I_r)(A)=16, 18, 20, 22, 25, 28, 32, 34, 37, 40 In the case of (I_n)=100 A Adjustable to (I_r)(A)=40, 45, 50, 57, 63, 72, 80, 87, 93, 100 In the case of (I_n)=160 A Adjustable to (I_r)(A)=63, 70, 80, 90, 100, 110, 125, 135, 150, 160 In the case of (I_n)=250 A Adjustable to (I_r)(A)=100, 110, 125, 140, 160, 180, 200, 225, 250 Select (I_r) with the dial. Adjustable in 1 A steps between the selected (I_r) and the level below (I_r). However, the minimum is 16 A when (I_n)=40A, 40A when (I_n)=100A, 63A when (I_n)=160A and 100A when (I_n)=250A. ③
Long time-delay time settings (s) : (t_r)	0.5, 1.5, 2.5, 5, 7.5, 9, 10, 12, 14, 16 adjustable at (I_r) $\times$ 600% Time-delay setting tolerance -20% -20ms or more +0% +30ms or less
Short time-delay pick-up current (A) : (I_{sd})	(I_r) $\times$ 1.5 to 10 (0.5 steps) or OFF ⑥ Current setting tolerance within $\pm$ 10%
Short time-delay time settings (ms) : (t_{sd})	50, 100, 200, 300, 400 adjustable Ramp characteristics I ^t : ON or OFF However, definite time-delay characteristics with (I_r) $\times$ 10 or more When (t_{sd}) = 50ms Time-delay setting tolerance -30 ms or more +30 ms or less When (t_{sd}) = 100ms to 400ms Time-delay setting tolerance -20 ms or more +50 ms or less
Instantaneous trip pick-up current (A) : (I_i)	When (I_n) = 40A or 100A, (I_n) $\times$ 3 to 15 (0.5 step) When (I_n) = 160A or 250A, (I_n) $\times$ 3 to 11 (0.5 step) Current setting tolerance within $\pm$ 15%
N-phase protection pick-up current (A) : (I_N)	For 4P (I_r) $\times$ 50%, 100% or OFF ⑧
N-phase protection time settings (s) : (t_N)	Operates with long time-delay time setting (t_r) and short time-delay time setting (t_{sd}) and also operates with instantaneous trip ⑨
Ground fault trip pick-up current (A) : (I_g)	3P for 3 ϕ 3W, 4P for 3 ϕ 4W (3P 3 ϕ 4W not supported ④) When (I_n) = 40A, (I_n) $\times$ 40% to 100% (5% steps) or OFF When (I_n) = 100A, 160A or 250A, (I_n) $\times$ 20% to 100% (5% steps) or OFF Current setting tolerance within $\pm$ 10%
Ground fault trip time settings (ms) : (t_g)	50, 100, 200, 300, 400, 500 adjustable Ramp characteristics I ^t : ON or OFF ⑤ However, definite time-delay characteristics with (I_n) $\times$ 1 or more Time-delay setting tolerance -20 ms or more +50 ms or less
Preferential trip alarm pick-up current (A) : (I_p)	(I_r) $\times$ 60% to 80% to 95% (5% steps) or OFF Current setting tolerance within $\pm$ 10%
Preferential trip alarm time settings (s) : (t_p)	(t_r) $\times$ 5% to 50% to 80% (5% steps) at (I_p) $\times$ 600% Time-delay setting tolerance -20% -20ms or more +0% +30ms or less
ZSI Zone interlock	STD Short time-delay GF Ground fault trip
Start operating characteristics	Hot start/cold start (selectable)

Remarks: If not otherwise specified, the product will be delivered with the underlined standard setting values.

Notes:

- ①: Trip with a pickup current value exceeding $I_r \times 1.05$ and 1.2 or less.
- ②: In the case of I_n =40A, I_r is adjustable in 1A steps between 16, 17 to 18, 19 to 20, 21 to 22, 23 to 25, 26 to 28, 29 to 32, 33 to 34, 35 to 37, 38 to 40.
In the case of I_n =100A, I_r is adjustable in 1A steps between 40, 41 to 45, 46 to 50, 51 to 57, 58 to 63, 64 to 72, 73 to 80, 81 to 87, 88 to 93, 94 to 100.
In the case of I_n =160A, I_r is adjustable in 1A steps between 63, 64 to 70, 71 to 80, 81 to 90, 91 to 100, 101 to 110, 111 to 125, 126 to 135, 136 to 150, 151 to 160.
- ③: In the case of I_n =40A, I_r is adjustable in 1A steps between 16, 17 to 18, 19 to 20, 21 to 22, 23 to 25, 26 to 28, 29 to 32, 33 to 34, 35 to 37, 38 to 40.
In the case of I_n =100A, I_r is adjustable in 1A steps between 40, 41 to 45, 46 to 50, 51 to 57, 58 to 63, 64 to 72, 73 to 80, 81 to 87, 88 to 93, 94 to 100.
In the case of I_n =160A, I_r is adjustable in 1A steps between 63, 64 to 70, 71 to 80, 81 to 90, 91 to 100, 101 to 110, 111 to 125, 126 to 135, 136 to 150, 151 to 160.
In the case of I_n =250A, I_r is adjustable in 1A steps between 100, 101 to 110, 111 to 125, 126 to 140, 141 to 160, 161 to 180, 181 to 200, 201 to 225, 226 to 250.
- ④: A 3-pole circuit breaker cannot be used with a 3-phase 4-wire system.
- ⑤: The ramp characteristics can be switched ON/OFF separately from the short time-delay trip.
- ⑥: Adjustable to $I_{sd}=I_r \times 10$ -9.5 -9 -8.5 -8 -7.5 -7 -6.5 -6 -5.5 -5 -4.5 -4 -3.5 -3 -2.5 -2 -1.5.
- ⑦: Trip with a pickup current value exceeding $I_n \times 1.05$ and 1.2 or less.
- ⑧: There is no N-phase protection function for 3P. Always set it to OFF.
- ⑨: The ON/OFF of the ramp characteristics conform to the short time-delay trip settings.

Rated current (I_n) : 250A, 400A

Rated current settings (A) : (I_r) ①	In the case of (I_n)=250 A Adjustable to (I_r)(A)=100, 110, 125, 140, 160, 180, 200, 225, 250 In the case of (I_n)=400 A Adjustable to (I_r)(A)=160, 180, 200, 225, 250, 300, 350, 370, 400 Select (I_r) with the dial. Adjustable in 1 A steps between the selected (I_r) and the level below (I_r). However, the minimum is 100 A when (I_n)=250A and 160A when (I_n)=400A. ⑩
Long time-delay time settings (s) : (t_r)	0.5, 1.5, 2.5, <u>5</u> , 7.5, 9, 10, 12, 14, 16 adjustable at (I_r) $\times$ 600% Time-delay setting tolerance -20% -20ms or more +0% +30ms or less
Short time-delay pick-up current (A) : (I_{sd})	(I_r) $\times$ 1.5, 2, 3, 4, 5, 6, 7, 8, <u>10</u> or OFF Select the magnification with the setting dial. You can adjust between the selected magnification and magnification +0.5 one level below in additional 0.5 $\times$ steps on the display. ⑪ Current setting tolerance within $\pm 10\%$
Short time-delay time settings (ms) : (t_{sd})	50, <u>100</u> , 200, 300, 400 adjustable Ramp characteristics I ² t: ON or OFF However, definite time-delay characteristics with (I_r) $\times$ 10 or more When (t_{sd}) = 50ms Time-delay setting tolerance -30 ms or more +30 ms or less When (t_{sd}) = 100ms to 400ms Time-delay setting tolerance -20 ms or more +50 ms or less
Instantaneous trip pick-up current (A) : (I_i)	(I_n) $\times$ 3 to <u>12</u> (0.5 steps) Current setting tolerance within $\pm 15\%$
N-phase protection pick-up current (A) : (I_N)	For 4P (I_r) $\times$ 50%, <u>100%</u> or OFF ⑧
N-phase protection time settings (s) : (t_N)	Operates with long time-delay time setting (t_r) and short time-delay time setting (t_{sd}) and also operates with instantaneous trip ⑨
Ground fault trip pick-up current (A) : (I_g)	3P for 3 ϕ 3W, 4P for 3 ϕ 4W (3P 3 ϕ 4W not supported ③) (I_n) $\times$ 20% to 100% (5% steps) or OFF Current setting tolerance within $\pm 10\%$
Ground fault trip time settings (ms) : (t_g)	50, 100, <u>200</u> , 300, 400, 500 adjustable Ramp characteristics I ² t: ON or OFF ④ However, definite time-delay characteristics with (I_n) $\times$ 1 or more Time-delay setting tolerance -20 ms or more +50 ms or less
Preferential trip alarm pick-up current (A) : (I_p)	(I_r) $\times$ 60% to <u>80%</u> to 95% (5% steps) or OFF Current setting tolerance within $\pm 10\%$
Preferential trip alarm time settings (s) : (t_p)	(t_r) $\times$ 5% to 50% to 80% (5% steps) at (I_p) $\times$ 600% Time-delay setting tolerance -20% -20ms or more +0% +30ms or less
ZSI Zone interlock	STD Short time-delay ON or <u>OFF</u> GF Ground fault trip ON or <u>OFF</u>
Start operating characteristics	Hot start/cold start (selectable)

Rated current (I_n) : 630A

Rated current settings (A) : (I_r) ①	Adjustable to (I_r)(A)=250, 300, 350, 370, 400, 500, 600, 630 Select (I_r) with the dial. Adjustable in 1 A steps between the selected (I_r) and the level below (I_r). However, the minimum is 250 A. ⑫
Long time-delay time settings (s) : (t_r)	0.5, 1.5, 2.5, 5, 7.5, 9, 10, 12, 14, 16 adjustable at (I_r) $\times$ 600% Time-delay setting tolerance -20% -20ms or more +0% +30ms or less
Short time-delay pick-up current (A) : (I_{sd})	(I_r) $\times$ 1.5, 2, 3, 4, 5, 6, 7, 8, <u>10</u> or OFF Select the magnification with the setting dial. You can adjust between the selected magnification and magnification +0.5 one level below in additional 0.5 $\times$ steps on the display. ⑪ Current setting tolerance within $\pm 10\%$
Short time-delay time settings (ms) : (t_{sd})	50, <u>100</u> , 200, 300, 400 adjustable Ramp characteristics I ² t: ON or OFF However, definite time-delay characteristics with (I_r) $\times$ 10 or more When (t_{sd}) = 50ms Time-delay setting tolerance -30 ms or more +30 ms or less When (t_{sd}) = 100ms to 400ms Time-delay setting tolerance -20 ms or more +50 ms or less
Instantaneous trip pick-up current (A) : (I_i)	(I_n) $\times$ 3 to <u>11</u> (0.5 steps) Current setting tolerance within $\pm 15\%$
N-phase protection pick-up current (A) : (I_N)	For 4P (I_r) $\times$ 50%, <u>100%</u> or OFF ⑧
N-phase protection time settings (s) : (t_N)	Operates with long time-delay time setting (t_r) and short time-delay time setting (t_{sd}) and also operates with instantaneous trip ⑨
Ground fault trip pick-up current (A) : (I_g)	3P for 3 ϕ 3W, 4P for 3 ϕ 4W (3P 3 ϕ 4W not supported ③) (I_n) $\times$ 20% to 100% (5% steps) or OFF Current setting tolerance within $\pm 10\%$
Ground fault trip time settings (ms) : (t_g)	50, 100, <u>200</u> , 300, 400, 500 adjustable Ramp characteristics I ² t: ON or OFF ④ However, definite time-delay characteristics with (I_n) $\times$ 1 or more Time-delay setting tolerance -20 ms or more +50 ms or less
Preferential trip alarm pick-up current (A) : (I_p)	(I_r) $\times$ 60% to 80% to 95% (5% steps) or OFF Current setting tolerance within $\pm 10\%$
Preferential trip alarm time settings (s) : (t_p)	(t_r) $\times$ 5% to 50% to 80% (5% steps) at (I_p) $\times$ 600% Time-delay setting tolerance -20% -20ms or more +0% +30ms or less
ZSI Zone interlock	STD Short time-delay ON or <u>OFF</u> GF Ground fault trip ON or <u>OFF</u>
Start operating characteristics	Hot start/cold start (selectable)

Remarks: If not otherwise specified, the product will be delivered with the underlined standard setting values.

Notes:

- ①: Trip with a pickup current value exceeding $I_r \times 1.05$ and 1.2 or less.
 ③: A 3-pole circuit breaker cannot be used with a 3-phase 4-wire system.
 ④: The ramp characteristics can be switched ON/OFF separately from the short time-delay trip.
 ⑦: Trip with a pickup current value exceeding $I_N \times 1.05$ and 1.2 or less.
 ⑧: There is no N-phase protection function for 3P. Always set it to OFF.
 ⑨: The ON/OFF of the ramp characteristics conform to the short time-delay trip settings.
 ⑩: In the case of $I_n=250A$, I_r is adjustable in 1A steps between 100, 101 to 110, 111 to 125, 126 to 140, 141 to 160, 161 to 180, 181 to 200, 201 to 225, 226 to 250.
 In the case of $I_n=400A$, I_r is adjustable in 1A steps between 160, 161 to 180, 181 to 200, 201 to 225, 226 to 250, 251 to 300, 301 to 350, 351 to 370, 371 to 400.
 ⑪: As an example
 When the setting dial is set to $I_r \times 10$, on the display, $I_{sd}=I_r \times 10 -9.5 -9 -8.5$ is adjustable.
 When the setting dial is set to $I_r \times 8$, on the display, $I_{sd}=I_r \times 8 -7.5$ is adjustable.
 When the setting dial is set to $I_r \times 2$, on the display, $I_{sd}=I_r \times 2$ is fixed.
 ⑫: I_r is adjustable in 1A steps between 250, 251 to 300, 301 to 350, 351 to 370, 371 to 400, 401 to 500, 501 to 600, 601 to 630.

4

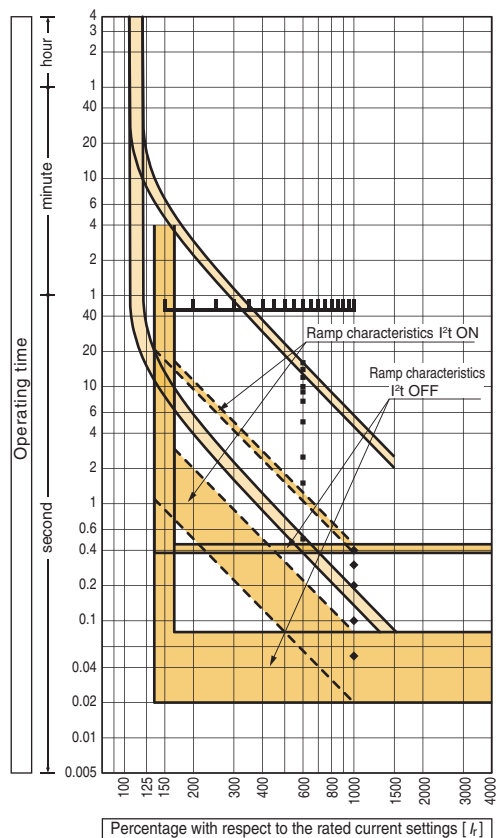
Special Breakers

Moulded Case Circuit Breakers

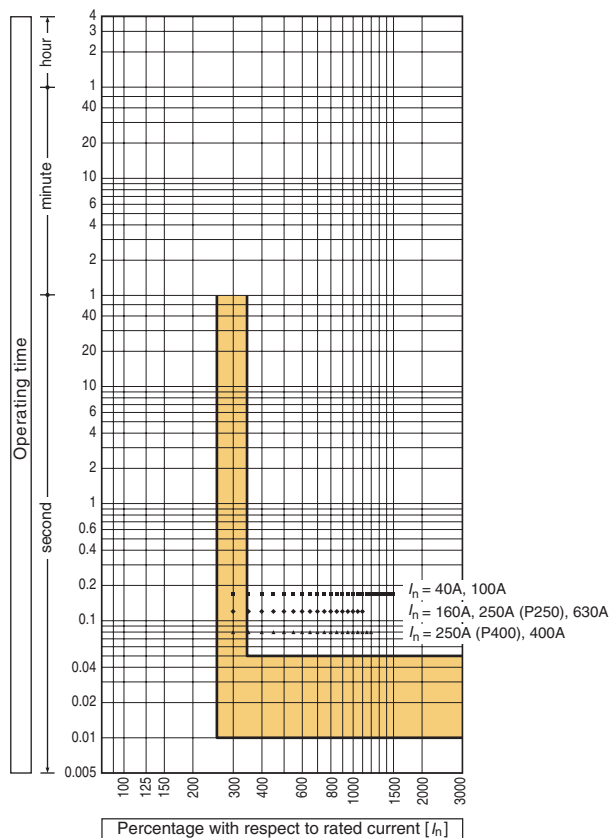
1 High-Performance Electronic Smart Circuit Breaker (TPOU type OCR)

Operating characteristic curve

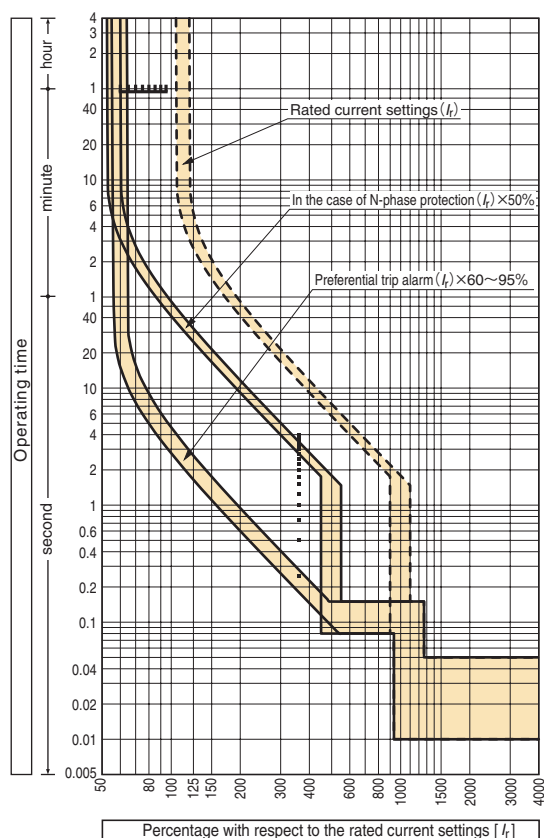
Long time-delay trip, short time-delay trip characteristics



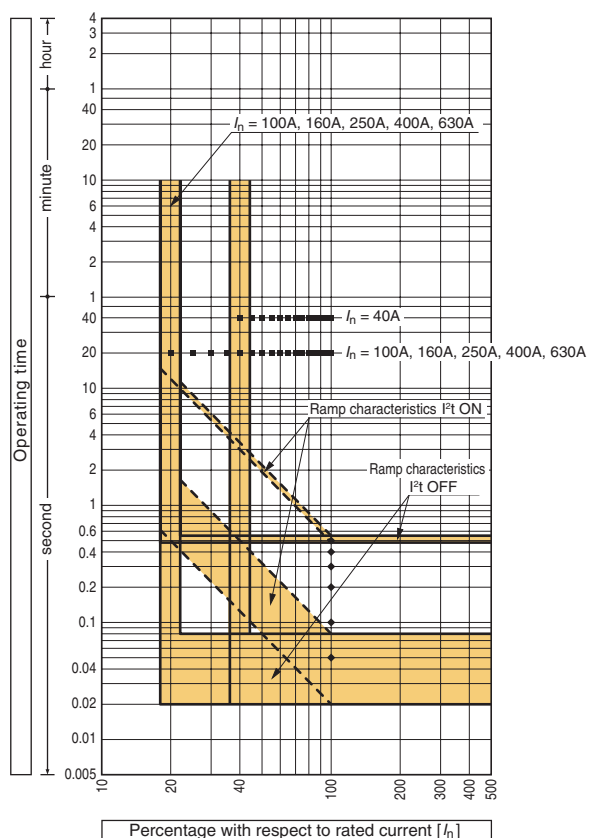
Instantaneous trip characteristics



N-phase protection, preferential trip alarm characteristics



Ground fault trip characteristics



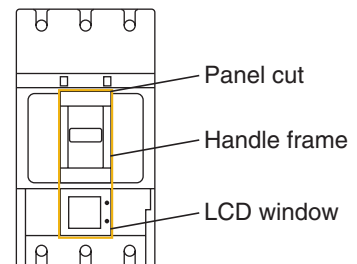
The XOW type high-performance electronic OCR measures the electric circuit current, voltage, instantaneous power, integrated electric energy, and power factor using the built-in VT and CT and displays them on the LCD mounted on the front of the circuit breaker. Also, it supports Modbus open network and transmits these measurement data and accident history information as data.

Appearance



- The LCD window provides the phase currents, line voltages (and their maximum values), power factor, electrical power and electrical energy. It can also provide the 1st to 19th harmonic currents for each phase.

- When a fault occurs, the cause of the fault and the fault current are indicated on the LCD. Data in memory is stored even if the power is lost. You can view event or fault logs after the power is restored.



The LCD window is equal to the handle frame in width; the panel cutout can be made easily.

- The breaker is available in three LCD orientations corresponding to the installation orientations of the breaker.

Vertical (move the handle up to ON) (Standard orientation)	Horizontal (move the handle right to ON)	Horizontal (move the handle left to ON)

If the breaker is installed in a horizontal orientation, please specify “Horizontal (move the handle right to ON)” or “Horizontal (move the handle left to ON)” when ordering. Otherwise the standard orientation “Vertical (move the handle up to ON)” will apply.

4

Special Breakers

Moulded Case Circuit Breakers

2 High-Performance Electronic Circuit Breaker (XOW type OCR)

Types of XOW type overcurrent trip device (OCR)

OCR type	Protection function				Alarm function	Display		
	Long time-delay Short time-delay Instantaneous	Ground fault trip ①	N-phase protection	Phase rotation protection	Preferential trip alarm	LCD window	LCD backlight	
	A	GF	NP	NS	PTA			
XOW-1L-A	●	—	—	—	—	●	—	
XOW-1L-AGN	●	●	●	—	—	●	—	
XOW-1L-AP	●	—	—	—	●	●	—	
XOW-1L-APGNS	●	●	●	●	●	●	—	
XOW-1L-APC	●	—	—	—	●	●	—	
XOW-1L-APGNSC	●	●	●	●	●	●	—	
XOW-1S-A	●	—	—	—	—	●	●	
XOW-1S-AGN	●	●	●	—	—	●	●	
XOW-1S-AP	●	—	—	—	●	●	●	
XOW-1S-APGNS	●	●	●	●	●	●	●	
XOW-1S-APCWH	●	—	—	—	●	●	●	
XOW-1S-APGNSCWH	●	●	●	●	●	●	●	

● : Standard equipment.

○ : Optional.

— : "no" or "not available".

① : In the case of (I_{CT})=250 A, ground fault trip is not available.

XOW type OCR measurement/display function specifications

Measurement/display items (accuracy)		Modbus communication function ○ : Yes — : No	Remarks
Load current (±1.5%)	Present value for each phase	○	Ground fault current and negative-phase current can be displayed depending on the specifications.
	Present max value	○	Among L1, L2, L3 phases, the phase having the highest current is subject to measurement and the value of the current is displayed.
Line voltage (±1.0%)	Present value of each line voltage	○	
	Present max value	○	
	Present phase voltage value for each phase	○	Applies to 4-pole breakers only.
Harmonic current (±2.5%)	Present value of 3rd, 5th, 7th, ...19th harmonic current for each phase	—	
Electric power (±2.5%)	Present value	○	
	Demand value	○	
	Max demand value	○	
Electric energy (±2.5%)	Electrical energy	○	
Power factor (±5%)	Present value	○	
Trip history	Fault current (±1.5%)	○	
	Indication of cause	○	
Alarm history	Cause of alarm, Indication of operated value	○	

Note: Electrical energy is stored every 2 hours and the fault current and cause of fault are stored every time a fault occurs in a flash memory.

	Measurement/display function						Communication function Modbus	External indicator	Test function	Indication via output contact	Control power supply
	Current	Voltage, power, electric energy, power factor, demand power	Electric energy pulse output	Harmonic current	Trip event history	Alarm history					
			W	H			C	I		Y	
	●	—	—	—	●	●	—	—	●	—	Required
	●	—	—	—	●	●	—	—	●	—	Required
	●	—	—	—	●	●	—	—	●	●	Required
	●	—	—	—	●	●	—	—	●	●	Required
	●	—	—	—	●	●	●	—	●	●	Required
	●	—	—	—	●	●	●	—	●	●	Required
	●	●	—	—	●	●	—	—	●	—	Required
	●	●	—	—	●	●	—	—	●	—	Required
	●	●	—	—	●	●	—	—	●	●	Required
	●	●	—	—	●	●	—	—	●	●	Required
	●	●	●	●	●	●	●	○	●	●	Required
	●	●	●	●	●	●	●	○	●	●	Required

■ Network interface I/O specifications

Item	Modbus specifications
Communication protocol	RS-485
Communication mode	2-wire, half-duplex
Topology	Multi-drop bus
Transmission rate	19.2 kbps max
Transmission distance	1.2 km max (at 19.2 kbps)
Data format	Modbus-RTU
Max number of nodes	1–31

■ Specifications of overcurrent trip device

Applicable MCCB type	CT rated primary current I_{CT}
H400-NE, L400-NE	250A 400A
S800-NE, S800-RE, S800-PE, H800-NE, L800-NE	630A 800A
S1000-SE, S1000-NE	1000A

Protection function		Symbol	Setting range
Rated current (A)		I_n	$[I_{CT}] \times (0.5-0.63-0.8-1.0)$
Long time-delay trip LT	Pick-up current (A)	I_r	$[I_n] \times (0.8-0.85-0.9-0.95-1.0)$ • Non tripping at not more than $[I_r] \times 1.05$ • Tripping at more than $[I_r] \times 1.05$ and not more than $[I_r] \times 1.2$
	Time-delay (s)	t_r	(0.5-1.25-2.5-5-10-15-20-25-30) (sec) at 600% of $[I_r]$ ① Time-delay setting tolerance: $\pm 20\%$, +0.13s –0s
	COLD / HOT	—	COLD / HOT
Short time-delay trip ST	Pick-up current (A)	I_{sd}	$[I_n] \times (1-1.5-2-2.5-3-4-6-8-10-NON)$ ② Current setting tolerance: $\pm 15\%$
	Time-delay (s)	t_{sd}	I ^t OFF: 0.05-0.1-0.2-0.3s (Definite time characteristic), Time-delay setting tolerance: +50ms –20ms I ^t ON: 0.05-0.1-0.2-0.3s (Ramp characteristic at less than 1000% of $[I_n]$, Definite time characteristic at 1000% or more of $[I_n]$) ③
	I ^t ramp characteristic	—	OFF / ON
Instantaneous trip INST	Pick-up current (A)	I_i	$[I_n] \times (2-3-4-6-8-10-12-13-14-NON)$ ④⑤ Current setting tolerance: $\pm 20\%$
Ground fault trip GF ⑦	Pick-up current (A)	I_g	$[I_{CT}] \times (0.2-0.3-0.4-NON)$ Current setting tolerance: $\pm 20\%$
	Time-delay (s)	t_g	I ^t OFF: 0.1-0.2-0.3-0.4-0.8s (Definite time characteristic) Time-delay setting tolerance: +50ms –20ms I ^t ON: 0.1-0.2-0.3-0.4-0.8s (Ramp characteristic at less than 40% of $[I_{CT}]$, Definite time characteristic at 40% or more of $[I_{CT}]$)
	I ^t ramp characteristic	—	OFF / ON
	Mode	—	TRIP / OFF ⑥
N-phase protection NP	Pick-up current (A)	I_N	$[I_{CT}] \times (0.4-0.5-0.63-0.8-1.0-NON)$ • Non tripping at not more than $[I_N] \times 1.05$ • Tripping at more than $[I_N] \times 1.05$ and not more than $[I_N] \times 1.2$
	Time-delay (s)	t_N	Tripping at 600% of $[I_N]$ with LT time-delay $[t_r]$.
	COLD / HOT	—	COLD / HOT
Phase rotation protection NS	Pick-up current (A)	I_{NS}	$[I_n] \times (0.2-0.3-0.4-0.5-0.6-0.7-0.8-0.9-1.0)$ Current setting tolerance: $\pm 10\%$
	Time-delay (s)	t_{NS}	(0.4-0.8-1.2-1.6-2.0-2.4-2.8-3.2-3.6-4.0) (sec) at 150% of $[I_{NS}]$ Time-delay setting tolerance: $\pm 20\%$, +0.13s –0s
	Mode	—	TRIP / OFF ⑥
Pre-trip alarm PTA	Pick-up current (A)	I_P	$[I_n] \times (0.7-0.8-0.9-1.0)$ Current setting tolerance: $\pm 10\%$
	Time-delay (s)	t_P	5-10-15-20-40-60-80-120-160-200s more than $[I_P]$ Time-delay setting tolerance: $\pm 10\%$, +0.1s –0s
	Mode	—	AL / OFF ⑥

Notes:

①: For S1000, (0.5-1.25-2.5-5-10-15-16)sec.

②: For S1000, $[I_n] \times (1-1.5-2-2.5-3-4-6-8-NON)$.③: For S1000, 800% or more of $[I_n]$.④: The max. pick-up current is set to 1300% $\times [I_{CT}]$ for H400 and L400, 1000% $\times [I_{CT}]$ for S1000, 1200% $\times [I_{CT}]$ for S800, H800 and L800.

⑤: When the short time delay trip function has been set to NON, the instantaneous trip function cannot be set to NON. When the instantaneous trip function has been set to NON, the short time delay trip function cannot be set to NON.

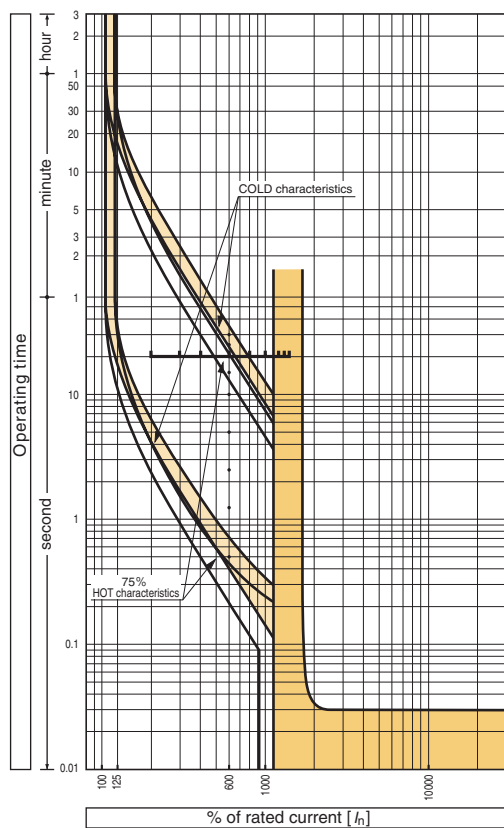
⑥: Selecting "OFF" disables protective functions.

⑦: GF is not available when I_n is 250A or less.

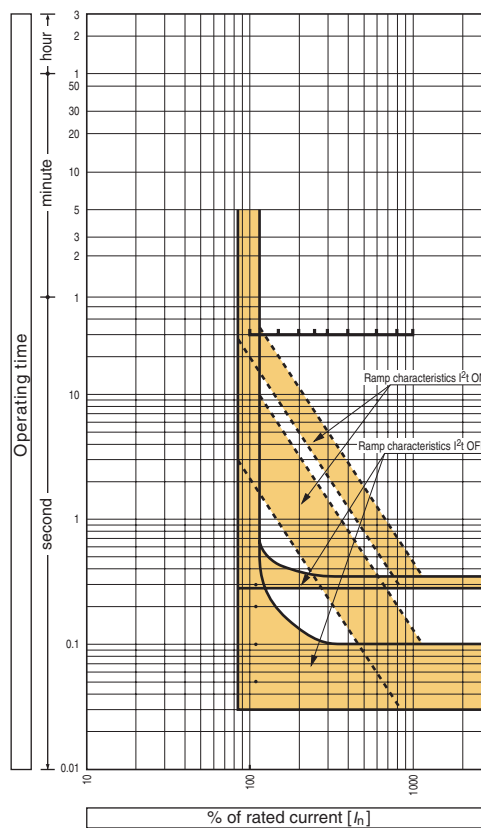
Unless otherwise specified when ordering, the settings will default to those underlined in the table above.

Operating characteristic curve

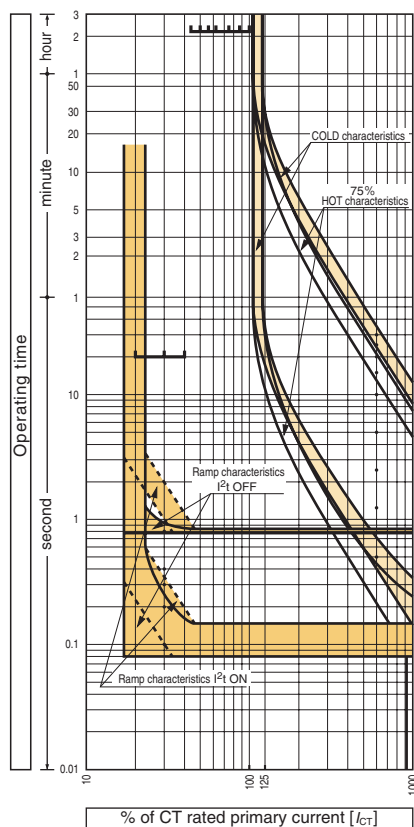
Long time-delay trip, instantaneous trip characteristics



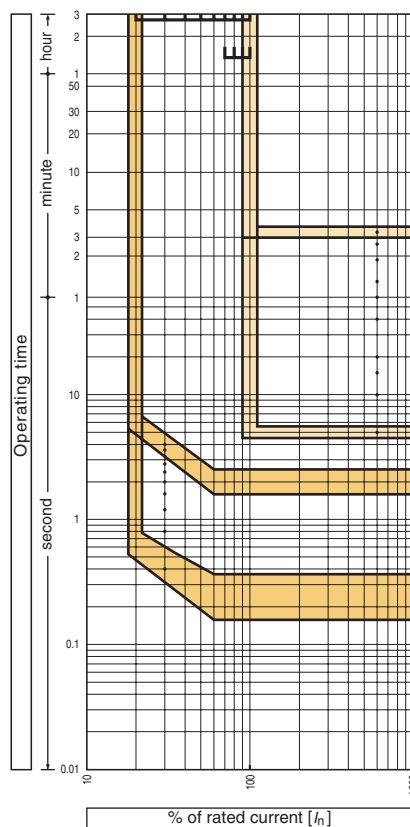
Short time-delay trip characteristics



N-phase protection, ground fault trip characteristics



Phase rotation protection, preferential trip alarm characteristics



■ XOW type OCR controller

The XOW type electronic OCR requires a control power supply and an XOW type OCR controller (supplied by Terasaki). When ordering, please specify whether you would like the OCR controller to be mounted on the breaker or separate.

Note ① : When the OCR controller is mounted on the breaker, the shunt trip device/undervoltage trip device with lead wire terminal block cannot be used.

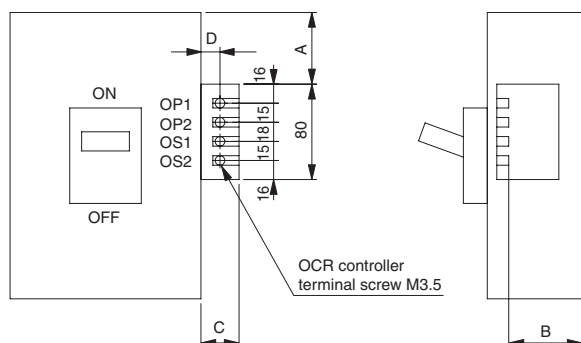
● OCR controller specifications

Control power supply Note ② (rated voltage)	100 to 120V AC or 200 to 240V AC
VA consumption	2VA

Note ② : The allowable voltage range of the control power supply is 85 to 110% of the rated voltage. When ordering, please specify the rated voltage.

● OCR controller breaker mounting position/terminal arrangement diagram

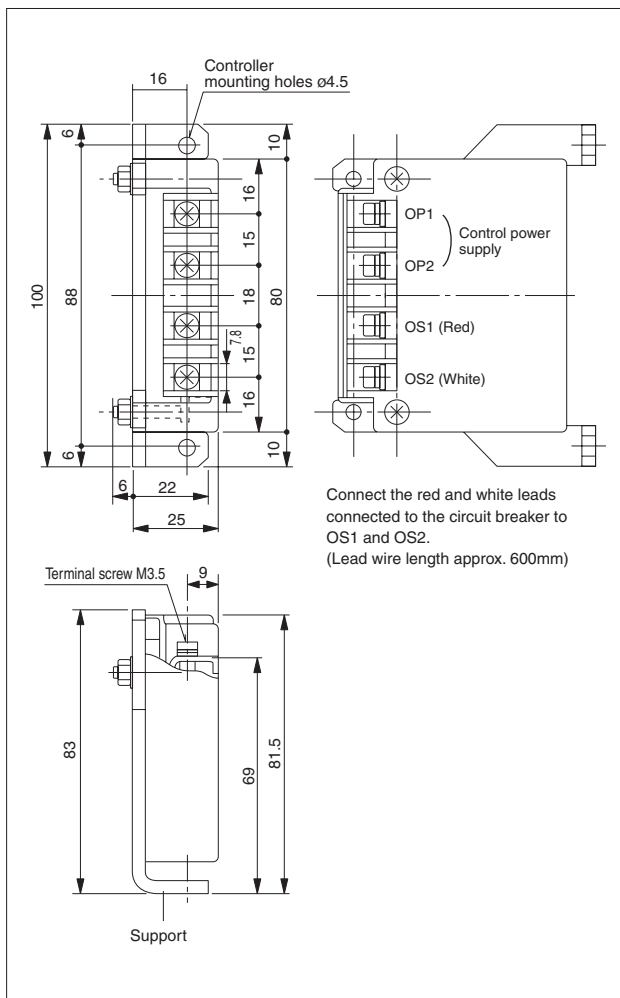
Applicable circuit breaker		A(mm)	B(mm)	C(mm)	D(mm)
S400	3P、4P	80	74	25.2	16.2
H400, L400	3P、4P	80	111	25.2	16.2
S630, S800, S1000	3P、4P	71.5	74	25.2	16.2
H630, L630 H800, L800	3P、4P	71.5	111	25.2	16.2



Note 1): Terminal screw tightening torque M3.5 ... 0.88 – 1.18N·m

2): Connectable wire 2.0mm² (max.)

● OCR controller separate outline drawing



5

Mounting and Connection

1	Type of connections and mountings	5-2
	Connecting parts	5-2
2	Insulation distance from the line side	5-4
3	Temperature Ratings	5-6

Connecting parts

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

1. Extension bars for front connection

Type	Number of poles	Shape	Moulded Case Circuit Breakers	Min order qty ①	Extension bar (pcs)
T2FB16L3WB	3	Spread extension bars	E160-SF, E160-SJ, S160-SCF, S160-SCJ, S160-SF, S160-SJ, S160-SN	1	6
T2FB16L4WB	4				8
T2FB12L2SB	2	Straight extension bars	E160-SF, S160-SCF	1	4
T2FB12L3SB	3		E160-SF, E160-SJ, S160-SCF, S160-SCJ, S160-SF, S160-SJ, S160-SN		6
T2FB12L4SB	4				8
TPFB163SB	3	Straight extension bars	P160F, P160N, P160H, P160D	1	6
TPFB164SB	4				8
T2FB25L3WB	3	Spread extension bars	E250-SCF, E250-SCJ, E250-SF, E250-SJ, S250-SN	1	6
T2FB25L4WB	4				8
T2FB25L3SB	3	Straight extension bars	E250-SCF, E250-SCJ, E250-SF, E250-SJ, S250-SN	1	6
T2FB25L4SB	4				8
T2FB25L3WB	3	Spread extension bars	P250F, P250N, P250H, P250D	1	6
T2FB25L4WB	4				8
T2FB25L3SB	3	Straight extension bars	P250F, P250N, P250H, P250D	1	6
T2FB25L4SB	4				8
T2FB253B	3	Spread extension bars	H125-NJ, L125-NJ, H160-NJ, L160-NJ, H250-NJ, L250-NJ, H250-NE	1	6
T2FB254B	4	Straight extension bars	H125-NJ, L125-NJ, H160-NJ, L160-NJ, H250-NJ, L250-NJ, H250-NE	1	8
T2FB403B	3	Spread extension bars	P400E, P400F, P400N, P400H, P400S, P400D	1	6
T2FB404B	4				8
T2FB403B	3	Spread extension bars	H400-NE, L400-NE	1	6
T2FB404B	4				8
T2FB463B	3	Spread extension bars	P630E, P630F, P630N, P630H, P630S, P630D	1	6
T2FB464B	4				8

Note: ① The min order qty is one unit on the line side and one on the load side. Please specify it separately if you need 1/2 of either the line side or the load side.

2. Plug-in base for switchboards

Type	Number of poles	IP20	Applicable breakers	Min order qty	Plug-in base (pcs)
			Moulded Case Circuit Breakers		
TPPM12B3	3	Non	P160F, P160N, P160H, P160D	1	1
TPPM12B4	4				1
T2PM25B3	3		P250F, P250N, P250H, P250D	1	1
T2PM25B4	4				1
T2PM25B3	3		H125-NJ, L125-NJ, L125-PJ, H160-NJ, L160-NJ, H250-NJ, L250-NJ	1	1
T2PM25B4	4				1
TPPM63B3	3		P400E, P400F, P400N, P400H, P400S, P400D	1	1
TPPM63B4	4				1
T2PM40B3	3		H400-NE, L400-NE, L400-PE	1	1
T2PM40B4	4		H400-NE, L400-NE	1	1
TPPM63B3	3		P630E, P630F, P630N, P630H, P630S ②	1	1
TPPM63B4	4				1
T2PM80B3	3		H800-NE, L800-NE, L800-PE, S800-CJ, S800-NJ, S800-NE, S800-RJ, S800-RE, S800-PJ, S800-PE, S800-NN	1	1
T2PM80B4	4		H800-NE, L800-NE, S800-CJ, S800-NJ, S800-NE, S800-RJ, S800-RE, S800-PJ, S800-PE, S800-NN	1	1
T2PMX3E3	3		S1250-SE, S1250-NE, S1250-GE, S1250-NN	1	1
TPPM12P3	3	Compliant	P160F, P160N, P160H, P160D	1	1
TPPM12P4	4				1
T2PM25P3	3		P250F, P250N, P250H, P250D	1	1
T2PM25P4	4				1
T2PM25P3	3		H125-NJ, L125-NJ, H160-NJ, L160-NJ, H250-NJ, L250-NJ	1	1
T2PM25P4	4				1
TPPM63P3	3		P400E, P400F, P400N, P400H, P400S, P400D	1	1
TPPM63P4	4				1
T2PM40P3	3		H400-NE, L400-NE, L400-PE	1	1
T2PM40P4	4		H400-NE, L400-NE	1	1
TPPM63P3	3		P630E, P630F, P630N, P630H, P630S	1	1
TPPM63P4	4				1
T2PM80P3	3		H800-NE, L800-NE, L800-PE, S800-CJ, S800-NJ, S800-NE, S800-RJ, S800-RE, S800-PJ, S800-PE, S800-NN	1	1
T2PM80P4	4		H800-NE, L800-NE, S800-CJ, S800-NJ, S800-NE, S800-RJ, S800-RE, S800-PJ, S800-PE, S800-NN	1	1
T2PMX3C3	3		S1250-SE, S1250-NE, S1250-GE, S1250-NN ①	1	1

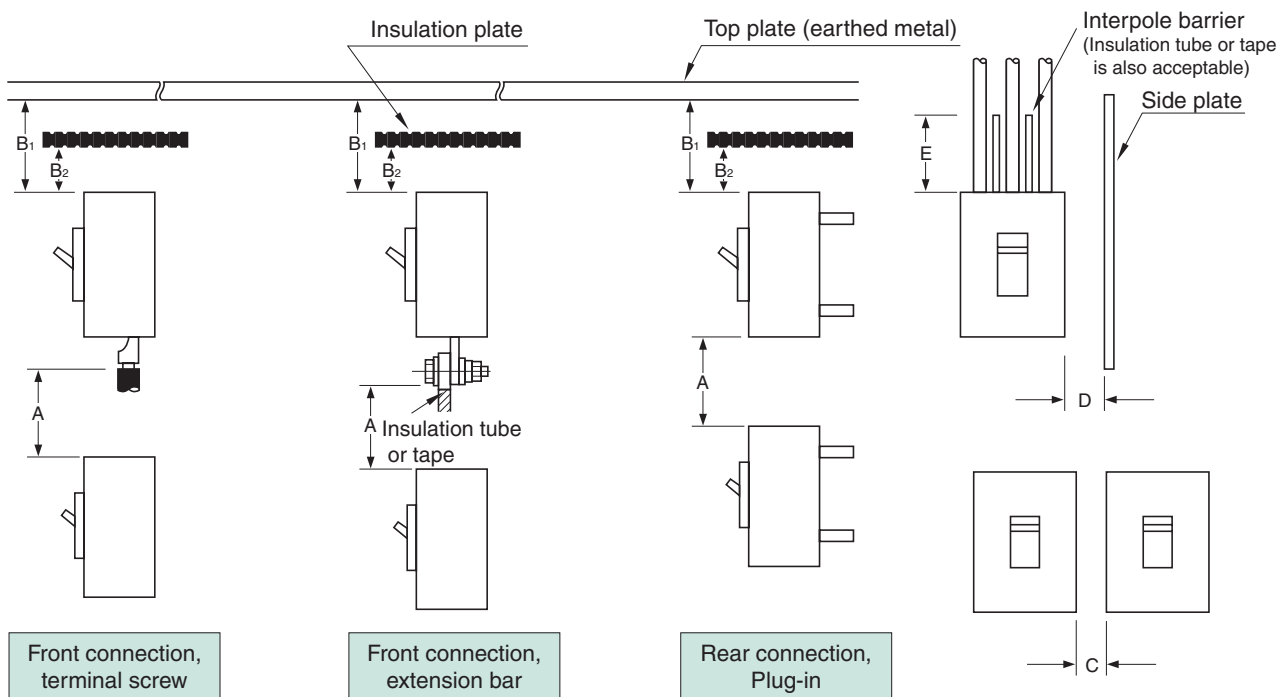
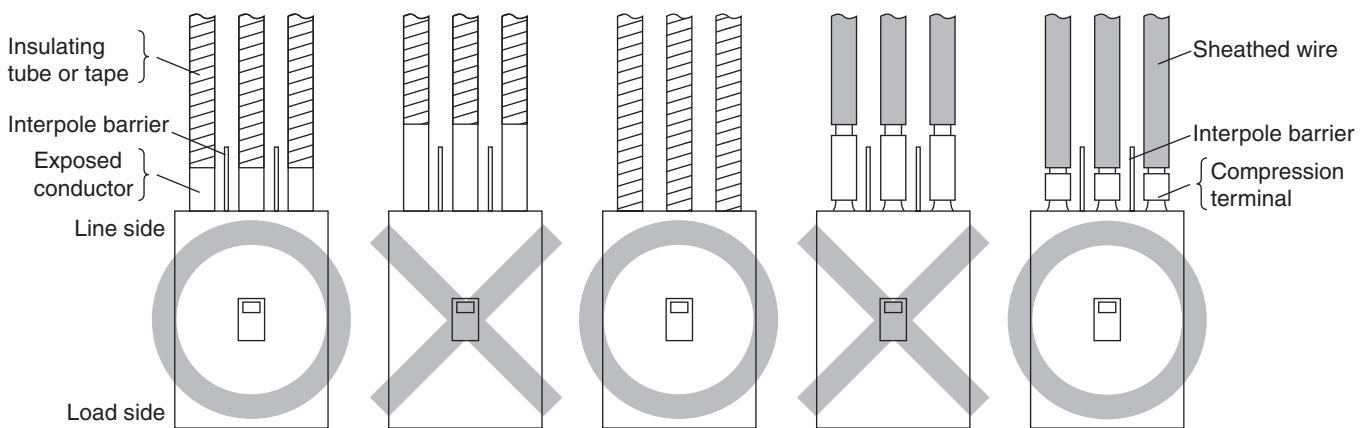
Remarks: Normally the plug-in base should be ordered at the same time as the breaker body. However, please order it if you will connect the plug-in base in advance.

Note: ① If internal accessories are fitted in the circuit breaker, auxiliary circuit terminals for IP20 are required. Please specify "IP20 applied product" when ordering the circuit breaker body.

② Electronic type is not available.

2 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, plug-in).

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 (415V AC or less) Note ①

Series	Moulded Case Circuit Breakers	A Breaker upper and lower gap Note ②	B1 Bare grounded metal plate	B2 Insulating plate, coated plate	C	D	E Note ④
Economical series	E160-SF, E160-SJ	30	30	10	Possible to set close Note ⑥	25	Not less than the length of the bare live part
	E250-SCF, E250-SCJ	50	40	40	Possible to set close Note ⑥	50	Not less than the length of the bare live part
	E250-SF, E250-SJ	50	40	40	Possible to set close Note ⑥	50	Not less than the length of the bare live part
	P400E	80 Note ⑤	80	60	Possible to set close Note ⑥	80	Not less than the length of the bare live part
	P630E	80 Note ⑤	80	60	Possible to set close Note ⑥	80	Not less than the length of the bare live part
Standard series	S160-SCF, S160-SCJ	30	30	10	Possible to set close Note ⑥	25	Not less than the length of the bare live part
	S160-SF, S160-SJ	30	30	10	Possible to set close Note ⑥	25	Not less than the length of the bare live part
	P160F	50	10	10	Possible to set close Note ⑥	25	Not less than the length of the bare live part
	P160N	75	45	25	Possible to set close Note ⑥	25	Not less than the length of the bare live part
	P160H	75	45	25	Possible to set close Note ⑥	25	Not less than the length of the bare live part
	P250F	50	40	30	Possible to set close Note ⑥	25	Not less than the length of the bare live part
	P250N	80	80	30	Possible to set close Note ⑥	25	Not less than the length of the bare live part
	P250H	80	80	30	Possible to set close Note ⑥	25	Not less than the length of the bare live part
	P400F	80 Note ⑤	80	60	Possible to set close Note ⑥	80	Not less than the length of the bare live part
	P400N	80 Note ⑤	80	60	Possible to set close Note ⑥	80	Not less than the length of the bare live part
	P400H	80 Note ⑤	80	60	Possible to set close Note ⑥	80	Not less than the length of the bare live part
	P630F	80 Note ⑤	80	60	Possible to set close Note ⑥	80	Not less than the length of the bare live part
	P630N	80 Note ⑤	80	60	Possible to set close Note ⑥	80	Not less than the length of the bare live part
	P630H	80 Note ⑤	80	60	Possible to set close Note ⑥	80	Not less than the length of the bare live part
	S800-CJ	120	100	80	Possible to set close Note ③	80	Not less than the length of the bare live part
	S800-NJ, S800-NE	120	100	80	Possible to set close Note ③	80	Not less than the length of the bare live part
	S800-RJ, S800-RE	150	120	80	Possible to set close Note ③	80	Not less than the length of the bare live part
	S800-PJ, S800-PE	150	120	80	Possible to set close Note ③	80	Not less than the length of the bare live part
	S1000-SE, S1000-NE	150	120	80	Possible to set close Note ③	80	Not less than the length of the bare live part
	S1250-SE, S1250-NE	150	120	80	Possible to set close	80	Not less than the length of the bare live part
	S1250-GE	150	150	100	Possible to set close	100	Not less than the length of the bare live part
	S1600-SE, S1600-NE	150	150	100	Possible to set close	100	Not less than the length of the bare live part
	XS2000NE, XS2500NE, XS3200NE	150	150	100	Possible to set close	100	Not less than the length of the bare live part
High-fault series	H125-NJ, H160-NJ, H250-NJ, H250-NE	100	80	60	Possible to set close Note ⑥	50	Not less than the length of the bare live part
	P400S, P630S	120 Note ⑤	120	80	Possible to set close Note ⑥	80	Not less than the length of the bare live part
	H400-NE	120	120	80	Possible to set close Note ⑥	80	Not less than the length of the bare live part
	H800-NE	120 Note ⑤	120	80	Possible to set close Note ③	80	Not less than the length of the bare live part
Current- limiting series	L125-NJ, L160-NJ, L250-NJ	100	80	60	Possible to set close Note ⑥	50	Not less than the length of the bare live part
	L400-NE	120	120	80	Possible to set close Note ⑥	80	Not less than the length of the bare live part
	L800-NE	120 Note ⑤	120	80	Possible to set close Note ③	80	Not less than the length of the bare live part

Insulation distance, mm (690V AC) Note ①

Series	Moulded Case Circuit Breakers	A Breaker upper and lower gap Note ②	B1 Bare grounded metal plate	B2 Insulating plate, coated plate	C	D	E Note ④
690V AC Circuit Breaker	L125-PJ	120	120	80	Possible to set close Note ⑥	50	Not less than the length of the bare live part
	L400-PE	120	120	80	Possible to set close	80	—
	L800-PE	200 Note ⑤	200	160	Possible to set close Note ③	100	—

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 : When internal accessories are mounted, it cannot be closely fitted because the lead wires can not be pulled out to the load side.
- ④ : 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.
- ⑤ : Arc gas is discharged to the line side and load side. Please be careful when arranging within the board.
- ⑥ : If using extension bars (optional), ensure the insulation distance specified for the application.

Temperature Ratings for Thermal type MCCBs

MCCB Type	Connection Type	Rating at calibration temperature (50°C)	Rated Current (A)			
			55°C	60°C	65°C	70°C
H125-NJ L125-NJ L125-PJ	Front Rear Plug-in	20A	18.5	18	17.5	NA
		32A	30	29	28	NA
		50A	47	45	44	NA
		63A	59	57	55	NA
		100A	95	92	89	NA
		125A	118	114	111	NA
E160-SF S160-SCF S160-SF	Front Rear Plug-in	16A	15	14	13	12
		20A	19	18	17	17
		25A	24	24	23	22
		32A	30	28	27	25
		40A	39	37	36	34
		50A	48	47	45	44
		63A	61	59	57	55
		80A	76	73	70	66
		100A	97	94	91	88
		125A	122	118	115	111
		160A	156	152	149	144
		160A	156	152	149	144
E160-SJ S160-SCJ S160-SJ	Front Rear Plug-in	25A	24	24	23	22
		40A	39	37	36	34
		63A	61	59	57	57
		80A	78	76	74	72
		100A	97	94	91	87
		125A	122	118	115	110
P160F P160N P160H	Front Rear Plug-in	20A	19	19	18	17
		32A	31	30	29	28
		50A	47	45	42	39
		63A	59	54	49	43
		100A	97	93	89	85
		125A	121	118	115	110
H160-NJ L160-NJ	Front Rear Plug-in	160A	156	151	146	142
		160A	151	147	143	NA
E250-SCF E250-SF	Front Rear	125A	120	116	111	NA
		150A	146	143	139	NA
		175A	168	164	159	NA
		200A	194	189	184	NA
		225A	216	211	204	NA
		250A	243	236	229	NA
E250-SCJ E250-SJ	Front Rear	100A	98	96	94	92
		125A	122	119	115	111
		160A	156	152	148	143
		200A	195	189	183	177
		250A	243	236	229	NA
P250F P250N P250H	Front Rear Plug-in Draw-out	50A	49	47	45	44
		63A	60	57	54	50
		100A	96	92	88	83
		125A	121	118	114	110
		160A	154	148	141	134
		200A	190	180	170	159
H250-NJ L250-NJ	Front Rear Plug-in	250A	242	233	224	215
		250A	237	230	223	NA
P400E P400F P400N P400H P400S	Front Rear Plug-in Draw-out	250A	244	238	233	226
		400A	392	384	376	368
S800-CJ S800-NJ S800-RJ S800-PJ	Front Rear Plug-in Draw-out	630A	600	584	569	NA
		800A	758	737	716	NA

MCCB Type	Connection Type	Rating at calibration temperature (30°C)	Rated Current (A)							
			35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C
H250-NJ L250-NJ	Plug-in	250A	244	236	225	219	209	200	190	NA
P630E P630F P630N P630H P630S	Front Rear	630A	615	600	577	560	540	520	500	479

Temperature Ratings for Electronic type MCCBs

MCCB Type	Connection Type	Rating	Rated Current (A)						
			30°C	45°C	50°C	55°C	60°C	65°C	70°C
P160F P160N P160H	Front Rear Plug-in	40A	40	40	40	40	40	40	40
		100A	100	100	100	100	100	100	100
	Front Rear	160A	160	160	160	160	160	144	135
		Plug-in	160A	125	125	125	120	110	100
P250F P250N P250H	Front Rear Plug-in Draw-out	40A	40	40	40	40	40	40	40
		100A	100	100	100	100	100	100	100
	Front Rear	160A	160	160	160	160	160	144	135
		250A	250	250	250	245	240	218	200
	Plug-in Draw-out	160A	160	160	140	132	126	118	110
		250A	250	250	214	200	192	178	164
H250-NE	Front Rear	250A	250	250	237.5	225	200	200	NA
P400F P400N P400H P400S	Front Rear Plug-in Draw-out	250A	250	250	250	250	250	250	250
		400A	400	400	400	400	400	370	350
H400-NE L400-NE	Front Rear Plug-in	250A	250	250	250	250	225	200	NA
		400A	400	400	400	380	360	320	252
L400-PE	Rear Plug-in	250A	250	250	250	250	225	200	NA
	Rear	400A	400	400	400	380	360	320	252
	Plug-in	400A	400	400	400	360	340	320	252
P630F P630N P630H P630S	Front Rear	630A	630	630	630	611.1	558	500	400
	Plug-in Draw-out	570A	570	570	546	500	455	400	372
S800-NE S800-RE S800-PE	Front	630A	630	630	630	598.5	567	504	NA
		800A	800	800	800	720	640	504	400
	Rear Plug-in Draw-out	630A	630	630	630	598.5	567	504	NA
		800A	800	800	760	720	640	504	NA
H800-NE L800-NE	Front Rear Plug-in	630A	630	630	630	598.5	567	504	NA
		800A	800	800	720	640	504	504	NA
L800-PE	Rear Plug-in	630A	630	630	630	598.5	567	504	NA
		800A	800	800	720	640	504	504	NA
S1000-SE S1000-NE	Front Rear	1000A	1000	1000	900	800	630	630	500
S1250-SE S1250-NE S1250-GE	Front	1250A	1250	1250	1250	1000	787.5	787.5	625
	Rear Plug-in Draw-out	1250A	1250	1250	1125	1000	787.5	787.5	NA
S1600-SE S1600-NE	Front	1600A	1600	1600	1600	1440	1280	1008	NA
	Rear Draw-out	1600A	1600	1600	1520	1440	1280	1008	NA
XS2000NE	Front Rear Draw-out	2000A	2000	2000	2000	2000	1600	1200	NA
XS2500NE	Rear	2500A	2500	2500	2250	2125	2000	1500	NA

Temperature Ratings for Switch Disconnectors

MCCB Type	Connection Type	Rating	Rated Current (A)				
			50°C	55°C	60°C	65°C	70°C
P160D	Front Rear	160A	160	155	150	144	135
	Plug-in	125A	125	125	125	122	117
P250D	Front Rear	250A	250	242	234	225	216
	Plug-in Draw-out	250A	227	221	215	209	203
P400D	Front Rear Plug-in Draw-out	400A	400	392	384	376	368
P630D	Front Rear	630A	630	600	580	560	545

6

Accessories

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1. TPOT type and TPOP type electronic OCR

(1) Overcurrent trip characteristics

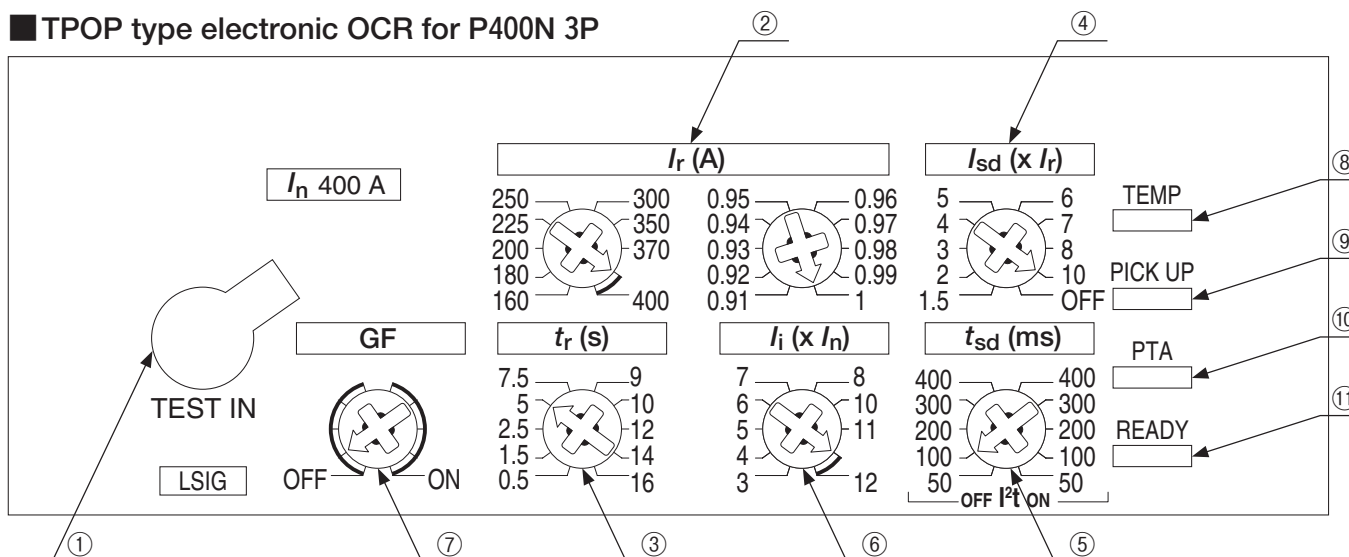
■ TPOT type and TPOP type OCR applicable breakers

Type of breaker	Rated Current (I_n) (A)
P160F, P160N, P160H	40, 100, 160
P250F, P250N, P250H	40, 100, 160, 250
P400F, P400N, P400H, P400S	250, 400
P630F, P630N, P630H, P630S	630

The TPOP electronic OCR is an OCR with long time-delay trip, short time-delay trip, instantaneous trip, ground fault trip, and a preferential trip alarm function. And in the case of 4-pole products, N-phase protection feature is also provided. It is set with seven dials, with one additional dial for ground fault trip ON/OFF. In the case of 4-pole products, the same dial is used for neutral protection pick-up current selection and ground fault trip ON/OFF.

In addition, since TPOT type electronic OCR and TPOP type electronic OCR use an r.m.s. value control method, the effects of harmonics do not cause any malfunction.

■ TPOP type electronic OCR for P400N 3P



- ① A terminal for connecting the OCR checker.
- ② The rated current settings is set with two dials: current value and magnification.
- ③ This is the long time-delay time settings dial.
- ④ This is the short time-delay pickup current dial.
- ⑤ This is the short time-delay time settings dial.
- ⑥ This is the instantaneous trip pick-up current dial.
- ⑦ This is the ground fault trip function ON/OFF dial.
- ⑧ Temperature LED
Lights red when the OCR ambient temperature reaches a high temperature of 105°C or higher.
- ⑨ Alarm LED
Lights red during long time-delay pickup.
During energisation at $105\% \times I_r$ to $112.5\% \times I_r$: Flashing
During energisation at $112.5\% \times I_r$ or more: Lights
- ⑩ PTA LED
The preferential trip alarm flashes orange during pickup and lights when it is output.
- ⑪ Status LED
Lights green when the OCR is operating normally. Flashes orange if there is an error.

TPOT and TPOP types overcurrent trip devices (OCR)

Rated Current I_n (A)	Number of poles	OCR type	Protection code	Setting method	Protective functions			Alarm function
					Long time, Short time, Instantaneous	Ground fault	N-phase protection	Preferential trip alarm
					L, S, I	GF	NP	PTA ②
40 100 160 250 400 630	3 ①	TPOT	LSI	Six dial type	●	—	—	●
		TPOP	LSIG	Seven dial type	●	●	—	●
	4	TPOT	LSI	Six dial type	●	—	—	●
		TPOP	LSIG	Seven dial type	●	●	●	●

● : Supplied as standard — : “no” or “not available”.

Note ① : 3-phase 4-wire systems cannot be used.

Note ② : Output contact is available by connecting an optional cable (order type TPPHQT130H).

OCR characteristics for P400N

TPOP type OCR (LSIG) (I_n)=250A, 400A

Rated current settings (A) $(I_r) = (I_{r1}) \times (I_{r2})$ ③	When (I_n)=250 A (I_{r1}) (A)=100, 110, 125, 140, 160, 180, 200, 225, <u>250</u> adjustable When (I_n)=400A (I_{r1}) (A)=160, 180, 200, 225, 250, 300, 350, 370, <u>400</u> adjustable $(I_{r2})=0.91, 0.92, 0.93, 0.94, 0.95, 0.96, 0.97, 0.98, 0.99, 1.00$
Long time-delay time settings (s) : (t_r)	0.5, 1.5, 2.5, <u>5</u> , 7.5, 9, 10, 12, 14, 16 adjustable at (I_r) $\times$ 600% Time-delay setting tolerance -20% -20ms or more +0% +30ms or less
Short time-delay pick-up current (A) : (I_{sd})	$(I_r) \times 1.5, 2, 3, 4, 5, 6, 7, 8, 10$ or OFF Current setting tolerance within $\pm 10\%$
Short time-delay time settings (ms) : (t_{sd})	50, <u>100</u> , 200, 300, 400 adjustable Ramp characteristics I ² t: ON or OFF However, definite time-delay characteristics with (I_r) $\times$ 10 or more When (t_{sd}) = 50ms Time-delay setting tolerance -30 ms or more +30 ms or less When (t_{sd}) = 100 ms to 400ms Time-delay setting tolerance -20ms or more +50ms or less
Instantaneous trip pick-up current (A) : (I_i)	$(I_n) \times 3, 4, 5, 6, 7, 8, 10, 11, 12$ adjustable Current setting tolerance within $\pm 15\%$
N-phase protection pick-up current (A) : (I_N)	For 3P OFF fixed ④ For 4P (I_r) $\times$ 50%, <u>100%</u> or OFF ⑤
N-phase protection time settings (s) : (t_N)	Operates with long time-delay time setting (t_r) and short time-delay time setting (t_{sd}) and also operates with instantaneous trip ⑥
Ground fault trip pick-up current (A) : (I_g)	Settings for 3P 3 ϕ 3W and 4P 3 ϕ 4W (3P 3 ϕ 4W not supported) $(I_n) \times 20\%$ or OFF ⑦ Current setting tolerance within $\pm 10\%$
Ground fault trip time settings (ms) : (t_g)	200 Time-delay setting tolerance -20ms or more +50ms or less ⑧
Preferential trip alarm pick-up current (A) : (I_p)	$(I_r) \times 80\%$ Current setting tolerance within $\pm 10\%$
Preferential trip alarm time settings (s) : (t_p)	$(t_r) \times 50\%$ at (I_p) $\times$ 600% Time-delay setting tolerance -20% -20ms or more +0% +30 ms or less

Notes:

- ③ : The rated current settings (I_r) can be set by two dials, the current value (I_{r1}) and the magnification (I_{r2}). Trip operation is performed with a pick-up current value exceeding (I_r) $\times$ 1.05 and 1.2 or less.
- ④ : There is no N-phase protection function for 3P.
- ⑤ : N-phase protection is adjustable to 50% or 100% of the rated current setting (I_r). It is also possible to turn off the protection function. The N-phase protection setting dial also serves as the ON/OFF switch for ground fault trip. Trip operation is performed with a pick-up current value exceeding (I_N) $\times$ 1.05 and 1.2 or less.
- ⑥ : There is no N-phase time setting dial. The ON/OFF of the ramp characteristics conforms to the short time-delay trip settings.
- ⑦ : In the case of 4P, the ON/OFF switch for ground fault trip is shared with the dial for N-phase protection pick-up current.
- ⑧ : The ON/OFF of the ground fault trip ramp characteristics conforms to the short time-delay trip settings. However, (I_n) $\times$ 1 or more with definite time-delay characteristics.

Remarks 1:

If not otherwise specified, the product will be delivered with the underlined standard setting values.

Remarks 2:

The TPOT type OCR (LSI) only has long time-delay trip, short time-delay trip, instantaneous trip, and preferential trip alarm.

6

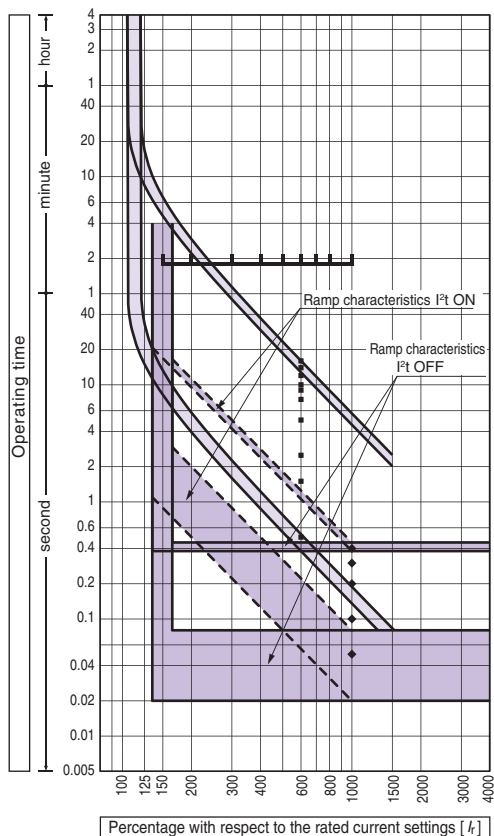
Accessories

Moulded Case Circuit Breakers

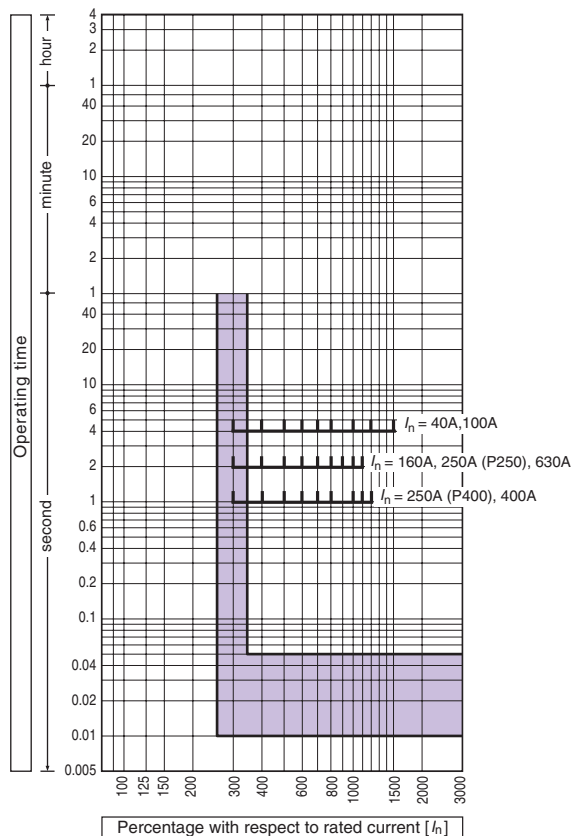
1 OCR for electronic breakers

TPOT type and TPOP type OCR operation characteristic curves

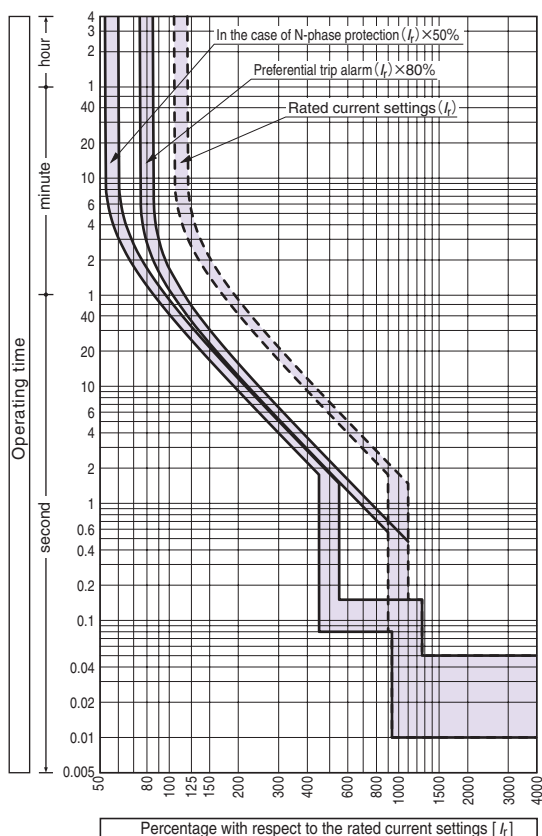
Long time-delay trip, short time-delay trip characteristics



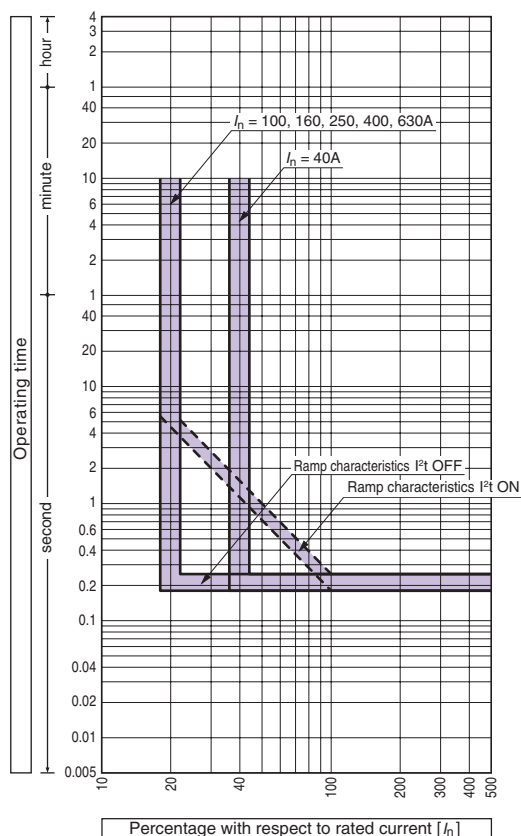
Instantaneous trip characteristics



N-phase protection, preferential trip alarm characteristics



Ground fault trip characteristics



(2) Alarm function/protective function

■ Preferential trip alarm (PTA)

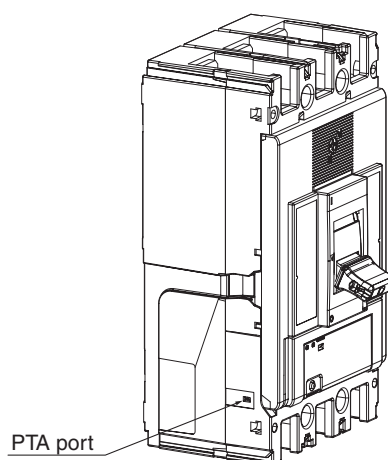
The load current is constantly monitored and if it exceeds the preferential trip alarm pick-up current I_p (= rated current setting (I_r) $\times$ 80%), the LED flashes and then the LED lights up and the contacts close at the operating times shown in the table below. If the load current becomes equal to or less than I_p , the LED turns off and the contacts open. Control power supply to the PTA is not required.

Long time-delay time setting t_r (s)		0.5	1.5	2.5	5.0	7.5	9.0	10	12	14	16
Estimated PTA operating time t_p (s)	For $I_p \times 200\%$	2.6	7.7	13	26	38	46	51	61	71	82
	For $I_p \times 600\%$	0.3	0.8	1.3	2.5	3.8	4.5	5.0	6.0	7.0	8.0
	For $I_p \times 720\%$	0.2	0.5	0.9	1.7	2.6	3.1	3.5	4.2	4.8	5.5

Contact rating

Output contact	Non-contact output 1a
	Contact capacity 24V AC/DC 100mA

By connecting the optional cable (order type TPPHQTT130H) to the PTA port, an alarm can be output using contact output (1a).



■ Ground fault trip (GF)

Protects equipment against fires caused by arc-ground fault currents. The ground fault trip current is set to 20% for rated current (I_n) of 100, 160, 250, 400 and 630 A and 40% for rated current (I_n) of 40 A.

Note: A 3-pole circuit breaker cannot be used with a 3-phase 4-wire system.

■ N-phase protection (NP)

A 4-pole circuit breaker can be used. This function protects against neutral wire overcurrent in a 3-phase 4-wire circuit. The N-phase protection pick-up current (I_N) can be switched to 100% or 50% of the rated current setting (I_r). It is also possible to turn off the N-phase protection function.

■ TPCH00 type OCR checker

You can use the OCR checker to easily check the long time-delay, short time-delay, instantaneous trip, ground fault trip, and preferential trip alarm functions in the field. For details, see Sections 8.

6

Accessories

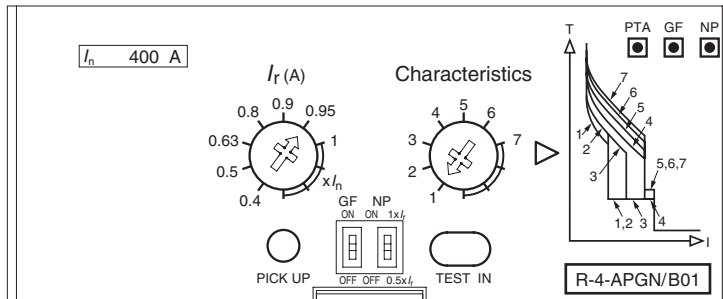
Moulded Case Circuit Breakers

1 OCR for electronic breakers

2. XOU type electronic OCR

(1) Overcurrent trip characteristics

■ XOU type electronic OCR for H400-NE



■ XOU type OCR Specifications

CT rated current (I_{CT})	poles	Protection code	Long time-delay, Short time-delay, 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	●	—	—	●
	4	APN	●	●	—	●
400 630 800 1000 1250 1600	3	A	●	—	—	—
	3	AP	●	●	—	—
	3	AG	●	—	●	—
	3	APG	●	●	●	—
	4	A	●	—	—	—
	4	AP	●	●	—	—
	4	AN	●	—	—	●
	4	APN	●	●	—	●
	4	AGN	●	—	●	●
	4	APGN	●	●	●	●

■ OCR characteristics for H400-NE $I_n=250A, 400A$

Characteristics No.	1	2	3	4	5	6	7
Rated current settings (A) : (I_r)	$(I_r) = (I_n) \times 0.4, 0.5, 0.63, 0.8, 0.9, 0.95, 1.0$						
Long time-delay time settings (s) : (t_l)	11	21	21	5	10	19	29
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)	$(I_i) \times 1400\%$ Max. $(I_n) \times 1300\%$ 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_g)	$(I_g) \times 20\%$ 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_N)	$(I_N) \times 100\%$ or 50% selectable ②					
	Time-settings (s) : (t_N)	$(I_N) = (I_r)$ Same as Long time-delay time settings					

Notes:

①: Ground fault trip is not available when (I_n) is 250A.

②: In case of (I_r) < (I_n), the setting tolerance becomes big when (I_N) is set at (I_r) $\times 50\%$.

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

■ XOU type OCR Applicable breakers

Frame size (A)	Type of breaker
225	H250-NE
400	H400-NE, L400-NE, L400-PE
800	S800-NE, S800-RE, S800-PE, H800-NE, L800-NE, L800-PE
1000	S1000-SE, S1000-NE
1250	S1250-SE, S1250-NE, S1250-GE
1600	S1600-SE, S1600-NE

XOU type electronic OCRs allow you to select a wide range of protection characteristics 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. They are equipped with five to seven protection characteristics as standard, providing optimum protective coordination between upstream circuit breakers and downstream circuit breakers and/or loads.

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.

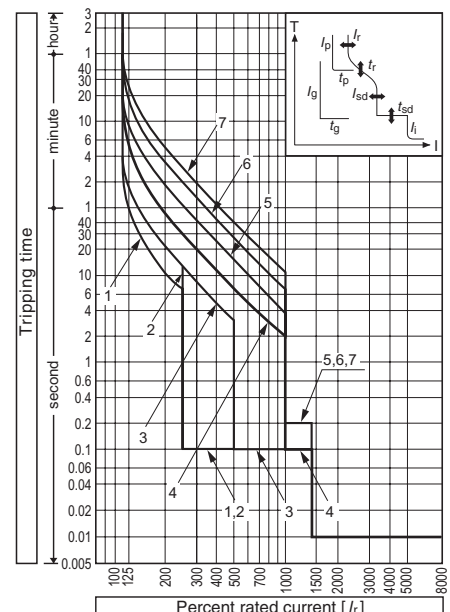
The selection of the option best suited to motor startup characteristics provides an optimum protection solution to motors.

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.

■ XOU type OCR

Time/Current characteristic curves



(2) Optional OCR functions

■ Preferential trip alarm (PTA)

The preferential trip alarm function causes the alarm LED to flash when the load current exceeds 80% of the rated current (IR) 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)	100 – 120V AC or 200 – 240V AC
Power consumption, VA	2VA

Note ② : The control voltage must be 85 to 110% of the rated voltage. Please state the rated voltage when ordering.

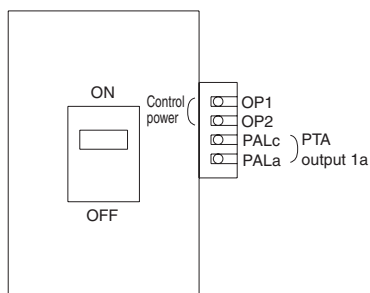
Contact rating

Operating time (s) (t_p)	40 secs (fixed definite time-delay) setting tolerance is $\pm 10\%$.		
	Contact output, (1a) lead wire standard. length (450mm)		
Output contact	Resistive load		Inductive load
	Rating of contact	250V AC	125VA (2A max)
		220V DC	20VA (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) is output. PTA is automatically reset at a lower current than [I_p].

● OCR controller connection diagram

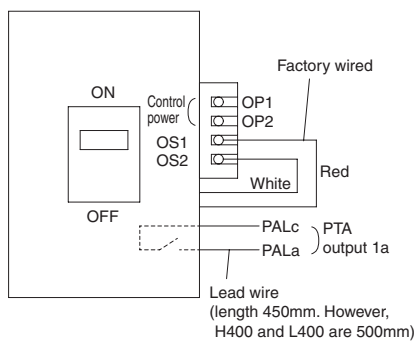
Applicable breakers: H250-NE



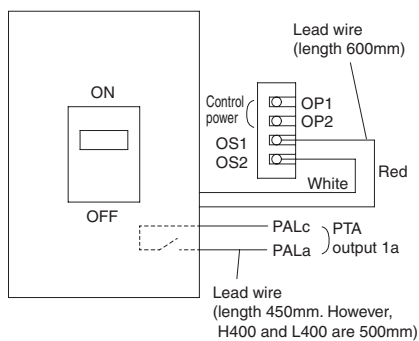
Note ③ : Separate installation of the OCR controller is not available. Flush-mounted type (FP) cannot be used.

Applicable breakers: H400-NE, L400-NE/PE, S800-NE/RE/PE, H800-NE, L800-NE/PE, S1000-SE/NE, S1250-SE/NE/GE, S1600-SE/NE

OCR controller installed on the breaker



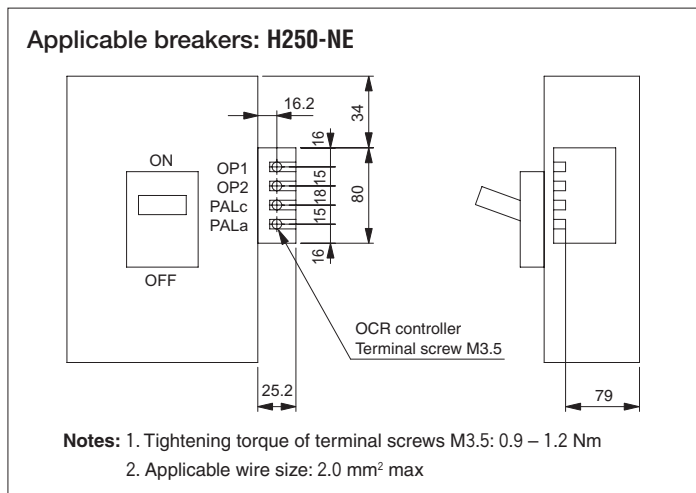
OCR controller installed external to the breaker



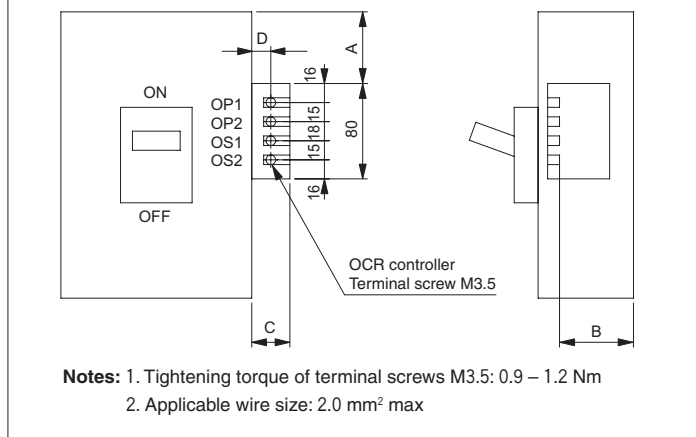
Note 4 : Standard installation of the OCR controller is on the right side of the breaker.
Separate installation is standard for the flush-mounted breakers.

(2) Optional OCR functions

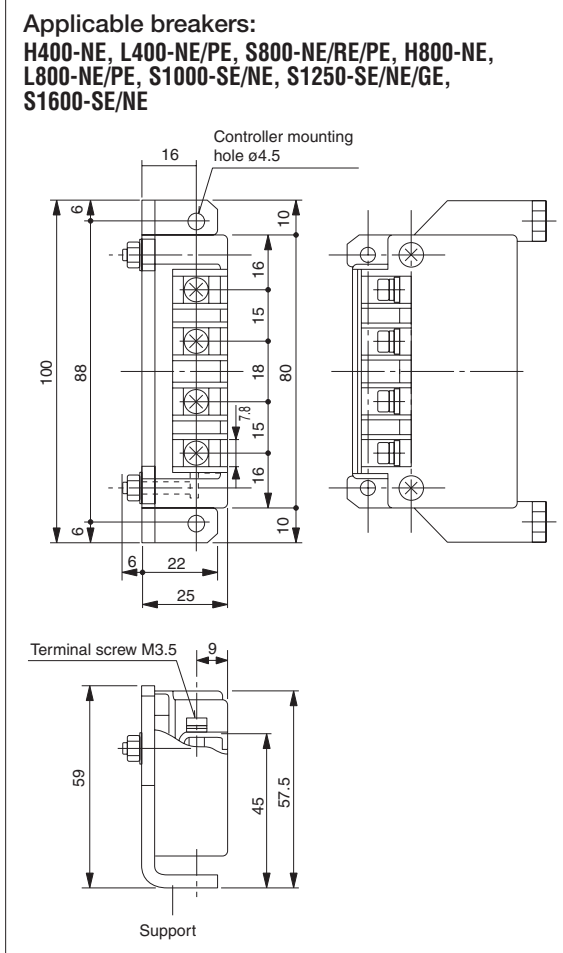
- Mounting dimensions and terminal arrangement of the OCR controller installed on the breaker



Applicable breakers		A(mm)	B(mm)	C(mm)	D(mm)
H400-NE, L400-NE, L400-PE	3P, 4P	71	111	25.2	16.2
S800-NE/RE/PE, S1000-SE/NE	3P, 4P	62.5	74	25.2	16.2
H800-NE, L800-NE, L800-PE	3P, 4P	62.5	111	25.2	16.2
S1250-SE/NE/GE	3P	33	72	21	12
	4P	43	72	21	12
S1600-SE/NE	3P	33	92	21	12
	4P	43	92	21	12



- Outline of the OCR controller installed external to the breaker



■ Ground fault trip (GF)

The ground fault trip pickup current is 20% of the rated current (I_n). The GF function provides protection against fire that may be caused by arcing ground fault current. The GF function is not available when (I_n) 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 pick-up current (I_N) can be switched to 100% or 50% of the rated current setting (I_r). The NP protection function can also be turned off. However, in the case of H250-NE, NP protection becomes (I_r) × 100% interlocking, and the protection function cannot be turned off.

When (I_r) < (I_n) , (I_N) = (I_r) × 50% setting will result in a large setting current error.

■ TNS-3 type OCR checker

You can use the OCR checker to easily check the OCR's long time-delay, short time-delay, instantaneous trip, ground fault trip and preferential trip alarm functions in the field. For details, see Section 8.

6

Accessories

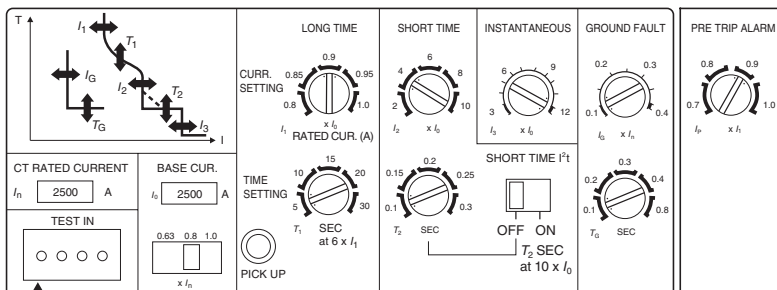
Moulded Case Circuit Breakers

1 OCR for electronic breakers

3. XOS type electronic OCR

(1) Overcurrent trip characteristics

■ XOS type electronic OCR for XS2500NE



■ XOS type OCR Applicable breakers

Frame size (A)	Type of breaker
2000	XS2000NE
2500	XS2500NE
3200	XS3200NE

With XOS type electronic OCR, the long time-delay trip, short time-delay trip, instantaneous trip, ground fault trip setting values can be independently changed.

You can set the ramp characteristics for short time-delay to facilitate selective coordination with downstream circuit breakers and fuses.

The ramp characteristics and the definite time-delay characteristics can be switched with the SHORT TIME I^2t switch in the OCR unit.

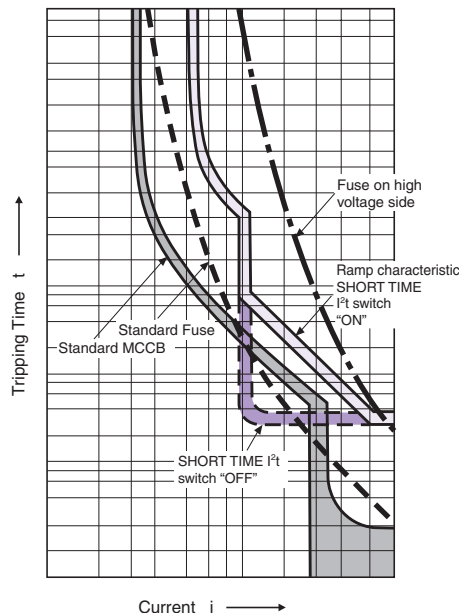
■ OCR characteristics for XS2500NE

CT rated current (A) : (I_n)	2500
Base current setting (A) : (I_b)	$(I_n) \times (0.63-0.8-1.0)$
Long time-delay pick-up current (A) : (I_1)	$(I_b) \times (0.8-0.85-0.9-0.95-1.0)$ Non-tripping at (I_1) setting $\times 105\%$ and below. Tripping at 125% & above.
Long time-delay time settings (S) : (T_1)	(5-10-15-20-30) at (I_1) $\times 600\%$ current. Setting tolerance $\pm 20\%$
Short time-delay pick-up current (A) : (I_2)	$(I_b) \times (2-4-6-8-10)$ 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 setting.
Instantaneous trip pick-up current (A) : (I_3)	Continuously adjustable from (I_b) $\times (3$ to <u>12</u>) Setting tolerance $\pm 20\%$
* Pre-trip alarm pick-up current (A) : (I_P)	$(I_1) \times (0.7, 0.8, 0.9, 1.0)$ Setting tolerance $\pm 10\%$
* Pre-trip alarm time setting (S) : (T_P)	40 fixed definite time-delay. Setting tolerance $\pm 10\%$
* Ground fault trip pick-up current (A) : (I_G)	Continuously adjustable from (I_n) $\times (0.1 to 0.4)$ Setting tolerance $\pm 15\%$
* Ground fault trip time setting (S) : (T_G)	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 is -20ms for the time-delay settings.

Note: * Optional

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

■ XOS type OCR Time/Current characteristic curves



(2) Optional OCR functions

■ Preferential trip alarm (PTA)

The preferential trip 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

PTA pick-up current (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		
Output contact	Contact output, (1a) lead wire standard length (450mm)		
		Resistive load	Inductive load
Rating of contact	250V AC	125VA (2A max)	20VA (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) is output. PTA is automatically reset at a lower current than [I_P].

● OCR controller (PTA and trip indication)

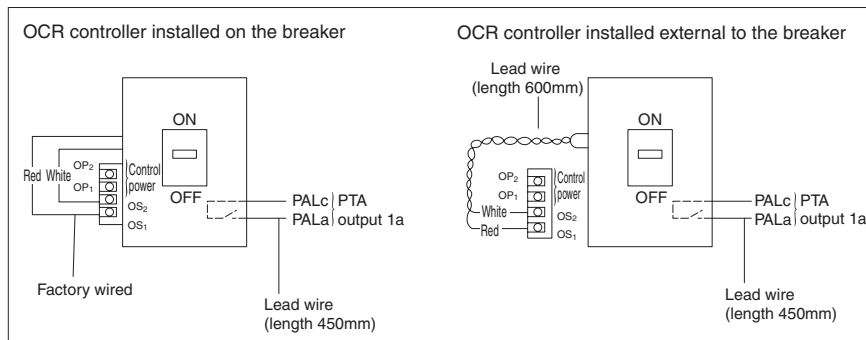
The OCR controller is installed in the left side of the breaker (standard). This can also be installed externally to the breaker (please specify when ordering).

● Specifications of OCR controller

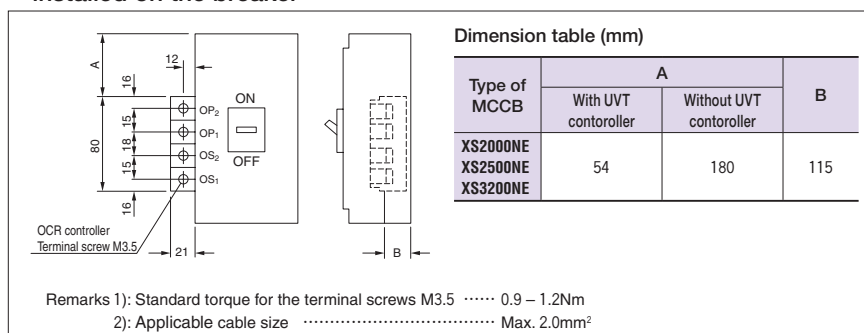
Power voltage ②	100 – 120V AC or 200 – 240V AC
(Rated voltage)	
Power consumption, VA	2VA

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

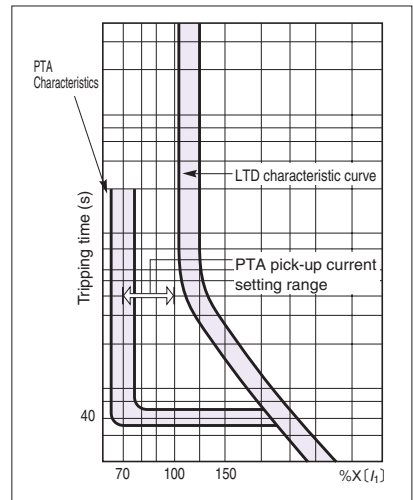
● OCR controller connection diagram



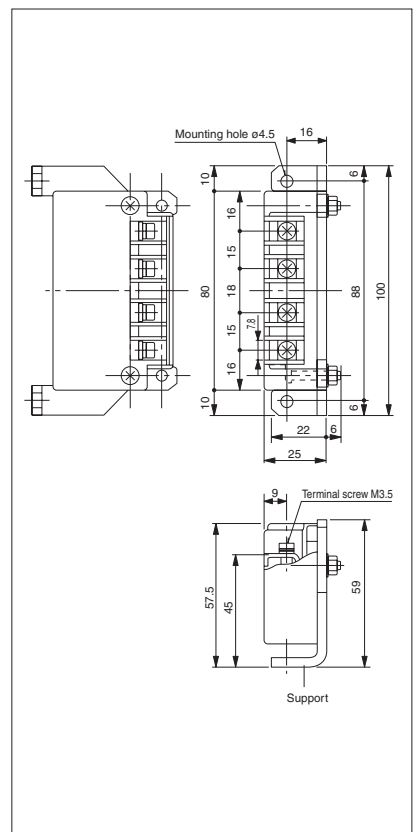
● Mounting dimensions and terminal arrangement of the OCR controller installed on the breaker



● PTA Characteristics



● Outline of the OCR controller installed external to the breaker



6

Accessories

Moulded Case Circuit Breakers

1 OCR for electronic breakers

(2) Optional OCR functions

■ Ground fault trip (GF)

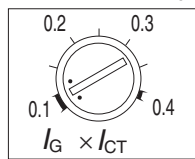
The ground fault trip pickup current is 10 to 40% of the CT rated current (I_{CT}).

