TERASAKI
Innovators in Protection Technology

TemBreak PRO

New release

IoT with SMART MCCB

TERASAKI ELECTRIC CO., LTD.
www.terasaki.co.jp
Catalogue No. '21-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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Product Warranty for Molded Case Circuit Breakers/Earth Leakage Circuit Breakers

Warranty Period

Products are warranted for a period of one (1) year from the date of purchase. However, if the date of purchase is unknown, products are warranted for a period of eighteen (18) months from the date of manufacture.

Warranty Scope

(1) Terasaki shall service products that incur trouble within the warranty period or shall replace them with new products free-of-charge, provided the products were properly used in a state, method and environment compliant with conditions and precautions specified in our catalogues, manuals and product warning plates.

(2) Servicing shall be subject to billing even within the warranty period in the following cases:
Trouble caused by improper or careless storage or handling;
Trouble caused by improper installation;
Trouble caused by improper use or unauthorized remodeling;
Trouble caused by external factors including fire and abnormal voltage, or force majeure including earthquakes, storms, flooding or other natural disaster; or
Trouble caused by technically or scientifically unforeseeable events at the time of delivery.

(3) "Warranty" as it used here applies strictly to the delivered product itself and excludes from compensation any and all damages induced by trouble with the delivered product.

Safety Notices

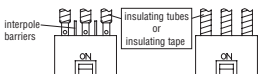
Before installing, using, or servicing products, read these "Safety Notices" and familiarize yourself with all aspects of products, safety information and precautions.

⚠ **Warning**	A 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.

■ 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.
- 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.
- 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.
- Even when tightening the terminal screws and after conductor connection, do not apply excessive force to the terminals. Otherwise, a fire may 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.

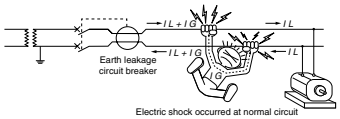
[Earth Leakeage Circuit Breaker]

- When using a 3-pole breaker in a single -phase 2-wire circuit, connect the power source to the right and left poles. Do not connect it to the central pole. Otherwise, the earth leakage tripping function will be inoperative.
- Using the test button, check the breaker for normal operation.Proceed as follows: After proper connection, move the handle to the |(ON) position and then (while applying voltage to the breaker) press the test button.The breaker will trip open.If pressing the test button for 2 or 3 seconds does not cause the breaker to trip open, the breaker is out of order. Please contact your local agent or our branch office immediately.

■ Handling Precautions

⚠ Warning

- Never touch terminals. Otherwise, electric shock may result.
- 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.



⚠ Caution

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

[Earth Leakeage Circuit Breaker]

- Be sure to connect the earth terminal of a load device to ground.
- Check the breaker for normal operation by pressing the test button once per month. If pressing the test button for 2 or 3 seconds does not cause the breaker to trip open, the breaker is out of order. Replace it by new one.

■ Maintenance Precautions

⚠ Caution

- Service and/or inspection of the product must be done by persons having expert knowledge.
- Before servicing or inspecting the product, open an upstream circuit breaker or the like to isolate all sources of power. Otherwise, electric shock may result.
- Regularly check that the breaker terminal screws are tightened to torque values shown within this manual, failure to do so may result in fire.

When placing orders

(1) Products and specifications appearing in this catalogue are subject to change (including discontinued sales) due to product improvements and other reasons, therefore contact us 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.

(2) If considering the shown products for applications where they may be used outside of the scope of specifications and conditions of use listed in this catalogue, applications under conditions or environments not specifically described in this catalogue, applications that especially require safety and high reliability such as safety devices or control systems for nuclear power plants, railroads, aircrafts, automobiles and medical equipment, or other applications that can potentially have a serious impact on human life or property, contact us and determine the adequacy of products for the intended application via specifications, etc.

1 General

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.

TemView PRO
Remote display

★Remote display of circuit information

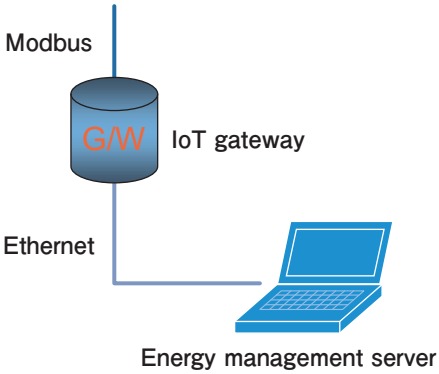
The TemViewPRO Remote display (optional) can be connected to the smart circuit breakers using a single cable and easily attached to the switchboard panel. It has a back-lit LCD display that is highly visible even in dark places.

★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.

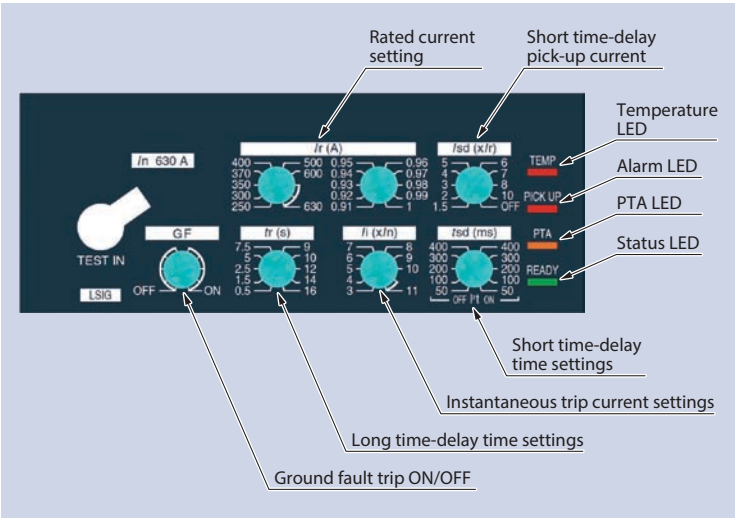
Advanced standard series electronic circuit breakers

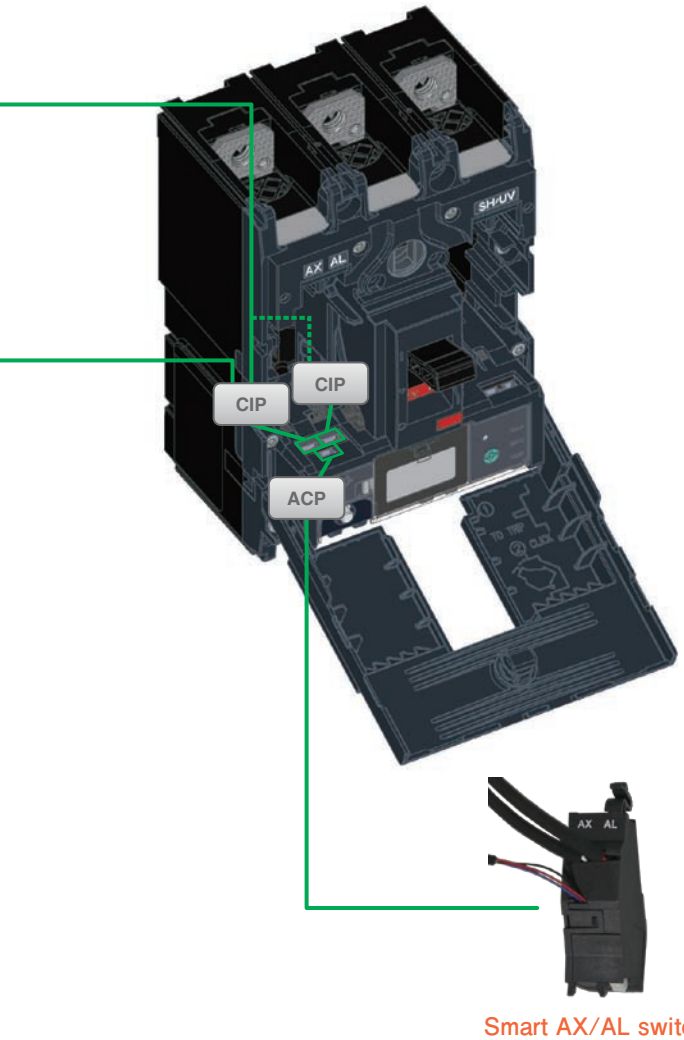
★Protection settings of standard series can be adjusted using multiple dials in place of conventional two dials, enabling flexible configuration of protection to meet a wide variety of needs.

★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.





Smart AX/AL switch

★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

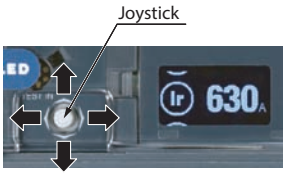
Rogowski coils are used for current sensors.
Measurement is now possible with higher precision than previous series.
Reading errors complying with the international standard IEC 61557-12 were adopted to realize enhanced measurement accuracy: ±1% for electric current, ±0.5% for voltage, and ±2% for wattage.
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.



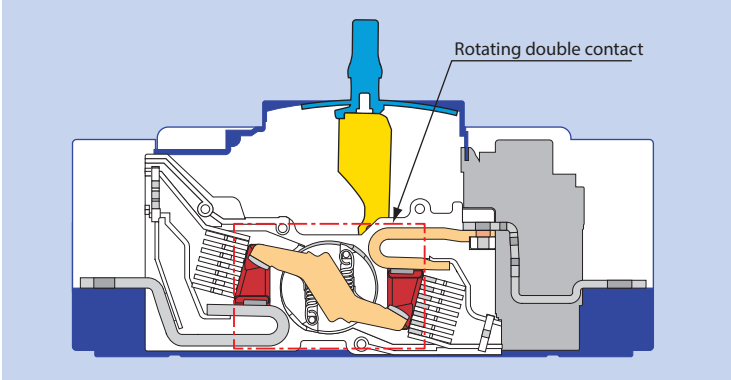
★Status indication realized by smart AX/AL switch

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.

Rated breaking capacity improved for 100AF - 630AF models

	TemBreak2	TemBreak PRO
125AF 160AF	 **S125-GJ** 415V AC I_{cu}/I_{cs}=65kA/33kA	 **P160H** 415V AC I_{cu}/I_{cs}=70kA/50kA
250AF	 **S250-GJ** 415V AC I_{cu}/I_{cs}=65kA/36kA	 **P250H** 415V AC I_{cu}/I_{cs}=70kA/50kA
400AF	 **S400-PJ** 415V AC I_{cu}/I_{cs}=85kA/85kA	 **P400S** 415V AC I_{cu}/I_{cs}=110kA/110kA
630AF 800AF	 **S800-RJ/630A** 415V AC I_{cu}/I_{cs}=70kA/50kA	 **P630S** 415V AC I_{cu}/I_{cs}=110kA/110kA

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} = 110kA/110kA (415V AC) .

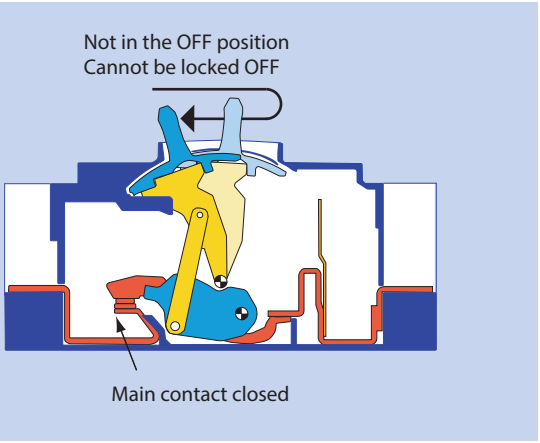


Safety inherited from *TemBreak2*

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

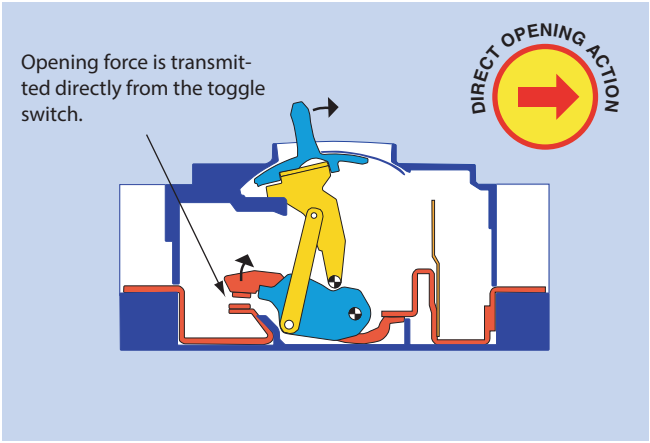
Isolation capability

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.



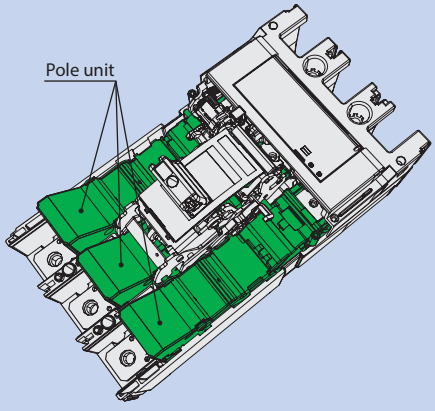
Direct Opening Action

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
GB standard:
GB/T 14048.2

●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.

中国国家强制性产品认证证书

证书编号：2019010307259638

委托人名称、地址

寺崎（中国）电气设备有限公司

广州增城区新塘镇文平洋五路 1 号

生产者（制造商）名称、地址

日本寺崎电气产业株式会社

日本大阪府大阪市平野区加美东 6 丁目 13 番 47 号

生产企业名称、地址

寺崎电气产业株式会社郑马溪制作所

日本大分県中津市郑马溪町大字戸原 1073 番地 1

产品名称和系列、规格、型号

塑料外壳式断路器

PE400-NE,PS400-CE,PS400-SE,PS400-NE,PS400-GE,PS400-RE,PH400-CE,PE630-NE,PS630-CE,PS630-SE,PS630-NE,PS630-GE,PS630-RE,PH630-CE,PE400-NF,PE400-NJ,PS400-CF,PS400-CJ,PS400-SF,PS400-SJ,PS400-NF,PS400-NJ,PS400-GF,PS400-GJ,PS400-RF,PS400-RJ,PH400-CF,PH400-CJ,PE630-NF,PE630-NJ,PS630-CF,PS630-CJ,PS630-SF,PS630-SJ,PS630-NF,PS630-NJ,PS630-GF,PS630-GJ,PS630-RF,PS630-RJ,PH630-CF,PH630-CJ;详见附件

产品标准和技术要求

GB/T14048. 2-2008

上述产品符合强制性产品认证实施规则 CNCA-C03-02:2014 的要求，特发此证。

发证日期：2019 年 12 月 16 日　　有效期至：2024 年 12 月 16 日

证书有效期内本证书的有效性依据发证机构的定期监督获得保持。

本证书的相关信息可通过国家认监委网站 www. cnca. gov. cn 查询

经中国合格评定国家认可委员会认可 CNAS C001-P

主任：

中国质量认证中心

http://www.cqc.com.cn　　中国・北京・南四环西路188号9区 100070　　电话：+86 10 83895666

Q 2495926

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.

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

CB TEST CERTIFICATE

Product: Moulded Case Circuit-breakers

Name and address of the applicant: TERASAKI ELECTRIC CO., LTD. 6-13-47 Kamihigashi, Hirano-ku, Osaka 547-0002 Japan

Name and address of the manufacturer: TERASAKI ELECTRIC CO., LTD. 6-13-47 Kamihigashi, Hirano-ku, Osaka 547-0002 Japan

Name and address of the factory: TERASAKI ELECTRIC CO., LTD. Yabakei Factory 1073-1, Tobaru Yabakei-machi Nakatsu-shi, Oita 871-0404 Japan

Ratings and principal characteristics: 3-pole, 4-pole (3-pole+N), with electronic release In 250 A, 400 A, 630 A, Ue 220 Vac to 690 Vac, 50/60 Hz, Uimp = 8 kV, Ui = 800 V, Suitable for isolation

Trademark (if any): TERASAKI

Customer's Testing Facility (CTF) Stage used: CTF Stage 2

Model / Type Ref.: PE...-N..., PS...-C..., PS...-S..., PS...-N..., PS...-G..., PS...-R..., PH...-C... series

Additional information (if necessary may also be reported on page 2)

A sample of the product was tested and found to be in conformity with: IEC 60947-2:2016

As shown in the Test Report Ref. No. which forms part of this Certificate: 2226199.02

This CB Test Certificate is issued by the National Certification Body

DEKRA Certification B.V. Meander 1051, NL-6825 MJ Arnhem, Netherlands

DEKRA

Date: 2019-01-09

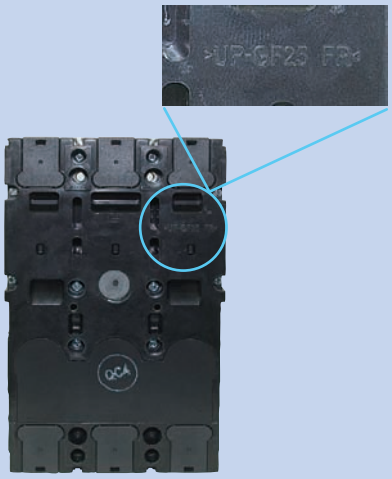
Signature: H.L. Schendstok

page 1 of 1

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 Disconnector	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

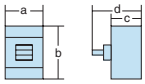
2 Ratings and Specifications

Moulded Case Circuit Breakers

2 Ratings and Specifications

Moulded Case Circuit Breakers

1 Economical series

Frame size (A)																					
Type	**E160-SF**										**E160-SJ**		**E250-SCF**		**E250-SCJ**						
Number of poles	1			2			3		4		3	4	3	4	3	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℃			40℃				50℃		50℃		50℃						
Rated insulation voltage 〔U_i〕 V AC				690			690				690		690		690						
Rated impulse withstand voltage 〔U_{imp}〕 kV				8			8				8		8		8						
Rated short time withstand current 〔I_{cw}〕 kA				—			—				—		—		—						
Utilization Category				A			A				A		A		A						
■Rated breaking capacity, kA																					
IEC 60947-2 AC 690V				—			—				—		—		—						
I_{cu}/I_{cs}(sym) 525V				—			6/3				6/3		6/3		6/3						
480V				—			6/3				6/3		6/3		6/3						
440V				—			10/5				10/5		10/5		10/5						
415V				—			16/8				16/8		16/8		16/8						
240V				25/13			25/13				25/13		25/13		25/13						
DC 250V				10/5 (125V)			13/7				13/7		13/7		13/7						
■External dimensions, mm																					
 a				25			50				75	100	105	140	105	140					
b				130			130				130		165		165						
c				68			68				68		68		68						
d				95			95				95		95		95						
Weight (◉ marked standard type) kg				0.3			0.6				0.8	1.0	0.8	1.0	1.5	1.9	1.5	1.9			
■Connections and Mountings																					
Front-connected Terminal screws (FC)				—			◉				◉		◉		◉						
With extension bars (FB)				—			○				○		○		○						
Cable clamp (FW)				◉ ㉕			—				○		○		○						
Rear-connected Flat bar studs (RC)				—			○				○		○		○						
Plug-in (PM) For switchboards (PMB)				—			—				—		—		—						
Draw-out type (DR)				—			—				—		—		—						
DIN rail mount (DA)				—			—				○ 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				—			●				●		●		●		●				
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						
Colour of cover				Grey Blue			Grey Blue				Grey Blue		Grey Blue		Grey Blue						
Trip button (Colour)				Yes (Red)			Yes (Red)				Yes (Red)		Yes (Red)		Yes (Red)						
Suitability for isolation				Yes			Yes				Yes		Yes		Yes						
Reverse connection				Yes			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.