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.

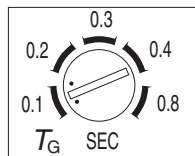
● GF Specifications

GF Pick-up current (A) (I_G)



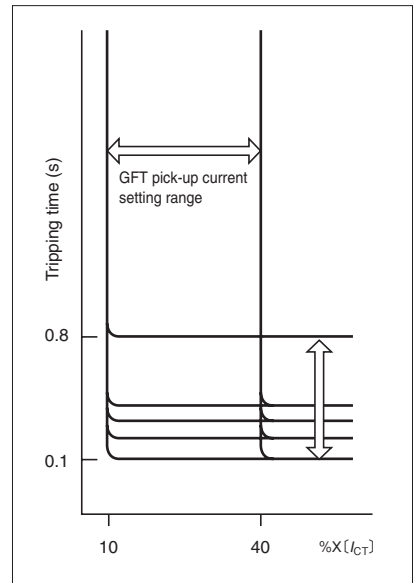
Continuously adjustable from 10 to 40% of the rated CT current [I_{CT}].
Setting tolerance $\pm 15\%$

GF 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 timedelay.

● GF characteristics

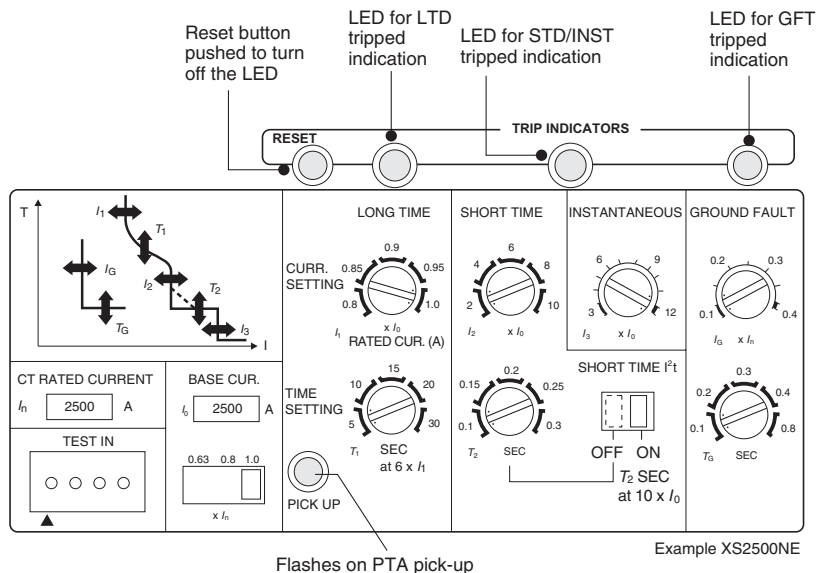


■ Trip indicators

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).

Trip indicator display



■ TNS-3 type OCR checker

You can use the OCR checker to easily check the OCR's long time-delay, short time-delay, instantaneous trip, ground fault trip, and preferential trip alarm functions in the field. For details, see Section 8.

1. Possible combinations

Moulded Case Circuit Breakers

E: Economical series
 S: Standard series
 H: High-fault series
 L: Current limiting series
 D: Switch disconnectors

TemBreak PRO						
Type	E160-SF, S160-SCF	E160-SF, E160-SJ				E250-SCF, E250-SCJ, E250-SF, E250-SJ
E						
S		S160-SCF, S160-SCJ, S160-SF, S160-SJ	P160F, P160N, P160H		P250F, P250N, P250H	
H				H125-NJ, H160-NJ, H250-NJ, H250-NE		
L				L125-NJ, L125-PJ, L160-NJ, L250-NJ		
D		S160-SN	P160D		P250D	S250-SN
Number of poles ①	2	3 ②	3 ②	3	3 ②	3 ②
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: For the four-pole type, see the column for the three-pole type.

②: For auxiliary switches or alarm switches, left side mounting has priority.

Moulded Case Circuit Breakers

E: Economical series
S: Standard series
H: High-fault series
L: Current limiting series
D: Switch disconnectors

TemBreak PRO				
Type	E	P400E, P630E		
	S	P400F, P400N, P400H, P630F, P630N, P630H	S800-CJ, S800-NJ, S800-NE, S800-RJ, S800-RE, S800-PJ, S800-PE, S1000-SE, S1000-NE	S1250-SE, S1250-NE, S1250-GE, S1600-SE, S1600-NE
	H	H400-NE	P400S, P630S	H800-NE
	L	L400-NE, L400-PE		L800-NE, L800-PE
	D		P400D, P630D	S800-NN, S1000-NN S1250-NN, S1600-NN
Number of poles ①				
3				
Combinations of accessories	AX			
	AL			
	SH			
	UV			
	AX AL			
	AX SH			
	AX UV			
	AL SH			
	AL UV			
	AX AL SH			
	AX AL UV			
	AX SH UV			
	AX AL SH UV			
	AX SH UV			
	AX AL SH UV			

Notes:

- ①: For the four-pole type, see the column for the three-pole type.
②: For auxiliary switches or alarm switches, left side mounting has priority.

Moulded Case Circuit Breakers

S: Standard series
N: Non-automatic series

TemBreak PRO	
Type	S XS2000NE, XS2500NE, XS3200NE
	N XS2000NN, XS2500NN, XS3200NN
Number of poles ①	
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
	AX SH UV
	AX AL SH UV
	AX SH UV
	AX AL SH UV

Notes:

- ①: For the four-pole type, see the column for the three-pole type.
③: A breaker with AC UVT is provided with an external UVT controller.

2. 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)			DC(V)		
	Voltage (V)	Current (A)		Voltage (V)	Current (A)		Voltage (V)	Current (A)	Minimum load
		Resistive load	Inductive load		Resistive load	Inductive load		Resistive load	
E160-SF/SJ, E250-SCF/SCJ/SF/SJ, S160-SCF/SCJ/SF/SJ/SN, S250-SN, P160F/N/H/D, P250F/N/H/D, P400E/F/N/H/S/D, P630E/F/N/H/S/D, S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN, S1250-SE/NE/GE/NN, S1600-SE/NE/NN, H125-NJ, H160-NJ, H250-NJ/NE, H400-NE, H800-NE L125-NJ, L125-PJ, L160-NJ, L250-NJ, L400-NE, L400-PE, L800-NE, L800-PE	480	—	—	250	—	—	DC15V 100mA	30	0.1
	250	3	2	125	0.4	0.05			
	125	3	2	30	3	2			
XS2000NE/NN, XS2500NE/NN, XS3200NE/NN	480	3	2	250	0.3	0.3	DC5V 160mA DC30V 26.7mA	30	0.1
	250	5	5	125	0.6	0.6			
	125	5	5	30	5	4			

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

Remarks: The inductive load means power factor of no smaller than 0.4 for AC and time constant of no larger than 7 ms for DC.

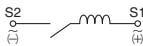
(2) Operation of AX and AL

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"

3. Shunt trip device (SH)

(1) Ratings of SHT

Type of breaker	Peak exciting current, (A)								Connection diagrams and terminal numbers
Moulded Case Circuit Breakers	Rated voltage	AC (V)			DC (V)				
		100-120	200-240	380-450	24	48	100-120	200-240	
E160-SF/SJ, E250-SCF/SCJ/SF/SJ, S160-SCF/SCJ/SF/SJ/SN, S250-SN, P160F/N/H/D, P250F/N/H/D, P400E/F/N/H/S/D, P630E/F/N/H/S/D, S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN, S1250-SE/NE/GE/NN, S1600-SE/NE/NN		0.016	0.016	0.0062	0.124	0.032	0.014	0.012	 Without anti-burn switch
H125-NJ, H160-NJ, H250-NJ/NE, H400-NE, H800-NE L125-NJ, L125-PJ, L160-NJ, L250-NJ, L400-NE, L400-PE, L800-NE, L800-PE		0.018	0.017	0.0068	0.124	0.032	0.014	0.012	

Type of breaker	Peak exciting current, (A) (60Hz AC)								Connection diagrams and terminal numbers
Moulded Case Circuit Breakers	Rated voltage	AC(V)			DC(V)				
		100-115	200-240	380-480	24	48	100-115	200-230	
XS2000NE, XS2000NN, XS2500NE, XS2500NN, XS3200NE, XS3200NN		1.1	0.4	0.93	2.52	1.55	0.67	0.35	 With anti-burn switch

Remarks:

- (1) The permissible voltage range is from 70% to 110% of the rated voltage.
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.

4. Undervoltage trip device (UV)

(1) Ratings of UVT with Inst

Type of breaker	Power supply capacity, (VA)			Exciting current, (mA)		
	Voltage (V)	AC(V)			DC(V)	
		100-120	200-240	380-450	24	100-120 200-240
E160-SF/SJ, E250-SCF/SCJ/SF/SJ, S160-SCF/SCJ/SF/SJ/SN, S250-SN, P160F/N/H/D, P250F/N/H/D, P400E/F/N/H/S/D, P630E/F/N/H/S/D		1.3	1.1	2.0	22	9 3.7
H125-NJ, H160-NJ, H250-NJ/NE, H400-NE, L400-NE, L400-PE, L125-NJ, L125-PJ, L160-NJ, L250-NJ		1.5	1.3	2.6	29	9.6 10

Remarks

- (1) Tripping voltage is 70 to 35% of the rated voltage. Resettable voltage is 85% or less of the rated voltage.
 (2) Operating time is below 50ms. (The time between no voltage and the main contact opening.)

Type of breaker	Power supply capacity, (VA)						Exciting current, (mA)		
	Voltage (V)	AC(V)						DC(V)	
		100-110	115-120	200-220	230-240	380-415	440-450	24	100-120 200-240
S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN, S1250-SE/NE/GE/NN, S1600-SE/NE/NN, H800-NE, L800-NE, L800-PE		1.3	1.5	1.1	1.3	2.2	2.6	29	9.6 10

Remarks

- (1) Tripping voltage is 70 to 35% of the rated voltage. Resettable voltage is 85% or less of the rated voltage.
 (2) Operating time is below 50ms. (The time between no voltage and the main contact opening.)

(2) Instantaneous UVT (with UVT controller)

Type of breaker	Power supply capacity, (VA) ②				Exciting current, (mA) ①		
	Voltage (V)	AC(V)			DC(V)		
		100-120	200-240	380-450	24	100-115	200-240
XS2000NE, XS2500NE, XS3200NE XS2000NN, XS2500NN, XS3200NN		5 or more	5 or more	5 or more	22.7	6.0	—

Note: ①: No UVT controller is required. Note: ②: Equipped with the UVT controller.

Remarks:

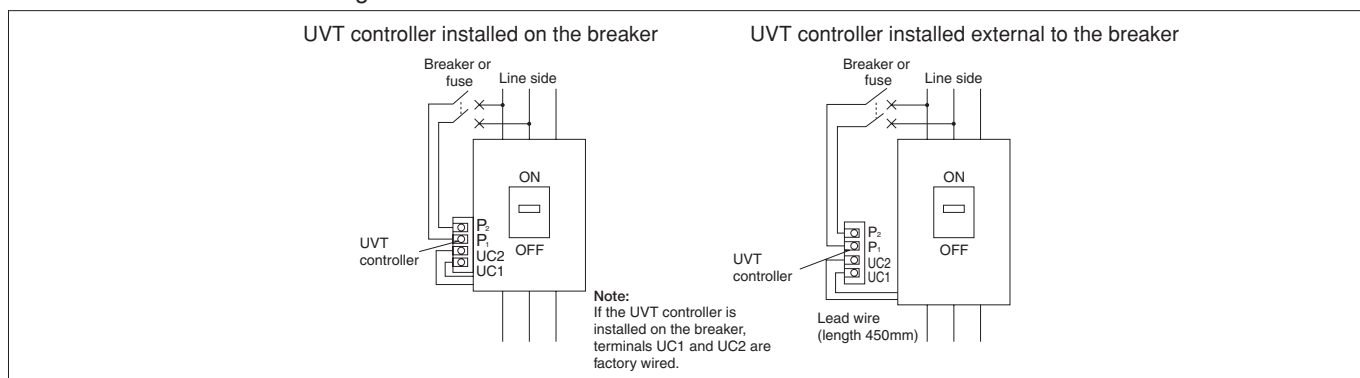
(1) Tripping voltage is 70 to 35% of the rated voltage. Resettable voltage is 85% or less of the rated voltage.

(2) When the breaker is in OFF position and becomes no control voltage, the UVT may trip or maintain OFF position the breakers.

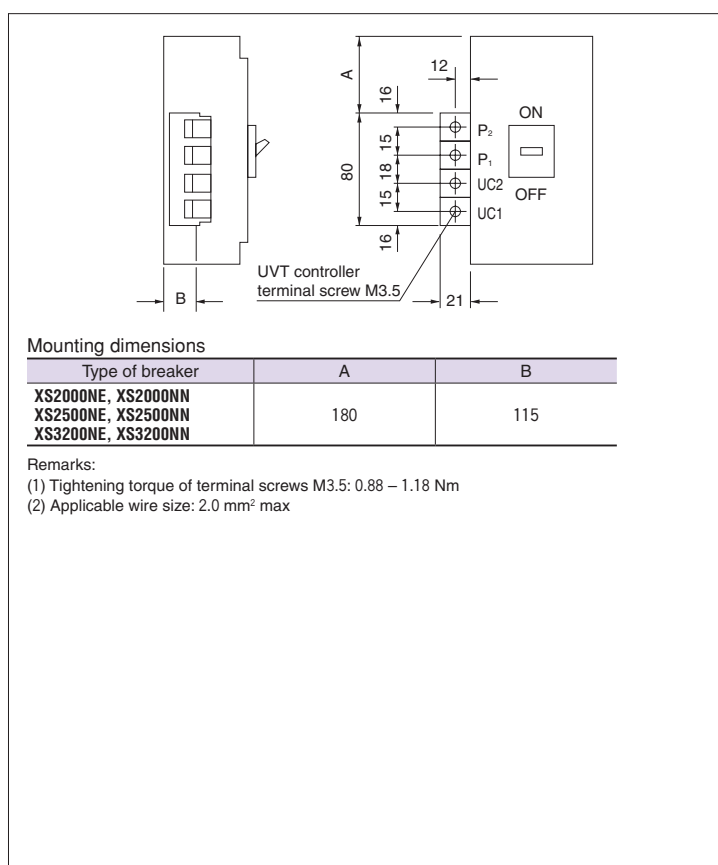
Please reset the breaker before turning the handle to ON position in either case.

A breaker equipped with the AC UVT needs a UVT controller (type XCU1S). The UVT controller is installed on the breaker by default. Separate installation of the controller is also available on request. Also, a UVT controller (XCU1D type) in the same shape with a time delay of less than 500 ms is available on request.

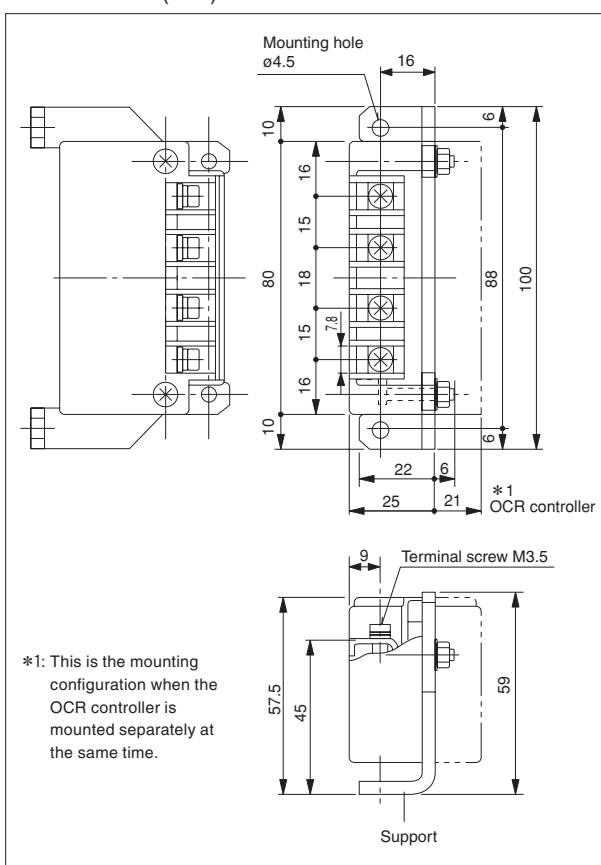
• UVT controller connection diagram



• Mounting dimensions and terminal arrangement of the UVT controller installed on the breaker



• Outline of the UVT controller installed external to the breaker (mm)



4. Undervoltage trip device (UV)

(3) Time delay type UVT (with UVT controller)

For the time-delay type UVT, the UVT controller is mounted on the circuit breaker body.

UVT controllers are available with 500 ± 300 ms operating times.

Applicable breakers	Power supply capacity, (VA) ②							Exciting current, (mA) ①				
	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
E160-SF/SJ, E250-SCF/SCJ/SF/SJ, S160-SCF/SCJ/SF/SJ/SN, S250-SN, P160F/N/H/D, P250F/N/H/D, P400E/F/N/H/S/D, P630E/F/N/H/S/D	1.1	1.3	0.9	1.1	1.7	2.0	22	8.1	8.9	3.4	3.7	
H125-NJ, H160-NJ, H250-NJ/NE, H400-NE, L400-NE, L400-PE, L125-NJ, L125-PJ, L160-NJ, L250-NJ, S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN, S1250-SE/NE/GE/NN, S1600-SE/NE/NN, H800-NE, L800-NE, L800-PE	1.3	1.5	1.1	1.3	2.2	2.6	29	8.8	9.6	9.2	10	

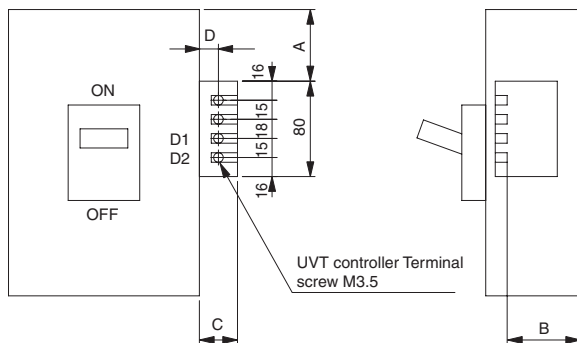
Notes: ①: In case the UV for DC voltage, no UVT controller is required.

②: Equipped with the UVT controller.

• Mounting dimensions and terminal arrangement of the UVT controller installed on the breaker

Applicable breakers	A(mm)	B(mm)	C(mm)	D(mm)
E160-SF/SJ, S160-SCF/SCJ/SF/SJ/SN	34	55	24	15
P160F/N/H/D	33	55	24	15
E250-SCF/SCJ/SF/SJ, S250-SN	49.5	55	24	15
P250F/N/H/D	50.5	55	24	15
H125-NJ, H160-NJ, H250-NJ/NE, L125-NJ, L125-PJ, L160-NJ, L250-NJ	33.5	79	25.2	16.2
P400E/F/N/H/S/D, P630E/F/N/H/S/D	102	85	24	15
H400-NE, L400-NE, L400-PE	71	111	25.2	16.2
S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN	62.5	74	25.2	16.2
H800-NE, L800-NE, L800-PE	62.5	111	25.2	16.2

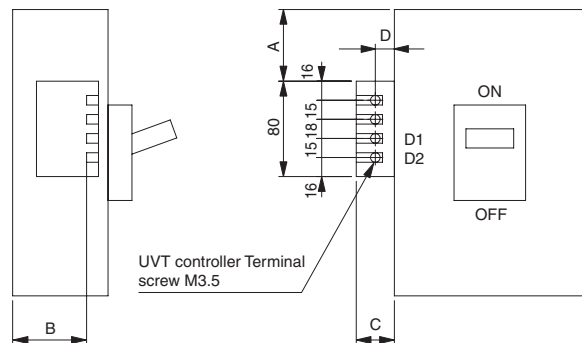
• The UVT controller is installed in the right side of the breaker



Notes: 1) Tightening torque of terminal screws M3.5: 0.9 – 1.2 Nm
2) Applicable lead wire size: 2.0 mm² max

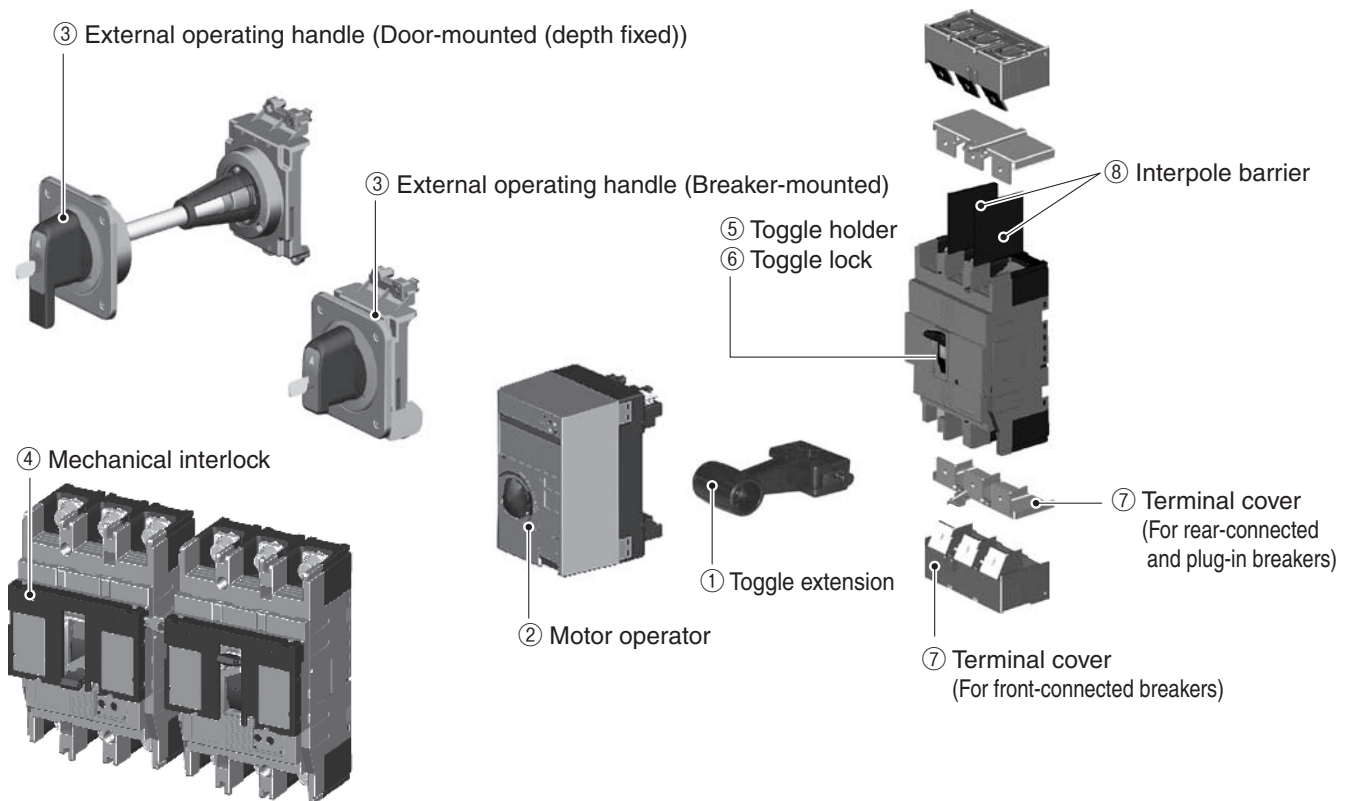
Applicable breakers	A(mm)	B(mm)	C(mm)	D(mm)
S1250-SE/NE/GE/NN	114	72	21	12
S1600-SE/NE/NN	114	92	21	12

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



Notes: 1) Tightening torque of terminal screws M3.5: 0.9 – 1.2 Nm
2) Applicable lead wire size: 2.0 mm² max

1. Overview

① Toggle extension _____ **HA**

Lessens the force require to close, open or reset the breaker.

② Motor operator _____ **MC**

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

③ External operating handle

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.

Door-mounted (depth fixed) _____ **HE**

④ Mechanical interlock

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

Slide type _____ **MS**Rear-connected type _____ **MB**Link type _____ **ML**Wire type _____ **MW**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

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 shortcircuit 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 _____ **DA**

Allows the breaker to be mounted on DIN rails.

2. Toggle extension (HA)

Reduces the force of ON, OFF, and RESET operations.

Outline dimensions

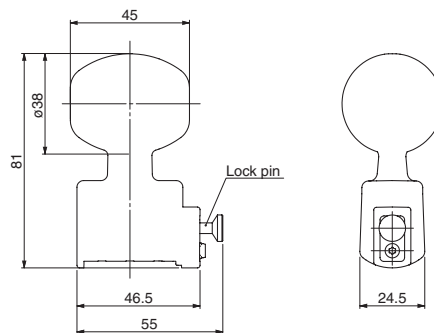
Frame size (A)	Type of breaker	Toggle extension Order code
400	P400E/F/N/H/S/D, H400-NE, L400-NE, L400-PE	T2HA40L
630	P630E/F/N/H/S/DE	

Note: Optional. Specify when ordering.

When used in conjunction with mechanical interlocks, care must be taken in the mounting direction.

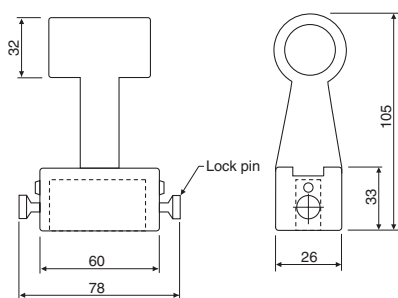
For more details please refer to the instruction manual.

T2HA40L

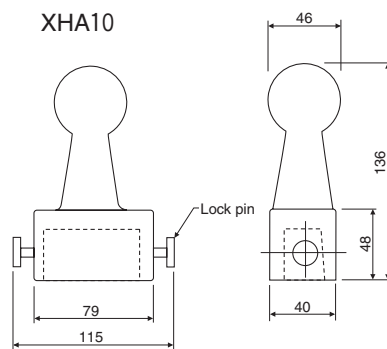


Outline dimensions

T2HA80



XHA10

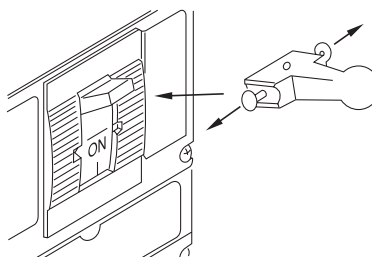


Frame size (A)	Type of breaker		Toggle extension Order code
800	S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, H800-NE, L800-NE, L800-PE	①	T2HA80
1000	S1000-SE/NE/NN		
1250	S1250-SE/NE/GE/NN	②	
1600	S1600-SE/NE/NN		XHA10
2000	XS2000NE/NN		
2500	XS2500NE/NN	③	
3200	XS3200NE/NN		

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 side lock pins and hold while removing.

3. Motor operators (MC)

(1) T2MC/TPMC motor operators

Features

★ Installation and removal ease

Motor driven type: Simply rotate the two fixing levers to allow the motor operator to be installed on or removed from the circuit breaker. Spring charged type: 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

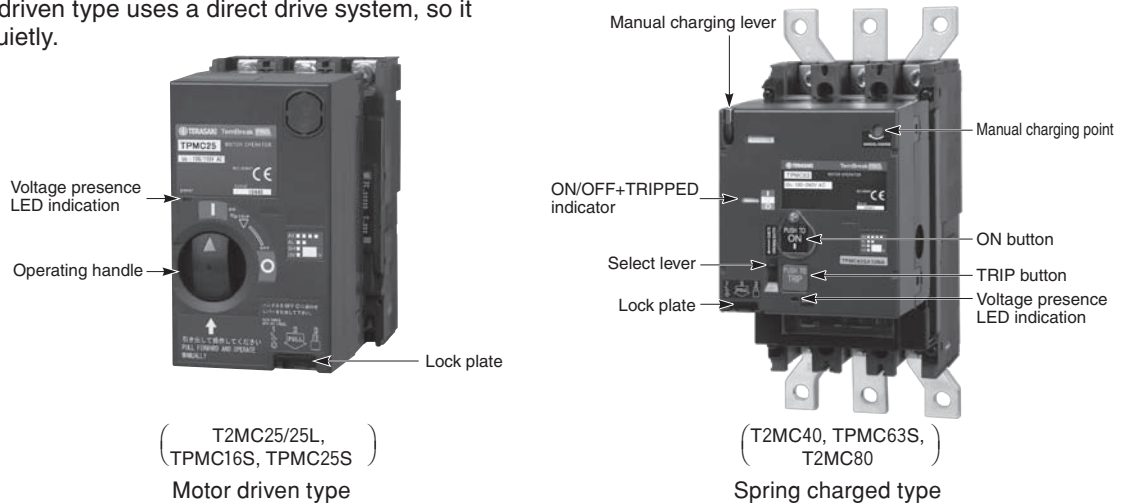
The motor driven type uses a direct drive system, so it operates quietly.

★ “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

The spring charged type is small and the OCR part of the circuit breaker is not hidden. This means that it is not necessary to be removed when changing the circuit breaker settings.



Ratings and Specifications Motor driven type

		T2MC25	T2MC25L	TPMC16S	TPMC25S
Type of breaker	E		E250-SCF/SCJ/SF/SJ		
	S			P160F/N/H	P250F/N/H
	H	H125-NJ, H160-NJ, H250-NJ/NE			
	L	L125-NJ, L125-PJ, L160-NJ, L250-NJ			
	D		S250-SN	P160D	P250D
Rated operational voltage ①		● 100-110V AC ● 200-220V AC ● 230-240V AC ● 24V DC ● 48V DC ● 100-110V DC ● 200-220V DC		● AC100-110V ● AC200-220V ● AC230-240V ● DC24V ● DC48V ● DC100-110V ● DC200-220V	
Steady-state current / Starting current (Peak value) (A) ②	100-110V AC	4.5/8		3.6/8.7	
	200-220V AC	4/8		3.6/6.6	
	230-240V AC	3.5/7		3.4/6	
	24V DC	18/26		14/27	
	48V DC	12/18		12/17	
	100-110V DC	2.2/6		3.4/7.6	
	200-220V DC	2.2/5.5		4.2/5.9	
Operation method		Motor driven (direct drive system)			
Operating time, (s)	ON	0.1 ③			
	OFF/RESET	0.1 ③④			
Operating switch ratings		100V 0.1A (Open voltage/current: 44V/4mA) ⑤			
Power supply required		300VA or higher			
Dielectric withstand voltage (for one minute)		1500V AC (1000V AC for 24/48V DC)			
Weight		1.4kg			
Colour of cover		Grey Blue			

See next page for the notes.

3. Motor operators (MC)

Ratings and Specifications

Spring charged type

		T2MC40	TPMC63S	T2MC80
Type of breaker	E			
	S		P400E/F/N/H, P630E/F/N/H	S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN
	H	H400-NE	P400S, P630S	H800-NE
	L	L400-NE, L400-PE		L800-NE, L800-PE
	D		P400D, P630D	
Rated operational voltage ①		● 100-240V AC ● 24-48V DC ● 100-120V DC	● 100-240V AC ● 24-48V DC ● 100-120V DC	● 100-240V AC ● 24-48V DC ● 100-120V DC
Steady-state current / Starting current (Peak value) (A) ②	100-110V AC	—/4.1 (ON) 1.3/3.8 (OFF,RESET)	—/4.1 (ON) 1.7/4.2 (OFF,RESET)	—/4.1 (ON) 1.7/3.5 (OFF,RESET)
	200-220V AC	—/4.0 (ON) 0.9/3.8 (OFF,RESET)	—/4.0 (ON) 1.4/3.9 (OFF,RESET)	—/4.0 (ON) 1.3/3.5 (OFF,RESET)
	230-240V AC	—/4.0 (ON) 0.9/3.8 (OFF,RESET)	—/4.0 (ON) 1.4/3.9 (OFF,RESET)	—/4.0 (ON) 1.3/3.5 (OFF,RESET)
	24V DC	—/12 (ON) 4.3/9.8 (OFF,RESET)	—/12 (ON) 6.7/15.3 (OFF,RESET)	—/12 (ON) 6.0/11.5 (OFF,RESET)
	48V DC	—/12 (ON) 4.3/9.8 (OFF,RESET)	—/12 (ON) 3.5/7.4 (OFF,RESET)	—/12 (ON) 3.2/6.5 (OFF,RESET)
	100-110V DC	—/4.1 (ON) 2.0/5.2 (OFF,RESET)	—/4.1 (ON) 1.4/4.4 (OFF,RESET)	—/4.1 (ON) 1.3/3.5 (OFF,RESET)
	200-220V DC	—	—	—
Operation method		Spring charged		
Operating time, (s)	ON	0.1 ③		
	OFF/RESET	1.5 ③④		
Operating switch ratings		100V 0.1A (Open voltage/current: 48V/1mA)		
Power supply required		300VA or higher		
Dielectric withstand voltage (for one minute)		1500V AC (1000V AC for 24/48V DC)		
Weight		3.5kg		
Colour of cover		Grey Blue		

- Notes:**
- ① : Permissible operating range is 85 to 110%. A power transformer is available as option for 380V AC or 400-460V AC.
- 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. Loss of the control power in this operating time may cause the motor operator to fail to work.
- 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 24V DC the open voltage will be 22V DC.

Motorized operation

The motor operator has an input-signal self-hold circuit. 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 1: 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.

Note 2: Do not use an alarm switch to reset breakers. This option resets the tripped breaker automatically, regardless of the cause of the tripping.

Manual operation

Motor driven type: Pull the manual operating handle out to turn it ON and OFF. Rotating the handle anticlockwise turns ON the breaker and clockwise turns OFF or resets the breaker.

Spring charged type: Switch to manual operation from motorized operation using the select lever. Use the manual spring charging handle to charge the spring and press the ON or TRIP button to perform manual operation. Spring charged type: When the TRIP button is pressed while the control power is supplied, the circuit breaker turns OFF automatically, and if equipped with an alarm switch, it provides an output signal because the MCCB trips once. Press the TRIP button all the way in. Pressing the TRIP button halfway causes the breaker to go off without tripping, resulting in no alarm signal delivered even if the breaker is equipped with an alarm switch.

Breakers position in tripped state

Breakers position when the breaker has tripped differs depending on the motor operator being of standard type or being equipped with the auto reset feature (optional), as shown in the table below:

Motor driven type

Cause of trip	Breakers position in tripped state	
	Standard type	With auto reset feature
Manually tripped	TRIP	○ (OFF) *
SHT/UVT		
Overcurrent		

* : The motor operator automatically provides OFF (reset) operation to the breaker.

Spring charged type

Cause of trip	Breakers position in tripped state	
	Standard type	With auto reset feature
Manually tripped	○ (OFF) *	○ (OFF) *
SHT/UVT	TRIP	
Overcurrent		

* : The motor operator automatically provides OFF (reset) operation to the breaker.

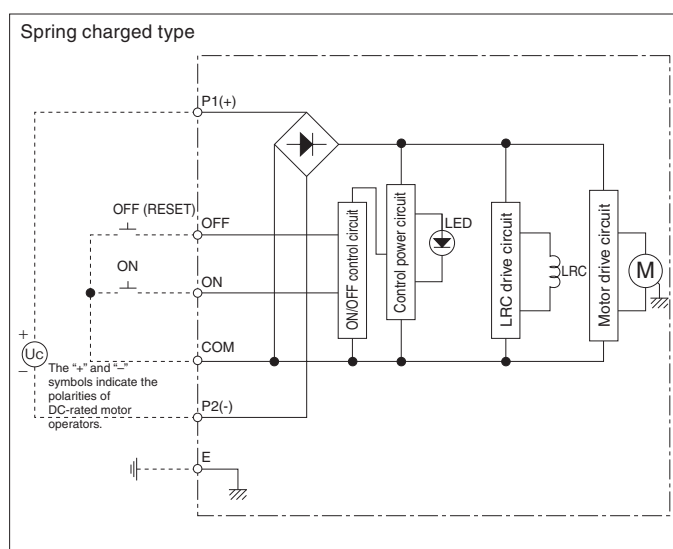
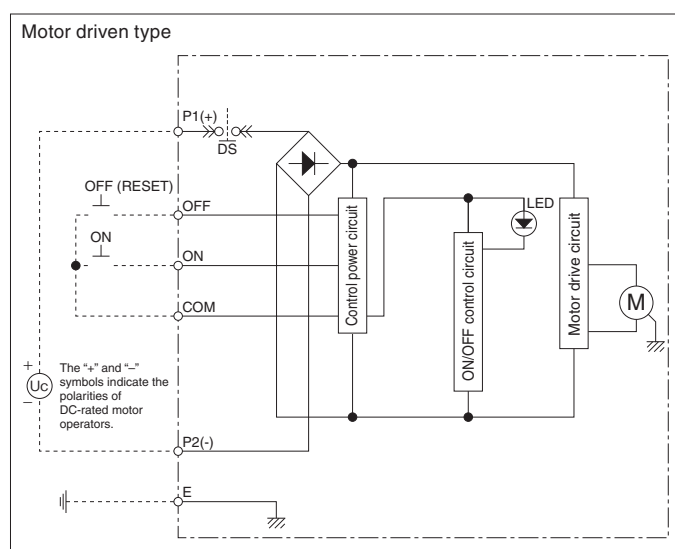
Table 1 Electrical interlock cables

Interlock cables Order codes	Length	Remarks
T2MM25L05	500mm	An electrical interlock is adopted between T2MC25/25L, TPMC16S, and TPMC25S types.
T2MM25L15	1500mm	
T2MM40L06	600mm	An electrical interlock is adopted between T2MC40, T2MC80, and TPMC63S types.
T2MM40L21	2100mm	
T2MM40S06	600mm	An electrical interlock is adopted between T2MC40 (or TPMC63S, T2MC80) and T2MC25 types (or TPMC16S, TPMC25S types).
T2MM40S21	2100mm	

Operation precautions

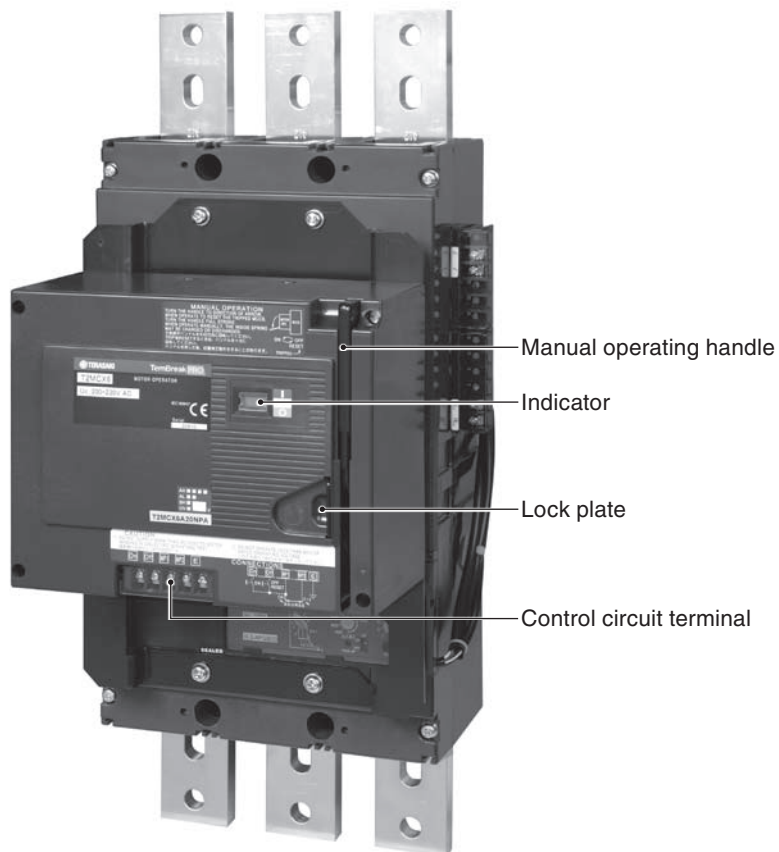
1. Ensure that the actual operation voltage ranges from 85% to 110% of the rated one.
2. Use operation switches whose ratings and power capacity is as specified in the "Ratings and Specifications" table on the previous page.
3. Ensure an operating time of 50 msec or more when operating switches to turn on/off the breaker. A shorter operating time may result in failure in operating the breaker. In such a case, repeat the operation.
4. Do not continuously apply ON/OFF operating signals. ON/OFF signals must be separated by 0.3 sec or more. With spring charged type, OFF and RESET operations must be 1.5 sec or more apart.
5. With motor driven type, do not connect alarm switches (AL) to the control circuit (OFF, ON or COM terminals). Doing so may cause the motor operator to fail to work.
6. If the motor operator is used in conjunction with a shunt trip device (SH), ensure that voltage supply to the (SH) is shut off after the reset operation ends.
7. To operate multiple motor operators in batch, do not directly connect their control terminals in series, but through a separate relay for each. Otherwise, sneak circuits may form and cause the motor operators to fail to work.
8. 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.
9. 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.

Control circuit diagrams of motor operators



3. Motor operators (MC)

(3) T2MC motor operators



(T2MCX6)

Spring charged type

Ratings and Specifications

			T2MCX6
Applicable breakers			S1250-SE/NE/GE/NN, S1600-SE/NE/NN
Rated operational voltage ①			● AC100-115V ● AC200-230V ● DC100-110V ● DC24V
Steady-state current / Starting current (Peak value) (A) ②	100-115V AC	ON	—/3.1
		OFF, RESET	1.8/6.0
	200-230V AC	ON	—/1.2
		OFF, RESET	1.0/3.2
	100-110V DC	ON	—/0.8
		OFF, RESET	1.1/4.2
	24V DC	ON	—/4.5
		OFF, RESET	4.0/12.0
Operation method			Spring charged
Operating time, (s)	ON (Max)		0.06 ③
	OFF/RESET		3 ③
Power supply required			300VA
Dielectric withstand voltage (for one minute)			AC1500V ④
Weight			6.4kg
Colour of cover			Grey Blue

Notes:

- ① : Permissible operating range is 85 to 110%. A power transformer is available as option for 380V AC or 400-460V AC.
- 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. Loss of the control power in this operating time may cause the motor operator to fail to work.
- ④ : Dielectric withstand voltage for 24V DC motor is 500V AC .

Features

★ Clear status indication

Colour 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

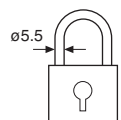
When the closing signal is applied, TRIP-RESET-ON cycles are not repeated even though the cause of tripping is in the breaker.

★ Ease of manual ON-OFF operation

It turns ON and OFF with one stroke using manual operating handle.

★ “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 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 manual operating handle turns the breaker ON and OFF/RESET alternately.

The handle returns to the original position when released.

* With auto-charge/discharge feature:

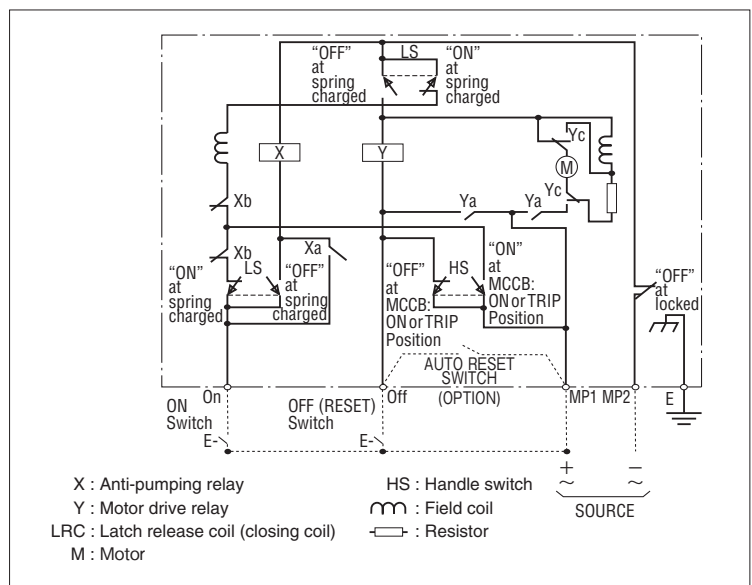
When manual ON operation is performed while the control power is applied, the handle switch (HS) operates to discharge the closing spring.

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



Operation Precautions

- Ensure that the actual operation voltage ranges from 85% to 110% of the rated one.
- 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.
- When conducting the dielectric withstand voltage test, apply voltage between the control terminal group and ground. Ensure that the test voltage does not exceed 1500V AC (500V AC if the rated operation voltage is 24V DC).
- 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.
- 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.
- The control power lost at the breaker charge process, and afterwards the control power is recovered, the closing spring is no more charged. Unusually the breaker reopen a charge depending on the handle position of the breaker.

4. External operating handles

(1) Breaker-mounted (field installable small type) (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

Types

T2HB16L

TPHB16S

T2HB25L

TPHB25S



Mounting instructions

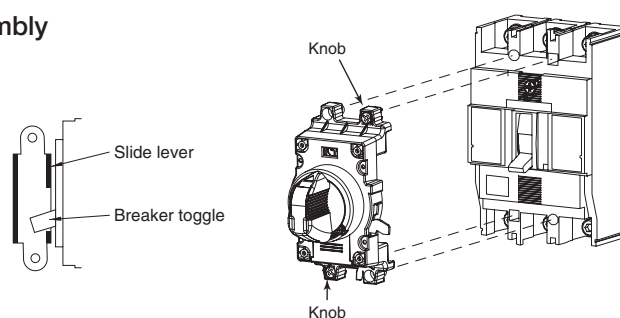
The external operating handle has not been mounted on the breakers.

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

[1] Mounting of external operating handle assembly

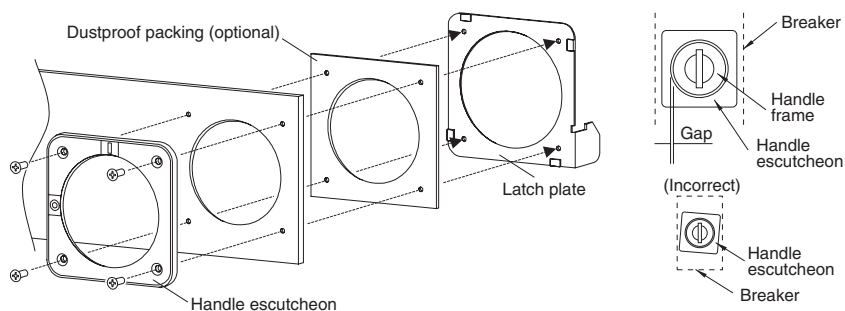
Install the circuit breakers and handles as follows.

- 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. Rotate two knobs 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 (I) and OFF (O) indication of the external operating handle can be re-oriented in steps of 90 degrees with respect to the operating mechanism.

This allows the indication position to remain the same whether the breaker is mounted vertically (right side up or upside down) or horizontally (on its left side or on its right side).

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 position to open the panel door.

(2) OFF Open

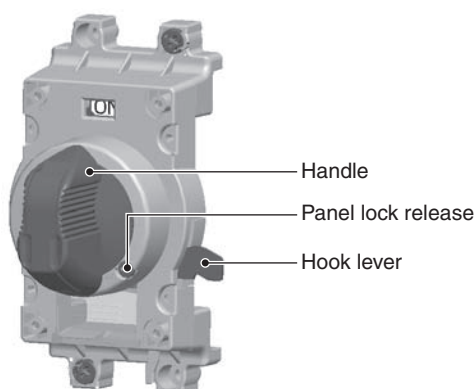
The handle is turned to the OFF position to open the panel door.

• Panel lock release knob (Standard)

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.

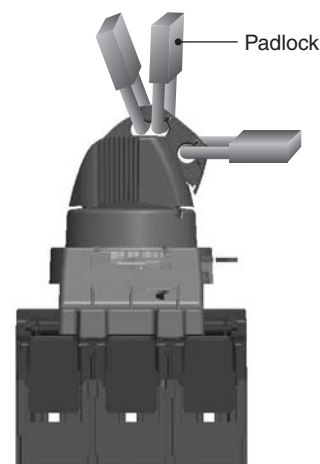
Padlocks are not supplied.

Up to three padlocks can be installed.



Padlock dimensions (mm)

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



■ Protection degree (IEC 60529)

Optional dust-proof gaskets may be used to protect against dust.

IP30	Standard specification
IP50	Optional, with a dust proof packing
IP55	Special specification ①

Notes ① : For the depth of switchboard, take account of thickness of the packing.
See the Operating Instructions packaged with the product.

■ To be stated when ordering

Order code T2HB16L U R 3 B N P

Type of external operating handle	Breaker mounting direction	Panel lock	Protection degree	Colour	Padlock	Series
T2HB16L T2HB25L	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 (Grey Blue base) R : Red handle (Yellow base)	N : Lock in OFF	P : PRO Series ①
TPHB16S TPHB25S						—

Note ① : For T2HB, specify "P". Do not specify anything in the case of TPHB (blank).

4. External operating handles

T2HB16L

Applicable breaker types

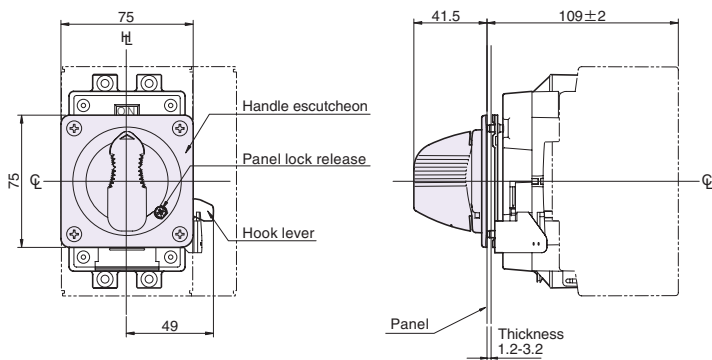
E160-SF/SJ,

S160-SCF/SCJ/SF/SJ/SN

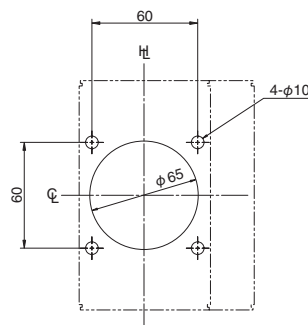
HL : Handle Frame Centre Line

CL : Handle Centre Line

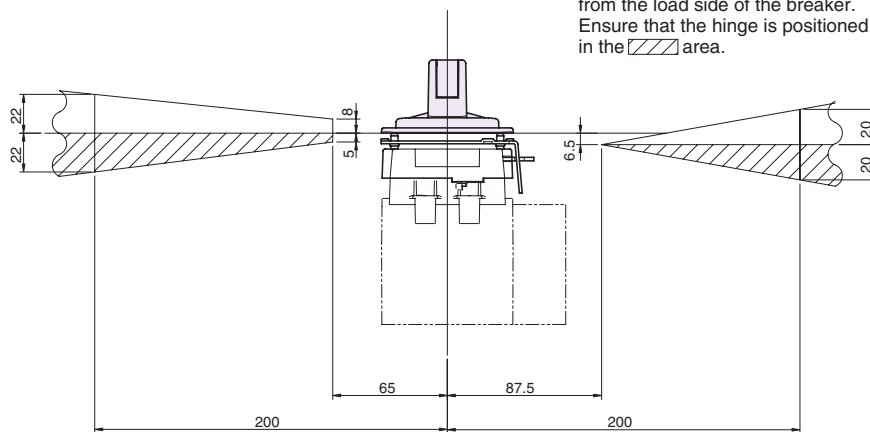
• Outline dimensions



• 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.



TPHB16S

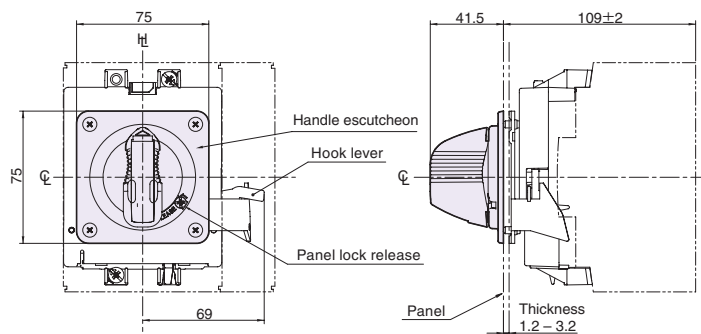
Applicable breaker types

P160F/N/H/D

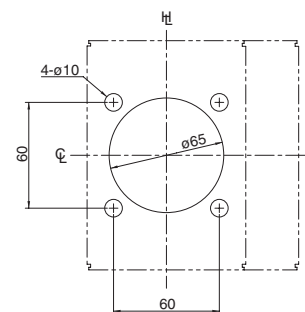
HL : Handle Frame Centre Line

CL : Handle Centre Line

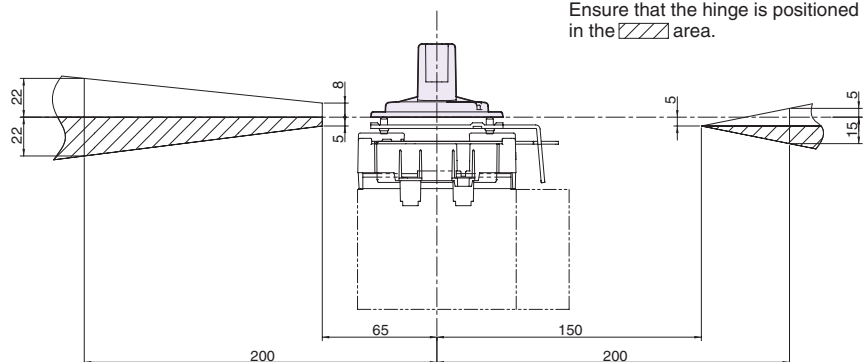
• Outline dimensions



• 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.



4. External operating handles

T2HB25L

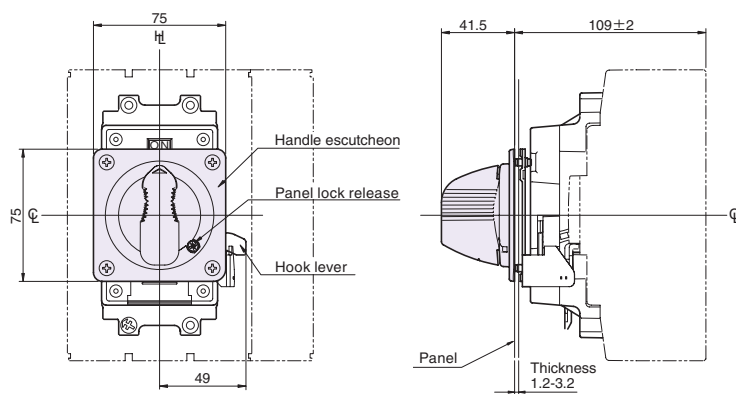
Applicable breaker types

E250-SCF/SCJ/SF/SJ,
S250-SN

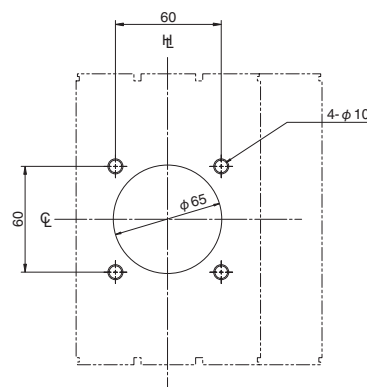
HL : Handle Frame Centre Line

CL : Handle Centre Line

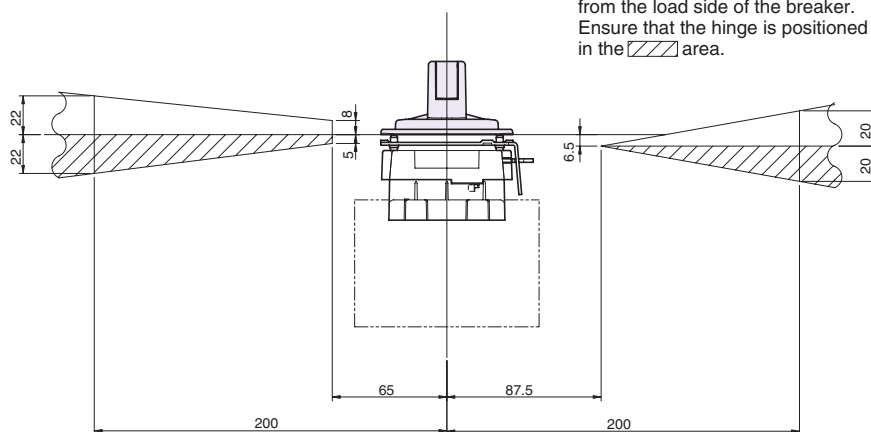
• Outline dimensions



• 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.



TPHB25S

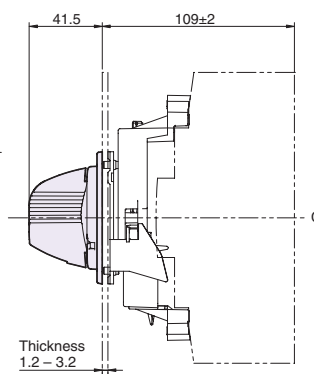
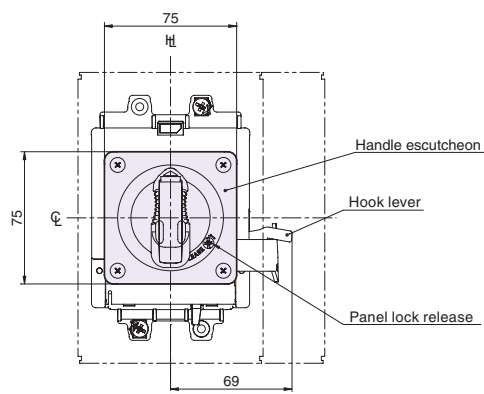
Applicable breaker types

P250F/N/H/D

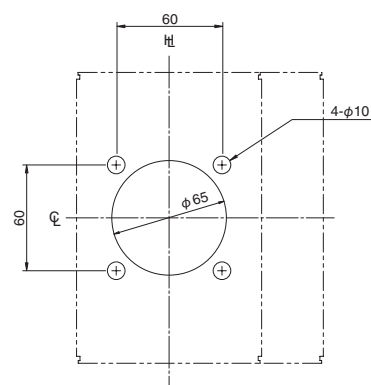
HL : Handle Frame Centre Line

CL : Handle Centre Line

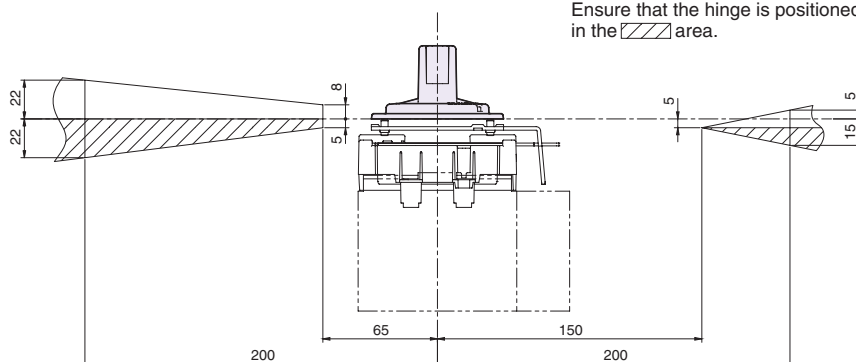
• Outline dimensions



• 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.



4. External operating handles

(2) Breaker-mounted (field installable standard type) (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

Types

T2HB25

T2HB40

TPHB63S

T2HB80



Mounting instructions

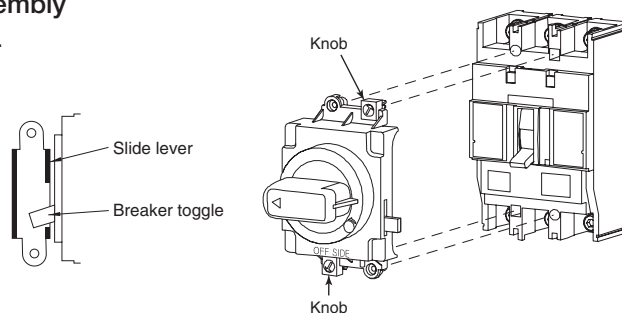
The external operating handle has not been mounted on the breakers.

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

[1] Mounting of external operating handle assembly

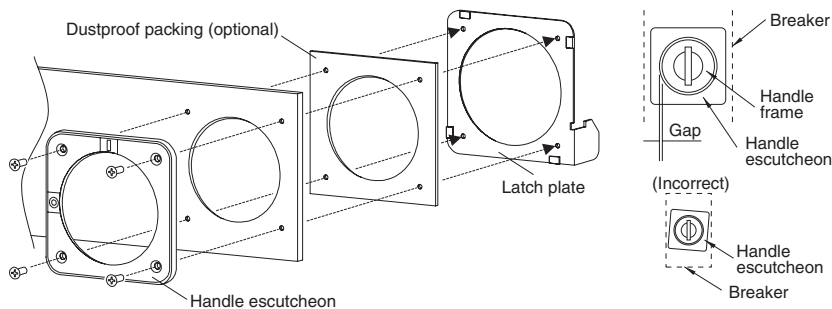
Install the circuit breakers and handles as follows.

- 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. Rotate two knobs to secure the handle assembly.
- For T2HB40, TPHB63S and T2HB80, tighten the bolts 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 (I) and OFF (O) indication of the external operating handle can be re-oriented in steps of 90 degrees with respect to the operating mechanism.

This allows the indication position to remain the same whether the breaker is mounted vertically (right side up or upside down) or horizontally (on its left side or on its right side).

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 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 (Standard)

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.

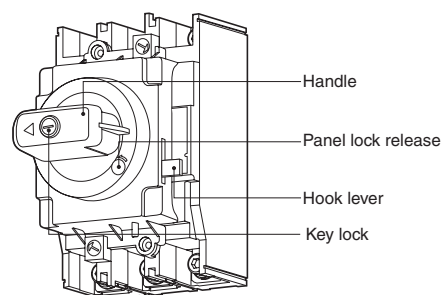


Padlock dimensions (mm)

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

• Key lock (Optional)

Key locking is possible in the OFF position.



■ Protection degree (IEC 60529)

Optional dust-proof gaskets may be used to protect against dust.

IP30	Standard specification
IP50	Optional, with a dust proof packing
IP55	Special specification ①

Notes ① : For the depth of switchboard, take account of thickness of the packing.
See the Operating Instructions packaged with the product.

■ To be stated when ordering

Order code T2HB25 U R 3 B N P

Type of external operating handle	Breaker mounting direction	Panel lock	Protection degree	Colour	Key lock / Padlock	Series
T2HB25 T2HB40 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 (Grey Blue base) R : Red handle (Yellow base)	N : with padlock (lock in OFF) K : with key lock and padlock (lock in OFF)	P : PRO Series ①
TPHB63S						—

Note ① : For T2HB, specify "P". Do not specify anything in the case of TPHB (blank).

Outline dimensions

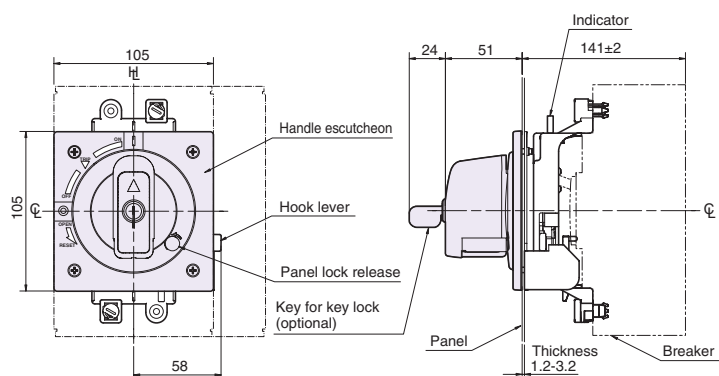
T2HB25

Applicable breaker types

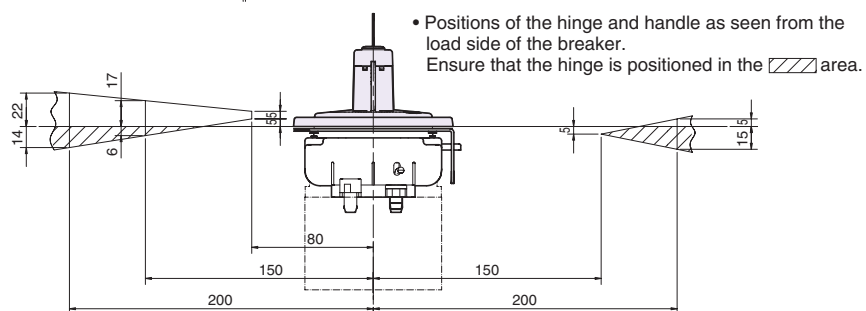
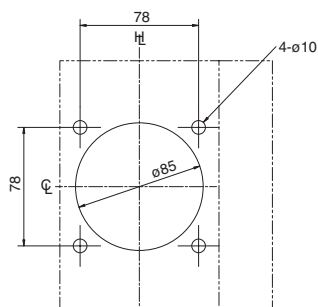
H125-NJ, H160-NJ, H250-NJ/NE,
L125-NJ, L125-PJ, L160-NJ, L250-NJ

HL : Handle Frame Centre Line

CL : Handle Centre Line



Panel cutout dimensions



Outline dimensions

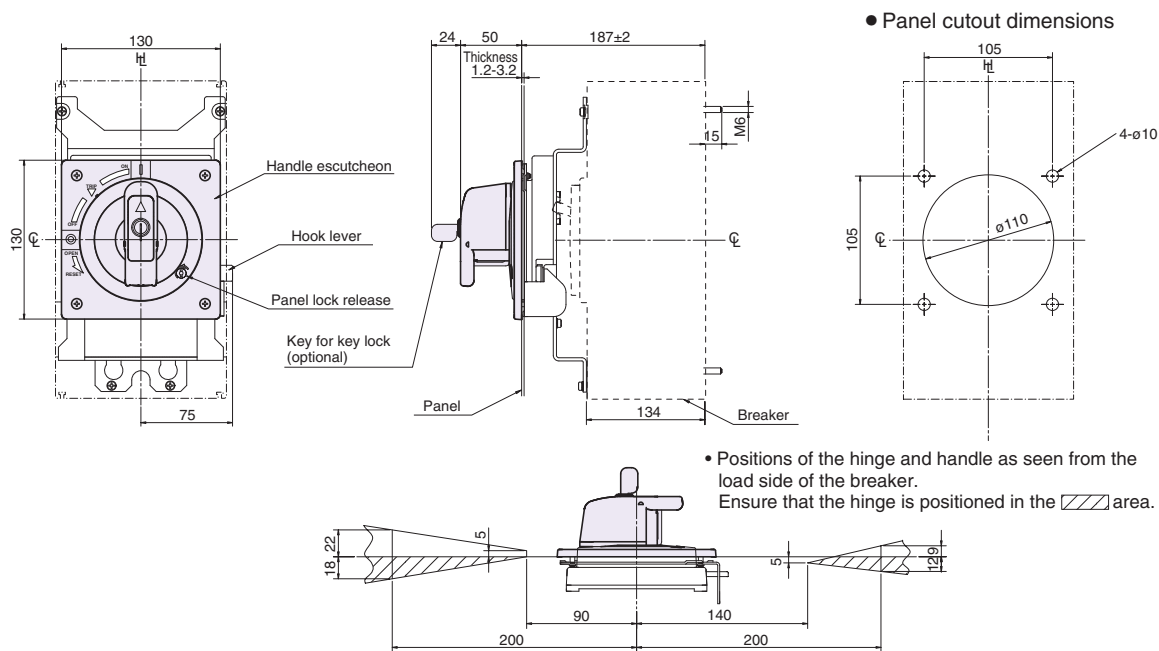
T2HB40

Applicable breaker types

H400-NE,
L400-NE, L400-PE

HL : Handle Frame Centre Line

CL : Handle Centre Line



Outline dimensions

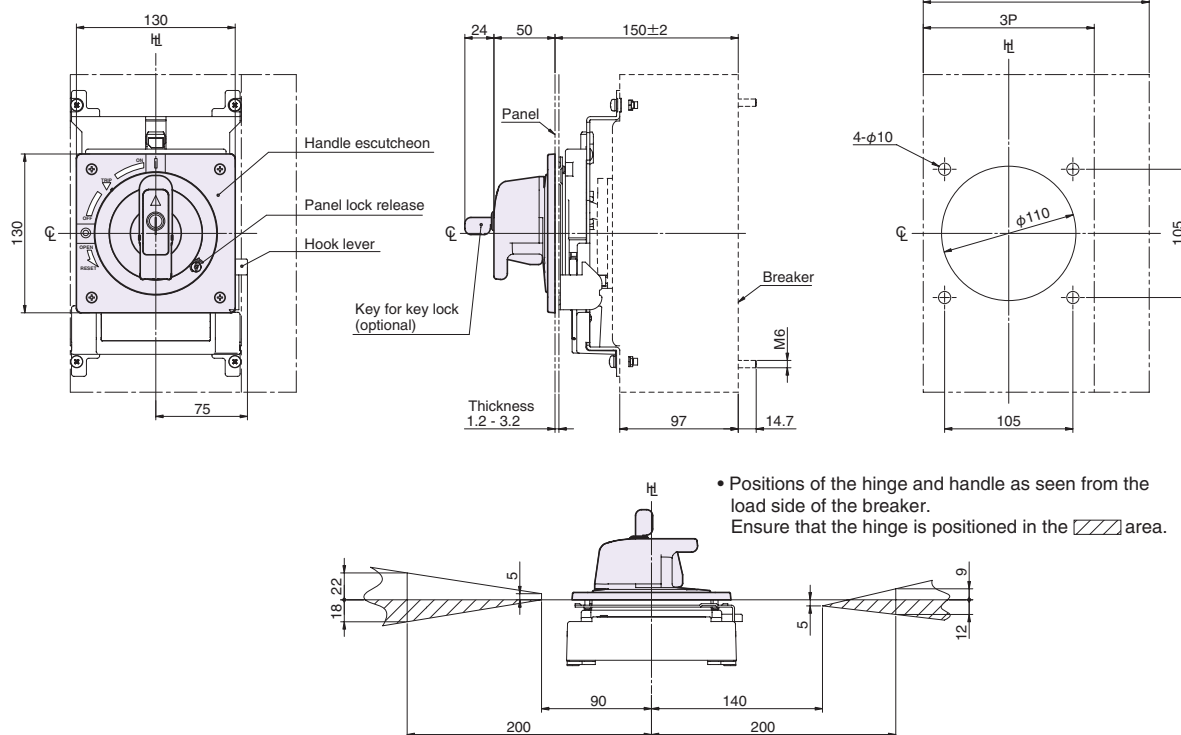
TPHB63S

Applicable breaker types

P400E/F/N/H/S/D,
P630E/F/N/H/S/D

HL : Handle Frame Centre Line

CL : Handle Centre Line



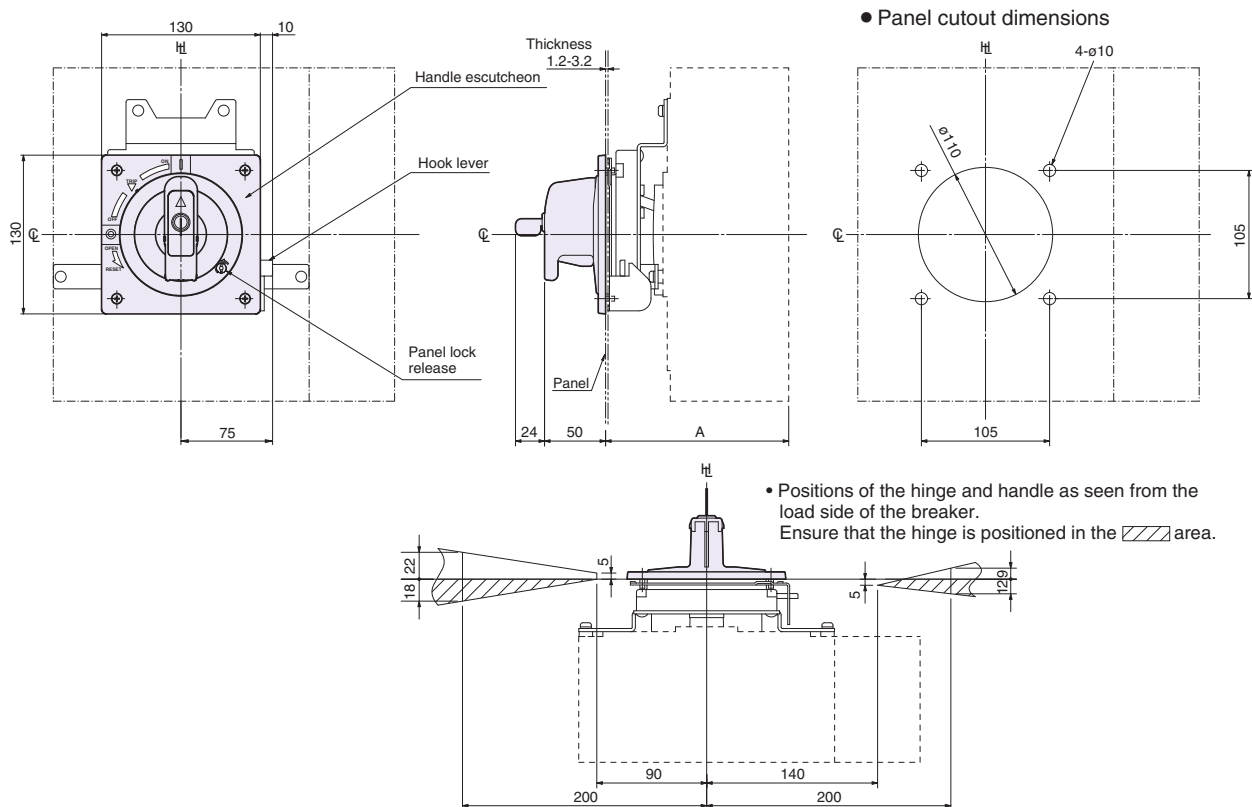
Outline dimensions

T2HB80

Applicable breaker types	A (mm)
S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN,	150±2
H800-NE, L800-NE, L800-PE	187±2

HL : Handle Frame Centre Line

CL : Handle Centre Line



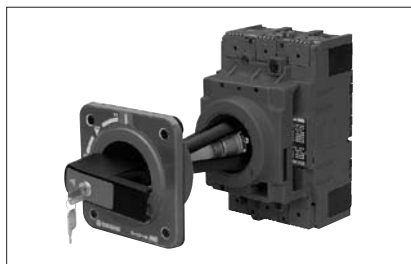
4. External operating handles

(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.

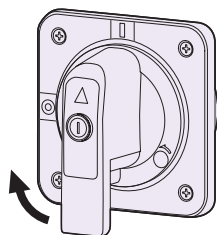
This handle assembly consists of an operation mechanism section which is to be installed in the breaker body, a handle section which is to be installed in a panel and a square shaft which couples both the sections.

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 (I) and OFF (O) indication of the external operating handle can be re-oriented in steps of 90 degrees with respect to the operating mechanism.

This allows the indication position to remain the same whether the breaker is mounted vertically (right side up or upside down) or horizontally (on its left side or on its right side).

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

■ 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)

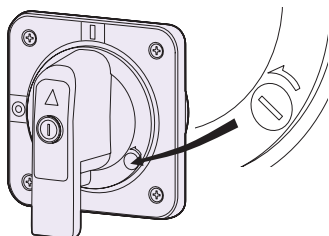
The handle is turned to the RESET OPEN position to open the panel door.

(2) OFF Open

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

• Panel lock release knob (Standard)

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.



■ Protection degree (IEC 60529)

IP54	Standard specification
IP65	Special specification

■ 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)

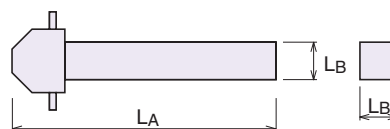
Type of handle	A	Dia.
T1HP, T2HP, TPHP	13 min	ø5.5-8

• Key lock (Optional)

Key locking is possible in the OFF position.

■ 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 N P

Type of external operating handle	Panel lock	Protection degree	Colour	Key lock / Padlock	Series
T2HP16L T2HP40 T2HP25L T2HP80 T2HP25 T2HPX6	R : RESET open F : OFF open	5 : IP54 6 : IP65	B : Black handle (Grey Blue base) R : Red handle (Yellow base)	N : with padlock (lock in OFF) K : with key lock and padlock (lock in OFF)	P : PRO Series ①
TPHP16S TPHP63S TPHP25S					—

Note ①: For T2HP, specify "P". Do not specify anything in the case of T1HP or TPHP (blank).

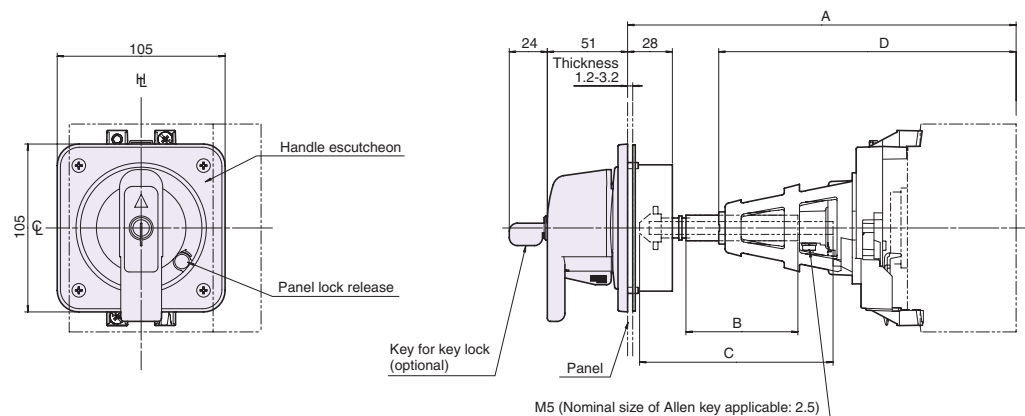
4. External operating handles

HL : Handle Frame Centre Line

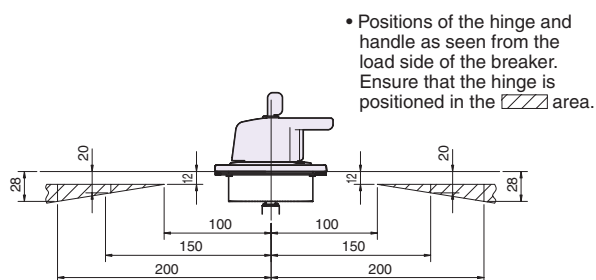
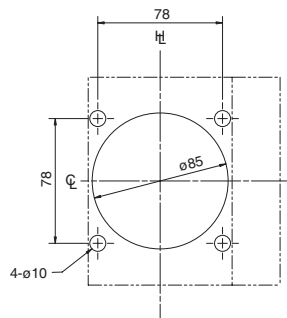
CL : Handle Centre Line

■ Outline dimensions

TPHP16S



● Panel cutout dimensions



Applicable breaker types	A ①	B	C	D	Square shaft applicable	Shaft support
P160F/N/H/D	229 min.	56	107	186	T2PS251 T2PS252 T2PS253 T2PS254	Yes
	243 max.	70	121	186		
	343 max.	170	221	186		
	443 max.	270	321	186		
	543 max.	370	421	186		

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

B: Length of the tube to cover the square shaft

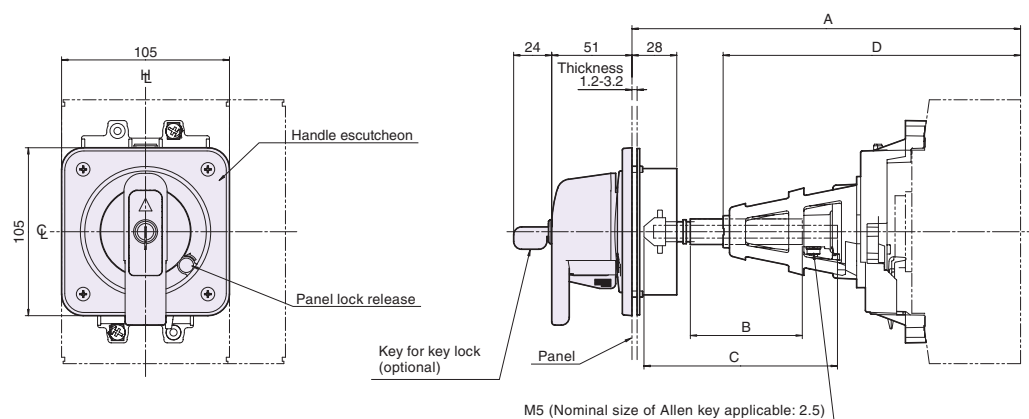
C: Length of the square shaft

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

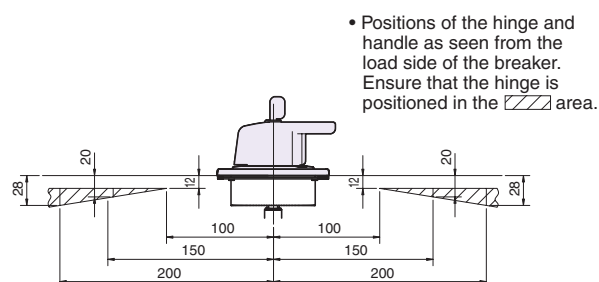
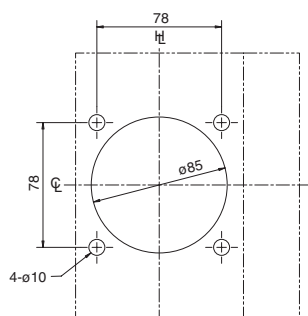
HL : Handle Frame Centre Line
 CL : Handle Centre Line

Outline dimensions

TPHP25S



Panel cutout dimensions



Applicable breaker types	A ①	B	C	D	Square shaft applicable	Shaft support
P250F/N/H/D	229 min.	56	107	186	T2PS251	Yes
	243 max.	70	121	186	T2PS252	
	343 max.	170	221	186	T2PS253	
	443 max.	270	321	186	T2PS254	
	543 max.	370	421	186		

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

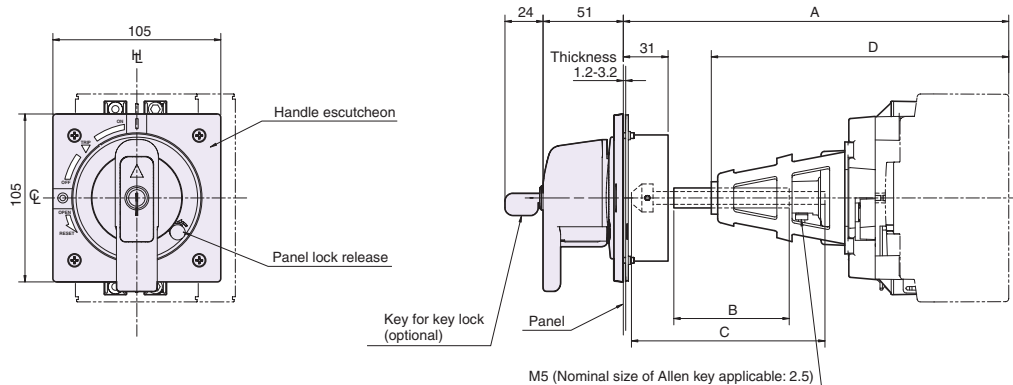
4. External operating handles

H : Handle Frame Centre Line

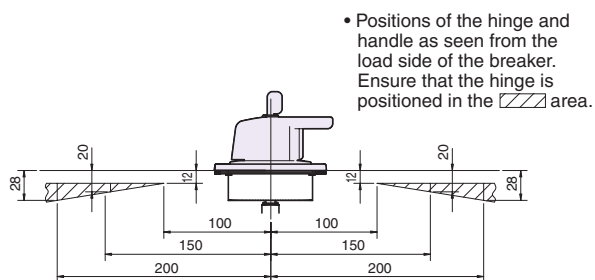
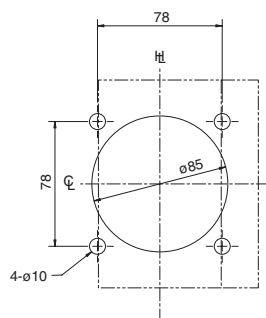
C : Handle Centre Line

■ Outline dimensions

T2HP16L



● Panel cutout dimensions



Applicable breaker types	A ①	B	C	D	Square shaft applicable	Shaft support
E160-SF/SJ, S160-SCF/SCJ/SF/SJ/SN	229 min.	56	107	186	T2PS251 T2PS252 T2PS253 T2PS254	Yes
	243 max.	70	121	186		
	343 max.	170	221	186		
	443 max.	270	321	186		
	543 max.	370	421	186		

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

B: Length of the tube to cover the square shaft

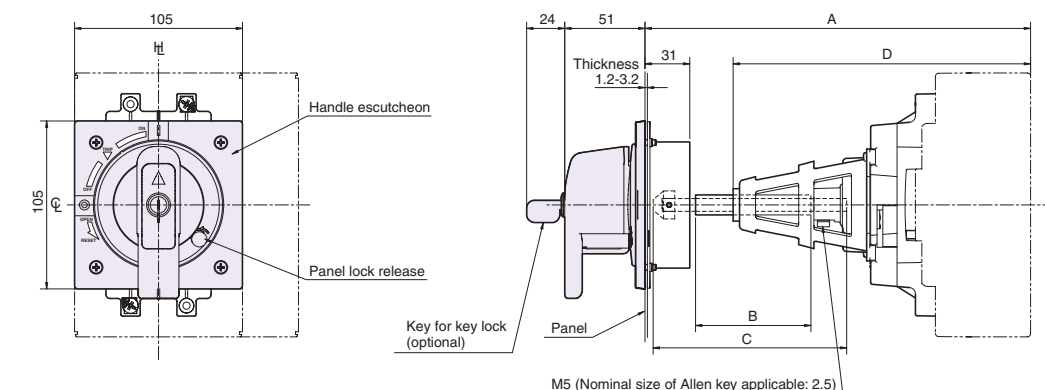
C: Length of the square shaft

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

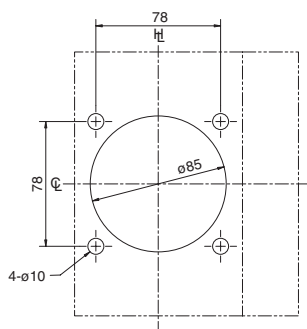
HL : Handle Frame Centre Line
 CL : Handle Centre Line

Outline dimensions

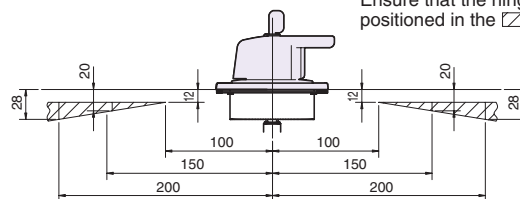
T2HP25L



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
E250-SCF/SCJ/SF/SJ, S250-SN	229 min.	56	107	186	T2PS251 T2PS252 T2PS253 T2PS254	Yes
	243 max.	70	121	186		
	343 max.	170	221	186		
	443 max.	270	321	186		
	543 max.	370	421	186		

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

B: Length of the tube to cover the square shaft

C: Length of the square shaft

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

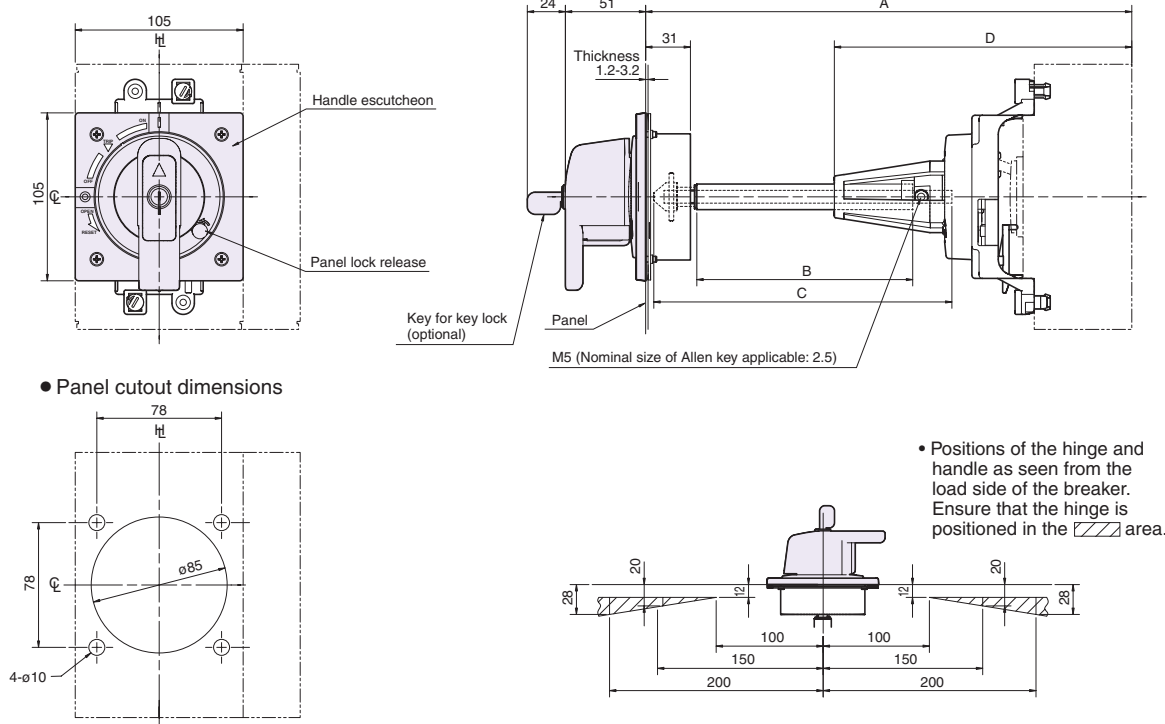
4. External operating handles

H : Handle Frame Centre Line

C : Handle Centre Line

■ Outline dimensions

T2HP25



Applicable breaker types	A ①	B	C	D	Square shaft applicable	Shaft support
H125-NJ, H160-NJ, H250-NJ/NE, L125-NJ, L125-PJ, L160-NJ, L250-NJ	264 min.	56	107	221	T2PS251	Yes
	278 max.	70	121	221		
	378 max.	170	221	221	T2PS252	
	478 max.	270	321	221	T2PS253	
	578 max.	370	421	221	T2PS254	

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

B: Length of the tube to cover the square shaft

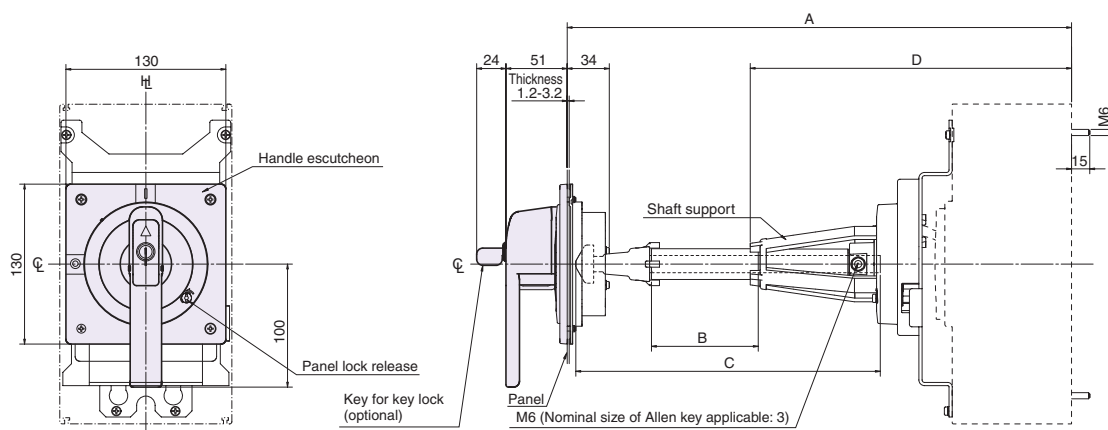
C: Length of the square shaft

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

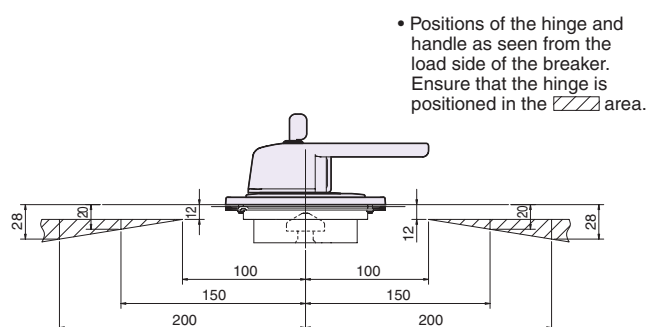
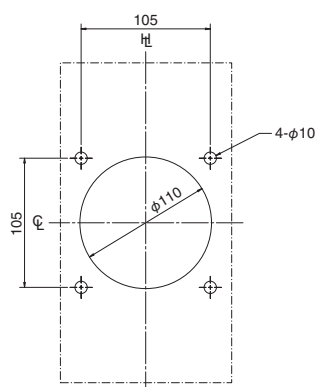
HL : Handle Frame Centre Line
 CL : Handle Centre Line

Outline dimensions

T2HP40



Panel cutout dimensions



Applicable breaker types	A ①	B	C	D	Square shaft applicable	Shaft support
H400-NE, L400-NE, L400-PE	307 min.	12	107.5	—	T2PS401	Non
	347 max. ②	52	147.5	—		
	377 min. ②	10	177.5	298	T2PS402	Yes
	447 max.	80	247.5	298	T2PS403	
	547 max.	180	347.5	298	T2PS404	
	647 max.	280	447.5	298		

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 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 to cover the square shaft

C: Length of the square shaft

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

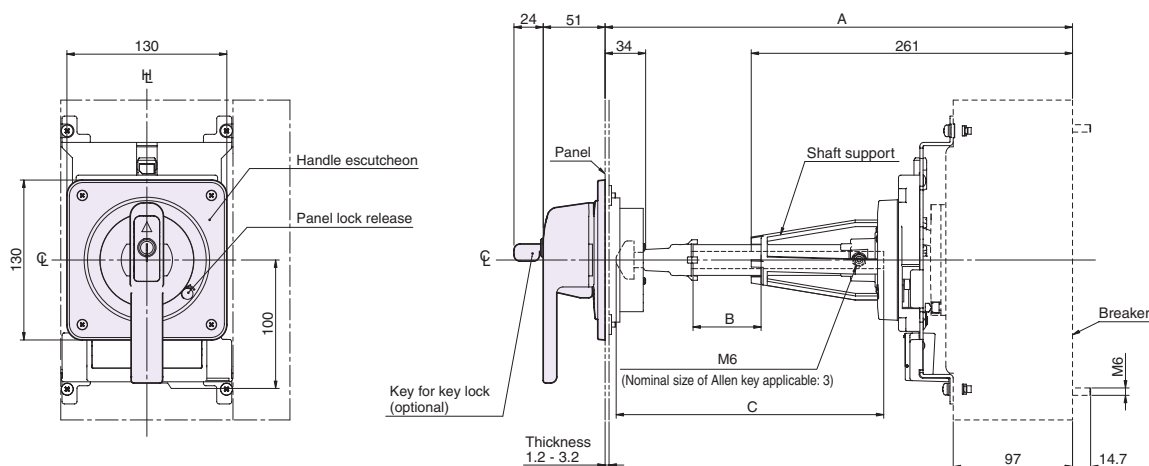
4. External operating handles

H : Handle Frame Centre Line

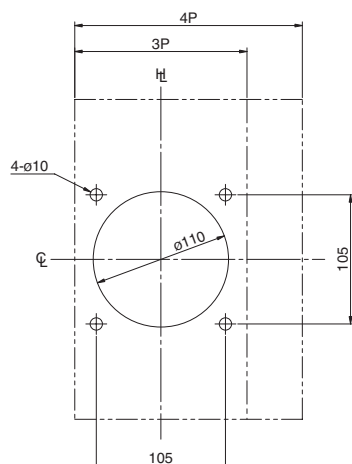
C : Handle Centre Line

■ Outline dimensions

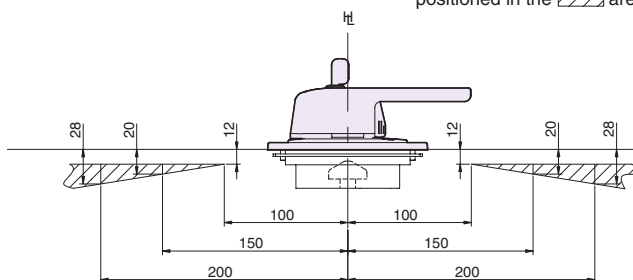
TPHP63S



● 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	Square shaft applicable	Shaft support
P400E/F/N/H/S/D, P630E/F/N/H/S/D	270 min.	12	107.5	T2PS401	Non
	310 max. ②	52	147.5		
	340 min. ②	10	177.5	T2PS402	Yes
	410 max.	80	247.5		
	510 max.	180	347.5		
	610 max.	280	447.5		

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.

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

B: Length of the tube to cover the square shaft

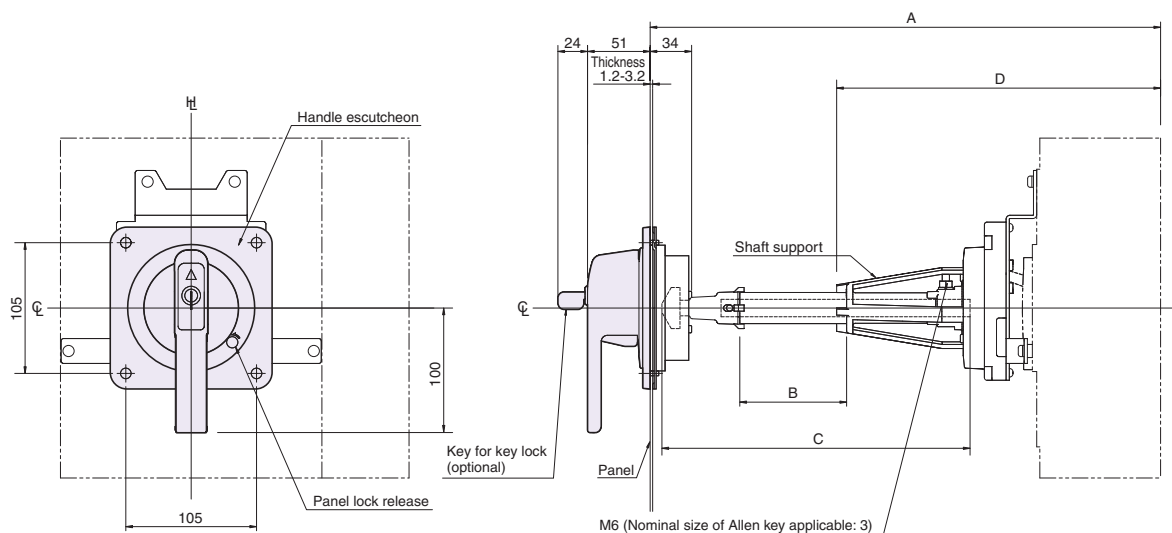
C: Length of the square shaft

HL : Handle Frame Centre Line

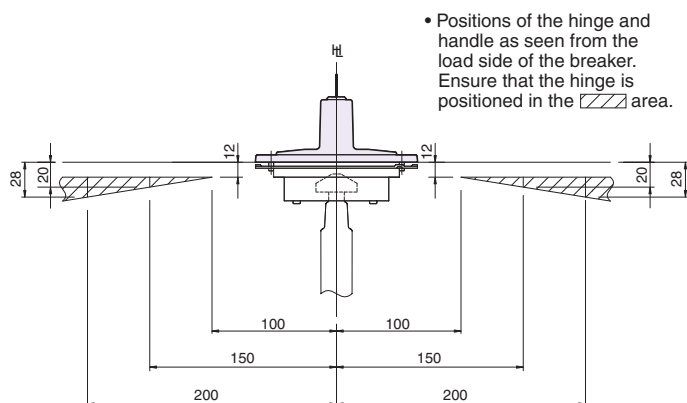
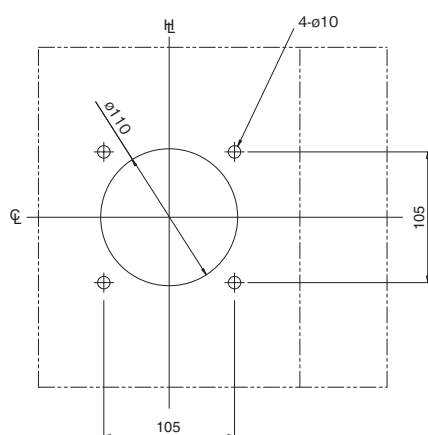
CL : Handle Centre Line

Outline dimensions

T2HP80



Panel cutout dimensions



Applicable breaker types	A ①	B	C	D	Square shaft applicable	Shaft support
S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN	270 min.	12	107.5	—	T2PS401	Non
	310 max. ②	52	147.5	—	T2PS402	
	340 min. ②	10	177.5	261	T2PS403	Yes
	410 max.	80	247.5	261	T2PS404	
	510 max.	180	347.5	261	T2PS404	
H800-NE, L800-NE, L800-PE	610 max.	280	447.5	261	T2PS401	Non
	307 min.	12	107.5	—	T2PS402	
	347 max. ③	52	147.5	—	T2PS403	Yes
	377 min. ③	10	177.5	298	T2PS404	
	447 max.	80	247.5	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 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 to cover the square shaft

C: Length of the square shaft

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

6

Accessories

Moulded Case Circuit Breakers

3 Externally mounted accessories

ASL : Arrangement Standard Line

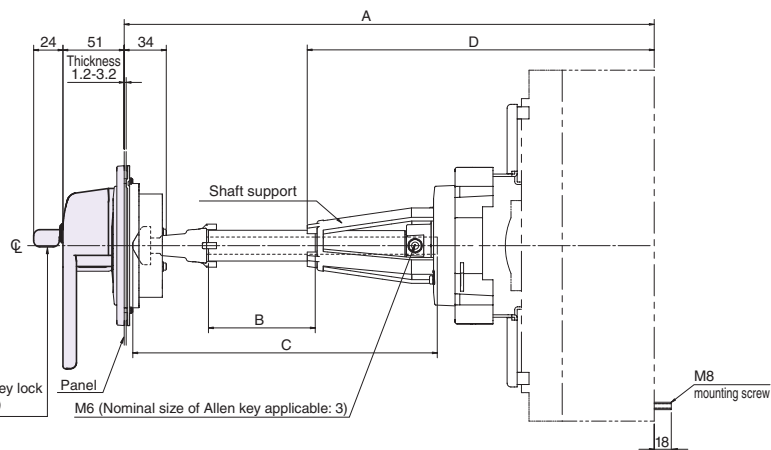
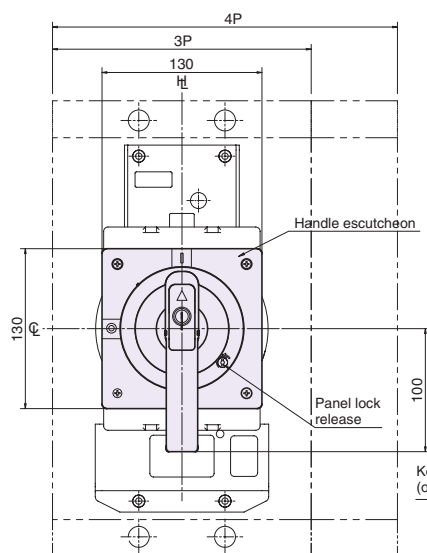
HL : Handle Frame Centre Line

CL : Handle Centre Line

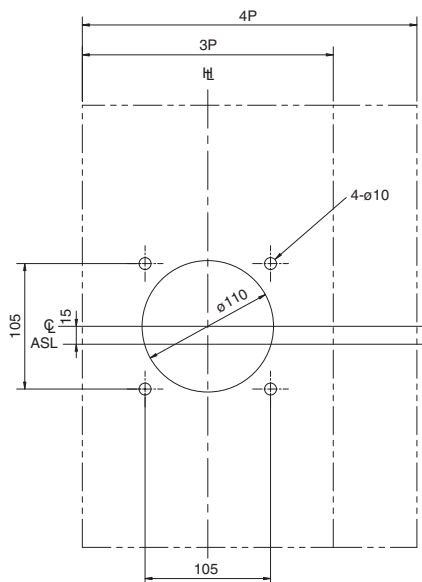
Outline dimensions

T2HPX6

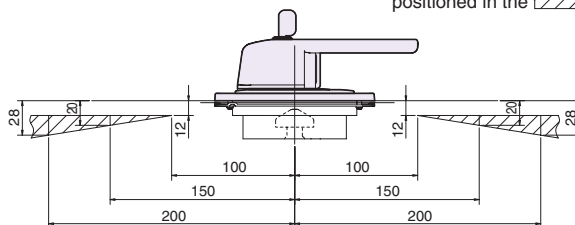
Type of external operating handle	Applicable breaker types
T2HPX6	S1250-NE/GE/NN, S1600-NE/NN



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.



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

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

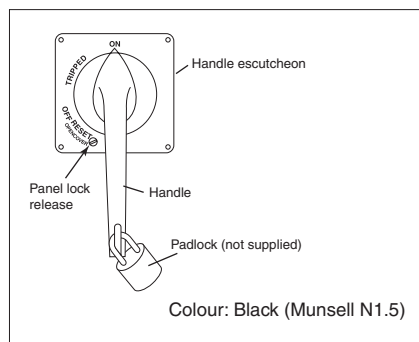
B: Length of the tube to cover the square shaft
 D: Distance from the tip of the shaft support to the breaker mounting surface

4. External operating handles

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

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.
- **OFF**
Turn the handle anti-clockwise to the OFF position.
- **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.

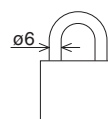
Panel lock release knob

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.

Padlock dimensions



Outline dimensions

XFE10

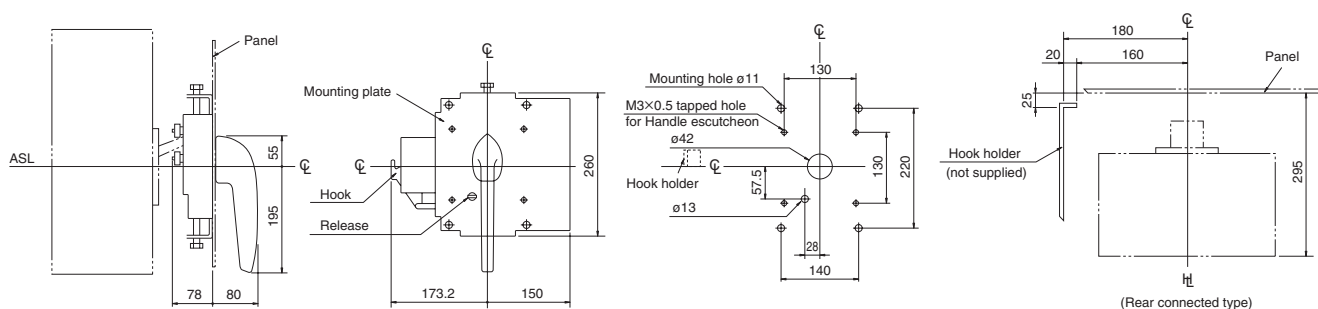
Applicable breaker types

XS2000NE, XS2500NE, XS3200NE,
XS2000NN, XS2500NN, XS3200NN

ASL : Arrangement Standard Line

HL : Handle Frame Centre Line

CL : Handle Centre Line



5. Mechanical interlock

The slide interlock provides a mechanical interlock between two breakers so that only one of the two can be closed. There are four types: slide type, rear-connected type, link type, and wire type.

(1) Slide interlock (MS)

HL : Handle Frame Centre Line

CL : Handle Centre Line

Dimensions, mm

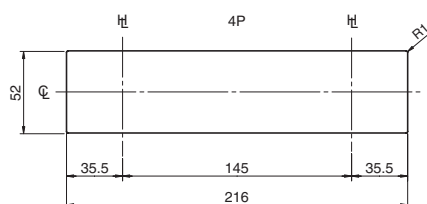
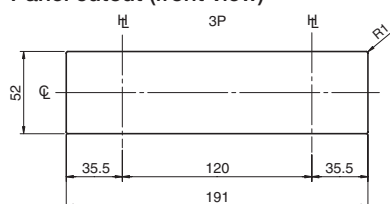
Frame size (A)	Types of MCCBs	Number of poles	Breaker connection method	Interlock Order codes
160	E160-SF/SJ, S160-SCF/SCJ/SF/SJ/SN	3	FC, RC	T2MS16L3SF
		4	FC, RC	T2MS16L4SF

Notes:

1: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.

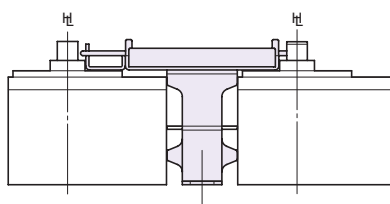
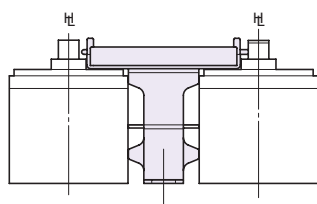
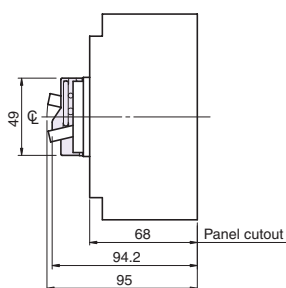
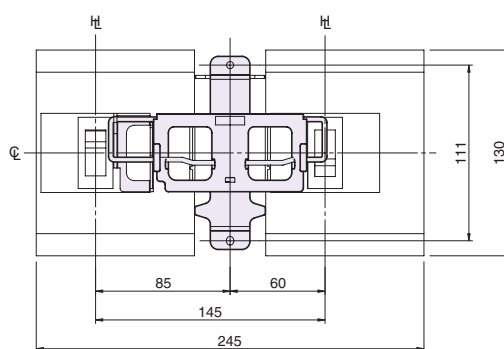
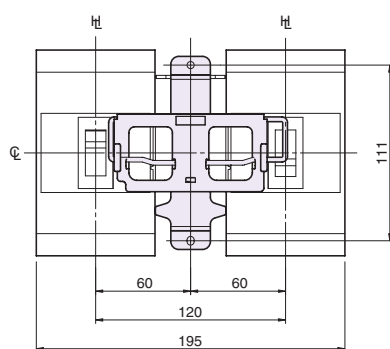
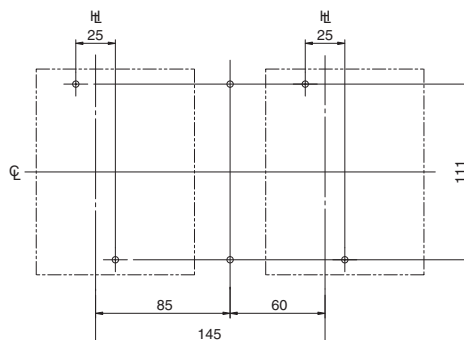
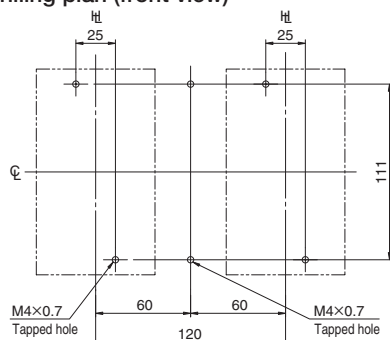
2: UVT with time-delay cannot be fitted to the left circuit breaker.

Panel cutout (front view)



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

Drilling plan (front view)



HL : Handle Frame Centre Line
CL : Handle Centre Line

Dimensions, mm

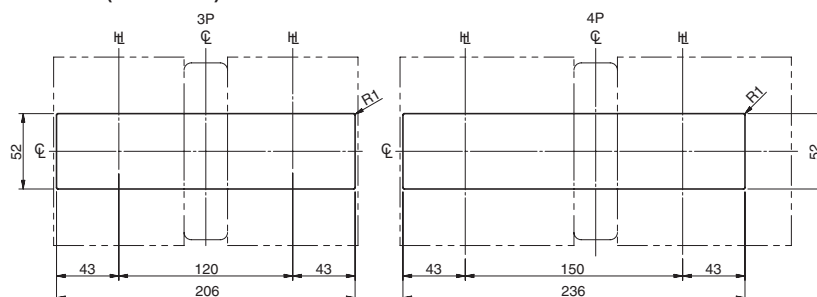
Frame size (A)	Types of MCCBs	Number of poles	Breaker connection method	Interlock Order codes
160	P160F/N/H/D	3	FC, RC	TPMS163SF
		4	FC, RC	TPMS164SF

Notes:

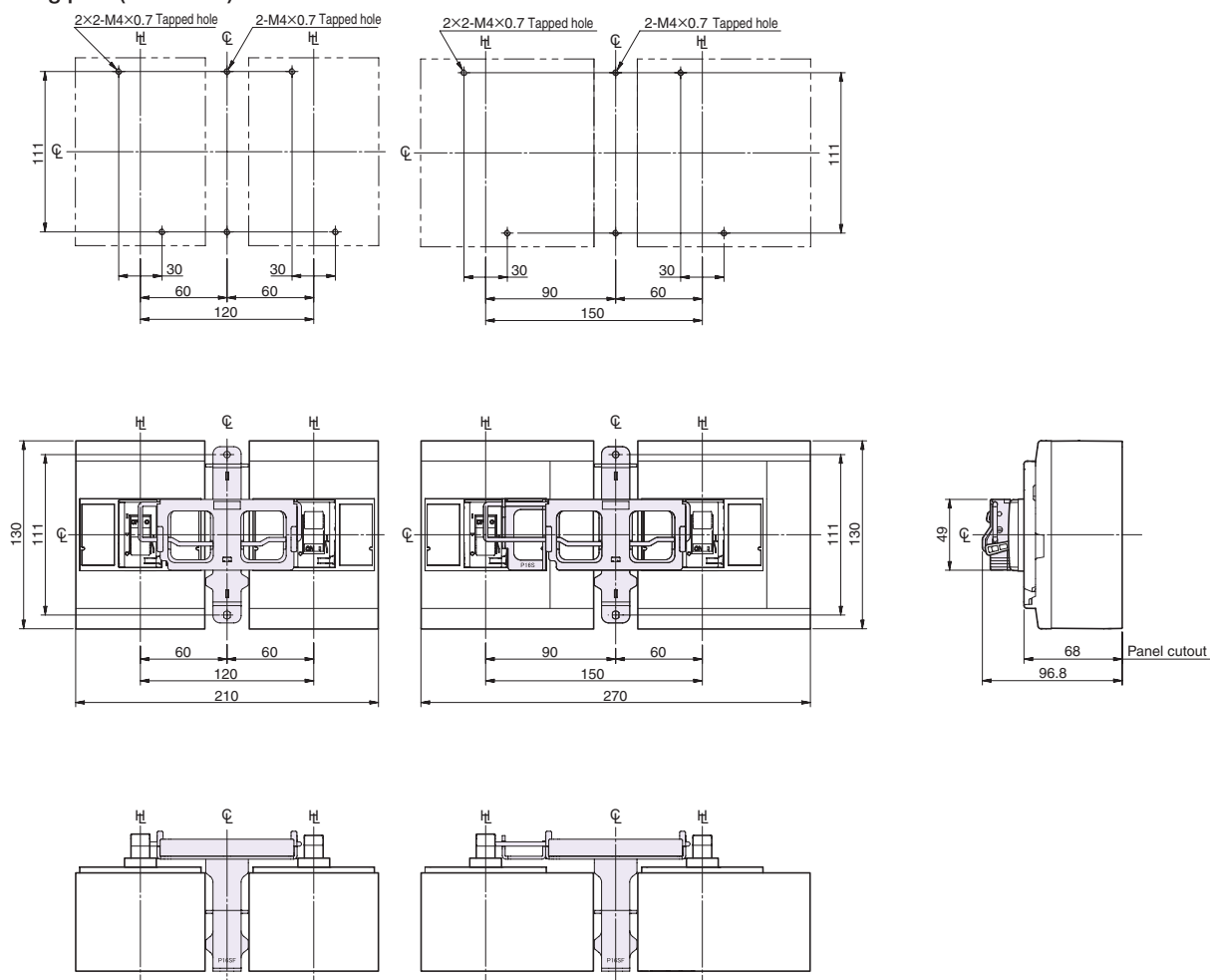
- 1: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.
- 2: UVT with time-delay cannot be fitted to the left circuit breaker.
- 3: For high-performance electronic smart circuit breakers, the panel cutout dimensions will vary. Please contact us for details.

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

Panel cutout (front view)



Drilling plan (front view)



(1) Slide interlock (MS)

H_L : Handle Frame Centre LineC_L : Handle Centre Line

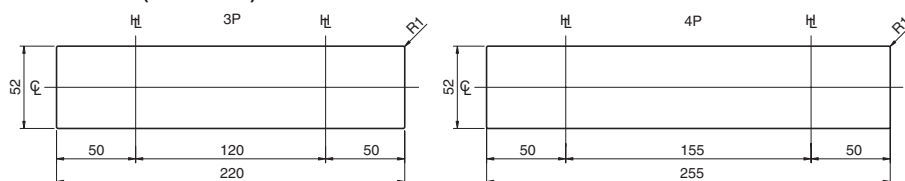
Dimensions, mm

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

Notes:

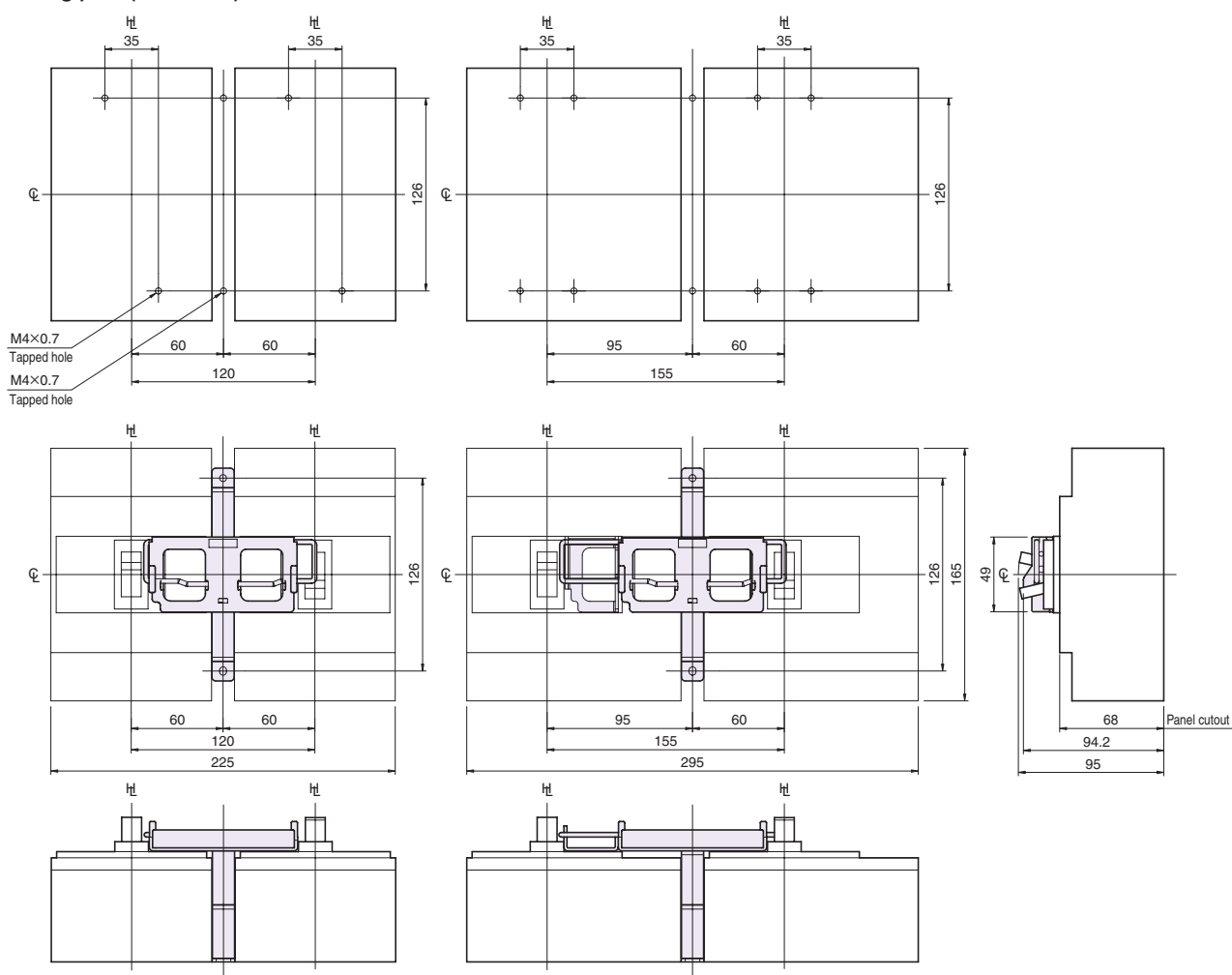
- 1: If the insulation distance is insufficient due to the front-connected extension bars, be sure to insulate with insulating tape or the like.
- 2: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.
- 3: UVT with time-delay cannot be fitted to the left circuit breaker.

Panel cutout (front view)



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

Drilling plan (front view)



HL : Handle Frame Centre Line
CL : Handle Centre Line

Dimensions, mm

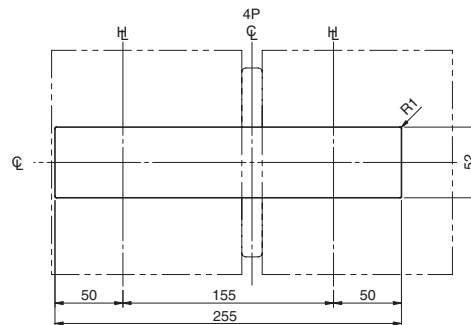
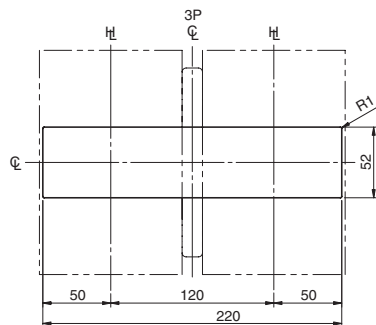
Frame size (A)	Types of MCCBs	Number of poles	Breaker connection method	Interlock Order codes
250	P250F/N/H/D	3	FC、RC	TPMS253SF
		4	FC、RC	TPMS254SF

Notes:

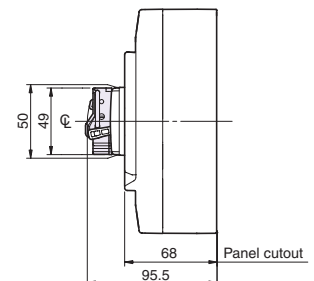
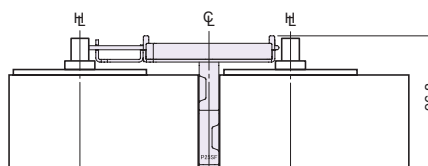
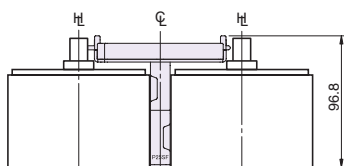
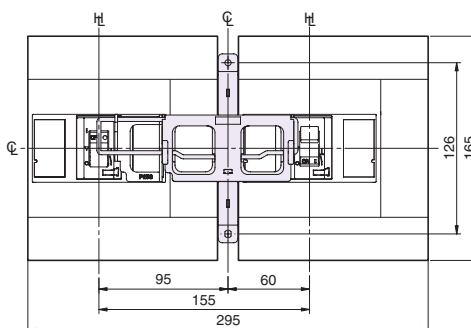
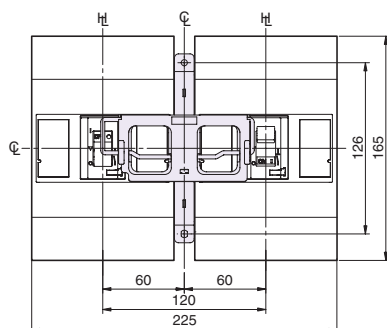
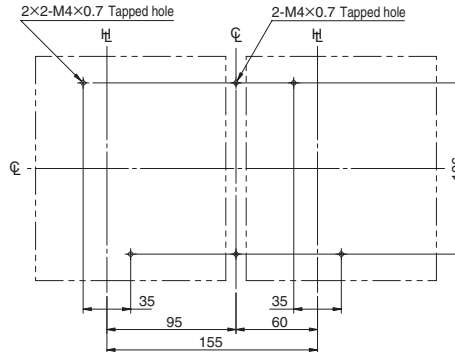
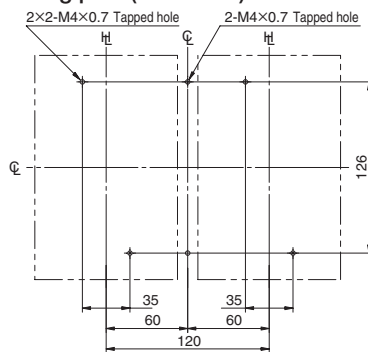
- 1: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.
- 2: UVT with time-delay cannot be fitted to the left circuit breaker.
- 3: For high-performance electronic smart circuit breakers, the panel cutout dimensions will vary. Please contact us for details.

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

Panel cutout (front view)



Drilling plan (front view)



6

Accessories

Moulded Case Circuit Breakers

3 Externally mounted accessories

(1) Slide interlock (MS)

HL : Handle Frame Centre Line

CL : Handle Centre Line

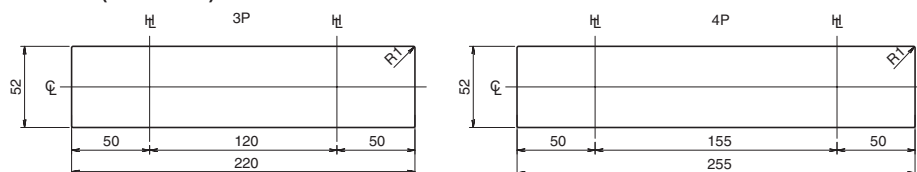
Dimensions, mm

Frame size (A)	Types of MCCBs	Number of poles	Breaker connection method	Interlock Order codes
125, 160, 250	H125-NJ, H160-NJ, H250-NJ/NE, L125-NJ, L125-PJ, L160-NJ, L250-NJ	3	FC, RC	T2MS253LF
		4	FC, RC	T2MS254LF

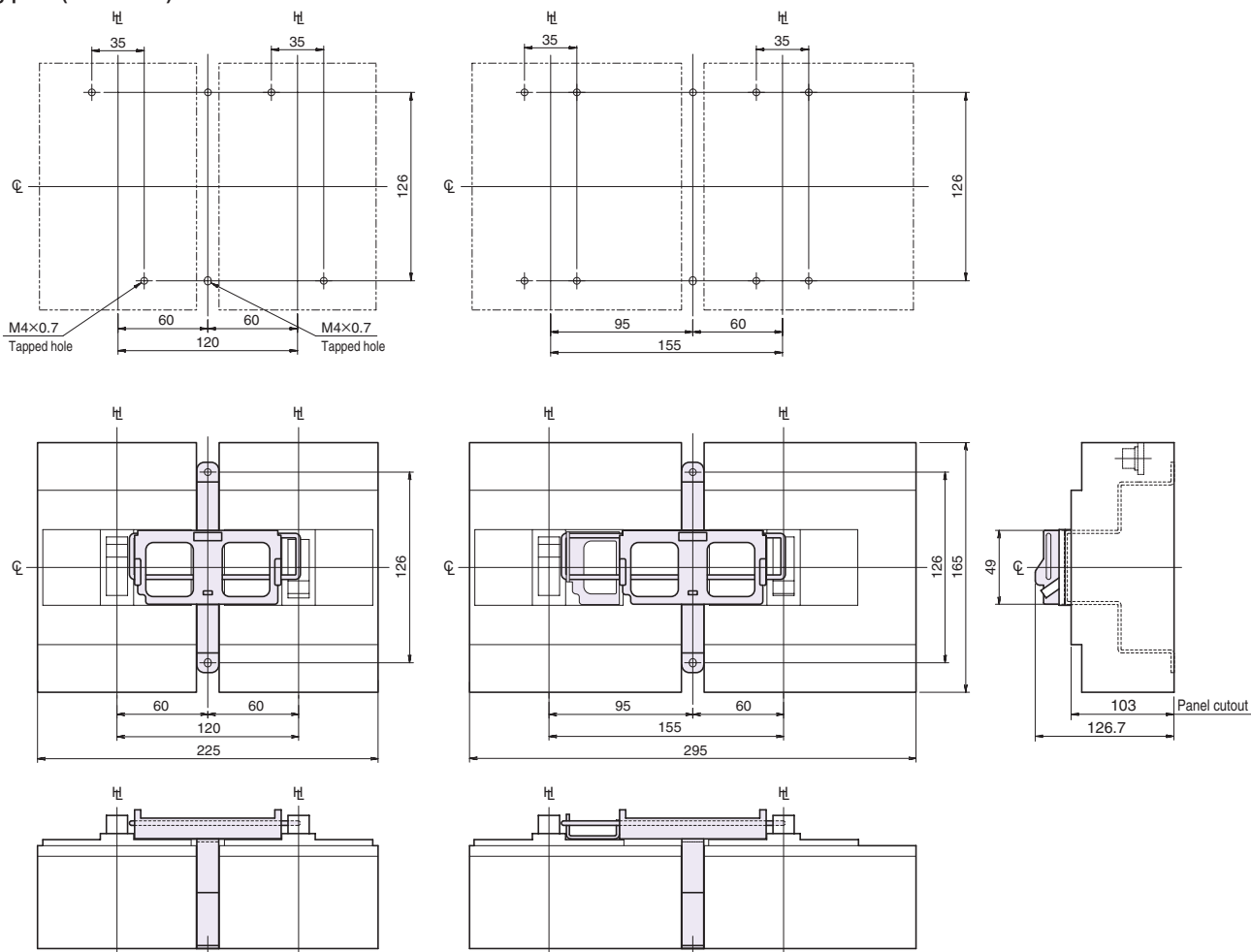
Notes:

- 1: If the insulation distance is insufficient due to the front-connected extension bars, be sure to insulate with insulating tape or the like.
- 2: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.
- 3: UVT with time-delay cannot be fitted to the left circuit breaker.

Panel cutout (front view)



Drilling plan (front view)



HL : Handle Frame Centre Line
CL : Handle Centre Line

Dimensions, mm

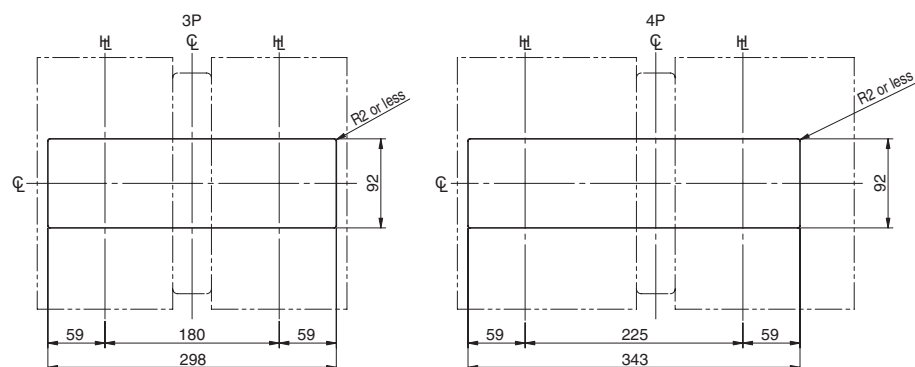
Frame size (A)	Types of MCCBs	Number of poles	Breaker connection method	Interlock Order codes
400, 630	P400E/F/N/H/S/D, P630E/F/N/H/S/D	3	FC, RC	TPMS633SF
		4	FC, RC	TPMS634SF

Notes:

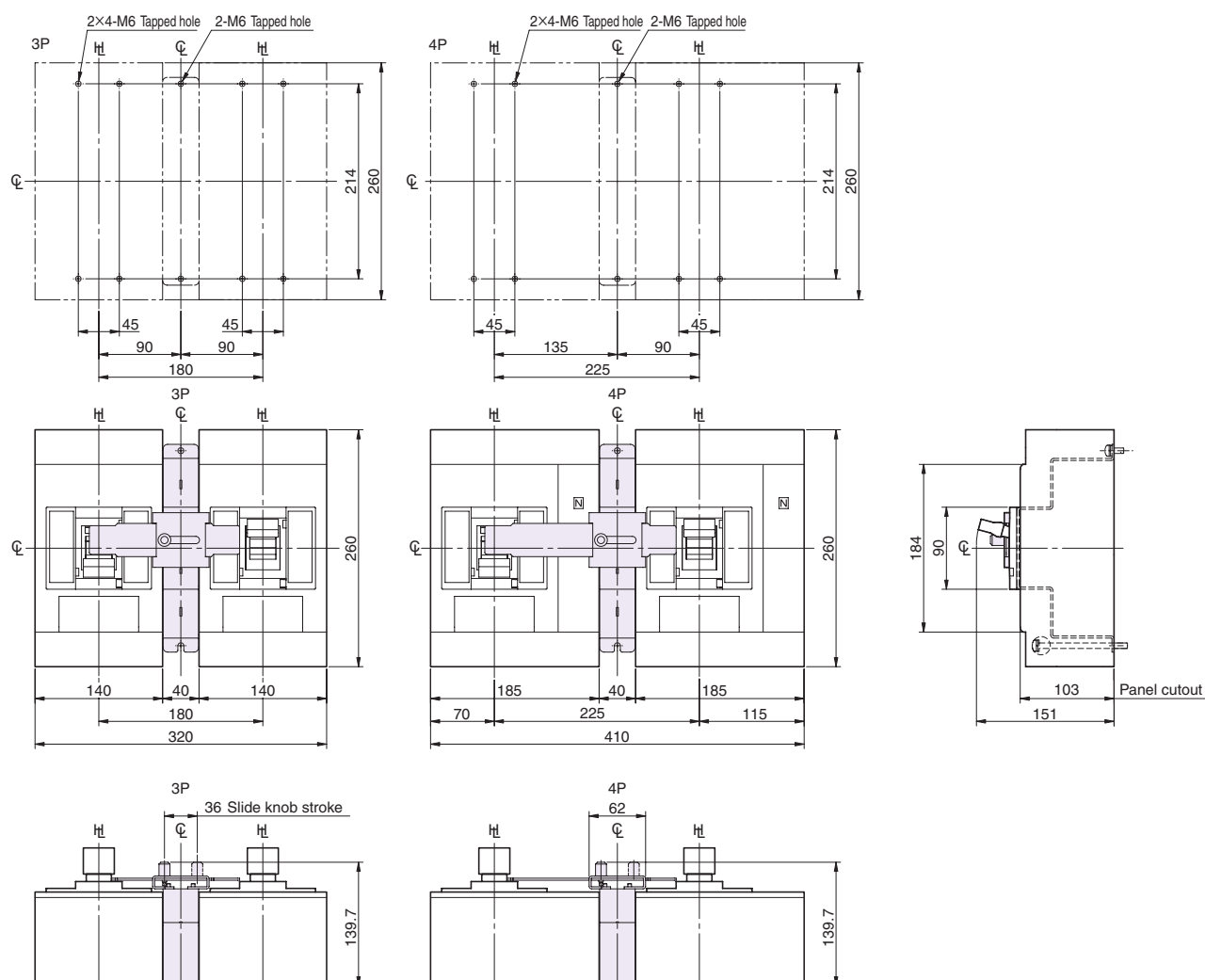
- 1: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.
- 2: UVT with time-delay cannot be fitted to the left circuit breaker.
- 3: For high-performance electronic smart circuit breakers, the panel cutout dimensions will vary. Please contact us for details.

Panel cutout (front view)

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



Drilling plan (front view)



(1) Slide interlock (MS)

HL : Handle Frame Centre Line

CL : Handle Centre Line

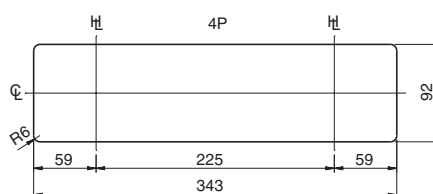
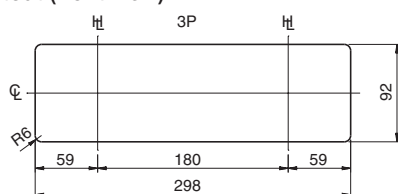
Dimensions, mm

Frame size (A)	Types of MCCBs	Number of poles	Breaker connection method	Interlock Order codes
400	H400-NE, L400-NE, L400-PE	3	FC, RC	T2MS403LF
		4	FC, RC	T2MS404LF

Notes:

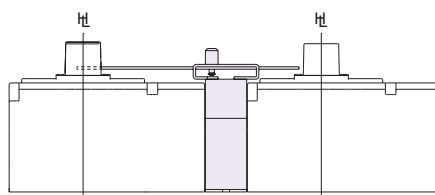
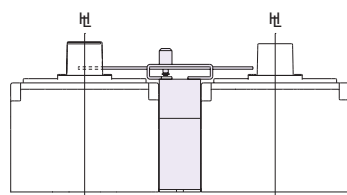
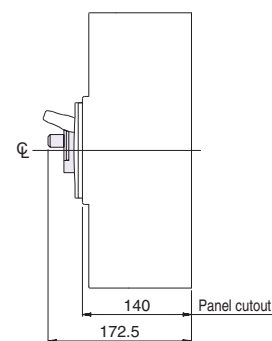
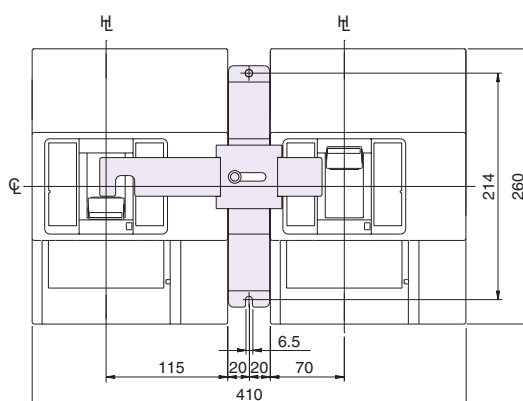
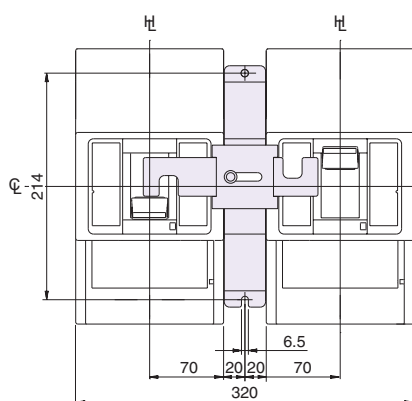
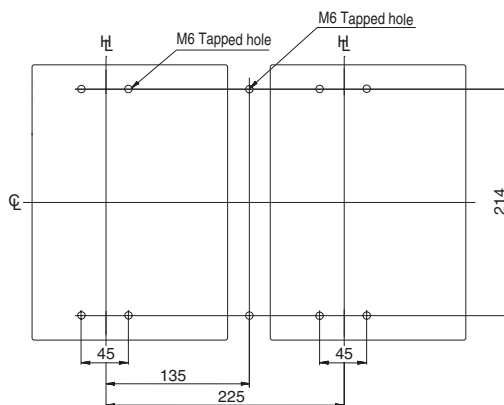
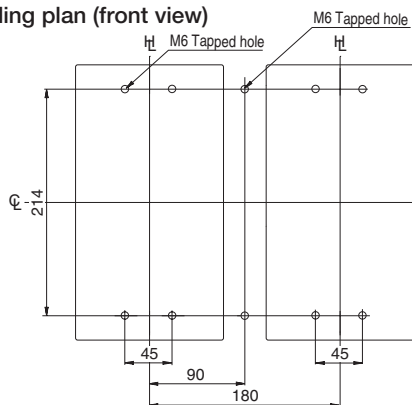
- 1: If the insulation distance is insufficient due to the front-connected extension bars, be sure to insulate with insulating tape or the like.
- 2: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.
- 3: UVT with time-delay cannot be fitted to the left circuit breaker.
- 4: Wide terminal covers can not be fitted to interfere with each other. Straight terminal covers can be fitted.
- 5: For high-performance electronic smart circuit breakers, the panel cutout dimensions will vary. Please contact us for details.

Panel cutout (front view)



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

Drilling plan (front view)



ASL : Arrangement Standard Line
 HL : Handle Frame Centre Line

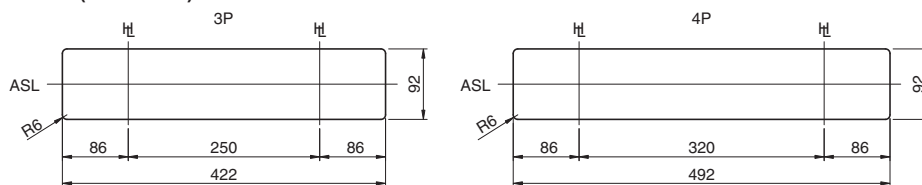
Dimensions, mm

Frame size (A)	Types of MCCBs	Number of poles	Breaker connection method	Interlock Order codes	Panel cutout A (mm)	B (mm)
800, 1000	S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN	3	FC, RC	T2MS803SF	103	135.5
		4	FC, RC	T2MS804SF		
	H800-NE, L800-NE, L800-PE	3	FC, RC	T2MS803LF	140	172.5
		4	FC, RC	T2MS804LF		

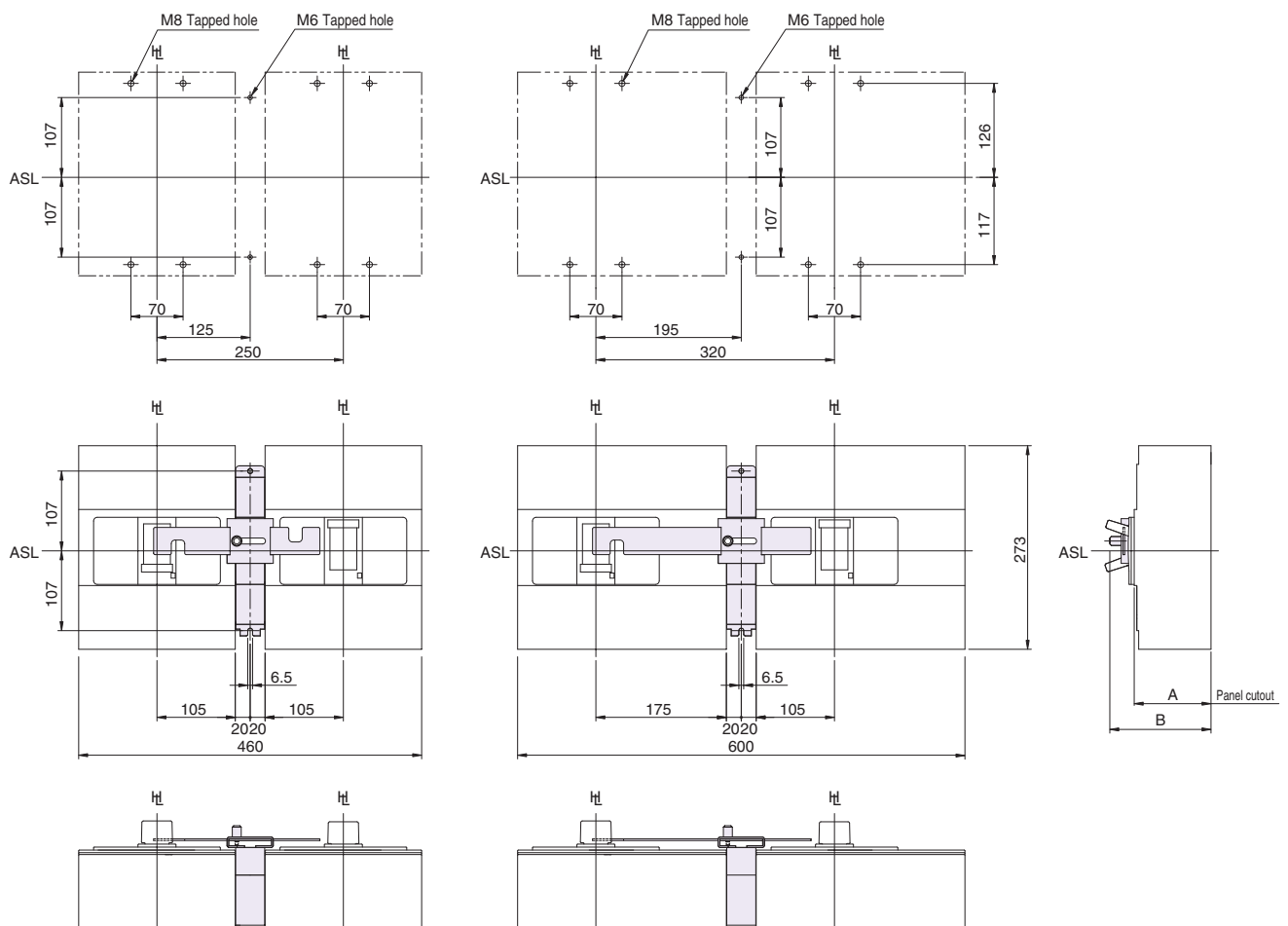
Notes:

- 1: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.
- 2: UVT with time-delay cannot be fitted to the left circuit breaker.
- 3: For high-performance electronic smart circuit breakers, the panel cutout dimensions will vary. Please contact us for details.

Panel cutout (front view)



Drilling plan (front view)



(1) Slide interlock (MS)

Dimensions, mm

Frame size (A)	Types of MCCBs	Interlock Order codes	Number of poles	a	b	c	d	e	f	g	h	k	m	ℓ	R
1250	S1250-SE/NE/GE/NN	T2MSX63SF	3	220	340	124.5	61.5	343	53.5	74	127.5	430	159.2	30	8.5
		T2MSX64SF	4	290	410	124.5	61.5	413	53.5	74	127.5	570	159.2	30	8.5
1600	S1600-SE/NE/NN	T2MSX63SF	3	220	340	124.5	61.5	343	53.5	74	127.5	430	179.2	30	8.5
		T2MSX64SF	4	290	410	124.5	61.5	413	53.5	74	127.5	570	179.2	30	8.5

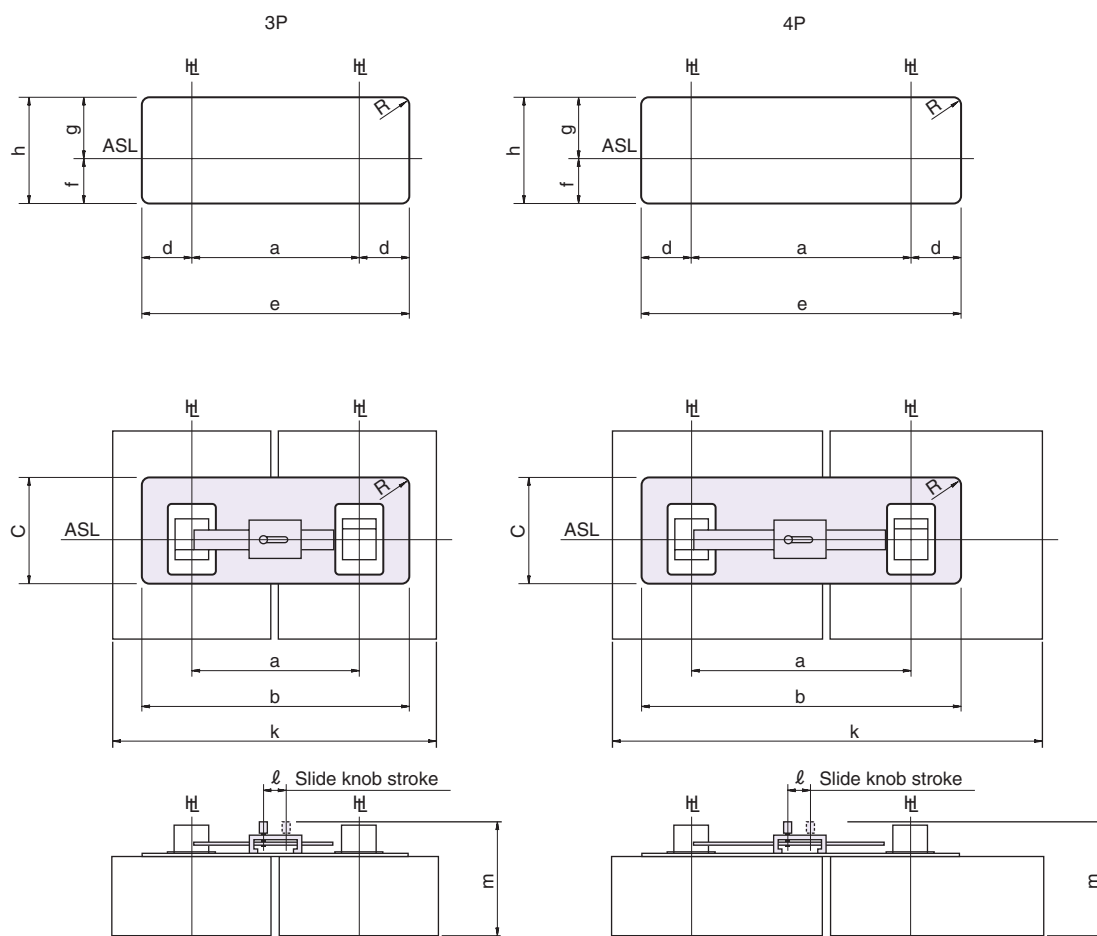
Notes:

- 1: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.
 2: The UVT controller or the OCR controller may be required to be installed external to the breaker.
 3: See the outline dimensions of the breaker of section 7 for the drilling plan.

ASL : Arrangement Standard Line

H₁ : Handle Frame Centre Line

Panel cutout (front view)



5. Mechanical interlock

ASL : Arrangement Standard Line

HL : Handle Frame Centre Line

CL : Handle Centre Line

(2) Rear-connected interlock (MB)

Dimensions, mm

Frame size (A)	Types of MCCBs	Types of ELCBs	Interlock Order codes	A (mm)
1250	S1250-SE/NE/GE/NN	—	Factory-installed	120
1600	S1600-SE/NE/NN	—	Factory-installed	140
2000	XS2000NE, XS2000NN	—	Factory-installed	①
2500, 3200	XS2500NE, XS2500NN, XS3200NE (3P only), XS3200NN (3P only)	—	Factory-installed	①

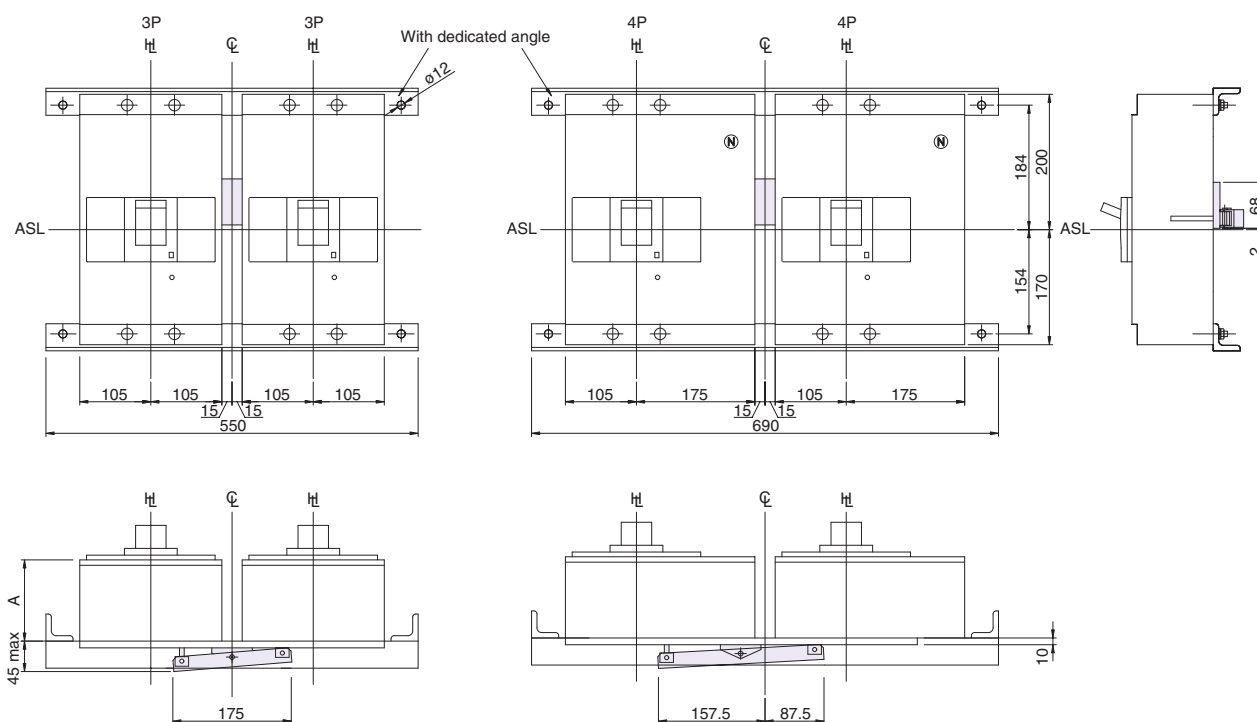
Notes:

①: Contact us for the detailed dimensions.

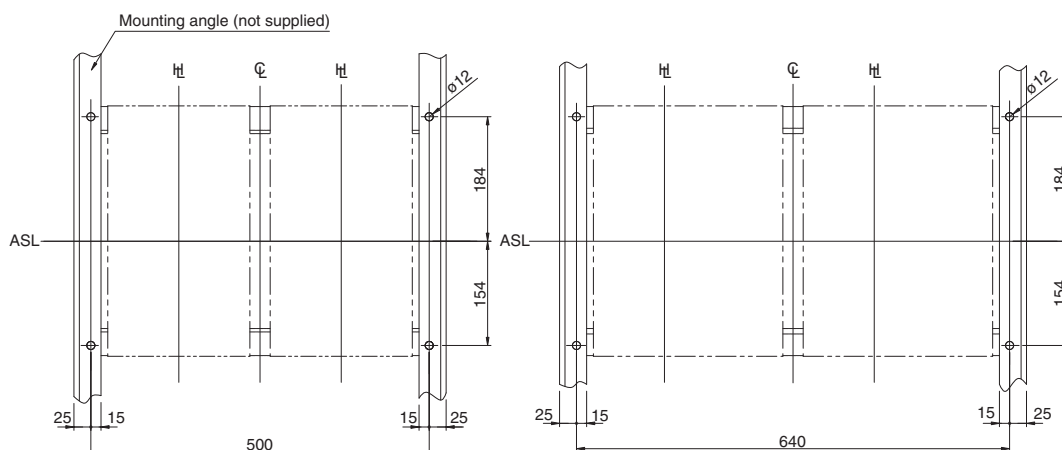
1: Not applicable for plug-in.

2: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.

3: The UVT controller or the OCR controller may be required to be installed external to the breaker.



Drilling plan



5. Mechanical interlock

HL : Handle Frame Centre Line

CL : Handle Centre Line

(3) Link Interlock (ML)

A type that interlocks the left and right circuit breakers with a link bar. It requires little space and is very easy to install.

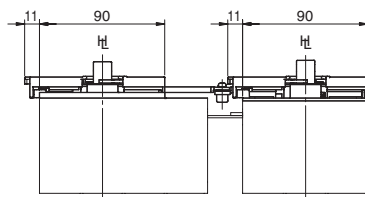
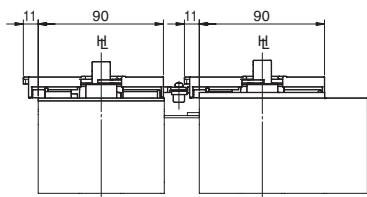
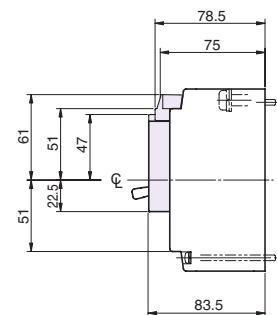
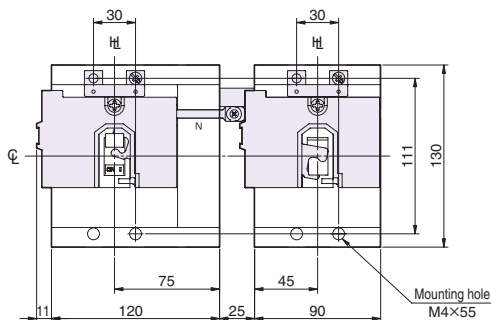
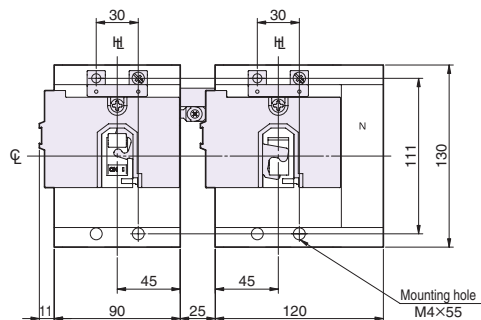
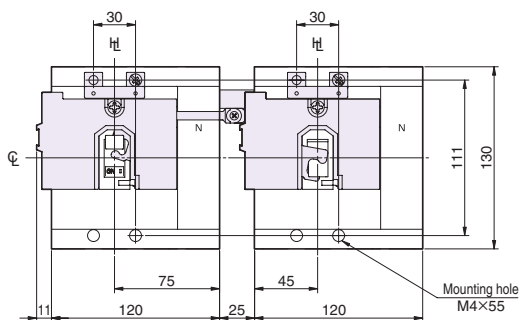
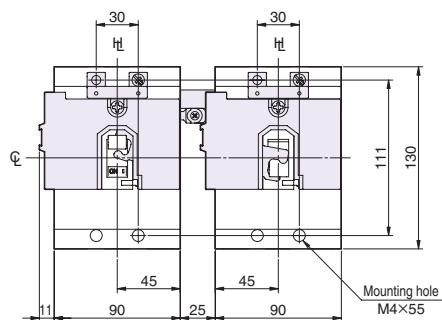
Dimensions, mm

Frame size (A)	Types of MCCBs	Number of poles	Position	Interlock Order codes
160	P160F/N/H/D	3	Right	TPML16SR3N
		4		TPML16SR4N
		3	Left	TPML16SL3N
		4		TPML16SL4N

Notes:

1: The lead wire terminal block cannot be fitted to either side of the left circuit breaker or to the left side of the right circuit breaker.

2: UVT with time-delay cannot be fitted to the left circuit breaker.



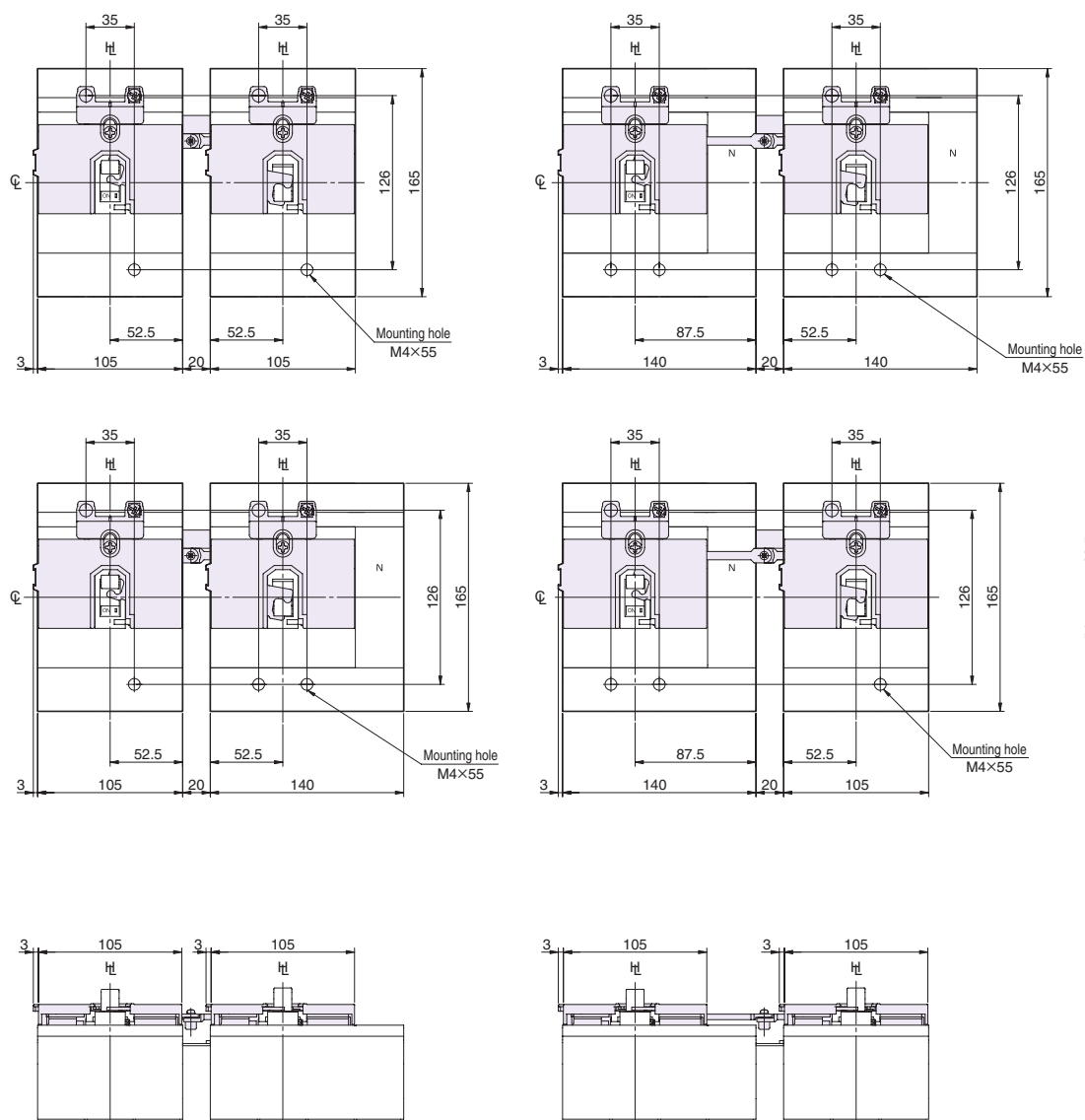
HL : Handle Frame Centre Line
 CL : Handle Centre Line

Dimensions, mm

Frame size (A)	Types of MCCBs	Number of poles	Position	Interlock Order codes
250	P250F/N/H/D	3	Right	TPML25SR3N
		4		TPML25SR4N
		3	Left	TPML25SL3N
		4		TPML25SL4N

Notes:

- 1: The extension bars for front connection cannot be applied due to insufficient insulation distance.
- 2: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.
- 3: UVT with time-delay cannot be fitted to the left circuit breaker.



6

Accessories

Moulded Case Circuit Breakers

3 Externally mounted accessories

HL : Handle Frame Centre Line

CL : Handle Centre Line

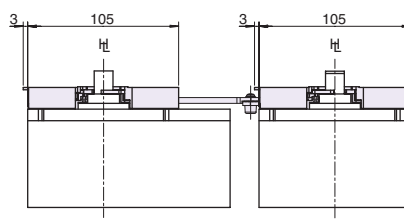
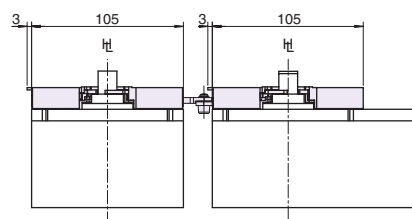
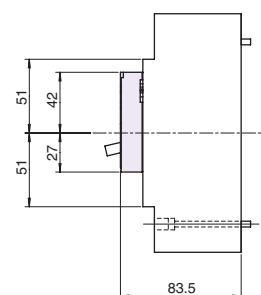
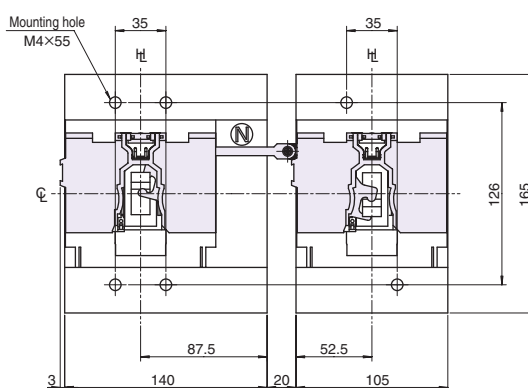
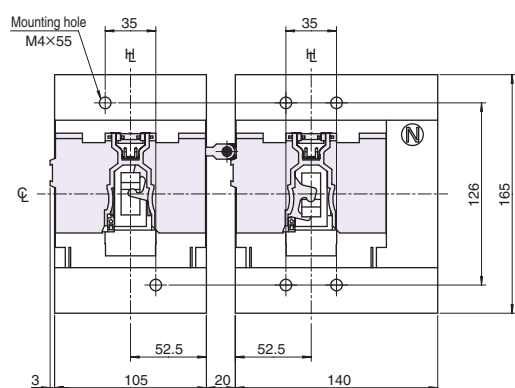
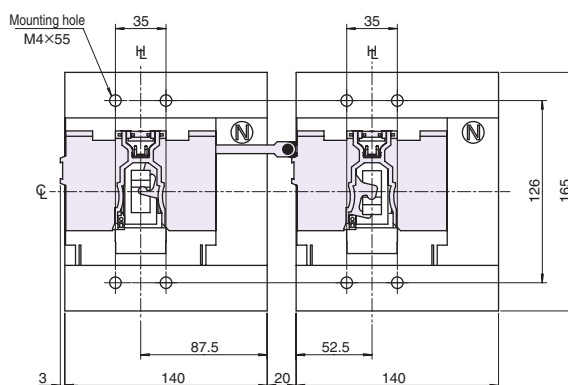
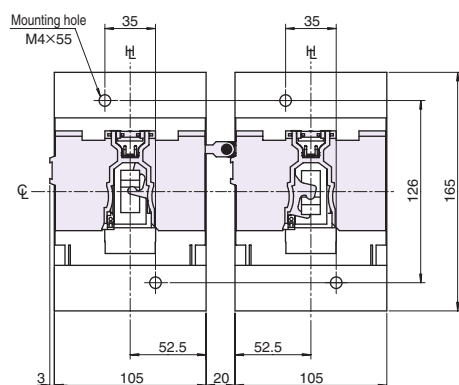
(3) Link Interlock (ML)

Dimensions, mm

Frame size (A)	Types of MCCBs	Number of poles	Position	Interlock Order codes
250	E250-SCF/SCJ/SF/SJ, S250-SN	3	Right	T2ML25LRP
		4		
		3	Left	T2ML25LL3P
		4		

Notes:

- 1: The extension bars for front connection cannot be applied due to insufficient insulation distance.
- 2: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.
- 3: UVT with time-delay cannot be fitted to the left circuit breaker.



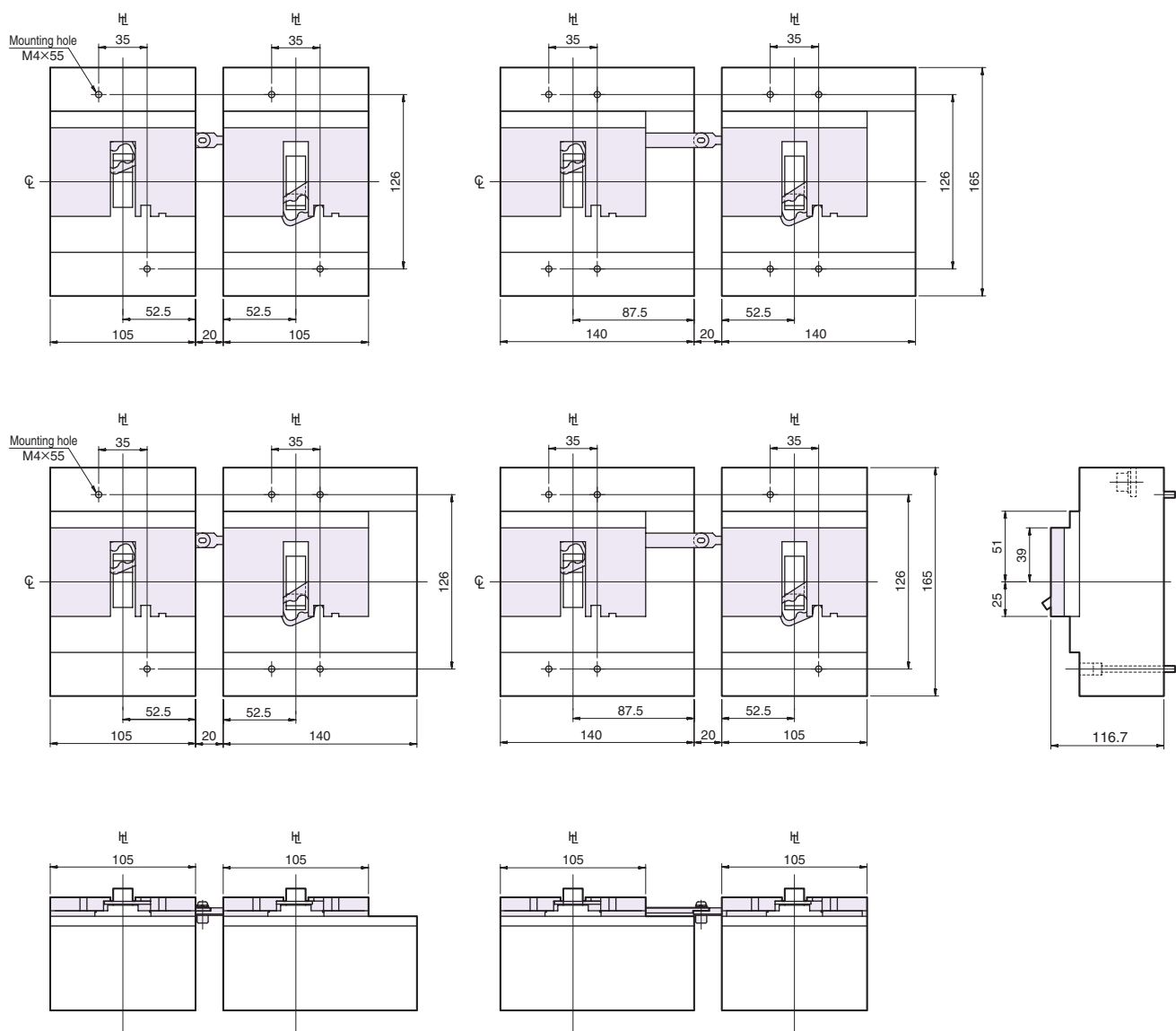
H : Handle Frame Centre Line
 C : Handle Centre Line

Dimensions, mm

Frame size (A)	Types of MCCBs	Number of poles	Position	Interlock Order codes
125, 160, 250	H125-NJ, H160-NJ, H250-NJ/NE, L125-NJ, L125-PJ, L160-NJ, L250-NJ	3	Right	T2ML25RP
		4		
		3	Left	T2ML25L3P
		4		T2ML25L4P

Notes:

- 1: The extension bars for front connection cannot be applied due to insufficient insulation distance.
- 2: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.
- 3: UVT with time-delay cannot be fitted to the left circuit breaker.



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Accessories

Moulded Case Circuit Breakers

3 Externally mounted accessories

HL : Handle Frame Centre Line

CL : Handle Centre Line

(3) Link Interlock (ML)

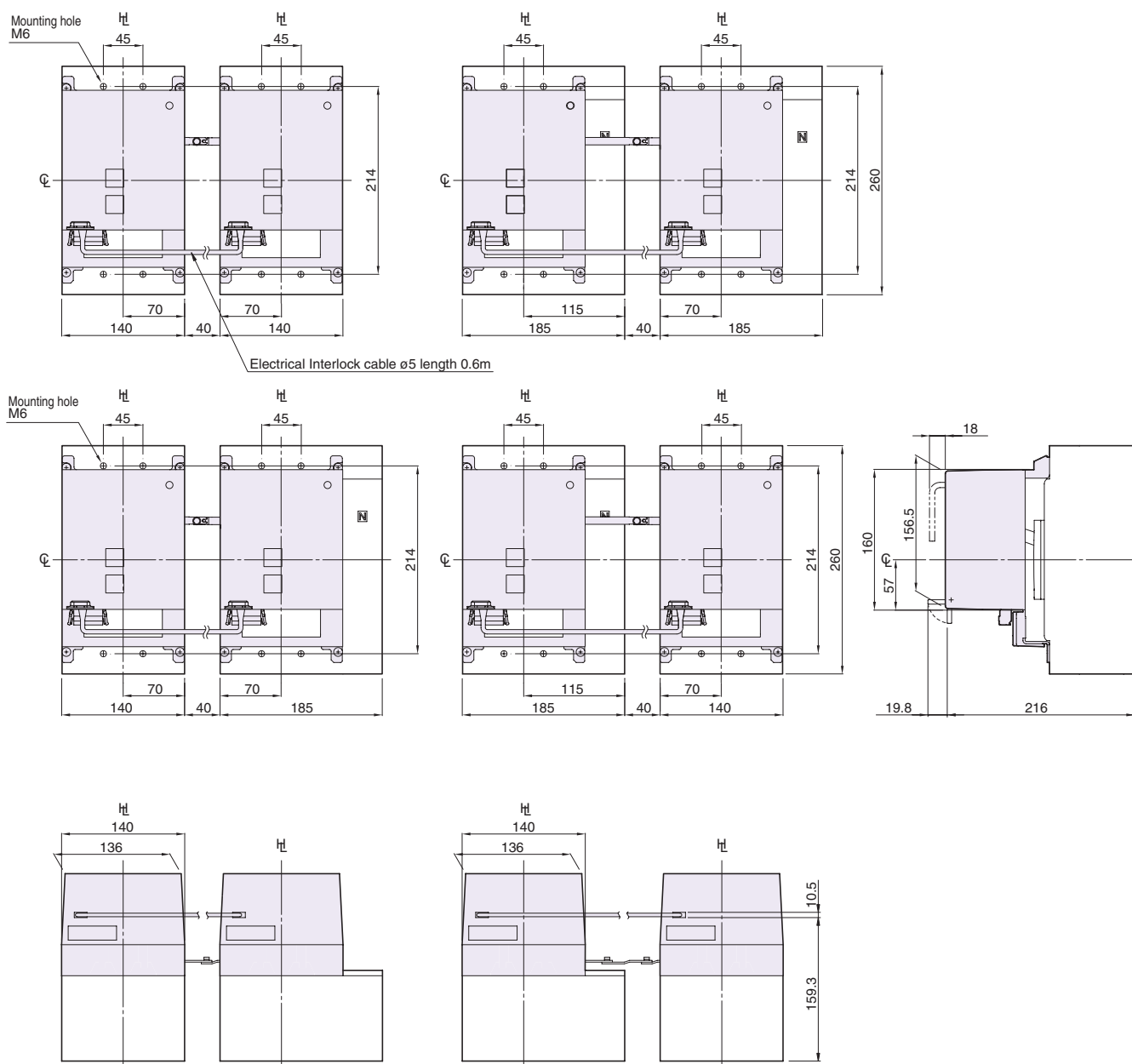
With motor operators

Dimensions, mm

Frame size (A)	Types of MCCBs	Number of poles	Position	Interlock Order codes
400, 630	P400E/F/N/H/S/D, P630E/F/N/H/S/D	3	Right	Factory-installed
		4		
		3	Left	
		4		

Notes:

- 1: The extension bars for front connection cannot be applied due to insufficient insulation distance.
- 2: Due to space limitations between the circuit breakers, the lead wire terminal block can only be fitted to either the right side of the left breaker or the left side of the right breaker.
- 3: Terminal covers cannot be fitted because they would interfere with each other.
- 4: The 400AF to 630AF link type interlock are only available with either the motor operator or external operating handle.
- 5: The interlock device is shipped installed to the breaker.



HL : Handle Frame Centre Line
CL : Handle Centre Line

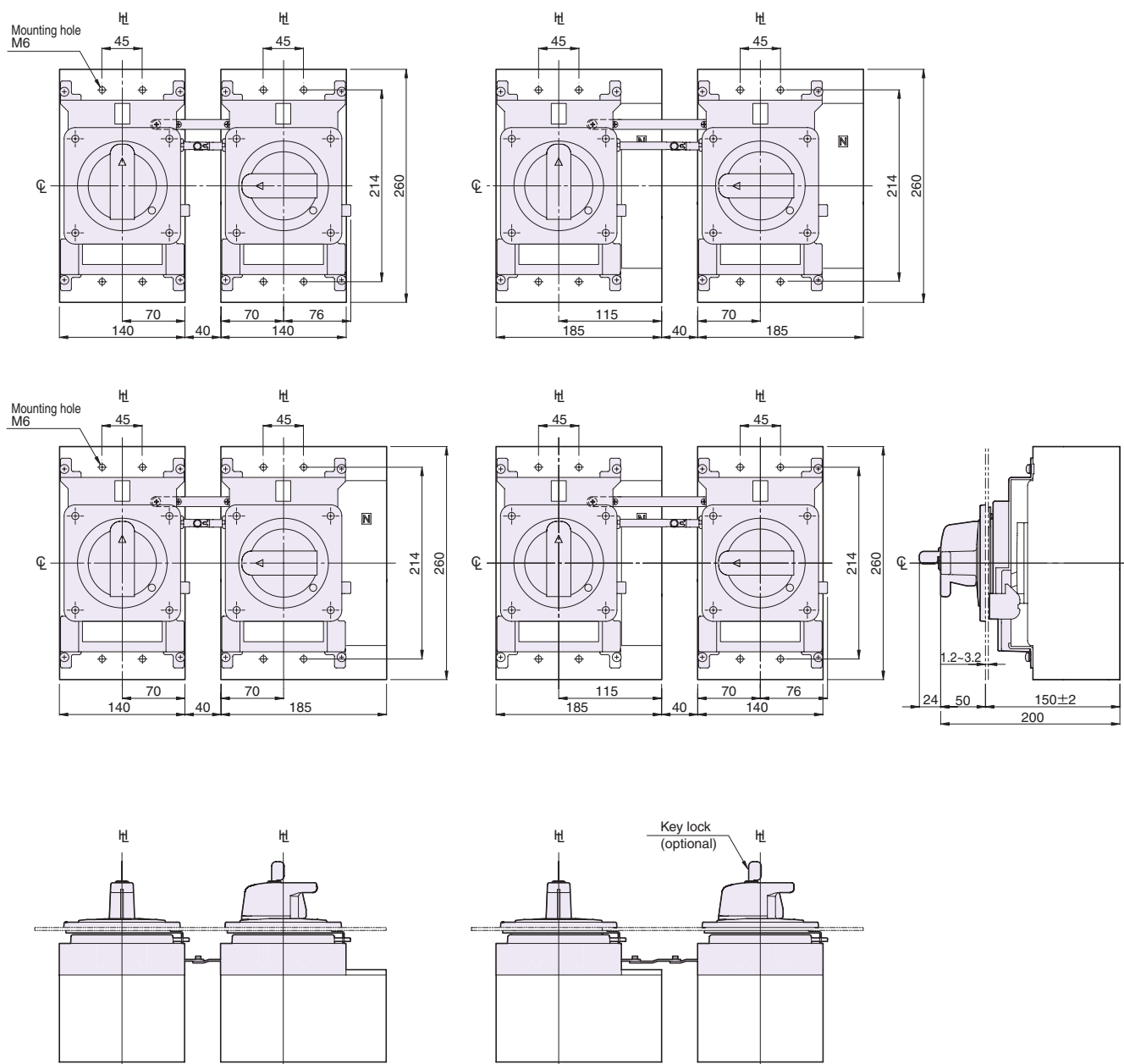
With external operating handle

Dimensions, mm

Frame size (A)	Types of MCCBs	Number of poles	Position	Interlock Order codes
400, 630	P400E/F/N/H/S/D, P630E/F/N/H/S/D	3	Right	Factory-installed
		4		
		3	Left	
		4		

Notes:

- 1: The extension bars for front connection cannot be applied due to insufficient insulation distance.
- 2: Due to space limitations between the circuit breakers, the lead wire terminal block can only be fitted to either the right side of the left breaker or the left side of the right breaker.
- 3: Terminal covers cannot be fitted because they would interfere with each other.
- 4: The 400AF to 630AF link type interlock are only available with either the motor operator or external operating handle.
- 5: The interlock device is shipped installed to the breaker. The external operating handle is supplied separately.



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Accessories

Moulded Case Circuit Breakers

3 Externally mounted accessories

HL : Handle Frame Centre Line

CL : Handle Centre Line

(3) Link Interlock (ML)

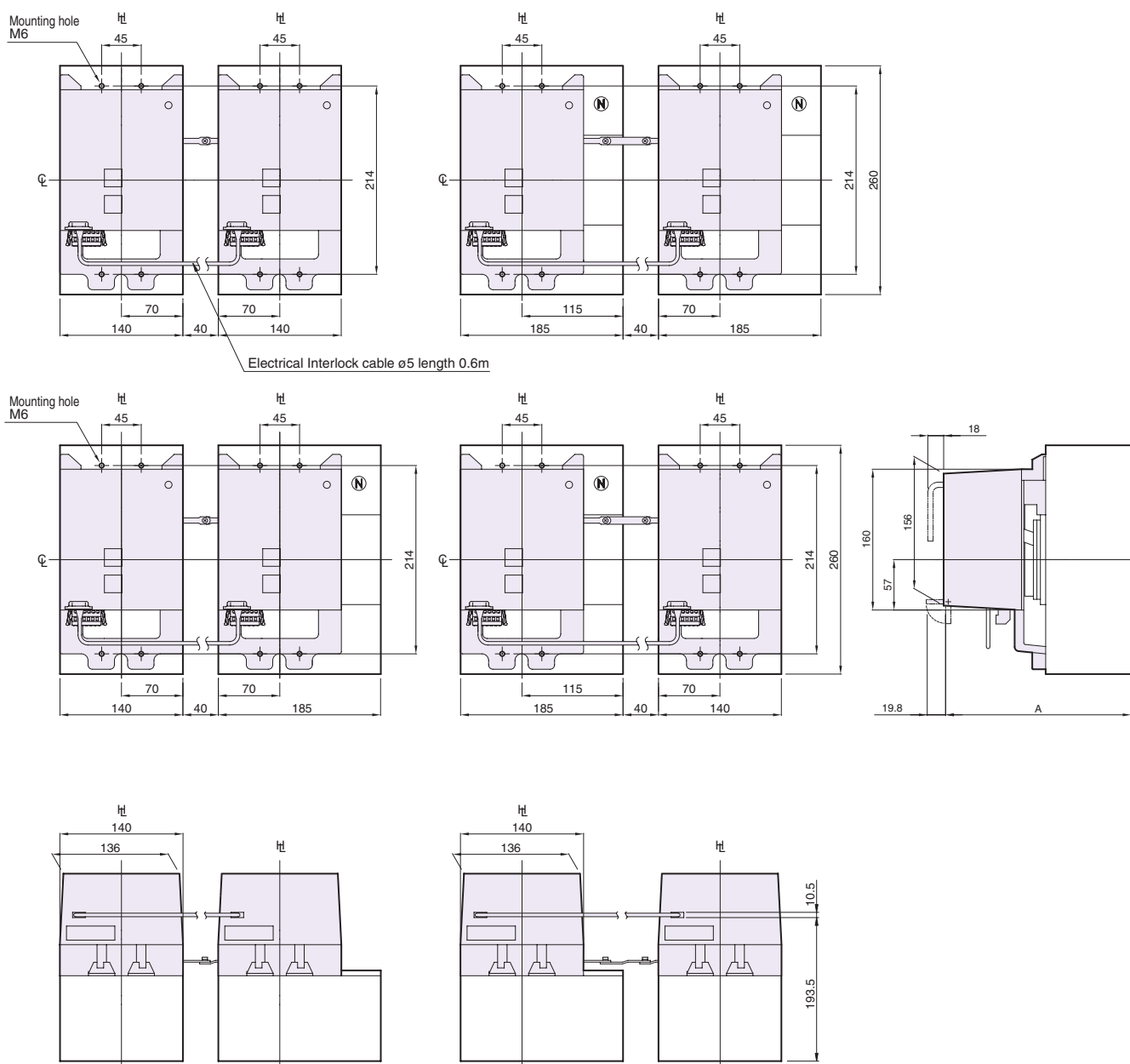
With motor operators

Dimensions, mm

Frame size (A)	Types of MCCBs	Number of poles	Position	Interlock Order codes	A (mm)
400	H400-NE, L400-NE, L400-PE	3	Right	Factory-installed	250
		4			
		3	Left		
		4			

Notes:

- 1: The extension bars for front connection cannot be applied due to insufficient insulation distance.
- 2: Due to space limitations between the circuit breakers, the lead wire terminal block can only be fitted to either the right side of the left breaker or the left side of the right breaker.
- 3: Terminal covers cannot be fitted because they would interfere with each other.
- 4: The 400AF link type interlock is only available with either the motor operator or external operating handle.
- 5: The interlock device is shipped installed to the breaker.



HL : Handle Frame Centre Line
CL : Handle Centre Line

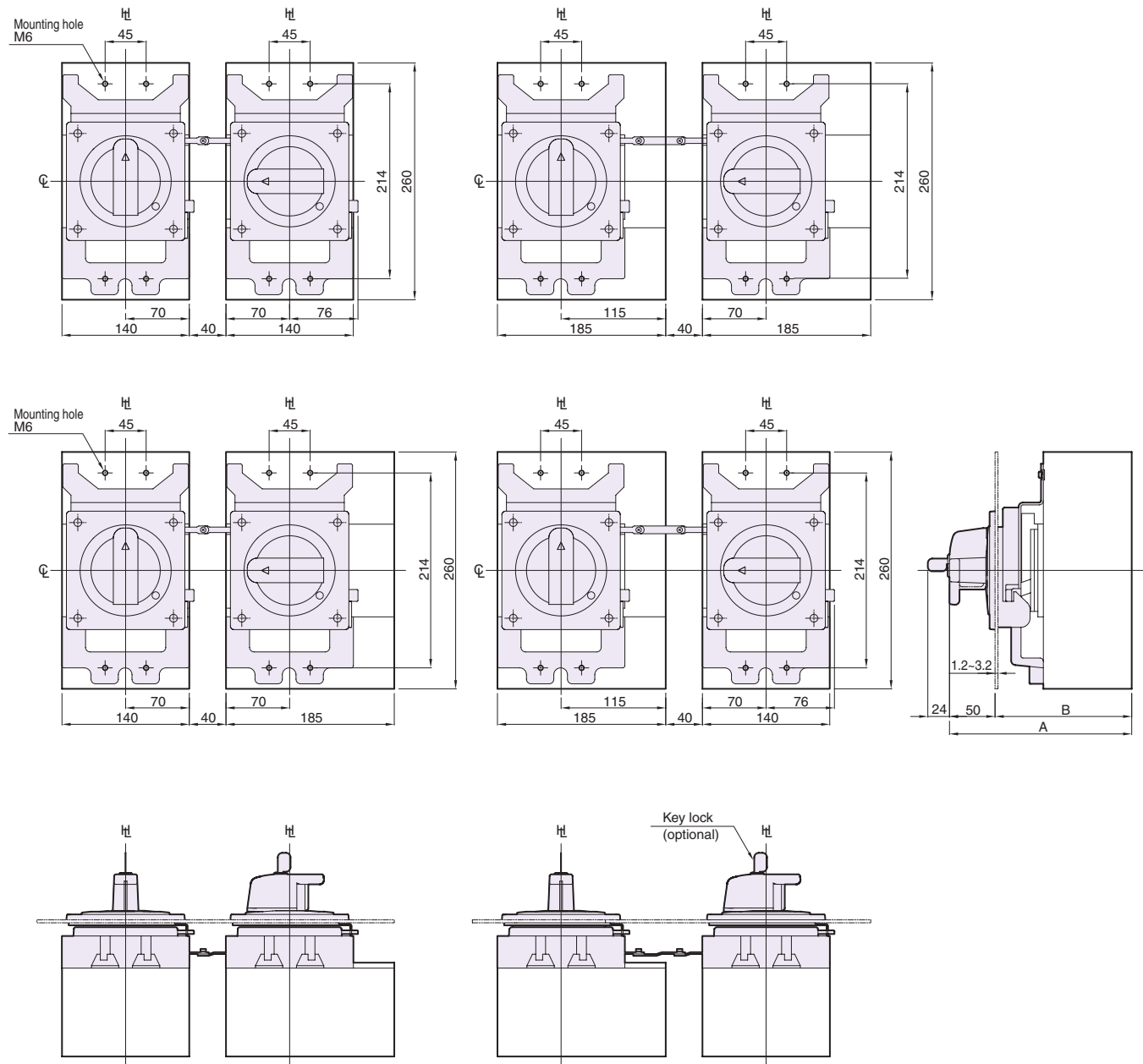
With external operating handle

Dimensions, mm

Frame size (A)	Types of MCCBs	Number of poles	Position	Interlock Order codes	A (mm)	B (mm)
400	H400-NE, L400-NE, L400-PE	3	Right	Factory-installed	237	187±2
		4				
		3	Left			
		4				

Notes:

- 1: The extension bars for front connection cannot be applied due to insufficient insulation distance.
- 2: Due to space limitations between the circuit breakers, the lead wire terminal block can only be fitted to either the right side of the left breaker or the left side of the right breaker.
- 3: Terminal covers cannot be fitted because they would interfere with each other.
- 4: The 400AF link type interlock is only available with either the motor operator or external operating handle.
- 5: The interlock device is shipped installed to the breaker. The external operating handle is supplied separately.