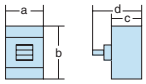
● : "yes" or "available".

— : "no" or "not available".

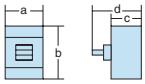
④ : Please order the DIN rail adapter separately.

⑦ : 14,000 for less than 125A

㉕ : Factory-installed.

Frame size (A)																			
Type				**E250-SF**		**E250-SJ**		**P400E**		**P630E**									
Number of poles				3	4	3	4	3	4	3	4								
■Ratings																			
Rated current, A				125 150 175 200 225 250		100 125 160 200 250		250 400		630 ㉛									
Calibrated at				50℃		50℃		50℃		30℃									
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	●		●		●		●									
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 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.
㉛ : Max. rating 560A at 50℃

Frame size (A)																					
Type			**S160-NF**		**S160-SCF**				**S160-SCJ**		**S160-SF**		**S160-SJ**		**P160F**						
Number of poles			1		2		3	4	3	4	3	4	3	4	3	4			3	4	
■Ratings																					
Rated current, A			16	63	15	75	16	63	25	160	16	63	25	160	20	160 ㉙			I_n=40		
			20	80	20	100	20	80	40		20	80	40		32				I_n=100		
			25	100	30	125	25	100	63		25	100	63		50				I_n=160 ㉟		
			32	125	40	160	32	125	80		32	125	80		63 ㉚						
			40	160	50		40	160	100		40	160	100		100				㊳		
			50		60		50		125		50		125		125						
Calibrated at			50℃		40℃		50℃		50℃		50℃		50℃		50℃				50℃		
Rated insulation voltage 〔U_i〕 V AC			800		690		690		690		690		690		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	—		—		—		—		6/3		6/3		6/6				6/6 ㊴		
I_{cu}/I_{cs}(sym)		525V	—		7.5/4		7.5/4		7.5/4		10/7.5		10/7.5		18/18				18/18		
		480V	—		7.5/4		7.5/4		7.5/4		10/7.5		10/7.5		25/22				25/22		
		440V	—		15/7.5		15/7.5		15/7.5		25/13		25/13		25/25				25/25		
		415V	—		25/13		25/13		25/13		40/20		40/20		36/36				36/36		
		240V	25/19		35/18		35/18		35/18		50/25		50/25		50/50				50/50		
	DC	250V	—		20/10		20/10		20/10		25/13		25/13		25/19				—		
■External dimensions, mm																					
		a	35		50		75	100	75	100	75	100	75	100	90	120			90	120	
		b	165		130		130		130		130		130		130				130		
		c	68		68		68		68		68		68		68				68		
		d	92		95		95		95		95		95		95.5				95.5		
Weight (◉ marked standard type) kg			0.5		0.6		0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	1.0	1.3			1.0	1.3	
■Connections and Mountings																					
Front-connected	Terminal screws	(FC)	◉		◉		◉		◉		◉		◉		◉				◉		
	With extension bars	(FB)	○ ⑤		○ ⑤		○ ⑤		○ ⑤		○ ⑤		○ ⑤		○ ⑤				○ ⑤		
	Cable clamp	(FW)	○		—		—		○		—		○		○				○		
Rear-connected	Flat bar studs	(RC)	—		○		○		○		○		○		○				○		
Plug-in (PM)	For switchboards	(PMB)	—		—		—		—		—		—		○ ㉓				○ ㉓		
Draw-out type		(DR)	—		—		—		—		—		—		—				—		
DIN rail mount		(DA)	—		—		○ 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	—		●		●		●		●		●		●				●		
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 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	20,000		10,000 ⑦		10,000 ⑦		10,000 ⑦		10,000 ⑦		10,000 ⑦		30,000				30,000		
	Mechanical		30,000		20,000		20,000		20,000		20,000		20,000		50,000				50,000		

Notes:

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

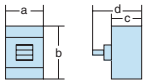
④ : Please order the DIN rail adapter separately. ⑤ : For the extension bars, please place the order separately in parts. ⑦ : 14,000 for less than 125A

㉓ : A safety trip function is provided. ㉙ : Not available for Plug-in

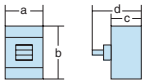
㉚ : Adjustable range (I_r)=0.8-0.9-1.0×(I_n) ㉟ : Max. rating 125A at 50℃ for Plug-in.

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

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

Frame size (A)																			
Type			**P160N**				**P160H**				**P250F**				**P250N**				
Number of poles			3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	
■Ratings																			
Rated current, A			20	160 ㉙	I_n=40		20	160 ㉙	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 ㉟		50		I_n=160 ㉟		100		I_n=160 ㊹		100		I_n=160 ㊹		
			63 ㉚				63 ㉚				125		I_n=250 ㊺		125		I_n=250 ㊺		
			100		㊳		100		㊳		160				160				
			125				125				200		㊳		200		㊳		
Calibrated at			50℃		—		50℃		—		50℃		—		50℃		—		
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 ㊴		6/6		6/6 ㊴		6/6		6/6 ㊴		6/6		6/6 ㊴		
I_{cu}/I_{cs}(sym)		525V	22/18		22/18		25/18		25/18		22/22		22/22		25/25		25/25		
		480V	35/22		35/22		50/22		50/22		25/22		25/22		36/25		36/25		
		440V	35/35		35/35		50/35		50/35		25/25		25/25		36/36		36/36		
		415V	50/50		50/50		70/50		70/50		36/36		36/36		50/50		50/50		
		240V	85/85		85/85		85/85		85/85		50/50		50/50		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	1.5	2.0	
■Connections and Mountings																			
Front-connected	Terminal screws	(FC)	◉		◉		◉		◉		◉		◉		◉		◉		
	With extension bars	(FB)	○ ⑤		○ ⑤		○ ⑤		○ ⑤		○ ⑤		○ ⑤		○ 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		
Draw-out type		(DR)	—		—		—		—		▲		▲		▲		▲		
DIN rail mount		(DA)	○ 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	●		●		●		●		●		●		●		●		
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 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		
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		10,000		10,000		10,000		10,000		
	Mechanical		50,000		50,000		50,000		50,000		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.
⑲ : Mechanical interlocks cannot be applied to draw-out type (DR).
㉓ : A safety trip function is provided. ㉙ : Not available for Plug-in
㉚ : Adjustable range (I_r)=0.8-0.9-1.0×(I_n) ㉟ : Max. rating 125A at 50℃ for Plug-in.
㊳ : For (I_r) rated current settings (A) please refer to Section 7. ㊴ : MCCB cannot be used in IT systems at this voltage.
㊹ : Max. rating 140A at 50℃ for Plug-in.
㊺ : Max. rating 214A at 50℃ for Plug-in.

Frame size (A)																			
Type				**P250H**				**P400F**				**P400N**				**P400H**			
Number of poles				3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4
■Ratings																			
Rated current, A				50 63 100 125 160 200	250	I_n=40 I_n=100 I_n=160 ㊹ I_n=250 ㊺ ㊳		250 400		I_n=250 I_n=400 ㊳		250 400		I_n=250 I_n=400 ㊳		250 400		I_n=250 I_n=400 ㊳	
Calibrated at				50℃		—		50℃		—		50℃		—		50℃		—	
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 ㊴		7/7		7/7 ㊴		12/12		12/12 ㊴		12/12		12/12 ㊴	
I_{cu}/I_{cs}(sym)		525V		30/25		30/25		20/20		20/20		22/22		22/22		35/35		35/35	
		480V		50/25		50/25		25/25		25/25		30/30		30/30		50/50		50/50	
		440V		50/40		50/40		30/30		30/30		45/45		45/45		65/65		65/65	
		415V		70/50		70/50		36/36		36/36		50/50		50/50		70/70		70/70	
		240V		85/85		85/85		50/50		50/50		85/85		85/85		100/100		100/100	
	DC	250V		40/40		—		25/25		—		50/50		—		50/50		—	
■External dimensions, mm																			
		a		105	140	105	140	140	185	140	185	140	185	140	185	140	185	140	185
		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	7.5
■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	
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 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		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		10,000		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	

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).

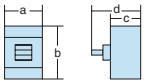
㉓ : A safety trip function is provided.

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

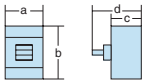
㊴ : MCCB cannot be used in IT systems at this voltage.

㊹ : Max. rating 140A at 50℃ for Plug-in.

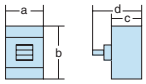
㊺ : Max. rating 214A at 50℃ for Plug-in.

Frame size (A)															
Type			**P630F**				**P630N**				**P630H**					
Number of poles			3	4	3	4	3	4	3	4	3	4	3	4		
■Ratings																
Rated current, A			630 ㉛		I_n=630 ㊳		630 ㉛		I_n=630 ㊳		630 ㉛		I_n=630 ㊳			
Calibrated at			30℃		—		30℃		—		30℃		—			
Rated insulation voltage 〔U_i〕 V AC			800		800		800		800		800		800			
Rated impulse withstand voltage 〔U_{imp}〕 kV			8		8		8		8		8		8			
Rated short time withstand current 〔I_{cw}〕 kA			—		—		—		—		—		—			
Utilization Category			A		A		A		A		A		A			
■Rated breaking capacity, kA																
IEC 60947-2	AC	690V	7/7		7/7 ㊴		12/12		12/12 ㊴		12/12		12/12 ㊴			
I_{cu}/I_{cs}(sym)		525V	20/20		20/20		22/22		22/22		35/35		35/35			
		480V	25/25		25/25		30/30		30/30		50/50		50/50			
		440V	30/30		30/30		45/45		45/45		65/65		65/65			
		415V	36/36		36/36		50/50		50/50		70/70		70/70			
		240V	50/50		50/50		85/85		85/85		100/100		100/100			
	DC	250V	25/25		—		50/50		—		50/50		—			
■External dimensions, mm																
		a	140	185	140	185	140	185	140	185	140	185	140	185		
		b	260		260		260		260		260		260			
		c	103		103		103		103		103		103			
		d	151		151		151		151		151		151			
Weight (◉ marked standard type) kg			5.9	7.8	6.0	8.0	5.9	7.8	6.0	8.0	5.9	7.8	6.0	8.0		
■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	(PMB)	—		○ ㉓ ㉜		—		○ ㉓ ㉜		—		○ ㉓ ㉜			
Draw-out type		(DR)	—		▲ ㉜		—		▲ ㉜		—		▲ ㉜			
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	●		●		●		●		●		●			
Internally mounted: Alarm switch		A L	●		●		●		●		●		●			
Internally mounted: Shunt trips		S H	●		●		●		●		●		●			
Internally mounted: Undervoltage trips		U V	●		●		●		●		●		●			
Externally mounted: Motor operator		M C	●		●		●		●		●		●			
Externally mounted: External operating handle	Breaker-mounted	H B	●		●		●		●		●		●			
	Door-mounted (variable depth)	H P	●		●		●		●		●		●			
Externally mounted: Toggle extension		H A	●		●		●		●		●		●			
Externally mounted: Mechanical interlock ⑲	Slide type	M S	●		●		●		●		●		●			
	Link type	M L	●		●		●		●		●		●			
	Wire type	M W	●		●		●		●		●		●			
Externally mounted: Toggle holder		H H	●		●		●		●		●		●			
Externally mounted: Toggle lock		H L														
Externally mounted: Terminal cover	For front-connected	C F	●		●		●		●		●		●			
	For rear-connected and plug-in	C R	●		●		●		●		●		●			
	For cable clamps	C S	●		●		●		●		●		●			
Externally mounted: Terminal block for lead		T F	●		●		●		●		●		●			
Externally mounted: 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			

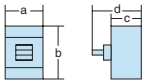
Notes:
◉ : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.
● : "yes" or "available". — : "no" or "not available". ▲ : Semi-standard.
⑲ : Mechanical interlocks cannot be applied to draw-out type (DR).
㉓ : A safety trip function is provided.
㉛ : Max. rating 560A at 50℃
㉜ : Max. rating 546A at 50℃ for Plug-in/Draw-out
㊳ : For (I_r) rated current settings (A) please refer to Section 7.
㊴ : MCCB cannot be used in IT systems at this voltage.

Frame size (A)															
Type			**S800-CJ**		**S800-NJ**		**S800-NE**		**S800-RJ**		**S800-RE**		**S800-PJ**		**S800-PE**	
Number of poles			3	4	3	4	3	4	3	4	3	4	3	4	3	4
■Ratings																
Rated current, A			630 800		630 800		I_n=630 I_n=800 ㊽ ㊳		630 800		I_n=630 I_n=800 ㊽ ㊳		630 800		I_n=630 I_n=800 ㊽ ㊳	
Calibrated at			50℃		50℃		—		50℃		—		50℃		—	
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	
Weight (◉ marked standard type) kg			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
■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		**OCR type**														
Thermal magnetic	Adjustable thermal	ADJ	●		●		—		●		—		●		—	
	Fixed thermal	FIX	—		—		—		—		—		—		—	
Electronic		TPOT	—		—		—		—		—		—		—	
		TPOP	—		—		—		—		—		—		—	
		XOU	—		—		● ⑳		—		● ⑳		—		● ⑳	
		XOS	—		—		—		—		—		—		—	
■Accessories (optional)		**Symbol**														
Internally mounted: Auxiliary switch		A X	●		●		●		●		●		●		●	
Internally mounted: Alarm switch		A L	●		●		●		●		●		●		●	
Internally mounted: Shunt trips		S H	●		●		●		●		●		●		●	
Internally mounted: Undervoltage trips		U V	●		●		●		●		●		●		●	
Externally mounted: Motor operator		M C	●		●		●		●		●		●		●	
Externally mounted: External operating handle	Breaker-mounted	H B	●		●		●		●		●		●		●	
	Door-mounted (variable depth)	H P	●		●		●		●		●		●		●	
Externally mounted: Toggle extension		H A	●		●		●		●		●		●		●	
Externally mounted: Mechanical interlock ⑲	Slide type	M S	●		●		●		●		●		●		●	
	Link type	M L	●		●		●		●		●		●		●	
	Wire type	M W	●		●		●		●		●		●		●	
Externally mounted: Toggle holder		H H	●		●		●		●		●		●		●	
Externally mounted: Toggle lock		H L														
Externally mounted: Terminal cover	For front-connected	C F	●		●		●		●		●		●		●	
	For rear-connected and plug-in	C R	●		●		●		●		●		●		●	
	For cable clamps	C S	—		—		—		—		—		—		—	
Externally mounted: Terminal block for lead		T F	●		●		●		●		●		●		●	
Externally mounted: 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.
㊳ : For (I_r) 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℃ for Rear/Plug-in/Draw-out.

Frame size (A)															
Type			**S1000-SE**		**S1000-NE**		**S1250-SE**		**S1250-NE**		**S1250-GE**		**S1600-SE**		**S1600-NE**	
Number of poles			3	4	3	4	3	4	3	4	3	4	3	4	3	4
■Ratings																
Rated current, A			I_n=1000 ㊵ ㊳		I_n=1000 ㊵ ㊳		I_n=800 I_n=1250 ㊶ ㊳		I_n=800 I_n=1250 ㊶ ㊳		I_n=800 I_n=1250 ㊶ ㊳		I_n=1600 ㊷ ㊳		I_n=1600 ㊷ 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 ㊴		25/20 ㊴		20/15 ㊴		25/20 ㊴		45/34 ㊴		20/15 ㊴		45/34 ㊴	
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
		b	273		273		370		370		370		370		370	
		c	103		103		120		120		120		140		140	
		d	145		145		171		171		171		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	● ⑳		● ⑳		● ⑳		● ⑳		● ⑳		● ⑳		● ⑳	
		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	●		●		● ②		● ②		● ②		● ②		● ②	
	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	
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	

Notes:
◉ : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering.
● : "yes" or "available". — : "no" or "not available". ▲ : Semi-standard.
② : One is supplied with every five breakers. Please specify if more are required.
⑧ : 100kA/75kA at 400V
⑲ : Mechanical interlocks cannot be applied to draw-out type (DR).
⑳ : Optional preferential alarm or ground fault trip function available on request.
㊳ : For (I_r) rated current settings (A) please refer to Section 7.
㊴ : MCCB cannot be used in IT systems at this voltage.
㊵ : Max. rating 900A at 50°C
㊶ : Max. rating 1125A at 50°C for Rear/Plug-in/Draw-out
㊷ : Max. rating 1520A at 50°C for Rear/Draw-out

Frame size (A)													
Type				**XS2000NE**		**XS2500NE**		**XS3200NE**					
Number of poles				3	4	3	4	3					
■Ratings													
Rated current, A				I_n=2000 ㊳		I_n=2500 ㊸ ㊳		I_n=3200 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 ㊴		45/42 ㊴		45/42 ㊴					
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	429	320	429	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	● ⑳		● ⑳		● ⑳					
■Accessories (optional)			**Symbol**										
Internally mounted	Auxiliary switch		A X	●		●		●					
	Alarm switch		A L	●		●		●					
	Shunt trips		S H	●		●		●					
	Undervoltage trips		U V	● ⑱		● ⑱		● ⑱					
Externally mounted	Motor operator		M C	●		●		●					
	External operating handle	Breaker-mounted	H B	—		—		—					
		Door-mounted (fixed depth)	H E	● ㉖ XFE		● ㉖ XFE		● ㉖ XFE					
	Toggle extension		H A	● ①		● ①		● ①					
	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				Non		Non		Non					
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.

⑧ : 100kA/75kA at 400V

⑱ : With AC UVT, the UVT controller is externally mounted.

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

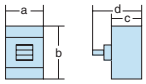
⑳ : Optional preferential alarm or ground fault trip function available on request.

㉖ : Fixed depth, not adjustable.

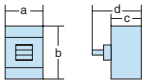
㊳ : For (I_r) rated current settings (A) please refer to Section 7.