6

Accessories

Moulded Case Circuit Breakers

3 Externally mounted accessories

HL : Handle Frame Centre Line

CL : Handle Centre Line

(3) Link Interlock (ML)

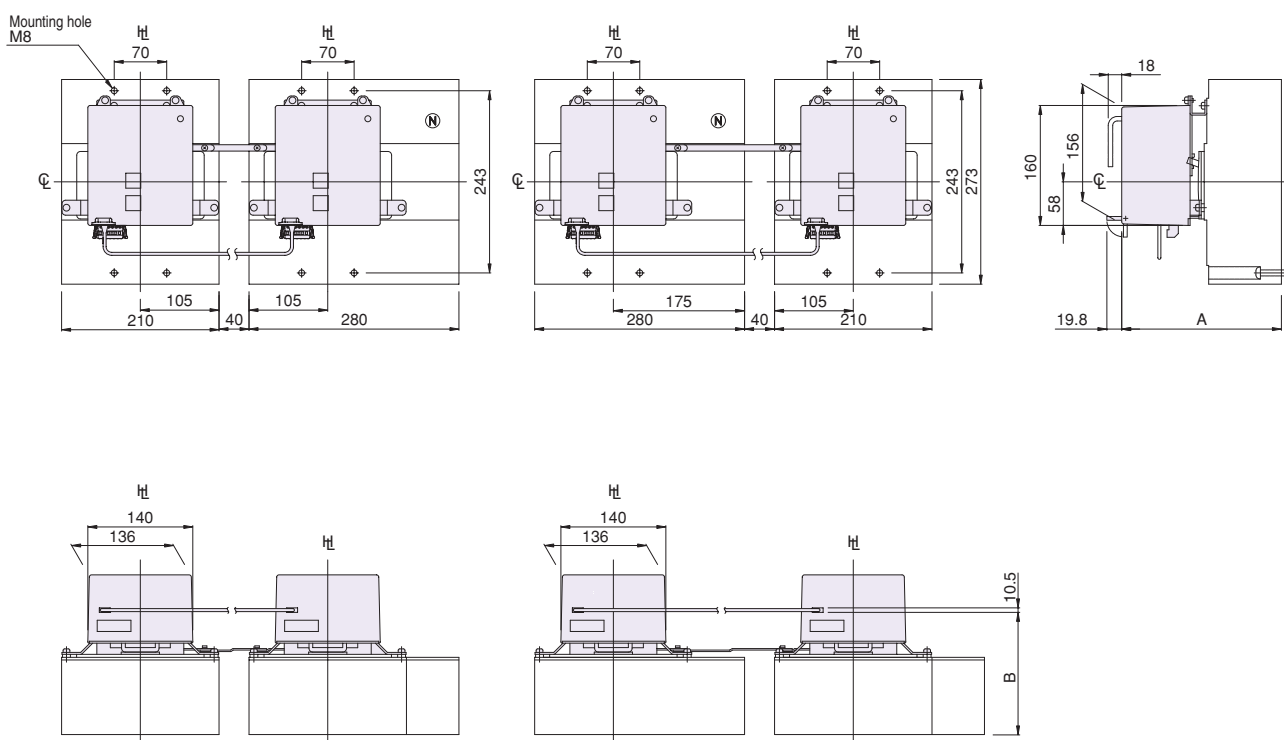
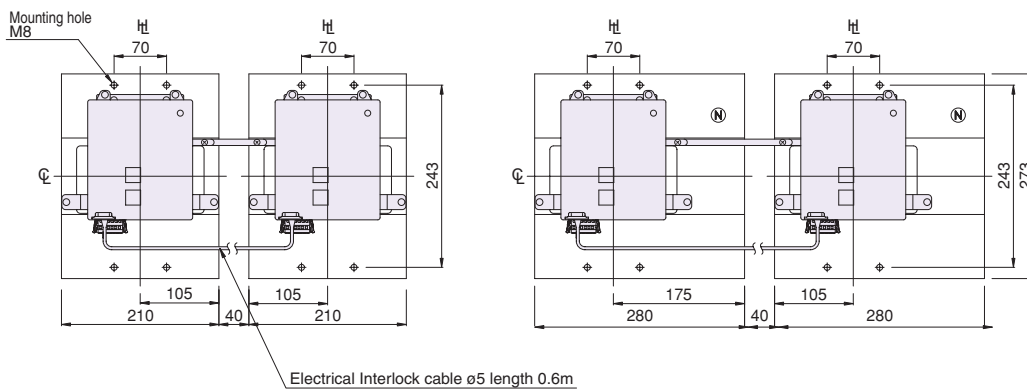
With motor operators

Dimensions, mm

Frame size (A)	Types of MCCBs	Number of poles	Position	Interlock Order codes	A (mm)	B (mm)
800, 1000	S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN	3	Right	Factory-installed	213	156.5
		4				
		3	Left			
		4				
	H800-NE, L800-NE, L800-PE	3	Right	Factory-installed	250	193.5
		4				
		3	Left			
		4				

Notes:

- 1: Due to space limitations between the circuit breakers, the lead wire terminal block can only be fitted to either the right side of the left breaker or the left side of the right breaker.
- 2: The 800AF to 1000AF link type interlock are only available with the motor operator or external operating handle.
- 3: The interlock device is shipped installed to the breaker.



HL : Handle Frame Centre Line
 CL : Handle Centre Line

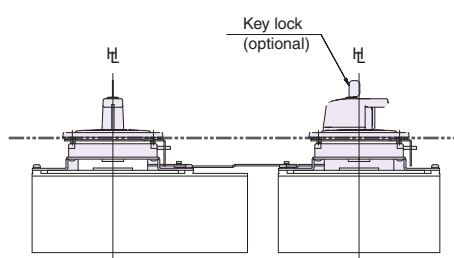
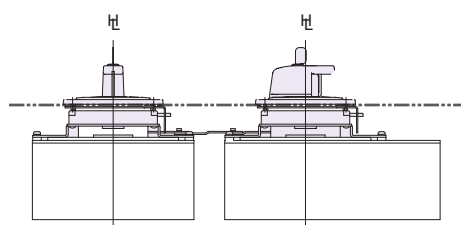
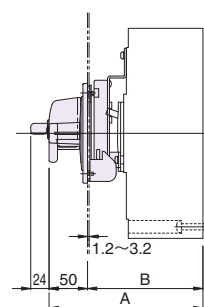
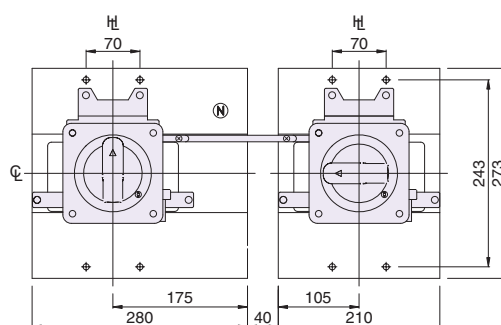
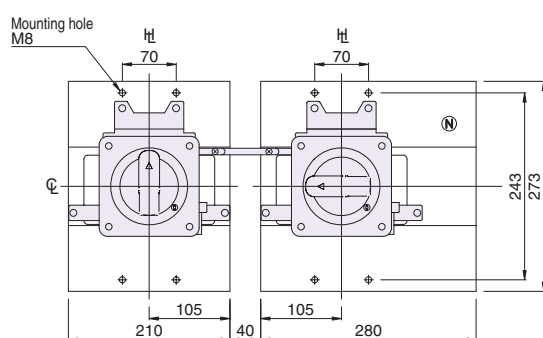
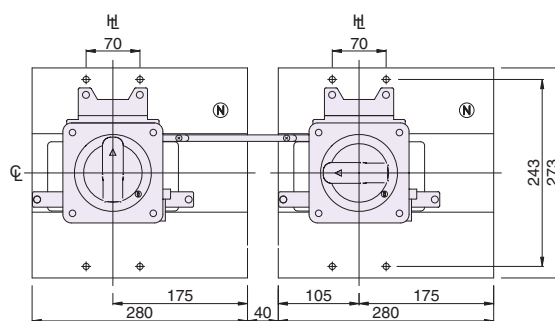
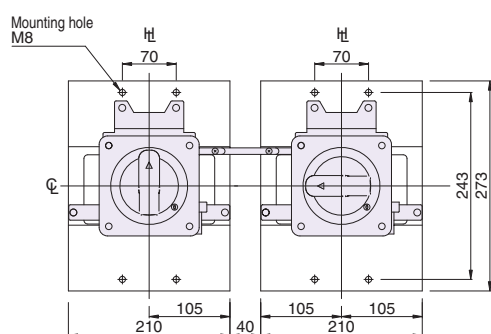
With external operating handle

Dimensions, mm

Frame size (A)	Types of MCCBs	Number of poles	Position	Interlock Order codes	A (mm)	B (mm)
800, 1000	S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN	3	Right	Factory-installed	200	150
		4				
		3	Left			
		4				
	H800-NE, L800-NE, L800-PE	3	Right	Factory-installed	237	187
		4				
		3	Left			
		4				

Notes:

- 1: Due to space limitations between the circuit breakers, the lead wire terminal block can only be fitted to either the right side of the left breaker or the left side of the right breaker.
- 2: The 800AF to 1000AF link type interlock are only available with either the motor operator or external operating handle.
- 3: The interlock device is shipped installed to the breaker. The external operating handle is supplied separately.



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Accessories

Moulded Case Circuit Breakers

3 Externally mounted accessories

5. Mechanical interlock

HL : Handle Frame Centre Line

CL : Handle Centre Line

(4) Wire interlock (MW)

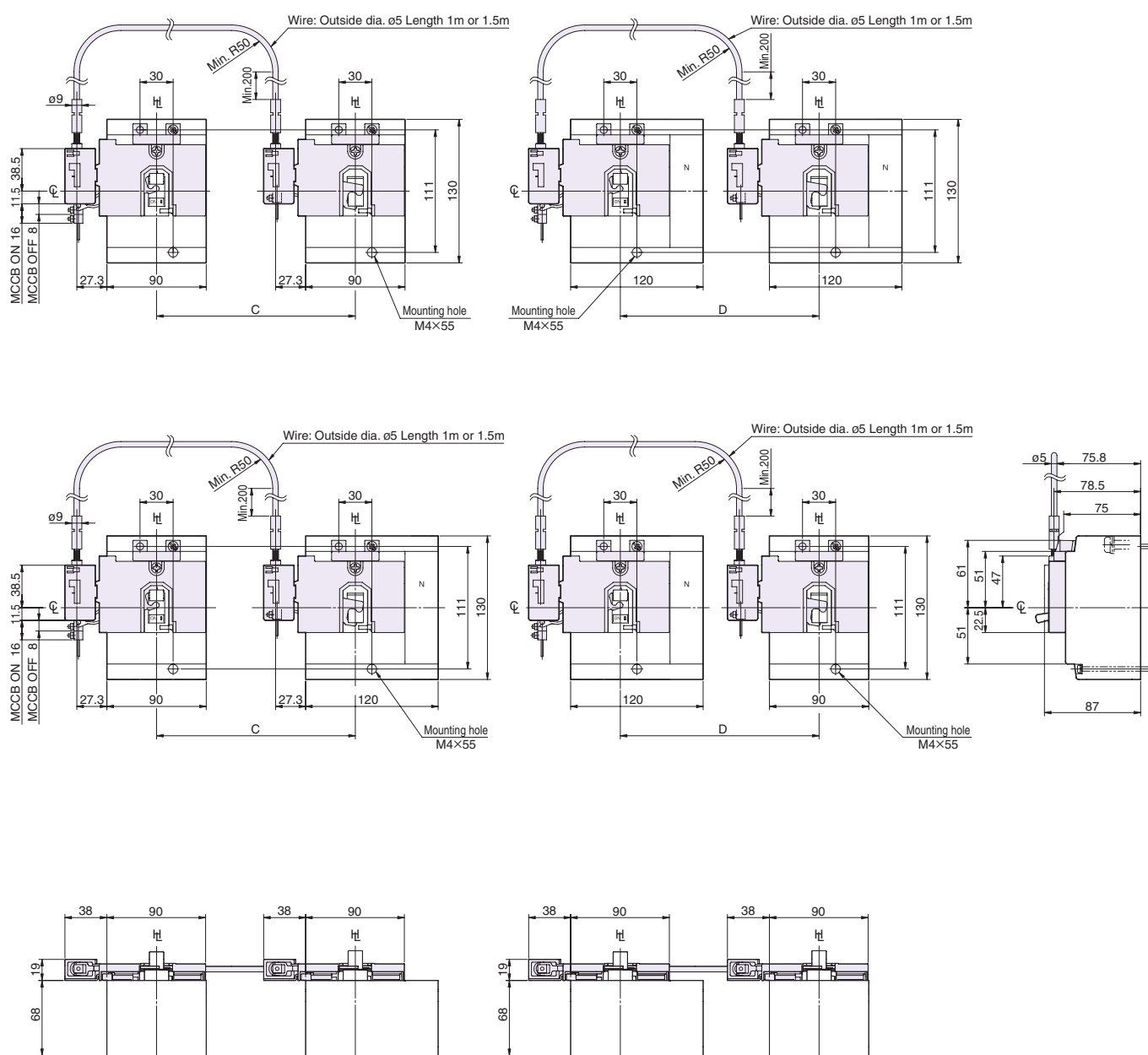
A type that interlocks the left and right circuit breakers with a wire. It is possible to interlock between circuit breakers of different sizes.

Dimensions, mm

Frame size (A)	Types of MCCBs	Interlock Order codes	Interlock wire order codes (length)	C (mm)	D (mm)
160	P160F/N/H/D	TPMW16SCN	TPMW00S(1m)	140min.-480max.	170min.-480max.
			TPMW00L(1.5m)	140min.-980max.	170min.-980max.

Note:

1: The lead wire terminal block cannot be fitted to the left side of the circuit breaker because it would interfere with the interlock device.



Ⓢ : Handle Centre Line

Frame size (A)	Types of MCCBs	Interlock Order codes
250	P250F/N/H/D	TPMW25SCN

Interlock wire order codes (length)	C (mm)	D (mm)
TPMW00S(1m)	155min.-480max.	180min.-480max.
TPMW00L(1.5m)	155min.-980max.	180min.-980max.

1: The lead wire terminal block cannot be fitted to the left side of the circuit breaker because it would interfere with the interlock device.



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Accessories

Moulded Case Circuit Breakers

3 Externally mounted accessories

HL : Handle Frame Centre Line

CL : Handle Centre Line

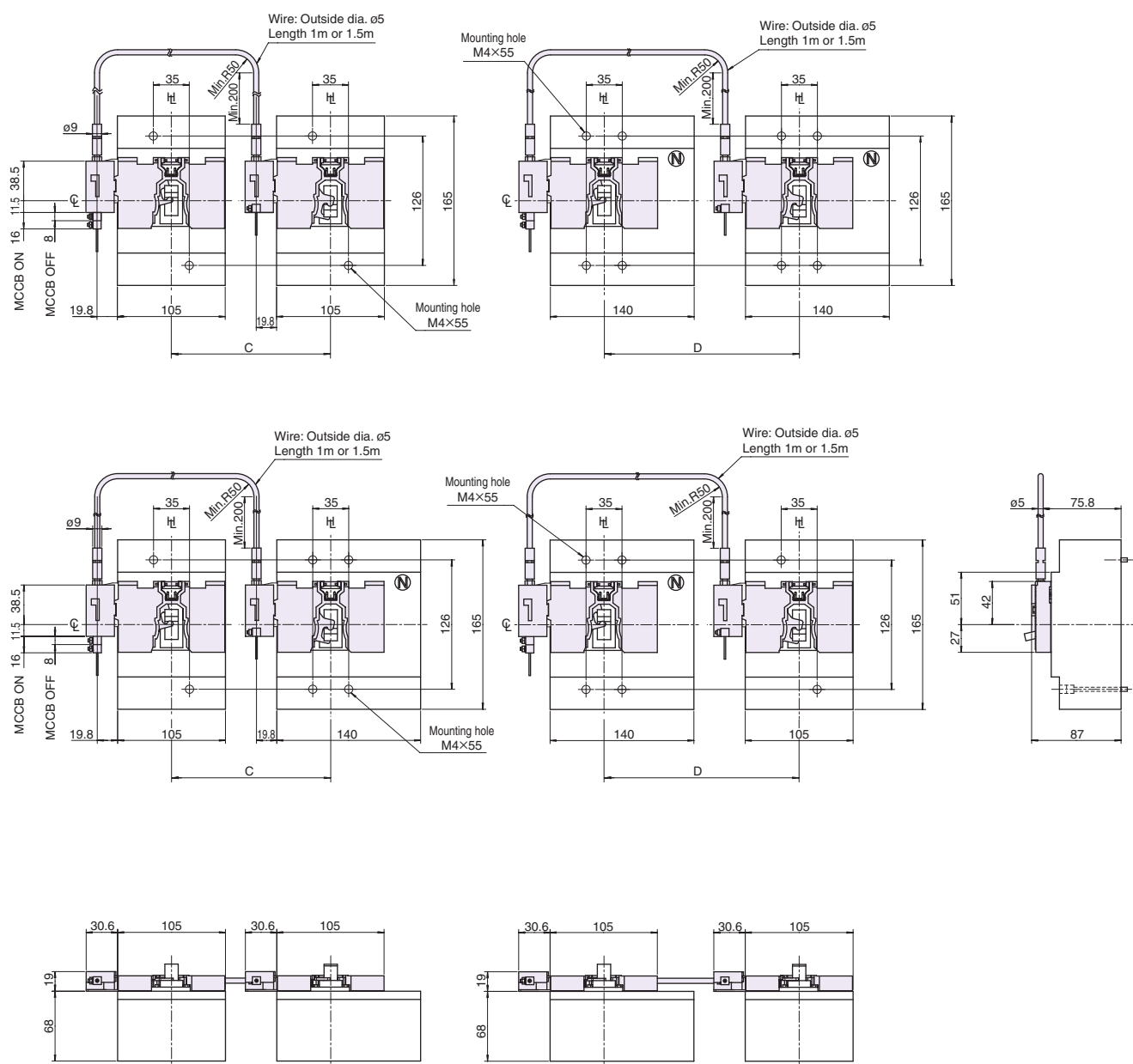
(4) Wire interlock (MW)

Dimensions, mm

Frame size (A)	Types of MCCBs	Interlock Order codes	Interlock wire order codes (length)	C (mm)	D (mm)
250	E250-SCF/SCJ/SF/SJ, S250-SN	T2MW25LCP	T2MW00S(1m)	155min.-480max.	180min.-480max.
			T2MW00L(1.5m)	155min.-980max.	180min.-980max.

Note:

1: The lead wire terminal block cannot be fitted to the left side of the circuit breaker because it would interfere with the interlock device.



℄ : Handle Centre Line

Frame size (A)	Types of MCCBs	Interlock Order codes	Interlock wire order codes (length)	C (mm)	D (mm)
125, 160, 250	H125-NJ, H160-NJ, H250-NJ/NE, L125-NJ, L125-PJ, L160-NJ, L250-NJ	T2MW25CP	T2MW00S(1m)	155min.-480max.	180min.-480max.
			T2MW00L(1.5m)	155min.-980max.	180min.-980max.

1: The lead wire terminal block cannot be fitted to the left side of the circuit breaker because it would interfere with the interlock device.



Accessories

3 Externally mounted accessories

℄ : Handle Centre Line

With motor operators

Frame size (A)	Types of MCCBs	Interlock Order codes
400, 630	P400E/F/N/H/S/D, P630E/F/N/H/S/D	Factory-installed

Interlock wire order codes (length)	C (mm)	D (mm)
TPMW00S(1m)	180min.-430max.	225min.-430max.
TPMW00L(1.5m)	180min.-930max.	225min.-930max.

- 1: The lead wire terminal block cannot be fitted to the left side of the circuit breaker because it would interfere with the interlock device.
- 2: The 400AF to 630AF Wire interlock are only available with either the motor operator or external operating handle.
- 3: The interlock device is shipped installed to the breaker.



HL : Handle Frame Centre Line
 CL : Handle Centre Line

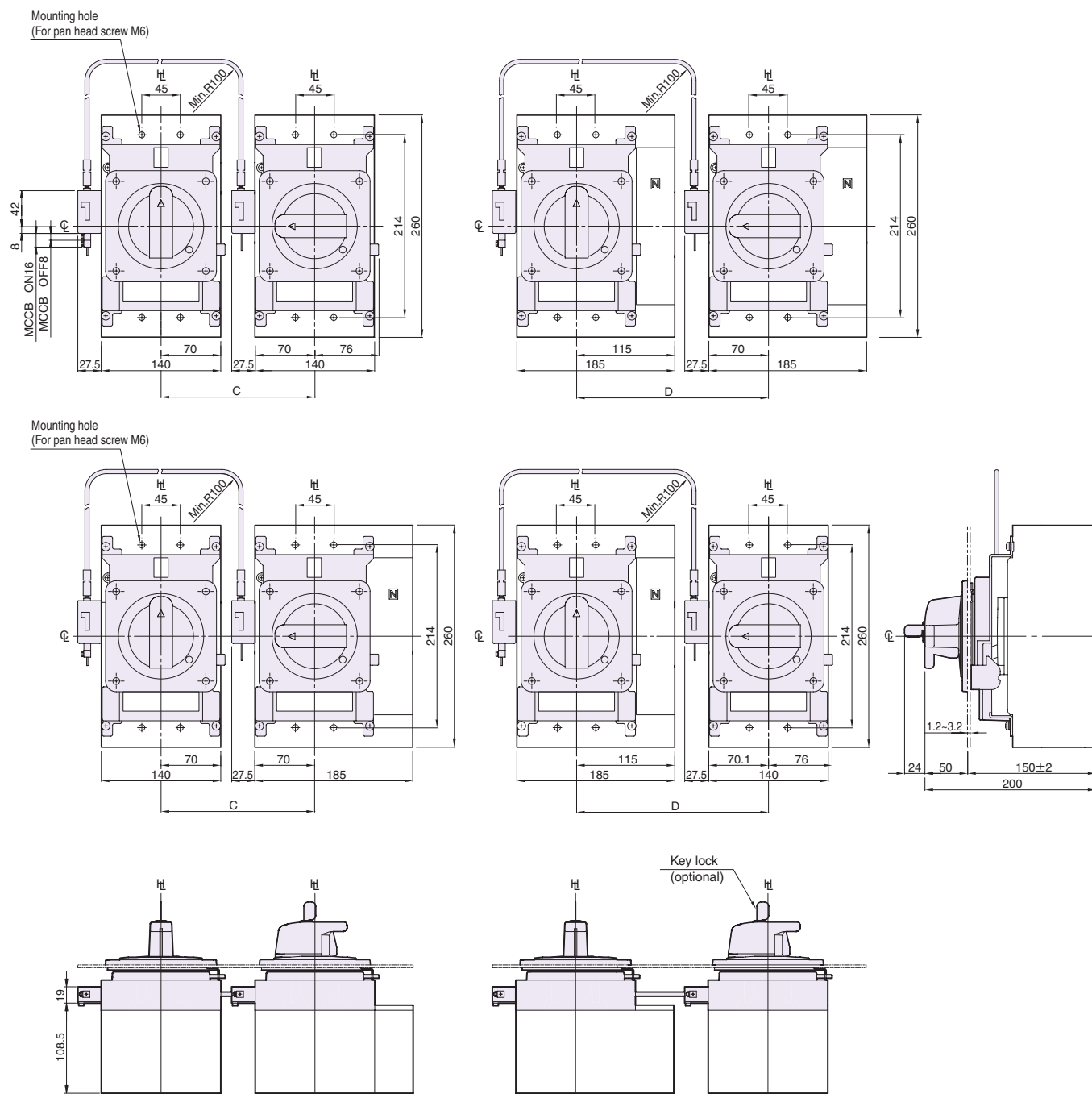
With external operating handle

Dimensions, mm

Frame size (A)	Types of MCCBs	Interlock Order codes	Interlock wire order codes (length)	C (mm)	D (mm)
400, 630	P400E/F/N/H/S/D, P630E/F/N/H/S/D	Factory-installed	TPMW00S(1m)	180min.-430max.	225min.-430max.
			TPMW00L(1.5m)	180min.-930max.	225min.-930max.

Notes:

- 1: The lead wire terminal block cannot be fitted to the left side of the circuit breaker because it would interfere with the interlock device.
- 2: The 400AF to 630AF Wire interlock are only available with either the motor operator or external operating handle.
- 3: The interlock device is shipped installed to the breaker. The external operating handle is supplied separately.



6

Accessories

Moulded Case Circuit Breakers

3 Externally mounted accessories

HL : Handle Frame Centre Line

CL : Handle Centre Line

(4) Wire interlock (MW)

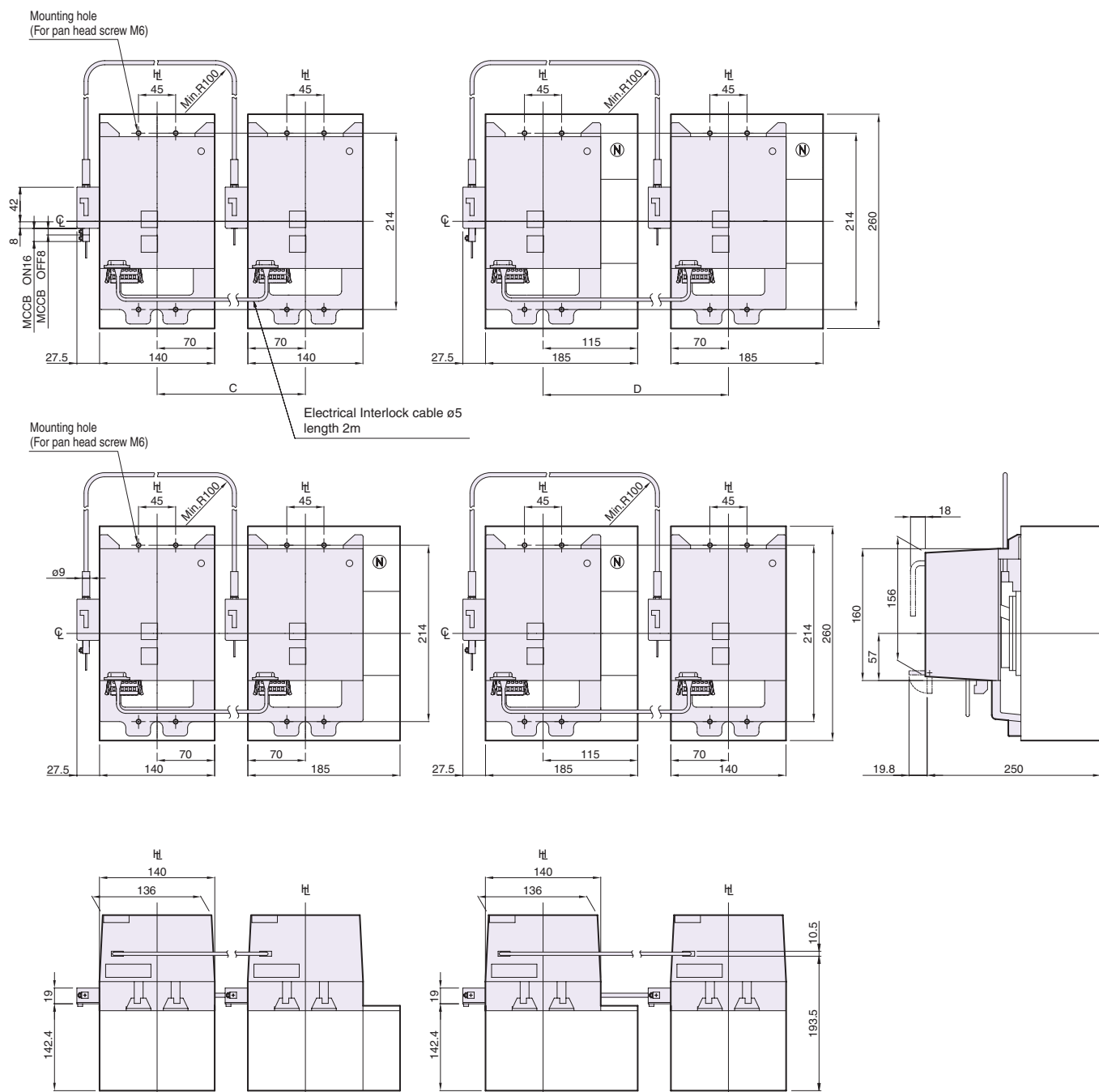
With motor operators

Dimensions, mm

Frame size (A)	Types of MCCBs	Interlock Order codes	Interlock wire order codes (length)	C (mm)	D (mm)
400	H400-NE, L400-NE, L400-PE	Factory-installed	T2MW00S(1m)	180min.-430max.	225min.-430max.
			T2MW00L(1.5m)	180min.-930max.	225min.-930max.

Notes:

- 1: The lead wire terminal block cannot be fitted to the left side of the circuit breaker because it would interfere with the interlock device.
- 2: The 400AF Wire interlock is only available with either the motor operator or external operating handle.
- 3: The interlock device is shipped installed to the breaker.



HL : Handle Frame Centre Line
 CL : Handle Centre Line

With external operating handle

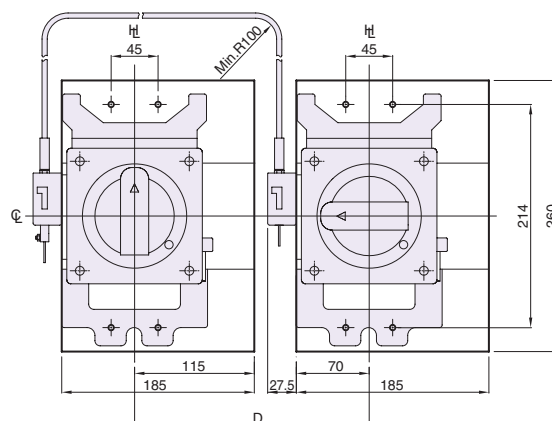
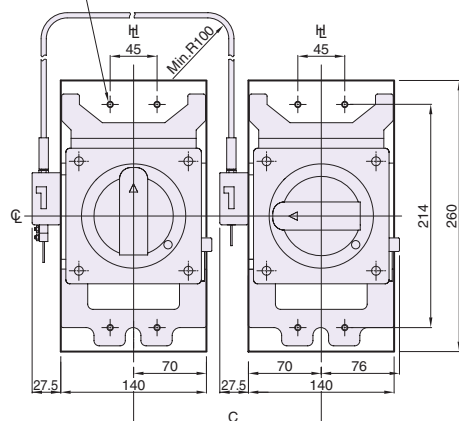
Dimensions, mm

Frame size (A)	Types of MCCBs	Interlock Order codes	Interlock wire order codes (length)	C (mm)	D (mm)
400	H400-NE, L400-NE, L400-PE	Factory-installed	T2MW00S(1m)	180min.-430max.	225min.-430max.
			T2MW00L(1.5m)	180min.-930max.	225min.-930max.

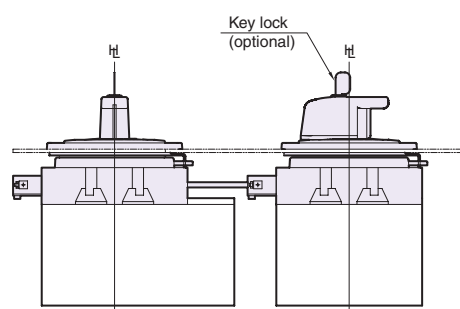
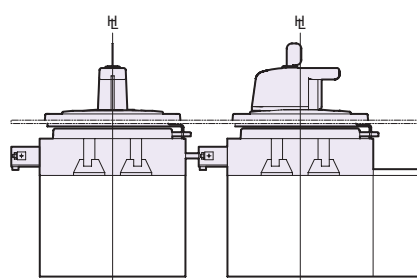
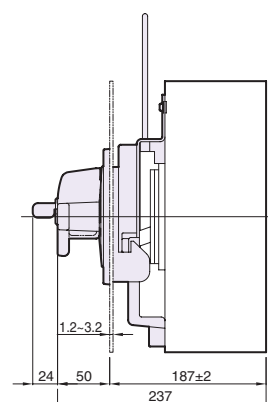
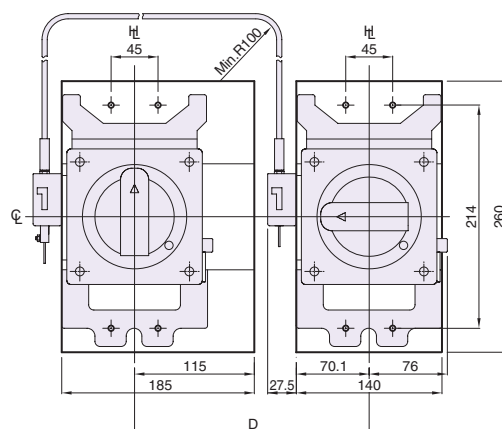
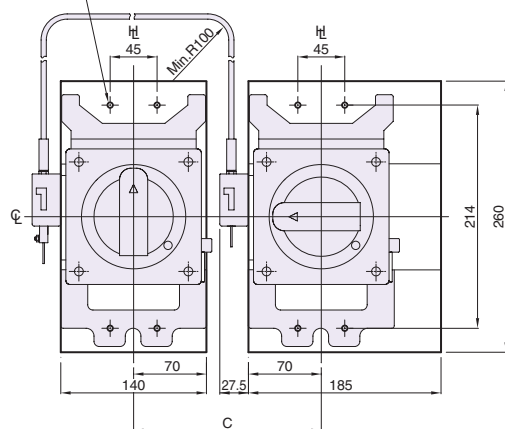
Notes:

- 1: The lead wire terminal block cannot be fitted to the left side of the circuit breaker because it would interfere with the interlock device.
- 2: The 400AF Wire interlock is only available with either the motor operator or external operating handle.
- 3: The interlock device is shipped installed to the breaker. The external operating handle is supplied separately.

Mounting hole
(For pan head screw M6)



Mounting hole
(For pan head screw M6)



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Accessories

Moulded Case Circuit Breakers

3 Externally mounted accessories

HL : Handle Frame Centre Line

CL : Handle Centre Line

(4) Wire interlock (MW)

With motor operators

Dimensions, mm

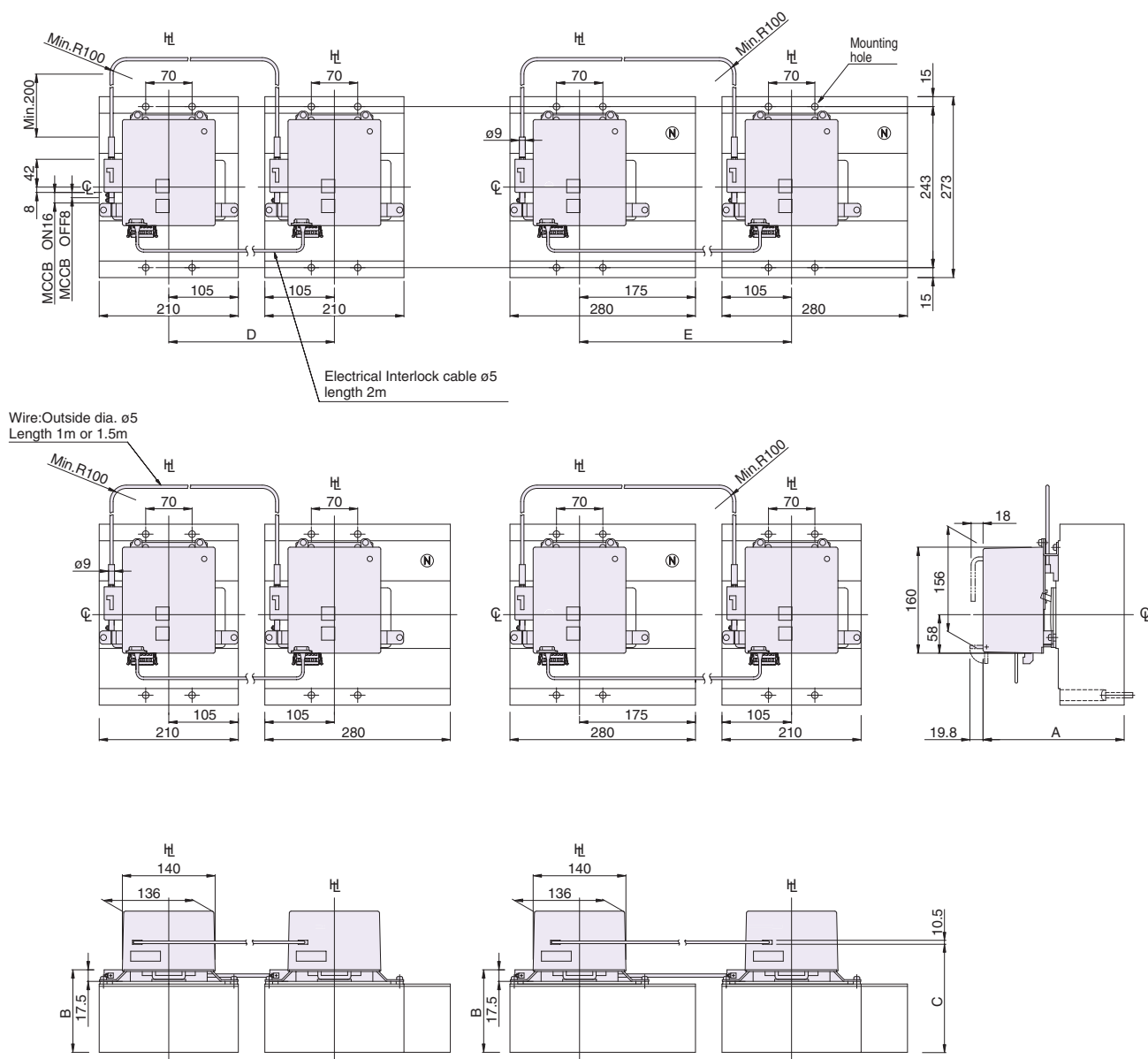
Frame size (A)	Types of MCCBs	Interlock Order codes	A (mm)	B (mm)	C (mm)
800, 1000	S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN	Factory-installed	213	124.5	156.5
	H800-NE, L800-NE, L800-PE	Factory-installed	250	161.5	193.5

Interlock wire order codes (length)	D (mm)	E (mm)
T2MW00S(1m)	250min.-430max.	320min.-430max.
T2MW00L(1.5m)	250min.-930max.	320min.-930max.

Notes:

1: The 800AF to 1000AF Wire interlock are only available with either the motor operator or external operating handle.

2: The interlock device is shipped installed to the breaker.



HL : Handle Frame Centre Line
CL : Handle Centre Line

With external operating handle

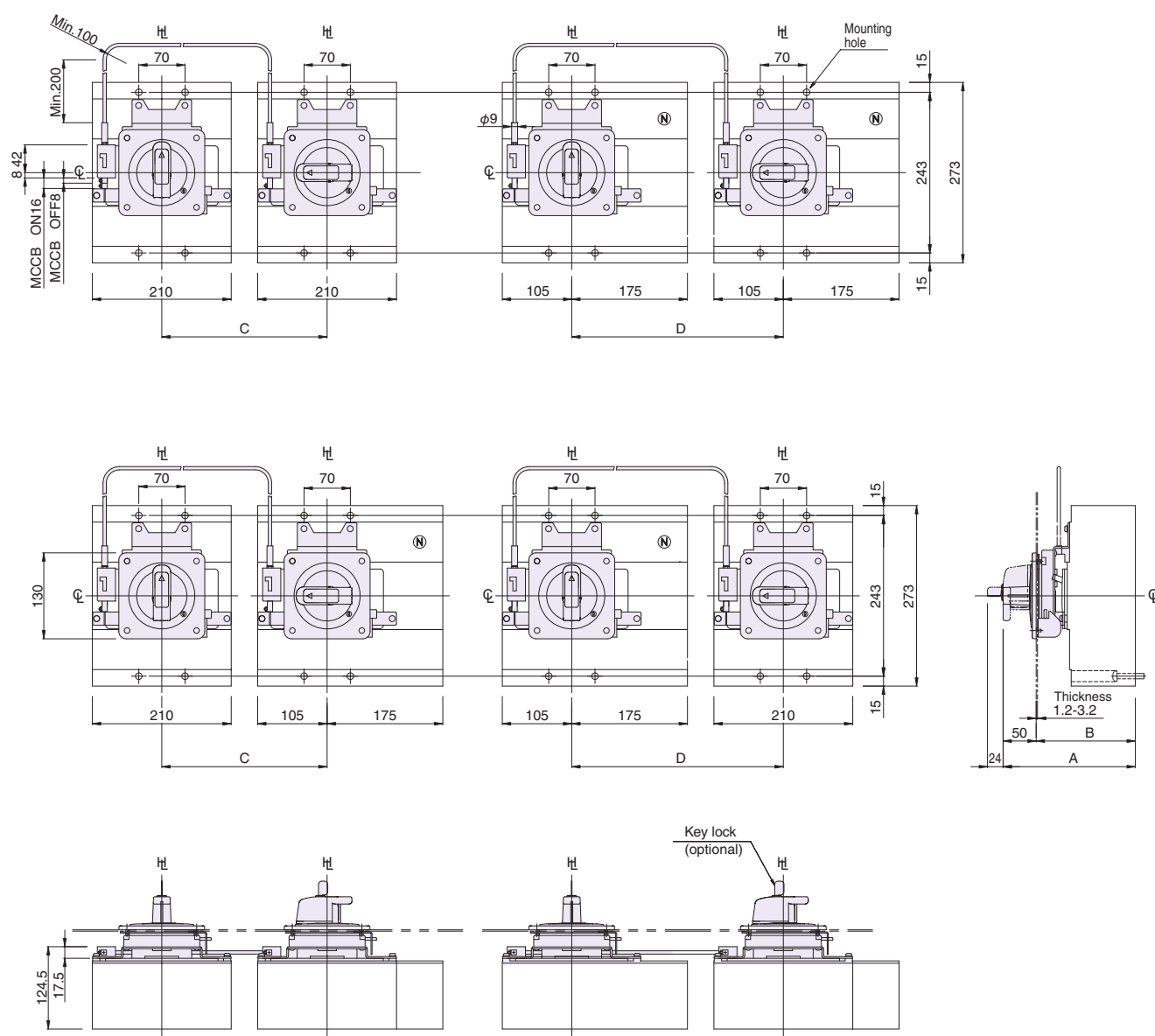
Dimensions, mm

Frame size (A)	Types of MCCBs	Interlock Order codes	A (mm)	B (mm)
800, 1000	S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN	Factory-installed	200	150±2
	H800-NE, L800-NE, L800-PE	Factory-installed	237	187±2

Interlock wire order codes (length)	C (mm)	D (mm)
T2MW00S(1m)	250min.-430max.	320min.-430max.
T2MW00L(1.5m)	250min.-930max.	320min.-930max.

Notes:

- 1: The 800AF to 1000AF Wire interlock are only available with either the motor operator or external operating handle.
- 2: The interlock device is shipped installed to the breaker. The external operating handle is supplied separately.



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Accessories

Moulded Case Circuit Breakers

3 Externally mounted accessories

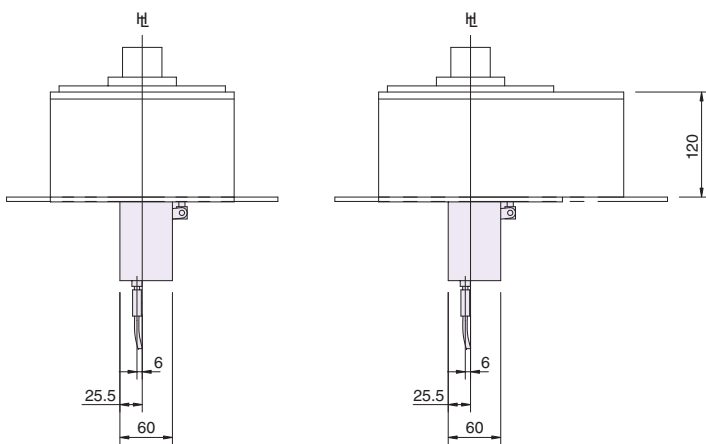
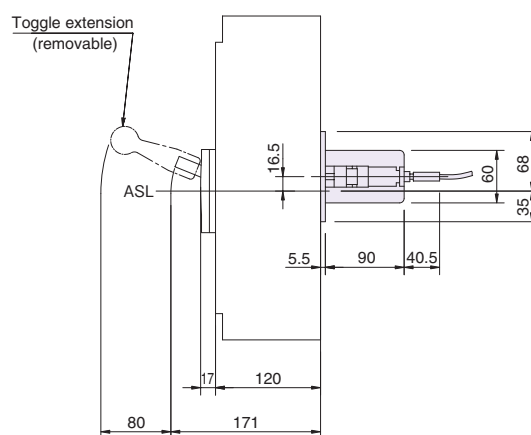
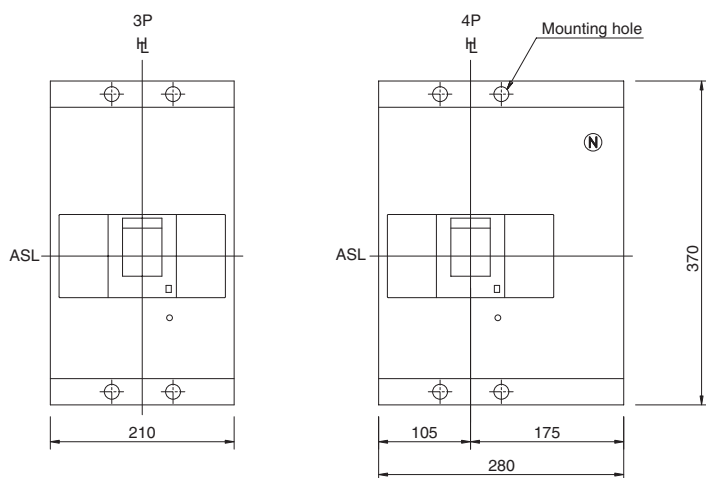
ASL : Arrangement Standard Line

HL : Handle Frame Centre Line

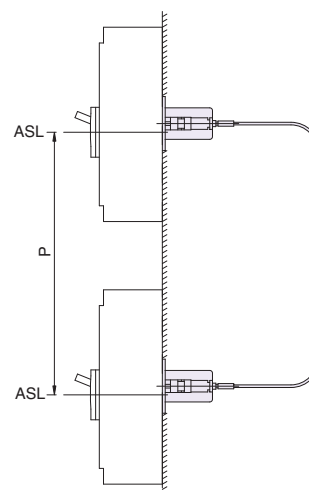
(4) Wire interlock (MW)

Dimensions, mm

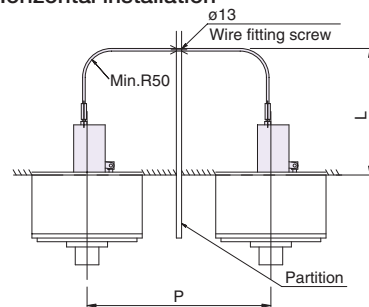
Frame size (A)	Types of MCCBs	Interlock Order codes	Interlock wire order codes (length)	P (mm)	L (mm)
1250	S1250-SE/NE/GE/NN	Factory-installed	1m	650-500-350	450-500-530 ± 30
			1.5m	1000-900-750	550-600-700 ± 30



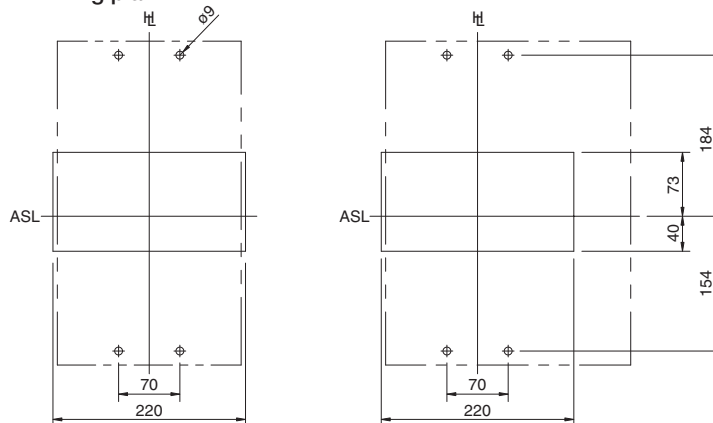
Vertical installation



Horizontal installation



Drilling plan

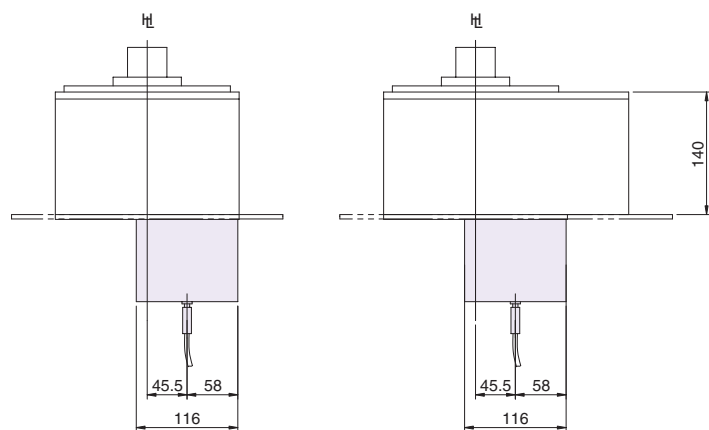
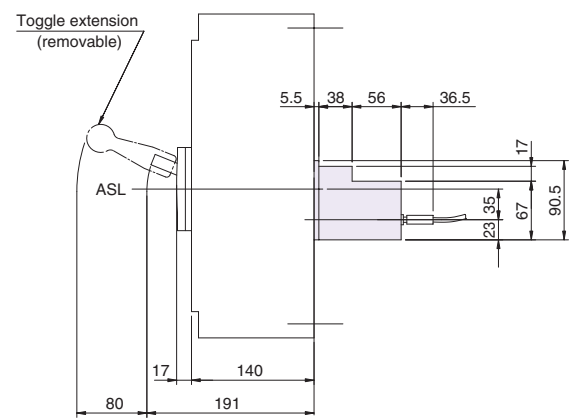
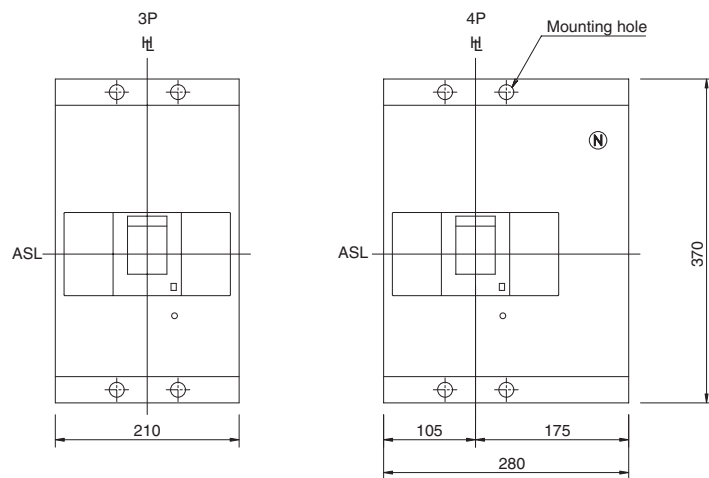


ASL : Arrangement Standard Line
 H_L : Handle Frame Centre Line

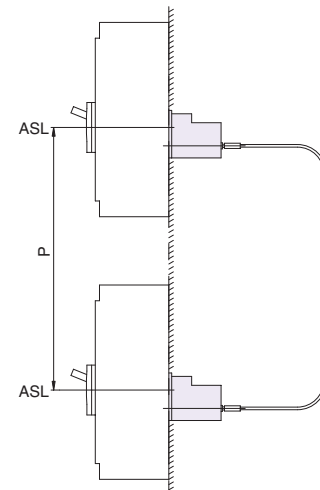
Dimensions, mm

Frame size (A)	Types of MCCBs	Interlock Order codes
1600	S1600-SE/NE/NN	Factory-installed

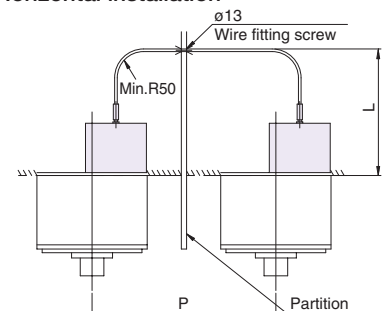
Interlock wire order codes (length)	P (mm)	L (mm)
1m	650-500-350	450-500-530 ± 30
1.5m	1000-900-750	550-600-700 ± 30



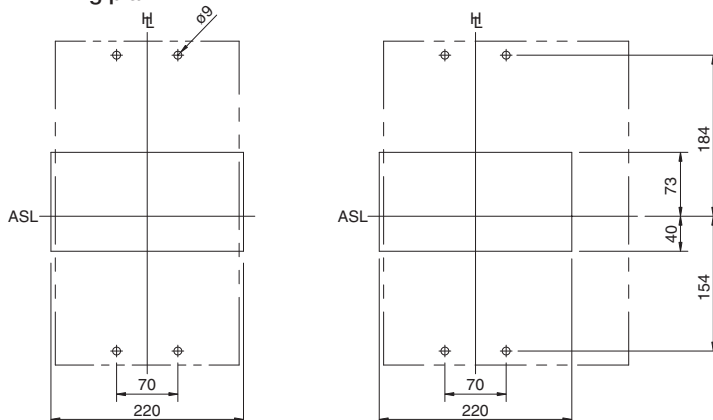
Vertical installation



Horizontal installation



Drilling plan



6. 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)

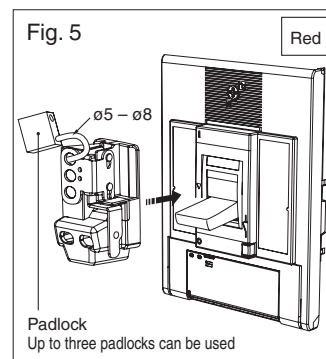
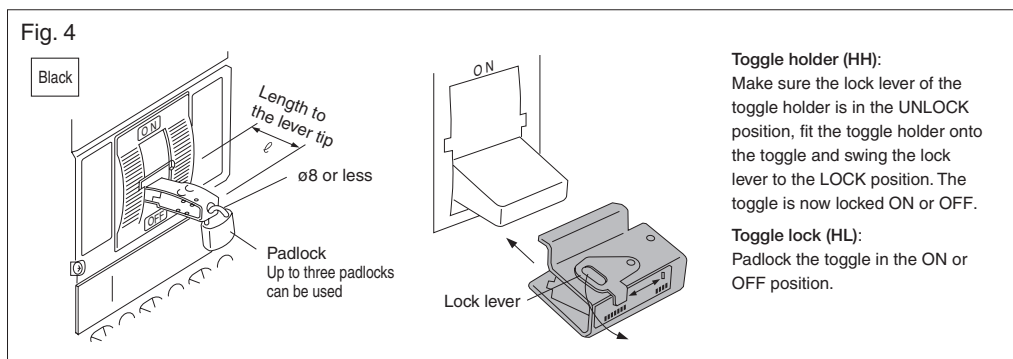
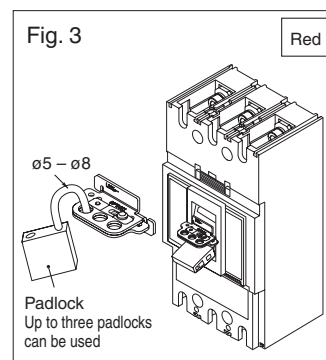
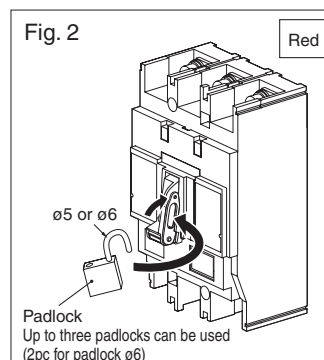
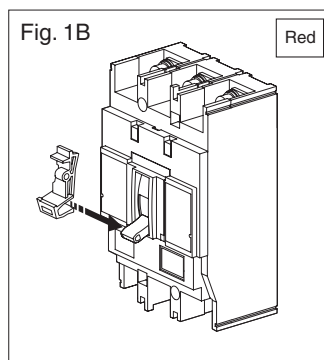
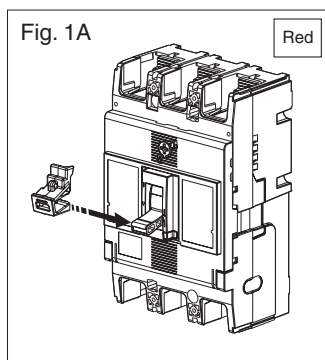
The toggle lock is a tool that locks the breaker ON or OFF. When an overcurrent occurs, the breaker will trip even if the breaker toggle is locked in the ON position. (Use commercially available padlocks).

Toggle holders/toggle locks

Frame size (A)	Type of breaker	Toggle holder		Figure	Toggle lock		Figure
		Order codes	Marking codes		Order codes	Marking codes	
160, 250	E160-SF/SJ, S160-SCF/SCJ/SF/SJ/SN, P160F/N/H/D, E250-SCF/SCJ/SF/SJ, S250-SN, P250F/N/H/D	T2HH25L	T2HH25L	1A	T2HL25L	T2HL25L	2
125, 160, 250	H125-NJ, H160-NJ, H250-NJ/NE, L125-NJ, L125-PJ, L160-NJ, L250-NJ	T2HH25	T2HH25	1B	T2HL25	T2HL25	2
400,	P400E/F/N/H/S/D, P630E/F/N/H/S/D	TPHL63S ①	TPHL63S	5	TPHL63S	TPHL63S	5
400, 800, 1000	H400-NE, L400-NE, L400-PE, H800-NE, L800-NE, L800-PE, S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN	T2HL40 ①	T2HL40	3	T2HL40	T2HL40	3
1250, 1600	S1250-SE/NE/GE/NN, S1600-SE/NE/NN	T2HLX 6 ①	XKC9	4 (ℓ=86)	T2HLX6	XKC9	4 (ℓ=86)
2000, 2500, 3200	XS2000NE/NN, XS2500NE/NN, XS3200NE/NN	XKC10 ①	XKC10	4 (ℓ=94)	XKC10	XKC10	4 (ℓ=94)

Notes:

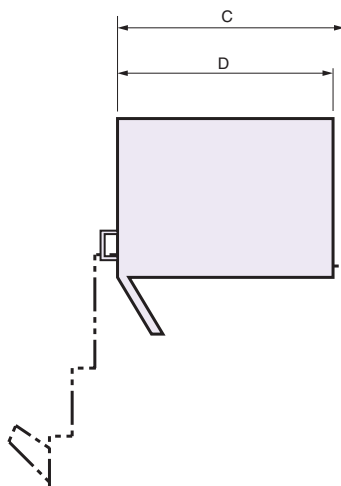
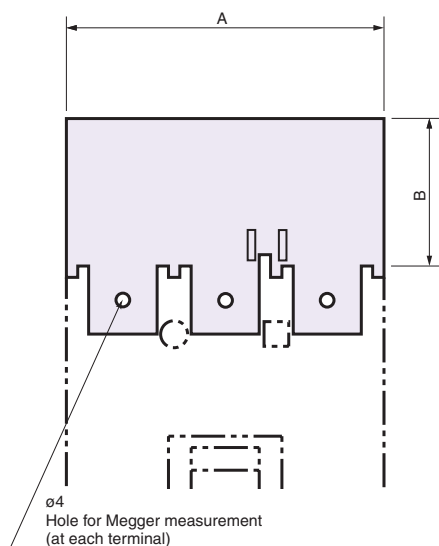
①: Same as toggle lock.



7. Terminal covers

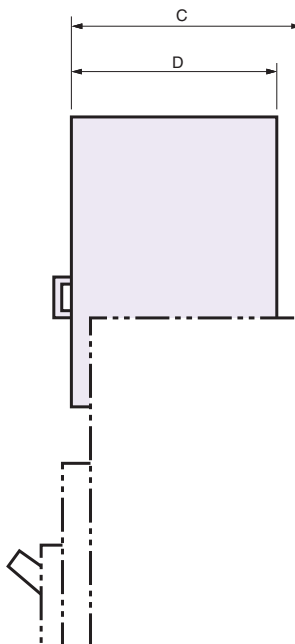
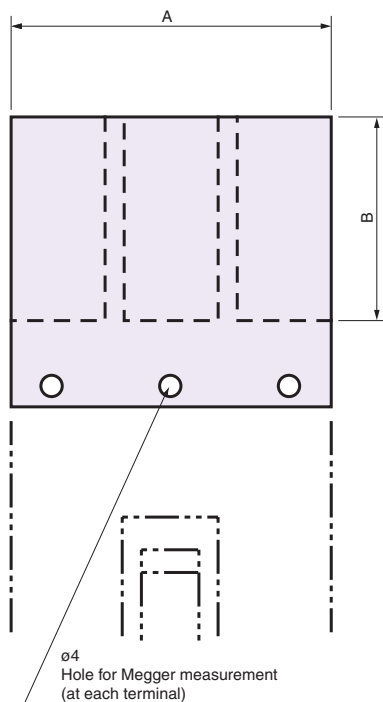
Terminal covers prevent live parts of the circuit breaker from being exposed to the external environment. There are three types of terminal covers: front-connected type, rear-connected and plug-in type, and cable clamps type. Select appropriate terminal covers depending on the type and application of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

(1) CF for front-connected breakers



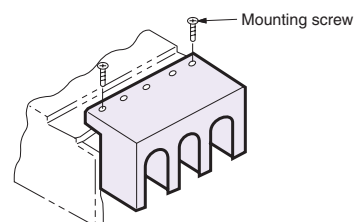
Plug-in mounted version

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



Screw-mounted version

The terminal covers for 630 to 1000AF (except P630E/F/N/H/S/D) are mounted to the breaker covers using tapping screws. The terminal cover for 1250AF is mounted to insert nuts of the circuit breaker cover using screws. The insert nuts do not come standard with the circuit breaker. Please be sure to state "with terminal cover (CF)" when ordering the circuit breaker.



■ To be stated when ordering

- Please state the order codes on the next page if ordering separately from the breaker.
- For the terminal cover for 1250AF, please order with the breakers.

Dimensions, mm

Frame size (A)	Types of MCCBs	Terminal cover				A				B		C ⑦		D ⑦		Colour of cover P: Grey Blue C: Transparent	Mounting version	
		Size ①	Note:	Order codes ②	Marking codes	1 pole	2 poles	3 poles	4 poles	1, 2, 3 poles	4 poles	1, 2, 3 poles	4 poles	1, 2, 3 poles	4 poles		Plug-in mounted	Screw-mounted
125, 160, 250	P160F/N/H/D	Long Straight		TPCF16 * SLNPH TPCF16 * SLNCH	TPCF16 * SL	—	60	90	120	40	40	60.5	60.5	58.5	58.5	P C	○	—
		Short Straight		TPCF16 * SSNPH TPCF16 * SSNCH	TPCF16 * SS	—	60	90	120	20	20	60.5	60.5	58.5	58.5	P C	○	—
		Long Straight		T2CF16L * SLHP	—	25	—	—	—	50	—	61	—	60.3	—	P	○	—
		Long Straight		T2CF16 * SLHP T2CF16 * SLHC	—	35	—	—	—	40	—	48	—	46	—	P C	○	—
	E160-SF 1pole	Long Straight		T2CF16L * SLHP	—	—	50	75	100	50	50	61	61	60.3	60.3	P C	○	—
		Short Straight		T2CF16L * SSHP T2CF16L * SSHC	—	—	50	75	100	25	25	61	61	60.3	60.3	P C	○	—
		Long Wide	④	T2CF16L * SWHP T2CF16L * SWHC	—	—	—	107	142	50	50	61	61	60.3	60.3	P C	○	—
		Long Straight		T2CF16L * SLHP T2CF16L * SLHC	—	—	—	75	100	50	50	61	61	60.3	60.3	P C	○	—
	S160-NF 1pole	Long Straight		T2CF16L * SLHP T2CF16L * SLHC	—	—	—	75	100	25	25	61	61	60.3	60.3	P C	○	—
		Short Straight		T2CF16L * SSHP T2CF16L * SSHC	—	—	—	75	100	25	25	61	61	60.3	60.3	P C	○	—
		Long Wide	④	T2CF16L * SWHP T2CF16L * SWHC	—	—	—	107	142	50	50	61	61	60.3	60.3	P C	○	—
		Long Straight		T2CF16L * SLHP T2CF16L * SLHC	—	—	—	75	100	25	25	61	61	60.3	60.3	P C	○	—
	E160-SJ, S160-SCJ/SF/SJ/SN	Long Straight		T2CF16L * SLHP T2CF16L * SLHC	—	—	—	75	100	25	25	61	61	60.3	60.3	P C	○	—
		Short Straight		T2CF16L * SSHP T2CF16L * SSHC	—	—	—	75	100	25	25	61	61	60.3	60.3	P C	○	—
		Long Wide	④	T2CF16L * SWHP T2CF16L * SWHC	—	—	—	107	142	50	50	61	61	60.3	60.3	P C	○	—
		Long Straight		T2CF25L * SLHP T2CF25L * SLHC	T2CF25L * SL	—	105	105	140	55	55	59	59	57.5	57.5	P C	○	—
	E250-SCF/SCJ/SF/SJ, S250-SN, P250F/N/H/D	Short Straight	⑨	T2CF25L * SSHP T2CF25L * SSHC	T2CF25L * SS	—	105	105	140	29	29	59	59	57.5	57.5	P C	○	—
		Long Wide	④, ⑨	T2CF25L * SWHP T2CF25L * SWHC	T2CF25L * SW	—	147.5	147.5	196	55	55	59	59	57.5	57.5	P C	○	—
		Long Straight	③, ⑨	T2CF25 * LLHP T2CF25 * LLHC	T2CF25 * LL	—	—	105	140	55	55	89	89	87	87	P C	○	—
		Long Straight		T2CF25 * LLHP T2CF25 * LLHC	T2CF25 * LL	—	—	105	140	55	55	89	89	87	87	P C	○	—
400, 630	P400E/F/N/H/S/D, P630E/F/N/H/S/D	Long	⑤	TPCF63 * SLNPH TPCF63 * SLNCH	TPCF63 * SL	—	—	140	185	85	85	97	97	95.5	95.5	P C	○	—
		Long Wide	④, ⑩	TPCF63 * SWNPH TPCF63 * SWNCH	TPCF63 * SW	—	—	180	240	110	110	97	97	95.5	95.5	P C	○	—
		Long	⑤, ⑥	T2CF40 * SLHP T2CF40 * SLHC	T2CF40 * SL	—	—	140	185	85	85	134	134	94.5	94.5	P C	○	—
		Long Wide	④, ⑥	T2CF40 * SWHP T2CF40 * SWHC	T2CF40 * SW	—	—	180	240	110	114	134	135	94.5	98	P C	○	—
	H400-NE, L400-NE	Long Straight		T2CF80 * SLHP T2CF80 * SLHC	TPR-5BA	—	—	215	285	130	130	99.5 (102)	99.5 (102)	99 (101.5)	99 (101.5)	P C	—	○
		Long Straight	⑥	T2CF80 * SLHP T2CF80 * SLHC	TPR-5BA	—	—	215	285	130	130	136.5 (139)	136.5 (139)	99 (101.5)	99 (101.5)	P C	—	○
1000	S1000-SE/NE/NN	Long Straight		T2CF80 * SLHP T2CF80 * SLHC	TPR-5BA	—	—	215	285	130	130	99.5 (102)	99.5 (102)	99 (101.5)	99 (101.5)	P C	—	○
1250	S1250-SE/NE/GE/NN	Long Straight	⑧	—	TPR-5BA	—	—	215	285	130	130	115	115	99 (102.5)	99 (102.5)	P C	—	○

Notes:

- ①: Long: Long cover, Short: Short cover, Straight: Straight cover for straight extension bars, Wide: Wide cover for spread extension bars
- ②: The asterisk indicates the number of poles. Please state the number of poles at the asterisk position when ordering. One set includes 1 pc terminal cover.
- ③: Not applicable to 3-pole breakers with extension bars.
- ④: Applicable to 3-pole breakers with spread extension bars.
- ⑤: When used without the extension bars.
- ⑥: There will be an approx. 40 mm gap between the bottom of the terminal cover and the breaker mounting surface.
- ⑦: Values in parentheses indicate the distance to the head of terminal cover mounting screws.
- ⑧: Not sold as a single unit. When ordering the circuit breaker, please specify whether you require a grey-blue terminal cover or a transparent terminal cover.
- ⑨: Please use with a connection wire of 100mm² or less. If you use 150mm², the insulating sleeve will touch the terminal cover and cannot be attached.
- ⑩: Please use with a connection wire of 200mm² or less. If you use 325mm², the insulating sleeve will touch the terminal cover and cannot be attached.

7. Terminal covers

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

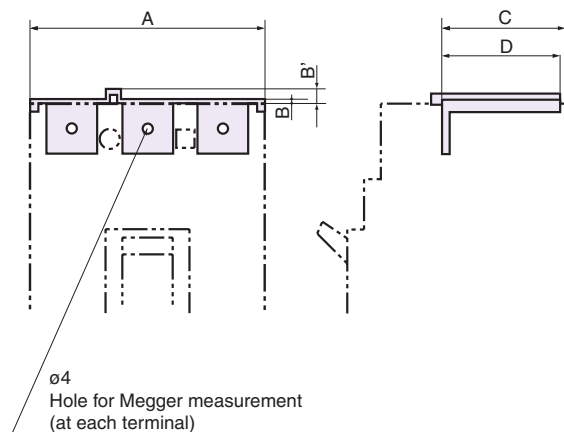


Fig. 1

Plug-in mounted version

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

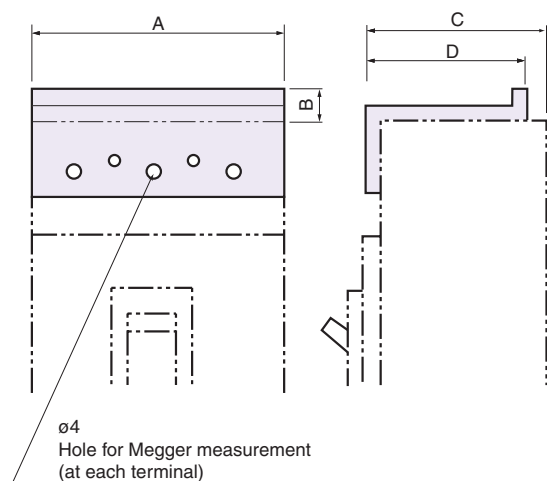
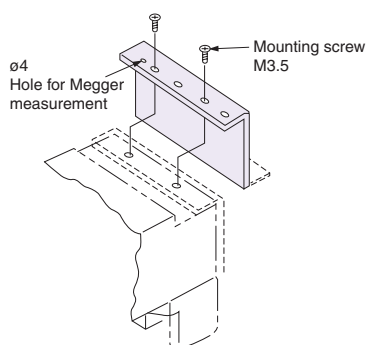


Fig. 2



Screw-mounted version

The terminal covers are mounted to the breakers using tapping screws.

■ 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.

Dimensions, mm

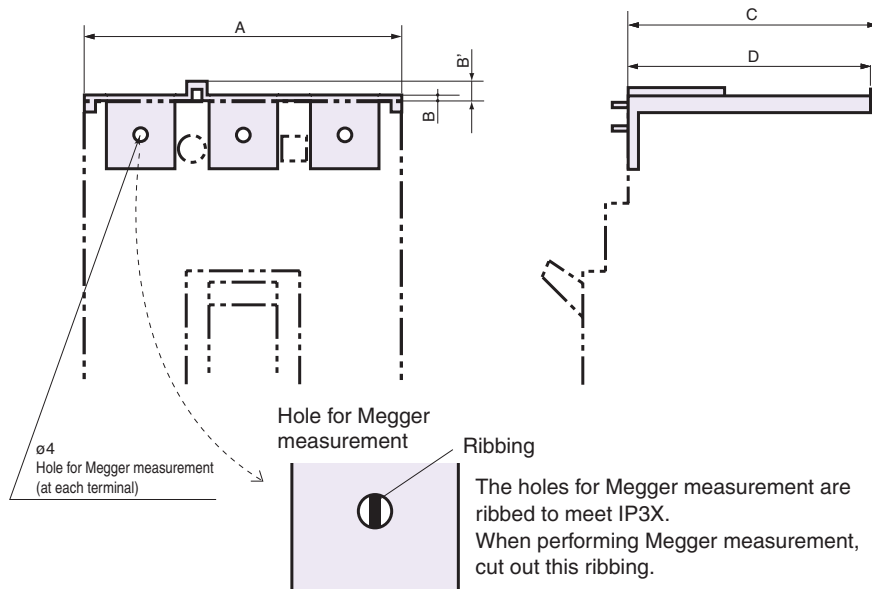
Frame size (A)	Types of MCCBs	Order codes ①	Marking codes	A			B		B'	C ②		D ②		Colour of cover B: Black P: Grey Blue	Mounting version		
				2 poles	3 poles	4 poles	2, 3 poles	4 poles		2, 3 poles	4 poles	2, 3 poles	4 poles		Plug-in mounted	Screw-mounted	Fig.
125, 160	P160F/N/H/D	TPCR16 * SPH	TPCR16 * S	—	90	120	2	2	4.5	61	61	60	60	P	○	—	1
	E160-SF, S160-SCF	T2CR12L * SHP	—	50	75	100	5.3	5.3	—	61	61	60.3	60.3	P	○	—	1
	E160-SJ, S160-SCJ/SF/SJ/SN	T2CR12L * SHP	—	—	75	100	5.3	5.3	—	61	61	60.3	60.3	P	○	—	1
	H125-NJ, L125-NJ	T2CR25 * SHP	T2CR25 * S	—	105	140	2	2	6	77.5	77.5	39.5	39.5	P	○	—	1
160, 250	E250-SCF/SCJ/SF/SJ, S250-SN, P250F/N/H/D	T2CR25L * SHP	—	—	105	140	2.3	2.3	5.3	58.6	58.6	57.1	57.1	P	○	—	1
	H160-NJ, H250-NJ/NE, L160-NJ, L250-NJ	T2CR25 * SHP	T2CR25 * S	—	105	140	2	2	6	77.5	77.5	39.5	39.5	P	○	—	1
400, 630	P400E/F/N/H/S/D, P630E/F/N/H/S/D	TPCR63 * SPH	TPCR63 * S	—	140	185	3.5	3.5	5	97	97	96	96	P	○	—	1
	H400-NE, L400-NE	T2CR40 * SHP	T2CR40 * S	—	140	185	3	3	5	134	134	93	93	P	○	—	1
800	S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN	T2CR803SHP	XPS6	—	206	280	15	18	—	101 (103.5)	99 (101.5)	100.5 (103)	98 (100.5)	P (3 poles)	—	○	2
		T2CR804SHB		—	206	280	15	18	—	101 (103.5)	99 (101.5)	100.5 (103)	98 (100.5)	B (4 poles)	—	○	2
	H800-NE, L800-NE	T2CR80 * LHB	—	—	210	280	15	15	—	136 (138.5)	136 (138.5)	135 (137.5)	135 (137.5)	B	—	○	2
1000	S1000-SE/NE/NN	T2CR803SHP	XPS6	—	206	280	15	18	—	101 (103.5)	99 (101.5)	100.5 (103)	98 (100.5)	P (3 poles)	—	○	2
		T2CR804SHB		—	206	280	15	18	—	101 (103.5)	99 (101.5)	100.5 (103)	98 (100.5)	B (4 poles)	—	○	2

Notes:

- ①: The asterisk indicates the number of poles. Please state the number of poles at the asterisk position when ordering. One set includes 1 pc terminal cover.
 ②: Values in parentheses indicate the distance to the head of terminal cover mounting screws.

7. Terminal covers

(3) CS for 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 CS" if ordering along with the breaker.
- Please state the order codes of the following table if ordering separately from the breaker.

Dimensions, mm

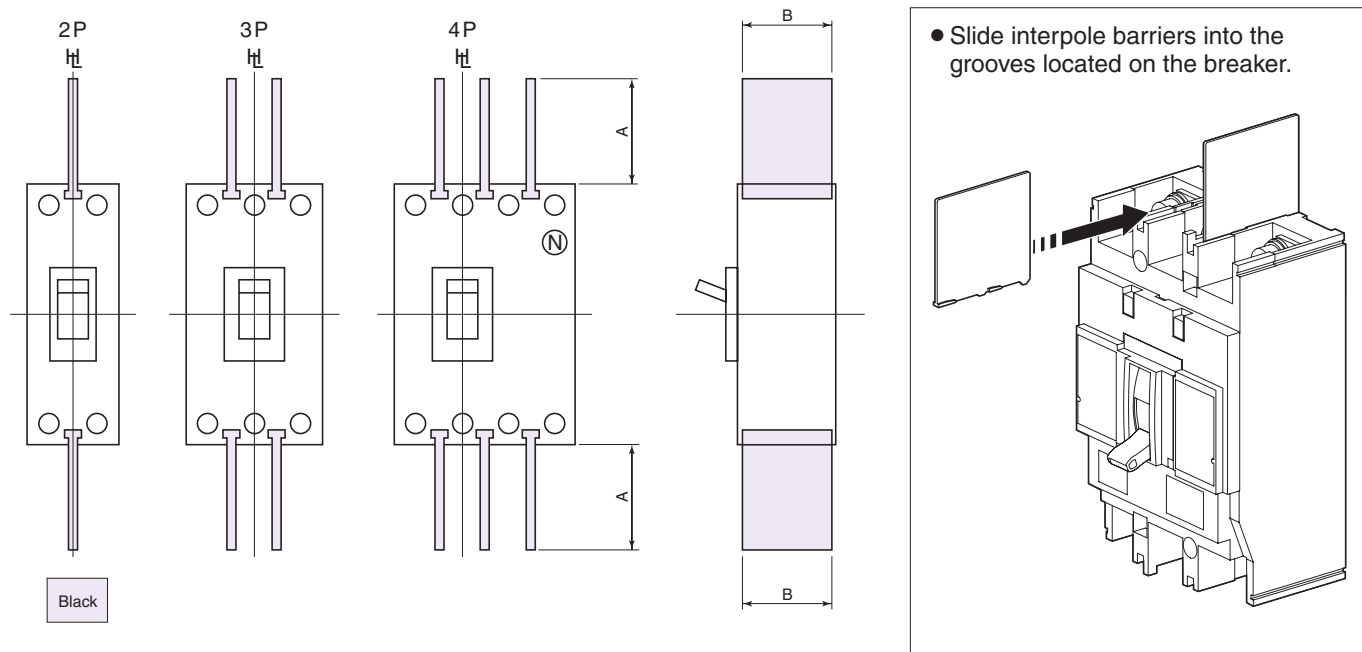
Frame size (A)	Types of MCCBs	Order codes ①	Marking codes	A		B	B'	C	D	Colour of cover P: Grey Blue	Mounting version	
				3 poles	4 poles						Plug-in mounted	Screw-mounted
125, 160, 250	P160F/N/H/D	TPCS16*SPH	TPCS16*S	90	120	2	4.5	61	60	P	○	—
	E160-SF/SJ, S160-SCF/SCJ/SF/SJ/SN	T2CS12L*SHP	—	75	100	25	—	61	60.3	P	○	—
	H125-NJ, L125-NJ	T2CS25*SHP	T2CS25*S	105	140	2.5	4.5	96	59.5	P	○	—
	E250-SCF/SCJ/SF/SJ, S250-SN, P250F/N/H/D	T2CS25L*SHP	T2CS25L*S	105	140	2.3	5.3	58.6	57.1	P	○	—
	H160-NJ, H250-NJ/NE, L160-NJ, L250-NJ	T2CS25*SHP	T2CS25*S	105	140	2.5	4.5	96	59.5	P	○	—
400, 630	P400E/F/N/H/S/D, P630E/F/N/H/S/D	TPCS63*SPH	TPCS63*S	140	185	3.5	4.6	97	96	P	○	—
	H400-NE, L400-NE	T2CS40*SHP	T2CS40*S	140	185	3	5	134	93	P	○	—

Notes:

① : The asterisk indicates the number of poles. Please state the number of poles at the asterisk position when ordering. One set includes 1 pc terminal cover.

8. 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 specify the type when ordering. Supplied as a set of 2 pcs.

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

Dimensions, mm

Types of MCCBs	Order codes	Marking codes	A	B	Front-connected
E160-SF/SJ, S160-SCF/SCJ/SF/SJ/SN	T2BA16L3SH	—	50	55	⊙
P160F/N/H/D	T2BA16L3SH	—	50	55	⊙
H125-NJ, H160-NJ, H250-NJ/NE, L125-NJ, L125-PJ, L160-NJ, L250-NJ	T2BA25L3SH	T2BA25L	100	88	⊙
E250-SCF/SCJ/SF/SJ, S250-SN	T2BA25L3SH	T2BA25LS	101	53	⊙
P250F/N/H/D	T2BA25L3SH	T2BA25LS	101	53	⊙
P400E/F/N/H/S/D, P630E/F/N/H/S/D	T2BA403SH	TQQ-5BA	110	95	⊙
H400-NE, L400-NE	T2BA403SH	TQQ-5BA	110	95	⊙
S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, H800-NE, L800-NE, S1000-SE/NE/NN	T2BA403SH	TQQ-5BA	110	95	⊙
S1250-SE/NE/GE/NN	T2BA403SH	TQQ-5BA	110	95	⊙
S1600-SE/NE/NN	T2BA403SH	TQQ-5BA	110	95	⊙
XS2000NE/NN, XS2500NE/NN, XS3200NE/NN	—	—	—	—	—

⊙: 2P: 1 pc, 3P: 2 pcs, 4P: 3 pcs of interpole barriers are supplied as standard. (Front-connected only)

—: "no" or "not available".

One set include 2 pcs for a 3P single-sided pole.

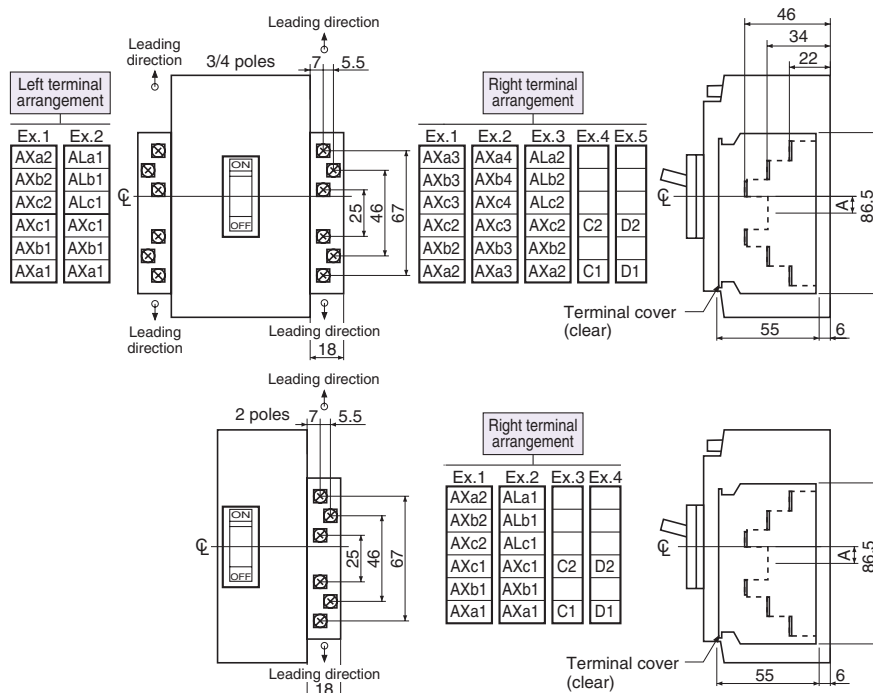
9. Terminal blocks (TF)

Applies to front-connected type and rear-connected type circuit breakers with internally mounted accessories.
The lead wires from internally mounted accessories are connected to this terminal block.

18mm width 6 terminals

Vertical leading type (T2TF00L) with 160A frame MCCB

Mounting position/typical terminal arrangement



Dimensions, mm

Frame size (A)	Types of breakers MCCB	Number of poles	A
160	E160-SF, S160-SCF	2/3/4 poles	9
	E160-SJ, S160-SCJ/SF/SJ/SN	3/4 poles	9

Notes:

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

Combination of terminal arrangement (for 3 poles/4 poles)

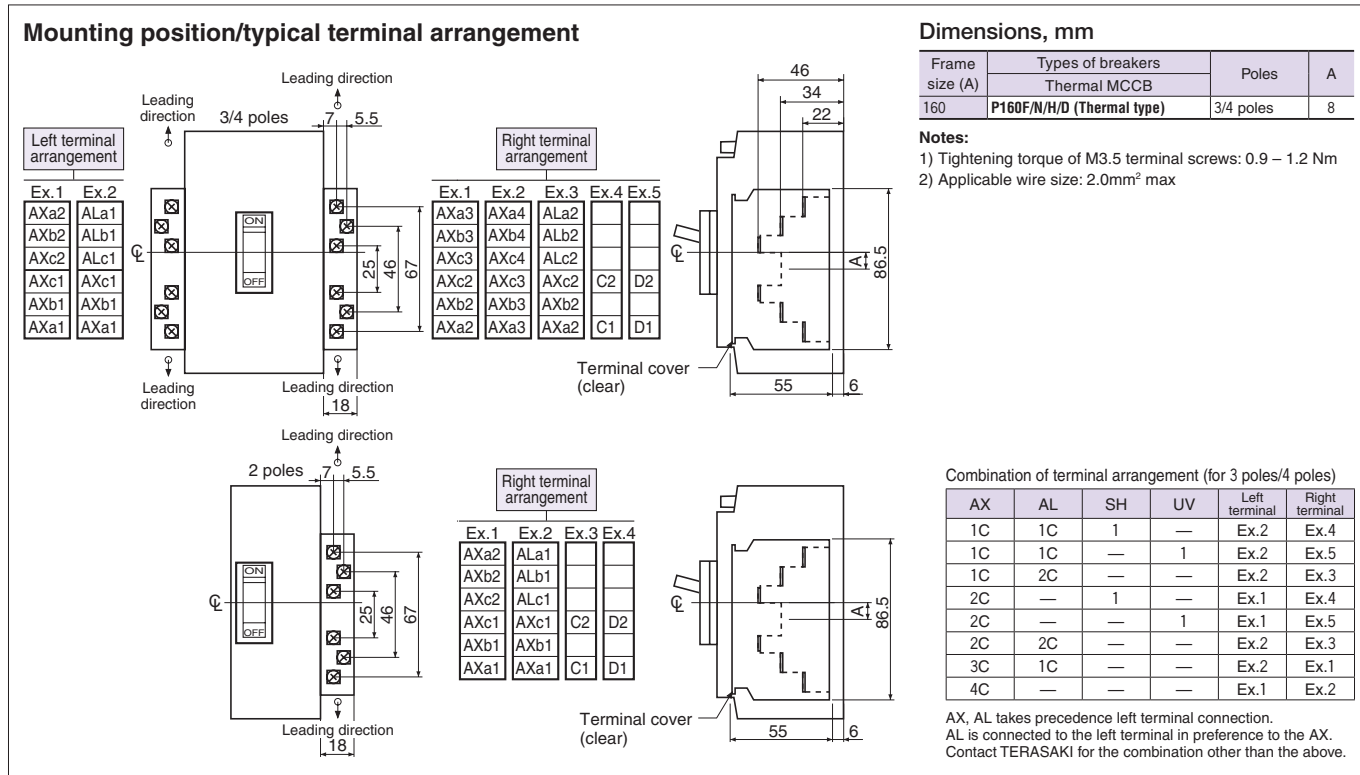
AX	AL	SH	UV	Left terminal	Right terminal
1C	1C	1	—	Ex.2	Ex.4
1C	1C	—	1	Ex.2	Ex.5
1C	2C	—	—	Ex.2	Ex.3
2C	—	1	—	Ex.1	Ex.4
2C	—	—	1	Ex.1	Ex.5
2C	2C	—	—	Ex.2	Ex.3
3C	1C	—	—	Ex.2	Ex.1
4C	—	—	—	Ex.1	Ex.2

AX, AL takes precedence left terminal connection.

AL is connected to the left terminal in preference to the AX.
Contact TERASAKI for the combination other than the above.

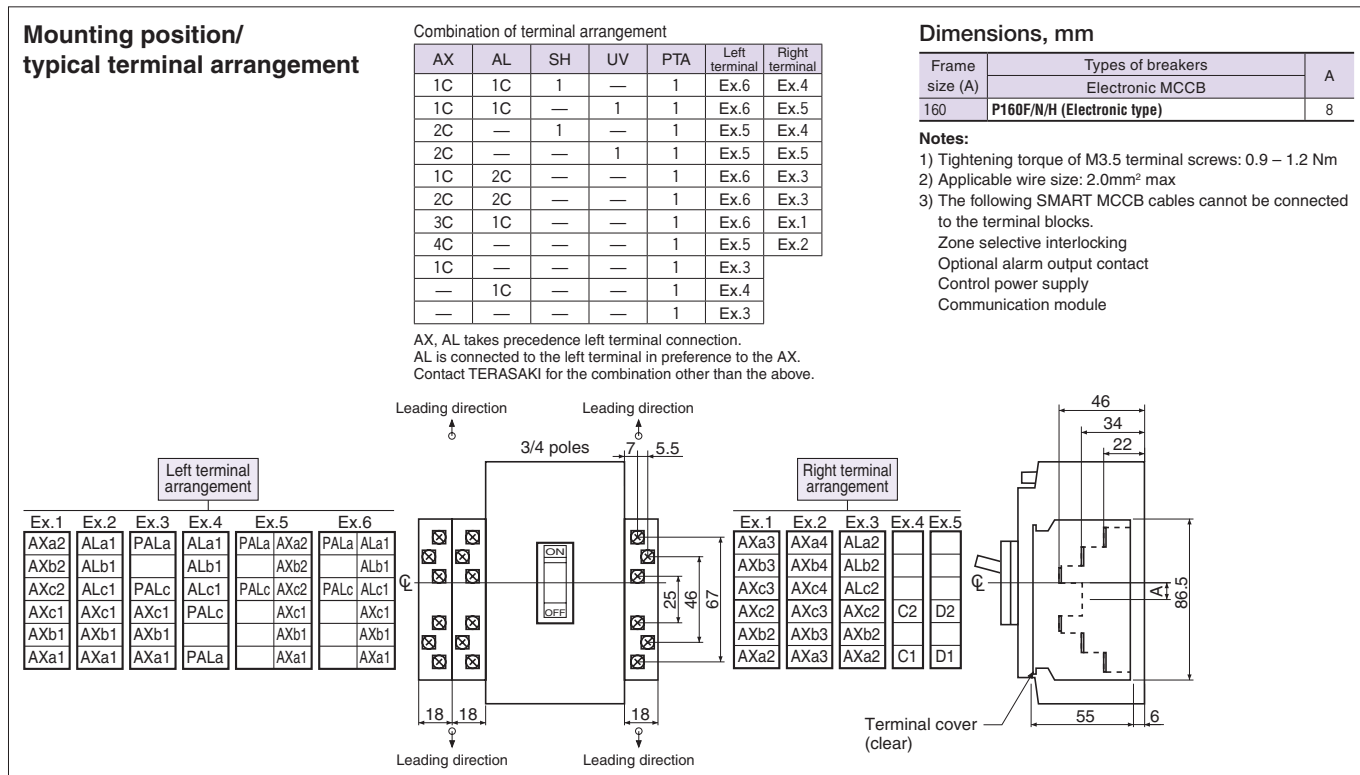
18mm width 6 terminals

Vertical leading type (T2TF00L) with 160A frame Thermal MCCB



18mm width 6 terminals

Vertical leading type (T2TF00L) with 160A frame Electronic MCCB



6

Accessories

Moulded Case Circuit Breakers

3 Externally mounted accessories

9. Terminal blocks (TF)

18mm width 6 terminals

Vertical leading type (T2TFX0) with 125/160/250A frame MCCB

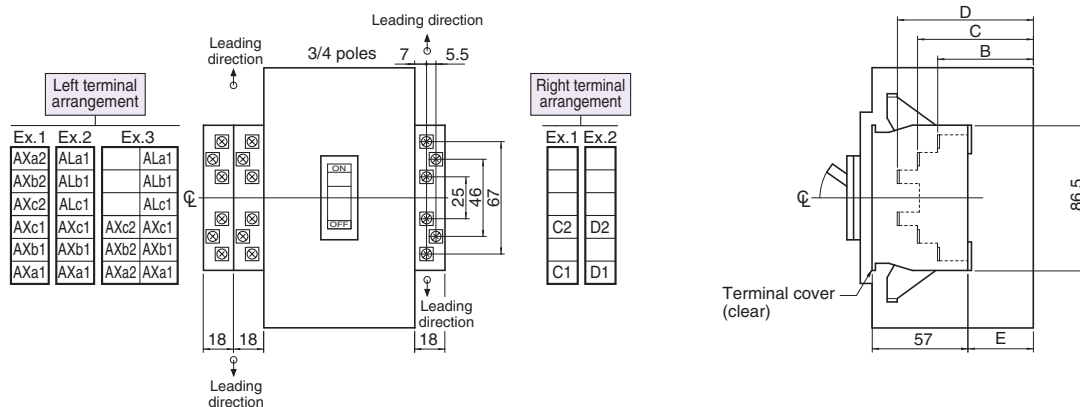
Mounting position/typical terminal arrangement

Dimensions, mm

Frame size (A)	Types of breakers	B	C	D	E
	MCCB				
125, 160, 250	H125-NJ, H160-NJ, H250-NJ/NE, L125-NJ, L125-PJ, L160-NJ, L250-NJ	57	69	81	39

Notes:

- 1) Tightening torque of M3.5 terminal screws: 0.9 – 1.2 Nm
- 2) Applicable wire size: 2.0mm² max
- 3) Contact to TERASAKI for the combination other than the below.