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

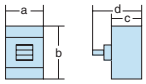
㊸ : Max. rating 2250A at 50°C

Frame size (A)																							
Type			**H125-NJ**		**H160-NJ**		**H250-NJ**		**H250-NE**		**P400S**				**H400-NE**								
Number of poles			3	4	3	4	3	4	3	4	3	4	3	4	3	4							
■Ratings																							
Rated current, A			20 32 50 63 100 125		160		160 250		I_n=40 I_n=125 I_n=160 I_n=250 ㊼ ㊳		250 400		I_n=250 I_n=400 ㊳		I_n=250 I_n=400 ㊳								
Calibrated at			50℃		50℃		50℃ ㊱		—		50℃		—		—								
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		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	105	140	140	185	140	185	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								
Weight (◉ marked standard type) kg			2.4	3.2	2.4	3.2	2.4	3.2	2.5	3.3	5.5	7.3	5.7	7.5	7.1	9.4							
■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		—		—		● ⑳								
		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 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								
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								

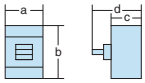
Notes:
◉ : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering. ▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available".
⑤ : For the extension bars, please place the order separately in parts. ⑥ : Available up to 525V AC
⑲ : Mechanical interlocks cannot be applied to draw-out type (DR). ⑳ : 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℃ for Plug-in
㊱ : Calibrated at 30℃ for Plug-in 250A ㊳ : For (I_r) 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℃.

Frame size (A)																			
Type					**P630S**				**H800-NE**										
Number of poles					3	4	3	4	3	4									
■Ratings																			
Rated current, A					630 ㉛		I_n=630 ㊳		I_n=630 I_n=800 ㉞ ㊳										
Calibrated at					30℃		—		—										
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					—		—		10 (0.3sec.)										
Utilization Category					A		A		B										
■Rated breaking capacity, kA																			
IEC 60947-2		AC	690V		12/12		12/12 ㊴		25/20 ㊴										
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		273										
				c	103		103		140										
				d	151		151		182										
Weight (◉ marked standard type) kg					5.9	7.8	6.0	8.0	14.8⑪	18.8⑫									
■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 ㉜		○ ㉔										
Draw-out type			(DR)		—		▲ ㉜		—										
DIN rail mount			(DA)		—		—		—										
■Overcurrent trip mechanism			**OCR type**																
Thermal magnetic	Adjustable thermal		ADJ		●		—		—										
	Fixed thermal		FIX		—		—		—										
Electronic			TPOT		—		●		—										
			TPOP		—		●		—										
			XOU		—		—		● ⑳										
			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 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										
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					Yes		Yes		Yes										
Endurance	Electrical		415V		4,000		4,000		4,000										
	Mechanical				15,000		15,000		10,000										

Notes:
◉ : Standard. This configuration used unless otherwise specified. ○ : Optional standard. Specify when ordering. ▲ : Semi-standard. ● : "yes" or "available". — : "no" or "not available".
⑪ : 13.3kg/630A, 14.8kg/800A ⑫ : 16.8kg/630A, 18.8kg/800A ⑲ : Mechanical interlocks cannot be applied to draw-out type (DR).
⑳ : Optional preferential alarm or ground fault trip function available on request.
㉓ : A safety trip function is provided. ㉔ : A safety lock function is provided. ㉛ : Max. rating 560A at 50℃
㉜ : Max. rating 546A at 50℃ for Plug-in/Draw-out ㉞ : Max. rating 720A at 50℃
㊳ : For (I_r) rated current settings (A) please refer to Section 7.
㊴ : MCCB cannot be used in IT systems at this voltage.

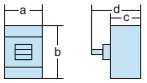
Frame size (A)																					
Type				**L125-NJ**		**L160-NJ**		**L250-NJ**		**L400-NE**		**L800-NE**									
Number of poles				3	4	3	4	3	4	3	4	3	4								
■Ratings																					
Rated current, A				20 32 50 63 100 125		160		160 250		I_n=250 I_n=400 ㊳		I_n=630 I_n=800 ㉞ ㊳									
Calibrated at				50℃		50℃		50℃ 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 ㊴									
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	14.8⑪	18.8⑫								
■Connections and Mountings																					
Front-connected	Terminal screws		(FC)	◉		◉		◉		◉		—									
	With extension bars		(FB)	○ ⑤		○ ⑤		○ ⑤		○		◉									
	Cable clamp		(FW)	○		○		○		○		—									
Rear-connected	Flat bar studs		(RC)	○		○		○		○		○									
Plug-in (PM)	For switchboards		(PMB)	○ ㉔		○ ㉔		○ ㉔ ㉝		○ 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	—		—		—		● ⑳		● ⑳									
			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		Yes									
Colour of cover				Grey Blue		Grey Blue		Grey Blue		Grey Blue		Grey Blue									
Trip button (Colour)				Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)									
Suitability for isolation				Yes		Yes		Yes		Yes		Yes									
Reverse connection				Yes ⑥		Yes ⑥		Yes ⑥		Yes		Yes									
Endurance	Electrical		415V	30,000		20,000		10,000		4,500		4,000									
	Mechanical			30,000		30,000		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".
⑤ : For the extension bars, please place the order separately in parts.
⑥ : Available up to 525V AC ⑪ : 13.3kg/630A, 14.8kg/800A ⑫ : 16.8kg/630A, 18.8kg/800A
⑳ : Optional preferential alarm or ground fault trip function available on request.
㉔ : A safety lock function is provided. ㉝ : Max. rating 219A at 50℃ for Plug-in
㉞ : Max. rating 720A at 50℃ ㊱ : Calibrated at 30℃ for Plug-in 250A
㊳ : For (I_r) rated current settings (A) please refer to Section 7.
㊴ : MCCB cannot be used in IT systems at this voltage.

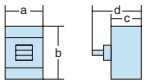
Frame size (A)																					
Type			**S160-SN**		**P160D**		**S250-SN**		**P250D**		**P400D**		**P630D**		**S800-NN**		**S1000-NN**	
Number of poles			3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4
■Ratings																		
Rated current, A			160		160 ㉟		250		250 ㊻		400		630		630 800		1000	
Rating at			50℃		50℃		50℃		50℃		50℃		50℃		50℃		50℃	
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		690	
		DC	250		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		AC-23A ㊲		AC-23A		AC-23A	
IEC 60947-3		DC	DC-22A		DC-22A		DC-22A		DC-22A		DC-22A		DC-22A		DC-22A		DC-22A	
Upstream breaker (OCPD) ㉒			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	210	280
		b	130		130		165		165		260		260		273		273	
		c	68		68		68		68		103		103		103		103	
		d	95		95.5		95		95.5		151		151		145		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	●		●		●		●		●		●		●		●	
	External operating handle — Door-mounted (variable depth)	H P	●		●		●		●		●		●		●		●	
	Toggle extension	H A	—		—		—		—		●		●		●		●	
	Mechanical interlock ⑲ — Slide type	M S	●		●		●		●		●		●		●		●	
	Mechanical interlock ⑲ — Link type	M L	—		●		●		●		●		●		●		●	
	Mechanical interlock ⑲ — Wire type	M W	—		●		●		●		●		●		●		●	
	Toggle holder	H H	●		●		●		●		●		●		●		●	
	Toggle lock	H L	●		●		●		●		●		●					
	Terminal cover — For front-connected	C F	●		●		●		●		●		●		●		●	
	Terminal cover — For rear-connected and plug-in	C R	●		●		●		●		●		●		●		●	
	Terminal cover — 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		4,000	
	Mechanical		20,000		50,000		18,000		30,000		15,000		15,000		10,000		10,000	

Notes:

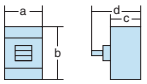
◉ : Standard. This configuration used unless otherwise specified.
○ : Optional standard. Specify when ordering. ▲ : Semi-standard.
● : "yes" or "available". — : "no" or "not available".
④ : Please order the DIN rail adapter separately.
⑤ : For the extension bars, please place the order separately in parts.
⑦ : 14,000 for less than 125A
⑬ : 8.0kg/630A, 8.5kg/800A
⑭ : 11.0kg/630A, 11.5kg/800A
⑲ : Mechanical interlocks cannot be applied to draw-out type (DR).
㉒ : 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.
㉓ : A safety trip function is provided.
㉔ : A safety lock function is provided.
㉟ : Max. rating 125A at 50℃ for Plug-in.
㊲ : AC-23A/up to 500A, AC-22A/up to 630A
㊻ : Max. rating 227A at 50℃ for Plug-in.

Frame size (A)																			
Type				**S1250-NN**				**S1600-NN**											
Number of poles				3		4		3		4									
■Ratings																			
Rated current, A				1250				1600											
Rating at				50℃				50℃											
Rated insulation voltage 〔U_i〕 V AC				800				800											
Rated operational voltage 〔U_e〕 V			AC	690				690											
			DC	250				250											
Rated impulse withstand voltage 〔U_{imp}〕 kV				8				8											
Rated short circuit making capacity 〔I_{cm}〕 kA peak				32				45											
Rated short time withstand current 〔I_{cw}〕 kA				15 (0.3sec.)				20 (0.3sec.)											
■Performance																			
Utilization category			AC	AC-23A				AC-23A											
IEC 60947-3			DC	DC-22A				DC-22A											
Upstream breaker (OCPD) ㉒				S1250-NE				S1600-NE											
■External dimensions, mm																			
			a	210		280		210		280									
			b	370				370											
			c	120				140											
			d	171				191											
Weight (◉ marked standard type) kg				18.2		23.4		24.9		32.9									
■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	●				●											
Externally mounted	Motor operator		M C	●				●											
	External operating handle	Breaker-mounted	H B	▲				▲											
		Door-mounted (variable depth)	H P	●				●											
	Toggle extension		H A	● ②				● ②											
	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											
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	4,000				2,000											
	Mechanical			5,000				5,000											

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.
⑲ : Mechanical interlocks cannot be applied to draw-out type (DR).
㉒ : 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.

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		690						
		DC	250		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) ㉒			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	● ⑱		● ⑱		● ⑱						
Externally mounted	Motor operator	M C	●		●		●						
	External operating handle — Breaker-mounted	H B	—		—		—						
	External operating handle — Door-mounted (fixed depth)	H E	● ㉖ XFE		● ㉖ XFE		● ㉖ XFE						
	Toggle extension	H A	● ①		● ①		● ①						
	Mechanical interlock ⑲ — Slide type	M S	●		●		●						
	Mechanical interlock ⑲ — Link type	M L	—		—		—						
	Mechanical interlock ⑲ — Wire type	M W	—		—		—						
	Toggle holder	H H	●		●		●						
	Toggle lock	H L											
	Terminal cover — For front-connected	C F	—		—		—						
	Terminal cover — For rear-connected and plug-in	C R	—		—		—						
	Terminal cover — For cable clamps	C S	—		—		—						
	Terminal block for lead	T F	●		●		●						
	Door flange	D F	●		●		●						
CE marking			Non		Non		Non						
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						

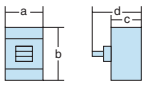
Notes:
◉ : Standard. This configuration used unless otherwise specified.
○ : Optional standard. Specify when ordering.
● : "yes" or "available". — : "no" or "not available".
① : Supplied as standard.
⑱ : With AC UVT, the UVT controller is externally mounted.
⑲ : Mechanical interlocks cannot be applied to draw-out type (DR).
㉒ : 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.
㉖ : 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 ㊳	I_n=630 I_n=800 ㉞ ㊳						
Calibrated at			50℃		—	—						
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	140	210						
		b	165		260	303						
		c	103		140	140						
		d	127		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		○ 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	—		● ⑳	● ⑳						
		XOS	—		—	—						
■Accessories (optional)		**Symbol**										
Internally mounted: Auxiliary switch		A X	●		●	●						
Internally mounted: Alarm switch		A L	●		●	●						
Internally mounted: Shunt trips		S H	●		●	●						
Internally mounted: Undervoltage trips		U V	●		●	●						
Externally mounted: Motor operator		M C	●		●	●						
Externally mounted: External operating handle	Breaker-mounted	H B	●		●	●						
	Door-mounted (variable depth)	H P	●		●	●						
Externally mounted: Toggle extension		H A	—		—	●						
Externally mounted: Mechanical interlock	Slide type	M S	●		●	●						
	Link type	M L	●		●	●						
	Wire type	M W	●		●	●						
Externally mounted: Toggle holder		H H	●		●	●						
Externally mounted: Toggle lock		H L	●									
Externally mounted: Terminal cover	For front-connected	C F	●		—	—						
	For rear-connected and plug-in	C R	● ③		● ③	● ③						
	For cable clamps	C S	—		—	—						
Externally mounted: Terminal block for lead		T F	●		●	●						
Externally mounted: 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			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
⑳ : Optional preferential alarm or ground fault trip function available on request.
㉔ : A safety lock function is provided.
㉞ : Max. rating 720A at 50℃
㊳ : For (I_r) rated current settings (A) please refer to Section 7.

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℃	50℃	
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	●	●	
Internally mounted: Alarm switch		A L	●	●	
Internally mounted: Shunt trips		S H	●	●	
Internally mounted: Undervoltage trips		U V	—	—	
Externally mounted: Motor operator		M C	—	—	
Externally mounted: External operating handle	Breaker-mounted	H B	●	●	
	Door-mounted (variable depth)	H P	—	—	
Externally mounted: Toggle extension		H A	●	●	
Externally mounted: Mechanical interlock	Slide type	M S	●	●	
	Link type	M L	—	—	
	Wire type	M W	—	—	
Externally mounted: Toggle holder		H H	●	●	
Externally mounted: Toggle lock		H L			
Externally mounted: Terminal cover	For front-connected	C F	●	●	
	For rear-connected and plug-in	C R	●	●	
	For cable clamps	C S	●	●	
Externally mounted: Terminal block for lead		T F	●	●	
Externally mounted: 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:

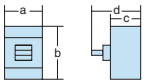
◉ : Standard. This configuration used unless otherwise specified.

○ : Optional standard. Specify when ordering.

● : "yes" or "available".

— : "no" or "not available".

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

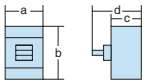
Frame size (A)										
Type			**VS125-NJ**		**VS125-GJ**	**VS250-NJ**	**VS250-GJ**			
Number of poles			3		3	3	3			
■Ratings										
Rated current, A			20	50	50	160	160			
			32	63	63	250	250			
				100	100					
				125	125					
Calibrated at			50℃		50℃	50℃	50℃			
Rated insulation voltage〔U_i〕V AC			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	1100V	4/4	6/4	6/4	6/4	6/4			
I_{cu}/I_{cs}(sym)		1000V	4/4	6/4	10/5	—	10/5			
		800V	—	—	—	—	—			
■External dimensions, mm										
		a	90		90	105	105			
		b	155		155	165	165			
		c	68		68	68	68			
		d	92		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	●		●	●	●			
Internally mounted: Alarm switch		A L	●		●	●	●			
Internally mounted: Shunt trips		S H	●		●	●	●			
Internally mounted: Undervoltage trips		U V	●		●	●	●			
Externally mounted: Motor operator		M C	●		●	●	●			
Externally mounted: External operating handle	Breaker-mounted	H B	●		●	●	●			
	Door-mounted (variable depth)	H P	●		●	●	●			
Externally mounted: Toggle extension		H A	—		—	—	—			
Externally mounted: Mechanical interlock	Slide type	M S	●		●	●	●			
	Link type	M L	●		●	●	●			
	Wire type	MW	●		●	●	●			
Externally mounted: Toggle holder		H H	●		●	●	●			
Externally mounted: Toggle lock		H L	●		●	●	●			
Externally mounted: Terminal cover	For front-connected	C F	●		●	●	●			
	For rear-connected and plug-in	C R	●		●	●	●			
	For cable clamps	C S	—		—	—	—			
Externally mounted: Terminal block for lead		T F	●		●	●	●			
Externally mounted: 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.

Moulded Case Circuit Breakers

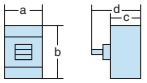
9 Mining Circuit Breakers (Refer to the catalogue P67E for the detailed specifications.)

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	● ⑳	—	—	—	● ⑳	● ⑳		
		XOS	—	● ⑳	● ⑳	● ⑳	—	—		
■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 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			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
⑳ : Optional preferential alarm or ground fault trip function available on request.

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

Frame size (A)			
Type			**VE400-NN**
Number of poles			3
■Ratings			
Rated current, A			250
Rating at			50℃
Rated insulation voltage 〔U_i〕 V AC			800
Rated operational voltage 〔U_e〕 V		AC	800
Rated impulse withstand voltage 〔U_{imp}〕 kV			8
Rated short circuit making capacity 〔I_{cm}〕 kA peak			9
Rated short time withstand current 〔I_{cw}〕 kA			5 (0.3sec.)
■Performance			
Utilization category		AC	AC-23A
IEC 60947-3			
Upstream breaker (OCPD) ㉒			VS400-NE
■External dimensions, mm			
		a	140
		b	260
		c	103
		d	144.5
Weight (◉ marked standard type) kg			4.8
■Connections and Mountings			
Front-connected	Terminal screws	(FC)	◉
	With extension bars	(FB)	○
	Cable clamp	(FW)	—
Rear-connected	Flat bar studs	(RC)	○
Plug-in (PM)	For switchboards	(PMC)	○
Draw-out type		(DR)	—
DIN rail mount		(DA)	—
■Accessories (optional)		**Symbol**	
Internally mounted: Auxiliary switch		A X	●
Internally mounted: Alarm switch		A L	●
Internally mounted: Shunt trips		S H	●
Internally 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	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
Colour of cover			Light Grey
Trip button (Colour)			Yes (Red)
Suitability for isolation			Yes
Reverse connection			Non
Endurance	Electrical	800V	1,000
	Mechanical		5,000

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 [Icc] will be the same as Rated short-circuit breaking capacity of upstream breaker.

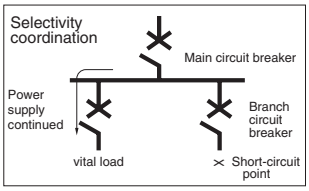
3 Selection

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 current I_n (A)	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-SCF	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-SCF	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

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

Breaker combination table for selectivity coordination for 415V AC circuit

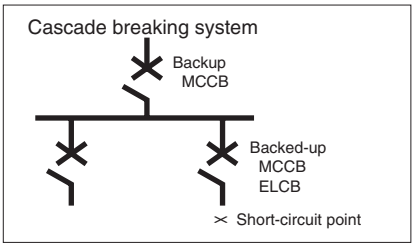
Frame (A)			800	1250		1600			2000				2500		3200		4000		5000	6300	
	Main circuit breaker (ACBs)		AR208S	AR212S	AR212H	AR216S	AR216H	AR316H	AR220S	AR220H	AR320H	AR420H	AR325S	AR325H	AR332S	AR332H	AR440SB	AR440H	AR650S	AR663S	AR663H
	Rated breaking capacity I_{cu} sym. (kA)		65	65	80	65	80	100	65	80	100	120	85	100	85	100	100	120	120	120	135
	Branch circuit breaker (MCCBs)																				
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	16
	S160-SCJ, S160-SCF	25	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	36
	S160-SJ, S160-SF	40	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	50
	P160H TM, P160H ELE	70	65	65	70	65	70	70	65	70	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	16
	E250-SJ, E250-SF	25	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	36
	P250N TM, P250N ELE	50	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	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	25
	P400F TM, P400F ELE	36	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	50
	P400H TM, P400H ELE	70	65	65	70	65	70	70	65	70	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	25
	P630F TM, P630F ELE	36	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	50
	P630H TM, P630H ELE	70	65	65	70	65	70	70	65	70	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	36
	S800-NJ, S800-NE	50	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	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	50
	S1000-NE	70	—	65	70	65	70	70	65	70	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	50
	S1250-NE	70	—	65	70	65	70	70	65	70	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	85
1600	S1600-SE	50	—	—	—	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	85

TM: Thermal type. ELE: Electronic type.