18mm width 6 terminals

Vertical leading type (T2TF00L) with 250A frame MCCB

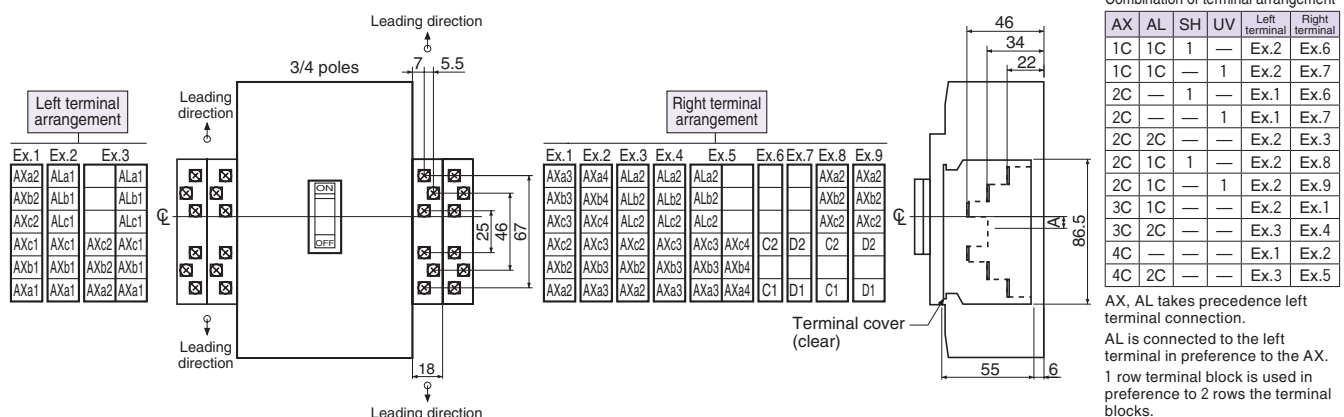
Mounting position/typical terminal arrangement

Dimensions, mm

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

Notes:

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

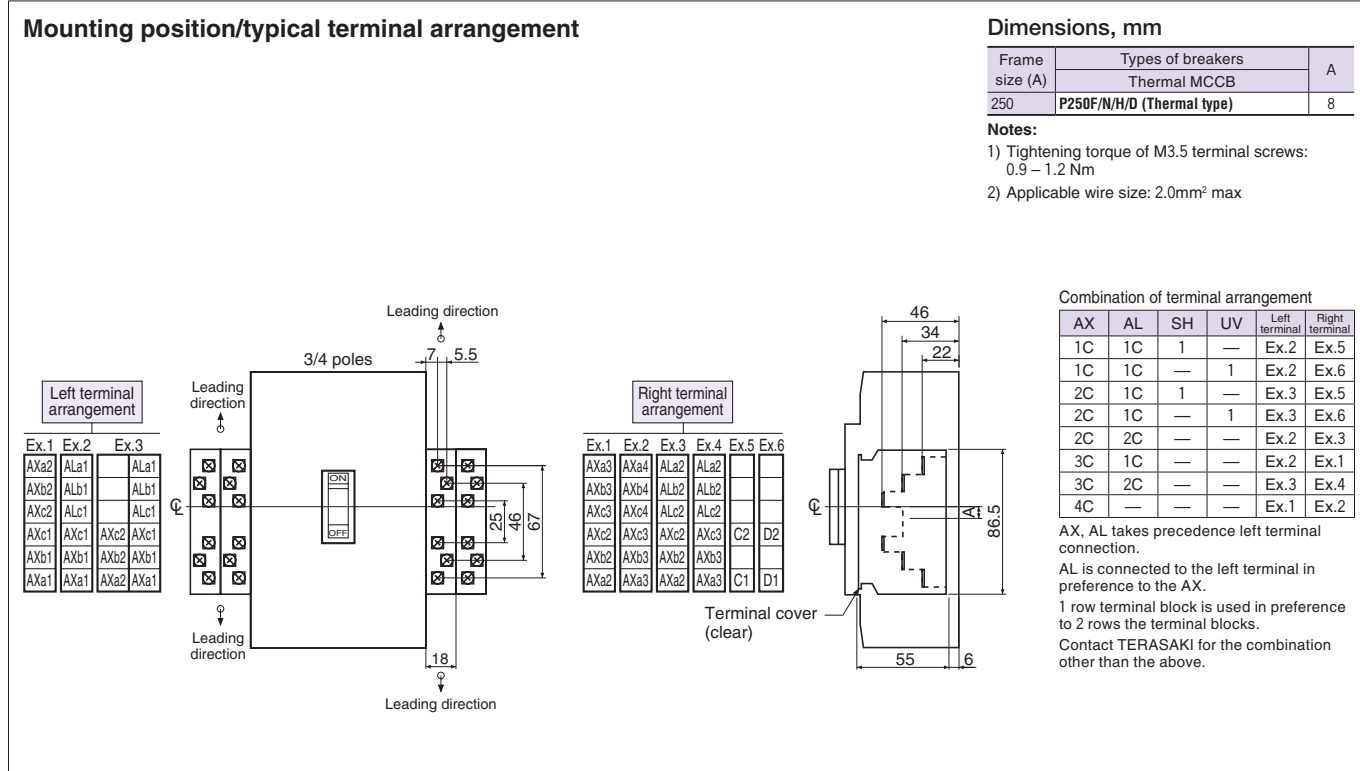


Combination of terminal arrangement

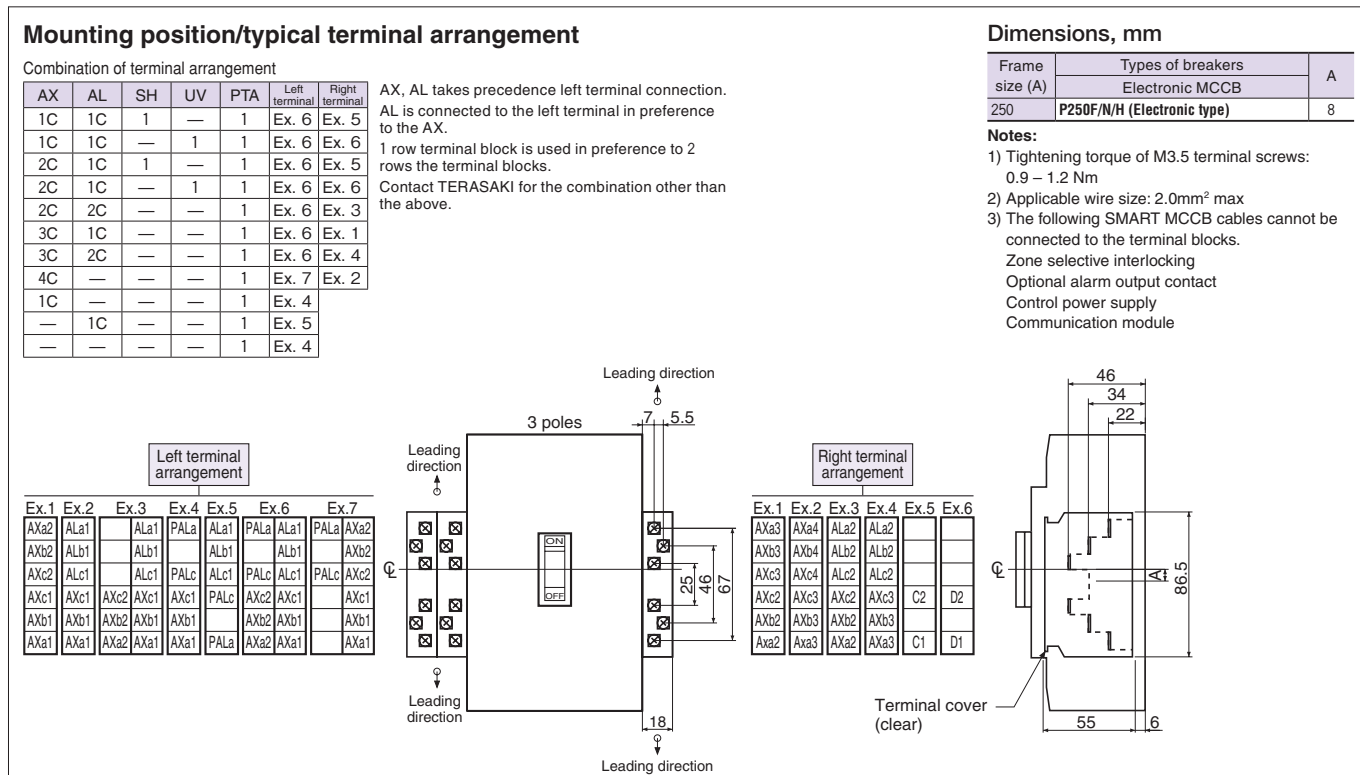
AX	AL	SH	UV	Left terminal	Right terminal
1C	1C	1	—	Ex.2	Ex.6
1C	1C	—	1	Ex.2	Ex.7
2C	—	1	—	Ex.1	Ex.6
2C	—	—	1	Ex.1	Ex.7
2C	2C	—	—	Ex.2	Ex.3
2C	1C	1	—	Ex.2	Ex.8
2C	1C	—	1	Ex.2	Ex.9
3C	1C	—	—	Ex.2	Ex.1
3C	2C	—	—	Ex.3	Ex.4
4C	—	—	—	Ex.1	Ex.2
4C	2C	—	—	Ex.3	Ex.5

AX, AL takes precedence left terminal connection.
AL is connected to the left terminal in preference to the AX.
1 row terminal block is used in preference to 2 rows the terminal blocks.
Contact TERASAKI for the combination other than the above.

18mm width 6 terminals Vertical leading type (T2TF00L) with 250A frame Thermal MCCB



18mm width 6 terminals Vertical leading type (T2TF00L) with 250A frame Electronic MCCB



9. Terminal blocks (TF)

18mm width 6 terminals

Vertical leading type (T2TFX0) with 400A frame MCCB

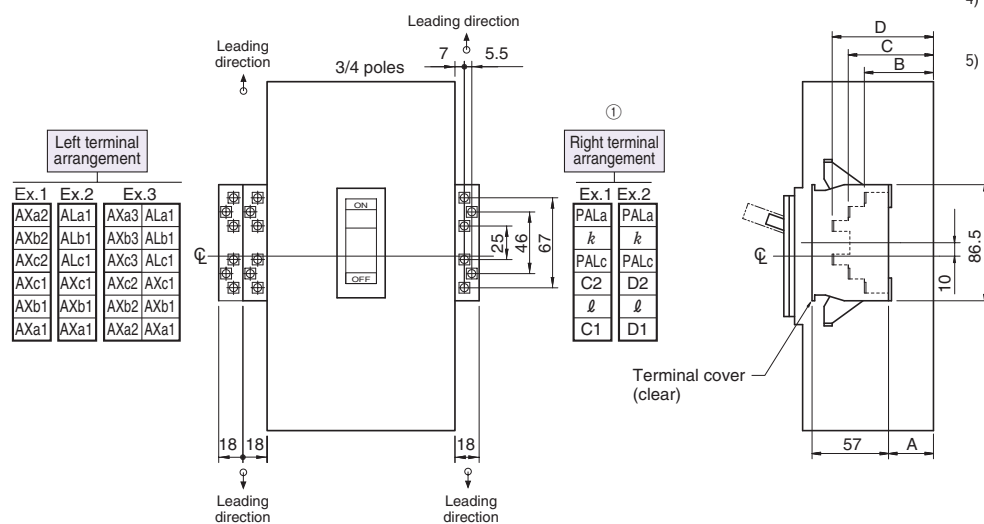
Mounting position/ typical terminal arrangement

Dimensions, mm

Frame size (A)	Types of breakers	A	B	C	D
400	H400-NE, L400-NE, L400-PE	70.5	88.5	100.5	112.5

Notes:

- 1) Tightening torque of M3.5 terminal screws:
0.9 – 1.2 Nm
- 2) Applicable wire size: 2.0mm² max
- 3) *k*, *ℓ* are the terminals to connect to the CT for a
separate neutral wire. Separate neutral wire CTs
are required for 3-phase 4-wire system, when a
3-pole circuit breaker with ground fault trip
function is used.
- 4) In the case of providing pre-trip alarm terminals
(PALa, PALc) to the terminal block, OCR controller
will be installed external to the breaker.
- 5) Contact to TERASAKI for the combination other
than the left.



18mm width 6 terminals

Vertical leading type (T2TF00L) with 400/630A frame Thermal MCCB

Mounting position/typical terminal arrangement

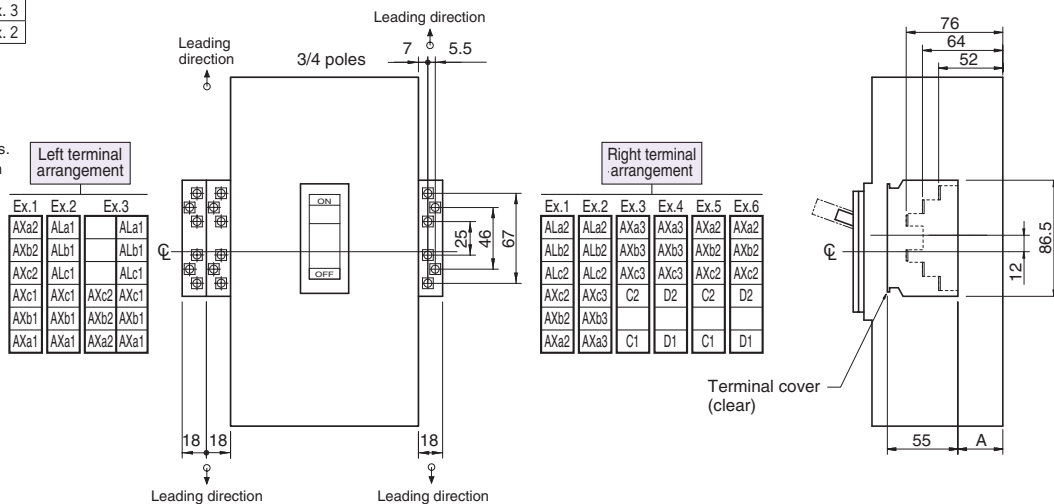
Combination of terminal arrangement

AX	AL	SH	UV	Left terminal	Right terminal
1C	1C	1	—	Ex. 2	Ex. 3
1C	1C	—	1	Ex. 2	Ex. 4
2C	—	1	—	Ex. 1	Ex. 3
2C	—	—	1	Ex. 1	Ex. 4
2C	2C	—	—	Ex. 2	Ex. 1
2C	1C	1	—	Ex. 2	Ex. 5
2C	1C	—	1	Ex. 2	Ex. 6
3C	1C	—	—	Ex. 3	Ex. 3
3C	2C	—	—	Ex. 3	Ex. 2

AX, AL takes precedence left terminal connection.

AL is connected to the left terminal in preference to the AX.

1 row terminal block is used in preference to 2 rows the terminal blocks.
Contact TERASAKI for the combination other than the above.



Dimensions, mm

Frame size (A)	Types of breakers	A
400	P400E/F/N/H/S/D (Thermal type)	36
630	P630E/F/N/H/S/D (Thermal type)	36

Notes:

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

18mm width 6 terminals

Vertical leading type (T2TF00L) with 400/630A frame Electronic MCCB

Mounting position/typical terminal arrangement

Combination of terminal arrangement

AX	AL	SH	UV	PTA	Left terminal	Right terminal
1C	1C	1	—	1	Ex. 6	Ex. 3
1C	1C	—	1	—	Ex. 6	Ex. 4
2C	—	1	—	1	Ex. 7	Ex. 3
2C	—	—	1	1	Ex. 7	Ex. 4
2C	2C	—	—	1	Ex. 6	Ex. 1
2C	1C	1	—	1	Ex. 8	Ex. 5
2C	1C	—	1	1	Ex. 8	Ex. 6
3C	1C	—	—	1	Ex. 6	Ex. 3
3C	2C	—	—	1	Ex. 6	Ex. 2
1C	—	—	—	1	Ex. 4	
—	1C	—	—	1	Ex. 5	
—	—	—	—	1	Ex. 4	

AX, AL takes precedence left terminal connection.

AL is connected to the left terminal in preference to the AX.

1 row terminal block is used in preference to 2 rows the terminal blocks.

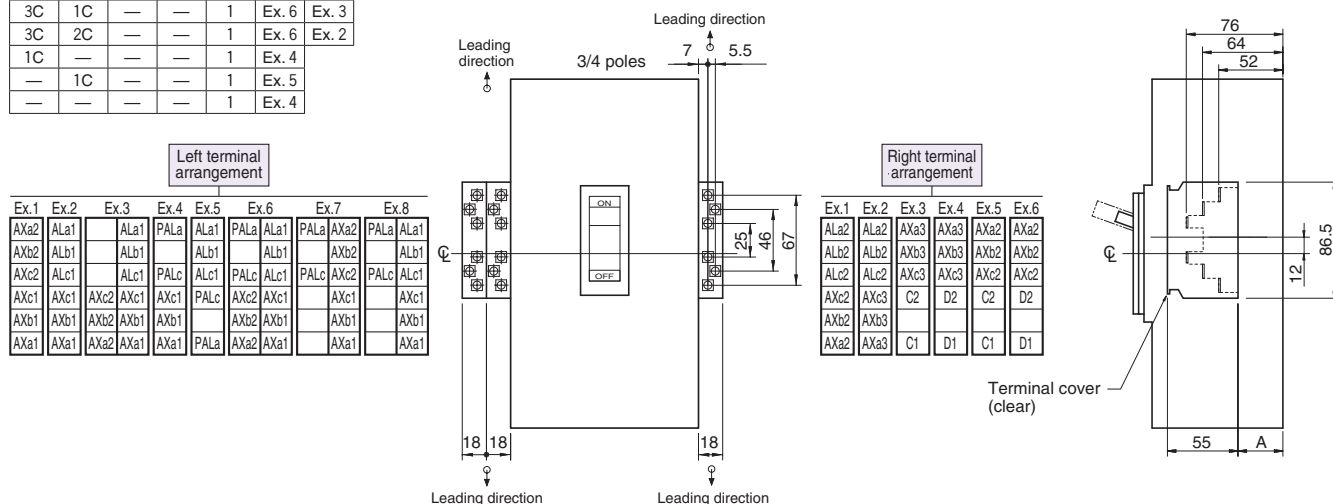
Contact TERASAKI for the combination other than the left.

Dimensions, mm

Frame size (A)	Types of breakers	A
400	P400F/N/H/S (Electronic type)	36
630	P630F/N/H/S (Electronic type)	36

Notes:

- 1) Tightening torque of M3.5 terminal screws: 0.9 – 1.2 Nm
- 2) Applicable wire size: 2.0mm² max
- 3) The following SMART MCCB cables cannot be connected to the terminal blocks.
Zone selective interlocking
Optional alarm output contact
Control power supply
Communication module



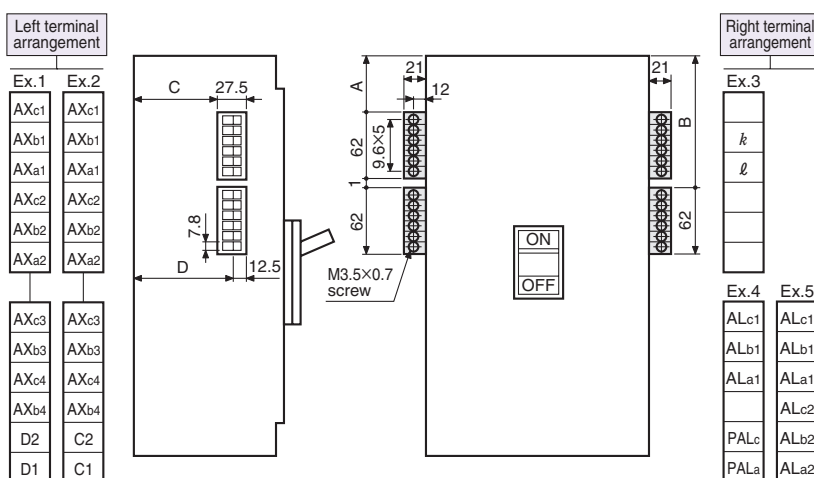
3 Externally mounted accessories

Vertical leading type (T2TFX0) with 800/1000A frame MCCB

6-98

Horizontal leading type (LTF) with 1250/1600A frame MCCB

Mounting position/typical terminal arrangement



Dimensions, mm

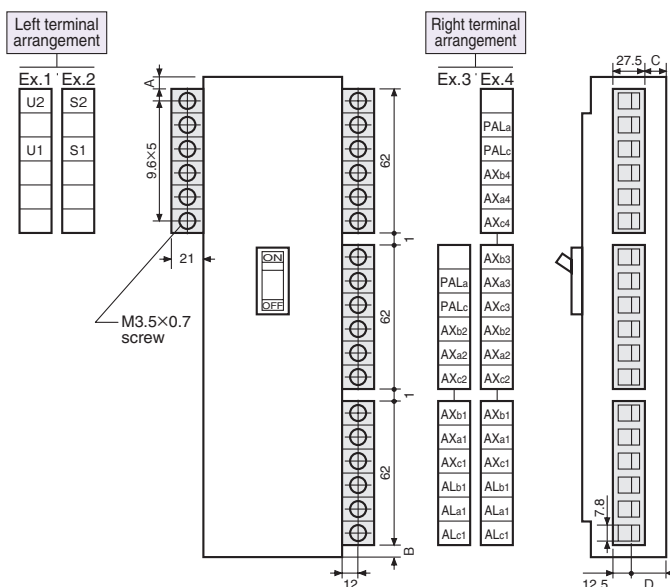
Frame size (A)	Types of breakers	A	B	C	D
1250	S1250-SE/NE/GE/NN	51	114 (124)	57	72
1600	S1600-SE/NE/NN	51	114 (124)	77	92

Notes:

- 1) Values in parentheses applies to 4-pole breakers.
- 2) Tightening torque of M3.5 terminal screws: 0.9 – 1.2 Nm
- 3) Applicable wire size: 2.0mm² max × 2
- 4) *k*, *l* are the terminals to connect to the CT for a separate neutral wire. Separate neutral wire CTs are required for 3-phase 4-wire system, when a 3-pole circuit breaker with ground fault trip function is used.
- 5) Contact to TERASAKI for the combination other than the left.

Horizontal leading type (LTF) with 2000 to 3200A frame MCCB

Mounting position/typical terminal arrangement



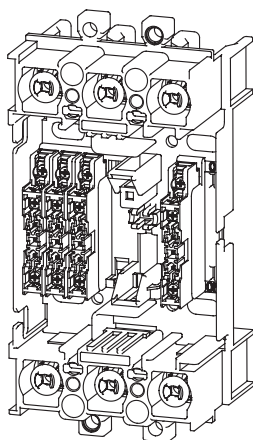
Dimensions, mm

Frame size (A)	Types of breakers	A	B	C	D
2000	XS2000NE, XS2000NN	54	208	100	115
2500	XS2500NE, XS2500NN	54	208	100	115
3200	XS3200NE, XS3200NN	54	208	100	115

Notes:

- 1) Values in parentheses applies to 4-pole breakers.
- 2) Tightening torque of M3.5 terminal screws: 0.9 – 1.2 Nm
- 3) Applicable wire size: 2.0mm² max × 2
- 4) Contact to TERASAKI for the combination other than the left.

10. Plug-in auxiliary circuit terminal blocks (PMB)



Auxiliary circuit terminals are of self-engaging type.

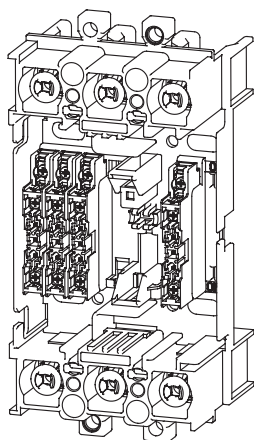
Shown in the table below are standard terminal arrangements as seen from the front of the plugin base.

Contact us for non-standard arrangements.

Terminal screw: M3.5

Suitable wire size: 0.5 – 0.75mm²

Breaker	H125-NJ, H160-NJ, H250-NJ/NE, L125-NJ, L125-PJ, L160-NJ, L250-NJ	S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, H400-NE, L400-NE, L400-PE, H800-NE, L800-NE, L800-PE																																					
	3P, 4P	3P, 4P																																					
Number of auxiliary circuit terminals (Max allowable)																																							
Arrangement 1	<table border="1"> <tr><td>AXa1</td><td>AXa2</td><td>ALa1</td><td>C1</td></tr> <tr><td>AXb1</td><td>AXb2</td><td>ALb1</td><td></td></tr> <tr><td>AXc1</td><td>AXc2</td><td>ALc1</td><td>C2</td></tr> </table>	AXa1	AXa2	ALa1	C1	AXb1	AXb2	ALb1		AXc1	AXc2	ALc1	C2	<table border="1"> <tr><td>AXa1</td><td>AXa2</td><td>AXa3</td><td>ALa1</td></tr> <tr><td>AXb1</td><td>AXb2</td><td>AXb3</td><td>ALb1</td></tr> <tr><td>AXc1</td><td>AXc2</td><td>AXc3</td><td>ALc1</td></tr> </table>	AXa1	AXa2	AXa3	ALa1	AXb1	AXb2	AXb3	ALb1	AXc1	AXc2	AXc3	ALc1	<table border="1"> <tr><td></td><td></td><td></td><td>C1</td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td>C2</td></tr> </table>				C1								C2
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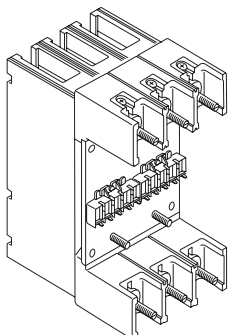
Auxiliary circuit terminals are of self-engaging type.
 Shown in the table below are standard terminal arrangements as seen from the front of the plugin base.
 Contact us for non-standard arrangements.

Terminal screw: M3.5
 Suitable wire size: 0.5 – 0.75mm²

Breaker	P160F/N/H/D	P250F/N/H/D	P400E/F/N/H/S/D, P630F/N/H/S/D																																								
	3P, 4P	3P, 4P	3P, 4P																																								
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AXc1	ALc1																																										
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Note: Optional cable for the preferential trip alarm (PTA) is lead wire draw-in.

10. Plug-in auxiliary circuit terminal blocks (PMC)



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.

Contact us for non-standard arrangements.

* If the number of auxiliary circuit terminals (self-engaging) is insufficient, 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	S1250-SE/NE/GE/NN									
	3P									
Number of auxiliary circuit terminals (Max allowable)										
Arrangement 1	AXc1	AXa1	AXb1	ALc1	ALa1	ALb1	OP1	OP2	D1	D2
						* 1				
	AXc2	AXa2	AXb2	PALc	PALa					
Arrangement 2	AXc1	AXa1	AXb1	ALc1	ALa1	ALb1	OP1	OP2	C1	C2
						* 1				
	AXc2	AXa2	AXb2	PALc	PALa					
Arrangement 3										

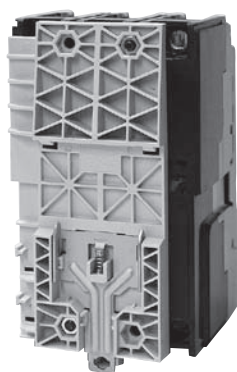
* 1: If the OCR controller is installed separately, substitute OS1 and OS2 for OP1 and OP2 and connect these terminals to the controller terminals having the same numbers.

11. DIN rail adapter (DA)

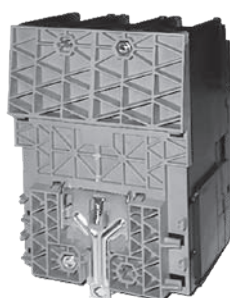
The circuit breaker can easily be mounted on a 35 mm wide DIN rail by mounting the DIN rail adapter on the rear of the circuit breaker.

■ Applicable breakers

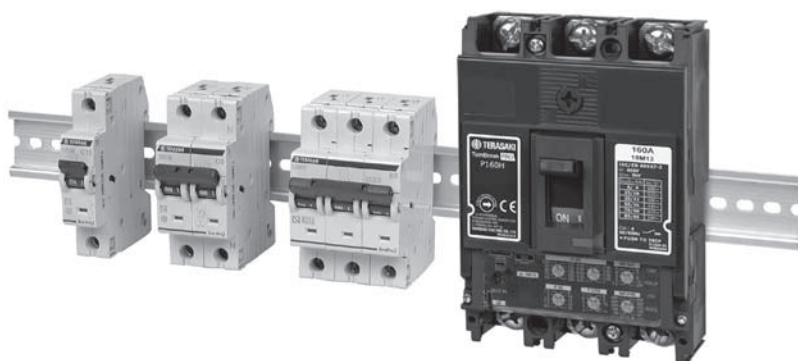
Frame size (A)	MCCB	Number of poles	DIN rail adaptor Order code
160	E160-SF/SJ,	3P, 4P	T2DA16L
	S160-SCF/SCJ/SF/SJ/SN		
	P160F/N/H/D	3P, 4P	TPDA16



T2DA16L



TPDA16



12. Door Flange (DF)

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

Fig. 1

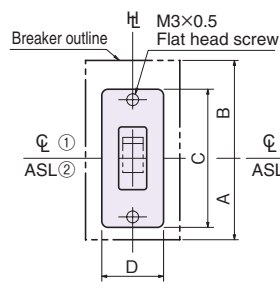
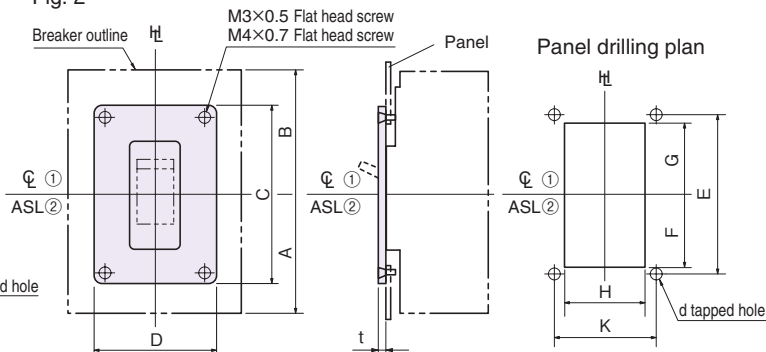


Fig. 2



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			
125, 160	E160-SF/SJ, S160-SCF/SCJ/SF/SJ/SN	T2DF25	1 ①	65	65	105	50	92	37	42	37	42	32	45	—	M3×0.5	2
	P160F/N/H/D	T2DF25	1 ①	65	65	105	50	92	37	42	37	42	32	45	—	M3×0.5	2
	H125-NJ, L125-NJ, L125-PJ	T2DF25	1 ①	82.5	82.5	105	50	92	37	42	37	42	32	45	—	M3×0.5	2
160, 250	E250-SCF/SCJ/SF/SJ, S250-SN	T2DF25	1 ①	82.5	82.5	105	50	92	37	42	37	42	32	45	—	M3×0.5	2
	P250F/N/H/D	T2DF25	1 ①	82.5	82.5	105	50	92	37	42	37	42	32	45	—	M3×0.5	2
	H160-NJ, H250-NJ/NE, L160-NJ, L250-NJ	T2DF25	1 ①	82.5	82.5	105	50	92	37	42	37	42	32	45	—	M3×0.5	2
400, 630, 800	P400E/F/N/H/S/D, P630E/F/N/H/S/D	T2DF40	2 ①	130	130	135	95	120	48	56	48	56	57	90	80	M3×0.5	2
	H400-NE, L400-NE, L400-PE	T2DF40	2 ①	130	130	135	95	120	48	56	48	56	57	90	80	M3×0.5	2
	S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, H800-NE, L800-NE, L800-PE	T2DF40	2 ②	132	141	135	95	120	48	56	48	56	57	90	80	M3×0.5	2
1000	S1000-SE/NE/NN	T2DF40	2 ②	132	141	135	95	120	48	56	48	56	57	90	80	M3×0.5	2
1250, 1600	S1250-SE/NE/GE/NN, S1600-SE/NE/NN	T2DFX6	2 ②	170	200	150	120	135	51	63.5	51	63.5	85	115	80	M3×0.5	2
2000, 2500, 3200	XS2000NE/NN, XS2500NE/NN, XS3200NE/NN	TAA-10	2 ②	193	257	200	175	175	74	83.5	74	83.5	123	170	150	M4×0.7	5

Notes:

① : CL Handle centre line is applied.

② : ASL Arrangement standard line is applied.

7

Characteristics and Outline Dimensions

Thermal Magnetic Characteristics

- | | | | |
|--|-----|--|------|
| • E160-SF, S160-NF 1pole | 7-3 | • P250F, P250N, P250H, | |
| • E160-SF, S160-SCF 2poles | 7-4 | H125-NJ, L125-NJ, L125-PJ | 7-8 |
| • E160-SF, S160-SCF, S160-SF, | | • H160-NJ, H250-NJ, L160-NJ, L250-NJ | 7-9 |
| E160-SJ, S160-SCJ, S160-SJ 3, 4 poles | 7-5 | • P400E, P400F, P400N, P400H, P400S, | |
| • P160F, P160N, P160H, E250-SCF, E250-SF | 7-6 | P630E, P630F, P630N, P630H, P630S | 7-10 |
| • E250-SCJ, E250-SJ | 7-7 | • S800-CJ, S800-NJ, S800-RJ, S800-PJ | 7-11 |

Electronic Characteristics

- | | | | |
|----------------------------------|------|--------------------------------------|------|
| • P160F, P160N, P160H | 7-12 | • S800-NE, S800-RE, S800-PE, | |
| • P250F, P250N, P250H | 7-13 | H800-NE, L800-NE, L800-PE | 7-17 |
| • P400F, P400N, P400H, P400S, | | • S1000-SE, S1000-NE | 7-18 |
| P630F, P630N, P630H, P630S | 7-14 | • S1250-SE, S1250-NE, S1250-GE | 7-19 |
| • H250-NE | 7-15 | • S1600-SE, S1600-NE | 7-20 |
| • H400NE, L400-NE, L400-PE | 7-16 | • XS2000NE, XS2500NE, XS3200NE | 7-21 |

Let-Through Peak Current Characteristics

Thermal type

- | | |
|--|------|
| • E160-SF, S160-SCF, S160-SF | 7-22 |
| • E160-SJ, S160-SCJ, S160-SJ | 7-23 |
| • P160F, P160N, P160H | 7-24 |
| • H125-NJ, L125-NJ | 7-26 |
| • H160-NJ, L160-NJ, H250-NJ, L250-NJ | 7-26 |
| • E250-SCF, E250-SF | 7-27 |
| • E250-SCJ, E250-SJ | 7-27 |
| • P250F, P250N, P250H | 7-28 |
| • P400E, P400F, P400N, P400H, P400S | 7-27 |
| • P630E, P630F, P630N, P630H, P630S | 7-27 |
| • S800-CJ, S800-NJ, S800-RJ, S800-PJ | 7-30 |

Electronic type

- | | |
|--------------------------------------|------|
| • P160F, P160N, P160H | 7-25 |
| • H250-NE | 7-26 |
| • P250F, P250N, P250H | 7-29 |
| • H400-NE, L400-NE | 7-26 |
| • P400F, P400N, P400H, P400S | 7-27 |
| • P630F, P630N, P630H, P630S | 7-27 |
| • S800-NE, S800-RE, S800-PE | 7-30 |
| • H800-NE, L800-NE | 7-30 |
| • S1000-SE, S1000-NE | 7-30 |
| • S1250-SE, S1250-NE, S1250-GE | 7-30 |
| • S1600-SE, S1600-NE | 7-30 |

Let-Through Energy Characteristics

Thermal type

• E160-SF, S160-SCF, S160-SF	7-31
• E160-SJ, S160-SCJ, S160-SJ	7-32
• P160F, P160N, P160H	7-33
• H125-NJ, L125-NJ	7-35
• H160-NJ, L160-NJ, H250-NJ, L250-NJ	7-35
• E250-SCF, E250-SF	7-36
• E250-SCJ, E250-SJ	7-36
• P250F, P250N, P250H	7-37
• P400E, P400F, P400N, P400H, P400S	7-36
• P630E, P630F, P630N, P630H, P630S	7-36
• S800-CJ, S800-NJ, S800-RJ, S800-PJ	7-39

Electronic type

• P160F, P160N, P160H	7-34
• H250-NE	7-35
• P250F, P250N, P250H	7-38
• H400-NE, L400-NE	7-35
• P400F, P400N, P400H, P400S	7-36
• P630F, P630N, P630H, P630S	7-36
• S800-NE, S800-RE, S800-PE	7-39
• H800-NE, L800-NE	7-39
• S1000-SE, S1000-NE	7-39
• S1250-SE, S1250-NE, S1250-GE	7-39
• S1600-SE, S1600-NE	7-39

Outline Dimensions

• E160-SF 1pole	7-40	• H400-NE, L400-NE	7-50
• S160-NF 1pole	7-41	• P630E, P630F, P630N, P630H, P630S, P630D ...	7-51
• E160-SF, S160-SCF, S160-SF	7-42	• S800-CJ, S800-NJ, S800-RJ, S800-PJ, S800-NN, S800-NE, S800-RE, S800-PE	7-52
• E160-SJ, S160-SCJ, S160-SJ, S160-SN	7-43	• H800-NE, L800-NE	7-53
• P160F, P160N, P160H, P160D	7-44	• S1000-SE, S1000-NE, S1000-NN	7-54
• E250-SCF, E250-SF	7-45	• S1250-SE, S1250-NE, S1250-GE, S1250-NN ...	7-55
• E250-SCJ, E250-SJ, S250-SN	7-46	• S1600-SE, S1600-NE, S1600-NN	7-56
• P250F, P250N, P250H, P250D	7-47	• XS2000NE, XS2000NN	7-57
• H125-NJ, H160-NJ, H250-NJ, H250-NE, L125-NJ, L160-NJ, L250-NJ	7-48	• XS2500NE, XS2500NN	7-58
• P400E, P400F, P400N, P400H, P400S, P400D ...	7-49	• XS3200NE, XS3200NN	7-59

Outline Dimensions (with motor operators)

• P160F, P160N, P160H, P160D	7-60	• P630E, P630F, P630N, P630H, P630S, P630D ...	7-66
• E250-SCF, E250-SCJ, E250-SF, E250-SJ, S250-SN ...	7-61	• S800-CJ, S800-NJ, S800-RJ, S800-PJ, S800-NN, S800-NE, S800-RE, S800-PE	7-67
• P250F, P250N, P250H, P250D	7-62	• H800-NE, L800-NE	7-68
• H125-NJ, H160-NJ, H250-NJ, H250-NE, L125-NJ, L160-NJ, L250-NJ	7-63	• S1000-SE, S1000-NE, S1000-NN	7-69
• P400E, P400F, P400N, P400H, P400S, P400D ...	7-64	• S1250-SE, S1250-NE, S1250-GE, S1250-NN ...	7-70
• H400-NE, L400-NE	7-65	• S1600-SE, S1600-NE, S1600-NN	7-71

Outline Dimensions (Special breakers)

High-Performance Electronic Smart Circuit Breaker (TPOU type OCR)

• P160F, P160N, P160H, P250F, P250N, P250H	7-72
• P400F, P400N, P400H, P400S, P630F, P630N, P630H, P630S	7-73

High-Performance Electronic Circuit Breaker (XOW type OCR)

• H400-NE, L400-NE, S800-NE, S800-RE, S800-PE	7-74
• H800-NE, L800-NE, S1000-SE, S1000-NE	7-75

690V AC Circuit Breakers

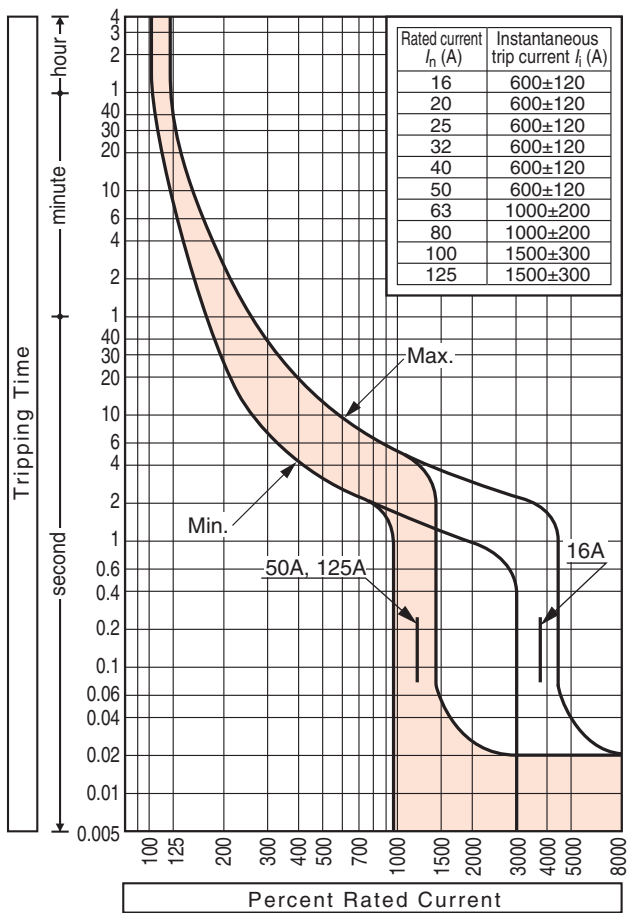
• L125-PJ	7-76
• L400-PE	7-77
• L800-PE	7-78

Thermal Magnetic Characteristics

E160-SF, S160-NF 1pole

Time/Current characteristic curves

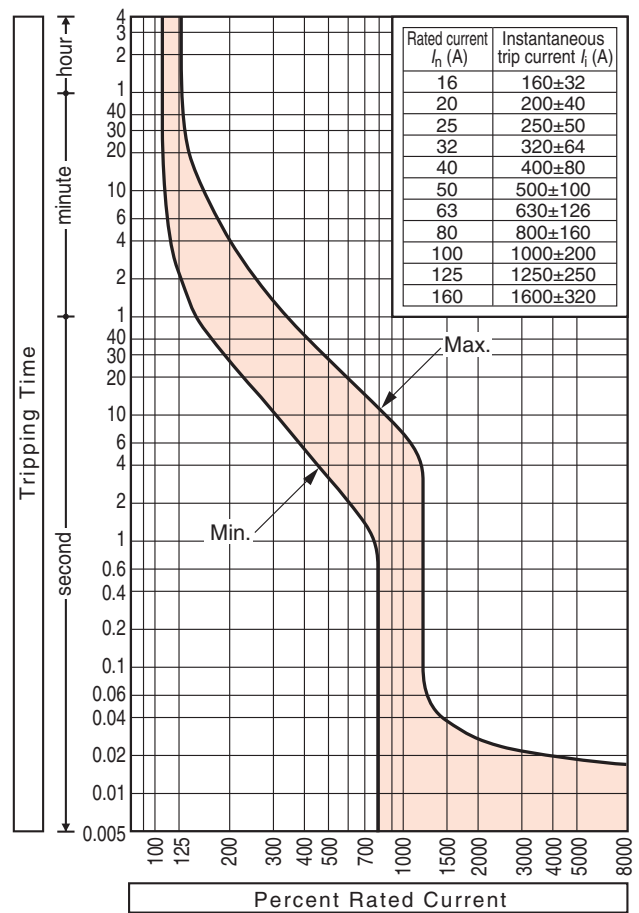
E160-SF 1pole

 $I_n=16, 20, 25, 32, 40, 50, 63, 80, 100, 125A$

Rated current settings (A): (I_r)	Fixed thermal trip ($I_r = I_n$)
Instantaneous trip pick-up current (A): (I_i)	Fixed magnetic trip

Time/Current characteristic curves

S160-NF 1pole

 $I_n=16, 20, 25, 32, 40, 50, 63, 80, 100, 125, 160A$

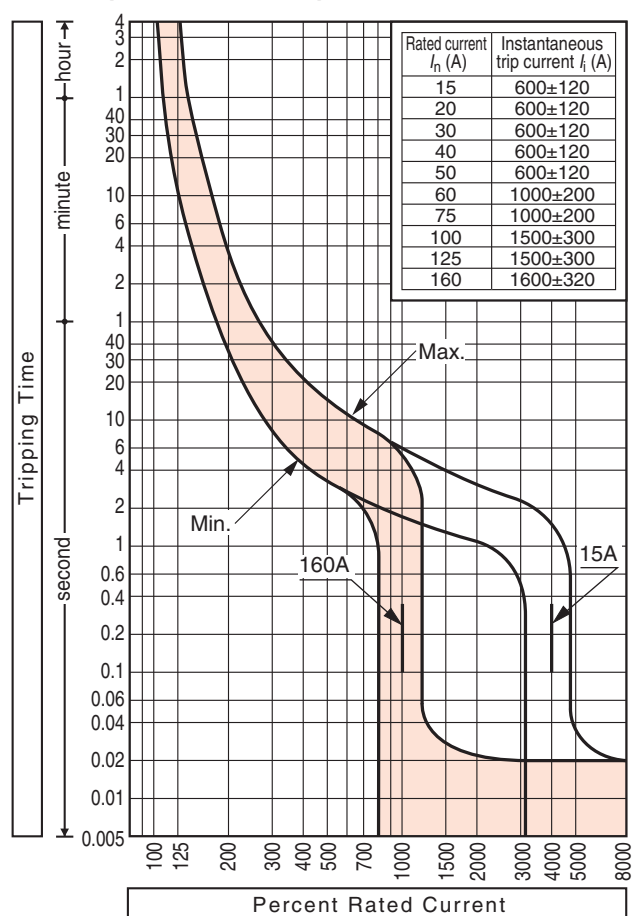
Rated current settings (A): (I_r)	Fixed thermal trip ($I_r = I_n$)
Instantaneous trip pick-up current (A): (I_i)	Fixed magnetic trip

Thermal Magnetic Characteristics

E160-SF, S160-SCF 2poles

Time/Current characteristic curves

E160-SF 2poles, S160-SCF 2poles



$I_n = 15, 20, 30, 40, 50, 60, 75, 100, 125, 160A$

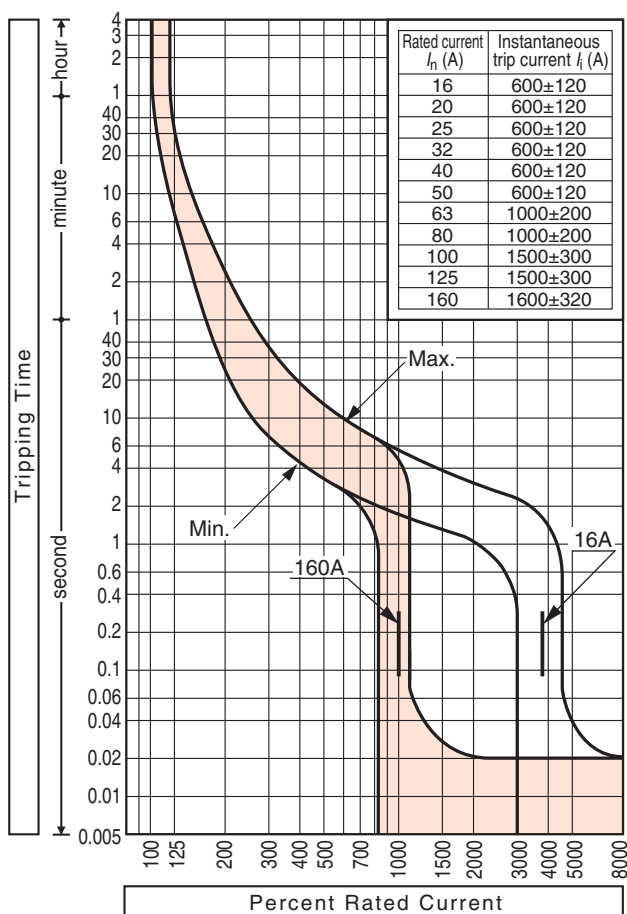
Rated current settings (A): (I_r)	Fixed thermal trip (I_r)= (I_n)
Instantaneous trip pick-up current (A): (I_i)	Fixed magnetic trip

Thermal Magnetic Characteristics

E160-SF, S160-SCF, S160-SF, E160-SJ, S160-SCJ, S160-SJ 3, 4 poles

Time/Current characteristic curves

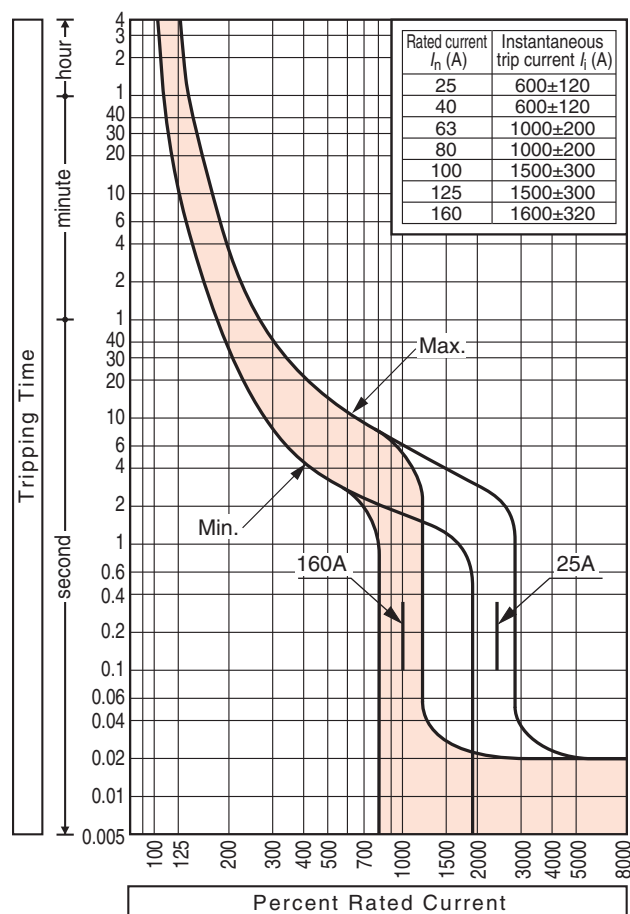
E160-SF, S160-SCF, S160-SF 3, 4 poles

 $I_n=16, 20, 25, 32, 40, 50, 63, 80, 100, 125, 160A$

Rated current settings (A): (I_r)	Fixed thermal trip ($I_r = I_n$)
Instantaneous trip pick-up current (A): (I_t)	Fixed magnetic trip

Time/Current characteristic curves

E160-SJ, S160-SCJ, S160-SJ 3, 4 poles

 $I_n=25, 40, 63, 80, 100, 125, 160A$

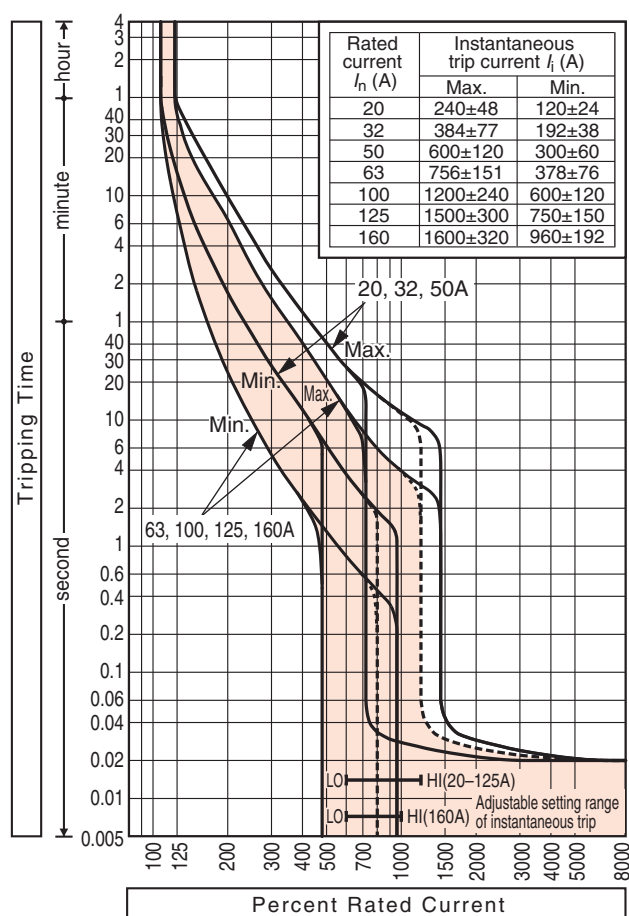
Rated current settings (A): (I_r)	Adjustable thermal trip ($I_r = 0.63-0.8-1.0 \times I_n$)
Instantaneous trip pick-up current (A): (I_t)	Fixed magnetic trip

Thermal Magnetic Characteristics

P160F, P160N, P160H, E250-SCF, E250-SF

Time/Current characteristic curves

P160F, P160N, P160H

 $I_n=20, 32, 50, 100, 125, 160A$

Rated current settings (A): (I_r)	Adjustable thermal trip (I_r)= 0.63-0.8-1.0×(I_n)
---------------------------------------	---

 $I_n=63A$

Rated current settings (A): (I_r)	Adjustable thermal trip (I_r)= 0.8-0.9-1.0×(I_n)
---------------------------------------	--

 $I_n=20, 32, 50, 63, 100, 125A$

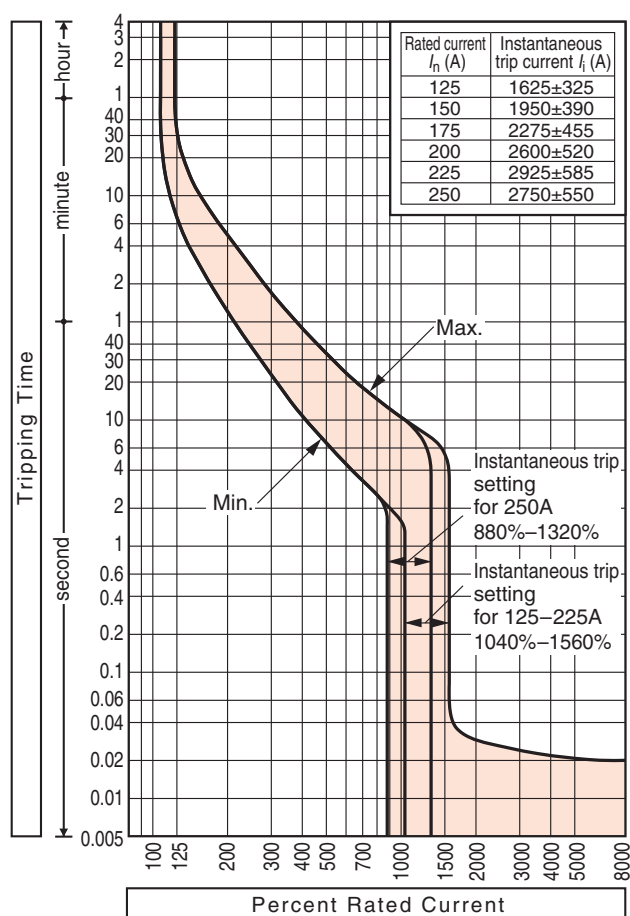
Instantaneous trip pick-up current (A): (I_i)	Adjustable magnetic trip (I_i)=6-8-10-12×(I_n)
---	--

 $I_n=160A$

Instantaneous trip pick-up current (A): (I_i)	Adjustable magnetic trip (I_i)=6-7-8-9-10×(I_n)
---	---

Time/Current characteristic curves

E250-SCF, E250-SF

 $I_n=125, 150, 175, 200, 225, 250A$

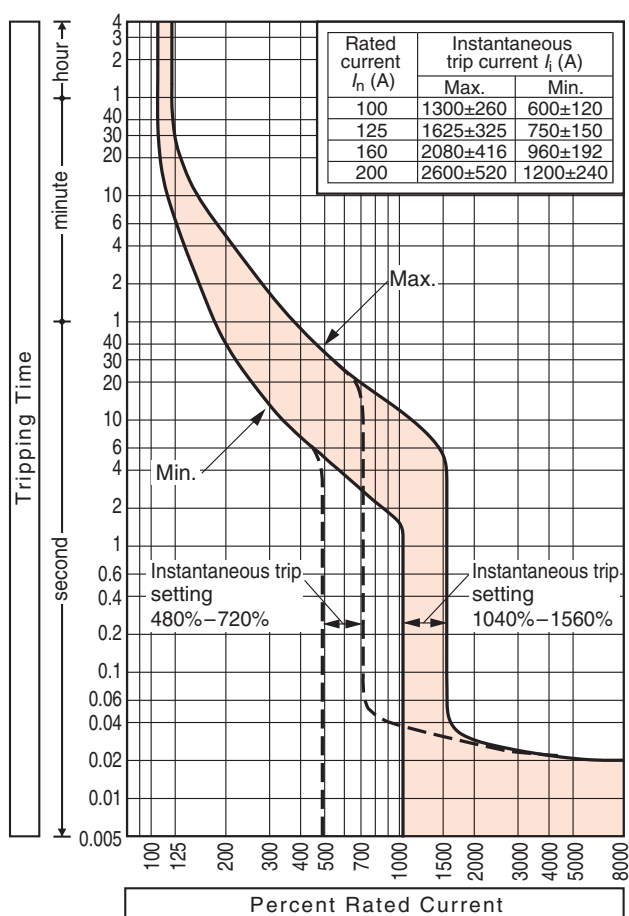
Rated current settings (A): (I_r)	Fixed thermal trip (I_r)= (I_n)
Instantaneous trip pick-up current (A): (I_i)	Fixed magnetic trip

Thermal Magnetic Characteristics

E250-SCJ, E250-SJ

Time/Current characteristic curves

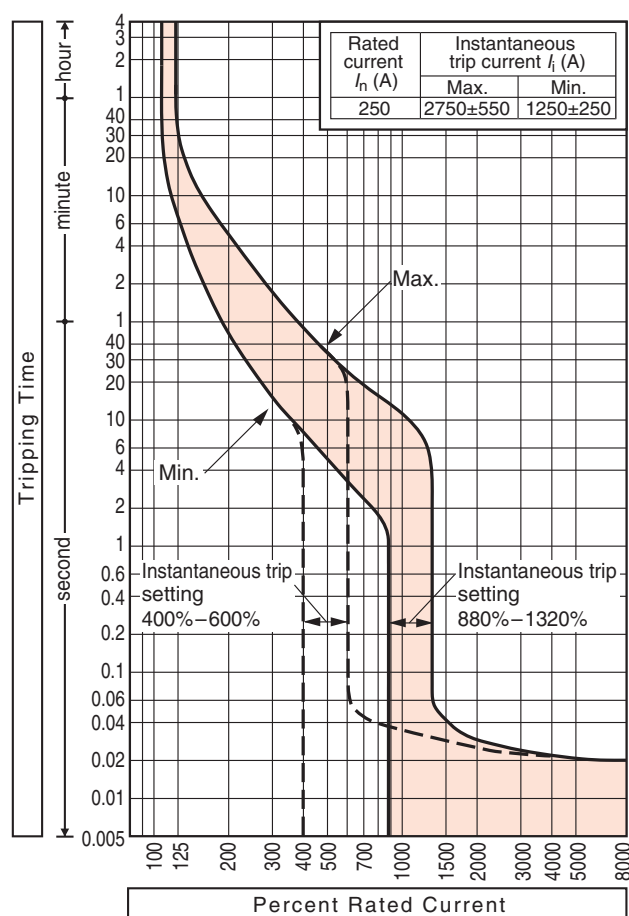
E250-SCJ, E250-SJ 100–200A

 $I_n=100, 125, 160, 200A$

Rated current settings (A): (I_r)	Adjustable thermal trip (I_r)= 0.63-0.8-1.0×(I_n)
Instantaneous trip pick-up current (A): (I_i)	Adjustable magnetic trip (I_i)= 6-8-10-13×(I_n)

Time/Current characteristic curves

E250-SCJ, E250-SJ 250A

 $I_n=250A$

Rated current settings (A): (I_r)	Adjustable thermal trip (I_r)= 0.63-0.8-1.0×(I_n)
Instantaneous trip pick-up current (A): (I_i)	Adjustable magnetic trip (I_i)= 5-7-9-11×(I_n)

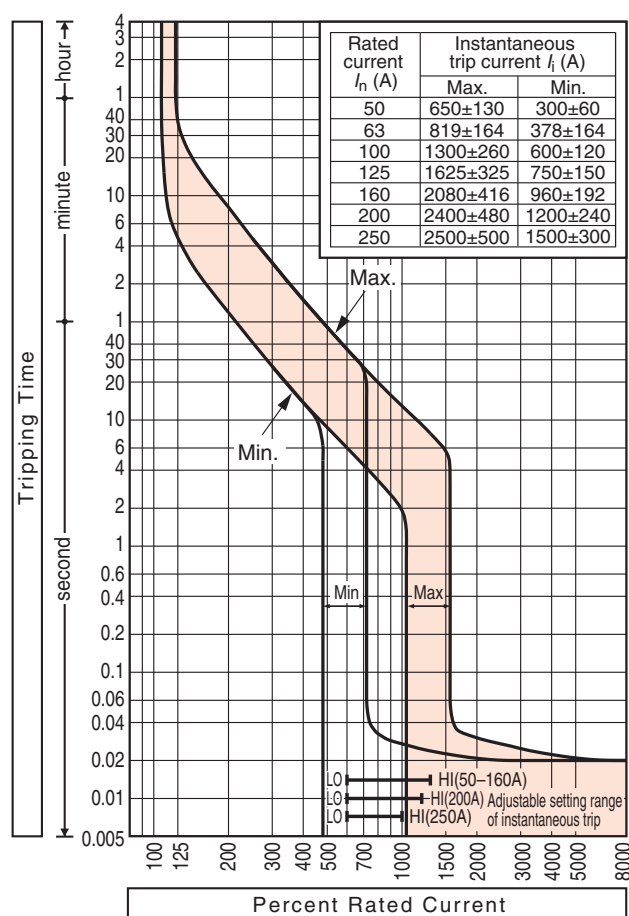
Thermal Magnetic Characteristics

P250F, P250N, P250H, H125-NJ, L125-NJ, L125-PJ

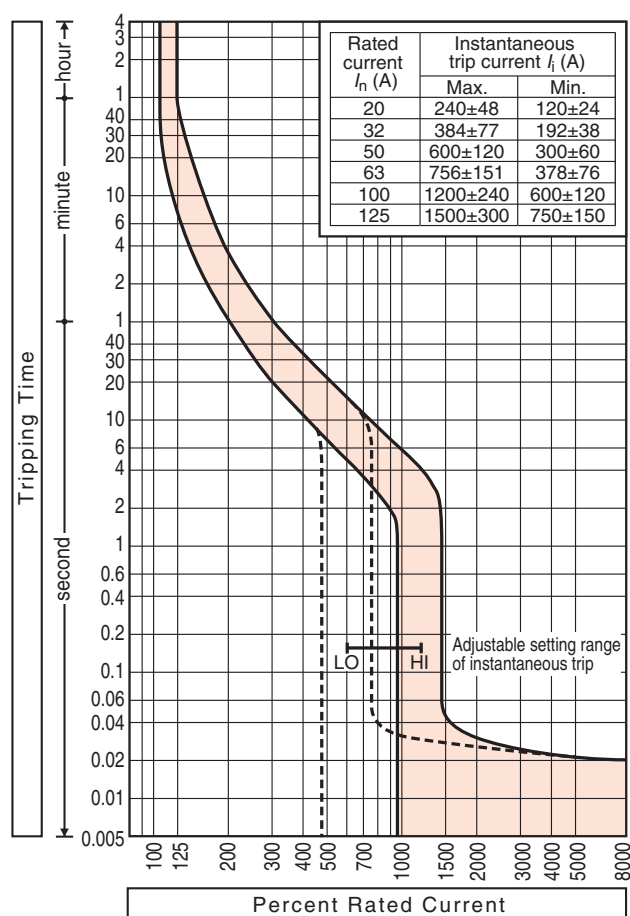
Time/Current characteristic curves

Time/Current characteristic curves

P250F, P250N, P250H



H125-NJ, L125-NJ, L125-PJ

 $I_n=50, 63, 100, 125, 160, 200, 250A$

Rated current settings (A): (I_r)	Adjustable thermal trip (I_r)= 0.63-0.8-1.0×(I_n)
--	--

 $I_n=50, 63, 100, 125, 160A$

Instantaneous trip pick-up current (A): (I_i)	Adjustable magnetic trip (I_i)= 6-8-10-13×(I_n)
--	--

 $I_n=200A$

Instantaneous trip pick-up current (A): (I_i)	Adjustable magnetic trip (I_i)=6-8-10-12×(I_n)
--	---

 $I_n=250A$

Instantaneous trip pick-up current (A): (I_i)	Adjustable magnetic trip (I_i)=6-7-8-9-10×(I_n)
--	--

 $I_n=20, 32, 50, 63, 100, 125A$

Rated current settings (A): (I_r)	Adjustable thermal trip (I_r)= 0.63-0.8-1.0×(I_n)
--	--

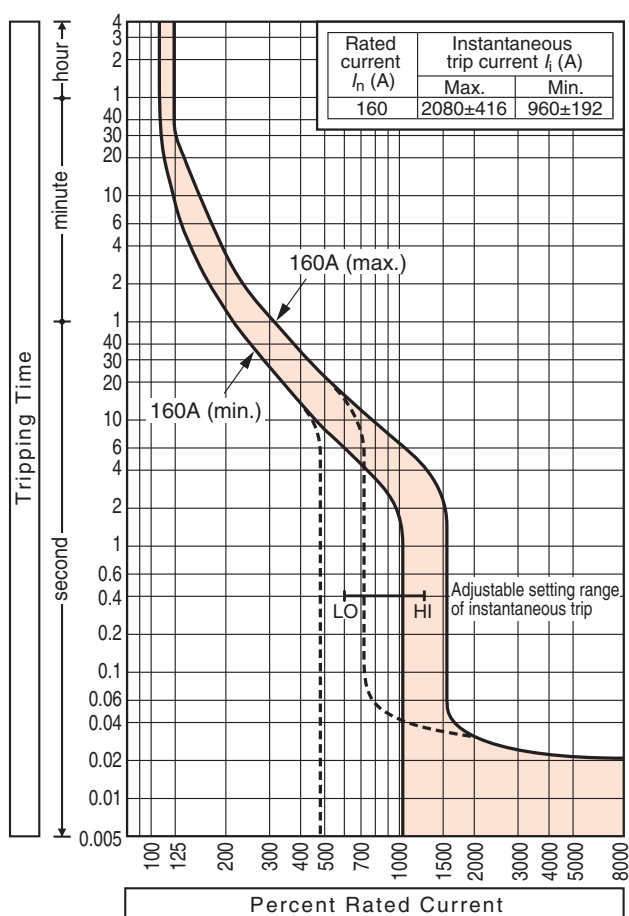
Instantaneous trip pick-up current (A): (I_i)	Adjustable magnetic trip (I_i)= 6-8-10-12×(I_n)
--	--

Thermal Magnetic Characteristics

H160-NJ, H250-NJ, L160-NJ, L250-NJ

Time/Current characteristic curves

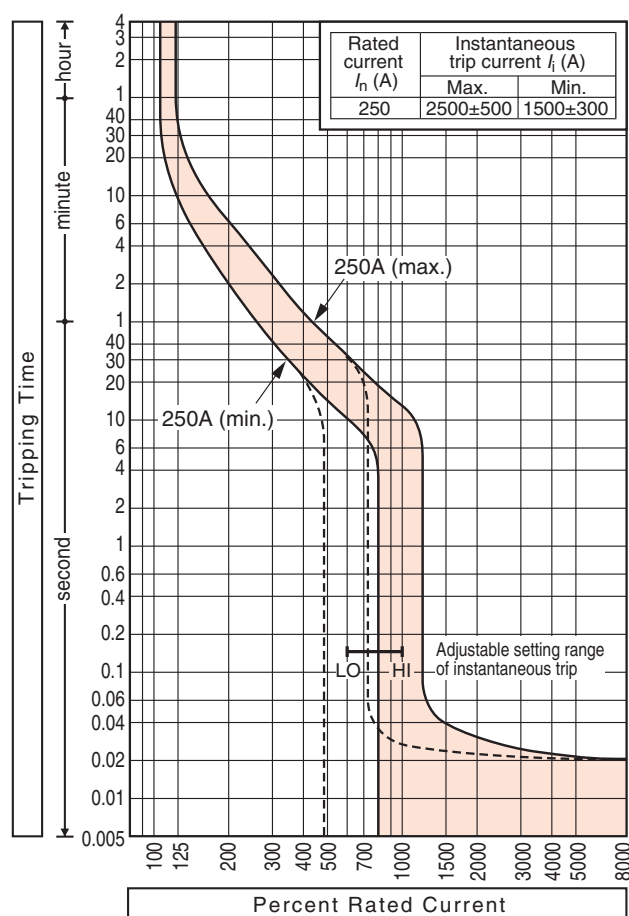
H160-NJ, H250-NJ, L160-NJ, L250-NJ 160A

 $I_n=160A$

Rated current settings (A): (I_r)	Adjustable thermal trip (I_r)= 0.63-0.8-1.0×(I_n)
Instantaneous trip pick-up current (A): (I_i)	Adjustable magnetic trip (I_i)= 6-8-10-13×(I_n)

Time/Current characteristic curves

H250-NJ, L250-NJ 250A

 $I_n=250A$

Rated current settings (A): (I_r)	Adjustable thermal trip (I_r)= 0.63-0.8-1.0×(I_n)
Instantaneous trip pick-up current (A): (I_i)	Adjustable magnetic trip (I_i)= 6-8-10×(I_n)

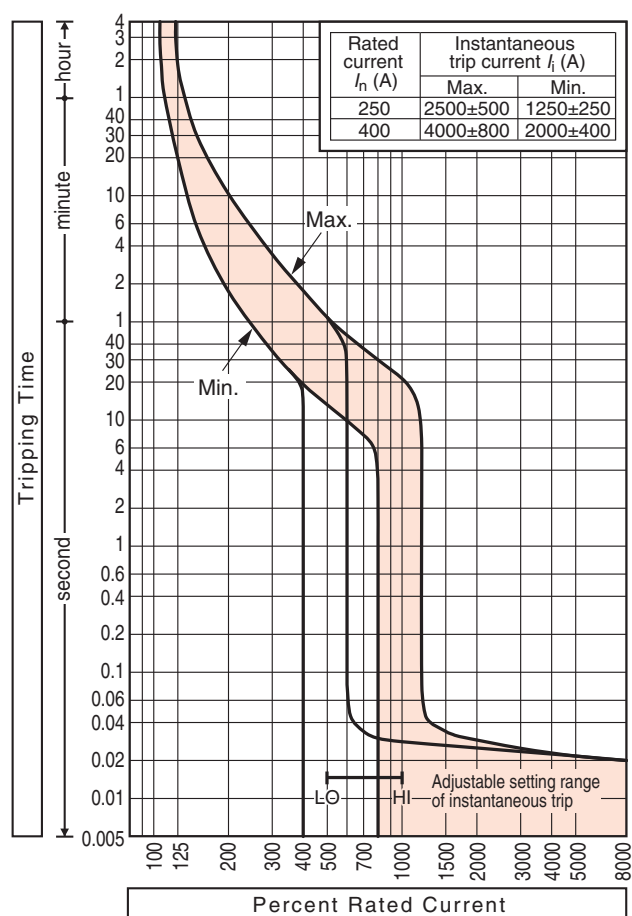
Thermal Magnetic Characteristics

P400E, P400F, P400N, P400H, P400S, P630E, P630F, P630N, P630H, P630S

Time/Current characteristic curves

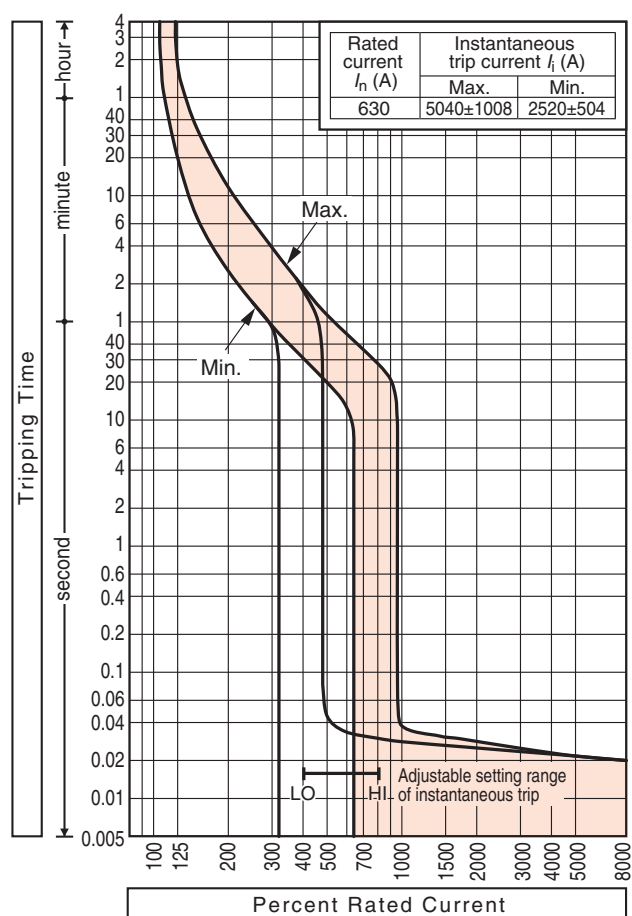
Time/Current characteristic curves

P400E, P400F, P400N, P400H, P400S

 $I_n=250, 400A$

Rated current settings (A): (I_r)	Adjustable thermal trip (I_r)= 0.63-0.8-1.0×(I_n)
Instantaneous trip pick-up current (A): (I_i)	Adjustable magnetic trip (I_i)= 5-6-7-8-9-10×(I_n)

P630E, P630F, P630N, P630H, P630S

 $I_n=630A$

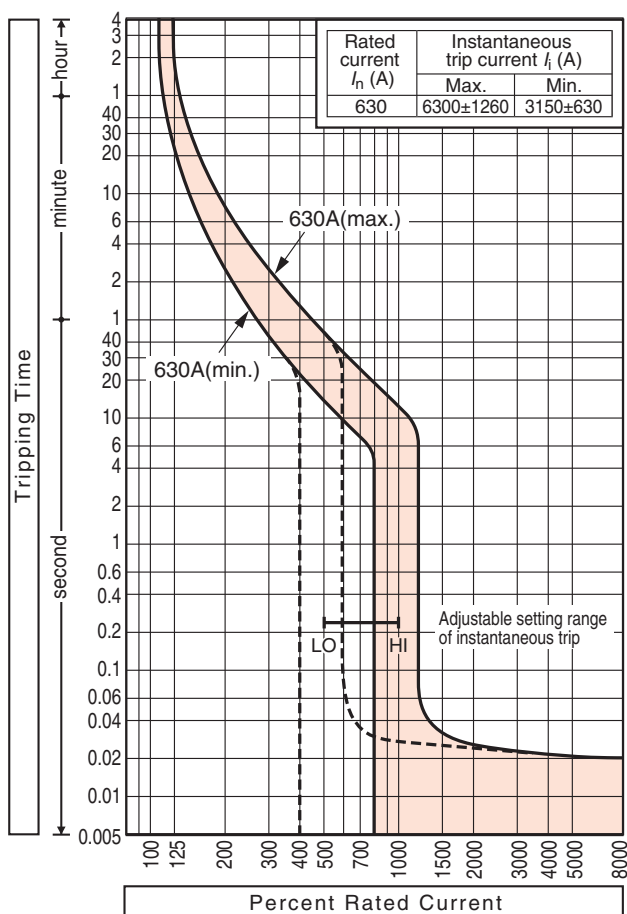
Rated current settings (A): (I_r)	Adjustable thermal trip (I_r)= 0.63-0.8-1.0×(I_n)
Instantaneous trip pick-up current (A): (I_i)	Adjustable magnetic trip (I_i)= 4-5-6-7-8×(I_n)

Thermal Magnetic Characteristics

S800-CJ, S800-NJ, S800-RJ, S800-PJ

Time/Current characteristic curves

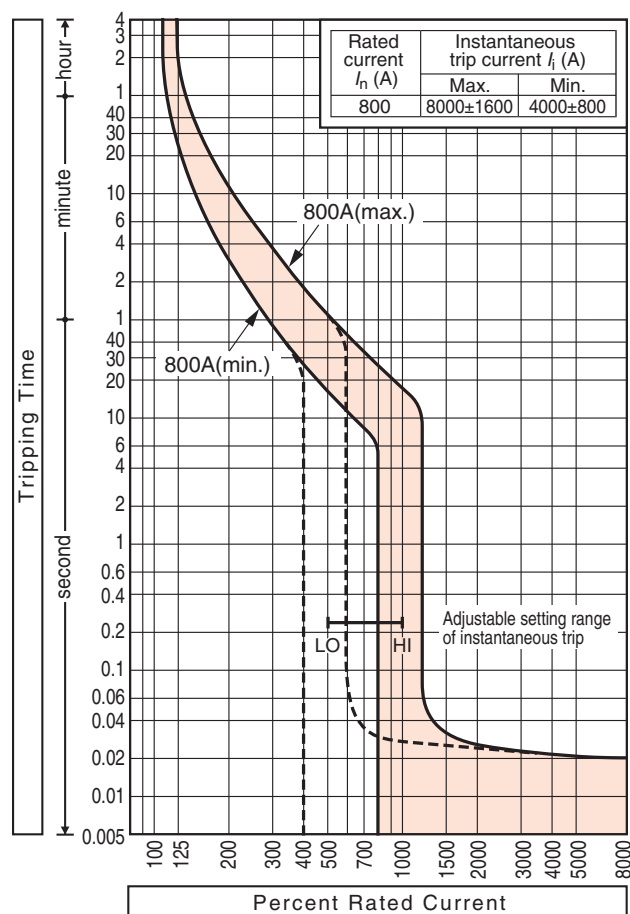
S800-CJ, S800-NJ, S800-RJ, S800-PJ 630A

 $I_n=630A$

Rated current settings (A): (I_r)	Adjustable thermal trip (I_r)= 0.63-0.8-1.0×(I_n)
Instantaneous trip pick-up current (A): (I_i)	Adjustable magnetic trip (I_i)= 5-6-7-8-9-10×(I_n)

Time/Current characteristic curves

S800-CJ, S800-NJ, S800-RJ, S800-PJ 800A

 $I_n=800A$

Rated current settings (A): (I_r)	Adjustable thermal trip (I_r)= 0.63-0.8-1.0×(I_n)
Instantaneous trip pick-up current (A): (I_i)	Adjustable magnetic trip (I_i)= 5-6-7-8-9-10×(I_n)

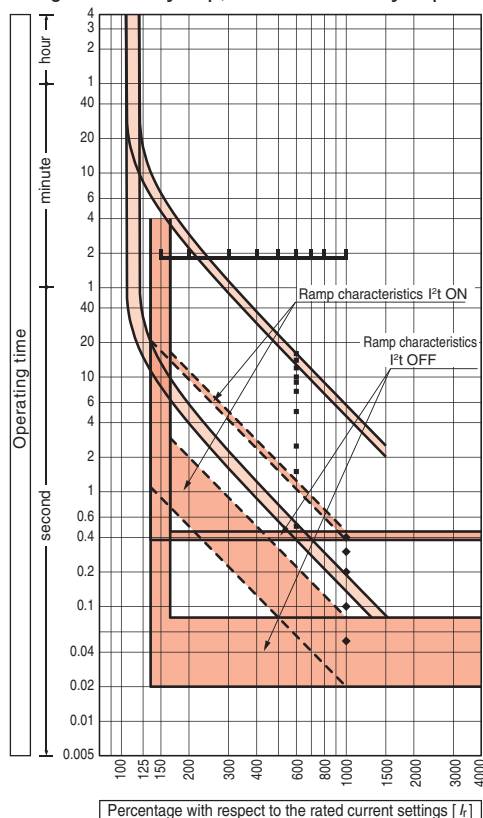
Electronic Characteristics

P160F, P160N, P160H

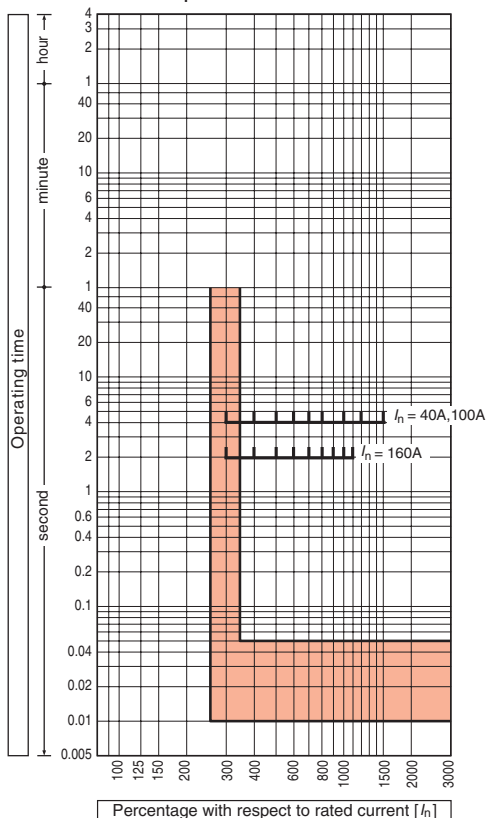
Time/Current characteristic curves

P160F, P160N, P160H $I_n=40A, 100A, 160A$

Long time-delay trip, short time-delay trip characteristics



Instantaneous trip characteristics



Note: See page 6-4 for ground fault trip and preferential trip alarm characteristics.

Overcurrent tripping characteristics

TPOP OCR (LSIG) $I_n=40A, 100A, 160A$

Rated current settings (A) (I_r) = (I_n) $\times$ (I_2)	When (I_n)=40 A, (I_r) (A)=16, 18, 20, 22, 25, 28, 32, 34, 37, <u>40</u> adjustable When (I_n)=100A, (I_r) (A)=40, 45, 50, 57, 63, 72, 80, 87, 93, <u>100</u> adjustable When (I_n)=160A, (I_r) (A)=63, 70, 80, 90, 100, 110, 125, 135, 150, <u>160</u> adjustable (I_2)=0.91, 0.92, 0.93, 0.94, 0.95, 0.96, 0.97, 0.98, 0.99, 1.00
Long time-delay time settings (s) : (t_l)	0.5, 1.5, 2.5, <u>5</u> , 7.5, 9, 10, 12, 14, 16 adjustable at (I_r) $\times$ 600% Time-delay setting tolerance -20% -20ms or more +0% +30ms or less
Short time-delay pick-up current (A) : (I_{sd})	(I_r) $\times$ 1.5, 2, 3, 4, 5, 6, 7, 8, <u>10</u> or OFF Current setting tolerance within $\pm 10\%$
Short time-delay time settings (ms) : (t_{sd})	50, <u>100</u> , 200, 300, 400 adjustable Ramp characteristics I't: ON or OFF However, definite time-delay characteristics with (I_r) $\times$ 10 or more When (t_{sd}) = 50ms, Time-delay setting tolerance -30 ms or more +30 ms or less When (t_{sd}) = 100 ms to 400ms, Time-delay setting tolerance -20ms or more +50ms or less
Instantaneous trip pick-up current (A) : (I_i)	(I_n) $\times$ 3, 4, 5, 6, 7, 8, 10, 12, <u>15</u> adjustable for I_n 40A, I_n 100A (I_n) $\times$ 3, 4, 5, 6, 7, 8, 9, 10, <u>11</u> adjustable for I_n 160A Current setting tolerance within $\pm 15\%$
N-phase protection pick-up current (A) : (I_N)	For 3P OFF fixed For 4P (I_r) $\times$ 50%, 100% or OFF
N-phase protection time settings (s) : (t_N)	Operates with long time-delay time setting (t_l) and short time-delay time setting (t_{sd}) and also operates with instantaneous trip
Ground fault trip pick-up current (A) : (I_g)	Settings for 3P 3 ϕ 3W and 4P 3 ϕ 4W (3P 3 ϕ 4W not supported) (I_n) $\times$ 40% for I_n 40A, (I_n) $\times$ 20% for I_n 100A, 160A Current setting tolerance within $\pm 10\%$ or OFF
Ground fault trip time settings (ms) : (t_g)	200 Time-delay setting tolerance -20ms or more +50ms or less
Preferential trip alarm pick-up current (A) : (I_p)	(I_r) $\times$ 80% Current setting tolerance within $\pm 10\%$
Preferential trip alarm time settings (s) : (t_p)	(t_l) $\times$ 50% at (I_p) $\times$ 600% Time-delay setting tolerance -20% -20ms or more +0% +30 ms or less

Notes:

- ① : When $I_r=144A$ or more and $t_r=16s$ is set, the device operates with $I_{sd}=I_r \times 9$ even if the max. $I_{sd}=I_r \times 10$ is set.
- ② : When $I_{sd}=OFF$ is set, the long time-delay will become ramp characteristics last to 2s at Max 1,760A in the area of 1280A or more of conduction current. If the long time-delay time setting is faster than the ramp characteristic time then the device operates with the long time-delay time setting.

Remarks:

- 1: If not otherwise specified, the product will be delivered with the underlined standard setting values.
- 2: The TPOT type OCR (LSI) only has long time-delay trip, short time-delay trip, instantaneous trip, and preferential trip alarm.

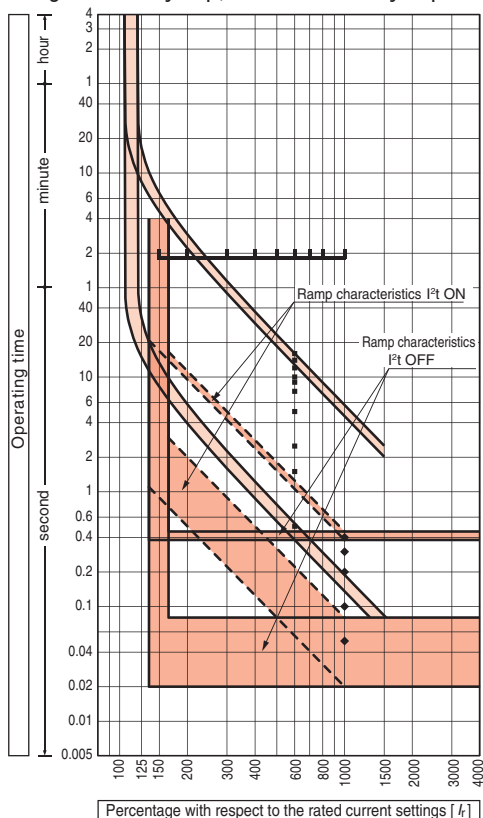
Electronic Characteristics

P250F, P250N, P250H

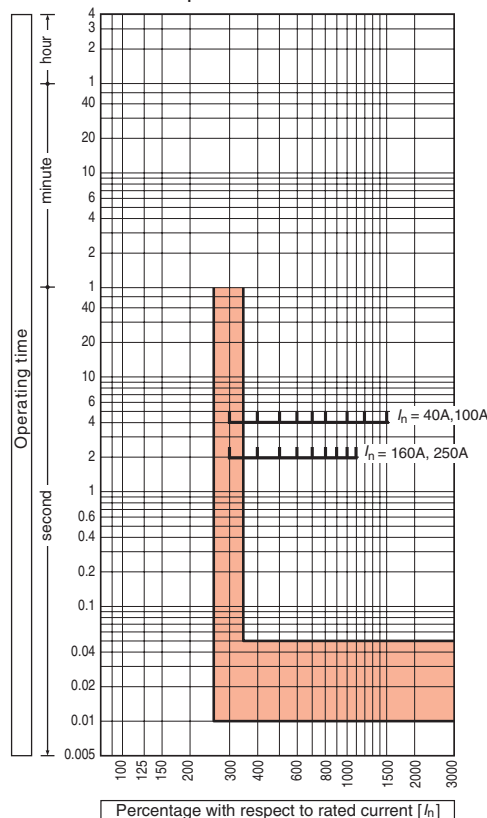
Time/Current characteristic curves

P250F, P250N, P250H $I_n=40A, 100A, 160A, 250A$

Long time-delay trip, short time-delay trip characteristics



Instantaneous trip characteristics



Note: See page 6-4 for ground fault trip and preferential trip alarm characteristics.

Overcurrent tripping characteristics

TPOT OCR (LSIG) $I_n=40A, 100A, 160A, 250A$

Rated current settings (A) ($I_r = (I_{r1}) \times (I_{r2})$)	When (I_n)=40 A, (I_{r1}) (A)=16, 18, 20, 22, 25, 28, 32, 34, 37, 40 adjustable When (I_n)=100A, (I_{r1}) (A)=40, 45, 50, 57, 63, 72, 80, 87, 93, 100 adjustable When (I_n)=160A, (I_{r1}) (A)=63, 70, 80, 90, 100, 110, 125, 135, 150, 160 adjustable When (I_n)=250A, (I_{r1}) (A)=100, 110, 125, 140, 160, 180, 200, 225, 250 adjustable (I_{r2})=0.91, 0.92, 0.93, 0.94, 0.95, 0.96, 0.97, 0.98, 0.99, 1.00
Long time-delay time settings (s) : (t_l)	0.5, 1.5, 2.5, 5, 7.5, 9, 10, 12, 14, 16 adjustable at (I_r) $\times$ 600% Time-delay setting tolerance -20% -20ms or more +0% +30ms or less
Short time-delay pick-up current (A) : (I_{sd})	(I_r) $\times$ 1.5, 2, 3, 4, 5, 6, 7, 8, 10 or OFF Current setting tolerance within $\pm 10\%$
Short time-delay time settings (ms) : (t_{sd})	50, 100, 200, 300, 400 adjustable Ramp characteristics I ² t: ON or OFF However, definite time-delay characteristics with (I_r) $\times$ 10 or more When (t_{sd}) = 50ms, Time-delay setting tolerance -30 ms or more +30 ms or less When (t_{sd}) = 100 ms to 400ms, Time-delay setting tolerance -20ms or more +50ms or less
Instantaneous trip pick-up current (A) : (I_i)	(I_n) $\times$ 3, 4, 5, 6, 7, 8, 10, 12, 15 adjustable for I_n 40A, I_n 100A (I_n) $\times$ 3, 4, 5, 6, 7, 8, 9, 10, 11 adjustable for I_n 160A, I_n 250A Current setting tolerance within $\pm 15\%$
N-phase protection pick-up current (A) : (I_N)	For 3P OFF fixed For 4P (I_r) $\times$ 50%, 100% or OFF
N-phase protection time settings (s) : (t_N)	Operates with long time-delay time setting (t_l) and short time-delay time setting (t_{sd}) and also operates with instantaneous trip
Ground fault trip pick-up current (A) : (I_g)	Settings for 3P 3 ϕ 3W and 4P 3 ϕ 4W (3P 3 ϕ 4W not supported) (I_n) $\times$ 40% for I_n 40A, (I_n) $\times$ 20% for I_n 100A, 160A, 250A Current setting tolerance within $\pm 10\%$ or OFF
Ground fault trip time settings (ms) : (t_g)	200 Time-delay setting tolerance -20ms or more +50ms or less
Preferential trip alarm pick-up current (A) : (I_p)	(I_r) $\times$ 80% Current setting tolerance within $\pm 10\%$
Preferential trip alarm time settings (s) : (t_p)	(t_l) $\times$ 50% at (I_p) $\times$ 600% Time-delay setting tolerance -20% -20ms or more +0% +30 ms or less

Notes:

- ①: When $I_{sd}=225A$ or more and $t_l=16s$ is set, the device operates with $I_{sd}=I_r \times 9$ even if the max. $I_{sd}=I_r \times 10$ is set.
- ②: When $I_{sd}=OFF$ is set, the long time-delay will become ramp characteristics last to 2s at Max 2,750A in the area of 2000A or more of conduction current. If long time-delay time setting is faster than the ramp characteristic time then the device operates with the long time-delay time setting.

Remarks:

- 1: If not otherwise specified, the product will be delivered with the underlined standard setting values.
- 2: The TPOT type OCR (LSI) only has long time-delay trip, short time-delay trip, instantaneous trip, and preferential trip alarm.

Electronic Characteristics

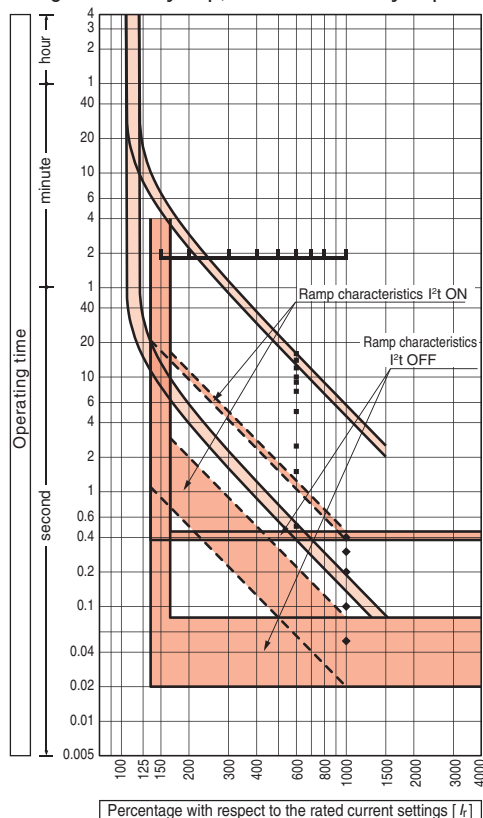
P400F, P400N, P400H, P400S, P630F, P630N, P630H, P630S

Time/Current characteristic curves

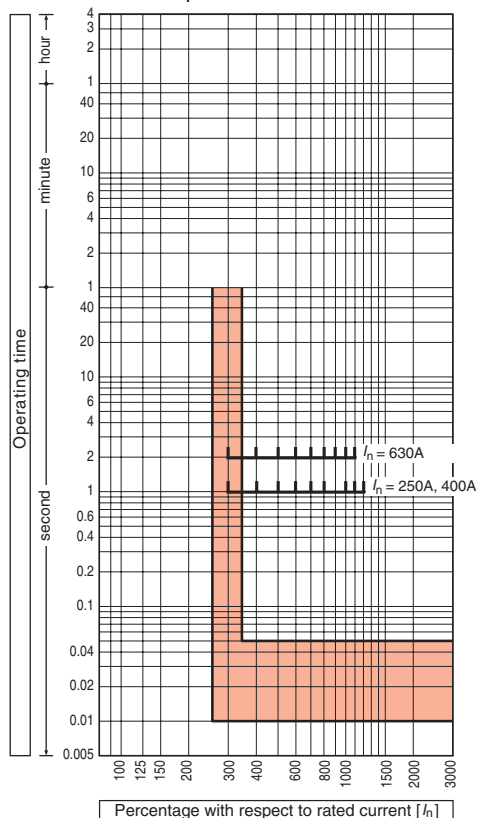
P400F, P400N, P400H, P400S, P630F, P630N, P630H, P630S

 $I_n=250A, 400A, 630A$

Long time-delay trip, short time-delay trip characteristics



Instantaneous trip characteristics



Note: See page 6-4 for ground fault trip and preferential trip alarm characteristics.

Overcurrent tripping characteristics

TPOP OCR (LSIG) $I_n=250A, 400A, 630A$

Rated current settings (A) $(I_r) = (I_n) \times (I_t2)$	When $(I_n)=250A$, (I_r) (A)=100, 110, 125, 140, 160, 180, 200, 225, <u>250</u> adjustable When $(I_n)=400A$, (I_r) (A)=160, 180, 200, 225, 250, 300, 350, 370, <u>400</u> adjustable When $(I_n)=630A$, (I_r) (A)=250, 300, 350, 370, 400, 500, 600, <u>630</u> adjustable $(I_t2)=0.91, 0.92, 0.93, 0.94, 0.95, 0.96, 0.97, 0.98, 0.99, 1.00$
Long time-delay time settings (s) : (t_t)	0.5, 1.5, 2.5, <u>5</u> , 7.5, 9, 10, 12, 14, 16 adjustable at $(I_r) \times 600\%$ Time-delay setting tolerance -20% $-20ms$ or more $+0\%$ $+30ms$ or less
Short time-delay pick-up current (A) : (I_{sd})	$(I_r) \times 1.5, 2, 3, 4, 5, 6, 7, 8, 10$ or OFF Current setting tolerance within $\pm 10\%$
Short time-delay time settings (ms) : (t_{sd})	50, <u>100</u> , 200, 300, 400 adjustable Ramp characteristics I^2t : ON or OFF However, definite time-delay characteristics with $(I_r) \times 10$ or more When $(t_{sd}) = 50ms$, Time-delay setting tolerance $-30 ms$ or more $+30 ms$ or less When $(t_{sd}) = 100 ms$ to 400ms, Time-delay setting tolerance $-20ms$ or more $+50ms$ or less
Instantaneous trip pick-up current (A) : (I_i)	$(I_n) \times 3, 4, 5, 6, 7, 8, 10, 11, 12$ adjustable for $I_n 250A, I_n 400A$ $(I_n) \times 3, 4, 5, 6, 7, 8, 9, 10, 11$ adjustable for $I_n 630A$ Current setting tolerance within $\pm 15\%$
N-phase protection pick-up current (A) : (I_N)	For 3P OFF fixed For 4P $(I_r) \times 50\%, 100\%$ or OFF
N-phase protection time settings (s) : (t_N)	Operates with long time-delay time setting (t_t) and short time-delay time setting (t_{sd}) and also operates with instantaneous trip
Ground fault trip pick-up current (A) : (I_g)	Settings for 3P 3ø3W and 4P 3ø4W (3P 3ø4W not supported) $(I_n) \times 20\%$ for $I_n 250A, 400A, 630A$ or OFF Current setting tolerance within $\pm 10\%$
Ground fault trip time settings (ms) : (t_g)	200 Time-delay setting tolerance $-20ms$ or more $+50ms$ or less
Preferential trip alarm pick-up current (A) : (I_p)	$(I_r) \times 80\%$ Current setting tolerance within $\pm 10\%$
Preferential trip alarm time settings (s) : (t_p)	$(t_t) \times 50\%$ at $(I_p) \times 600\%$ Time-delay setting tolerance -20% $-20ms$ or more $+0\%$ $+30 ms$ or less

Remarks:

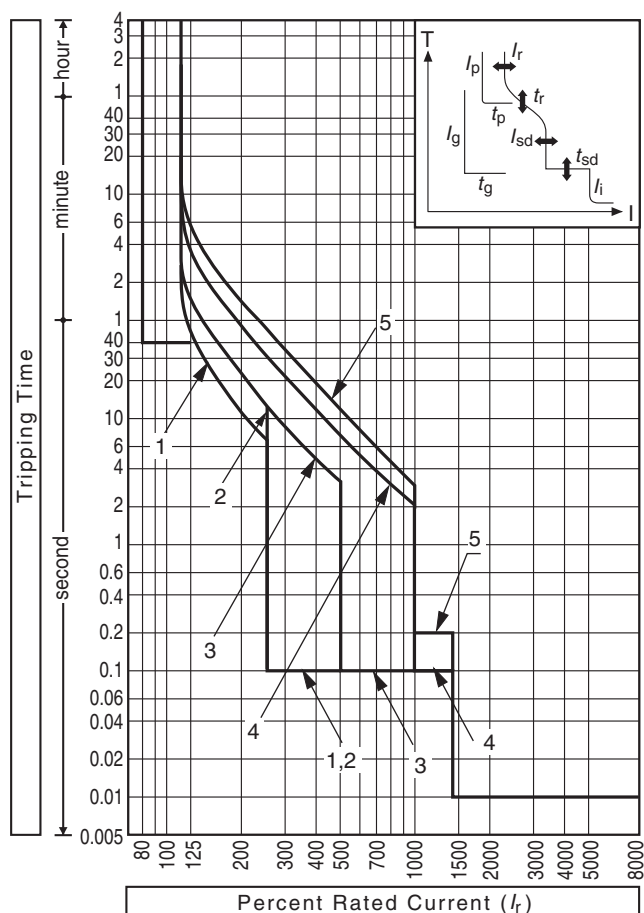
1: If not otherwise specified, the product will be delivered with the underlined standard setting values.

2: The TPOP type OCR (LSI) only has long time-delay trip, short time-delay trip, instantaneous trip, and preferential trip alarm.

Electronic Characteristics

H250-NE

Time/Current characteristic curves

H250-NE $I_n=40A, 125A, 160A, 250A$ 

Overcurrent tripping characteristics

XOU OCR (LSI) $I_n=40A, 125A, 160A, 250A$

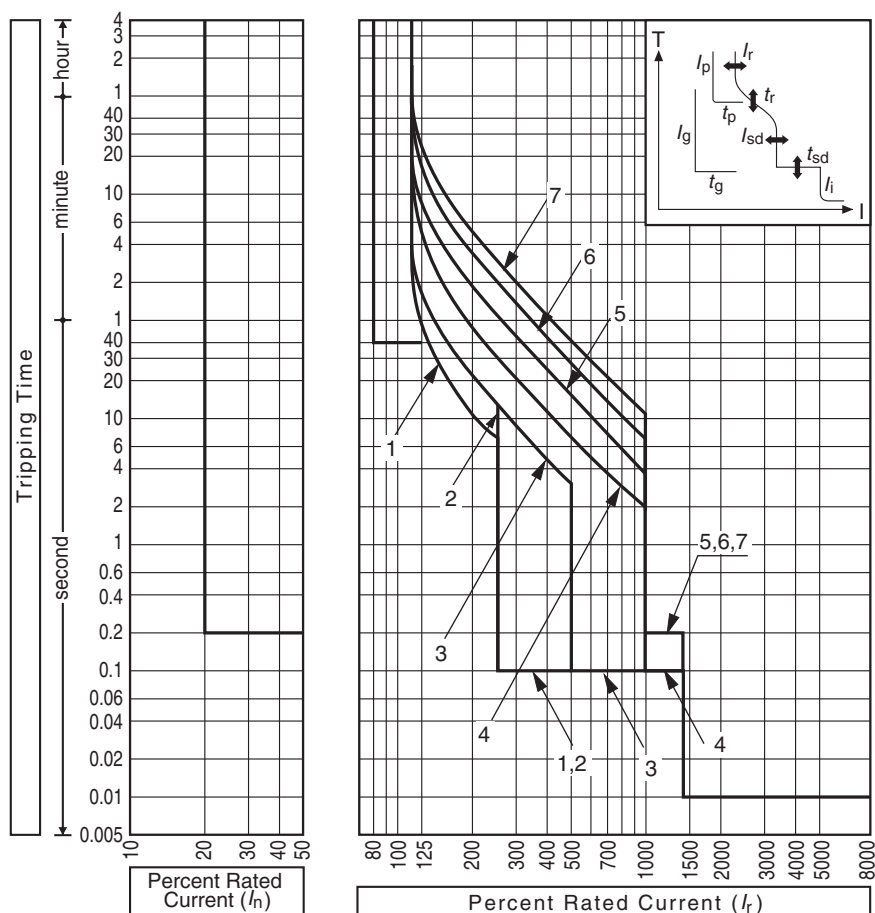
Characteristics No.		1	2	3	4	5
Rated current settings (A) : (I_r)		$(I_r) = (I_n) \times 0.4, 0.5, 0.63, 0.8, 0.9, 0.95, 1.0$				
Long time-delay time settings (s) : (t_r)		11	21	21	5	7.5
		at $(I_r) \times 200\%$			at $(I_r) \times 600\%$	
		Setting tolerance $\pm 20\%$				
Short time-delay pick-up current (A) : (I_{sd})		2.5	2.5	5	10	10
		Setting tolerance $\pm 15\%$				
Short time-delay time settings (s) : (t_{sd})		0.1	0.1	0.1	0.1	0.2
		Total clearing time +50ms, resettable time -20ms				
Instantaneous trip pick-up current (A) : (I_i)		$(I_r) \times 1400\%$ Max. $(I_n) \times 1300\%$ Setting tolerance $\pm 20\%$				
Option	Preferential trip alarm					
	Pick-up current (A) : (I_p)	$(I_r) \times 80\%$ 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_N)	$(I_r) \times 100\%$				
	Time settings (s) : (t_N)	$(t_N) = (t_r)$ Same as Long time-delay time settings				

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

Electronic Characteristics

H400NE, L400-NE, L400-PE

Time/Current characteristic curves

H400NE, L400-NE, L400-PE $I_n=250A, 400A$ 

Overcurrent tripping characteristics

XOU OCR (LSIG) $I_n=250A, 400A$

Characteristics No.		1	2	3	4	5	6	7
Rated current settings (A) : (I_r)		$(I_r) = (I_n) \times 0.4, 0.5, 0.63, 0.8, 0.9, 0.95, 1.0$						
Long time-delay time settings (s) : (t_r)		11	21	21	5	10	19	29
		at $(I_r) \times 200\%$			at $(I_r) \times 600\%$			
		Setting tolerance $\pm 20\%$						
Short time-delay (I_r) $\times$ 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)		$(I_r) \times 1400\%$ Max. $(I_n) \times 1300\%$ Setting tolerance $\pm 20\%$						
Option	Preferential trip alarm							
	Pick-up current (A) : (I_p)	$(I_r) \times 80\%$ 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)	$(I_n) \times 20\%$ 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_N)	$(I_r) \times 100\%$ or 50% selectable ②						
	Time settings (s) : (t_N)	$(t_N) = (t_r)$ Same as Long time-delay time settings						

Note ①: When $(I_n)=250A$, ground fault trip cannot be used.Note ②: When $(I_r) < (I_n)$, the pick-up current tolerance becomes large when $(I_N)=(I_r) \times 50\%$ is set.

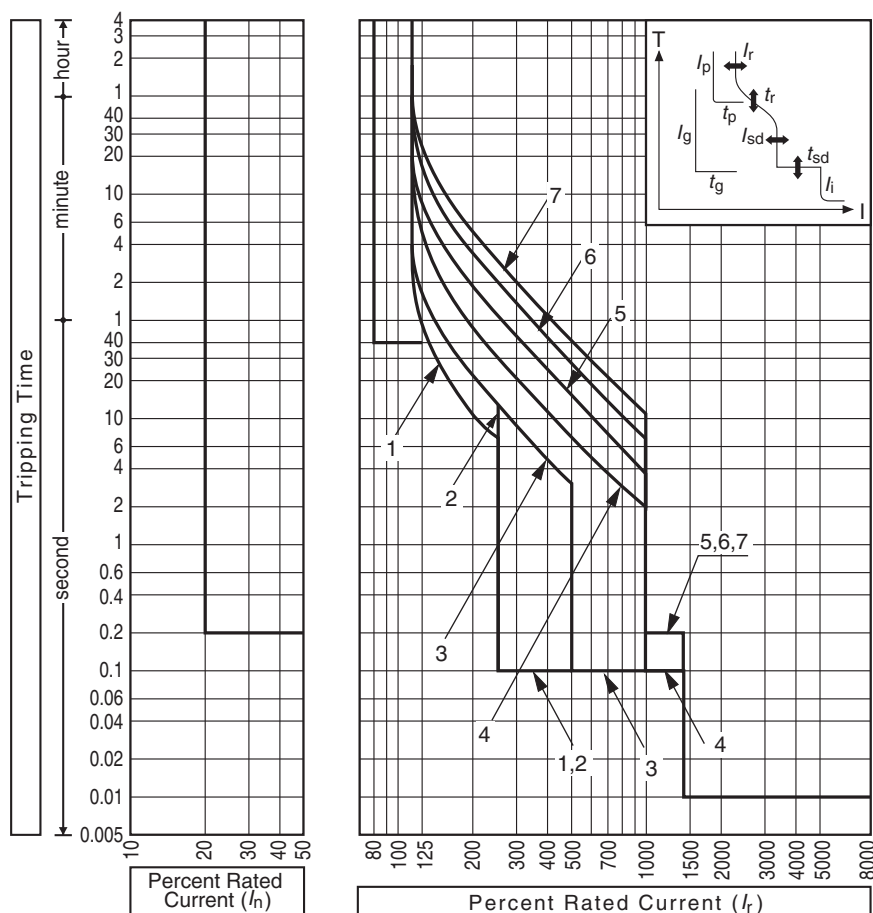
Note ③: When you specify GF on MCCBs with 3 poles the terminal block is automatically fitted to connect with the external neutral CT for 3 phases 4 wires system. See terminal blocks in section 6.

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

Electronic Characteristics

S800-NE, S800-RE, S800-PE, H800-NE, L800-NE, L800-PE

Time/Current characteristic curves

S800-NE, S800-RE, S800-PE, H800-NE, L800-NE, L800-PE $I_n=630A, 800A$ 

Overcurrent tripping characteristics

XOU OCR (LSIG) $I_n=630A, 800A$

Characteristics No.	1	2	3	4	5	6	7
Rated current settings (A) : (I_r)	$(I_r) = (I_n) \times 0.4, 0.5, 0.63, 0.8, 0.9, 0.95, 1.0$						
Long time-delay time settings (s) : (t_r)	11	21	21	5	10	19	29
	at (I_r) $\times$ 200%			at (I_r) $\times$ 600%			
	Setting tolerance $\pm 20\%$						
Short time-delay (I_r) $\times$ 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)	$(I_i) \times 1400\%$ Max. (I_n) $\times 1200\%$ 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_g) $(I_g) \times 20\%$ Setting tolerance $\pm 15\%$						
	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) $(I_r) \times 100\%$ or 50% selectable ②						
	Time settings (s) : (t_n) $(t_n) = (t_r)$ Same as Long time-delay time settings						

Note ②: When $(I_i) < (I_n)$, the pick-up current tolerance becomes large when $(I_N) = (I_i) \times 50\%$ is set.

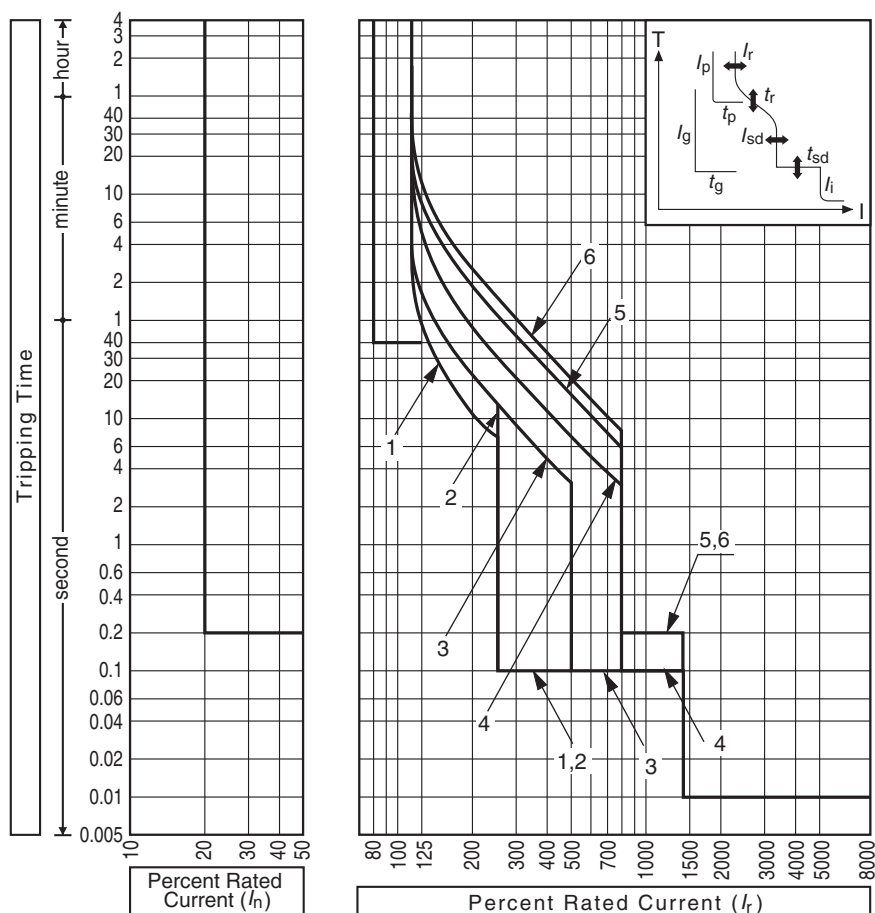
Note ③: When you specify GF on MCCBs with 3 poles the terminal block is automatically fitted to connect with the external neutral CT for 3 phases 4 wires system. See terminal blocks in section 6.

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

Electronic Characteristics

S1000-SE, S1000-NE

Time/Current characteristic curves

S1000-SE, S1000-NE $I_n=1000A$ 

Overcurrent tripping characteristics

XOU OCR (LSIG) $I_n=1000A$

Characteristics No.		1	2	3	4	5	6	
Rated current settings (A) : (I_r)		$(I_r) = (I_n) \times 0.4, 0.5, 0.63, 0.8, 0.9, 0.95, 1.0$						
Long time-delay time settings (s) : (t_r)		11	21	21	5	10	16	
		at $(I_r) \times 200\%$			at $(I_r) \times 600\%$			
		Setting tolerance $\pm 20\%$						
Short time-delay pick-up current (A) : (I_{sd}) $(I_p) \times$		2.5	2.5	5	8	8	8	
		Setting tolerance $\pm 15\%$						
Short time-delay time settings (s) : (t_{sd})		0.1	0.1	0.1	0.1	0.2	0.2	
		Total clearing time +50ms, resettable time -20ms						
Instantaneous trip pick-up current (A) : (I_i)		$(I_i) \times 1400\%$ Max. $(I_n) \times 1000\%$						
		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_g)		$(I_g) \times 20\%$ Setting tolerance $\pm 15\%$					
	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)		$(I_N) \times 100\%$ or 50% selectable ②					
		Time settings (s) : (t_N)		$(t_N) = (t_r)$ Same as Long time-delay time settings				

Note ②: When $(I_i) < (I_n)$, the pick-up current tolerance becomes large when $(I_N) = (I_i) \times 50\%$ is set.

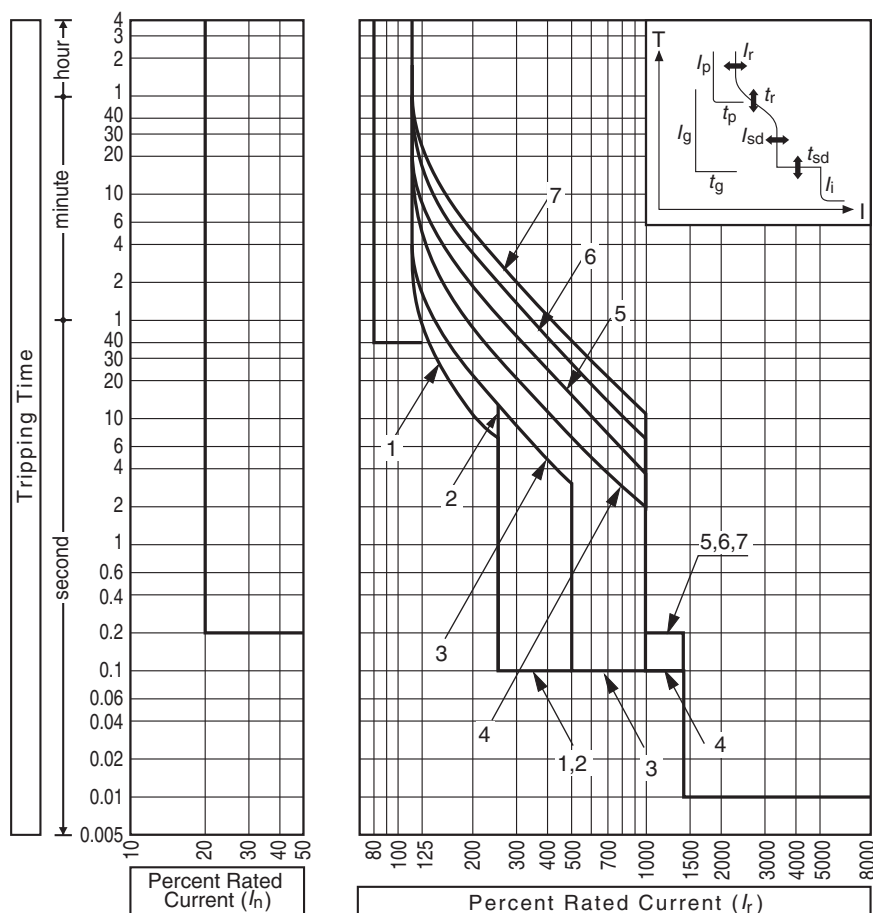
Note ③: When you specify GF on MCCBs with 3 poles the terminal block is automatically fitted to connect with the external neutral CT for 3 phases 4 wires system. See terminal blocks in section 6.

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

Electronic Characteristics

S1250-SE, S1250-NE, S1250-GE

Time/Current characteristic curves

S1250-SE, S1250-NE, S1250-GE $I_n=800A, 1250A$ 

Overcurrent tripping characteristics

XOU OCR (LSIG) $I_n=800A, 1250A$

Characteristics No.		1	2	3	4	5	6	7
Rated current settings (A) : (I_r)		$(I_r) = (I_n) \times 0.4, 0.5, 0.63, 0.8, 0.9, 0.95, 1.0$						
Long time-delay time settings (s) : (t_r)		11	21	21	5	10	19	29
		at $(I_r) \times 200\%$			at $(I_r) \times 600\%$			
		Setting tolerance $\pm 20\%$						
Short time-delay (I_r) $\times$ 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)		$(I_i) \times 1400\%$ Max. $(I_n) \times 1200\%$ 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_g)	$(I_g) \times 20\%$ Setting tolerance $\pm 15\%$						
	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)	$(I_r) \times 100\%$ or 50% selectable ②						
	Time settings (s) : (t_n)	$(t_n) = (t_r)$ Same as Long time-delay time settings						

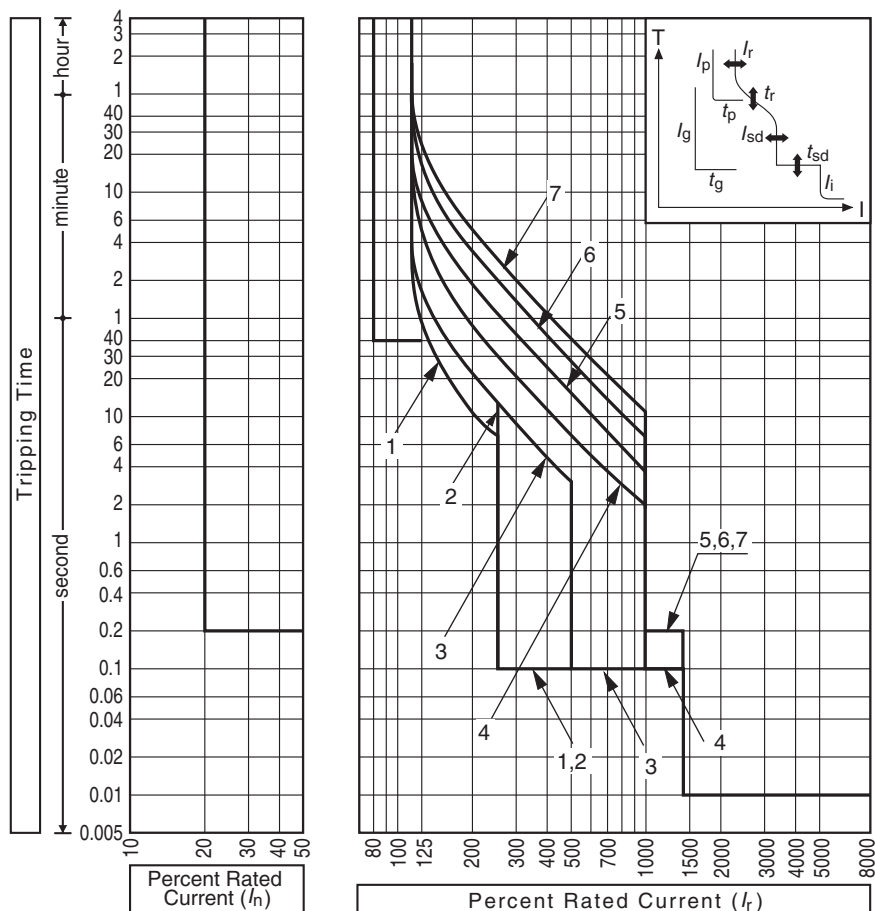
Note ②: When $(I_i) < (I_n)$, the pick-up current tolerance becomes large when $(I_N) = (I_i) \times 50\%$ is set.
 Note ③: When you specify GF on MCCBs with 3 poles the terminal block is automatically fitted to connect with the external neutral CT for 3 phases 4 wires system. See terminal blocks in section 6.

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

Electronic Characteristics

S1600-SE, S1600-NE

Time/Current characteristic curves

S1600-SE, S1600-NE $I_n=1600A$ 

Overcurrent tripping characteristics

XOU OCR (LSIG) $I_n=1600A$

Characteristics No.		1	2	3	4	5	6	7
Rated current settings (A) : (I_r)		$(I_r) = (I_n) \times 0.4, 0.5, 0.63, 0.8, 0.9, 0.95, 1.0$						
Long time-delay time settings (s) : (t_r)		11	21	21	5	10	19	29
		at $(I_r) \times 200\%$			at $(I_r) \times 600\%$			
		Setting tolerance $\pm 20\%$						
Short time-delay (I_r) $\times$ 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)		$(I_i) \times 1400\%$ Max. $(I_n) \times 1200\%$ 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_g)	$(I_g) \times 20\%$ Setting tolerance $\pm 15\%$						
	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)	$(I_N) \times 100\%$ or 50% selectable ②						
	Time settings (s) : (t_N)	$(t_N) = (t_r)$ Same as Long time-delay time settings						

Note ②: When $(I_i) < (I_n)$, the pick-up current tolerance becomes large when $(I_n) = (I_i) \times 50\%$ is set.

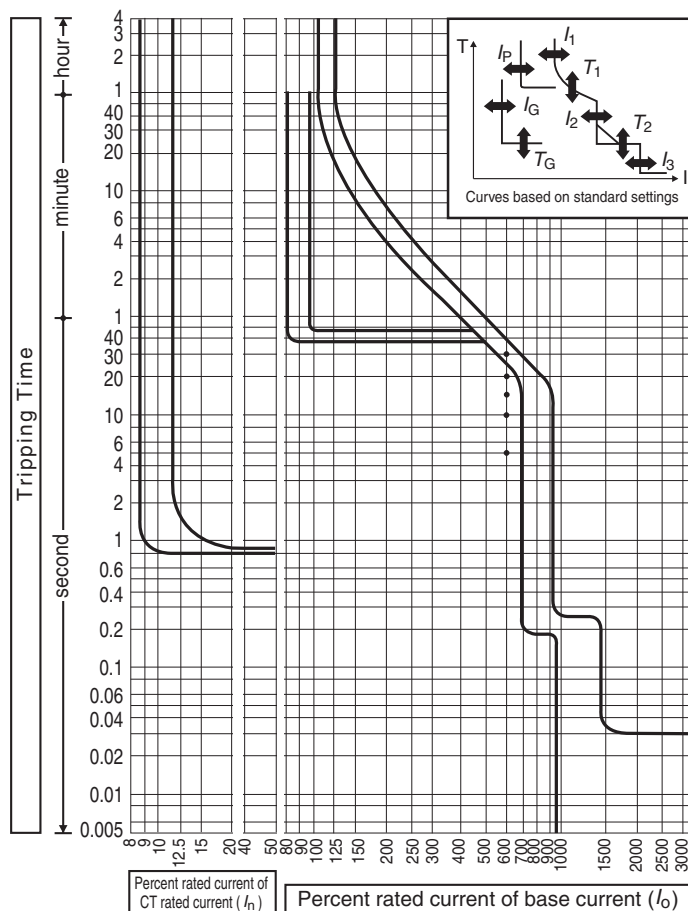
Note ③: When you specify GF on MCCBs with 3 poles the terminal block is automatically fitted to connect with the external neutral CT for 3 phases 4 wires system. See terminal blocks in section 6.

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

Electronic Characteristics

XS2000NE, XS2500NE, XS3200NE

Time/Current characteristic curves

XS2000NE, XS2500NE, XS3200NE $I_n=2000A, 2500A, 3200A$ 

Overcurrent tripping characteristics

XOS OCR (LSIG) $I_n=2000A, 2500A, 3200A$

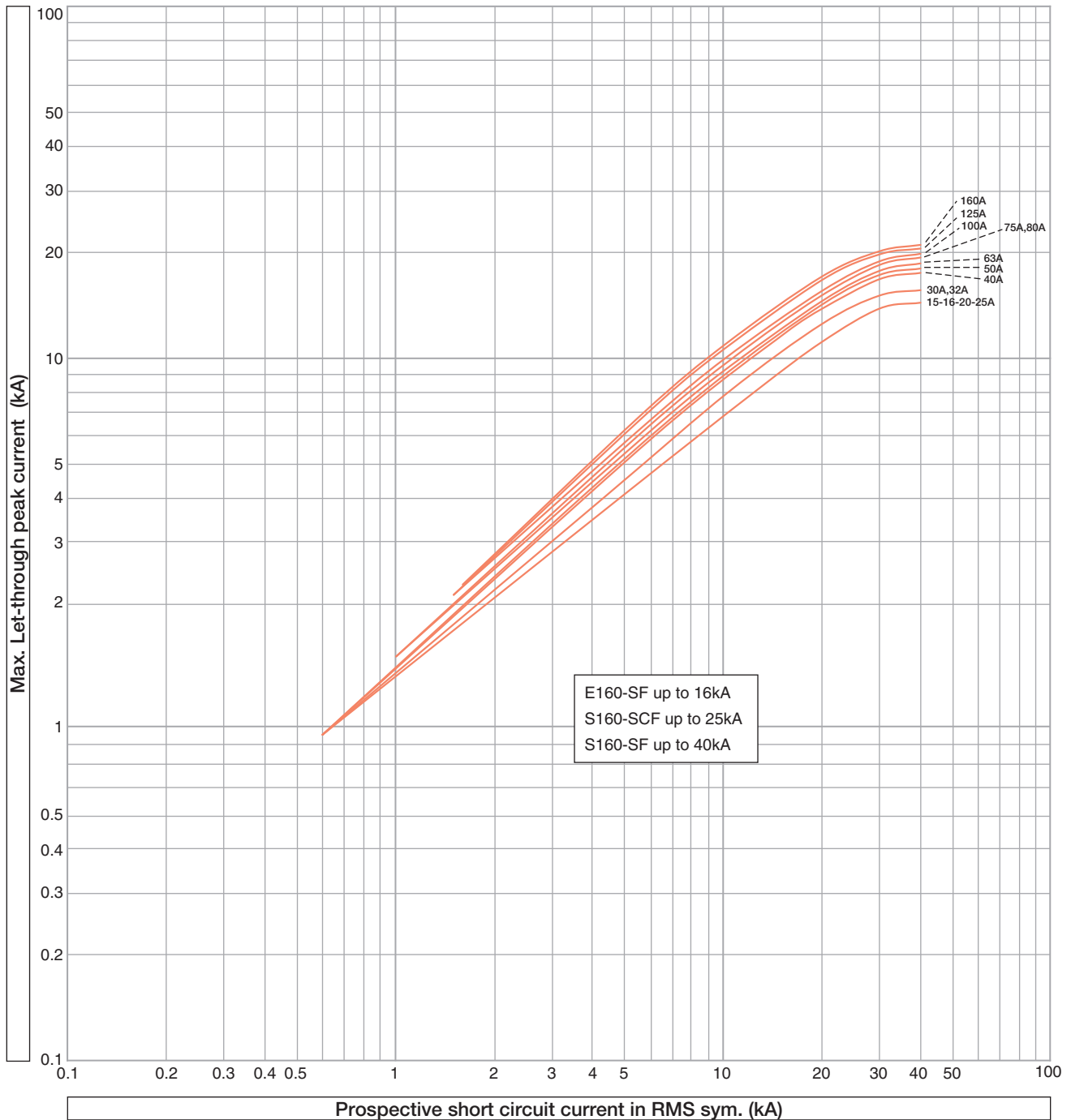
CT rated current (A) (I_n)		2000, 2500, 3200
Base current setting (A): (I_o)		$(I_n) \times (0.63-0.8-1.0)$
Long time-delay pick-up current (A): (I_1)		$(I_o) \times (0.8-0.85-0.9-0.95-1.0)$ Non-tripping at (I_1) setting $\times 105\%$ and below. Tripping at 125% & above.
Long time-delay time settings (S) (T_1)		(5–10–15–20–30) at (I_1) $\times 600\%$ current. Setting tolerance $\pm 20\%$
Short time-delay pick-up current (A): (I_2)		$(I_o) \times (2-4-6-8-10)$ 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 +50 ms and resettable time is –20ms for the time-delay setting.
Instantaneous trip pick-up current (A) (I_3)		Continuously adjustable from $(I_o) \times (3 \text{ to } 12)$ Setting tolerance $\pm 20\%$
Option	Pre-trip alarm pick-up current (A) (I_P)	$(I_1) \times (0.7, 0.8, \underline{0.9}, 1.0)$ Setting tolerance $\pm 10\%$
	Pre-trip alarm time setting (S) (T_P)	40 fixed definite time-delay. Setting tolerance $\pm 10\%$
	Ground fault trip pick-up current (A): (I_G) ①	Continuously adjustable from $(I_n) \times (\underline{0.1} \text{ to } 0.4)$ Setting tolerance $\pm 15\%$
	Ground fault trip time setting (S): (T_G) ①	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 is –20ms for the time-delay settings
	Trip indicators	See page 6-12

Note ①: Cannot be used with the preferential trip alarm.

Remark: If not otherwise specified, the product will be delivered with the underlined standard setting values.

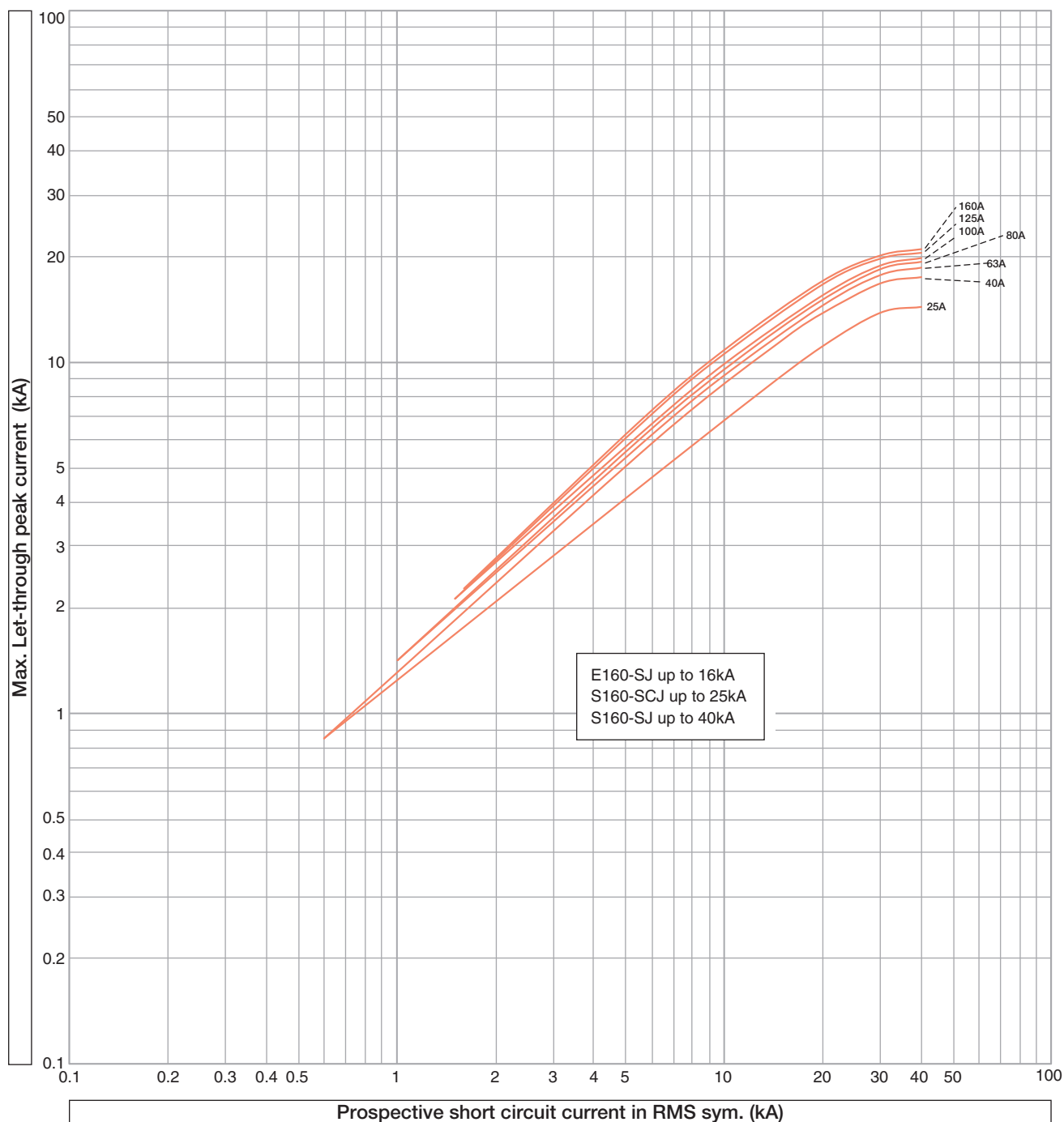
Let-Through Peak Current Characteristics

E160-SF, S160-SCF, S160-SF Thermal type 415V AC



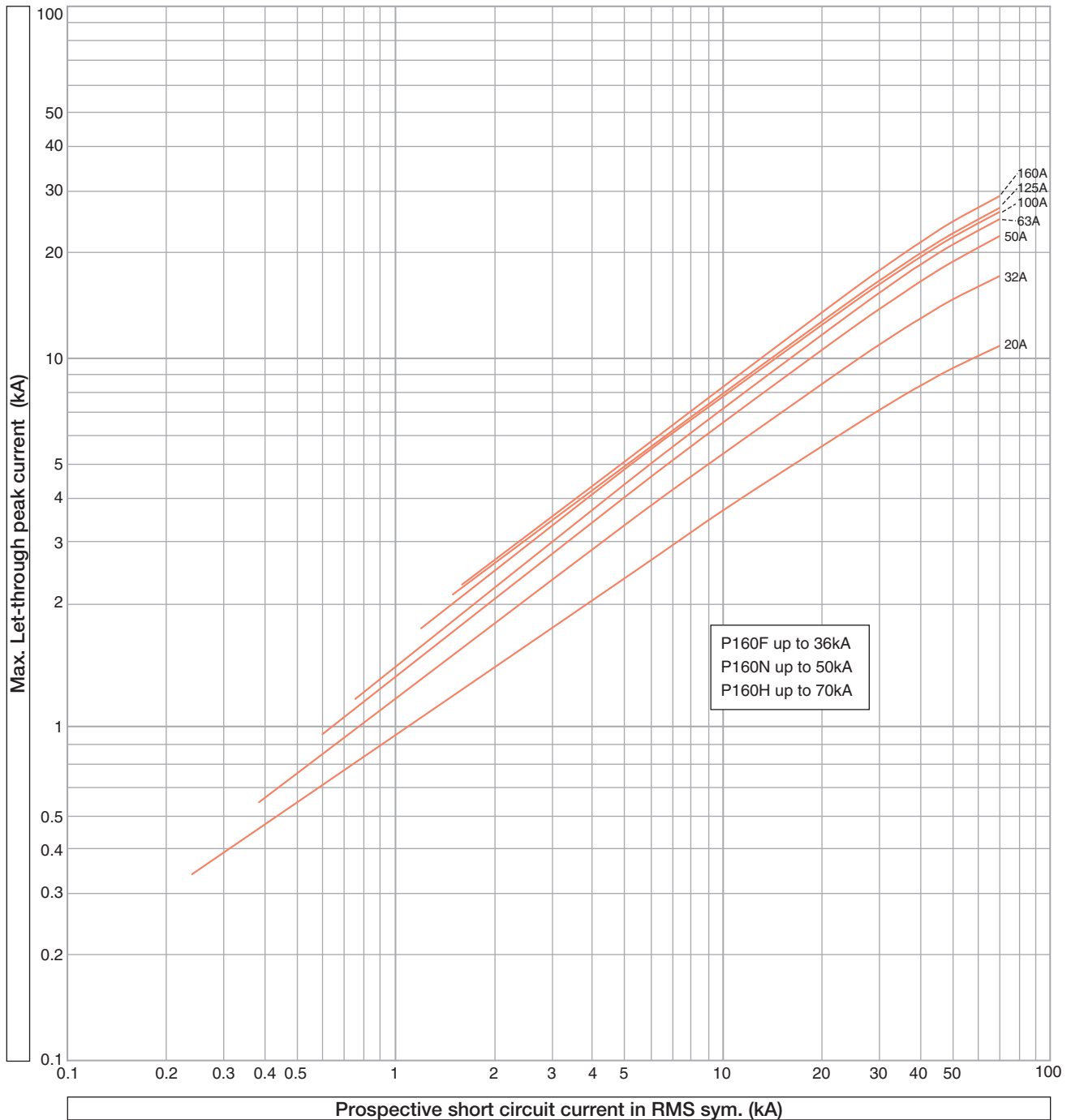
Let-Through Peak Current Characteristics

E160-SJ, S160-SCJ, S160-SJ Thermal type 415V AC



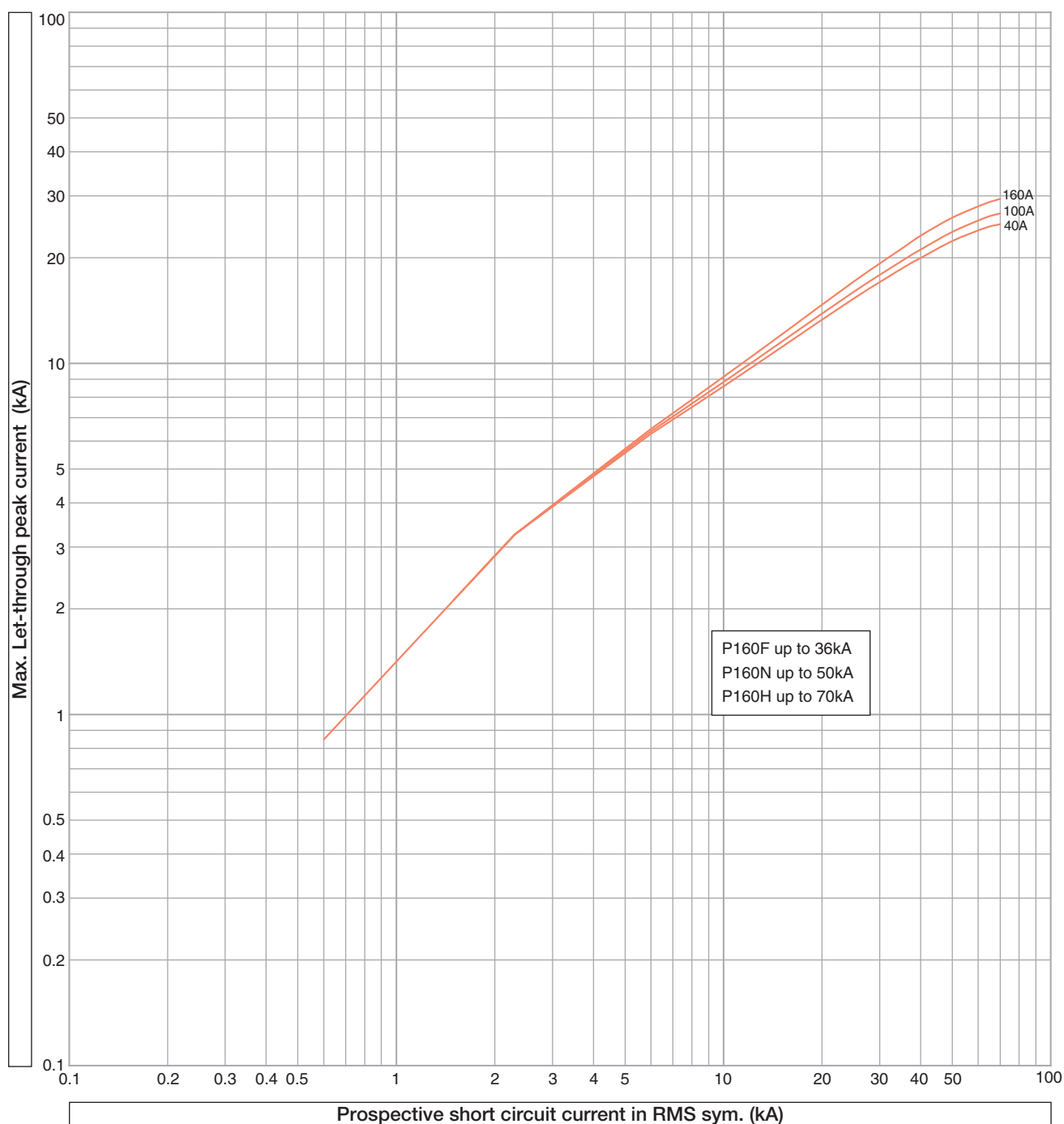
Let-Through Peak Current Characteristics

P160F, P160N, P160H Thermal type 415V AC

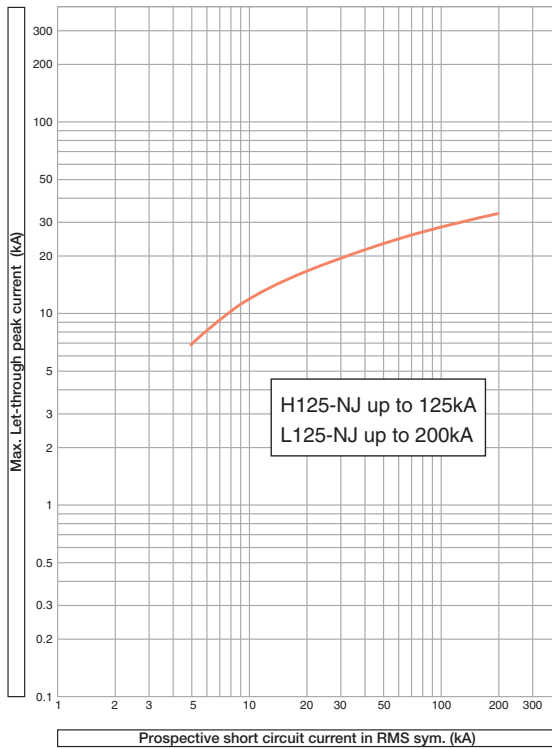
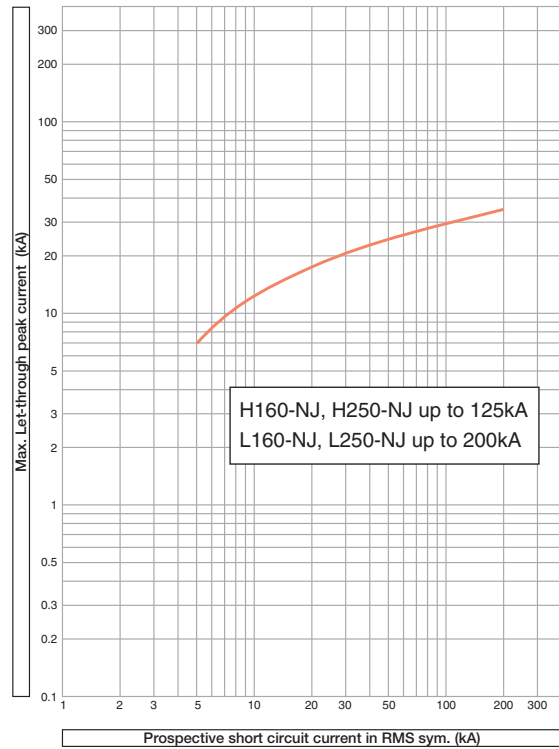
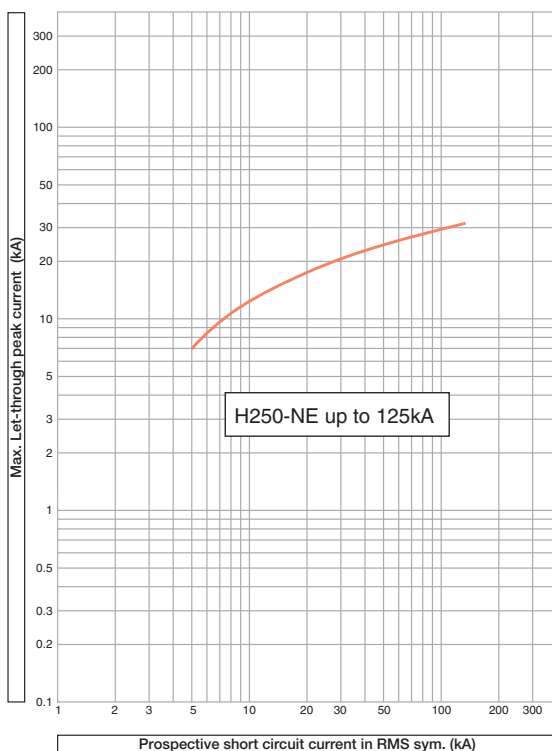
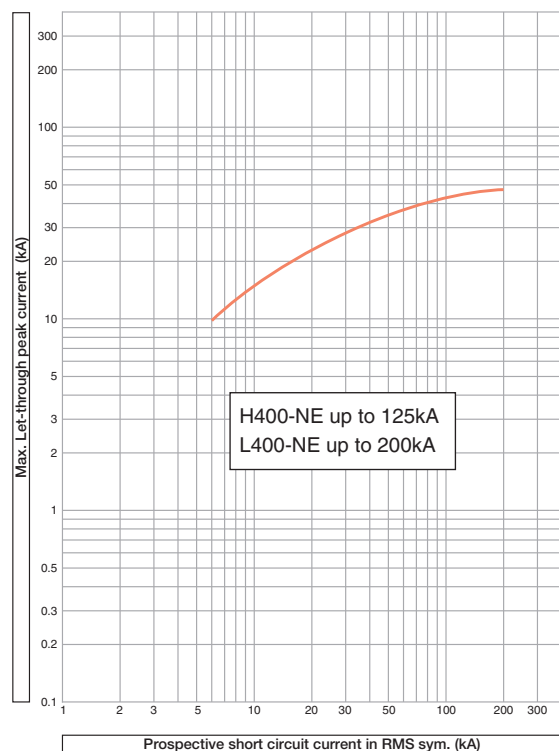


Let-Through Peak Current Characteristics

P160F, P160N, P160H Electronic type 415V AC

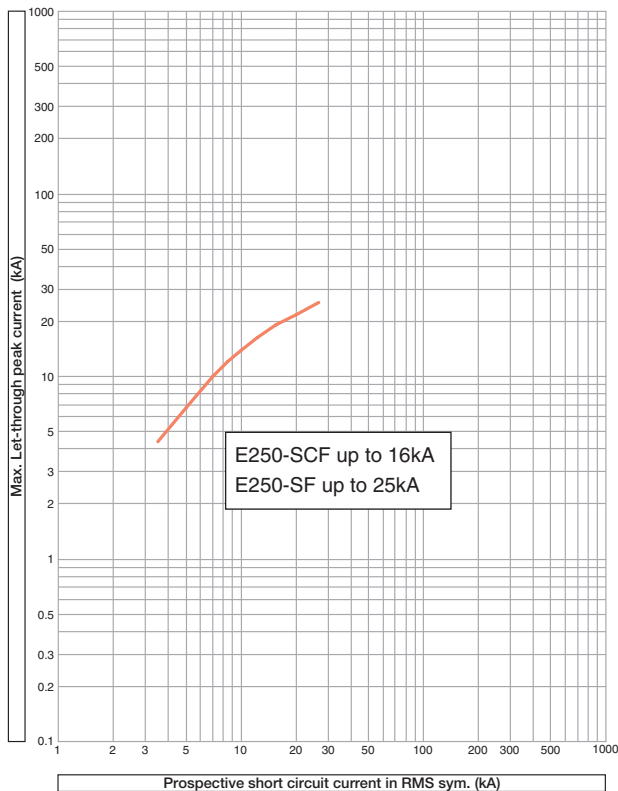


Let-Through Peak Current Characteristics

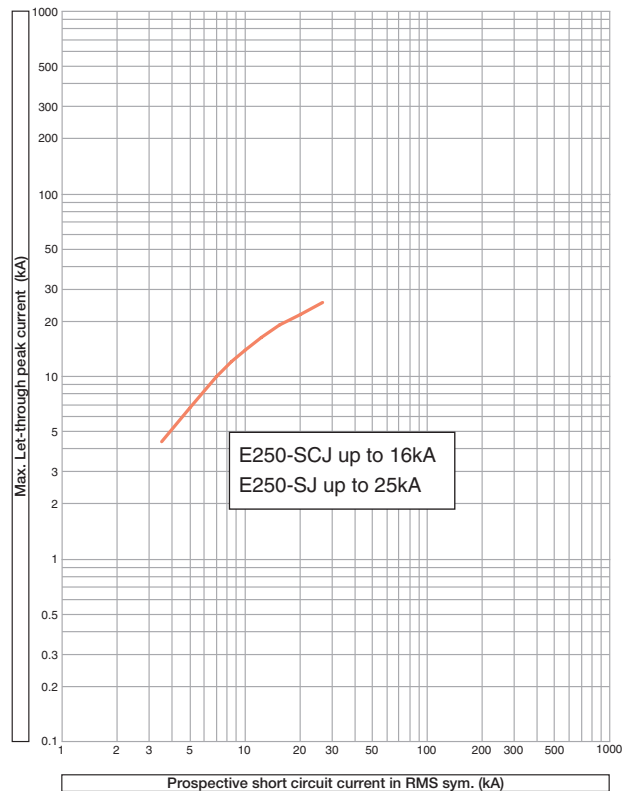
H125-NJ, L125-NJ Thermal type 415V AC**H160-NJ, L160-NJ, H250-NJ, L250-NJ Thermal type 415V AC****H250-NE Electronic type 415V AC****H400-NE, L400-NE Electronic type 415V AC**

Let-Through Peak Current Characteristics

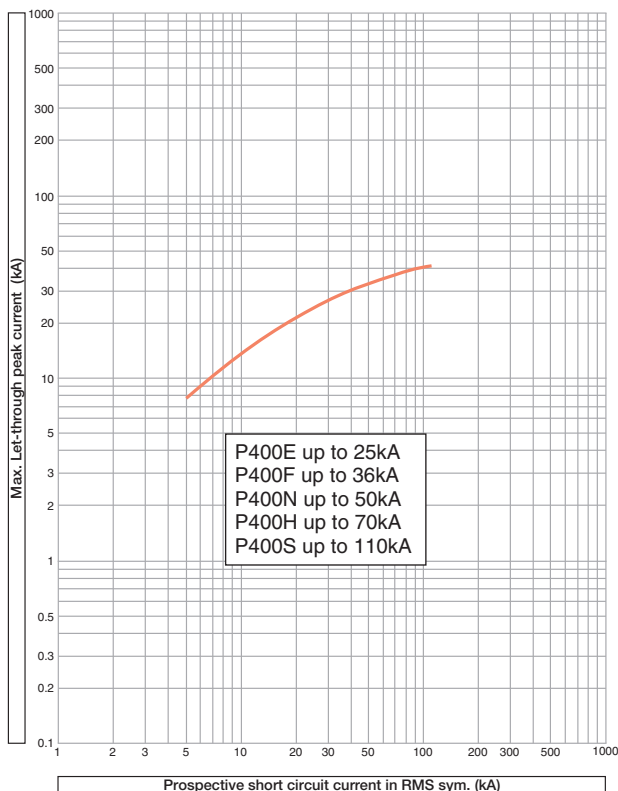
E250-SCF, E250-SF Thermal type 415V AC



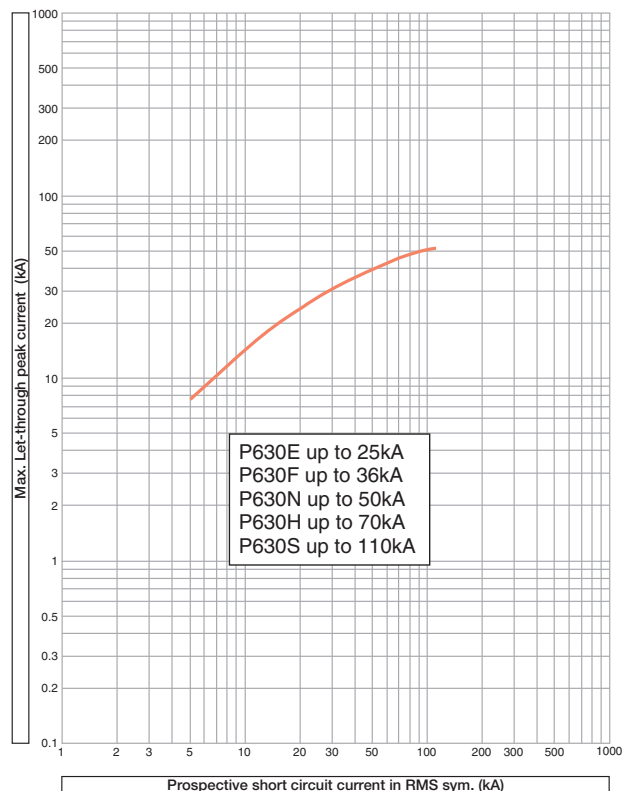
E250-SCJ, E250-SJ Thermal type 415V AC



P400E, P400F, P400N, P400H, P400S Thermal type 415V AC
P400F, P400N, P400H, P400S Electronic type 415V AC

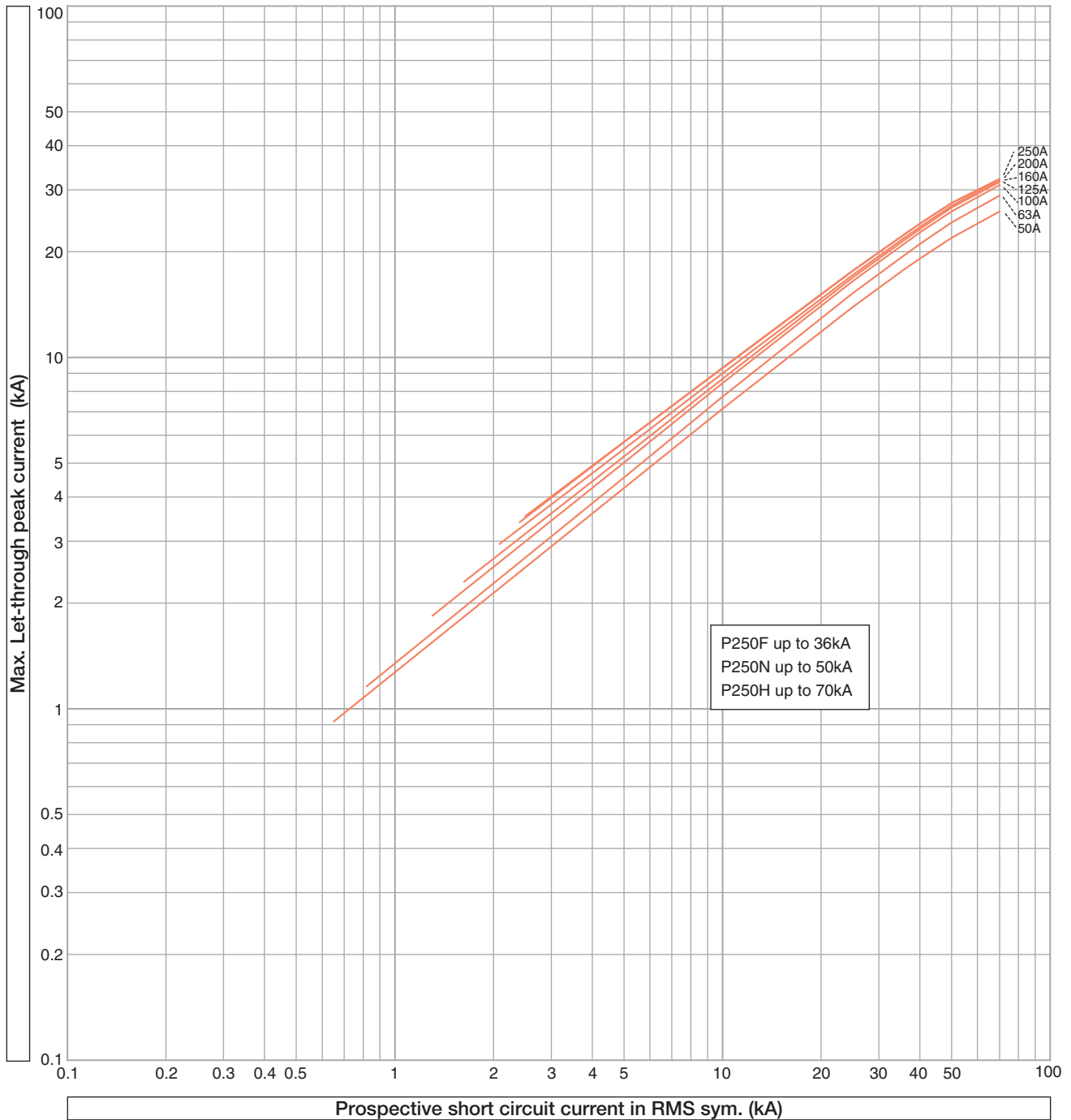


P630E, P630F, P630N, P630H, P630S Thermal type 415V AC
P630F, P630N, P630H, P630S Electronic type 415V AC



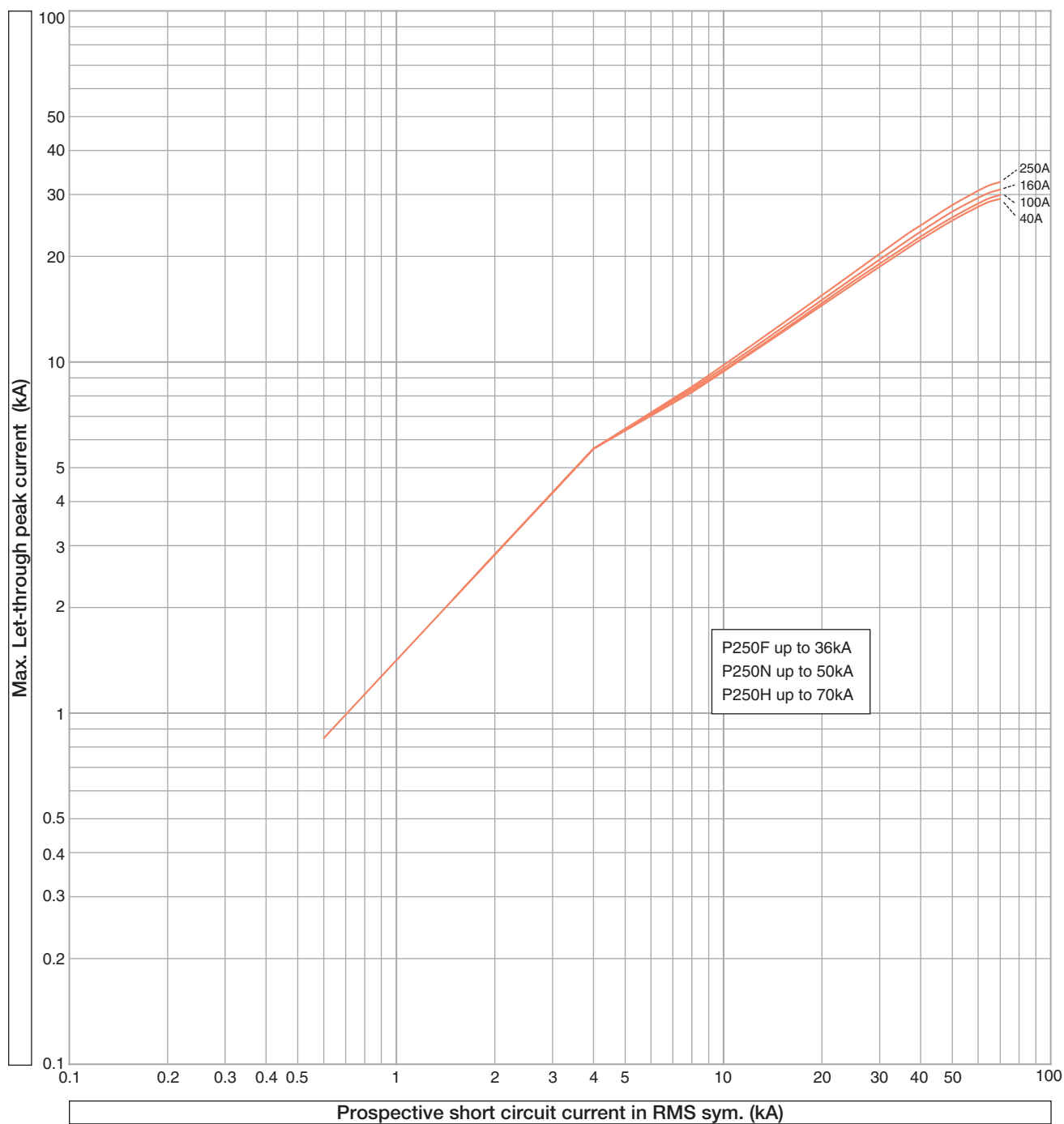
Let-Through Peak Current Characteristics

P250F, P250N, P250H Thermal type 415V AC



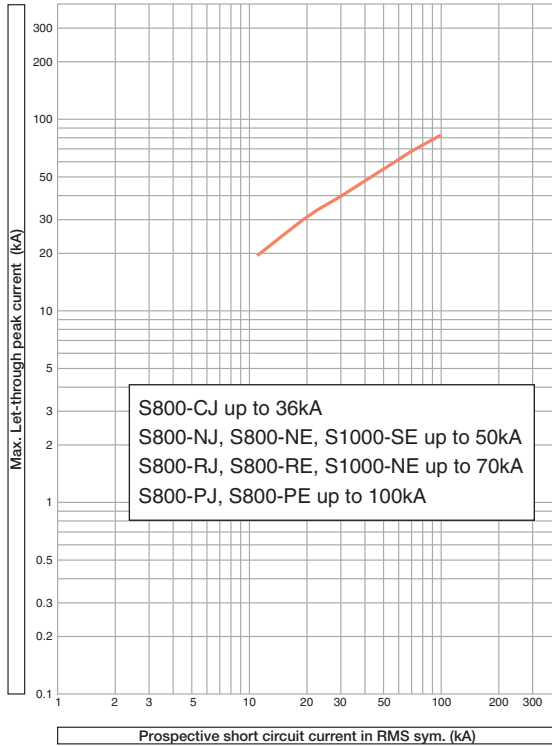
Let-Through Peak Current Characteristics

P250F, P250N, P250H Electronic type 415V AC

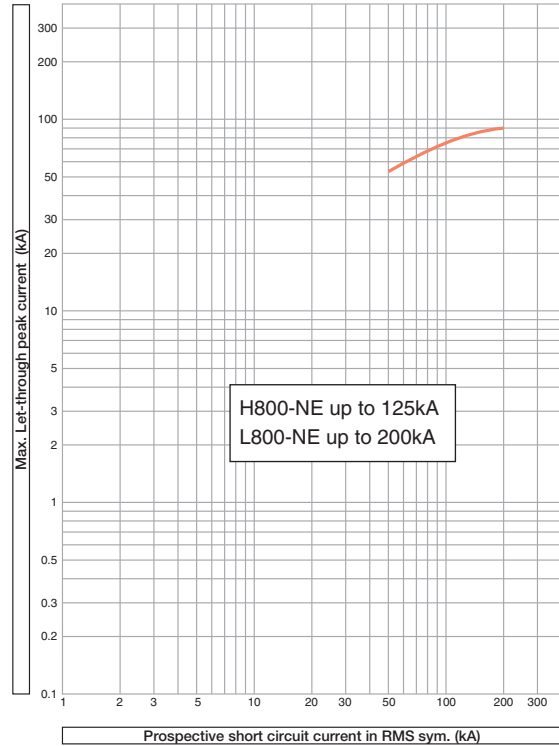


Let-Through Peak Current Characteristics

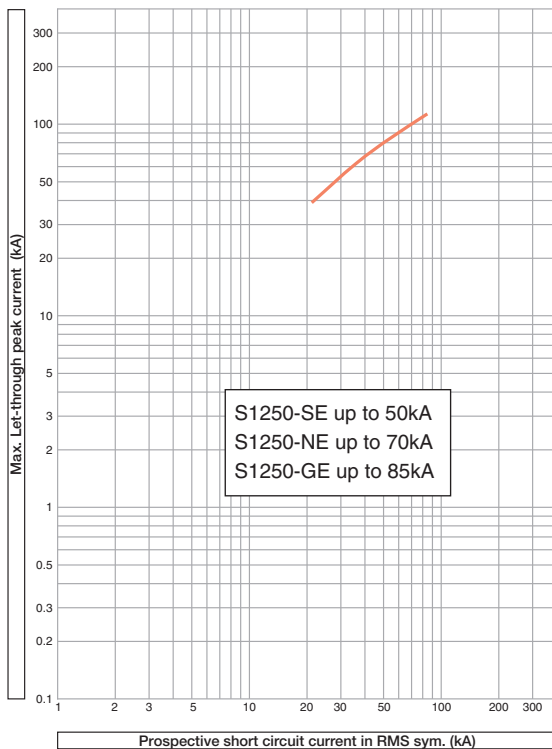
S800-CJ, S800-NJ, S800-RJ, S800-PJ Thermal type 415V AC
 S800-NE, S800-RE, S800-PE Electronic type 415V AC
 S1000-SE, S1000-NE Electronic type 415V AC



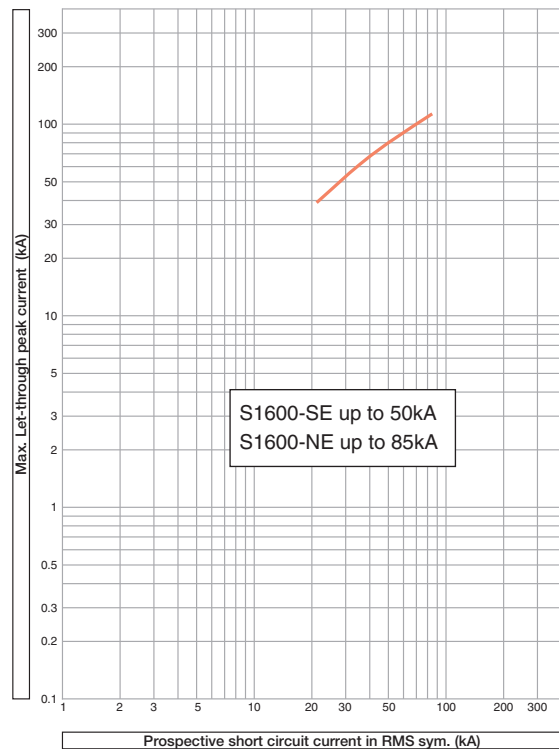
H800-NE, L800-NE Electronic type 415V AC



S1250-SE, S1250-NE, S1250-GE Electronic type 415V AC

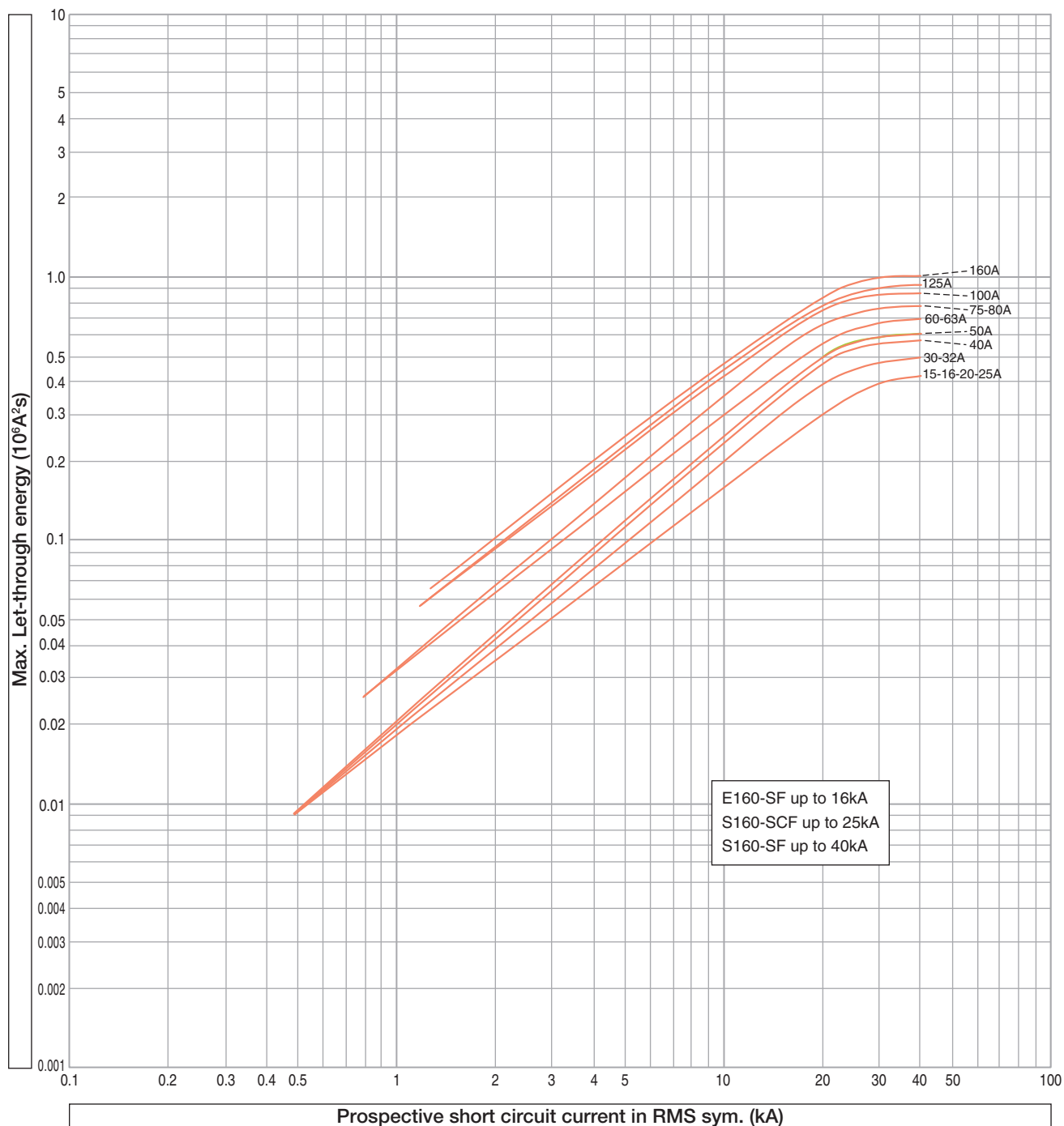


S1600-SE, S1600-NE Electronic type 415V AC



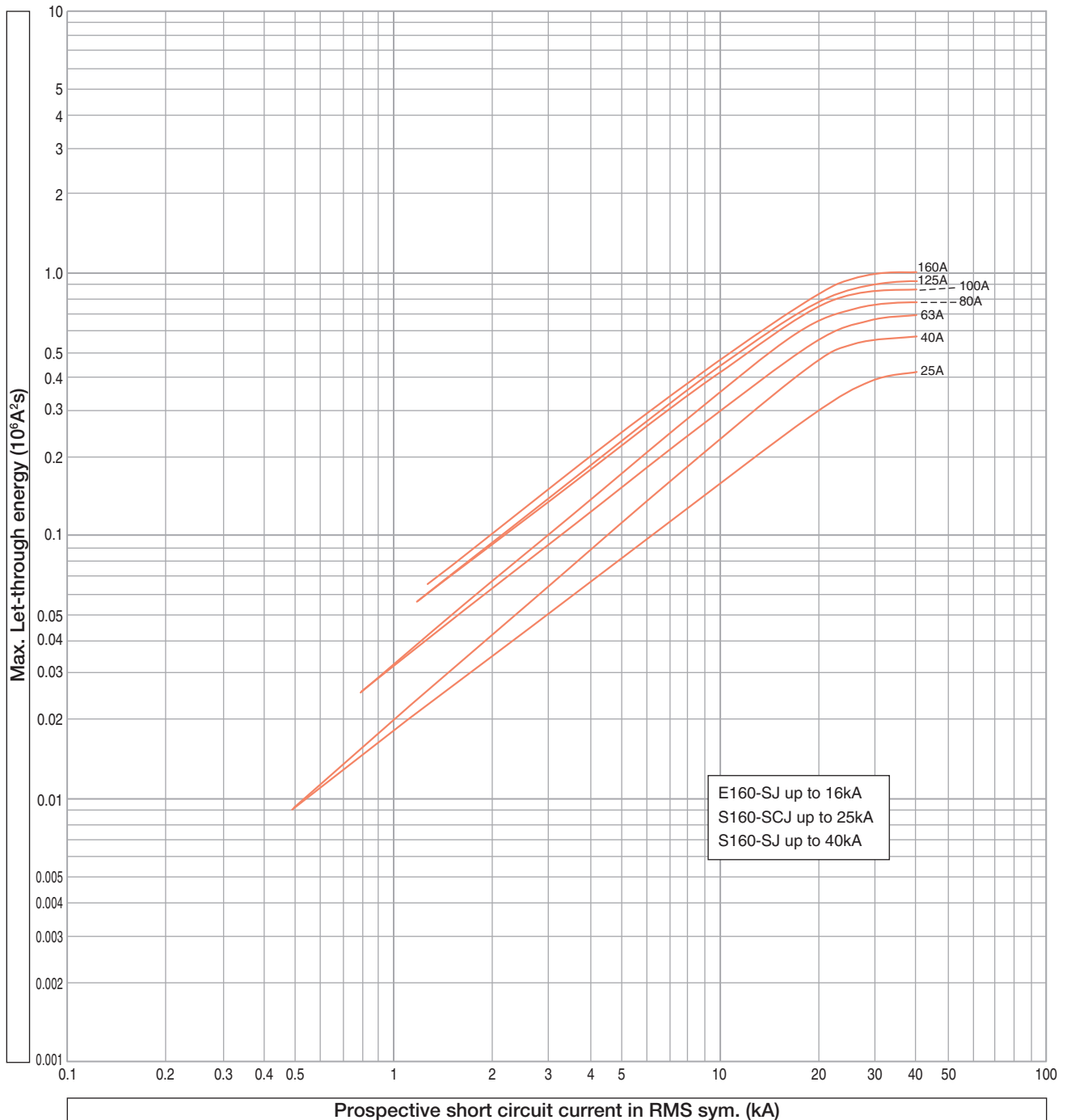
Let-Through Energy Characteristics

E160-SF, S160-SCF, S160-SF Thermal type 415V AC



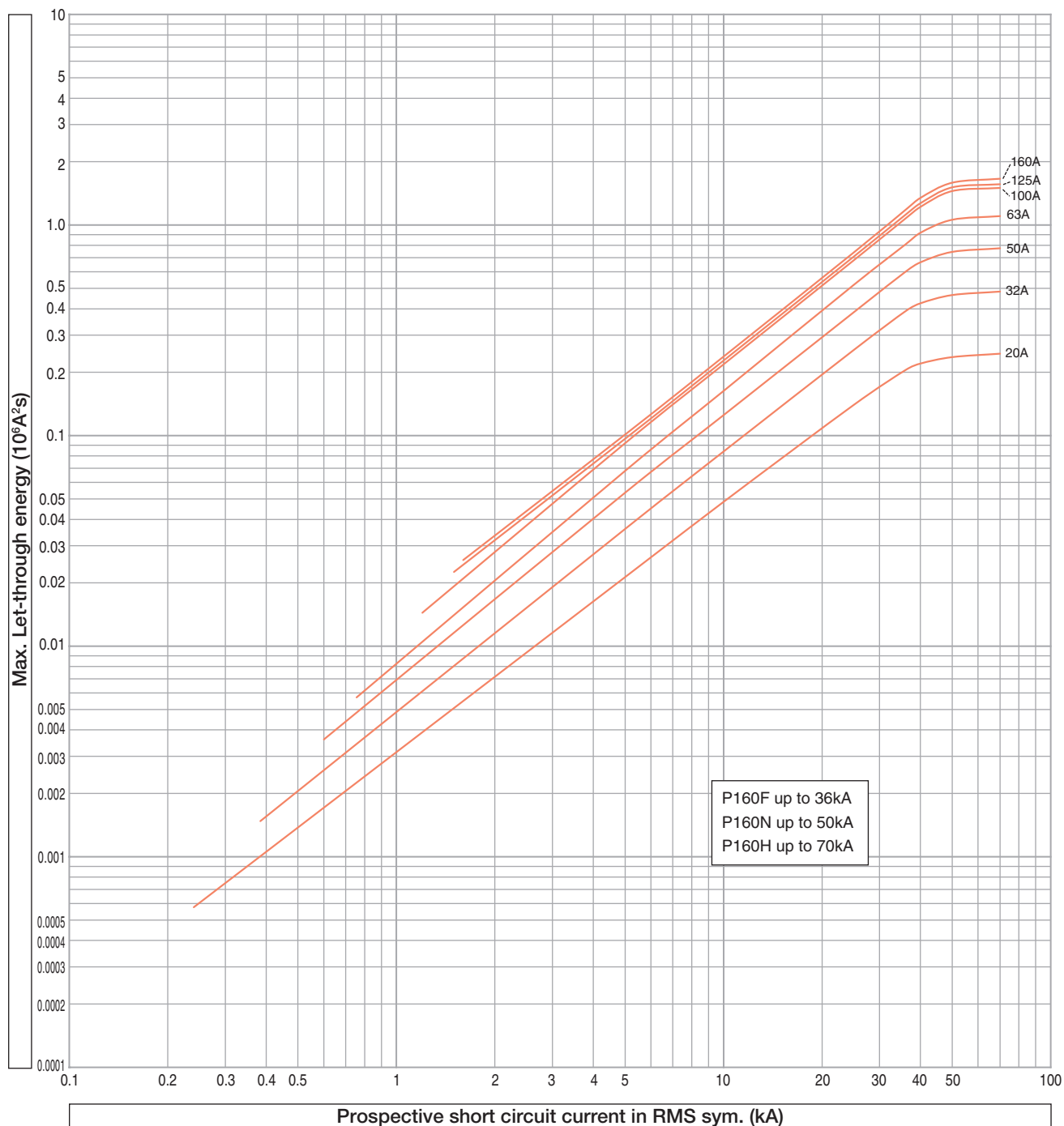
Let-Through Energy Characteristics

E160-SJ, S160-SCJ, S160-SJ Thermal type 415V AC



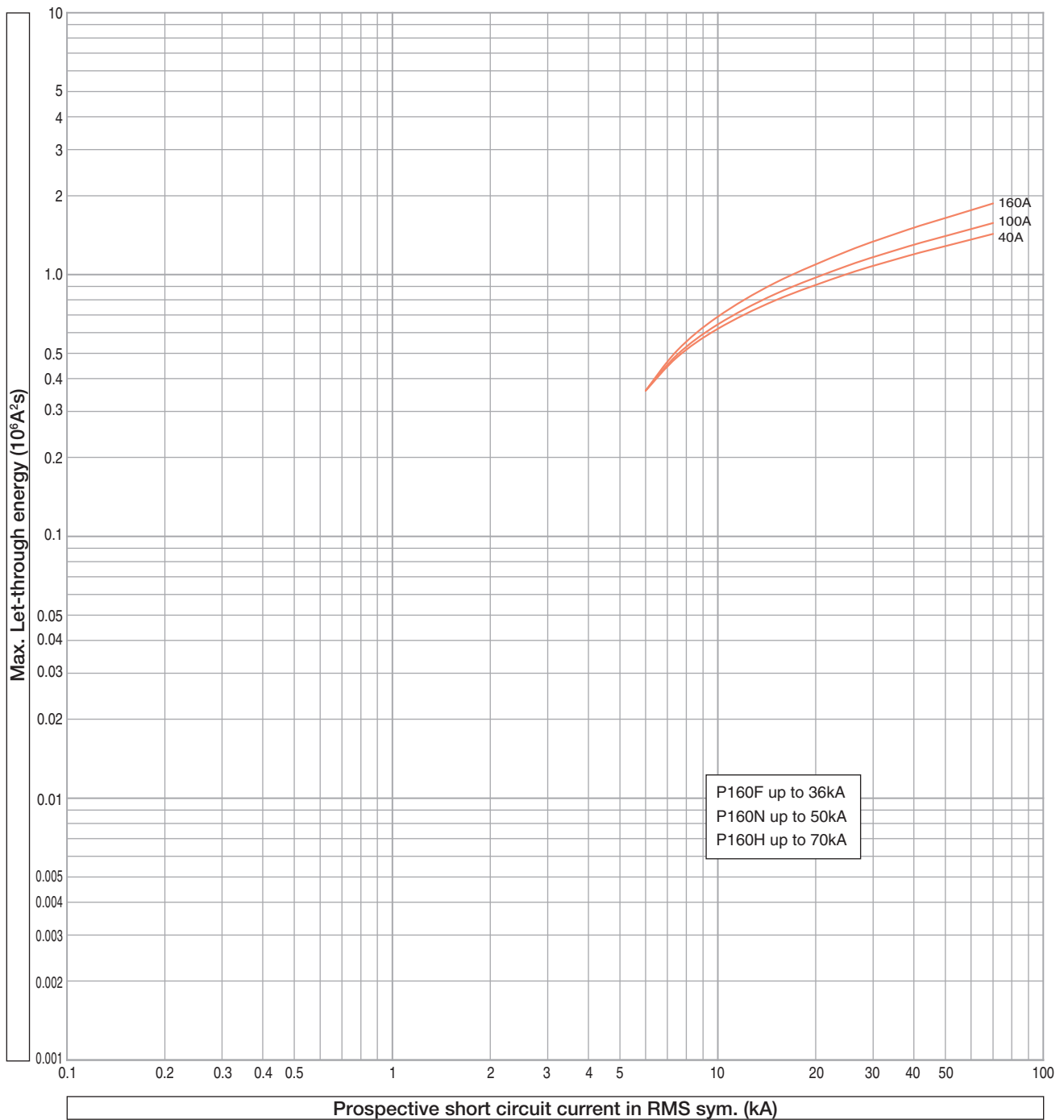
Let-Through Energy Characteristics

P160F, P160N, P160H Thermal type 415V AC



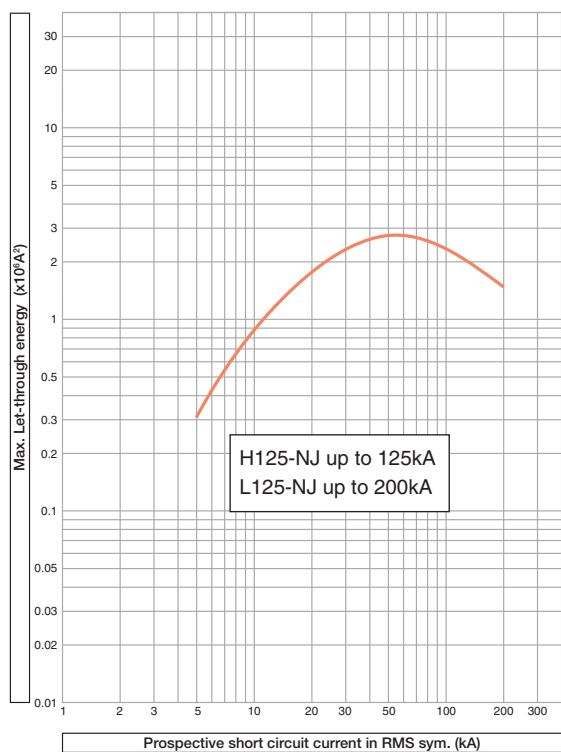
Let-Through Energy Characteristics

P160F, P160N, P160H Electronic type 415V AC

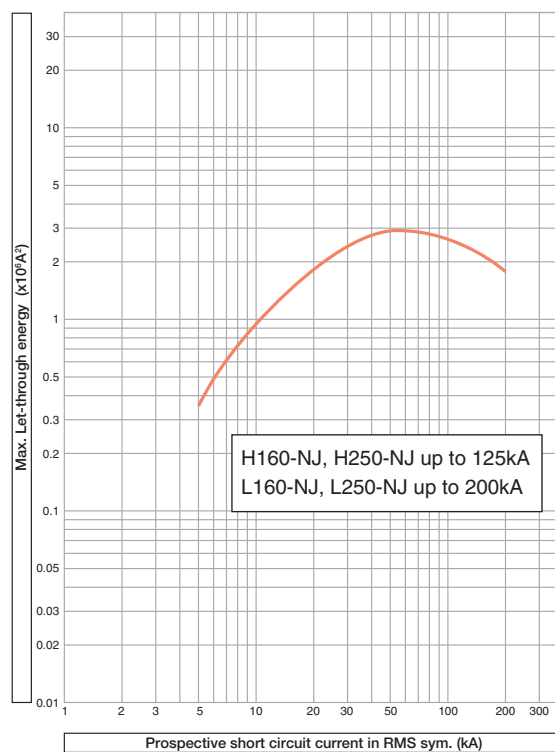


Let-Through Energy Characteristics

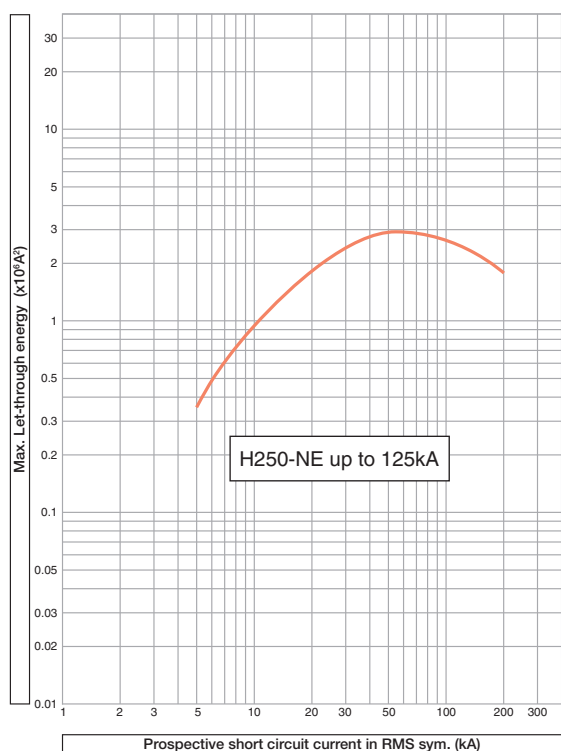
H125-NJ, L125-NJ Thermal type 415V AC



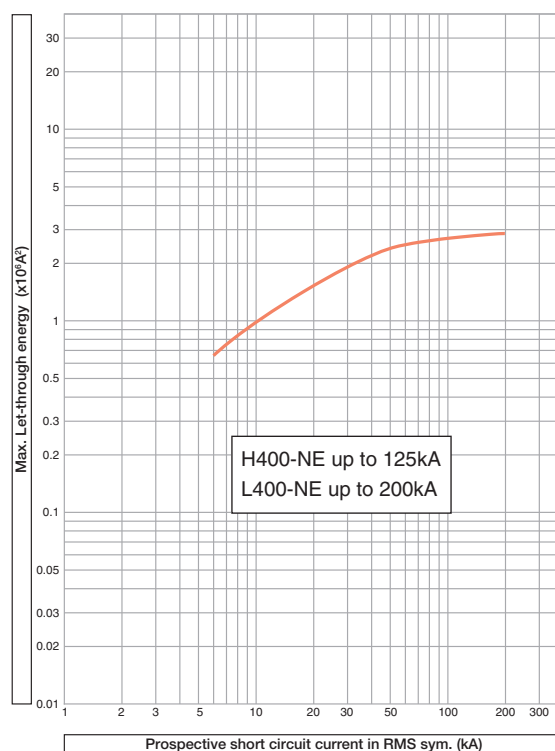
H160-NJ, L160-NJ, H250-NJ, L250-NJ Thermal type 415V AC



H250-NE Electronic type 415V AC

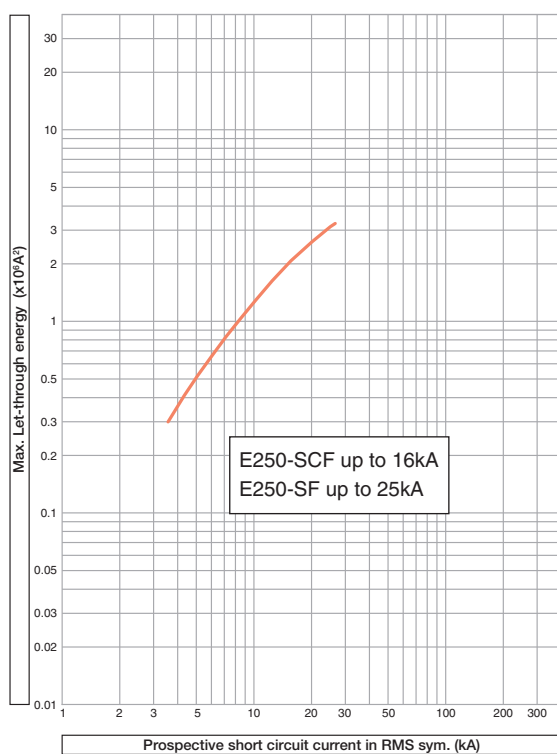


H400-NE, L400-NE Electronic type 415V AC

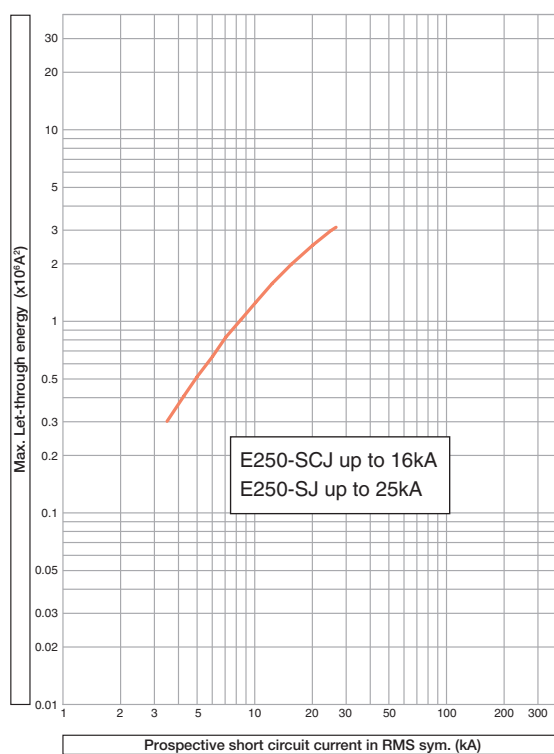


Let-Through Energy Characteristics

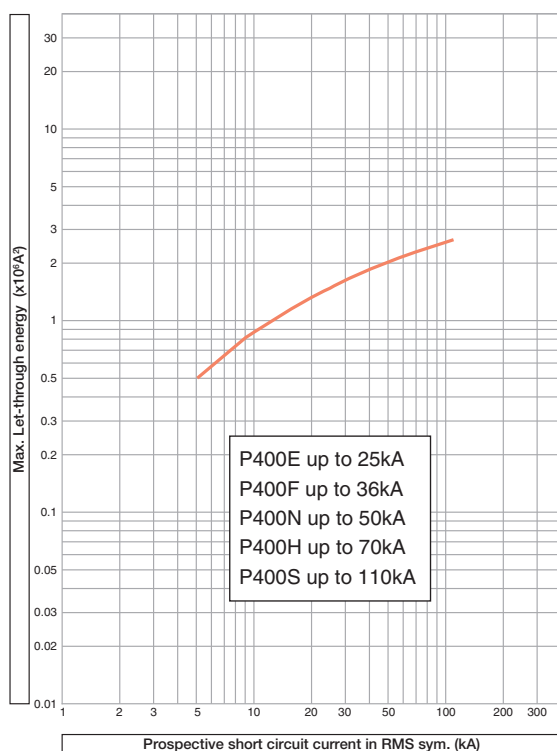
E250-SCF, E250-SF Thermal type 415V AC



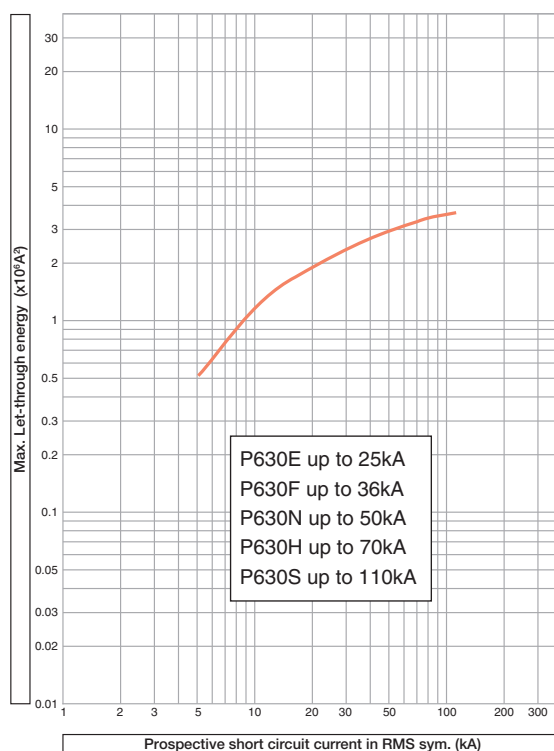
E250-SCJ, E250-SJ Thermal type 415V AC



P400E, P400F, P400N, P400H, P400S Thermal type 415V AC
P400F, P400N, P400H, P400S Electronic type 415V AC

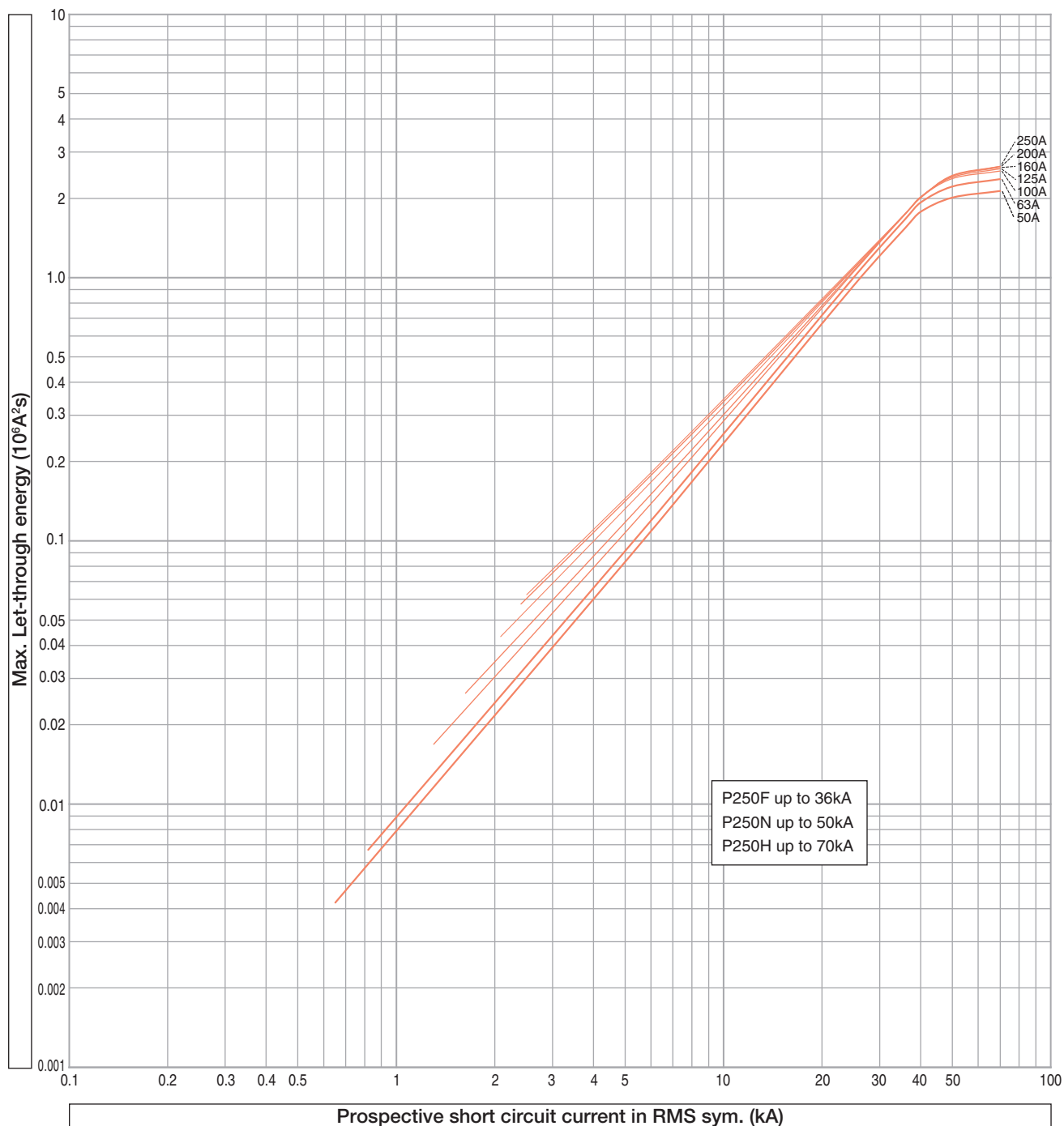


P630E, P630F, P630N, P630H, P630S Thermal type 415V AC
P630F, P630N, P630H, P630S Electronic type 415V AC