Notes:
1. All ACB's have I_i 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.

2 Combination of breakers for cascade breaking

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) / Branch circuit breaker (MCCBs)		36	50	70	36	50	70	200	200	200	25	36	50	70	110
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) / Branch circuit breaker (MCCBs)		200	25	36	50	70	110	70	100	200	70	85	85
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 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 symetrical)
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 (± 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
Contactor	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 symetrical)
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 (± 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_r to 1 (=I_n), and Overload relay is set to motor FLC.

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 symetrical)
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 toroid, 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 momitoring 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 Selection for Type 2 Coordination 70kA 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) :	70 kA (rms symetrical)
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 (± 20%)	Minimum trip amp multiple of motor FLC
0.18	0.6	P160H / 20A TM	CA7-30	CEP 7 EEBB *	0.2 – 1.0	240	320
0.25	0.85	P160H / 20A TM	CA7-30	CEP 7 EEBB *	0.2 – 1.0	240	225
0.37	1.1	P160H / 20A TM	CA7-30	CEP 7 EECB *	1.0 – 5.0	240	174
0.55	1.5	P160H / 20A TM	CA7-30	CEP 7 EECB *	1.0 – 5.0	240	128
0.75	1.9	P160H / 20A TM	CA7-30	CEP 7 EECB *	1.0 – 5.0	240	101
1.1	2.7	P160H / 20A TM	CA7-30	CEP 7 EECB *	1.0 – 5.0	240	71.1
1.5	3.6	P160H / 20A TM	CA7-30	CEP 7 EECB *	1.0 – 5.0	240	53.3
2.2	4.9	P160H / 20A TM	CA7-30	CEP 7 EEDB *	3.2 – 16	240	39.2
3	6.5	P160H / 20A TM	CA7-30	CEP 7 EEED	5.4 – 27	240	29.5
4	8.5	P160H / 20A TM	CA7-30	CEP 7 EEED	5.4 – 27	240	22.6
5.5	11.5	P160H / 20A TM	CA7-30	CEP 7 EEED	5.4 – 27	240	16.7
7.5	15.5	P160H / 32A TM	CA7-30	CEP 7 EEED	5.4 – 27	384	19.8
11	22	P160H / 32A TM	CA7-30	CEP 7 EEED	5.4 – 27	384	14.0
15	29	P160H / 50A TM	CA7-43	CEP 7 EEFD	9 – 45	600	16.6
18.5	35	P160H / 63A TM	CA7-43	CEP 7 EEFD	9 – 45	756	17.3
22	41	P160H / 63A TM	CA7-55	CEP 7 EEFD	9 – 45	756	14.8
30	55	P160H / 100A TM	CA7-72	CEP 7 EEGE	18 – 90	1200	17.5
37	66	P160H / 100A TM	CA7-85	CEP 7 EEGE	18 – 90	1200	14.5
45	80	P160H / 160A TM	CA9-116	CEP 7 EEHJ	30 – 150	1600	16.0
55	97	P250H / 160A TM	CA9-146	CEP 7 EEHJ	30 – 150	2080	17.2
75	132	P250H / 250A TM	CA9-190	CEP 7 EEJJ	40 – 200	2500	15.2
90	160	P400H / 250A ELE	CA9-265	CEP 7 EEJJ *	40 – 200	3000	15.0
110	195	P400H / 400A ELE	CA9-265	CEP 7 EEJJ *	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_r to 1 (=I_n), and Overload relay is set to motor FLC.

4 Selection for Type 2 Coordination 70kA 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-EE Electronic
Rated operational voltage	400 / 415V AC
Motor types	Premium Efficiency class: IE3
Rated conditional AC current (I_q) :	70 kA (rms symetrical)
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 (± 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-EEDB ＊	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 symetrical)
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	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 toroid, 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 momitoring 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

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.

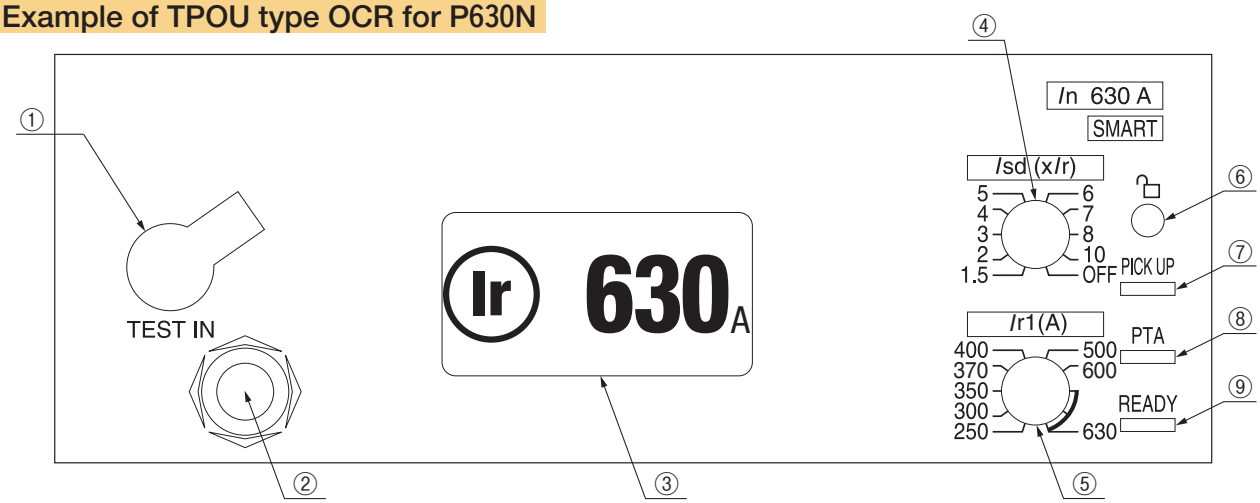
■ Outer view

■ 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

Smart circuit breakers with TPOU type OCR can be reversely connected in the same way as circuit breakers with thermal or standard electronic OCR. In addition, since the OCR uses an r.m.s. value control method, the effects of harmonics do not cause any malfunction.
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.

■ 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 magnification and magnification +0.5 one level below in additional 0.5× 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, 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. As a result, 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 remort display.

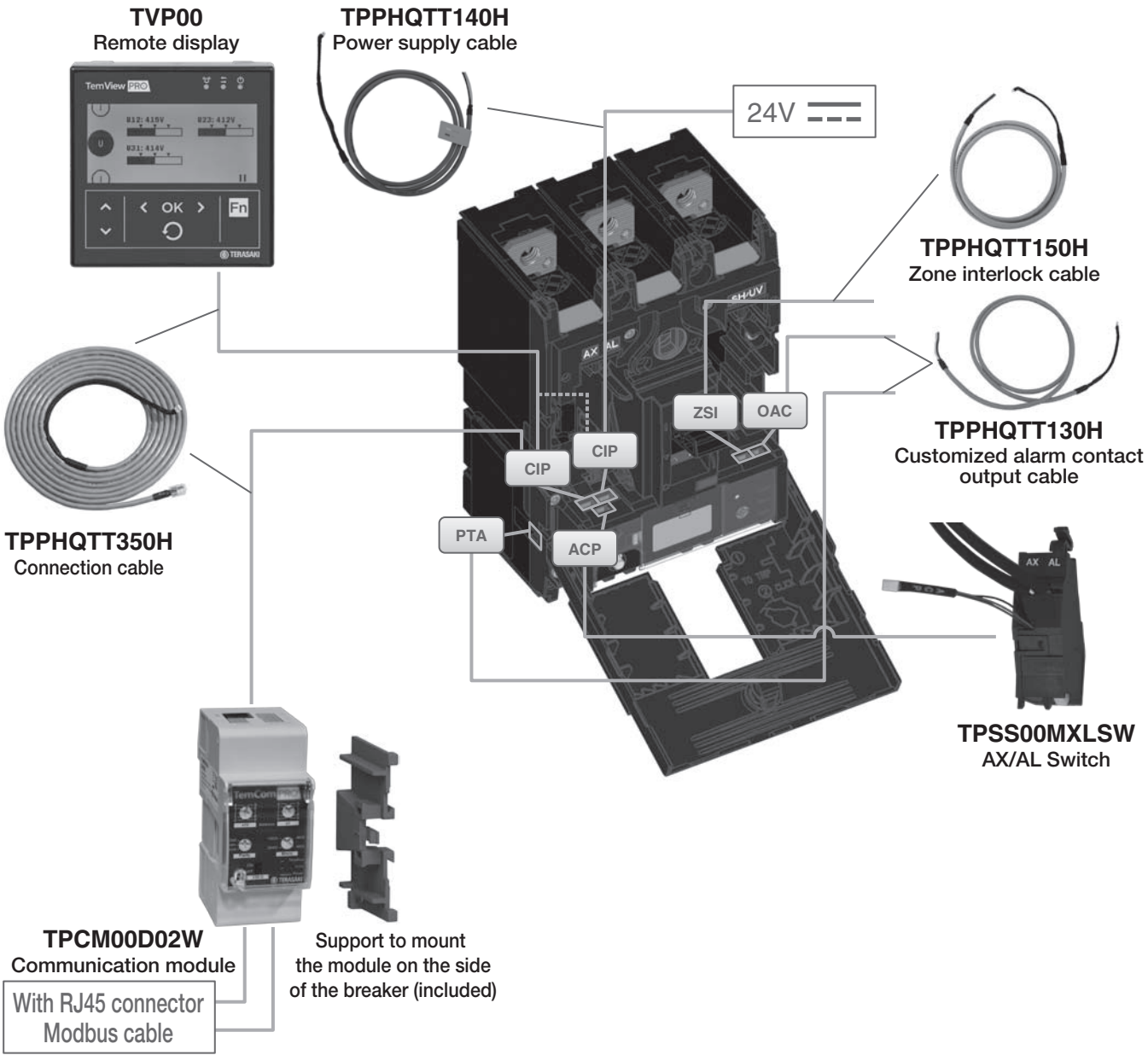
・Supports hot start

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

■ 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			Optional		
	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	Communication module TPCM ⑧	Remote display TPED ⑨	AX/AL switch 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)	
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 next page for the specifications of the AX/AL switch.

Note ①: Not compatible with 3-phase 4-wire systems.

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 ± 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 P160F/N/H 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 370H) 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.

■ 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 remort display TPED 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

■ TPCH00 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.

■ 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_r1)(A)=16, 18, 20, 22, 25, 28, 32, 34, 37, 40 In the case of (I_n)=100 A Adjustable to (I_r1)(A)=40, 45, 50, 57, 63, 72, 80, 87, 93, 100 In the case of (I_n)=160 A Adjustable to (I_r1)(A)=63, 70, 80, 90, 100, 110, 125, 135, 150, 160 Select (I_r1) with the dial. Adjustable in 1 A steps between the selected (I_r1) and the level below (I_r1). 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)×600%
		Time-delay setting tolerance –20% –20ms or more +0% +30ms or less
Short time-delay pick-up current (A) : (I_{sd})		(I_r)×1.5 to 10 (0.5 steps) or OFF ⑥
		Current setting tolerance within ±10%
Short time-delay time settings (ms) : (t_{sd})		50, 100, 200, 300, 400 adjustable
		Ramp characteristics I^2t: ON or OFF However, definite time-delay characteristics with (I_r)×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)×3 to 15 (0.5 step)
		When (I_n) = 160A, (I_n)×3 to 11 (0.5 step)
		Current setting tolerance within ±15%
N-phase protection pick-up current ⑦ (A) : (I_N)		For 4P (I_r)×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 3ø3W, 4P for 3ø4W (3P 3ø4W not supported ④) When (I_n) = 40A, (I_n)×40% to 100% (5% steps) or OFF When (I_n) = 100A or 160A, (I_n)×20% to 100% (5% steps) or OFF Current setting tolerance within ±10%
Ground fault trip time settings (ms) : (t_g)		50, 100, 200, 300, 400, 500 adjustable
		Ramp characteristics I^2t: ON or OFF ⑤ However, definite time-delay characteristics with (I_n)×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)×60% to 80% to 95% (5% steps) or OFF Current setting tolerance within ±10%
Preferential trip alarm time settings (s) : (t_p)		(t_r)×5% to 50% to 80% (5% steps) at (I_P)×600% Time-delay setting tolerance –20% –20ms or more +0% +30ms or less
ZSI Zone interlock	STD Short time-delay	ON or OFF
	GF Ground fault trip	ON or OFF
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_r1)(A)=16, 18, 20, 22, 25, 28, 32, 34, 37, 40 In the case of (I_n)=100 A Adjustable to (I_r1)(A)=40, 45, 50, 57, 63, 72, 80, 87, 93, 100 In the case of (I_n)=160 A Adjustable to (I_r1)(A)=63, 70, 80, 90, 100, 110, 125, 135, 150, 160 In the case of (I_n)=250 A Adjustable to (I_r1)(A)=100, 110, 125, 140, 160, 180, 200, 225, 250 Select (I_r1) with the dial. Adjustable in 1 A steps between the selected (I_r1) and the level below (I_r1). 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)×600%
		Time-delay setting tolerance –20% –20ms or more +0% +30ms or less
Short time-delay pick-up current (A) : (I_{sd})		(I_r)×1.5 to 10 (0.5 steps) or OFF ⑥
		Current setting tolerance within ±10%
Short time-delay time settings (ms) : (t_{sd})		50, 100, 200, 300, 400 adjustable
		Ramp characteristics I^2t: ON or OFF However, definite time-delay characteristics with (I_r)×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)×3 to 15 (0.5 step)
		When (I_n) = 160A or 250A, (I_n)×3 to 11 (0.5 step)
		Current setting tolerance within ±15%
N-phase protection pick-up current ⑦ (A) : (I_N)		For 4P (I_r)×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 3ø3W, 4P for 3ø4W (3P 3ø4W not supported ④) When (I_n) = 40A, (I_n)×40% to 100% (5% steps) or OFF When (I_n) = 100A, 160A or 250A, (I_n)×20% to 100% (5% steps) or OFF Current setting tolerance within ±10%
Ground fault trip time settings (ms) : (t_g)		50, 100, 200, 300, 400, 500 adjustable
		Ramp characteristics I^2t: ON or OFF ⑤ However, definite time-delay characteristics with (I_n)×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)×60% to 80% to 95% (5% steps) or OFF Current setting tolerance within ±10%
Preferential trip alarm time settings (s) : (t_p)		(t_r)×5% to 50% to 80% (5% steps) at (I_P)×600% Time-delay setting tolerance –20% –20ms or more +0% +30ms or less
ZSI Zone interlock	STD Short time-delay	ON or OFF
	GF Ground fault trip	ON or OFF
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 × 1.05 and 1.2 or less.

②: In the case of I_n=40A, Ir 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, Ir 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, Ir 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, Ir 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, Ir 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, Ir 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, Ir 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 × 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 × 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_r1)(A)=100, 110, 125, 140, 160, 180, 200, 225, 250 In the case of (I_n)=400 A Adjustable to (I_r1)(A)=160, 180, 200, 225, 250, 300, 350, 370, 400 Select (I_r1) with the dial. Adjustable in 1 A steps between the selected (I_r1) and the level below (I_r1). 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, 5, 7.5, 9, 10, 12, 14, 16 adjustable at (I_r)×600% Time-delay setting tolerance –20% –20ms or more +0% +30ms or less
Short time-delay pick-up current (A) : (I_{sd})		(I_r)×1.5, 2, 3, 4, 5, 6, 7, 8, 10 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× steps on the display. ⑪ Current setting tolerance within ±10%
Short time-delay time settings (ms) : (t_{sd})		50, 100, 200, 300, 400 adjustable Ramp characteristics I^2t: ON or OFF However, definite time-delay characteristics with (I_r)×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)×3 to 12 (0.5 steps) Current setting tolerance within ±15%
N-phase protection pick-up current ⑦ (A) : (I_N)		For 4P (I_r)×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 3ø3W, 4P for 3ø4W (3P 3ø4W not supported ③) (I_n)×20% to 100% (5% steps) or OFF Current setting tolerance within ±10%
Ground fault trip time settings (ms) : (t_g)		50, 100, 200, 300, 400, 500 adjustable Ramp characteristics I^2t: ON or OFF ④ However, definite time-delay characteristics with (I_n)×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)×60% to 80% to 95% (5% steps) or OFF Current setting tolerance within ±10%
Preferential trip alarm time settings (s) : (t_p)		(t_r)×5% to 50% to 80% (5% steps) at (I_P)×600% Time-delay setting tolerance –20% –20ms or more +0% +30ms or less
ZSI Zone interlock	STD Short time-delay	ON or OFF
	GF Ground fault trip	ON or OFF
Start operating characteristics		Hot start/cold start (selectable)

Rated current (I_n) : 630A

Rated current settings (A) : (I_r) ①		Adjustable to (I_r1)(A)=250, 300, 350, 370, 400, 500, 600, 630 Select (I_r1) with the dial. Adjustable in 1 A steps between the selected (I_r1) and the level below (I_r1). 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)×600% Time-delay setting tolerance –20% –20ms or more +0% +30ms or less
Short time-delay pick-up current (A) : (I_{sd})		(I_r)×1.5, 2, 3, 4, 5, 6, 7, 8, 10 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× steps on the display. ⑪ Current setting tolerance within ±10%
Short time-delay time settings (ms) : (t_{sd})		50, 100, 200, 300, 400 adjustable Ramp characteristics I^2t: ON or OFF However, definite time-delay characteristics with (I_r)×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)×3 to 11 (0.5 steps) Current setting tolerance within ±15%
N-phase protection pick-up current ⑦ (A) : (I_N)		For 4P (I_r)×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 3ø3W, 4P for 3ø4W (3P 3ø4W not supported ③) (I_n)×20% to 100% (5% steps) or OFF Current setting tolerance within ±10%
Ground fault trip time settings (ms) : (t_g)		50, 100, 200, 300, 400, 500 adjustable Ramp characteristics I^2t: ON or OFF ④ However, definite time-delay characteristics with (I_n)×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)×60% to 80% to 95% (5% steps) or OFF Current setting tolerance within ±10%
Preferential trip alarm time settings (s) : (t_p)		(t_r)×5% to 50% to 80% (5% steps) at (I_P)×600% Time-delay setting tolerance –20% –20ms or more +0% +30ms or less
ZSI Zone interlock	STD Short time-delay	ON or OFF
	GF Ground fault trip	ON or OFF
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 × 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 × 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.

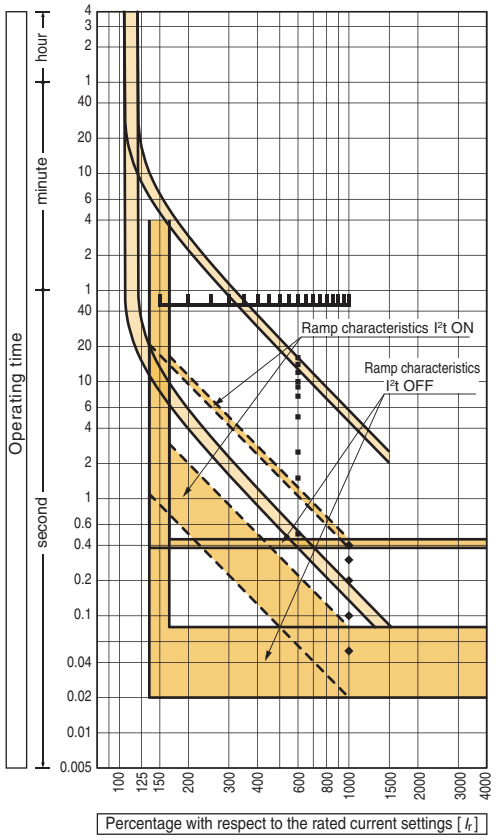
⑩: In the case of I_n=250A, I_r is adjustable in 1A steps between 100, 101 to 110, 111 to 125, 126 to 140, 141 to 160, 161 to 180, 181 to 200, 201 to 225, 226 to 250.
In the case of I_n=400A, I_r is adjustable in 1A steps between 160, 161 to 180, 181 to 200, 201 to 225, 226 to 250, 251 to 300, 301 to 350, 351 to 370, 371 to 400.

⑪: As an example
When the setting dial is set to I_r × 10, on the display, I_{sd}=I_r × 10 –9.5 –9 –8.5 is adjustable.
When the setting dial is set to I_r × 8, on the display, I_{sd}=I_r × 8 –7.5 is adjustable.
When the setting dial is set to I_r × 2, on the display, I_{sd}=I_r × 2 is fixed.

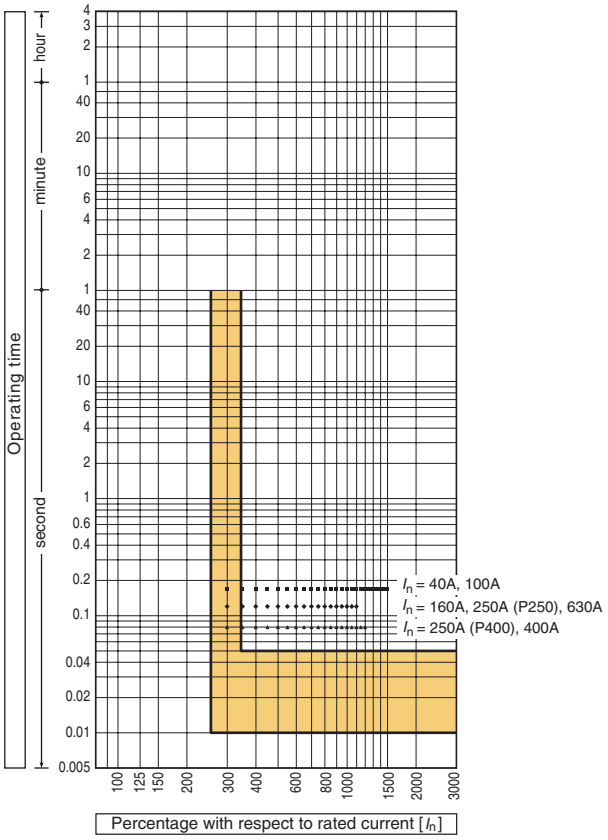
⑫ : I_r is adjustable in 1A steps between 250, 251 to 300, 301 to 350, 351 to 370, 371 to 400, 401 to 500, 501 to 600, 601 to 630.

■ Operating characteristic curve

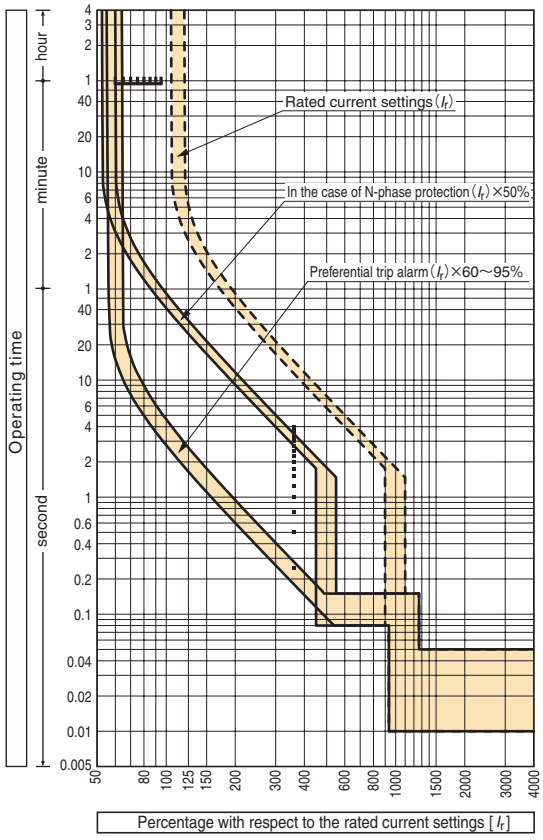
Long time-delay trip, short time-delay trip characteristics



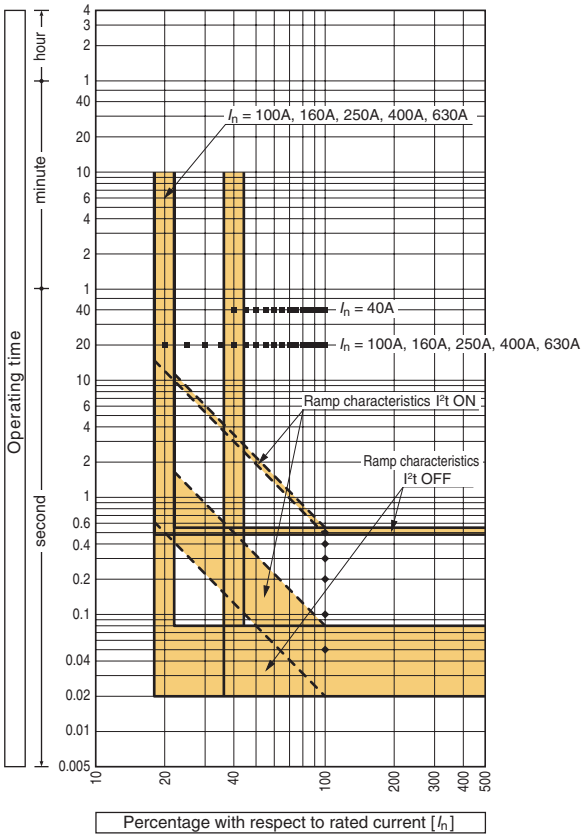
Instantaneous trip characteristics



N-phase protection, preferential trip alarm characteristics



Ground fault trip characteristics

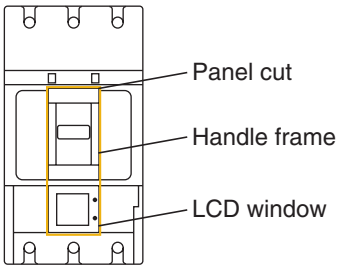


2 High-Performance Electronic Circuit Breaker (XOW type OCR)

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.

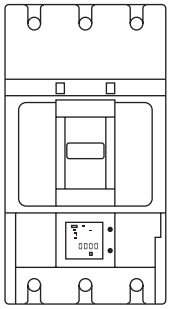
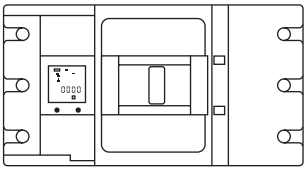
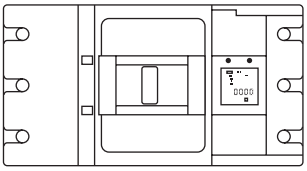
■Appearance

- 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.

■ 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

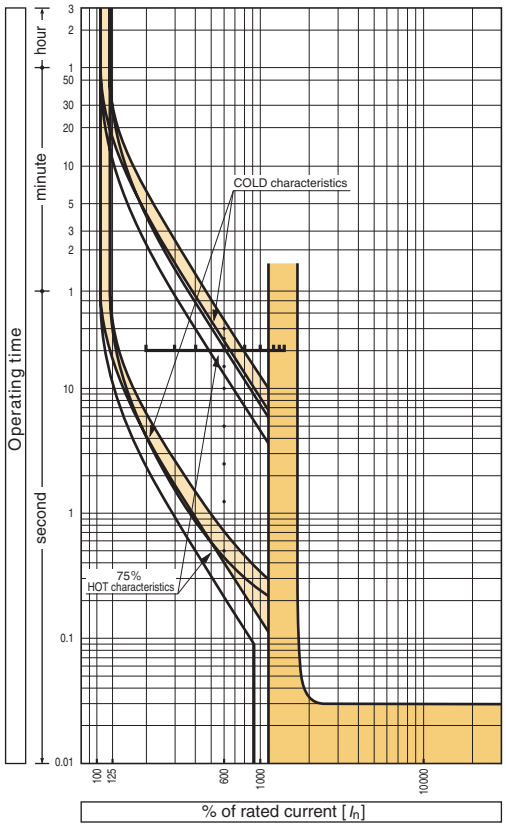
Applicable MCCB type	CT rated primary current I_{CT}
H400-NE, L400-NE	250A
	400A
S800-NE, S800-RE, S800-PE, H800-NE, L800-NE	630A
	800A
S1000-SE, S1000-NE	1000A

Protection function		Symbol	Setting range
Rated current (A)		I_n	[I_{CT}] x (0.5-0.63-0.8-1.0)
Long time-delay trip LT	Pick-up current (A)	I_r	[I_n] x (0.8-0.85-0.9-0.95-1.0) • Non tripping at not more than [I_r] x 1.05 • Tripping at more than [I_r] x 1.05 and not more than [I_r] x 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: ±20%, +0.13s –0s
	COLD / HOT	—	COLD / HOT
Short time-delay trip ST	Pick-up current (A)	I_{sd}	[I_n] x (1-1.5-2-2.5-3-4-6-8-10-NON) ② Current setting tolerance: ±15%
	Time-delay (s)	t_{sd}	I^2t OFF: 0.05-0.1-0.2-0.3s (Definite time characteristic), Time-delay setting tolerance: +50ms –20ms I^2t 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^2t ramp characteristic	—	OFF / ON
Instantaneous trip INST	Pick-up current (A)	I_i	[I_n] x (2-3-4-6-8-10-12-13-14-NON) ④⑤ Current setting tolerance: ±20%
Ground fault trip GF ⑦	Pick-up current (A)	I_g	[I_{CT}] x (0.2-0.3-0.4-NON) Current setting tolerance: ±20%
	Time-delay (s)	t_g	I^2t OFF: 0.1-0.2-0.3-0.4-0.8s (Definite time characteristic) Time-delay setting tolerance: +50ms –20ms I^2t 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^2t ramp characteristic	—	OFF / ON
	Mode	—	TRIP / OFF ⑥
N-phase protection NP	Pick-up current (A)	I_N	[I_{CT}] x (0.4-0.5-0.63-0.8-1.0-NON) • Non tripping at not more than [I_N] x 1.05 • Tripping at more than [I_N] x 1.05 and not more than [I_N] x 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] x (0.2-0.3-0.4-0.5-0.6-0.7-0.8-0.9-1.0) Current setting tolerance: ±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: ±20%, +0.13s –0s
	Mode	—	TRIP / OFF ⑥
Pre-trip alarm PTA	Pick-up current (A)	I_P	[I_n] x (0.7-0.8-0.9-1.0) Current setting tolerance: ±10%
	Time-delay (s)	t_P	5-10-15-20-40-60-80-120-160-200s more than [I_P] Time-delay setting tolerance: ±10%, +0.1s –0s
	Mode	—	AL / OFF ⑥

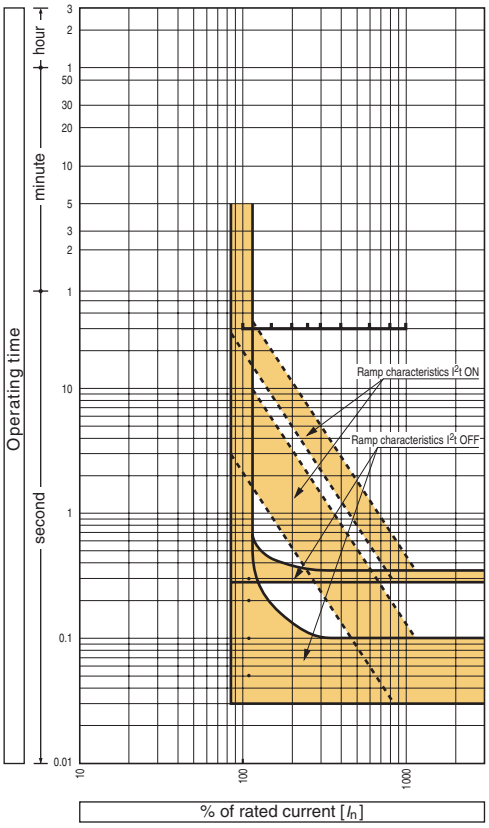
Notes:
① : For S1000, (0.5-1.25-2.5-5-10-15-16)sec.
② : For S1000, [I_n] x (1-1.5-2-2.5-3-4-6-8-NON).
③ : For S1000, 800% or more of [I_n].
④ : The max. pick-up current is set to 1300% x [I_{CT}] for H400 and L400, 1000% x [I_{CT}] for S1000, 1200% x [I_{CT}] for S800, H800 and L800.
⑤ : When the short 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 In is 250A or less.
Unless otherwise specified when ordering, the settings will default to those underlined in the table above.

■ Operating characteristic curve

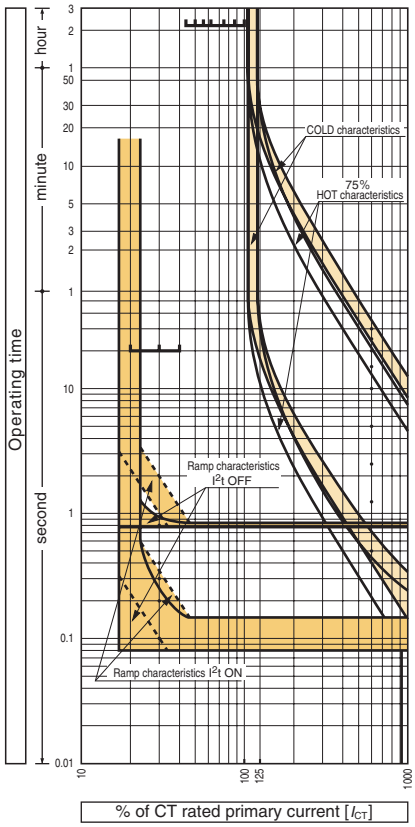
Long time-delay trip, instantaneous trip characteristics



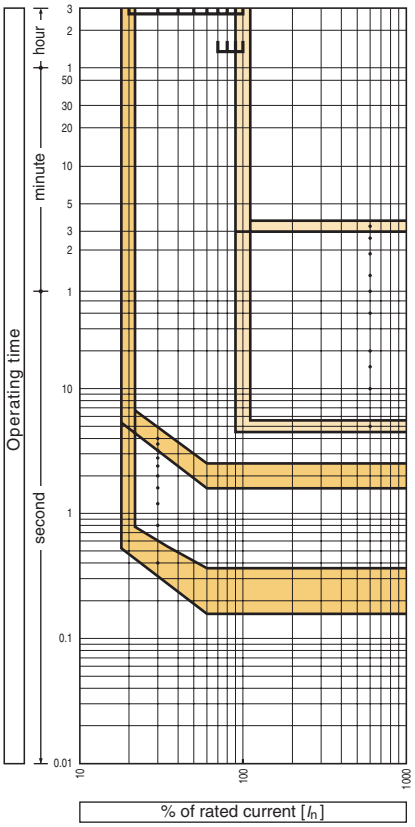
Short time-delay trip characteristics



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.

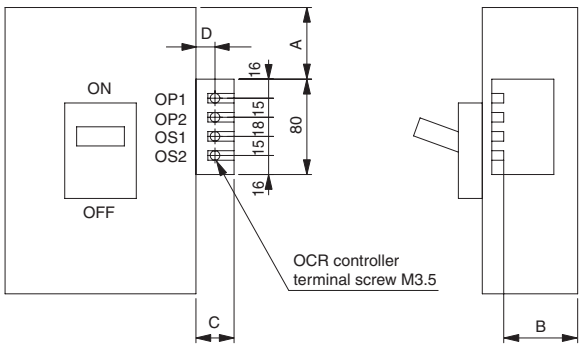
● OCR controller specifications

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.