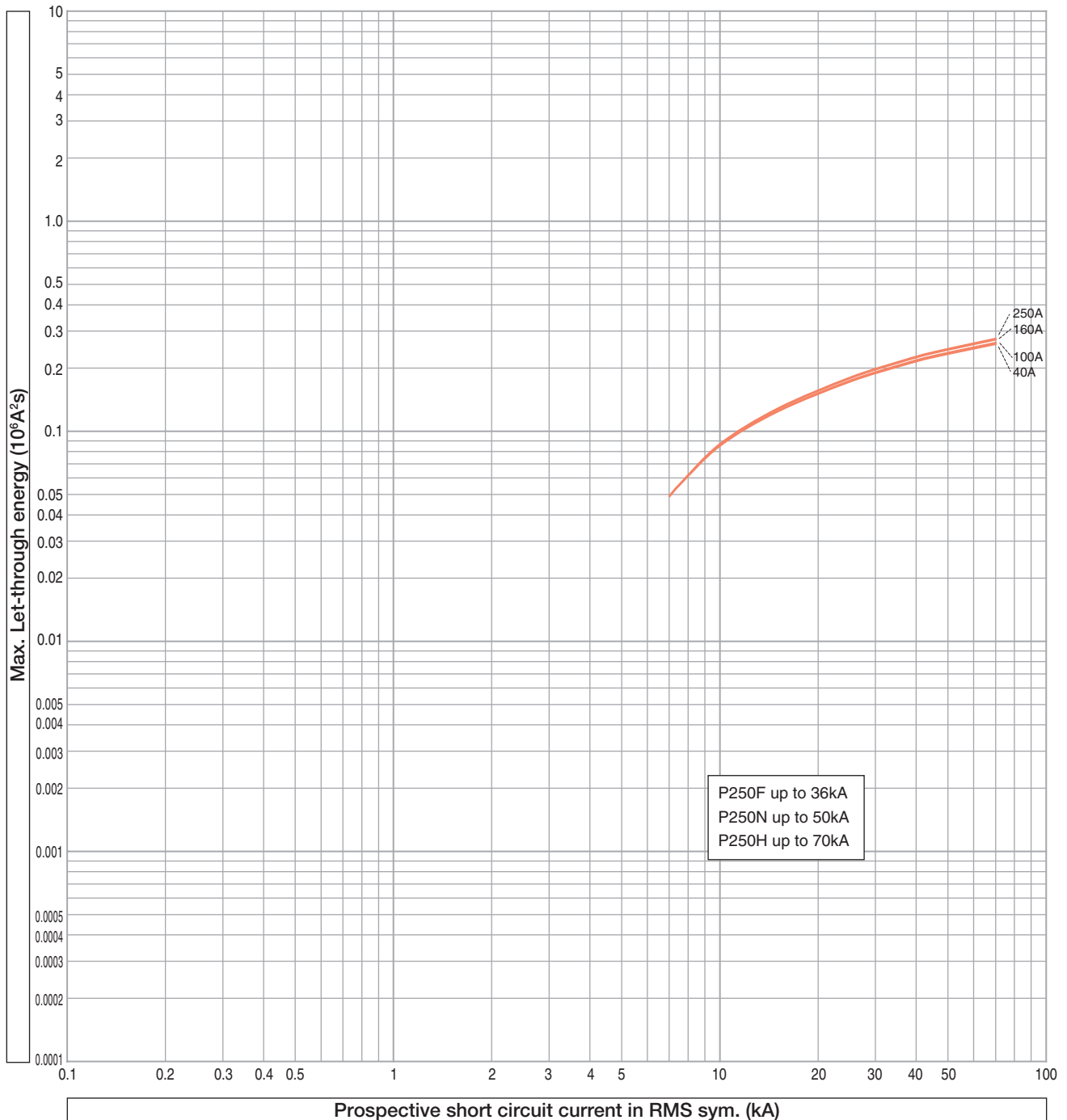
Let-Through Energy Characteristics

P250F, P250N, P250H Thermal type 415V AC



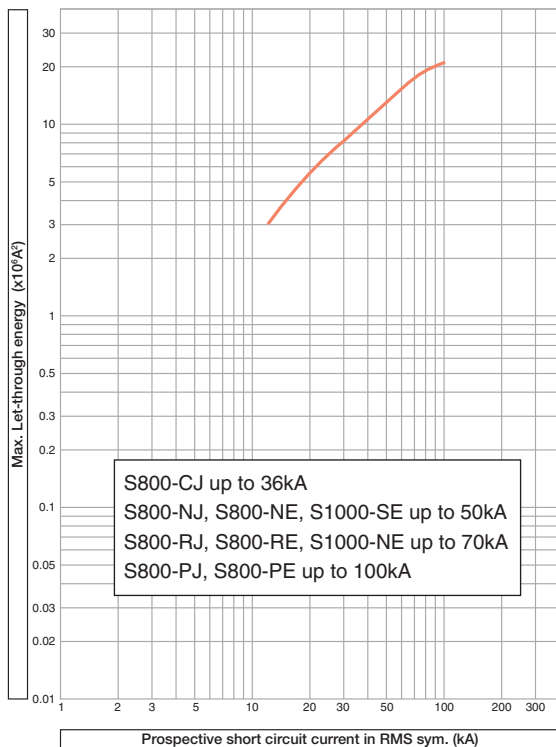
Let-Through Energy Characteristics

P250F, P250N, P250H Electronic type 415V AC

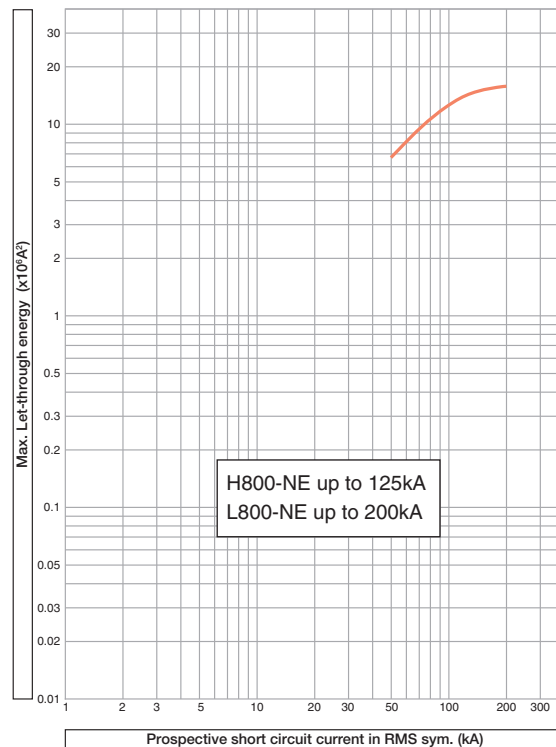


Let-Through Energy Characteristics

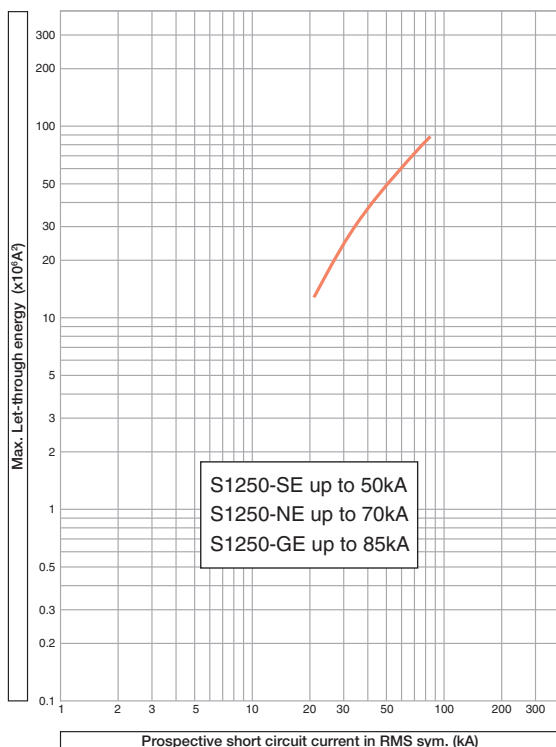
S800-CJ, S800-NJ, S800-RJ, S800-PJ Thermal type 415V AC
S800-NE, S800-RE, S800-PE Electronic type 415V AC
S1000-SE, S1000-NE Electronic type 415V AC



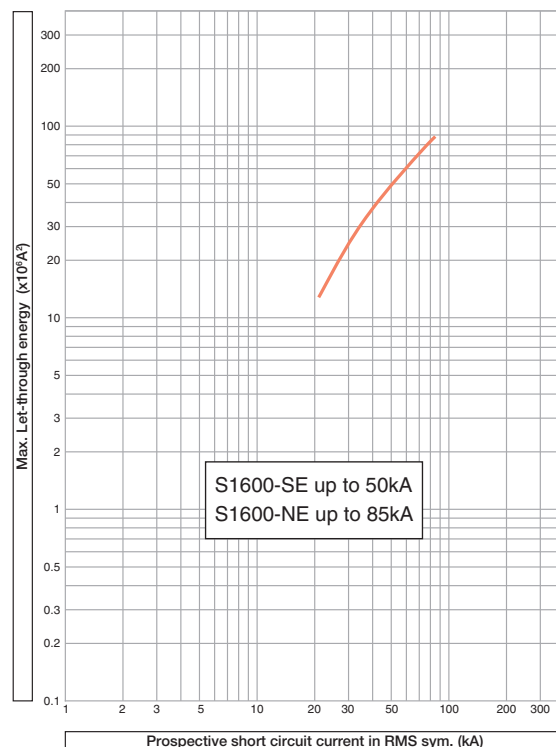
H800-NE, L800-NE Electronic type 415V AC



S1250-SE, S1250-NE, S1250-GE Electronic type 415V AC



S1600-SE, S1600-NE Electronic type 415V AC



Outline Dimensions

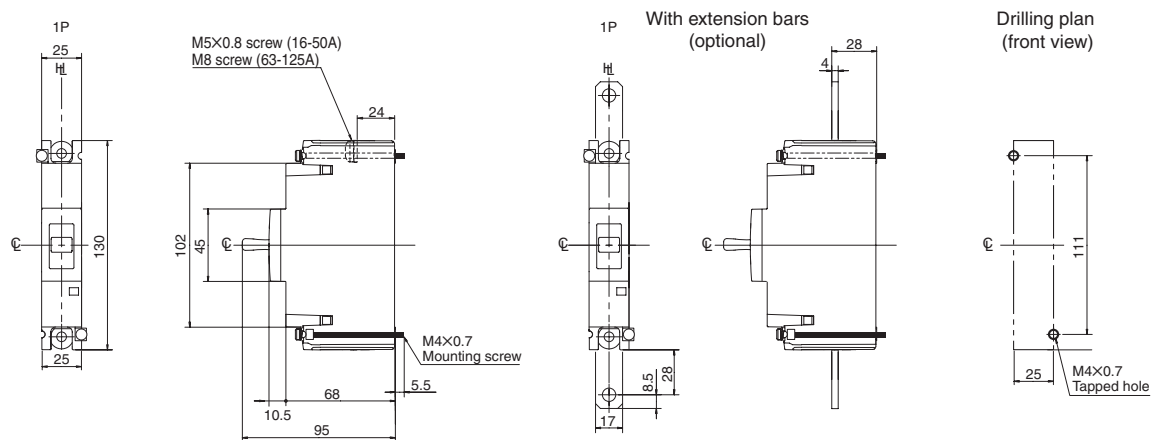
E160-SF 1pole

Outline dimensions (mm)

E160-SF 1pole

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

Front-connected



Outline Dimensions

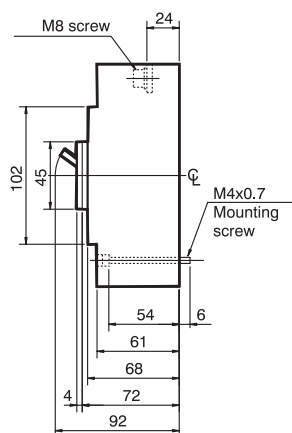
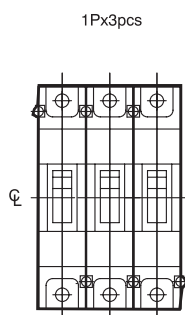
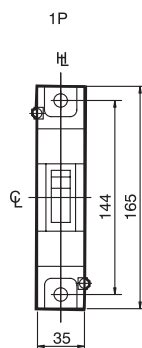
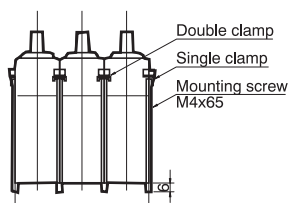
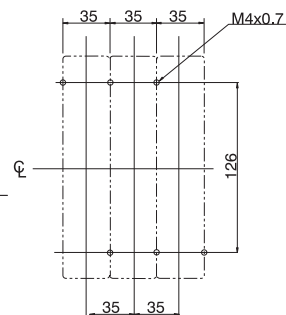
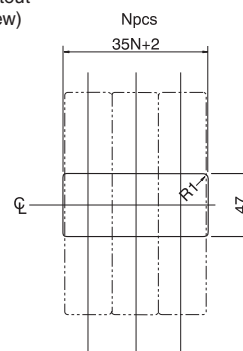
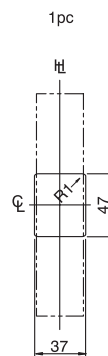
S160-NF 1pole

Outline dimensions (mm)

S160-NF 1pole

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

Front-connected

Drilling plan
(front view)Panel cutout
(front view)

Outline Dimensions

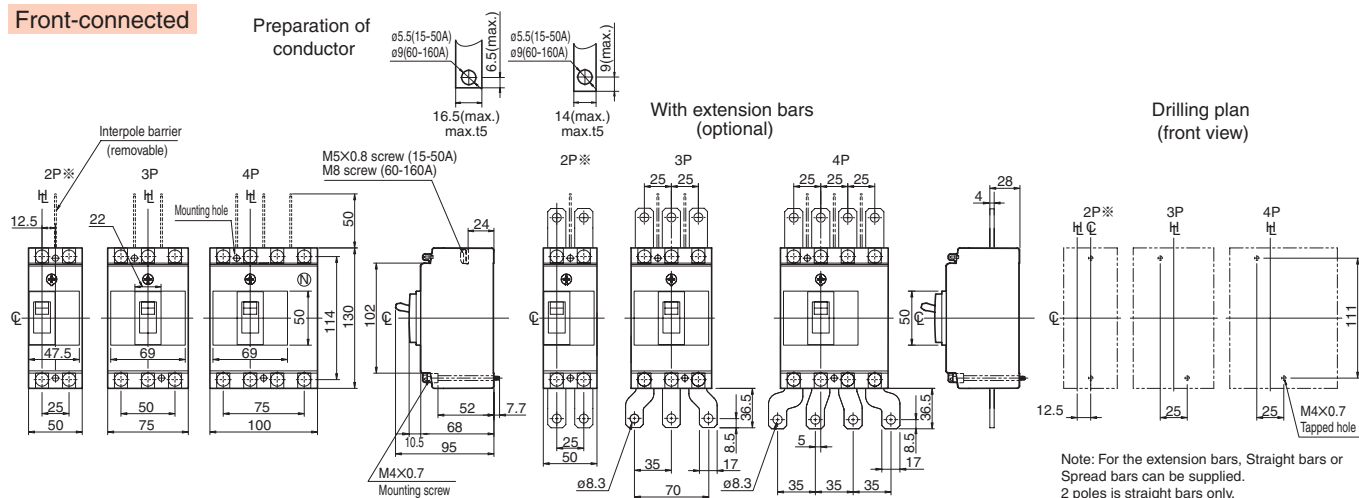
E160-SF, S160-SCF, S160-SF

Outline dimensions (mm)

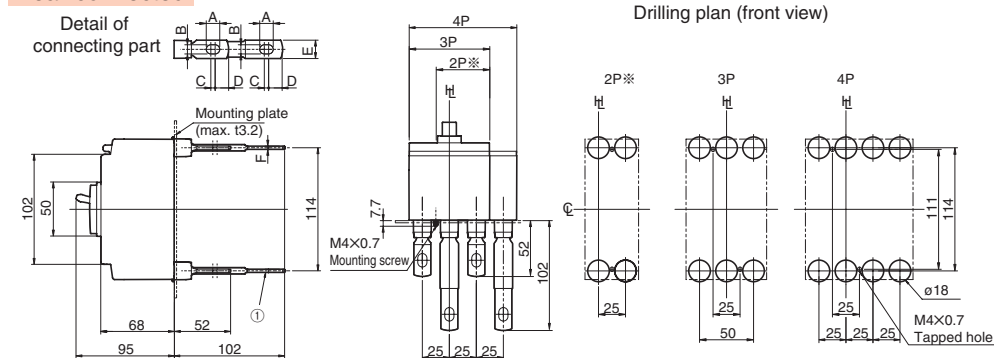
E160-SF, S160-SCF, S160-SF

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

Front-connected



Rear-connected



①: Studs are horizontal direction as standard. They will be factory installed in the horizontal direction unless otherwise specified. Vertical position is a special specification. Please specify this when ordering.

Note) If you will arrange the studs vertically, please insulate them carefully with insulating tubes, insulating tape, or similar because the insulation distance between the studs is insufficient.

Rated current (A)	A	B	C	D	E	F
15-50	10.5	6.5	4	13	16	4
60-160	12.5	8.5	4	13	16	5

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

※: 2 poles is not available for S160-SF.

Outline Dimensions

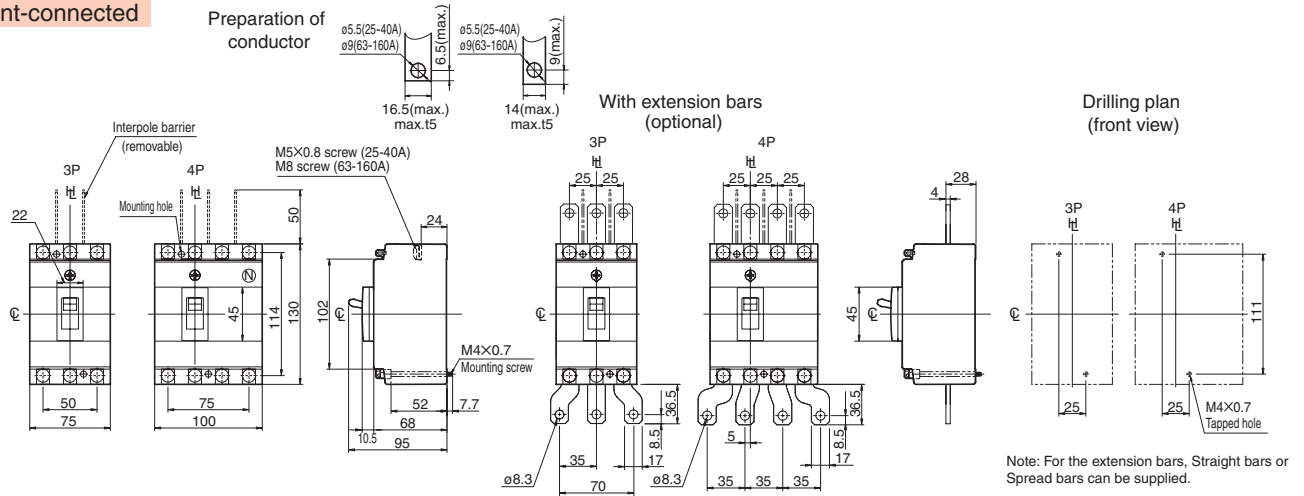
E160-SJ, S160-SCJ, S160-SJ, S160-SN

Outline dimensions (mm)

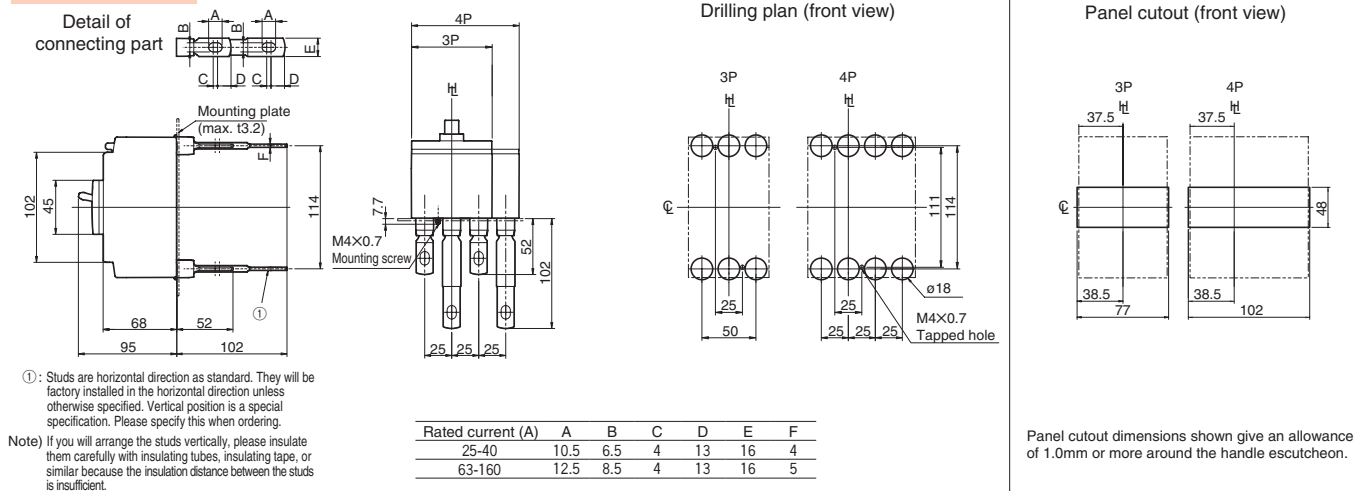
E160-SJ, S160-SCJ, S160-SJ, S160-SN

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

Front-connected



Rear-connected



Outline Dimensions

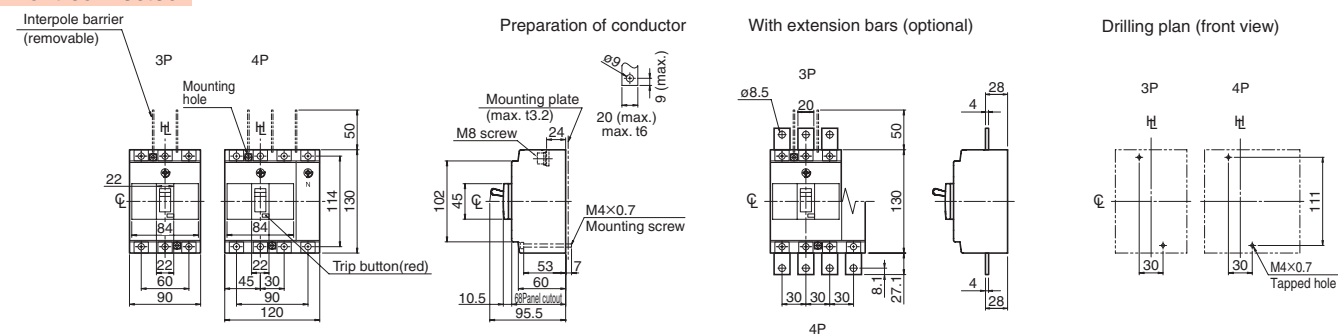
P160F, P160N, P160H, P160D

Outline dimensions (mm)

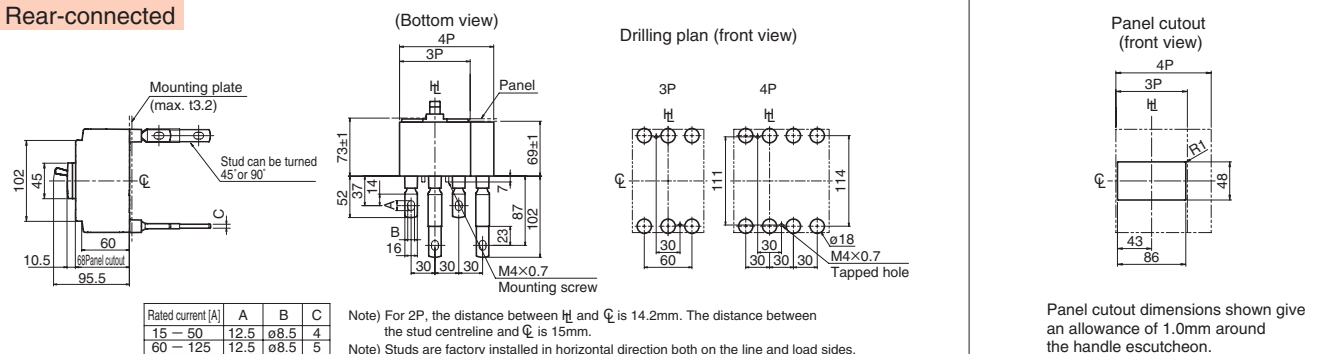
P160F, P160N, P160H, P160D

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

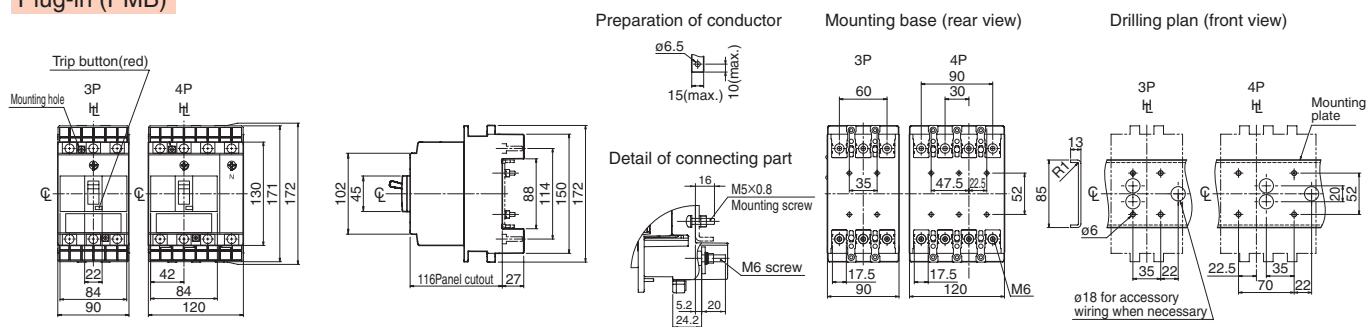
Front-connected



Rear-connected



Plug-in (PMB)



Note: Above outline dimensions are for the electronic type of TPOT OCR and TPOP OCR and for the thermal magnetic type. For the outline dimensions for SMART electronic type of TPOU OCR see page 7-74.

Outline Dimensions

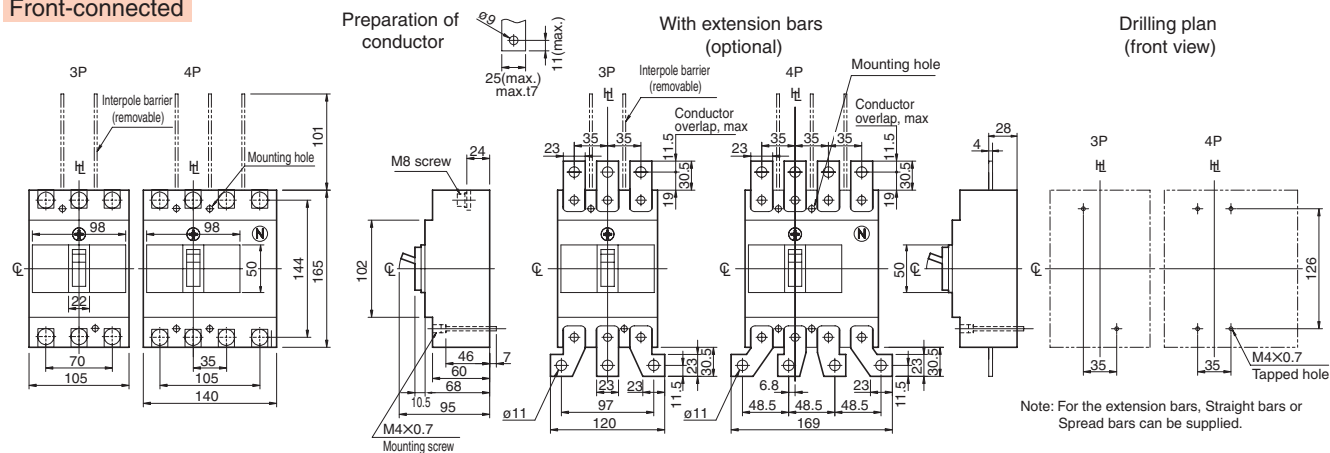
E250-SCF, E250-SF

Outline dimensions (mm)

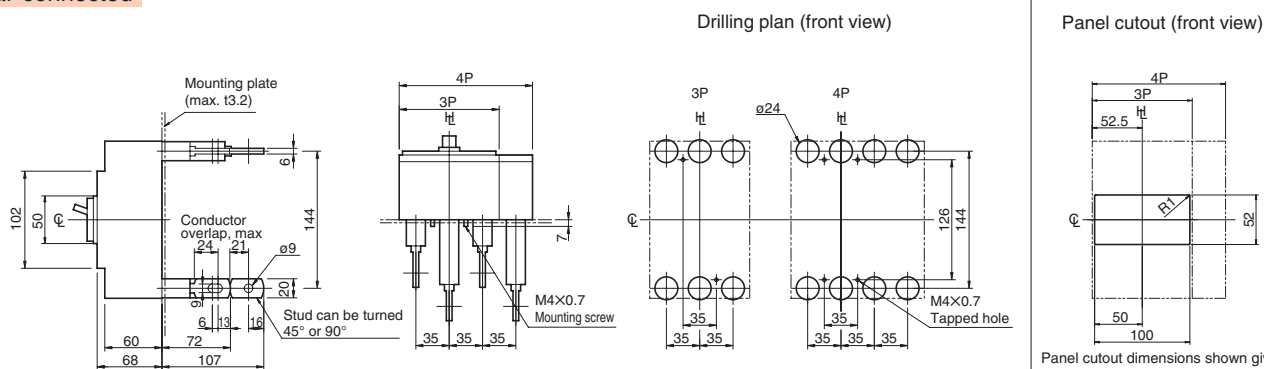
E250-SCF, E250-SF

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

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 around the handle escutcheon.

Outline Dimensions

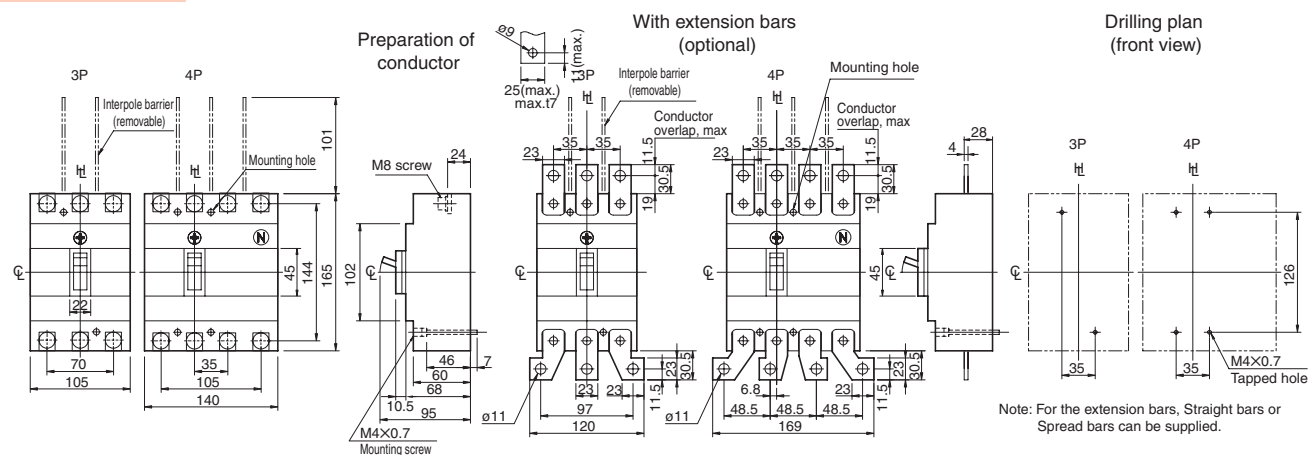
E250-SCJ, E250-SJ, S250-SN

Outline dimensions (mm)

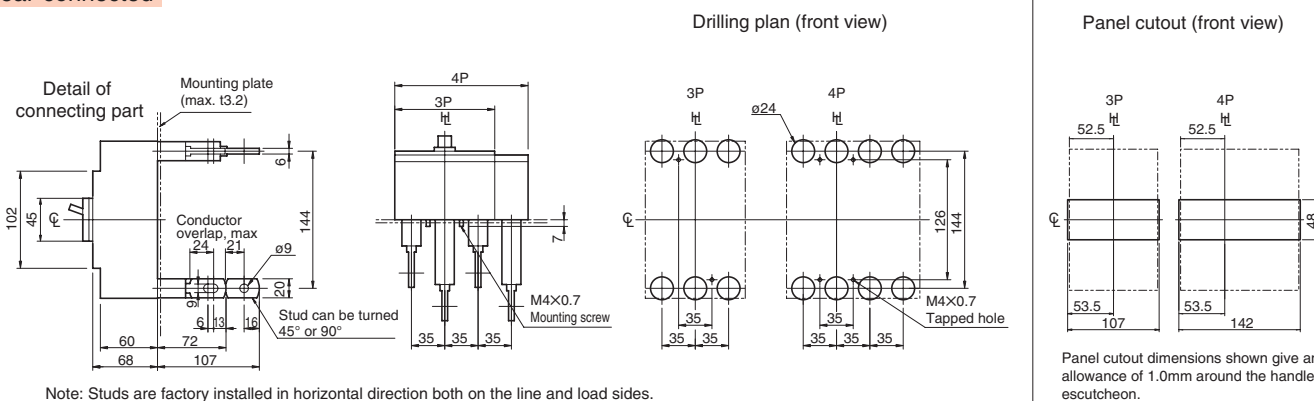
E250-SCJ, E250-SJ, S250-SN

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

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 around the handle escutcheon.

Outline Dimensions

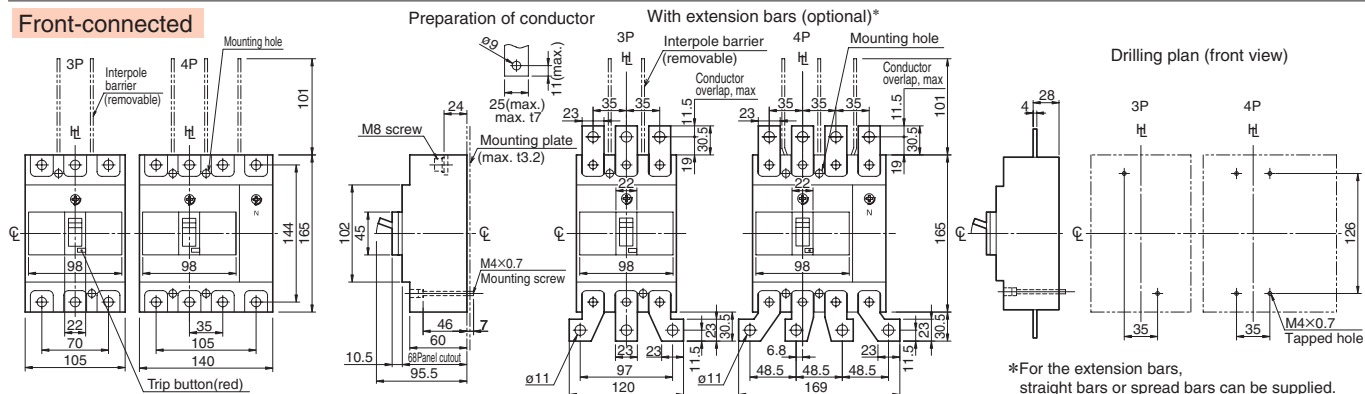
P250F, P250N, P250H, P250D

Outline dimensions (mm)

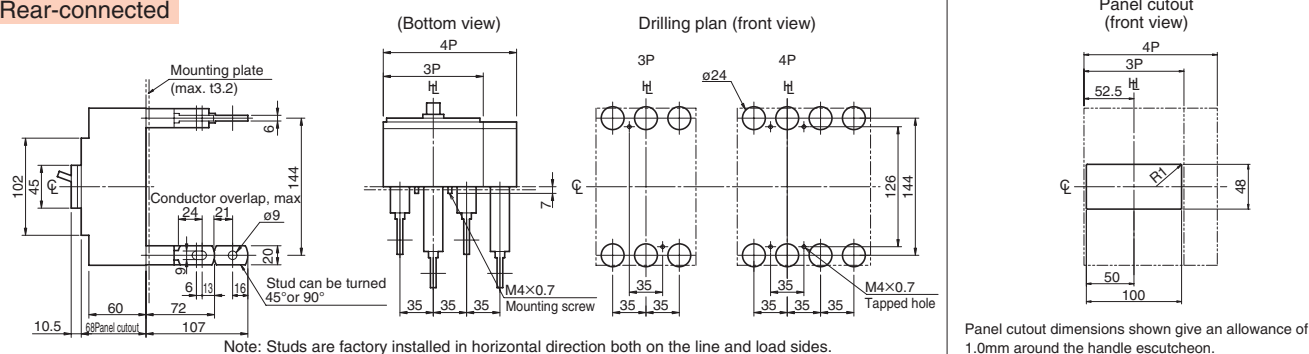
P250F, P250N, P250H, P250D

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

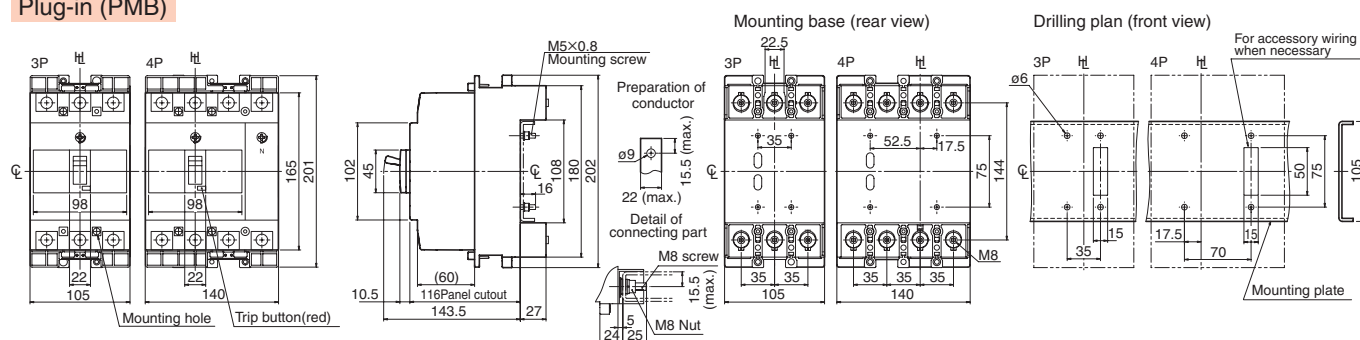
Front-connected



Rear-connected



Plug-in (PMB)



Note: Above outline dimensions are for the electronic type of TPOT OCR and TPOP OCR and for the thermal magnetic type. For the outline dimensions for SMART electronic type of TPOU OCR see page 7-74.

Outline Dimensions

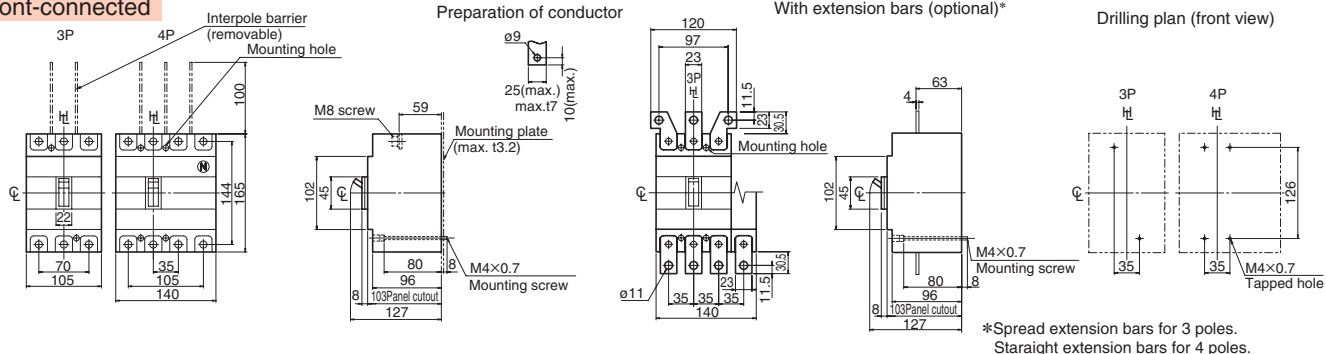
H125-NJ, H160-NJ, H250-NJ, H250-NE, L125-NJ, L160-NJ, L250-NJ

Outline dimensions (mm)

H125-NJ, H160-NJ, H250-NJ, H250-NE, L125-NJ, L160-NJ, L250-NJ

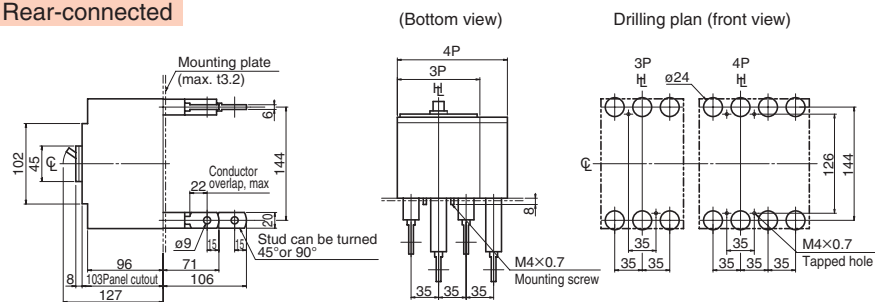
ASL : Arrangement Standard Line ℄ : Handle Centre Line H : Handle Frame Centre Line

Front-connected



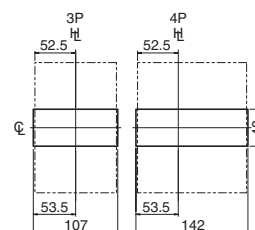
*Spread extension bars for 3 poles.
Staraitght extension bars for 4 poles.

Rear-connected



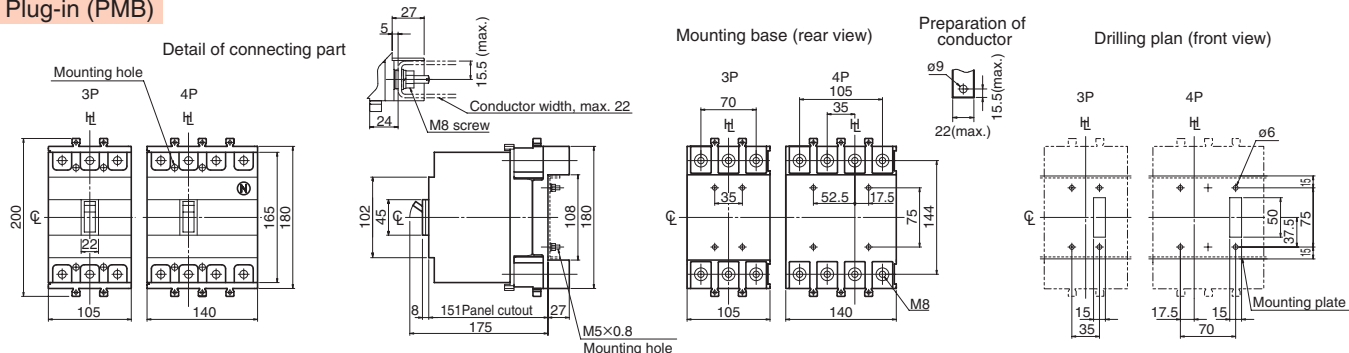
Note: Studs are factory installed in horizontal direction both on the line and load sides.

Panel cutout (front view)



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

Plug-in (PMB)



Note:

- 2) Plug-in type is not available for H250-NE.

P400E, P400F, P400N, P400H, P400S, P400D

P400E, P400F, P400N, P400H, P400S, P400D

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

7-49

Outline Dimensions

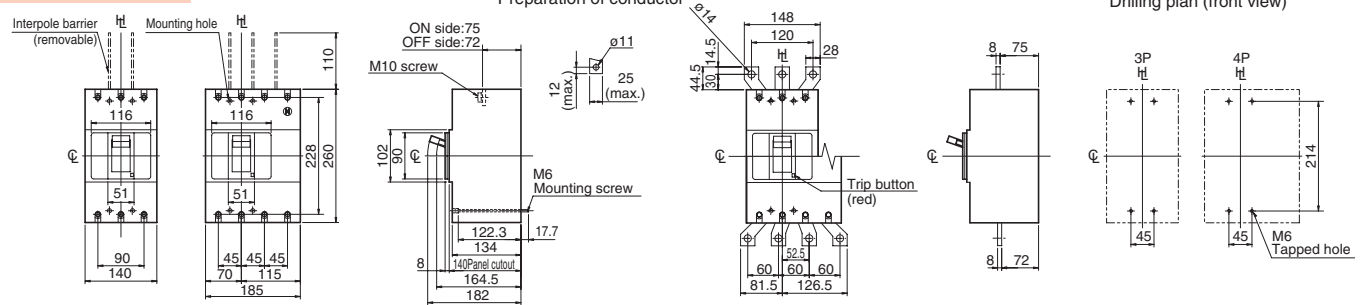
H400-NE, L400-NE

Outline dimensions (mm)

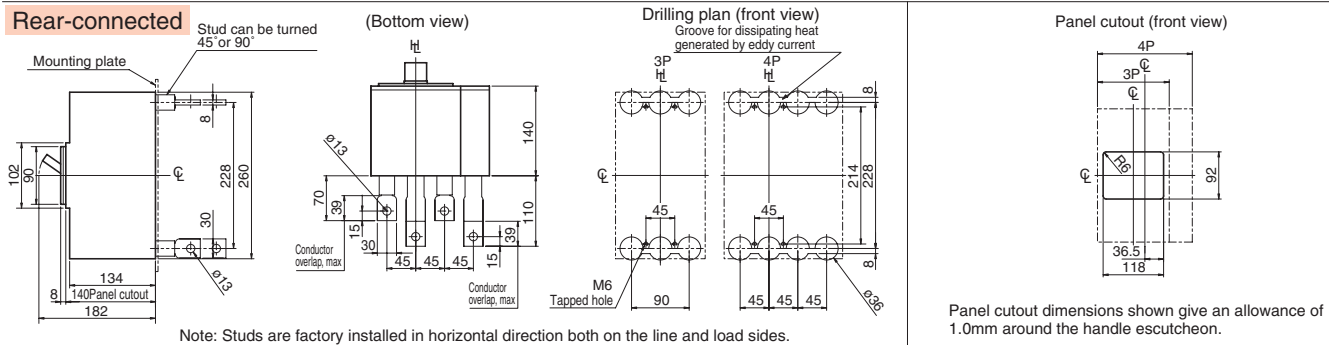
H400-NE, L400-NE

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

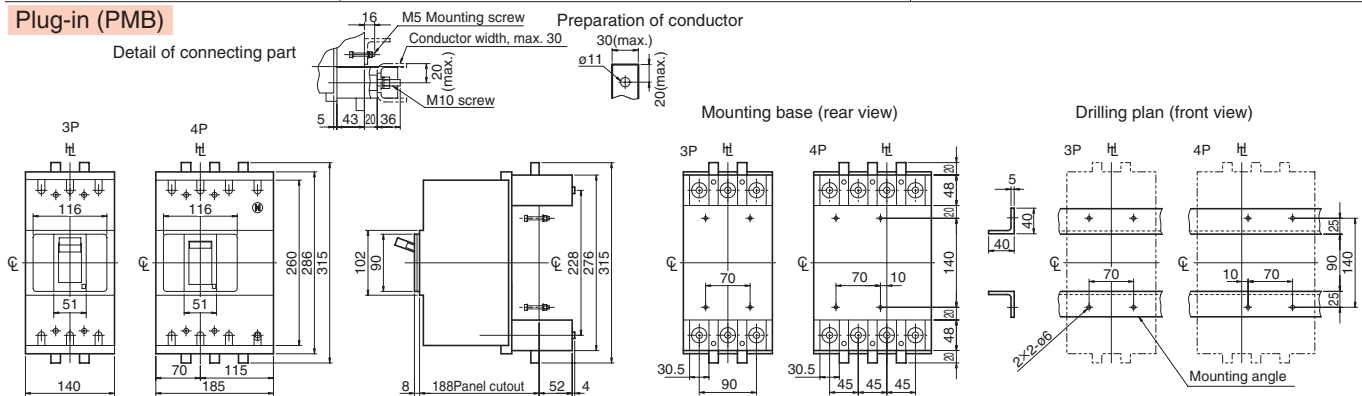
Front-connected



Rear-connected



Plug-in (PMB)



Note:

1) Above outline dimensions are for the electronic type of XOU OCR and for the thermal magnetic type. For the outline dimensions for electronic type of XOW OCR see page 7-76.

Outline Dimensions

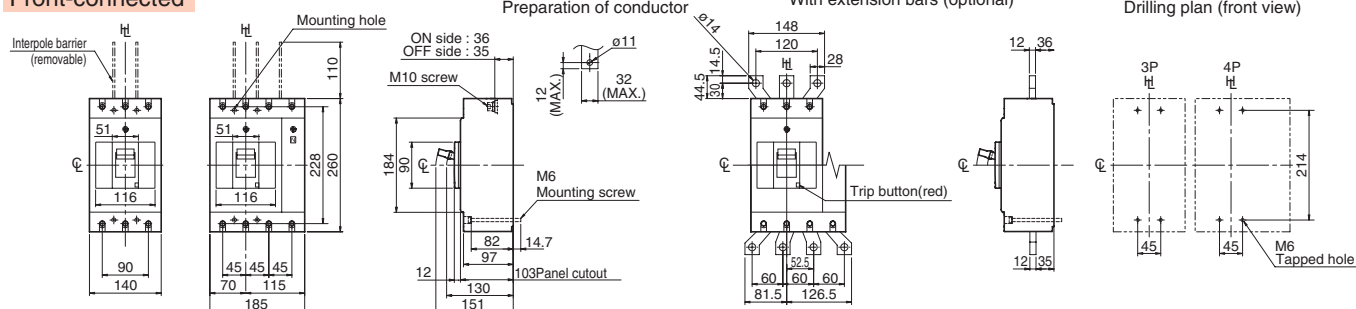
P630E, P630F, P630N, P630H, P630S, P630D

Outline dimensions (mm)

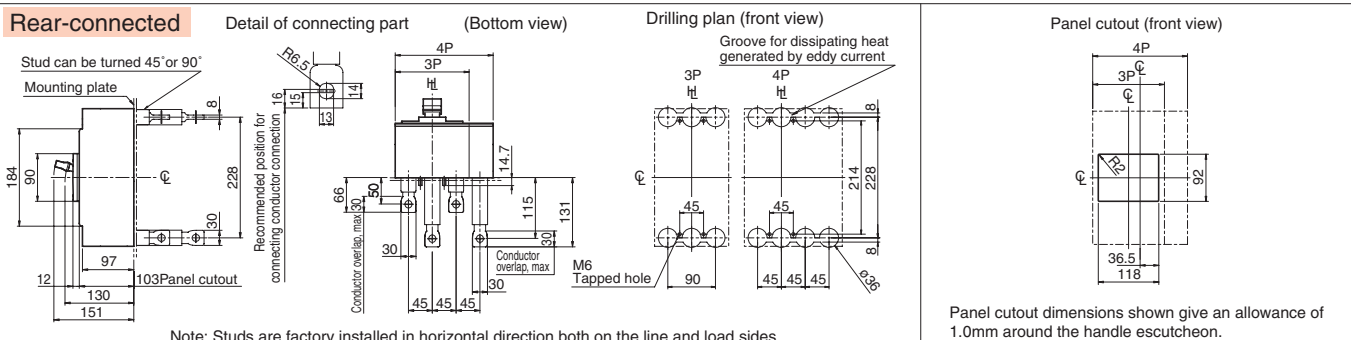
P630E, P630F, P630N, P630H, P630S, P630D

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

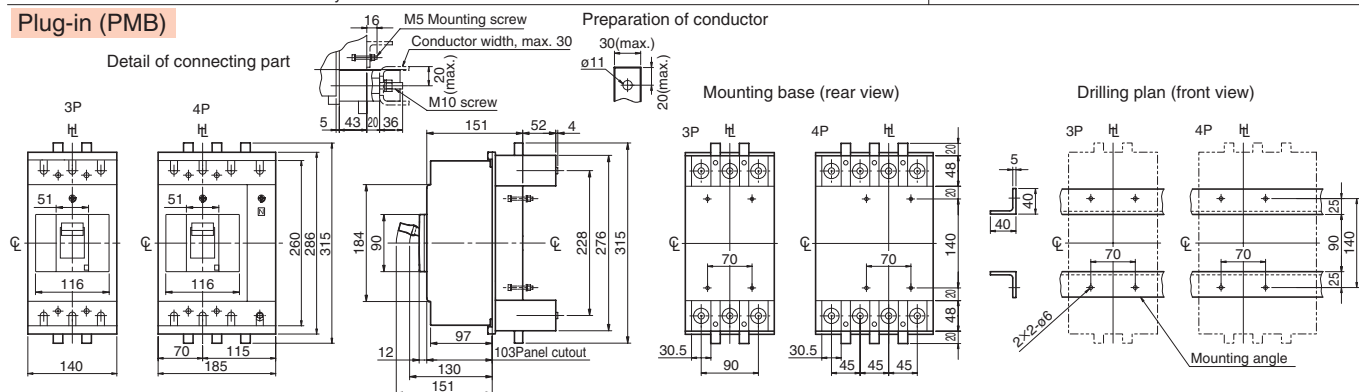
Front-connected



Rear-connected



Plug-in (PMB)



Note:

- 1) Above outline dimensions are for the electronic type of TPOT OCR and TPOU OCR and for the thermal magnetic type. For the outline dimensions for SMART electronic type of TPOU OCR see page 7-75.
- 2) The thermal magnetic type is not available for Plug-in connection.

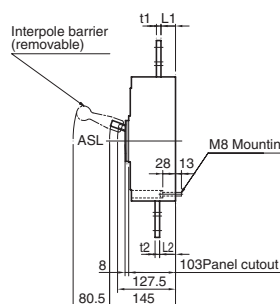
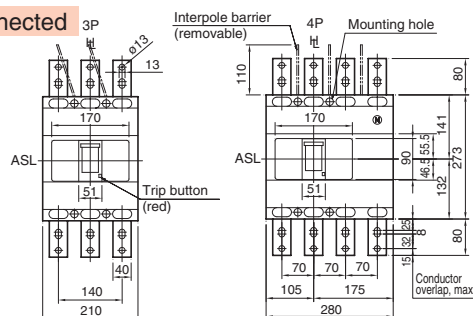
Outline Dimensions

S800-CJ, S800-NJ, S800-RJ, S800-PJ, S800-NN, S800-NE, S800-RE, S800-PE

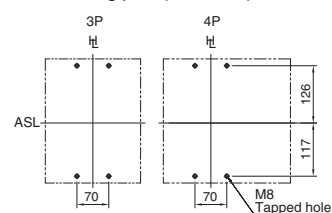
Outline dimensions (mm) S800-CJ, S800-NJ, S800-RJ, S800-PJ, S800-NN, S800-NE, S800-RE, S800-PE

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

Front-connected

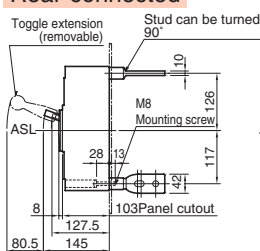


Drilling plan (front view)

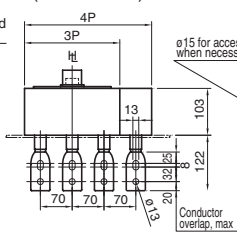


Breaker type	Rated current	t1	t2	L1	L2	W
S800-CJ, S800-NJ, S800-RJ, S800-PJ, S800-NN	630A	8	8	32	34	40
	800A	10	10	32	35	40
S800-NE, S800-RE, S800-PE	630A	8	8	32	36	40
	800A	10	10	32	36	40

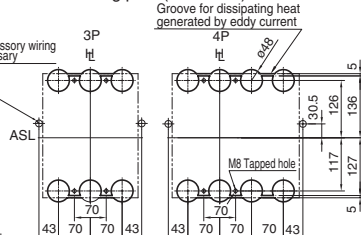
Rear-connected



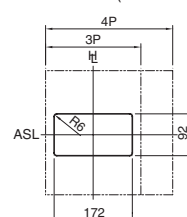
(Bottom view)



Drilling plan (front view)



Panel cutout (front view)

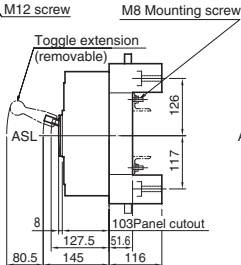
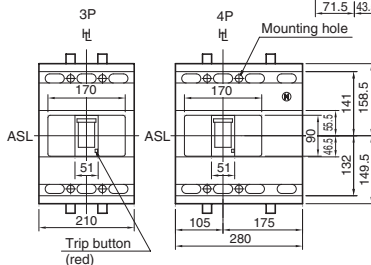
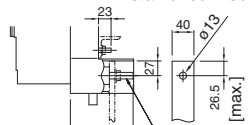


Note: Studs are factory installed in horizontal direction both on the line and load sides.

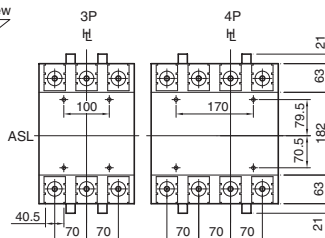
Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

Plug-in (PMB)

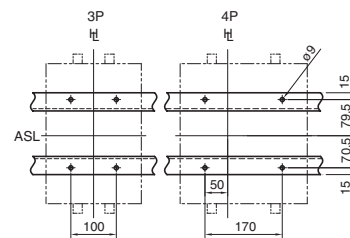
Detail of connecting part / Preparation of conductor



Mounting base (rear view)



Drilling plan (front view)



Note: Above outline dimensions are for the electronic type of XOU OCR and for the thermal magnetic type. For the outline dimensions for electronic type of XOW OCR see page 7-76.

Outline Dimensions

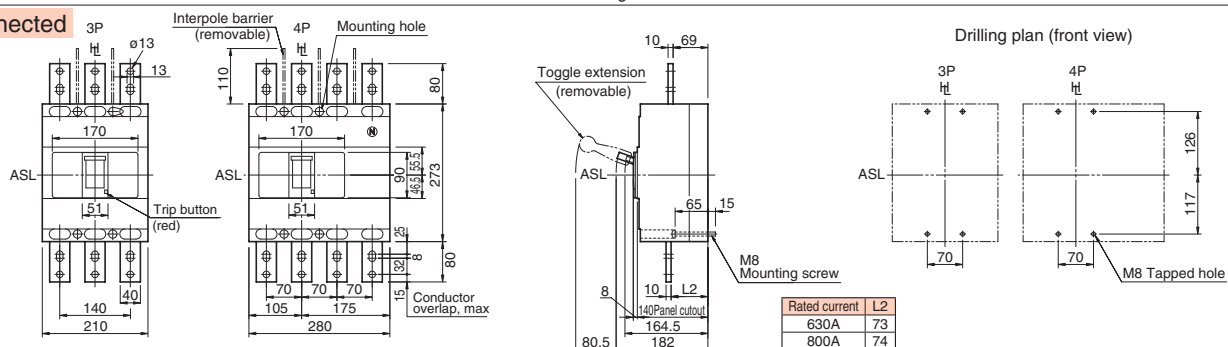
H800-NE, L800-NE

Outline dimensions (mm)

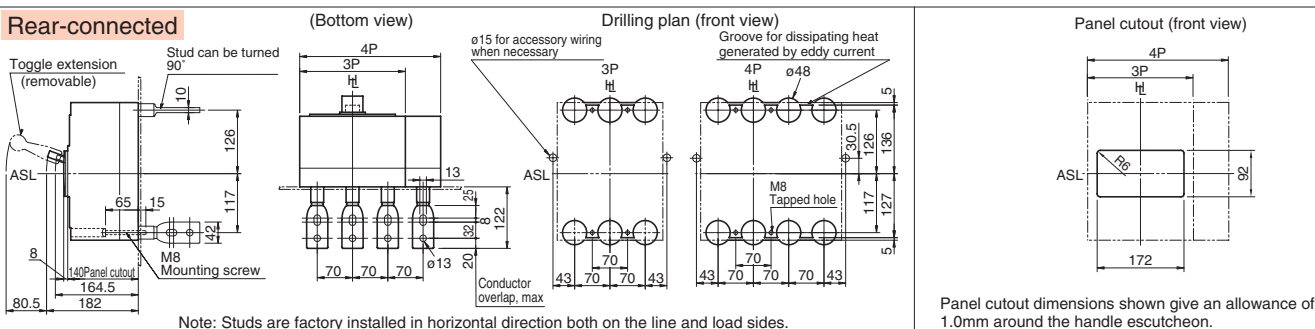
H800-NE, L800-NE

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

Front-connected

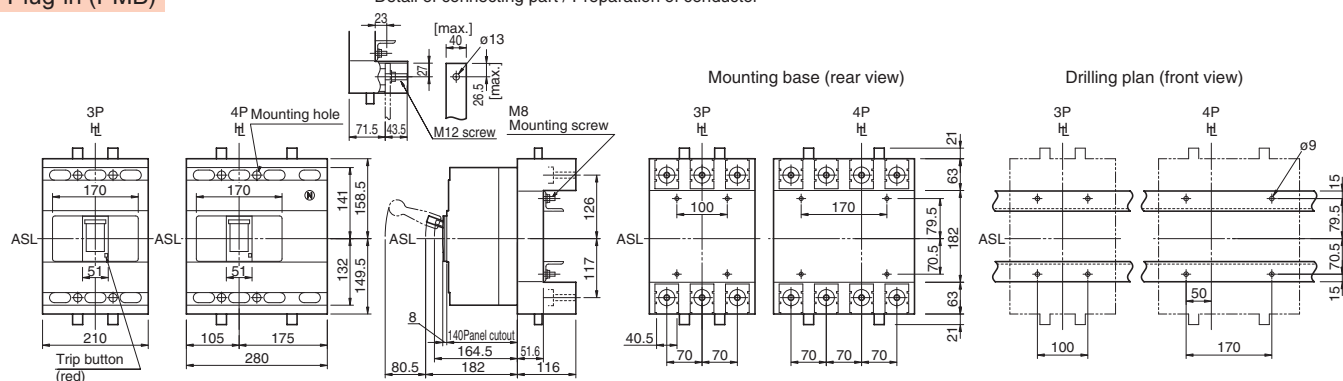


Rear-connected



Plug-in (PMB)

Detail of connecting part / Preparation of conductor



Note:

1) Above outline dimensions are for the electronic type of XOY OCR and for the thermal magnetic type. For the outline dimensions for electronic type of XOW OCR see page 7-77.

Outline Dimensions

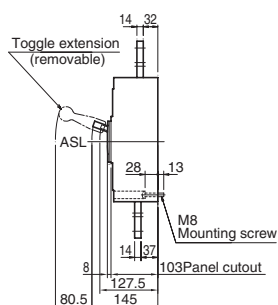
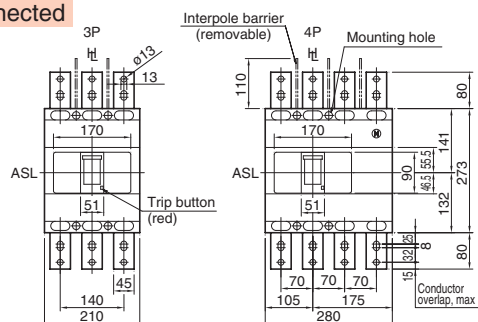
S1000-SE, S1000-NE, S1000-NN

Outline dimensions (mm)

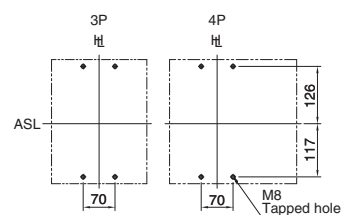
S1000-SE, S1000-NE, S1000-NN

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

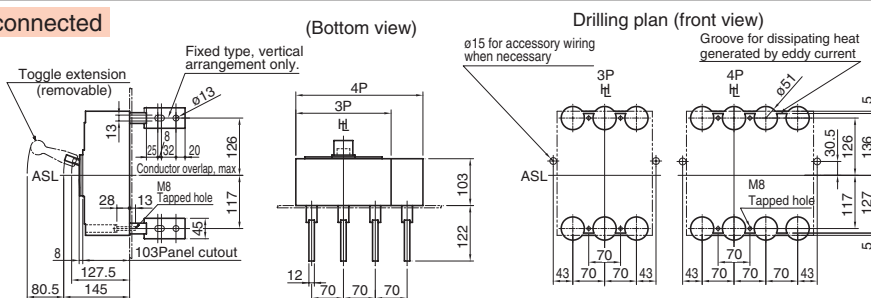
Front-connected



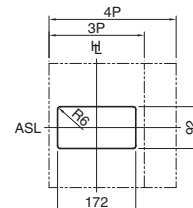
Drilling plan (front view)



Rear-connected



Panel cutout (front view)



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

Note: Above outline dimensions are for the electronic type of XOU OCR and for the thermal magnetic type. For the outline dimensions for electronic type of XOW OCR see page 7-77.

Outline Dimensions

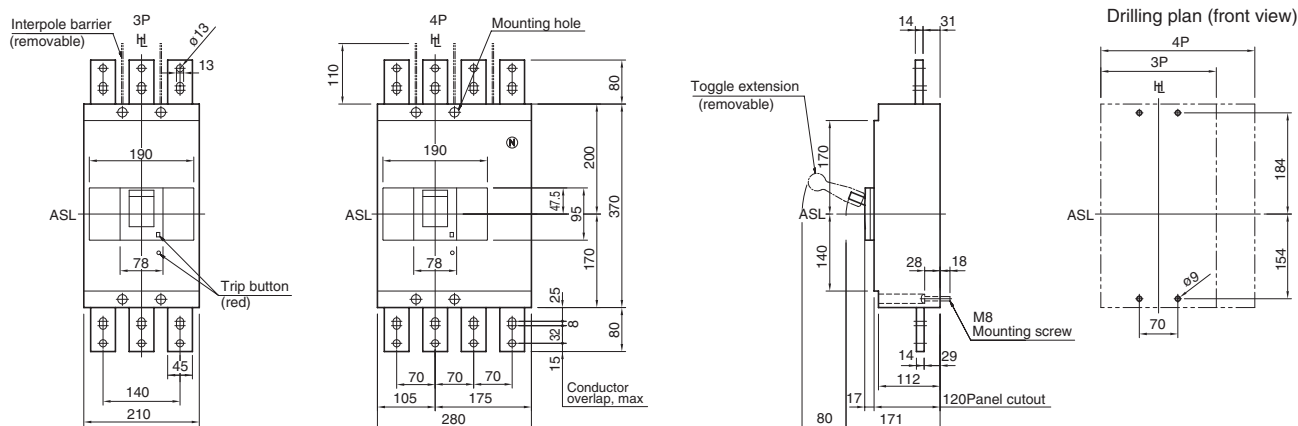
S1250-SE, S1250-NE, S1250-GE, S1250-NN

Outline dimensions (mm)

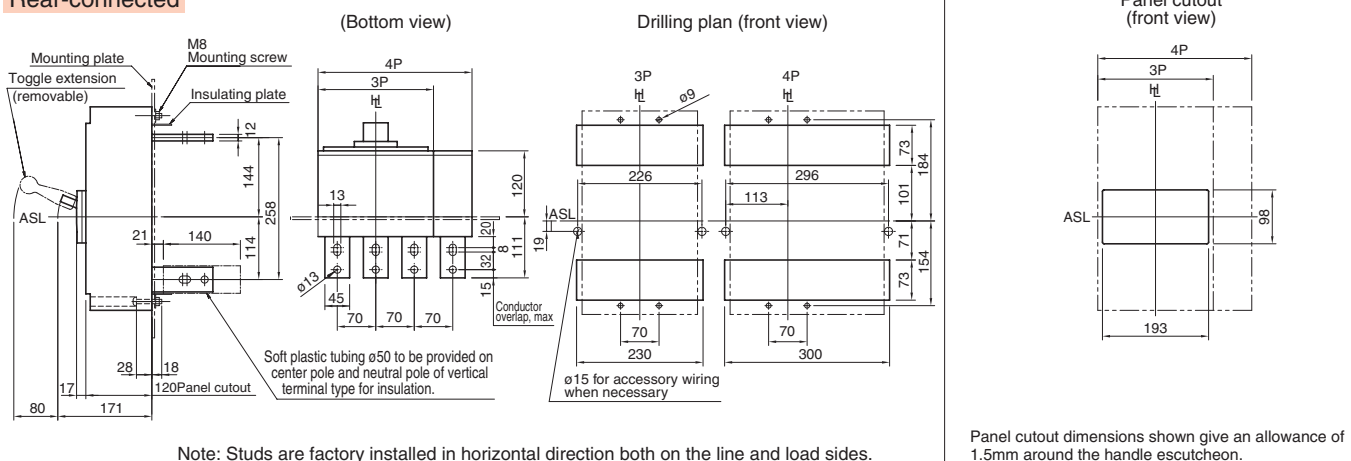
S1250-SE, S1250-NE, S1250-GE, S1250-NN

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

Front-connected

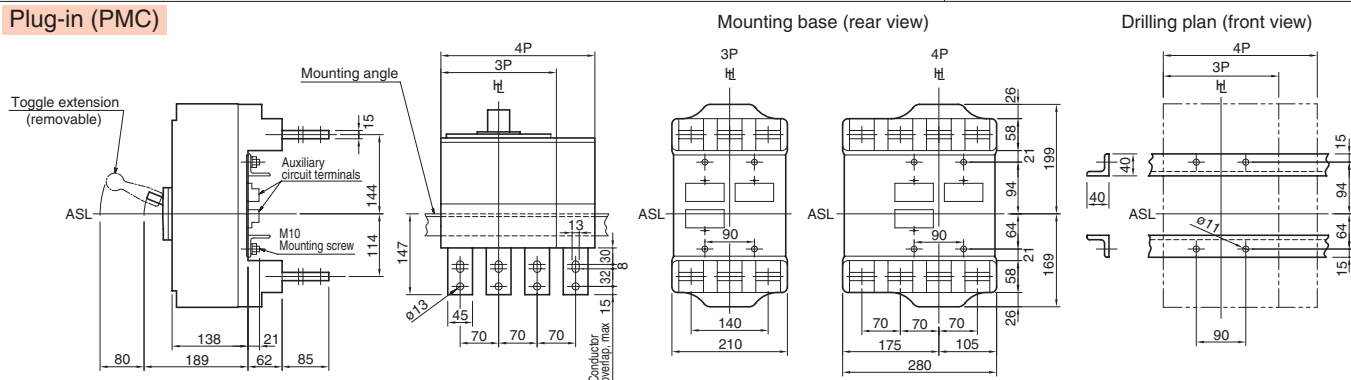


Rear-connected



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

Plug-in (PMC)



Outline Dimensions

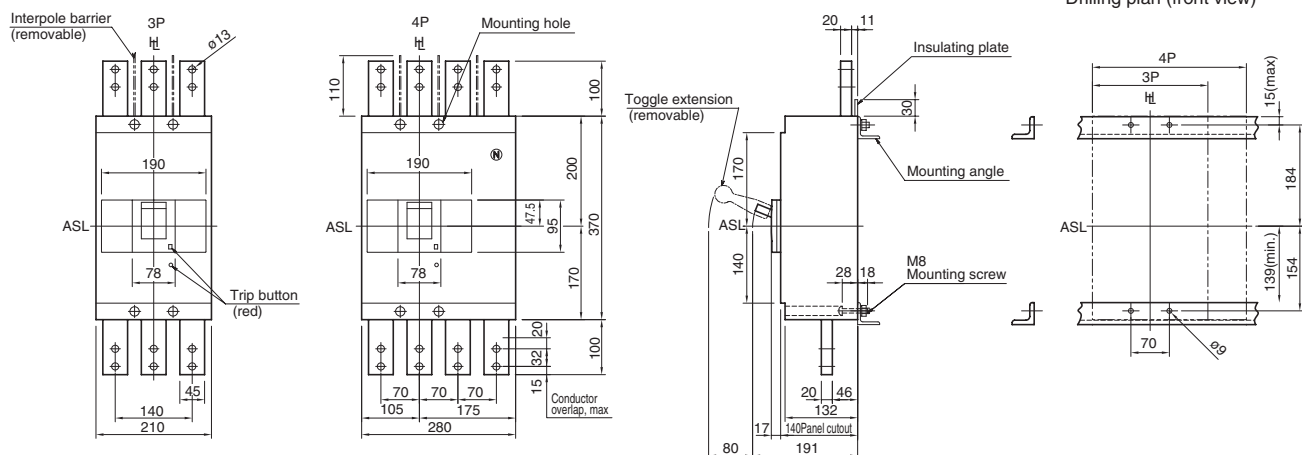
S1600-SE, S1600-NE, S1600-NN

Outline dimensions (mm)

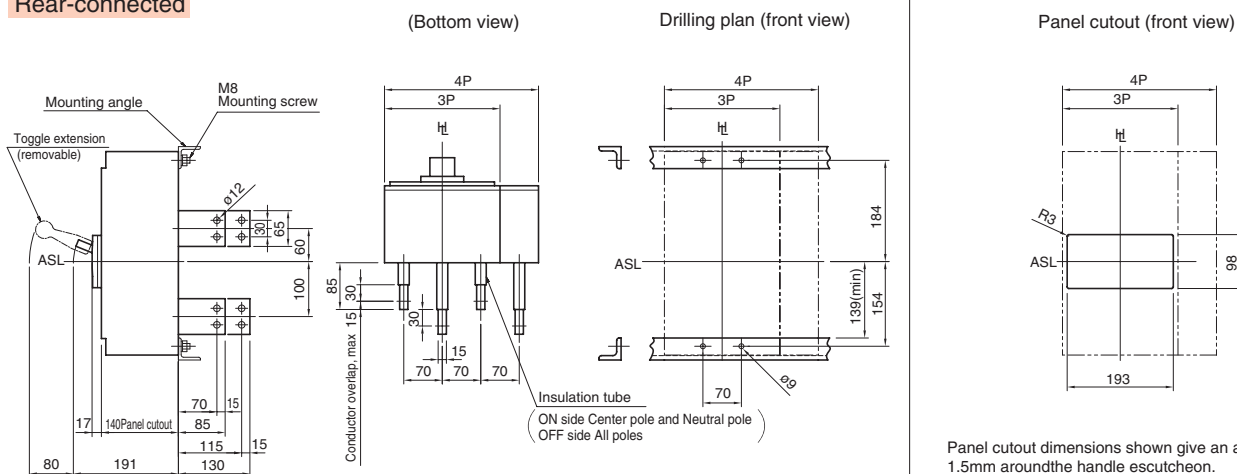
S1600-SE, S1600-NE, S1600-NN

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

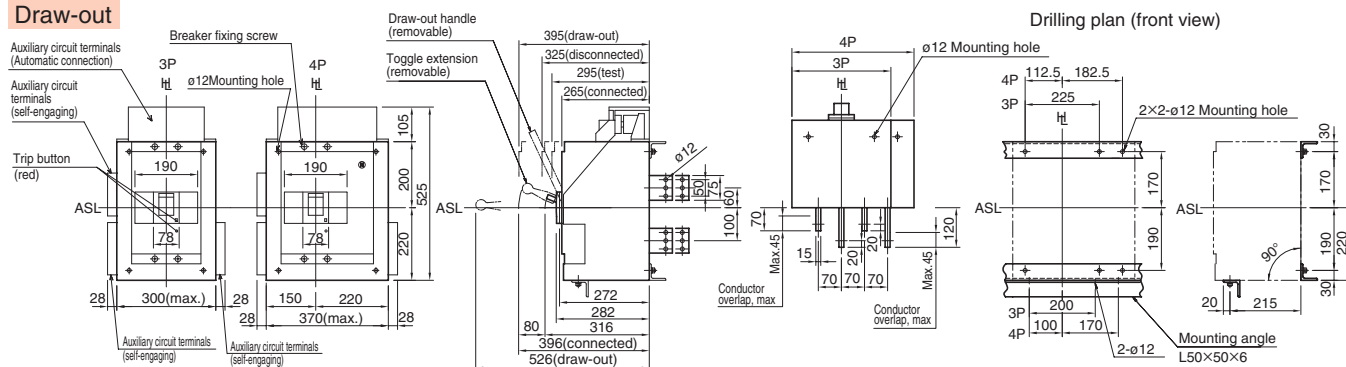
Front-connected



Rear-connected



Draw-out



Outline Dimensions

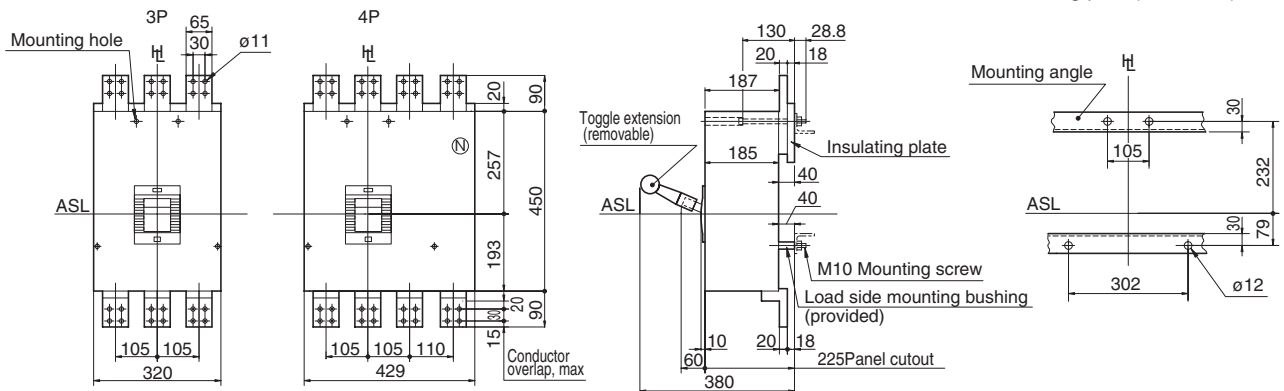
XS2000NE, XS2000NN

Outline dimensions (mm)

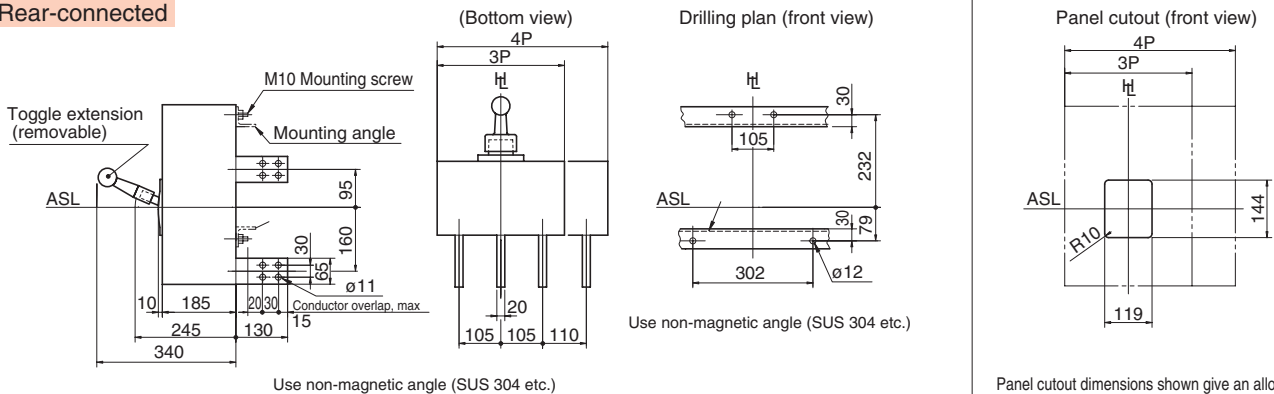
XS2000NE, XS2000NN

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

Front-connected

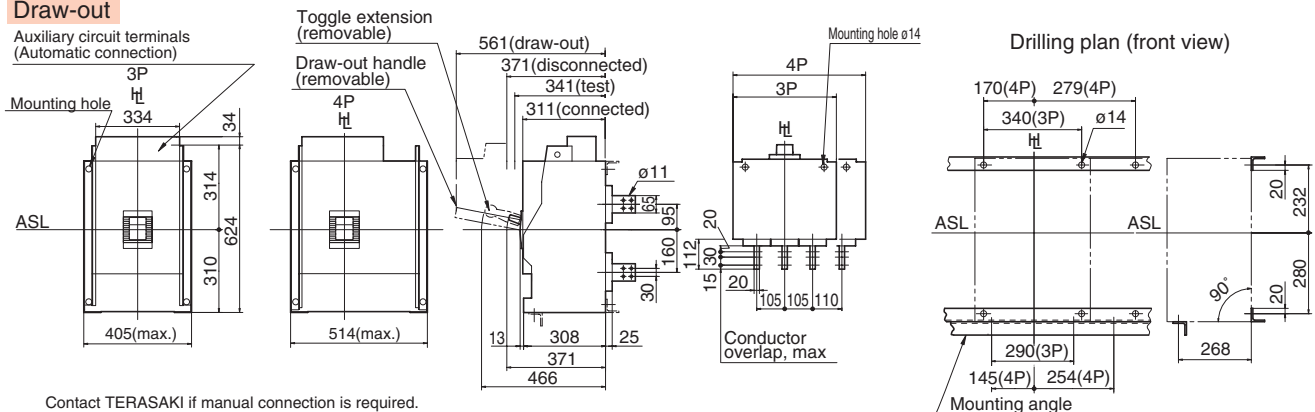


Rear-connected



Panel cutout dimensions shown give an allowance of 2mm around the handle escutcheon.

Draw-out



Contact TERASAKI if manual connection is required.

Outline Dimensions

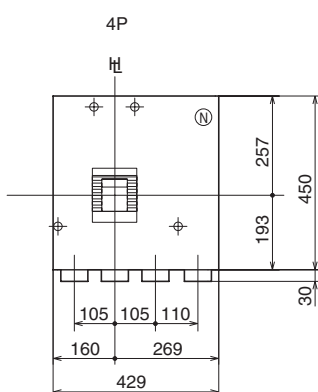
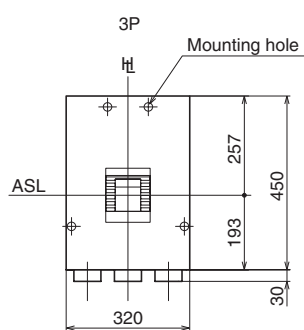
XS2500NE, XS2500NN

Outline dimensions (mm)

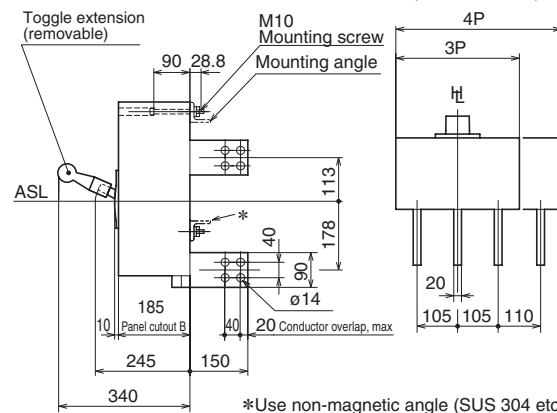
XS2500NE, XS2500NN

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

Rear-connected

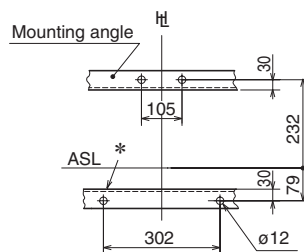
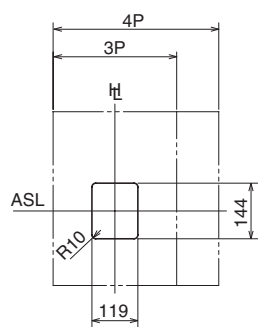
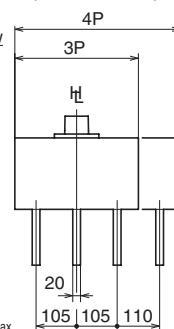


Panel cutout B (front view)



Drilling plan (front view)

(Bottom view)



*Use non-magnetic angle (SUS 304 etc.)

Panel cutout dimensions shown give an allowance of 2mm around the handle escutcheon.

Outline Dimensions

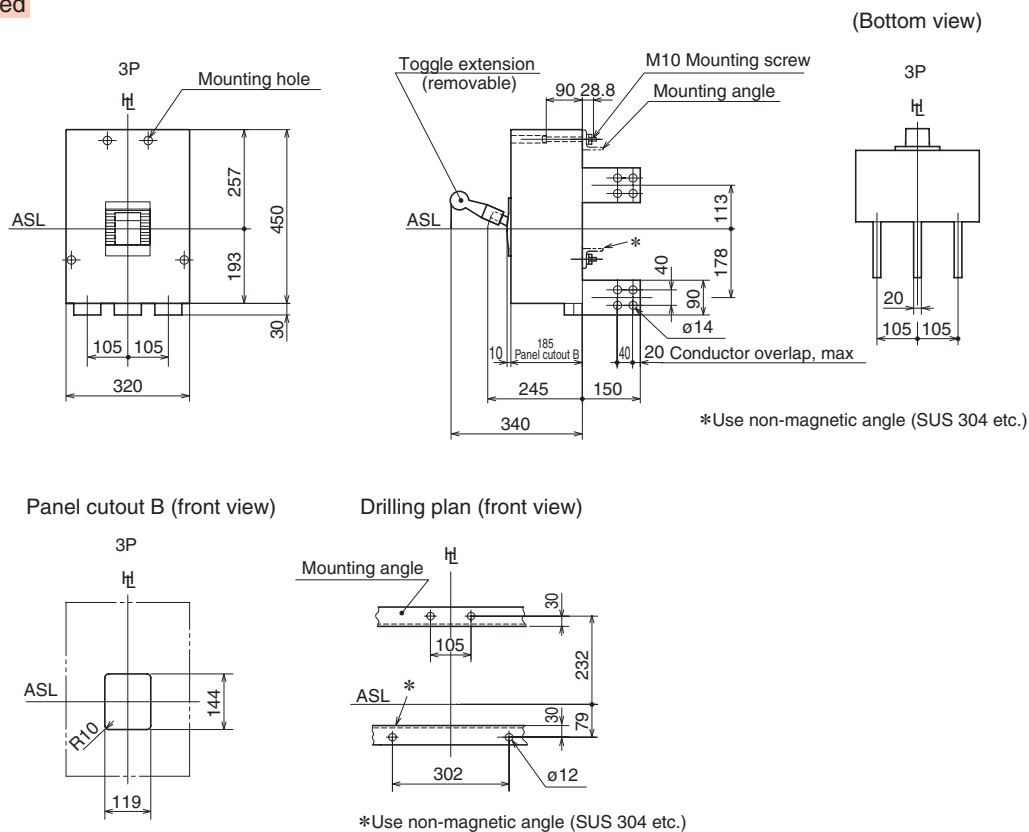
XS3200NE, XS3200NN

Outline dimensions (mm)

XS3200NE, XS3200NN

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

Rear-connected



Panel cutout dimensions shown give an allowance of 2mm around the handle escutcheon.

Outline Dimensions (with motor operators)

P160F, P160N, P160H, P160D

Outline dimensions (mm) (TPMC16S)

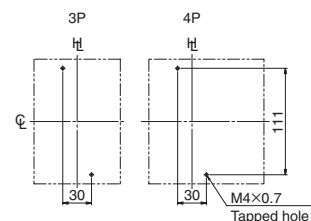
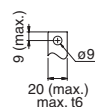
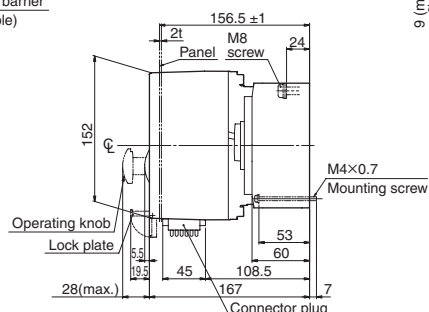
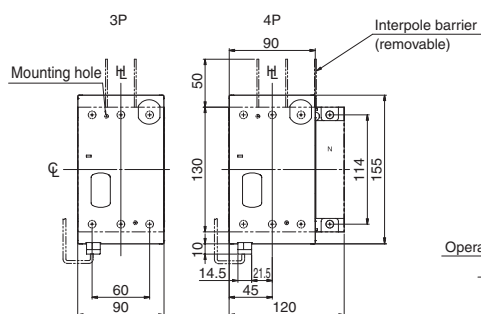
P160F, P160N, P160H, P160D

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

Front-connected

Preparation of conductor

Drilling plan (front view)



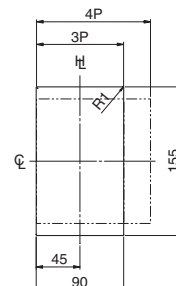
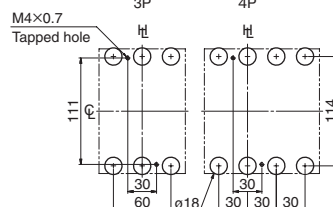
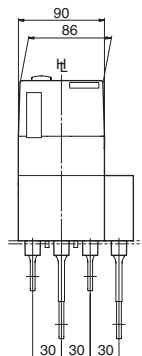
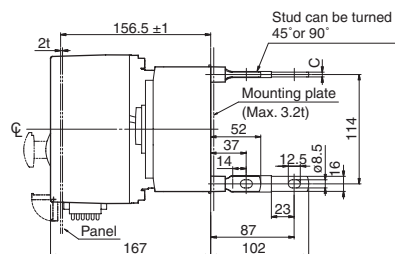
Rear-connected

Rated current [A]	C
15 ~ 50	4
60 ~ 125	5

(Bottom view)

Drilling plan (front view)

Panel cutout (front view)



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

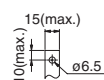
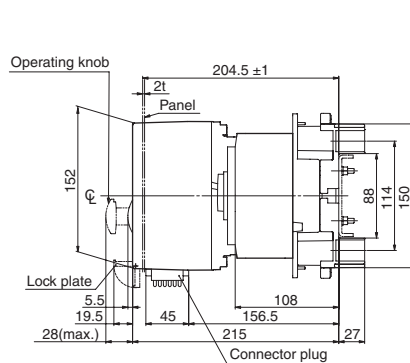
Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

Plug-in (PMB)

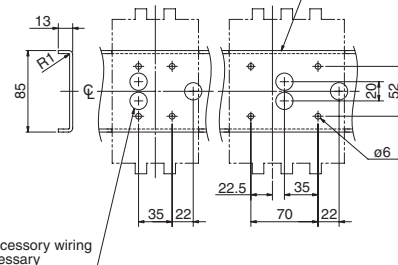
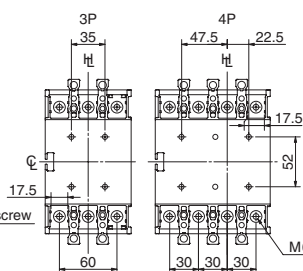
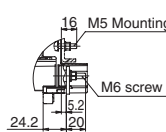
Preparation of conductor

Mounting base (rear view)

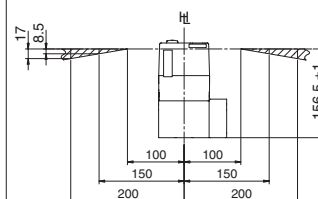
Drilling plan (front view)



Detail of connecting part



Panel hinge position (hatching area) (bottom view)



Note: Above outline dimensions are for the electronic type of TPOT OCR, TPOU OCR and SMART TPOU OCR and for the thermal magnetic type.