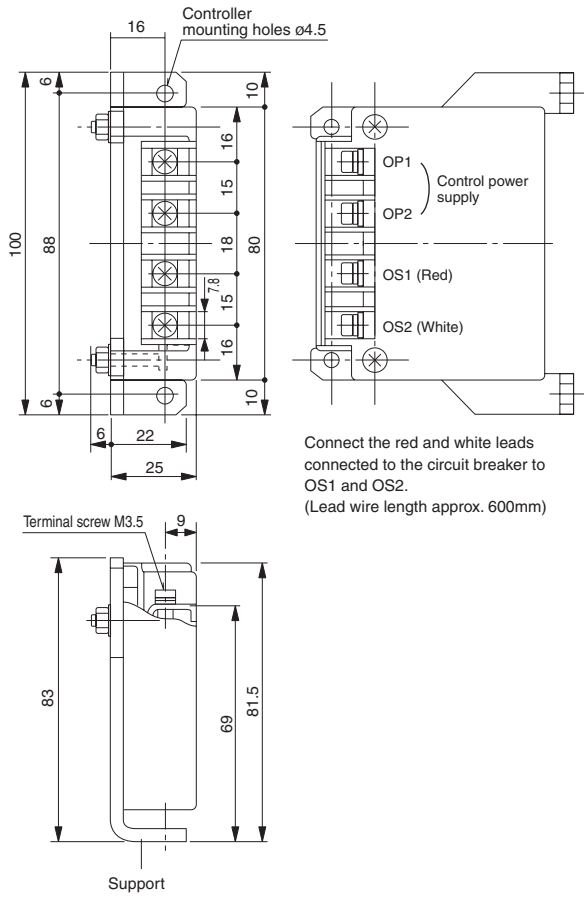
● OCR controller breaker mounting position/terminal arrangement diagram

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



Connect the red and white leads connected to the circuit breaker to OS1 and OS2.
(Lead wire length approx. 600mm)

5 Mounting and Connection

Connecting parts

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

1. Extension bars for front conection

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 Moulded Case Circuit Breakers	Min order qty	Plug-in base (pcs)
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**	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

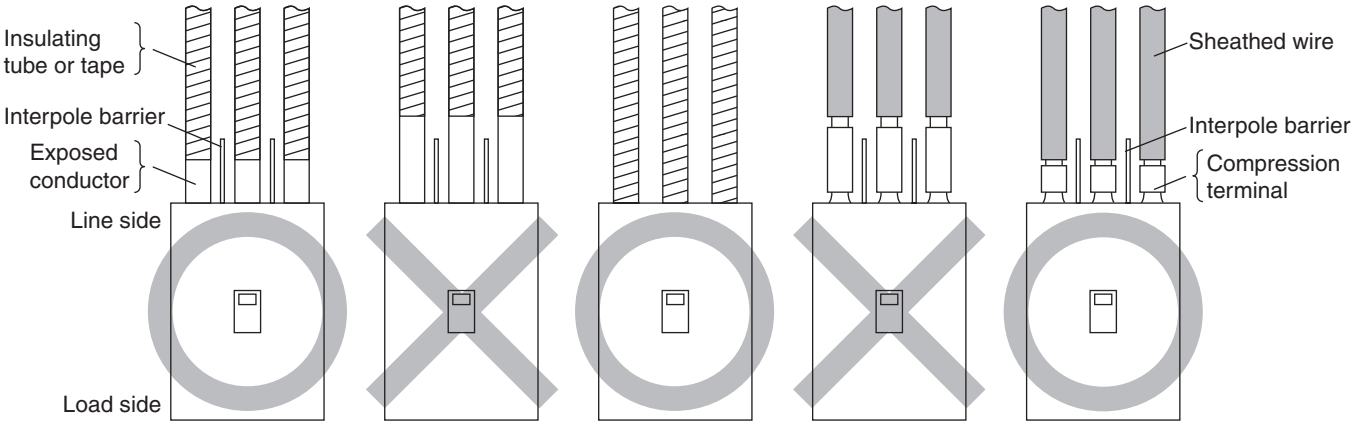
Remarks: Normally the plug-in base should be ordered at the same time as the breaker body. However, please order it if you will connect the plug-in base in advance.
Note: ① If internal accessories are fitted in the circuit breaker, auxiliary circuit terminals for IP20 are required. Please specify "IP20 applied product" when ordering the circuit breaker body.

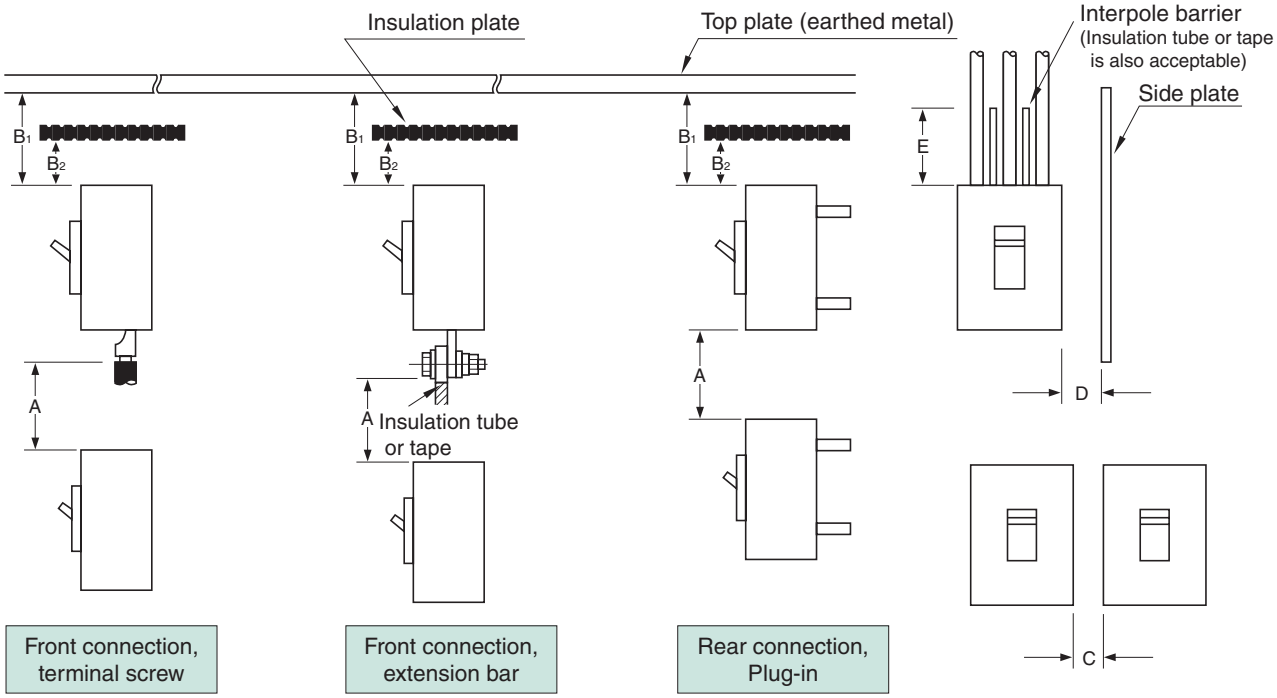
5 Mounting and Connection

Moulded Case Circuit Breakers

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).
B_1 : Distance from end face of breaker to top plate.
B_2 : 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	100 Note ⑤	80	60	Possible to set close Note ⑥	80	Not less than the length of the bare live part
	P630E	100 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	100 Note ⑤	80	60	Possible to set close Note ⑥	80	Not less than the length of the bare live part
	P400N	100 Note ⑤	80	60	Possible to set close Note ⑥	80	Not less than the length of the bare live part
	P400H	100 Note ⑤	80	60	Possible to set close Note ⑥	80	Not less than the length of the bare live part
	P630F	100 Note ⑤	80	60	Possible to set close Note ⑥	80	Not less than the length of the bare live part
	P630N	100 Note ⑤	80	60	Possible to set close Note ⑥	80	Not less than the length of the bare live part
	P630H	100 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
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
		160A	156	152	149	144
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
	Front Rear	160A	156	151	146	142
H160-NJ **L160-NJ**	Front Rear Plug-in	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
		250A	242	233	224	215
H250-NJ **L250-NJ**	Front Rear Plug-in	160A	151	147	143	NA
	Front Rear	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	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

1. TPOT type and TPOP type electronic OCR

(1) Overcurrent trip characteristics

■ TPOT type and TPOP type OCR applicable breakers

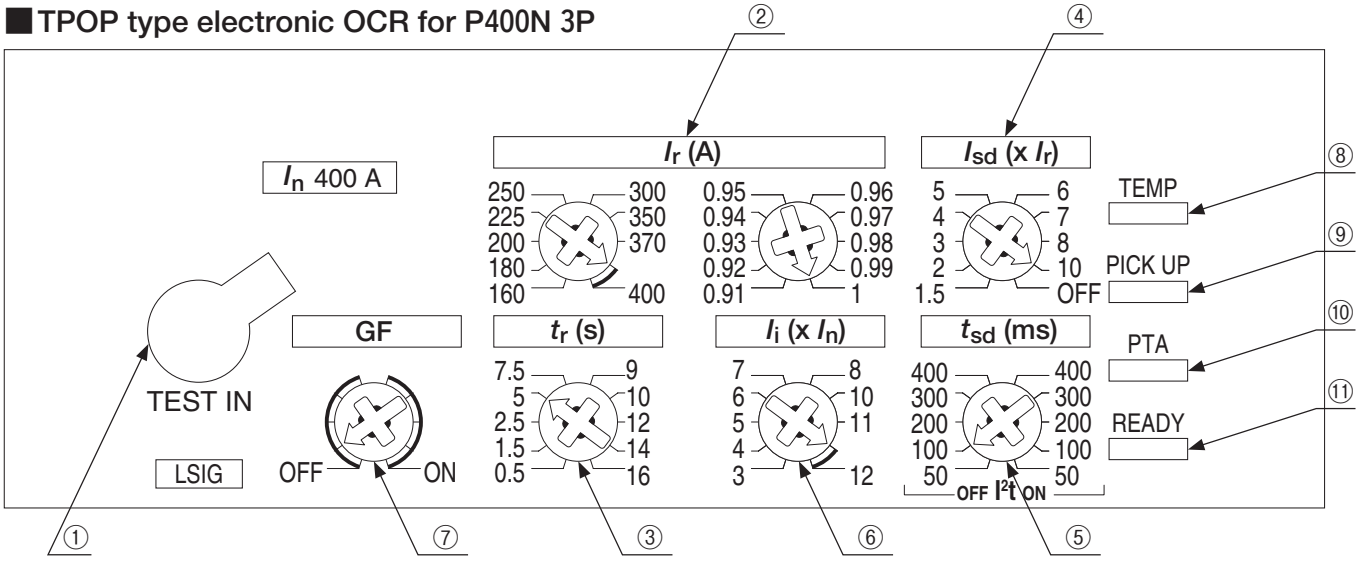
Type of breaker	Rated Current (I_n) (A)
P160F, P160N, P160H	40, 100, 160
P250F, P250N, P250H	40, 100, 160, 250
P400F, P400N, P400H, P400S	250, 400
P630F, P630N, P630H, P630S	630

The TPOT electronic OCR is an overcurrent trip device with three elements: long time-delay trip, short time-delay trip, and instantaneous trip. It also has a preferential trip alarm function.
There are six dials to set the long time-delay trip time, short time-delay current, short time-delay time and instantaneous trip current. Two dials are assigned to allow the long time-delay trip current to be finely tuned.

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 settigs 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% × I_r to 112.5% × I_r: Flashing
During energisation at 112.5% × 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 TPPHQTT130H).

■OCR characteristics for P400N

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

Rated current settings (A) (I_r) = (I_r1)×(I_r2) ③	When (I_n)=250 A (I_r1) (A)=100, 110, 125, 140, 160, 180, 200, 225, 250 adjustable When (I_n)=400A (I_r1) (A)=160, 180, 200, 225, 250, 300, 350, 370, 400 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, 5, 7.5, 9, 10, 12, 14, 16 adjustable at (I_r)×600%
	Time-delay setting tolerance –20% –20ms or more +0% +30ms or less
Short time-delay pick-up current (A) : (I_{sd})	(I_r)×1.5, 2, 3, 4, 5, 6, 7, 8, 10 or OFF
	Current setting tolerance within ±10%
Short time-delay time settings (ms) : (t_{sd})	50, 100, 200, 300, 400 adjustable
	Ramp characteristics I^2t: ON or OFF However, definite time-delay characteristics with (I_r)×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)×3, 4, 5, 6, 7, 8, 10, 11, 12 adjustable
	Current setting tolerance within ±15%
N-phase protection pick-up current (A) : (I_N)	For 3P OFF fixed ④
	For 4P (I_r)×50%, 100% 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 3ø3W and 4P 3ø4W (3P 3ø4W not supported) or OFF ⑦ (I_n)×20% Current setting tolerance within ±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)×80% Current setting tolerance within ±10%
Preferential trip alarm time settings (s) : (t_p)	(t_r)×50% at (I_P)×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) × 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) × 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.

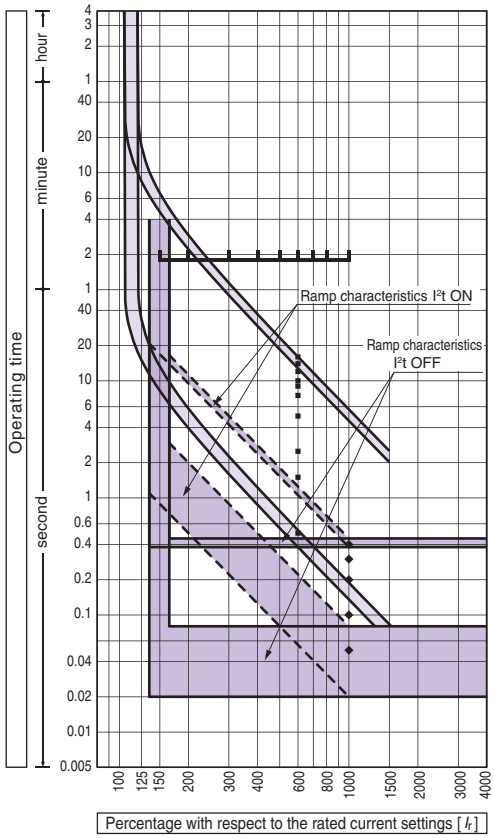
⑧: The ON/OFF of the ground fault trip ramp characteristics conforms to the short time-delay trip settings. However, (I_n) × 1 or more with definite time-delay characteristics.

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

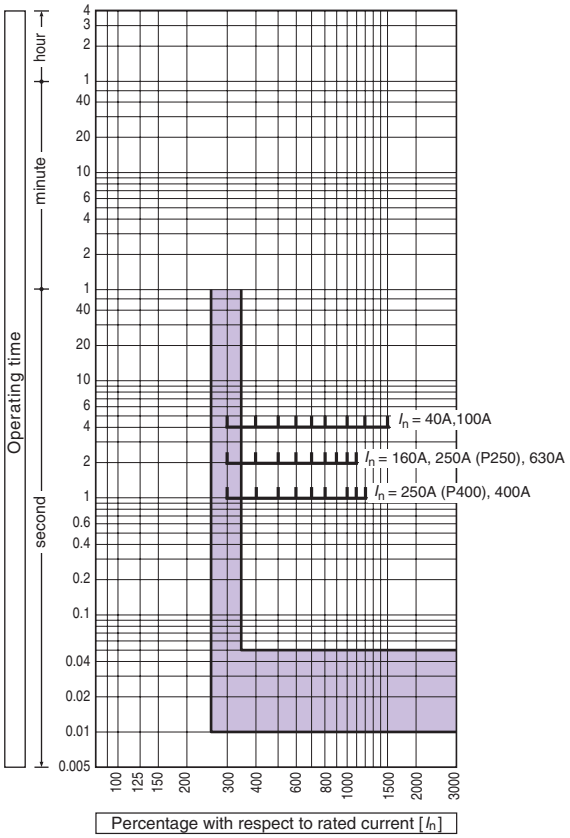
Remarks 2:
The TPOT type OCR (LSI) only has long time-delay trip, short time-delay trip, instantaneous trip, and preferential trip alarm.

■ TPOT type and TPOP type OCR operation characteristic curves

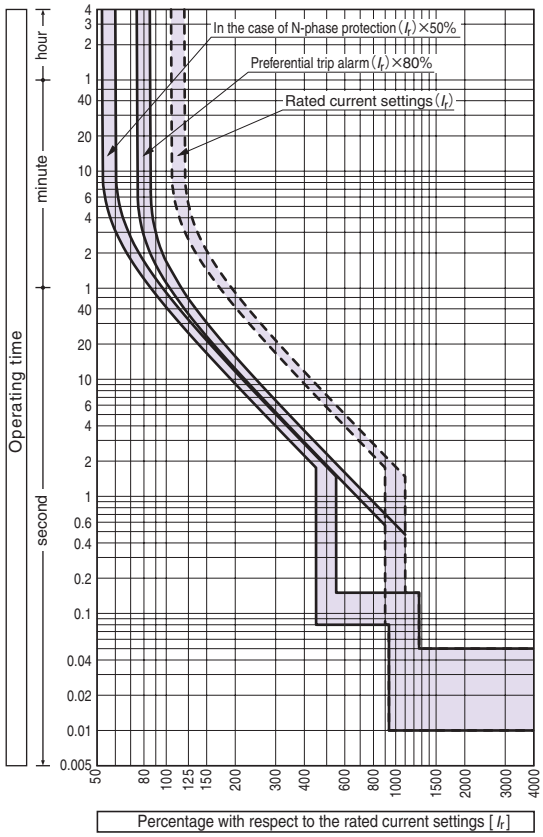
Long time-delay trip, short time-delay trip characteristics



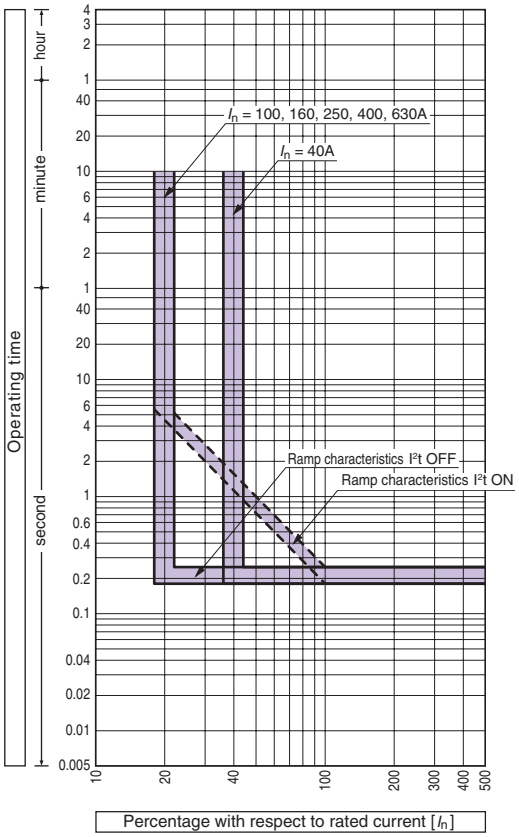
Instantaneous trip characteristics



N-phase protection, preferential trip alarm characteristics



Ground fault trip characteristics



(2) Alarm function/protective function

■ Preferential trip alarm (PTA)

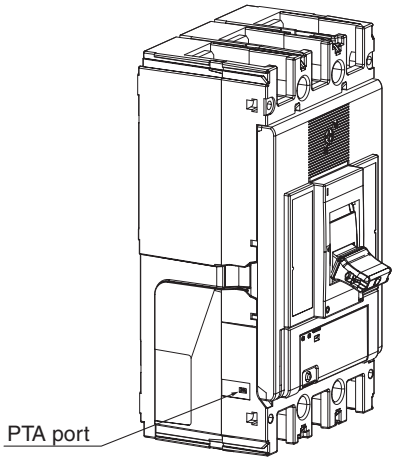
The load current is constantly monitored and if it exceeds the preferential trip alarm pick-up current I_p (= rated current setting (I_r) × 80%), the LED flashes and then the LED lights up and the contacts close at the operating times shown in the table below. If the load current becomes equal to or 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 × 200%	2.6	7.7	13	26	38	46	51	61	71	82
	For I_p × 600%	0.3	0.8	1.3	2.5	3.8	4.5	5.0	6.0	7.0	8.0
	For I_p × 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.

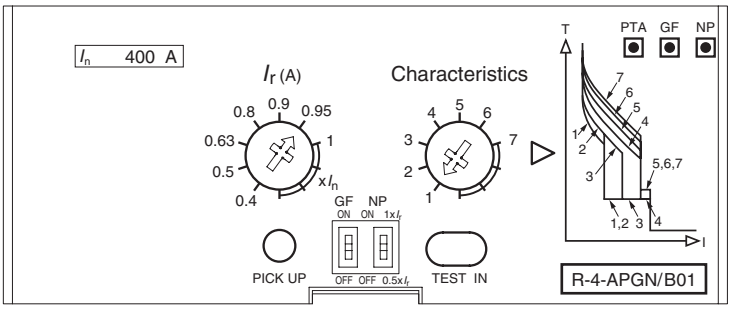
■ TPCH00 type OCR checker

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.

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)×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)×200%			at (I_r)×600%			
		Setting tolerance ±20%						
Short time-delay pick-up current (A) : (I_{sd})		(I_r)× 2.5	2.5	5	10	10	10	10
		Setting tolerance ±15%						
Short time-delay time settings (s) : (t_{sd})		0.1	0.1	0.1	0.1	0.2	0.2	0.2
		Total clearing time +50ms, resettable time –20ms						
Instantaneous trip pick-up current (A) : (I_i)		(I_r)×1400% Max. (I_n) × 1300% Setting tolerance ±20%						
Option	Preferential trip alarm							
	Pick-up current (A) : (I_p)	(I_r)×80% Setting tolerance±10%						
	Time-settings (s) : (t_p)	Definite time-delay characteristic, 40sec. Setting tolerance±10%						
	Ground falut trip							
	Pick-up current (A) : (I_g)	(I_n)×20% Setting tolerance±15% ①						
	Time-settings (s) : (t_g)	Difinite time-delay characteristic, 0.2sec. Total tripping time +50ms, resettable time –20ms.						
	Neutral protection							
	Pick-up current (A) : (I_N)	(I_r)×100% or 50% selectable ②						
	Time-settings (s) : (t_N)	(t_N)=(t_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)×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.

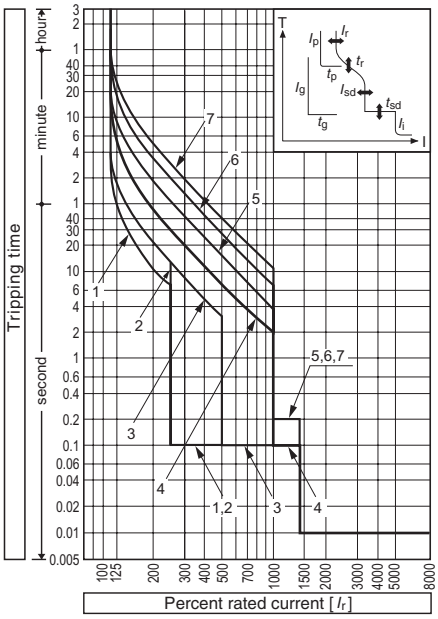
Characteristics 5, 6 and 7: For motor protection.

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.

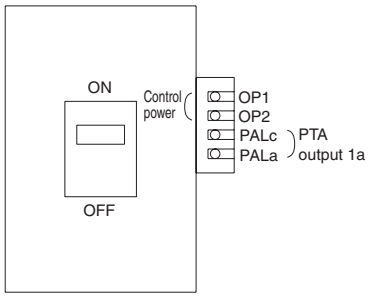
Contact rating

Operating time (s) (t_p)	40 secs (fixed definite time-delay) setting tolerance is ±10%.		
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)
	Rating of contact 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 connection diagram

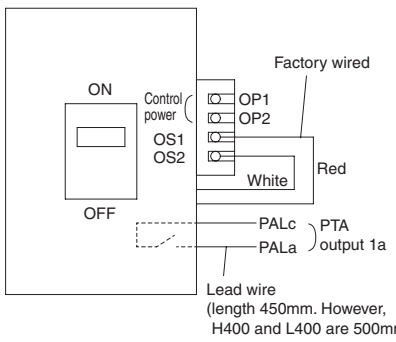
Applicable breakers: H250-NE



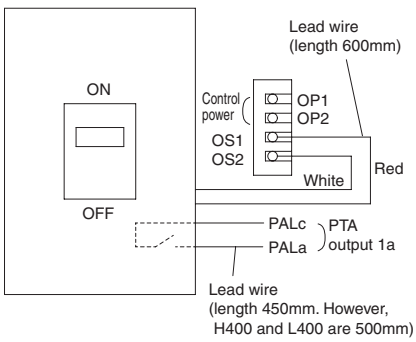
Note ③ : Separate installation of the OCR controller is not available. Flush-mounted type (FP) cannot be used.

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

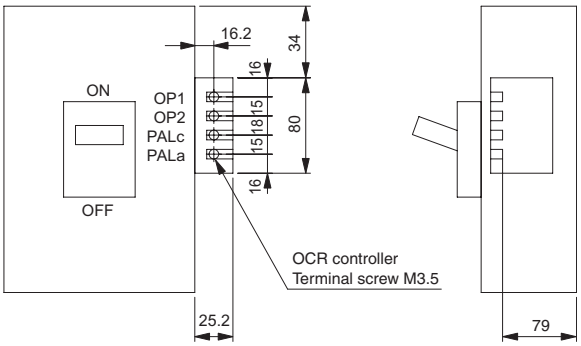


Note 4 : Standard installation of the OCR controller is on the right side of the breaker. Separate installation is standard for the flush-mounted breakers.

(2) Optional OCR functions

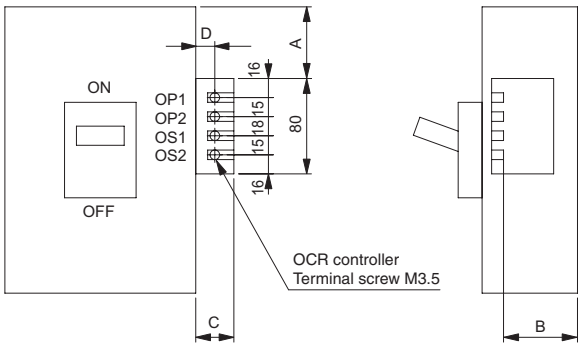
- Mounting dimensions and terminal arrangement of the OCR controller installed on the breaker

Applicable breakers: **H250-NE**



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

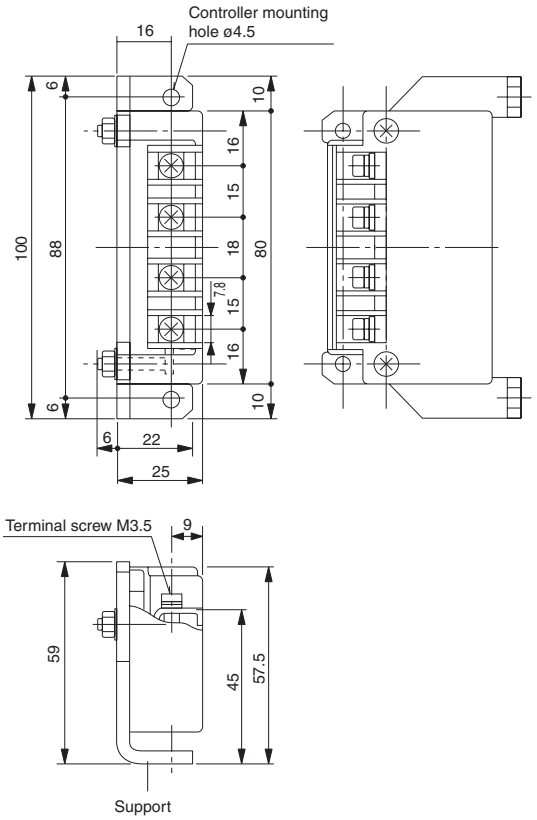
Applicable breakers		A(mm)	B(mm)	C(mm)	D(mm)
H400-NE, L400-NE, L400-PE	3P、4P	71	111	25.2	16.2
S800-NE/RE/PE, S1000-SE/NE	3P、4P	62.5	74	25.2	16.2
H800-NE, L800-NE, L800-PE	3P、4P	62.5	111	25.2	16.2
S1250-SE/NE/GE	3P	33	72	21	12
	4P	43	72	21	12
S1600-SE/NE	3P	33	92	21	12
	4P	43	92	21	12



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

- Outline of the OCR controller installed external to the breaker

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



■ 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 neural 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 cannnot be turned off.

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

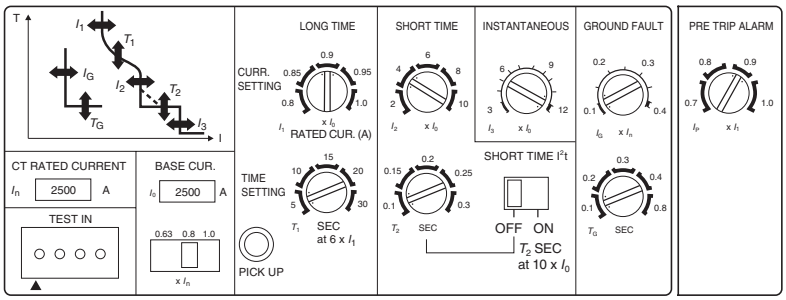
■ TNS-3 type OCR checker

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.

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

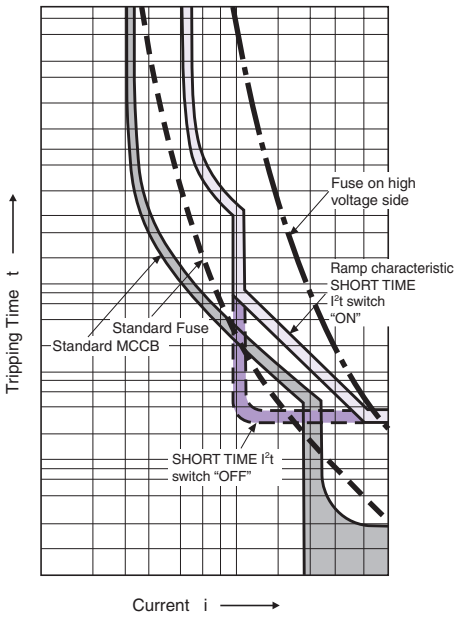
With XOS type electronic OCR, the long time-delay trip, short time-delay trip, instantaneous trip, ground fault trip setting values can be independently changed.
You can set the ramp characteristics for short time-delay to facilitate selective coordination with downstream circuit breakers and fuses.
The ramp characteristics and the definite time-delay characteristics can be switched with the SHORT TIME I²t switch in the OCR unit.

■ OCR characteristics for XS2500NE

CT rated current (A) : (I_n)	2500
Base current setting (A): (I_o)	(I_n) × (0.63-0.8-1.0)
Long time-delay pick-up current (A) : (I_1)	(I_o) × (0.8-0.85-0.9-0.95-1.0) Non-tripping at (I_1) setting × 105% and below. Tripping at 125% & above.
Long time-delay time settings (S) : (T_1)	(5–10–15–20–30) at (I_1) × 600% current. Setting tolerance ±20%
Short time-delay pick-up current (A): (I_2)	(I_o) × (2-4-6-8-10) Setting tolerance ±15%
Short time-delay time settings (S) : (T_2)	Opening time (0.1, 0.15, 0.2, 0.25, 0.3) in the definite time-delay. Total clearing time is +50ms and resettable time –20ms for the time-delay setting.
Instantaneous trip pick-up current (A) : (I_3)	Continuously adjustable from (Io) × (3 to 12) Setting tolerance ±20%
* Pre-trip alarm pick-up current (A) : (I_P)	(I_1) × (0.7, 0.8, 0.9, 1.0) Setting tolerance ±10%
* Pre-trip alarm time setting (S) : (T_P)	40 fixed definite time-delay.Setting tolerance ±10%
* Ground fault trip pick-up current (A) : (I_G)	Continiuously adjustable from (I_n) × (0.1 to 0.4) Setting tolerance ±15%
* Ground fault trip time setting (S) : (T_G)	Opening time (0.1-0.2-0.3-0.4-0.8) in the definite time-delay. Total clearing time is +50ms and resettable time 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

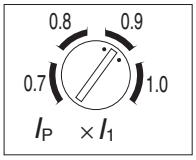


(2) Optional OCR functions

■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 ±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 ±10%.		
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)
	Rating of contact 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)

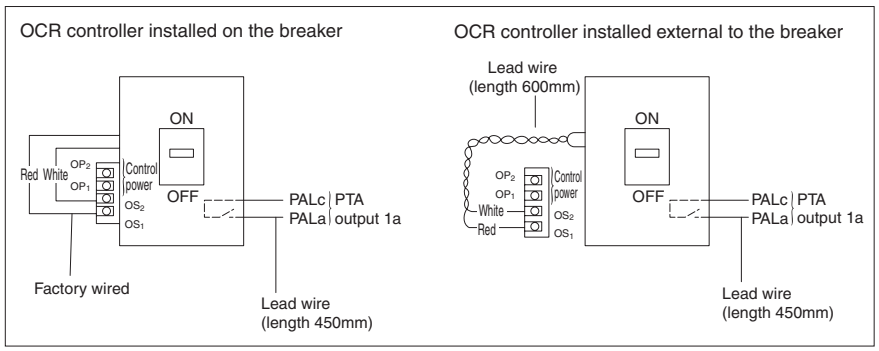
The OCR controller is installed in the left side of the breaker (standard). This can also be installed externally to the breaker (please specify when ordering).

● Specifications of OCR controller

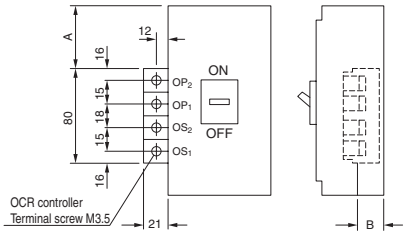
Power voltage ② (Rated voltage)	100 – 120V AC or 200 – 240V AC
Power consumption, VA	2VA

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

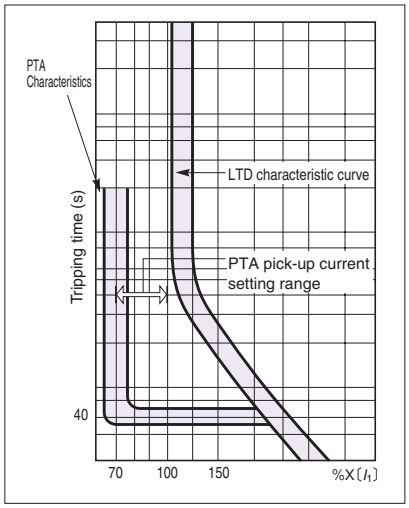


Dimension table (mm)

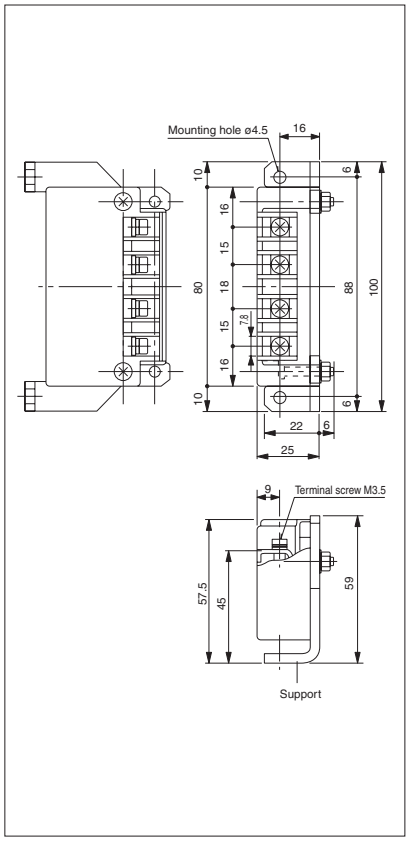
Type of MCCB	A		B
	With UVT contoroller	Without UVT contoroller	
XS2000NE XS2500NE XS3200NE	54	180	115

Remarks 1): Standard torque for the terminal screws M3.5 ····· 0.9 – 1.2Nm
2): Applicable cable size ····· Max. 2.0mm²

● PTA Characteristics



● Outline of the OCR controller installed external to the breaker

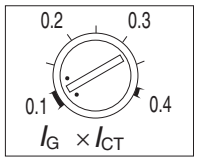
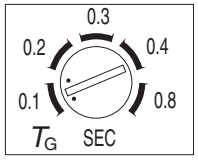


(2) Optional OCR functions

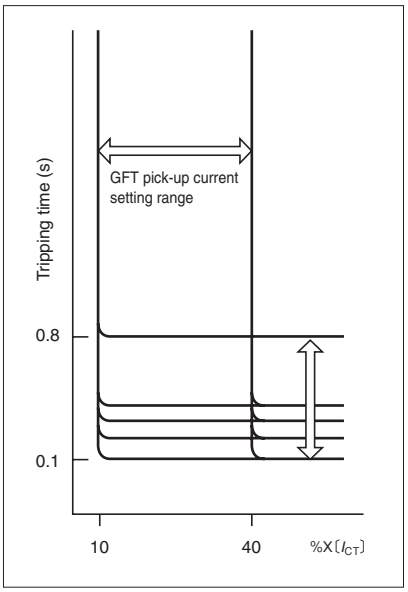
■ Ground fault trip (GF)

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 ±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.

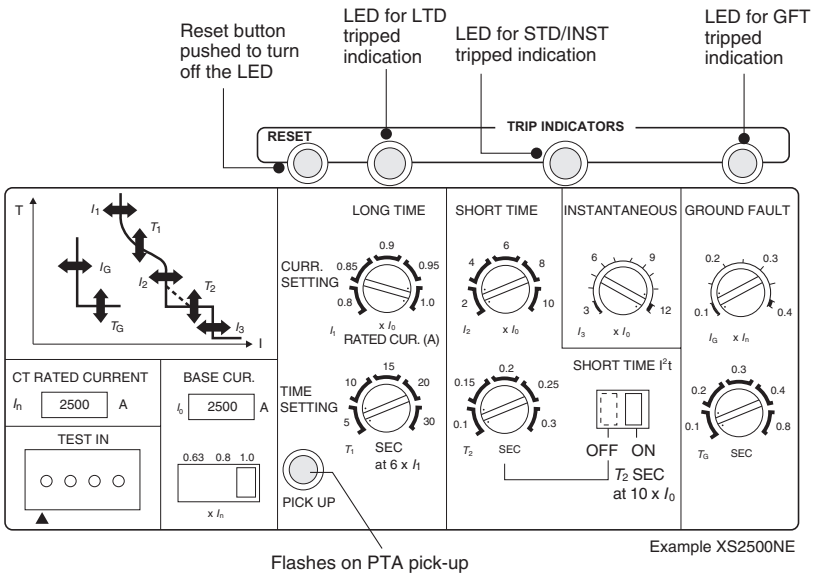
● GF characteristics



■ 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



Example XS2500NE

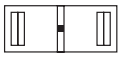
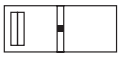
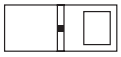
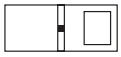
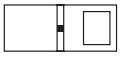
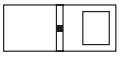
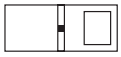
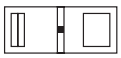
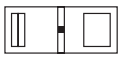
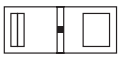
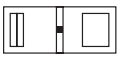
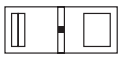
■ TNS-3 type OCR checker

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 E	E160-SF, S160-SCF	E160-SF, E160-SJ				E250-SCF, E250-SCJ, E250-SF, E250-SJ
Type S		S160-SCF, S160-SCJ, S160-SF, S160-SJ	P160F, P160N, P160H		P250F, P250N, P250H	
Type H				H125-NJ, H160-NJ, H250-NJ, H250-NE		
Type L				L125-NJ, L125-PJ, L160-NJ, L250-NJ		
Type 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	3 ②	3 ②	3
Combinations of accessories	AX				
	AL				
	SH				
	UV				
	AX – AL				
	AX – SH				
	AX – UV				
	AL – SH				
	AL – UV				
	AX – AL – SH				
	AX – AL – UV				

Notes:
①: 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	

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)			Minimum load	DC(V)		Minimum load
	Voltage (V)	Current (A)		Voltage (V)	Current (A)			Voltage (V)	Current (A)	
		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	DC5V 1mA
	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	DC5V 1mA DC30V 1mA
	250	5	5	125	0.6	0.6				
	125	5	5	30	5	4				

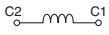
Note: ① This is a custom-built product. When ordering for this product, specify that it is intended for microlead use.
Remarks: The inductive load means power factor of no smaller than 0.4 for AC and time constant of no larger than 7 ms for DC.