Outline Dimensions (with motor operators)

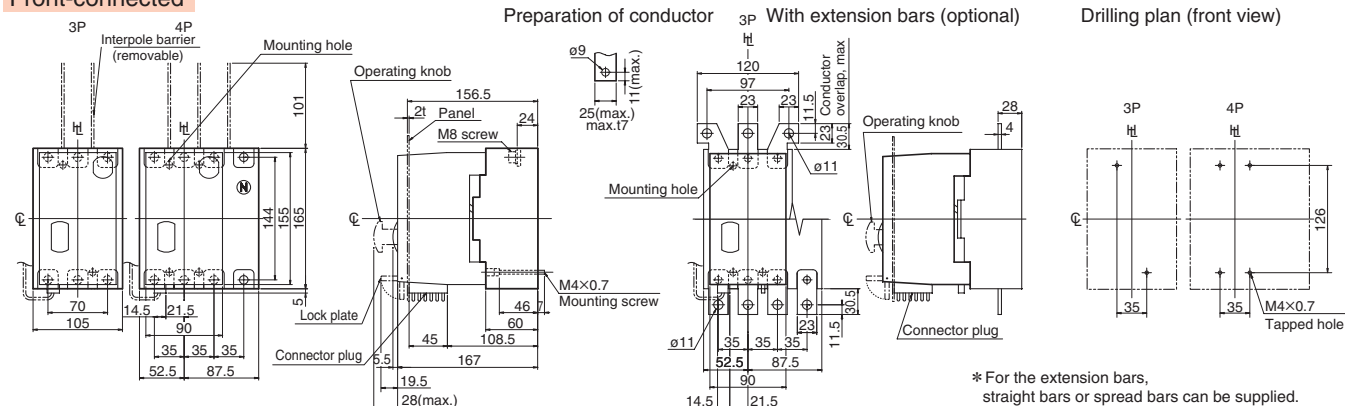
E250-SCF, E250-SCJ, E250-SF, E250-SJ, S250-SN

Outline dimensions (mm)(T2MC25L)

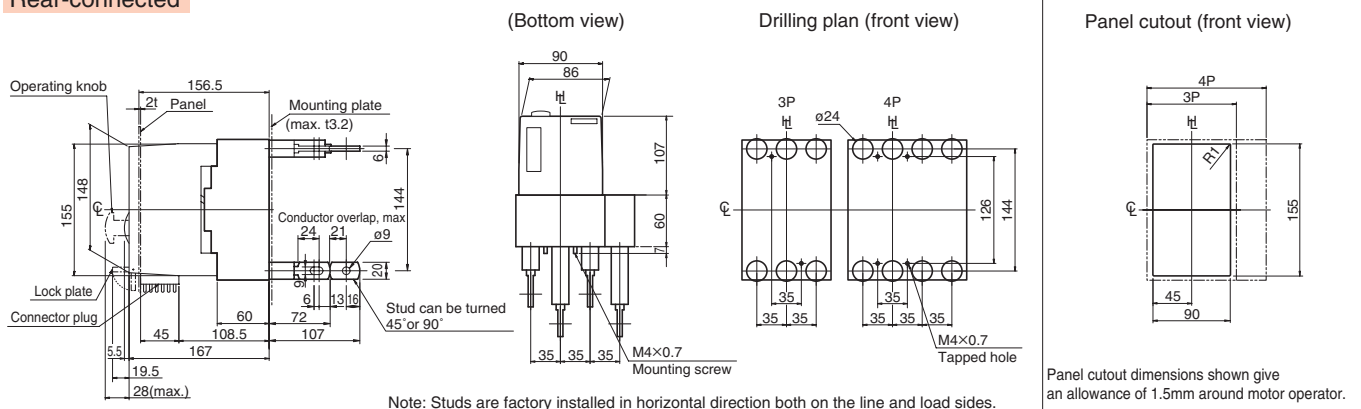
E250-SCF, E250-SCJ, E250-SF, E250-SJ, S250-SN

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

Front-connected

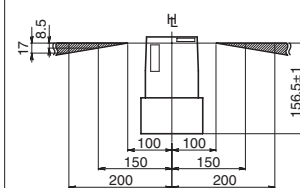


Rear-connected



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

Panel hinge position (hatching area)
(bottom view)



Outline Dimensions (with motor operators)

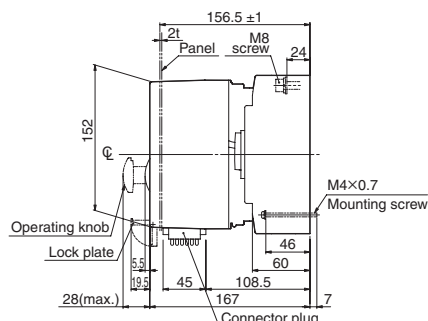
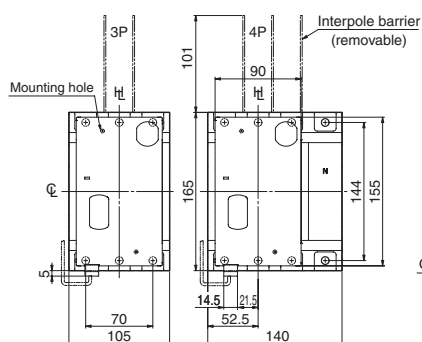
P250F, P250N, P250H, P250D

Outline dimensions (mm) (TPMC25S)

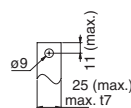
P250F, P250N, P250H, P250D

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

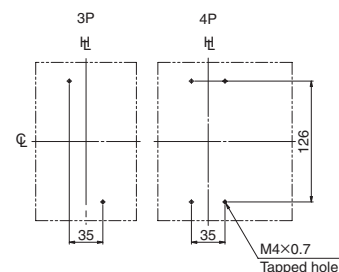
Front-connected



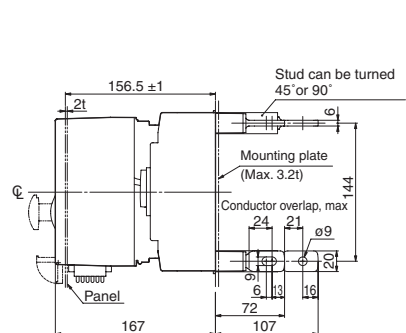
Preparation of conductor



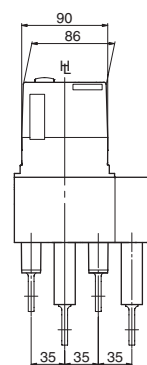
Drilling plan (front view)



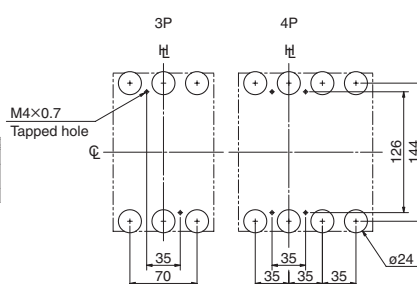
Rear-connected



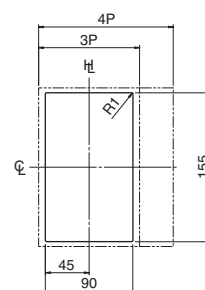
(Bottom view)



Drilling plan (front view)



Panel cutout (front view)

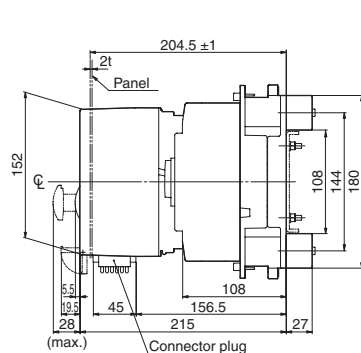


Note: Studs are factory installed in horizontal direction both on the line and load sides.

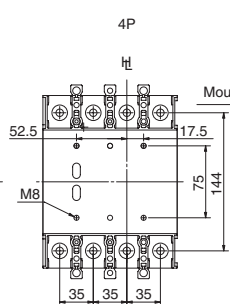
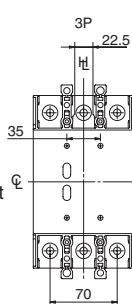
Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

Plug-in (PMB)

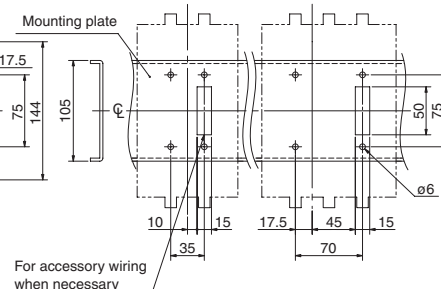
Preparation of conductor



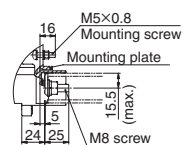
Mounting base (rear view)



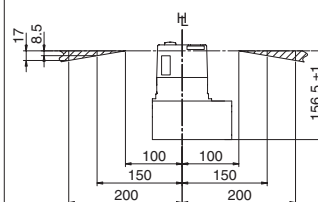
Drilling plan (front view)



Detail of connecting part



Panel hinge position (hatching area)
(bottom view)



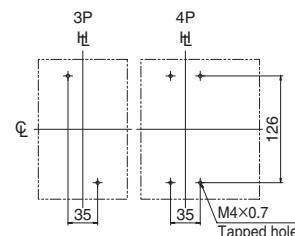
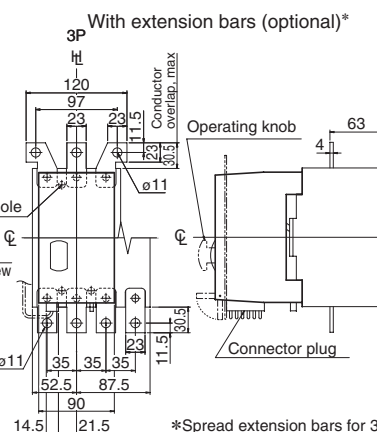
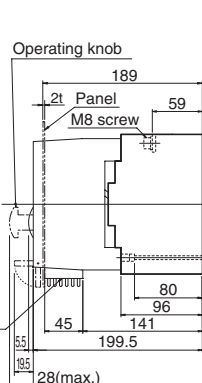
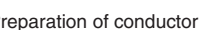
Note: Above outline dimensions are for the electronic type of TPOT OCR, TPOP OCR and SMART TPOU OCR and for the thermal magnetic type.

H125-NJ, H160-NJ, H250-NJ, H250-NE, L125-NJ, L160-NJ, L250-NJ

H125-NJ, H160-NJ, H250-NJ, H250-NE, L125-NJ, L160-NJ, L250-NJ

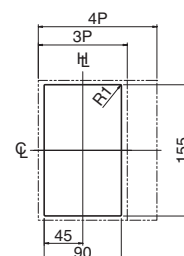
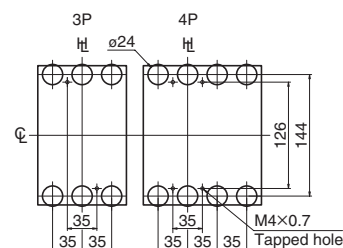
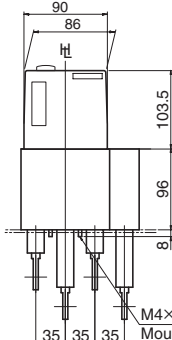
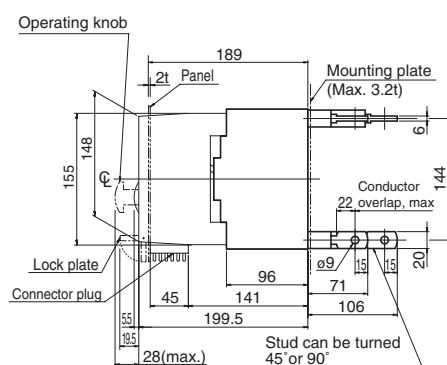
ASL : Arrangement Standard Line C : Handle Centre Line H : Handle Frame Centre Line

Preparation of conductor



*Spread extension bars for 3 poles. Staraight extension bars for 4 poles.

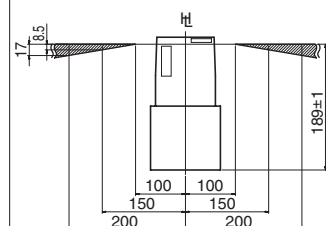
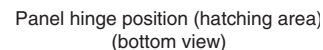
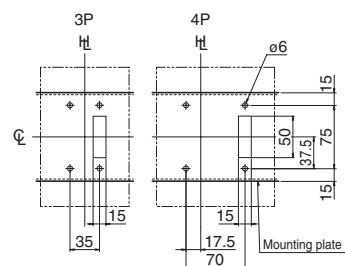
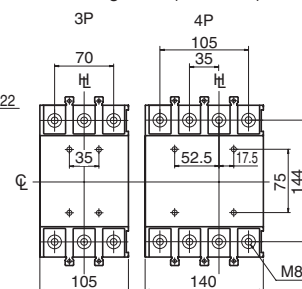
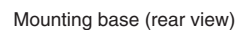
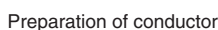
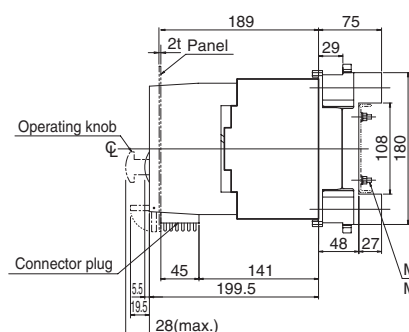
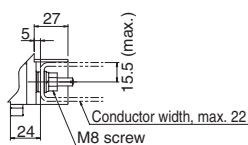
(Bottom view)



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



Characteristics and Outline Dimensions

Note:

1) Above outline dimensions are for the electronic type of XOU OCR and XOW OCR and for the thermal magnetic type.

2) Plug-in type is not available for H250-NE.

Outline Dimensions (with motor operators)

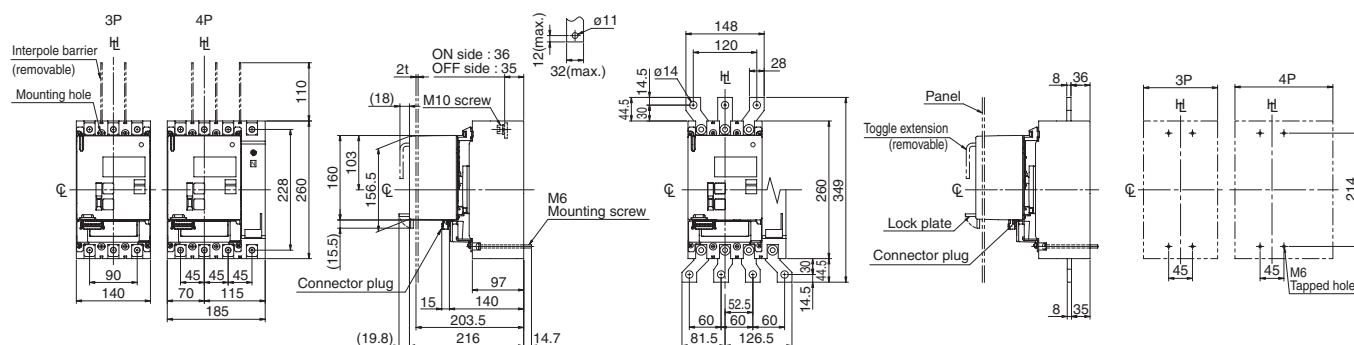
P400E, P400F, P400N, P400H, P400S, P400D

Outline dimensions (mm) (TPMC63S)

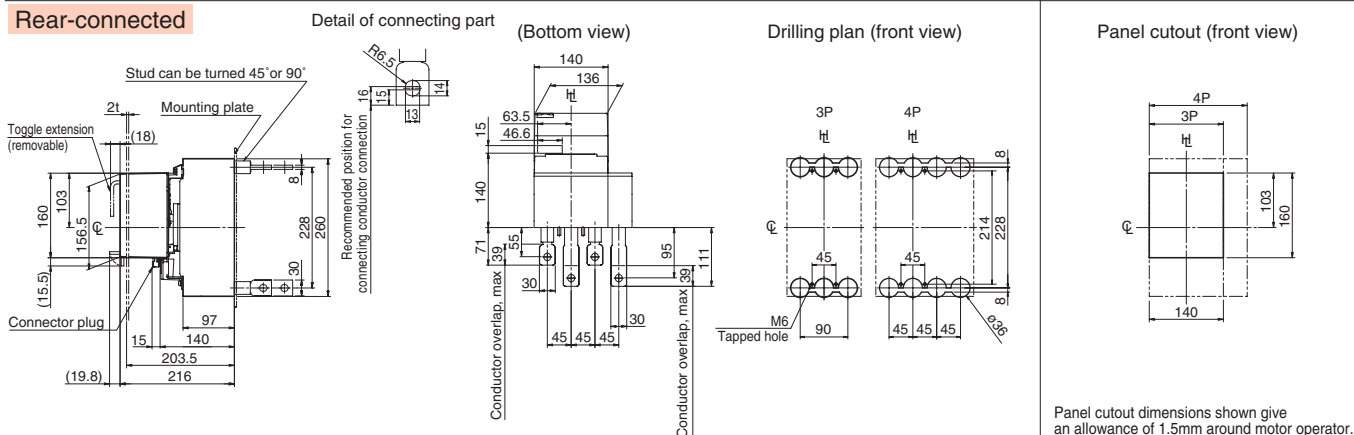
P400E, P400F, P400N, P400H, P400S, P400D

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

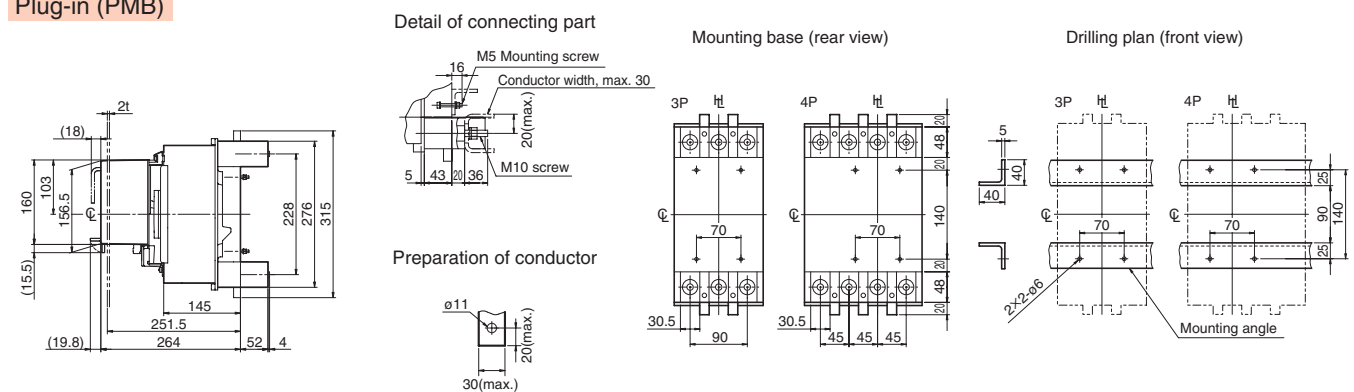
Front-connected



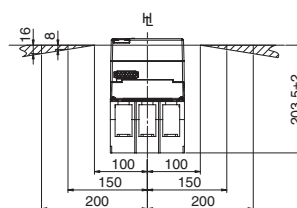
Rear-connected



Plug-in (PMB)



Panel hinge position (hatching area)
(bottom view)



Note: Above outline dimensions are for the electronic type of TPOT OCR, TPOP OCR and SMART TPOU OCR and for the thermal magnetic type.

Outline Dimensions (with motor operators)

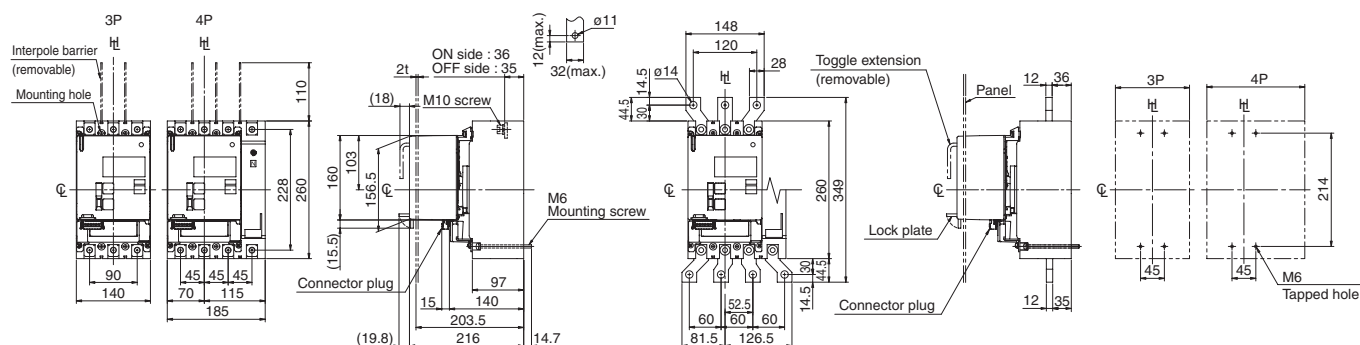
P630E, P630F, P630N, P630H, P630S, P630D

Outline dimensions (mm) (TPMC63S)

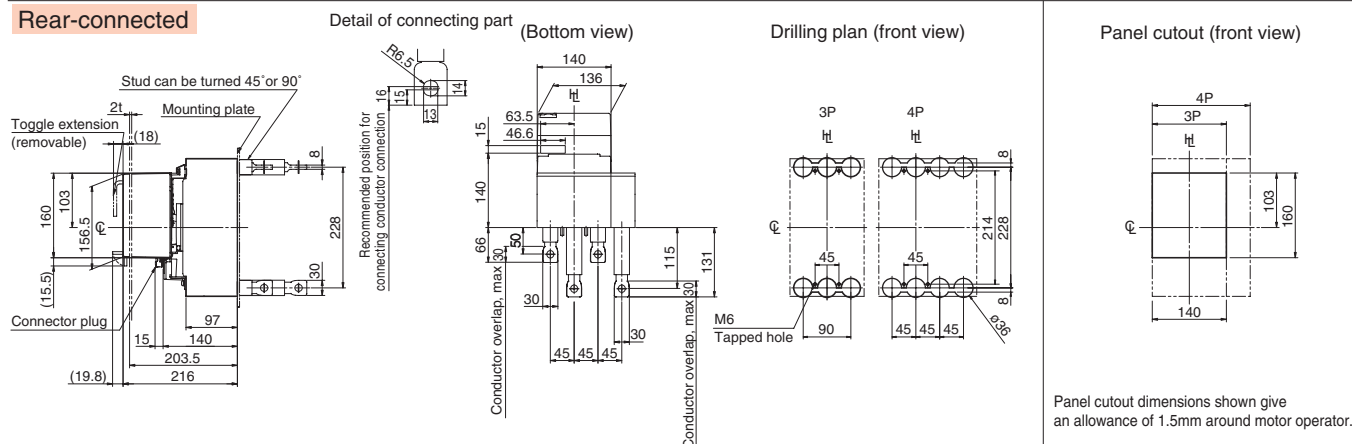
P630E, P630F, P630N, P630H, P630S, P630D

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

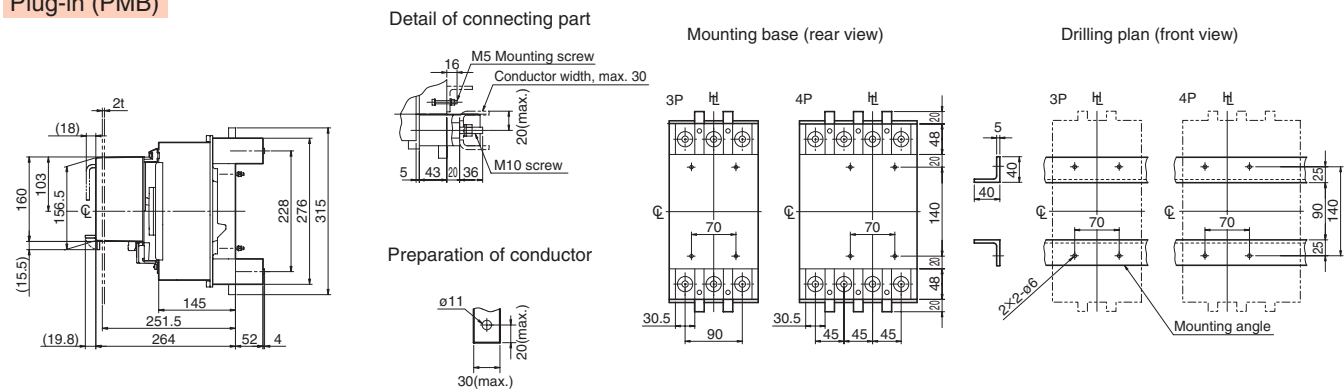
Front-connected



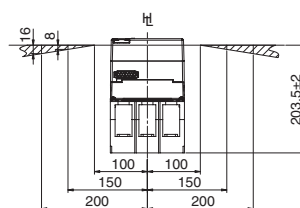
Rear-connected



Plug-in (PMB)



Panel hinge position (hatching area)
(bottom view)



Note: 1) Above outline dimensions are for the electronic type of TPOT OCR, TPOP OCR and SMART TPOU OCR and for the thermal magnetic type.
2) The thermal magnetic type is not available for Plug-in connection.

Outline Dimensions (with motor operators)

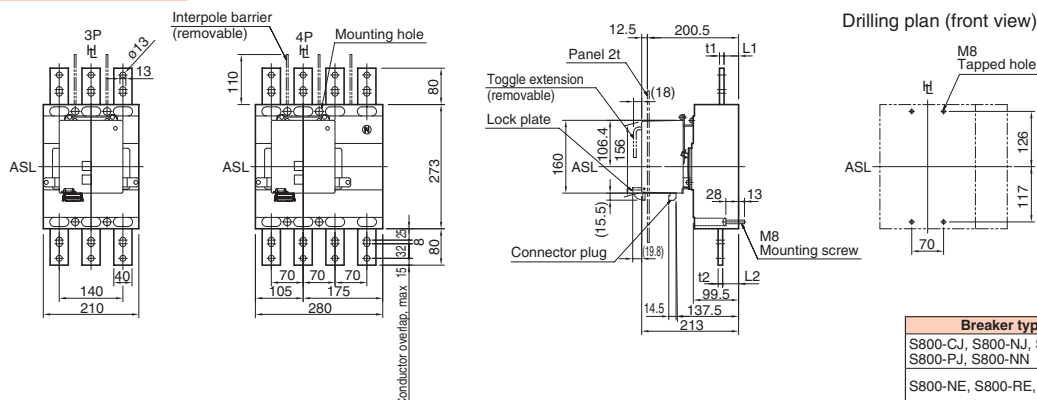
S800-CJ, S800-NJ, S800-RJ, S800-PJ, S800-NN, S800-NE, S800-RE, S800-PE

Outline dimensions (mm) (T2MC80)

S800-CJ, S800-NJ, S800-RJ, S800-PJ, S800-NN, S800-NE, S800-RE, S800-PE

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

Front-connected

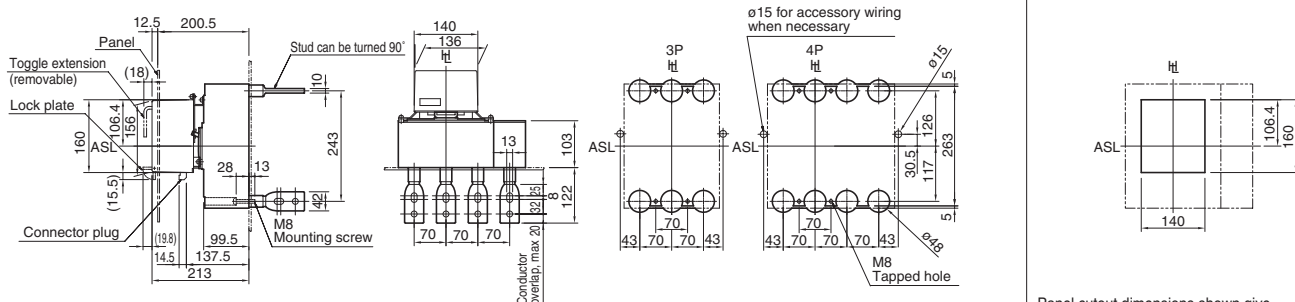


Rear-connected

(Bottom view)

Drilling plan (front view)

Panel cutout (front view)



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

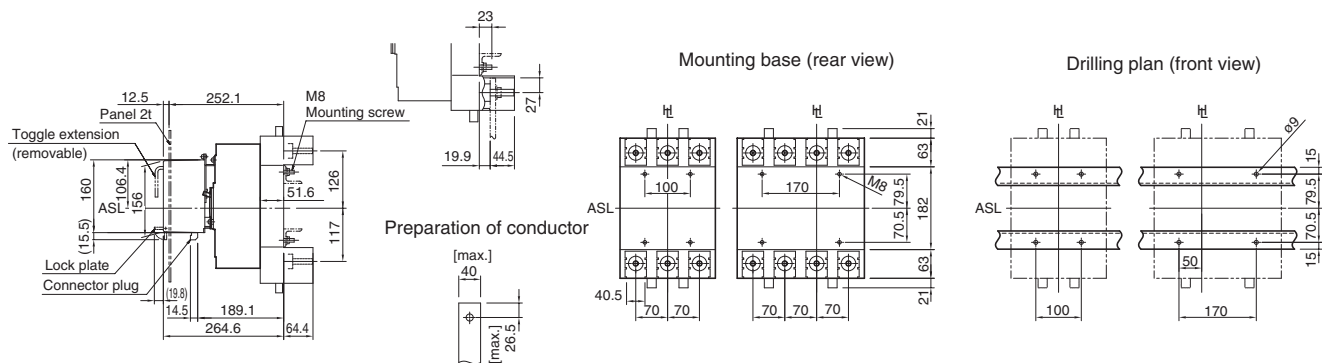
Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

Plug-in (PMB)

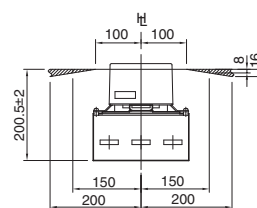
Detail of connecting part

Mounting base (rear view)

Drilling plan (front view)



Panel hinge position (hatching area) (bottom view)



Note:

1) Above outline dimensions are for the electronic type of XOU OCR and XOW OCR and for the thermal magnetic type.

Outline Dimensions (with motor operators)

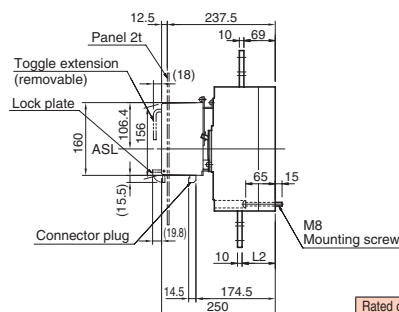
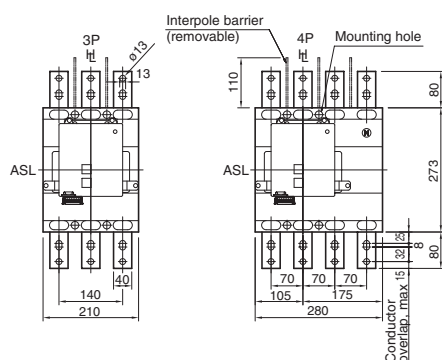
H800-NE, L800-NE

Outline dimensions (mm)(T2MC80)

H800-NE, L800-NE

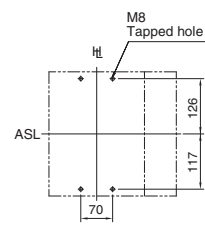
ASL : Arrangement Standard Line ℄ : Handle Centre Line H : Handle Frame Centre Line

Front-connected



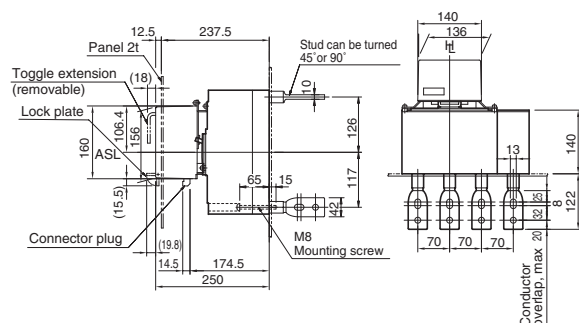
Rated current	L2
630A	73
800A	74

Drilling plan (front view)

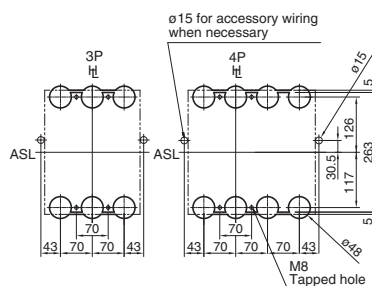


Rear-connected

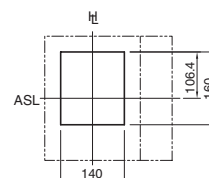
(Bottom view)



Drilling plan (front view)



Panel cutout (front view)

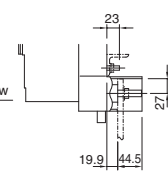


Note: Studs are factory installed in horizontal direction both on the line and load sides.

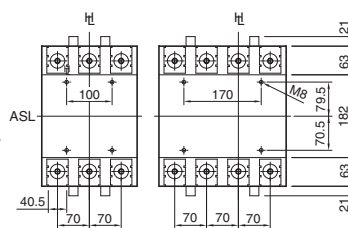
Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

Plug-in (PMB)

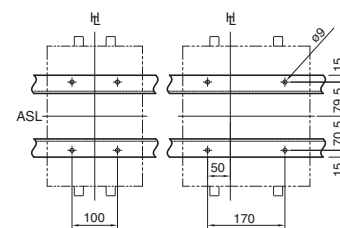
Detail of connecting part



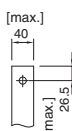
Mounting base (rear view)



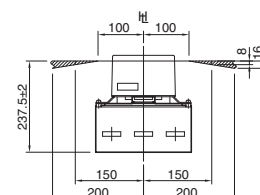
Drilling plan (front view)



Preparation of conductor



Panel hinge position (hatching area)
(bottom view)



Note:

1) Above outline dimensions are for the electronic type of XOU OCR and XOW OCR.

Outline Dimensions (with motor operators)

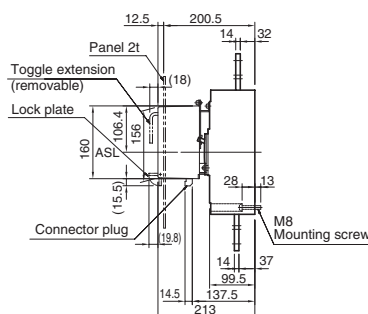
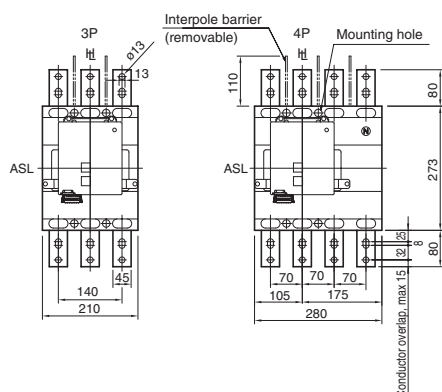
S1000-SE, S1000-NE, S1000-NN

Outline dimensions (mm)(T2MC80)

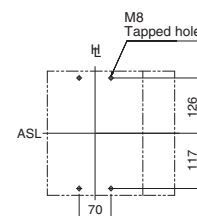
S1000-SE, S1000-NE, S1000-NN

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

Front-connected

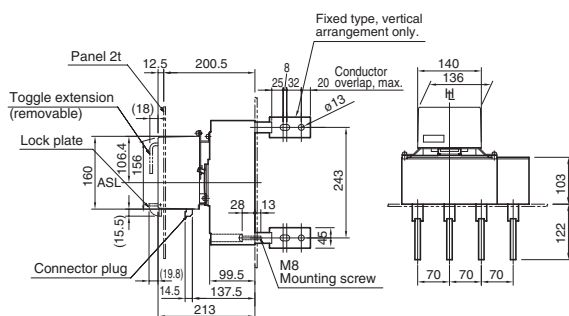


Drilling plan (front view)

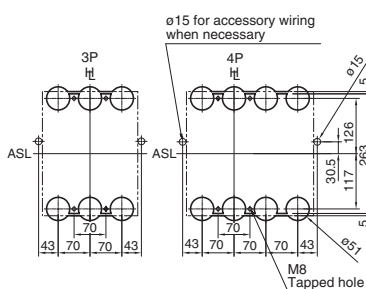


Rear-connected

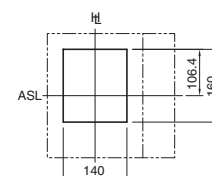
(Bottom view)



Drilling plan (front view)

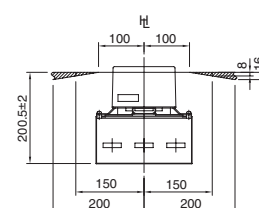


Panel cutout (front view)



Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

Panel hinge position (hatching area)
(bottom view)



Note:

1) Above outline dimensions are for the electronic type of XOU OCR and XOW OCR.

Outline Dimensions (with motor operators)

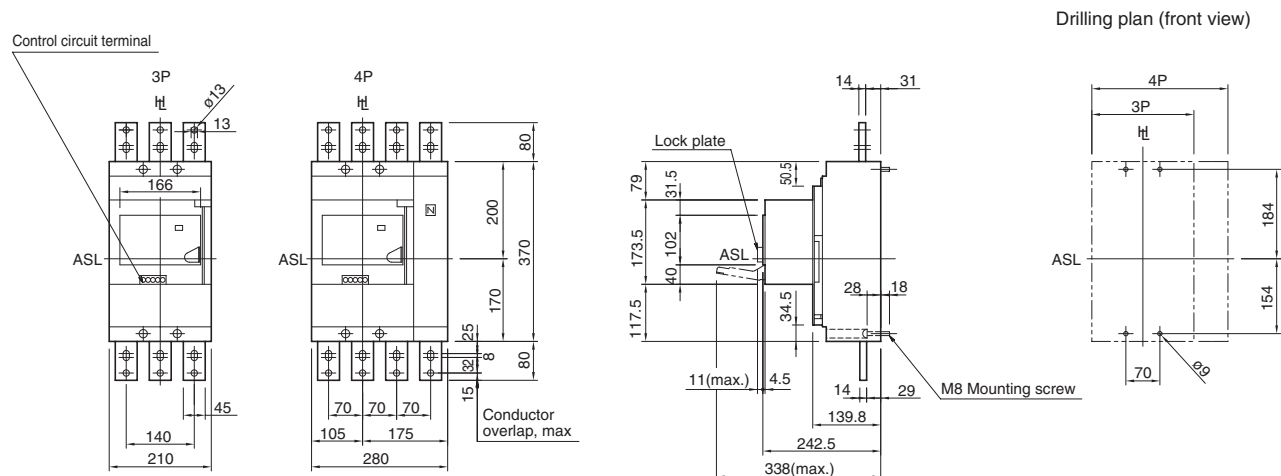
S1250-SE, S1250-NE, S1250-GE, S1250-NN

Outline dimensions (mm) (T2MCX6)

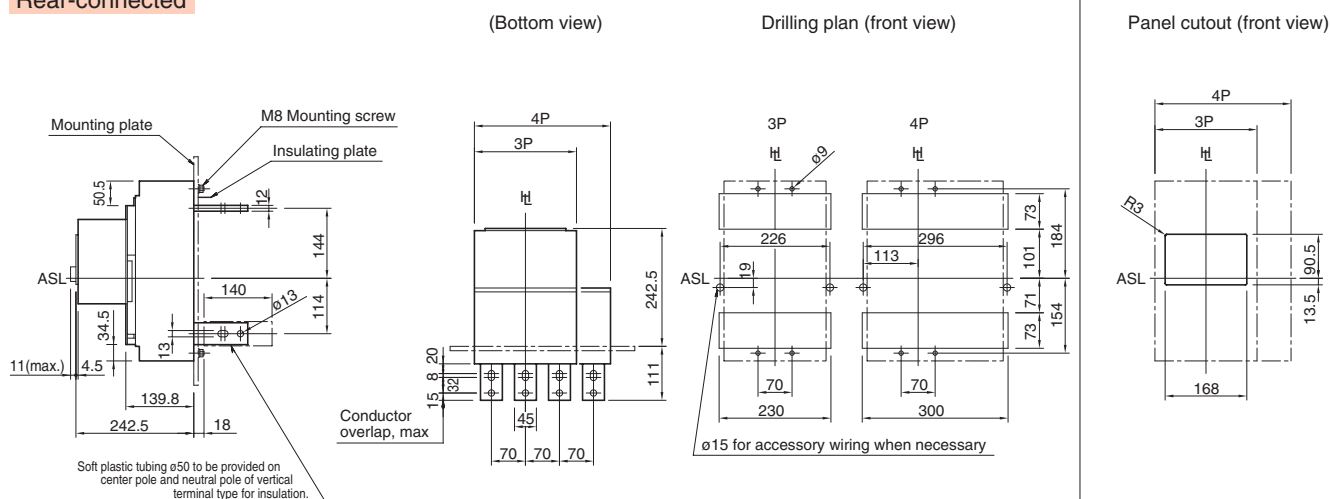
S1250-SE, S1250-NE, S1250-GE, S1250-NN

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

Front-connected



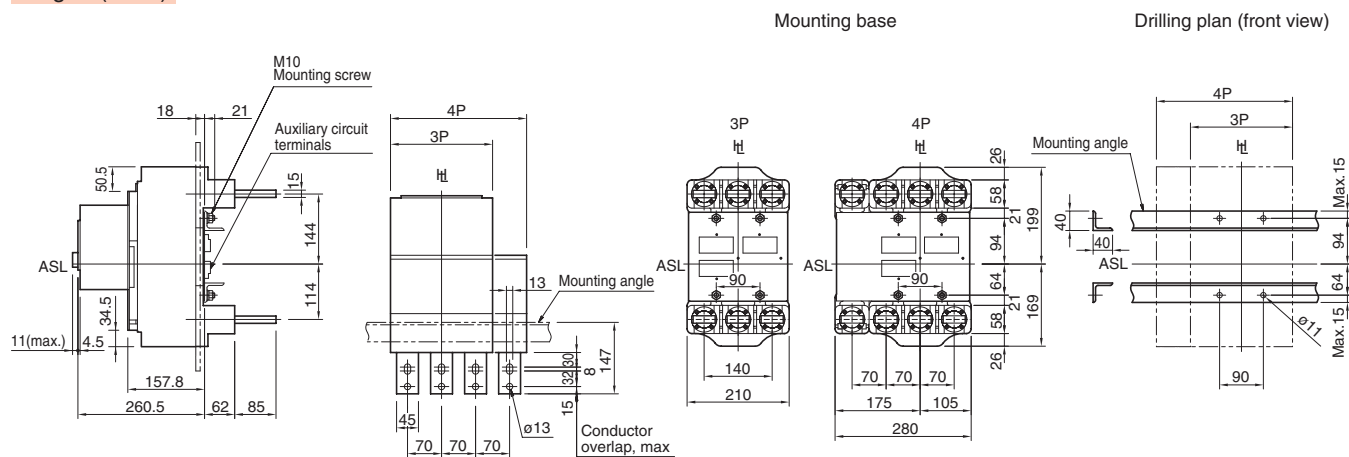
Rear-connected



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 around motor operator.

Plug-in (PMC)



Outline Dimensions (with motor operators)

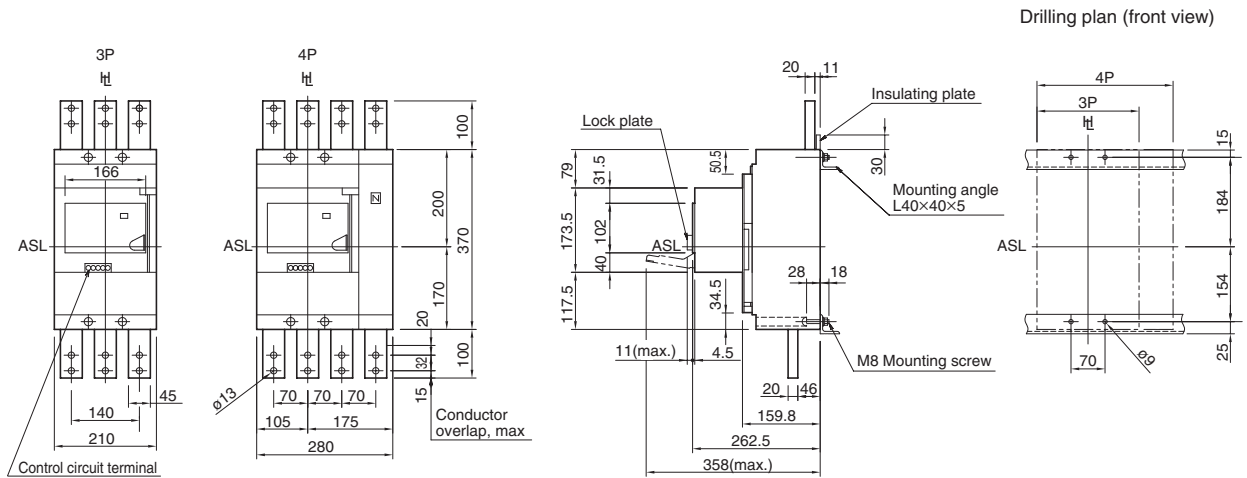
S1600-SE, S1600-NE, S1600-NN

Outline dimensions (mm) (T2MCX6)

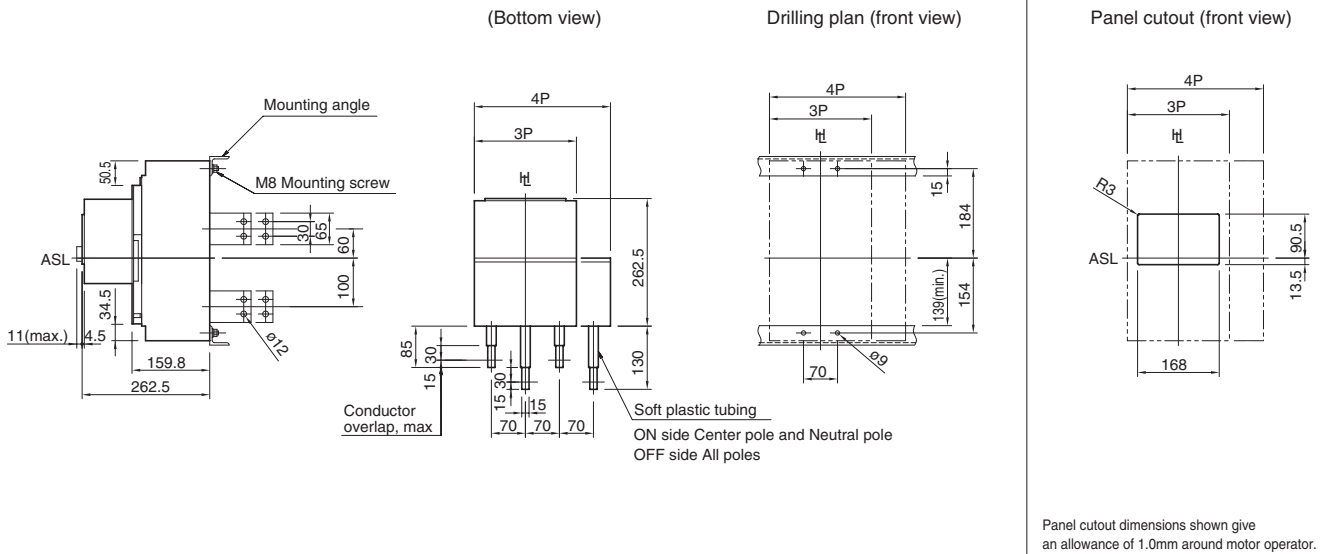
S1600-SE, S1600-NE, S1600-NN

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

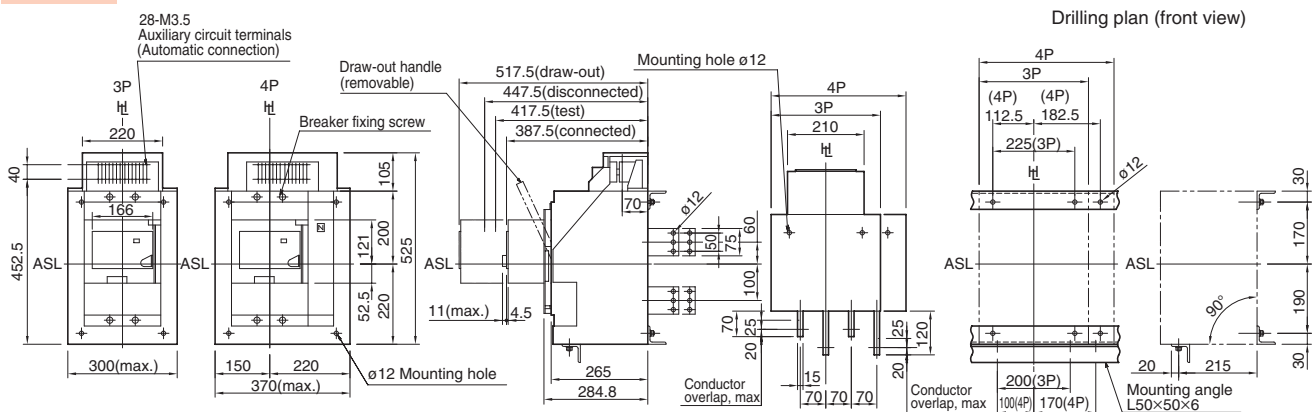
Front-connected



Rear-connected



Draw-out



* Contact TERASAKI if manual connection is required.
The external dimensions are different.

Outline Dimensions (Special breakers)

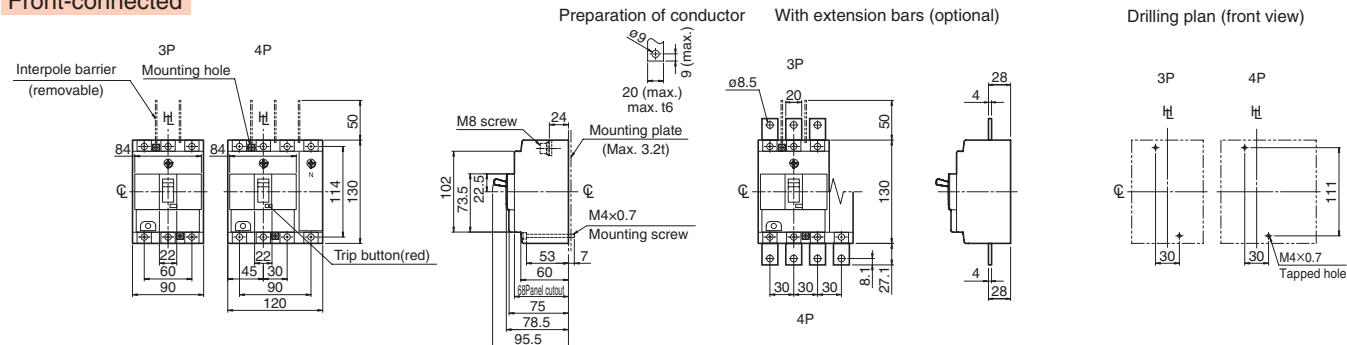
High-Performance Electronic Smart Circuit Breaker (TPOU type OCR)

Outline dimensions (mm)

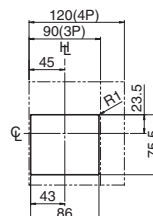
P160F, P160N, P160H

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

Front-connected



Panel cutout (front view)



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

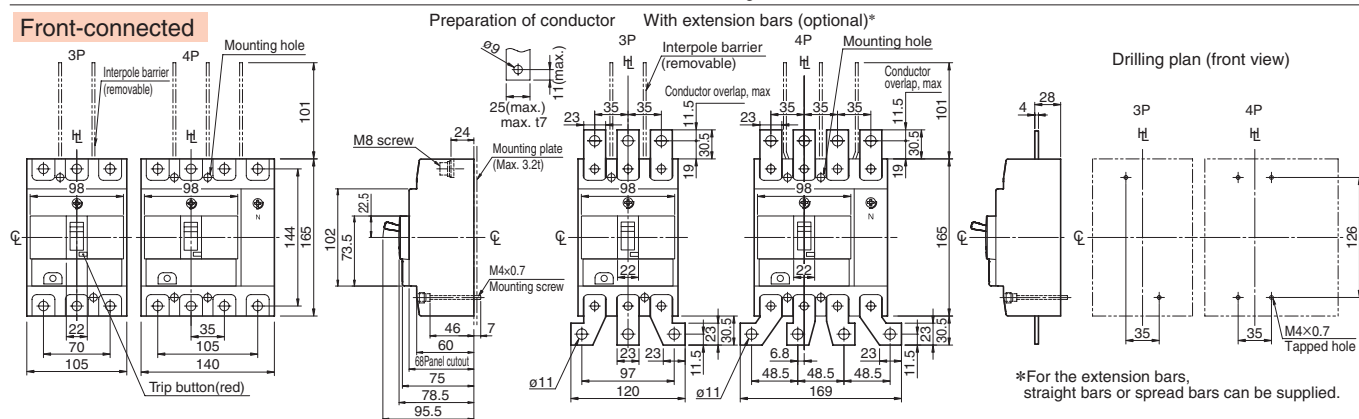
Note: The panel cutout differs from the standard type electronic circuit breaker.

Outline dimensions (mm)

P250F, P250N, P250H

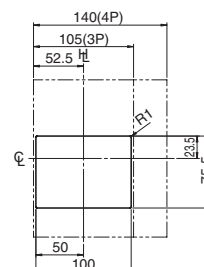
ASL : Arrangement Standard Line CL : Handle Centre Line HFL : Handle Frame Centre Line

Front-connected



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

Panel cutout (front view)



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

Note: The panel cutout differs from the standard type electronic circuit breaker.

Outline Dimensions (Special breakers)

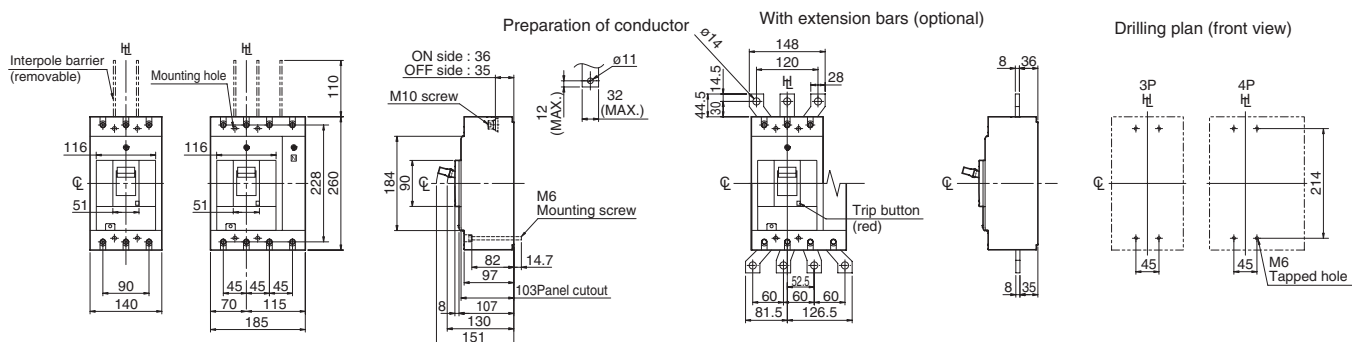
High-Performance Electronic Smart Circuit Breaker (TPOU type OCR)

Outline dimensions (mm)

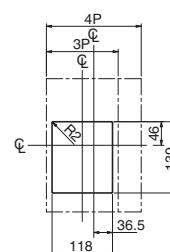
P400F, P400N, P400H, P400S

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

Front-connected



Panel cutout (front view)



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

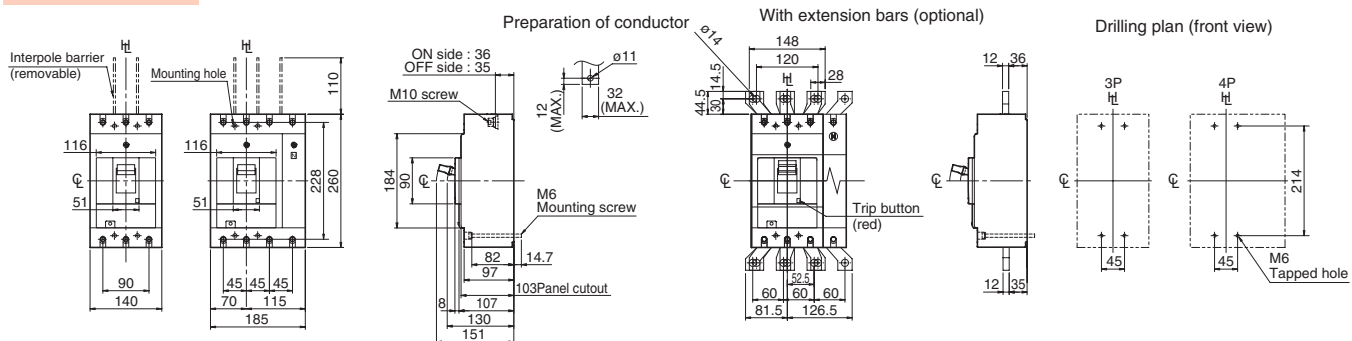
Note: The panel cutout differs from the standard type electronic circuit breaker.

Outline dimensions (mm)

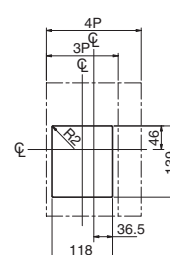
P630F, P630N, P630H, P630S

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

Front-connected



Panel cutout (front view)



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

Note: The panel cutout differs from the standard type electronic circuit breaker.

Outline Dimensions (Special breakers)

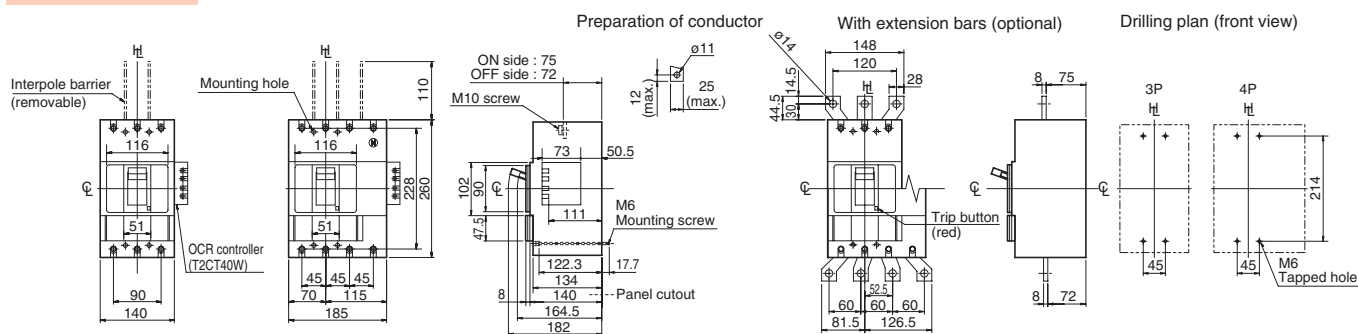
High-Performance Electronic Circuit Breaker (XOW type OCR)

Outline dimensions (mm)

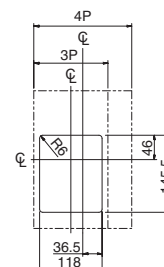
H400-NE, L400-NE

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

Front-connected



Panel cutout (front view)



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

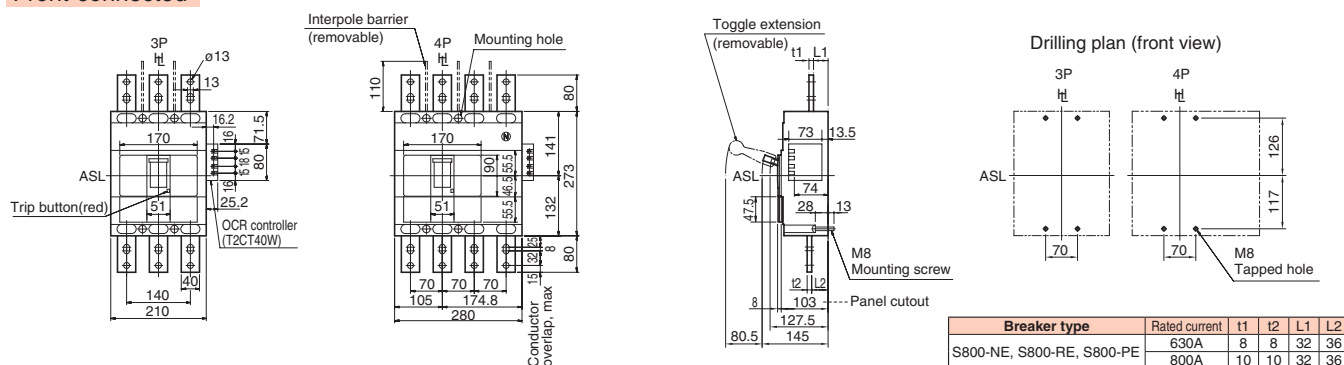
Note: All high-performance electronic circuit breakers are supplied with an OCR controller. The panel cutout differs from the standard type electronic circuit breaker.

Outline dimensions (mm)

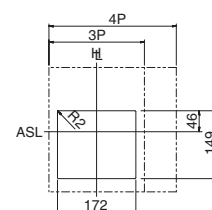
S800-NE, S800-RE, S800-PE

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

Front-connected



Panel cutout (front view)



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

Note: All high-performance electronic circuit breakers are supplied with an OCR controller. The panel cutout differs from the standard type electronic circuit breaker.

Outline Dimensions (Special breakers)

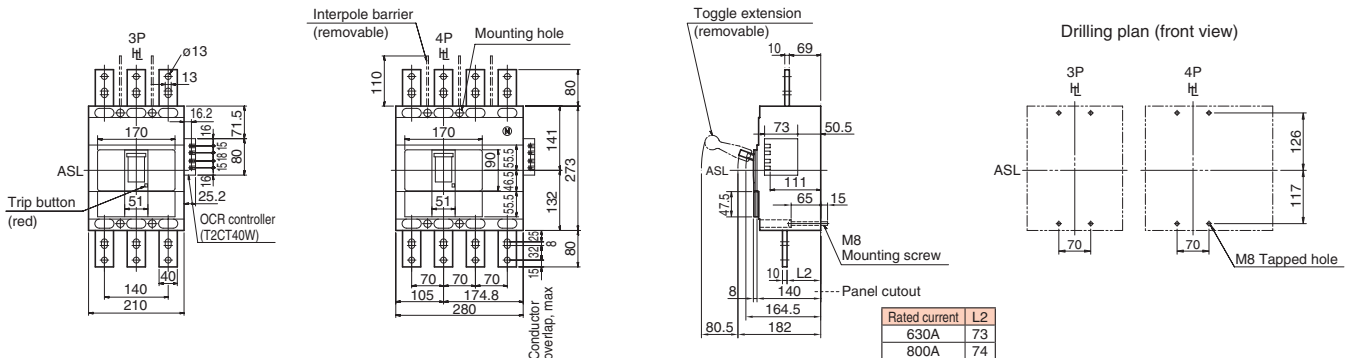
High-Performance Electronic Circuit Breaker (XOW type OCR)

Outline dimensions (mm)

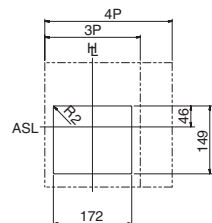
H800-NE, L800-NE

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

Front-connected



Panel cutout (front view)



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

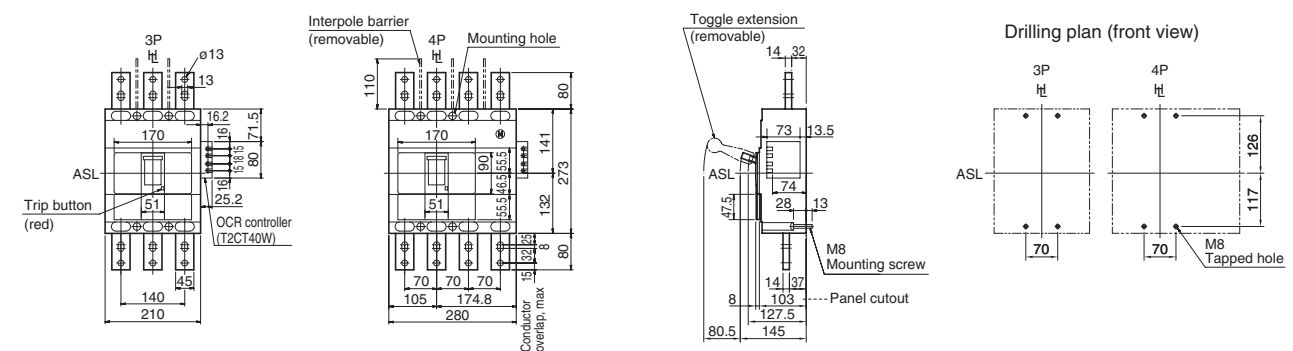
Note: All high-performance electronic circuit breakers are supplied with an OCR controller. The panel cutout differs from the standard type electronic circuit breaker.

Outline dimensions (mm)

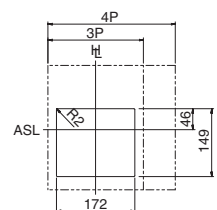
S1000-SE, S1000-NE

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

Front-connected



Panel cutout (front view)



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

Note: All high-performance electronic circuit breakers are supplied with an OCR controller. The panel cutout differs from the standard type electronic circuit breaker.

690V AC Circuit Breakers

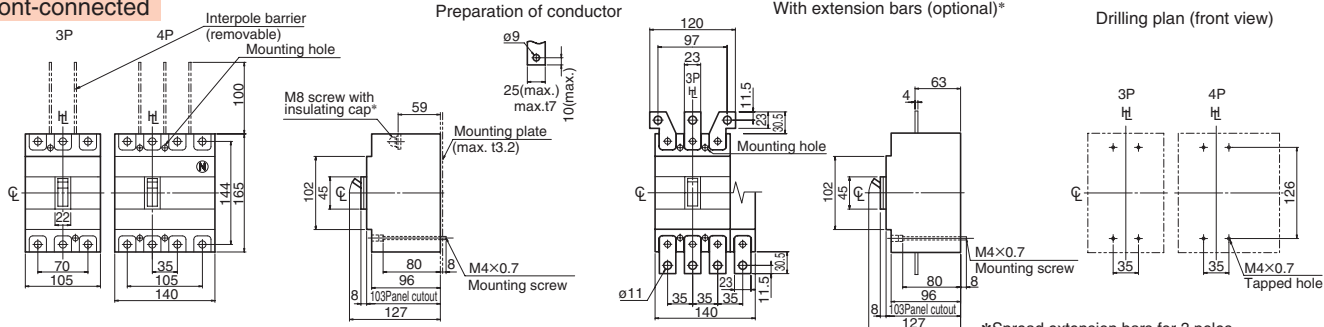
L125-PJ

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

Preparation of conductor

With extension bars (optional)*

Drilling plan (front view)



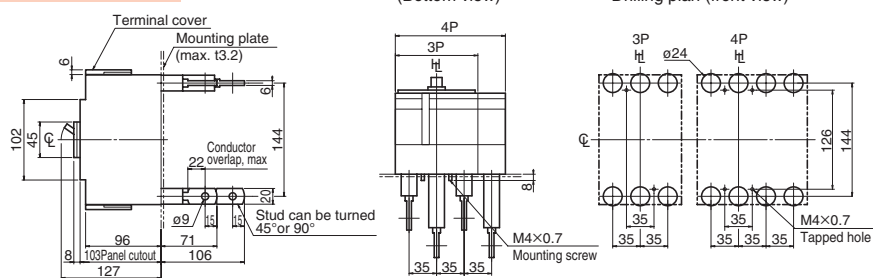
* Be sure to mount the standard equipment insulating cap.

*Spread extension bars for 3 poles.
Staraitght extension bars for 4 poles.

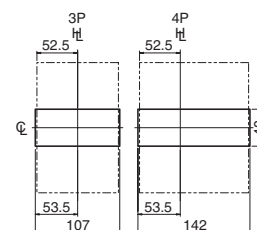
(Bottom view)

Drilling plan (front view)

Panel cutout (front view)



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



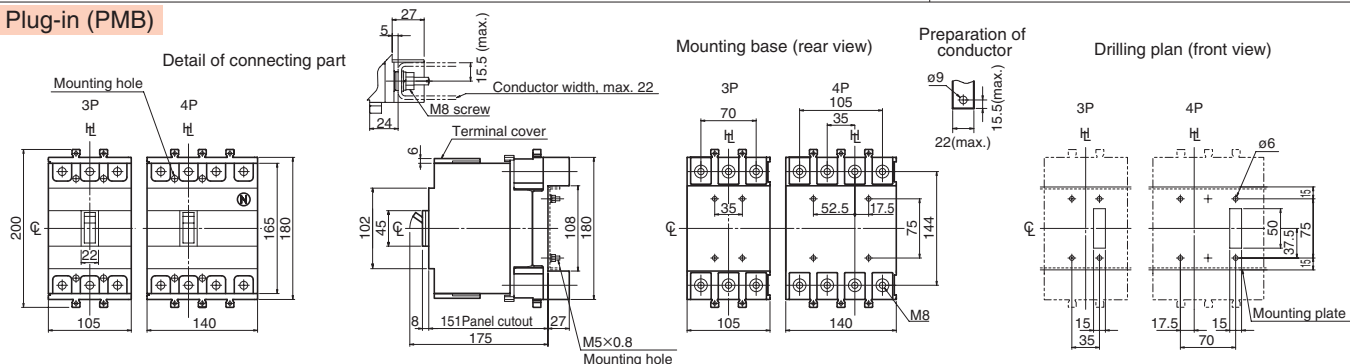
Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

Detail of connecting part

Mounting base (rear view)

Preparation of conductor

Drilling plan (front view)



Outline Dimensions (Special breakers)

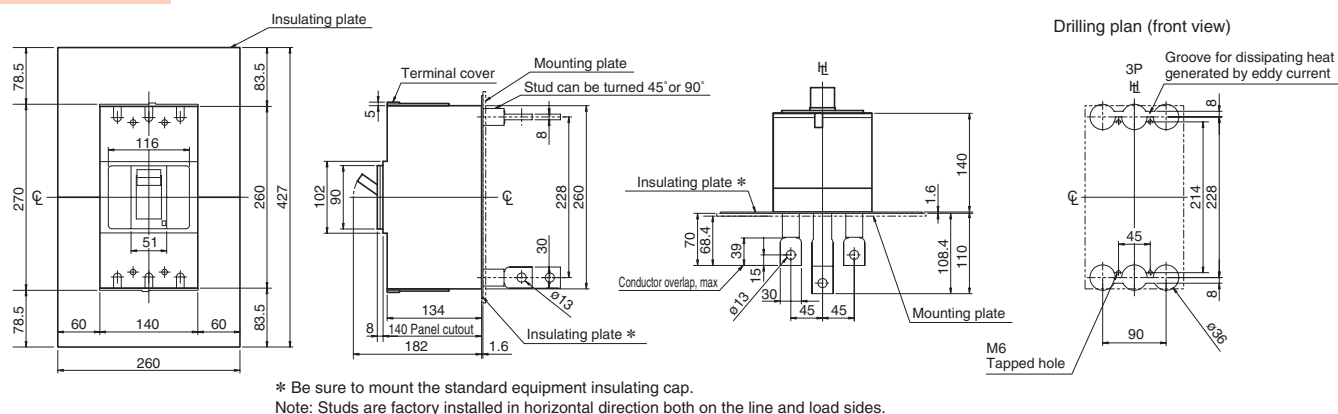
690V AC Circuit Breakers

Outline dimensions (mm)

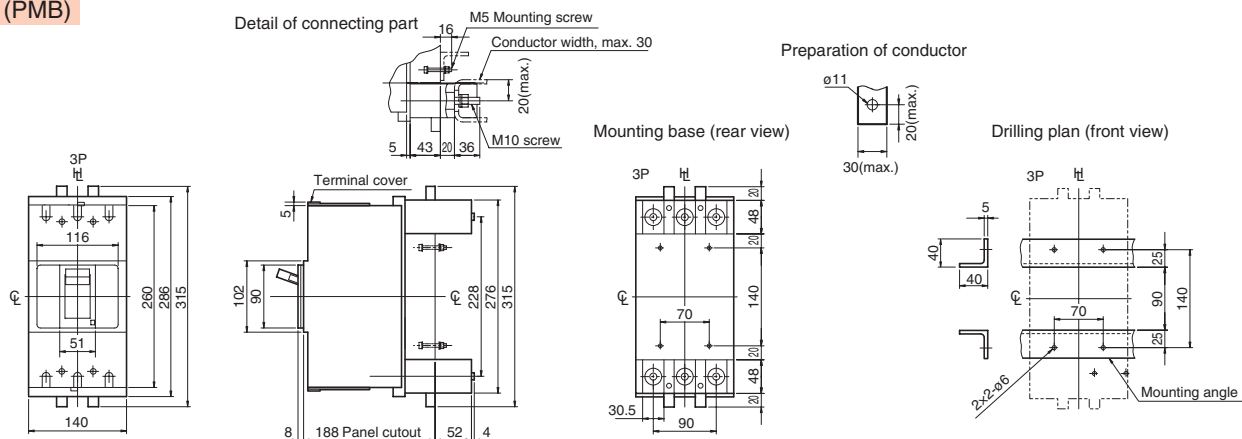
L400-PE

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

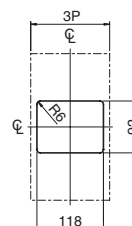
Rear-connected



Plug-in (PMB)



Panel cutout (front view)



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

Outline Dimensions (Special breakers)

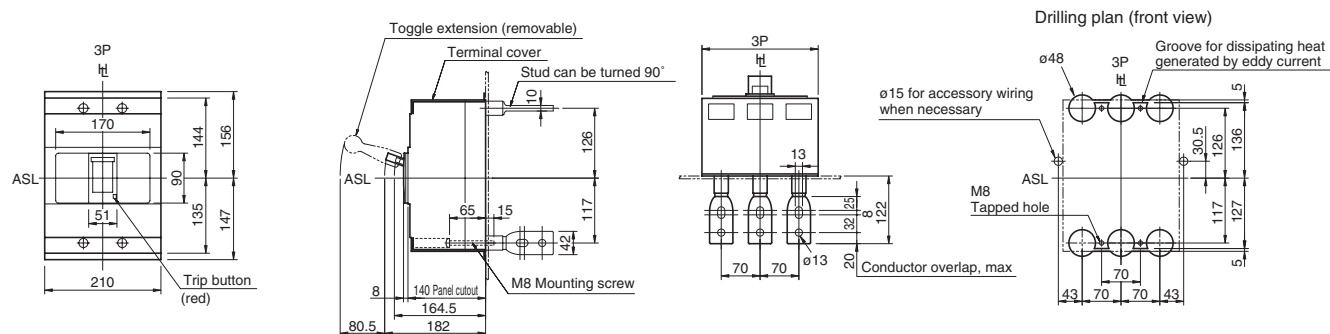
690V AC Circuit Breakers

Outline dimensions (mm)

L800-PE

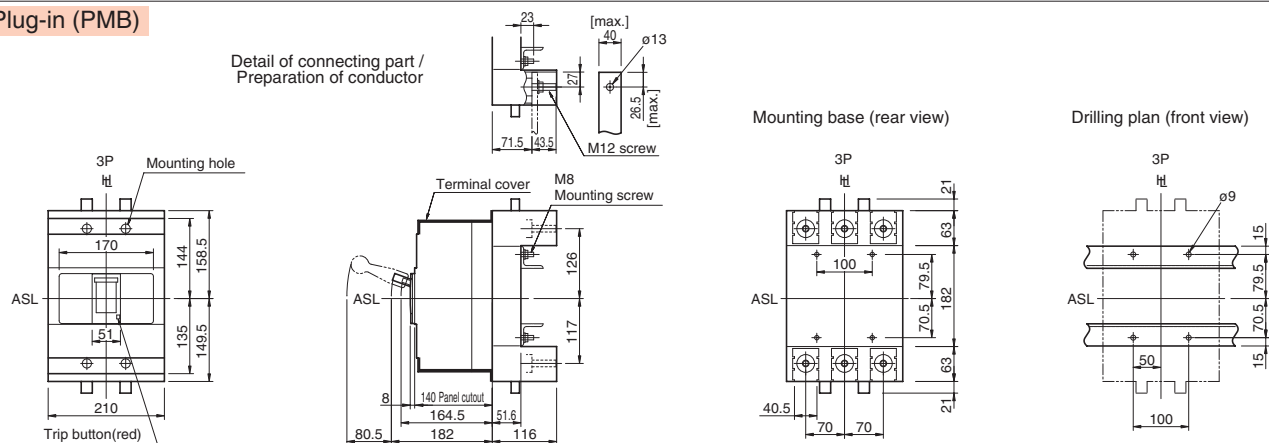
ASL : Arrangement Standard Line ℄ : Handle Centre Line H : Handle Frame Centre Line

Rear-connected

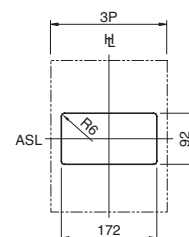


Note: Studs are factory installed in horizontal direction both on the line and load sides.

Plug-in (PMB)



Panel cutout (front view)



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

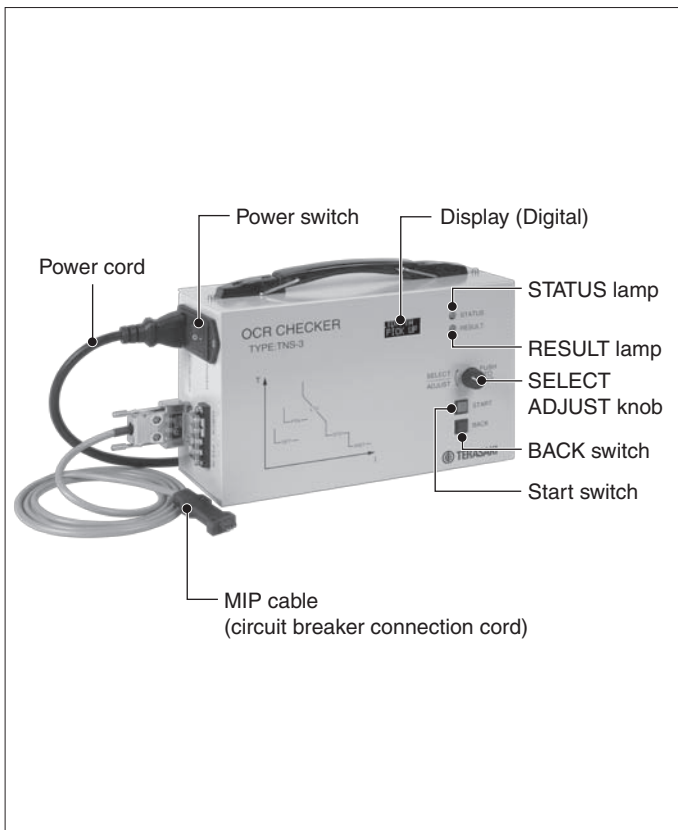
8

Appendix

1	Maintenance and Inspection Checker	8-2
2	Internal Resistance and Power Consumption	8-3
3	Order Form of Internal accessories	8-4

1 Maintenance and Inspection Checker

TNS-3 OCR Checker



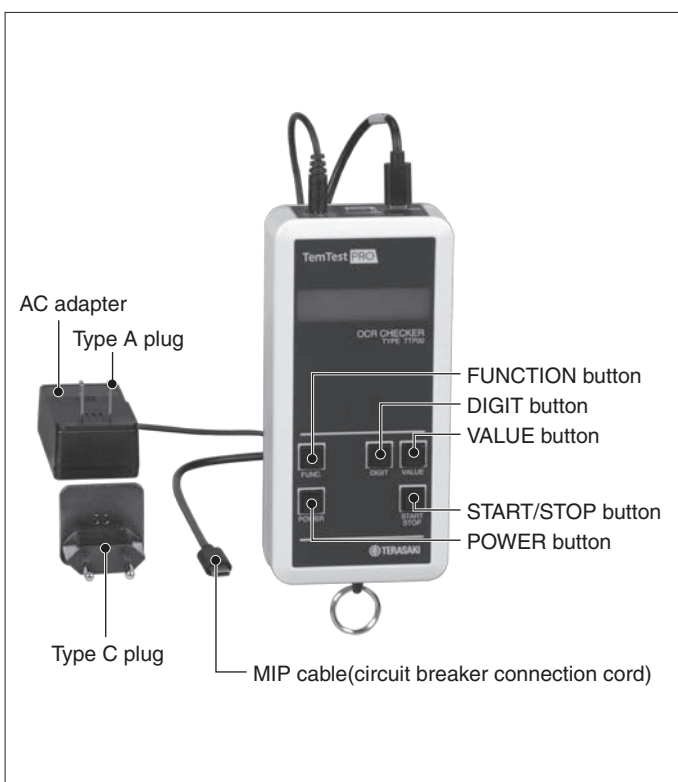
The TNS-3 type OCR checker can be used to easily check the trip function of XOY type OCR and XOS type OCR electronic circuit breakers and AGR12BL type OCR AR-E type air circuit breakers in the field. The types of check are the set current value and tripping time of each of Long Time Delay (LTD), Short Time Delay (STD), Instantaneous (INST), and Ground Fault Trip (GFT). Please use the checker according to the application.

Ratings and Specifications

Type	TNS-3
Power Source	100~240V AC Single Phase 50/60Hz
Power Consumption	30VA
Application (Please use with no power flowing through the circuit breaker)	●LTD function check ●STD function check ●INST function check ●GFT function check ●Preferential trip alarm function check
Measurement of set current values	●Display 4-digit digital display ●Range XOS(OCR) 0~750mA - XOU(OCR) 0~1500mA
Measurement of tripping time values	●Display 3-digit digital display ●Range 0.01~999.9s
Outline Dimensions	241mm(W)×157mm(H)×109mm(D)
Weight	2.3kg
Accessories	●Power cord (with power conversion plug type C) 3m, 1pc
Optional	Order codes
①	TNS-3 CABLE1 XOS type OCR MIP cable 2m, 1pc TNS-3 CABLE2 XOU type OCR (for 400 to 1600AF) MIP cable 2m, 1pc TNS-3 CABLE3 XOU type OCR (for 225AF) MIP cable 2m, 1pc TNS-3 CABLE4 AGR-12 BL type OCR (for AR-E type ACB) MIP cable 2m, 1pc

Note ① : MIP cables are not provided as standard. Please specify the cables you require separately.

TTP00 OCR Checker



The TTP00 type OCR checker can be used to easily check the trip function of TPOT type OCR, TPOP type OCR, and TPOU type OCR electronic circuit breakers in the field.

Ratings and Specifications

Type	TTP00
Power Source	Single-phase 100 to 240V AC, 50/60Hz or AA alkaline batteries 1.5V × 4 or nickel-metal hydride rechargeable batteries 1.2V × 4
Power Consumption	3VA
Application (Please use with no power flowing through the circuit breaker)	●LTD function check ●STD function check ●INST function check ●Preferential trip alarm function check ●GF function check ●N-phase protection function check
Measurement of set current values	●Display 4-digit digital display ●Range 1A~9,999A
Measurement of tripping time values	●Display Digital display (0.01s unit for 9.99s or less, 0.1s unit for 10.0s or more) ●Range 0.01~999.9sec
Outline Dimensions	80mm(W)×165mm(H)×35mm(D)
Weight	0.4kg (including accessories)
Accessories	MIP cable 2m × 1pc AC adapter (with power cord 1.9m) × 1unit AC adapter plug Type A (for domestic use) × 1pc Type C (for Europe) × 1pc
Optional cable ①	[Order codes] TTPMCA MIP cable for TPOT, TPOP and TPOU OCR 2m × 1pc TTPCCA MIP cable for calibration

Note ① : The MIP cable that is included as standard with TTP00 is used for TemPower PRO air circuit breakers, when using TTP00 for electronic circuit breaker, be sure to order the TTPMCA type MIP cable.

2 Internal Resistance and Power Consumption

■ Moulded Case Circuit Breakers

Frame size(A)	Breaker	Rated current (A)	Internal resistance (DCmΩ) ①		DC Power consumption (W) ②	
			• Value per pole		• Value per pole	
			FC	Plug-in	FC	Plug-in
125	H125-NJ L125-NJ L125-PJ	20	23.5	23.64	9.4	9.5
		32	11.9	12.04	12	12.3
		50	1.99	2.13	5	5.3
		63	1.62	1.76	6.4	7
		100	0.97	1.11	9.7	11.1
160	P160F TM P160N TM P160H TM	20	12.23	12.37	4.9	4.95
		32	8.78	8.92	9.0	9.13
		50	5.22	5.36	13.1	13.4
		63	1.56	1.7	6.2	6.75
		100	1.12	1.26	11.2	12.6
		125	1.2	1.34	18.8	20.9
		160	0.89	1.03	22.8	26.4
	P160F ELE P160N ELE P160H ELE	40	1	1.14	1.6	1.8
		100	1	1.14	10	11.4
		160	1	1.14	25.6	29.2
	H160NJ L160NJ	160	0.57	0.71	14.6	18.2
	E250-SCF 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	19.6
		225	0.26	0.4	13.16	20.25
	E250-SCJ E250-SJ	250	0.26	0.4	16.25	25
		100	0.87	1.01	8.7	10.1
		125	0.63	0.77	9.84	12
		160	0.47	0.61	12	15.6
		200	0.26	0.4	10.4	16
	P250F TM P250N TM P250H TM	250	0.26	0.4	16.3	25
		50	3	3.27	7.5	8.2
		63	1.8	2.07	7.1	8.2
		100	0.9	1.17	9.0	11.7
		125	0.9	1.17	14.1	18.3
		160	0.57	0.84	14.6	21.5
		200	0.45	0.72	18	28.8
	P250F ELE P250N ELE P250H ELE	250	0.41	0.68	25.6	42.5
		40	0.6	0.87	0.96	1.4
		100	0.6	0.87	6.0	8.7
		160	0.6	0.87	15.4	22.3
	H250NJ L250NJ	250	0.6	0.87	37.5	54.4
		160	0.57	0.71	14.6	18.2
		250	0.36	0.5	23	31
	H250-NE	40	0.39	0.53	0.62	0.85
		125	0.39	0.53	6.1	8.3
		160	0.39	0.53	10	13.6
		250	0.39	0.53	24.4	33.1
400	P400E TM P400F TM P400N TM P400H TM P400S TM	250	0.33	0.39	20	24
		400	0.24	0.33	38	53
		250	0.16	0.3	10	19
		400	0.16	0.25	26	40
		250	0.19	0.23	11.9	14.4
	H400-NE L400-NE	400	0.19	0.23	30.4	36.8
		250	0.19	0.23	11.9	14.4
	L400-PE	400	—	0.23	—	36.8
		630	0.13	—	52	—
	P630E TM P630F TM P630N TM P630H TM P630S TM	630	0.09	—	36	—
		630 (FC)	0.09	—	36	—
		570 (Plug-in)	—	0.2	—	65

Frame size(A)	Breaker	Rated current (A)	Internal resistance (DCmΩ) ①		DC Power consumption (W) ②	
			• Value per pole		• Value per pole	
			FC	Plug-in	FC	Plug-in
800	S800-CJ S800-NJ S800-RJ S800-PJ	630	0.11	0.12	43.7	47.6
		800	0.09	0.11	57.6	70.4
		630	0.08	0.09	31.8	35.7
		800	0.08	0.1	51.2	64
	S800-NE S800-RE S800-PE	630	0.1	0.12	39.7	47.6
		800	0.1	0.12	64	76.8
		630	—	0.12	—	47.6
		800	—	0.12	—	76.8
1000	S1000-SE S1000-NE	1000	0.062	—	62	—
1250	S1250-SE S1250-NE S1250-GE	800	0.04	0.053	25.6	33.9
		1250	0.04	0.053	62.5	82.8
1600	S1600-SE S1600-NE	1600	0.022	0.039 ③	56.3	99.8 ③
2000	XS2000NE	2000	0.017	0.023 ③	68	92 ③
2500	XS2500NE	2500	0.017 ④	—	106.2 ④	—
3200	XS3200NE	3200	0.017 ④	—	174.1 ④	—

Notes ① : The resistance value is a general reference value when new. It cannot be used for inspections when receiving goods.
 ② : The power consumptions are calculated on the basis of the DC internal resistance.
 ③ : The value of the Draw-out type.
 ④ : The value of the Rear-connected type.

TM: Thermal type
 ELE: Electronic type

3 Order Form of Internal accessories

Internal accessory order type

The following internal accessories are parts that can be mounted with one touch. They make it possible to quickly respond to emergencies and specification changes. When ordering, please specify the type ordered and quantity.

Internally mounted accessories	Moulded Case Circuit Breakers	Specification		Accessory order type ①
Auxiliary switch (AX)	E160-SF/SJ, E250-SCF/SCJ/SF/SJ, S160-SCF/SCJ/SF/SJ/SN, S250-SN, P160F/N/H/D, P250F/N/H/D, P400E/F/N/H/S/D, P630E/F/N/H/S/D	Standard ②	1C contact	AX00LML3ST
			2C contact	AX00LML4ST
		For microload ②	1C contact	AX00LML3RT
			2C contact	AX00LML4RT
	S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN, S1250-SE/NE/GE/NN, S1600-SE/NE/NN, H125-NJ, H160-NJ, H250-NJ/NE, H400-NE, H800-NE L125-NJ, L125-PJ, L160-NJ, L250-NJ, L400-NE, L400-PE, L800-NE, L800-PE	Standard②	1C contact	AX00M3ST
			2C contact	AX00M4ST
			3C contact	AX00M5ST
			4C contact	AX00M6ST
		For microload ②	1C contact	AX00M3RT
			2C contact	AX00M4RT
			3C contact	AX00M5RT
			4C contact	AX00M6RT
Alarm switch (AL)	E160-SF/SJ, E250-SCF/SCJ/SF/SJ, S160-SCF/SCJ/SF/SJ/SN, S250-SN, P160F/N/H/D, P250F/N/H/D, P400E/F/N/H/S/D, P630E/F/N/H/S/D	Standard	1C contact. Left side mounting	AL00LML3ST
			2C contact. Right side mounting	AL00LMR4ST
		For microload	1C contact. Left side mounting	AL00LML3RT
			2C contact. Right side mounting	AL00LMR4RT
	S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN, S1250-SE/NE/GE/NN, S1600-SE/NE/NN, H125-NJ, H160-NJ, H250-NJ/NE, H400-NE, H800-NE L125-NJ, L125-PJ, L160-NJ, L250-NJ, L400-NE, L400-PE, L800-NE, L800-PE	Standard	1C contact	AL00M3ST
		For microload	1C contact	AL00M3RT

Notes ① : All internal accessories are with terminals. The cable capacity of the terminals is 0.5 to 1.25mm².

② : 2C to 4C contacts do not mean there are 2 to 4 switches, but one switch on the 2nd C, 3rd C, and 4th C with ring marks labeled 2C, 3C, 4C. For auxiliary switches or alarm switches, left-hand mounting has priority.



Auxiliary switch



Alarm switch



Shunt trip



Undervoltage trip

Internally mounted accessories	Moulded Case Circuit Breakers	Specification		Accessory order type ①
Shunt trip (SH)	E160-SF/SJ, E250-SCF/SCJ/SF/SJ, S160-SCF/SCJ/SF/SJ/SN, S250-SN, P160F/N/H/D, P250F/N/H/D, P400E/F/N/H/S/D, P630E/F/N/H/S/D	100 – 120V AC		SH00LA10T
		200 – 240V AC		SH00LA20T
		380 – 450V AC		SH00LA40T
		24V DC		SH00LD02T
		48V DC		SH00LD04T
		100 – 120V DC		SH00LD10T
		200 – 240V DC		SH00LD20T
	H125-NJ, H160-NJ, H250-NJ/NE, H400-NE, L125-NJ, L125-PJ, L160-NJ, L250-NJ, L400-NE, L400-PE	100 – 120V AC		SH00A10T
		200 – 240V AC		SH00A20T
		380 – 450V AC		SH00A40T
		24V DC		SH00D02T
		48V DC		SH00D04T
		100 – 120V DC		SH00D10T
		200 – 240V DC		SH00D20T
	S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, H800-NE, L800-NE, L800-PE, S1000-SE/NE/NN	100 – 120V AC		SH80A10T
		200 – 240V AC		SH80A20T
		380 – 450V AC		SH80A40T
		24V DC		SH80D02T
		48V DC		SH80D04T
		100 – 120V DC		SH80D10T
		200 – 240V DC		SH80D20T
	S1250-SE/NE/GE/NN, S1600-SE/NE/NN	100 – 120V AC		SHX6A10T
		200 – 240V AC		SHX6A20T
		380 – 450V AC		SHX6A40T
		24V DC		SHX6D02T
		48V DC		SHX6D04T
		100 – 120V DC		SHX6D10T
		200 – 240V DC		SHX6D20T
Undervoltage trip (UV)	E160-SF/SJ, E250-SCF/SCJ/SF/SJ, S160-SCF/SCJ/SF/SJ/SN, S250-SN, P160F/N/H/D, P250F/N/H/D, P400E/F/N/H/S/D, P630E/F/N/H/S/D	Instantaneous type	100 – 120V AC	UV00LA10NT
			200 – 240V AC	UV00LA20NT
			380 – 450V AC	UV00LA40NT
			24V DC	UV00LD02NT
			100 – 120V DC	UV00LD10NT
			200 – 240V DC	UV00LD20NT
	H125-NJ, H160-NJ, H250-NJ/NE, H400-NE, H800-NE L125-NJ, L125-PJ, L160-NJ, L250-NJ, L400-NE, L400-PE	Instantaneous type	100 – 120V AC	UV00A10NT
			200 – 240V AC	UV00A20NT
			380 – 450V AC	UV00A40NT
			24V DC	UV00D02NT
			100 – 120V DC	UV00D10NT
			200 – 240V DC	UV00D20NT
	S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN, S1250-SE/NE/GE/NN, S1600-SE/NE/NN, L800-NE, L800-PE	Instantaneous type	100 – 110V AC	UV80A10NT
			115 – 120V AC	UV80A12NT
			200 – 220V AC	UV80A20NT
			230 – 240V AC	UV80A24NT
			380 – 415V AC	UV80A40NT
			440 – 450V AC	UV80A45NT
			24V DC	UV80D02NT
			100 – 120V DC	UV80D10NT
			200 – 240V DC	UV80D20NT

Note ① : All internal accessories are with terminals. The cable capacity of the terminals is 0.5 to 1.25mm².

TemCurve Lite

- for windows XP/vista/7/8/8.1/10 -

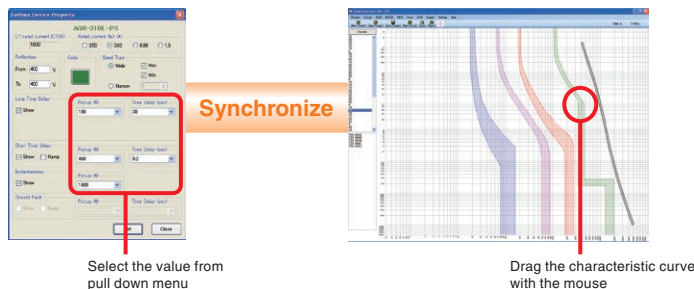


TemCurve Lite

can carry out the selectivity studies for Terasaki low-voltage air circuit breakers and moulded case circuit breakers very **simply** and **quickly**.

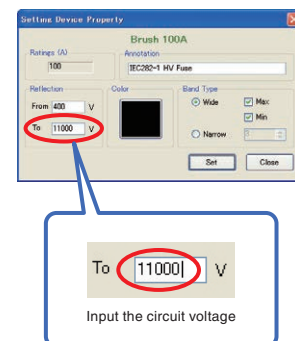
Time-current curves can be adjusted easily

The time-current curves can be adjusted by choosing different pick-up currents and the operating times. The time-current curves can also be easily adjusted by using the curve drag feature.



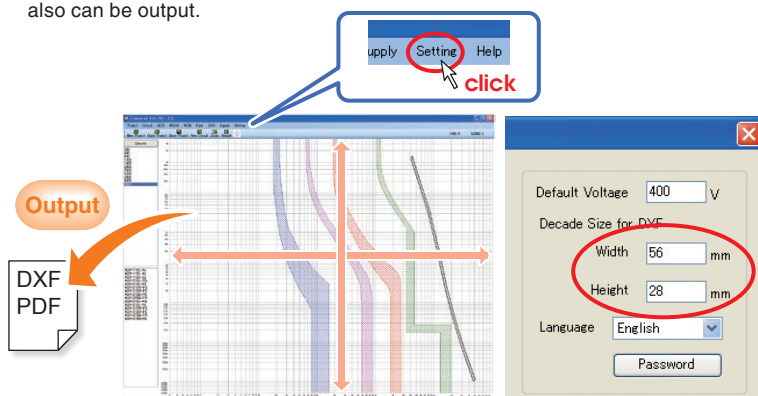
Simple coordination with high-voltage devices

It is possible to coordinate between high-voltage and low-voltage devices by inputting the voltage of the high-voltage side.



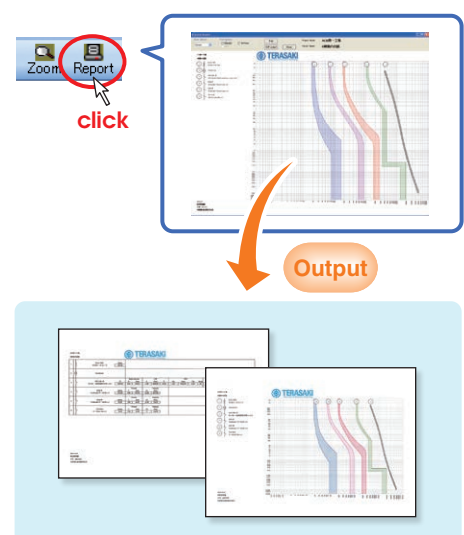
Output the coordination characteristics curves into CAD

The time-current curves drawn can be output in a DXF format file, and can be used in CAD software. Moreover, you can adjust the scale of the curves on a horizontal axis (current) and a vertical axis (time). PDF format file also can be output.



Output single line diagram with the setting values of the devices

Once the time-current curves are drawn, a single line diagram can be printed with individual device settings.



TemCurve Lite is the free software for windows XP/ vista / 7 / 8 / 8.1/10. Contact us for details.

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Since 1971 when we established TERASAKI ELECTRIC Europe, our first overseas subsidiary, in the UK, we have assembled a global network of 10 overseas subsidiaries and 72 agents to provide sales and technical supports to customers worldwide.

Safety Notice

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

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