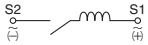
(2) Operation of AX and AL

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**		0.016	0.016	0.0068	0.124	0.032	0.014	0.012	 Without anti-burn switch
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**		0.015	0.015	0.0065	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) ①				Exciting current, (mA) ①		
	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

Note: ①: No UVT controller is required.
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) ①						Exciting current, (mA) ①		
	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

Note: ①: No UVT controller is required.
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.)

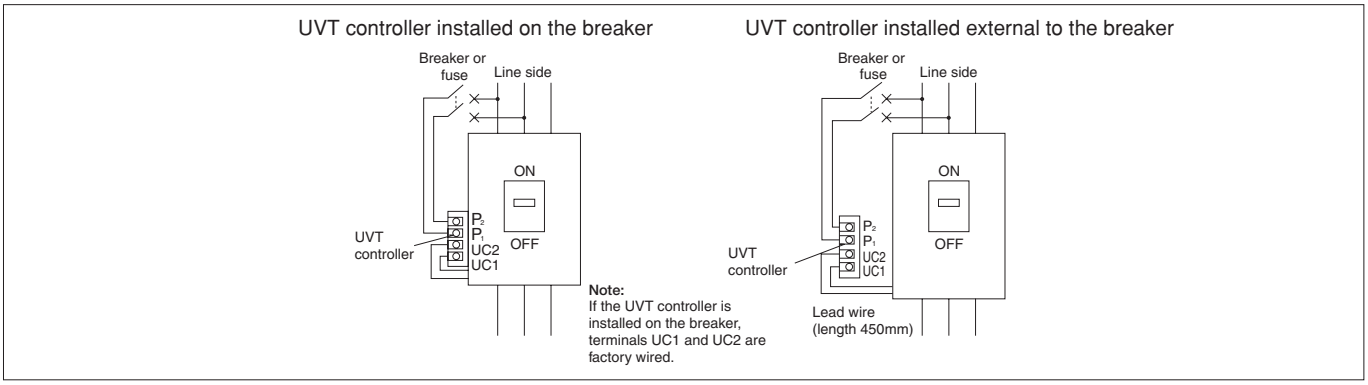
(2) Instantaneous UVT (with UVT controller)

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	—

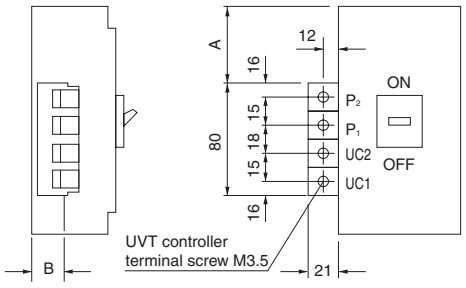
Note: ①: No UVT controller is required. Note: ②: Equipped with the UVT controller.
Remarks:
(1) Tripping voltage is 70 to 35% of the rated voltage. Resettable voltage is 85% or less of the rated voltage.
(2) When the breaker is in OFF position and becomes no control voltage, the UVT may trip or maintain 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 dimensios and terminal arrangement of the UVT controller installed on the breaker

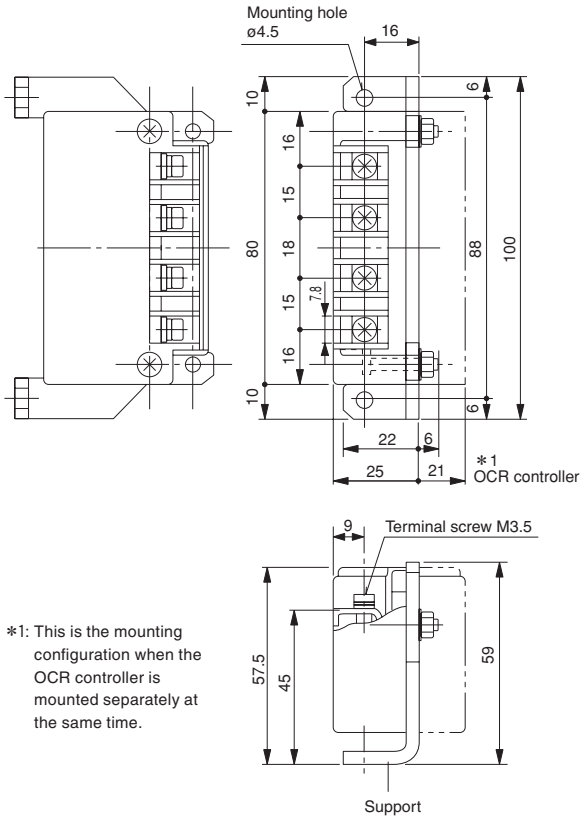


Mounting dimensions

Type of breaker	A	B
XS2000NE, XS2000NN XS2500NE, XS2500NN XS3200NE, XS3200NN	180	115

Remarks:
(1) Tightening torque of terminal screws M3.5: 0.88 – 1.18 Nm
(2) Applicable wire size: 2.0 mm² max

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



*1: This is the mounting configuration when the OCR controller is mounted separately at the same time.

4. Undervoltage trip device (UV)

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

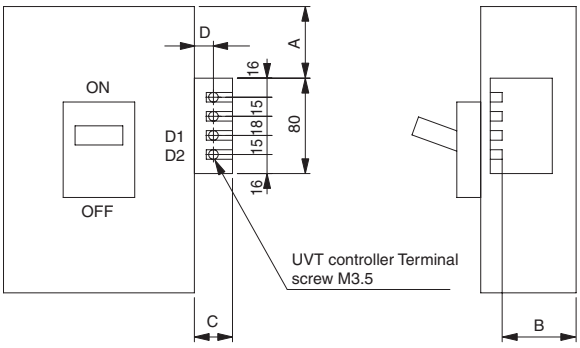
For the time-delay type UVT, the UVT controller is mounted on the circuit breaker body.
UVT controllers are available with 500 ± 300 ms operating times.

Applicable breakers	Power supply capacity, (VA)						Exciting current, (mA)				
	Rated voltage	AC (V)						DC (V)			
		100-110	115-120	200-220	230-240	380-415	440-450	24	100-110	115-120	200-220	230-240
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

● Mounting dimensios 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

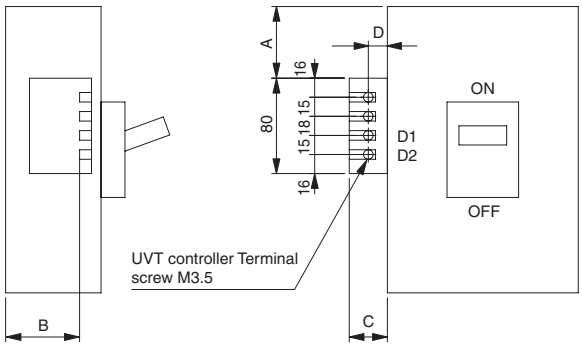
・The UVT controller is installed in the right side of the breaker



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

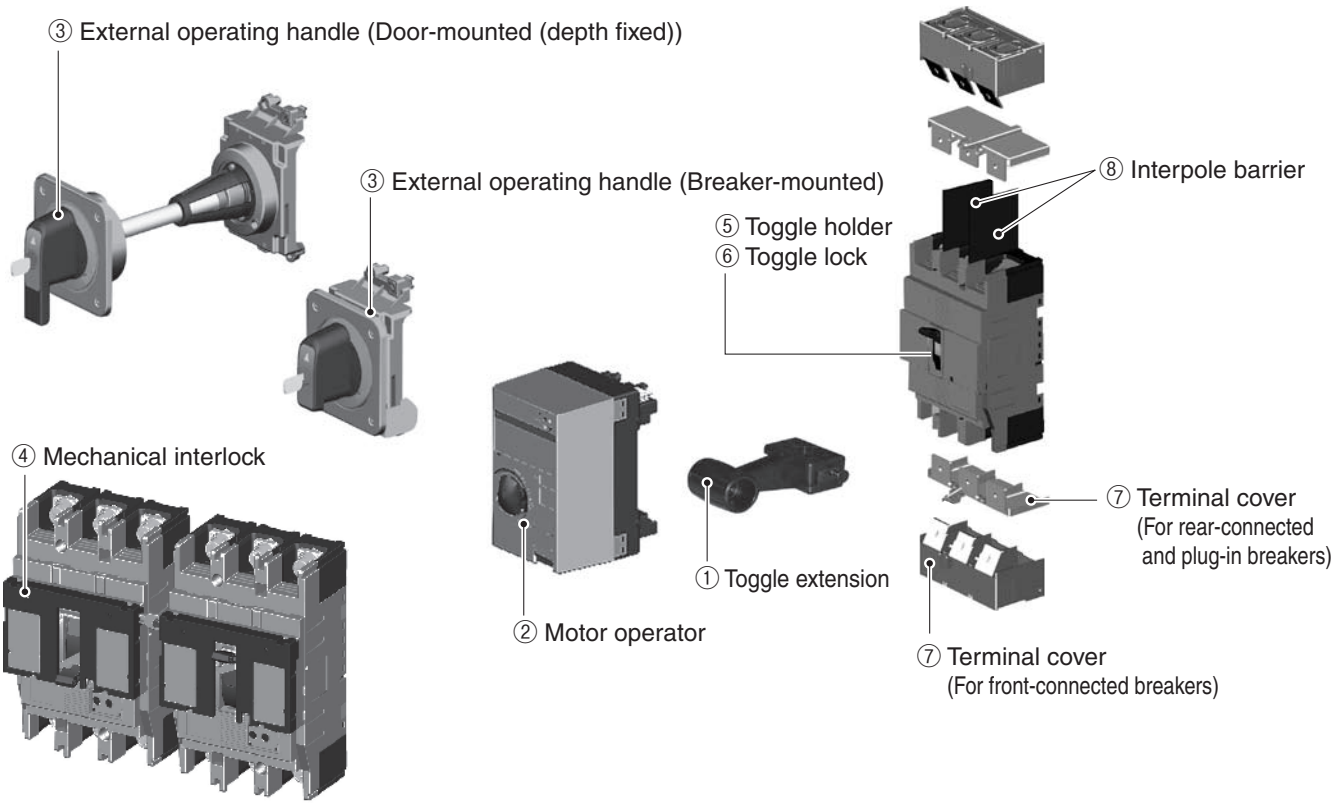
Applicable breakers	A(mm)	B(mm)	C(mm)	D(mm)
S1250-SE/NE/GE/NN	114	72	21	12
S1600-SE/NE/NN	114	92	21	12

・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



①Toggle extension ——— HA
Lessens the force require to close, open or reset the breaker.

②Motor operator ——— MC
Allows electrical operation (closing, opening and resetting) of the breaker.

③External 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

④Mechanical 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

⑤Toggle holder ——— HH
Holds the breaker ON or OFF when simply fitted onto the breaker toggle.

⑥Toggle lock ——— HL
Allows the breaker to be locked ON or OFF with commercially available padlocks.

⑦Terminal 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

⑧Interpole barrier ——— BA
Enhances electrical insulation between poles and prevents shortcircuit due to electrically conductive foreign matter.

⑨Terminal block ——— TF
Terminates lead wires from internally mounted accessories.

⑩Door flange ——— DF
Is intended to cover the cutout of a switchboard panel from the front.

⑪DIN rail adaptor ——— DA
Allows the breaker to be mounted on DIN rails.

2. Toggle extension (HA)

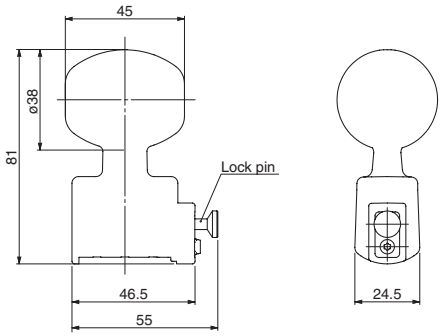
Reduces the force of ON, OFF, and RESET operations.

Outline dimensions

T2HA40L

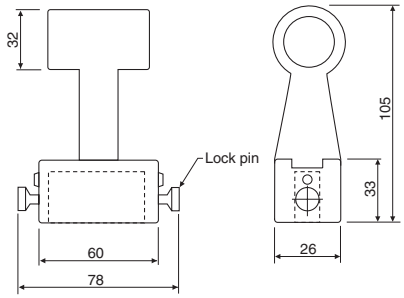
Frame size (A)	Type of breaker	Toggle extension Order code
400	**P400E/F/N/H/S/D, H400-NE, L400-NE, L400-PE**	T2HA40L
630	**P630E/F/N/H/S/DE**	

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.

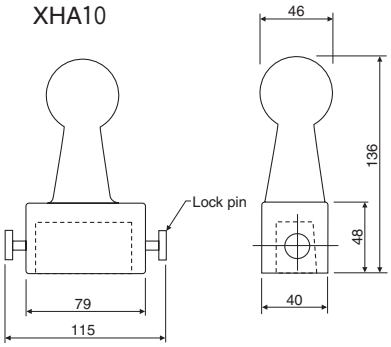


Outline dimensions

T2HA80

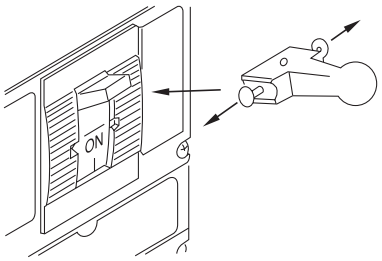


XHA10



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**		
2000	**XS2000NE/NN**	③	XHA10
2500	**XS2500NE/NN**		
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

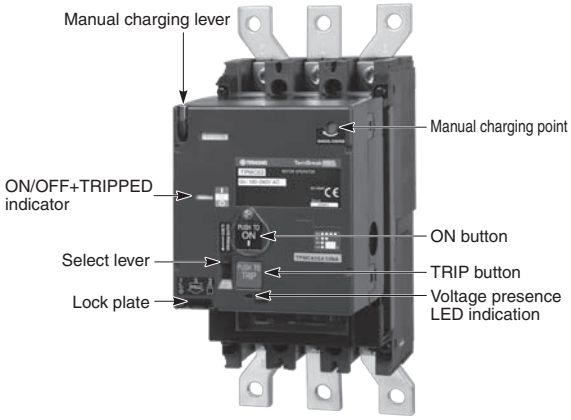
This capability allows the breaker to be padlocked in the OFF state. Up to thee padlocks with a 5 to 8 mm hasp diameter can be used.Padlocks are not supplied.

★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.

(T2MC25/25L, TPMC16S, TPMC25S)

Motor driven type



(T2MC40, TPMC63S, T2MC80)

Spring charged type

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

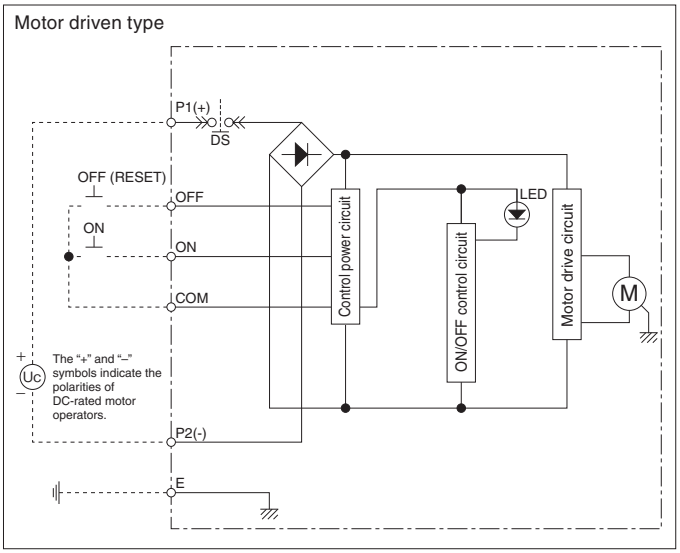
Interlock cables Order codes	Length	Remarks
T2MM25L05	500mm	An electrical interlock is adopted between T2MC25/25L, TPMC16S, and TPMC25S types.
T2MM25L15	1500mm	
T2MM40L06	600mm	An electrical interlock is adopted between T2MC40, T2MC80, and TPMC63S types.
T2MM40L21	2100mm	
T2MM40S06	600mm	An electrical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

Operation precautions

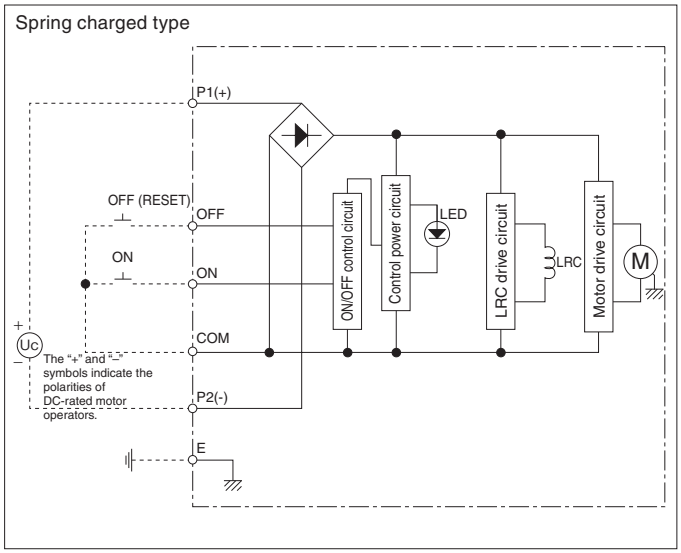
1. Ensure that the actual operation voltage ranges from 85% to 110% of the rated one.
2. Use operation switches whose ratings and power capacity is as specified in the “Ratings and Specifications” table on the previous page.
3. Ensure an operating time of 50 msec or more when operating switches to turn 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

Motor driven type

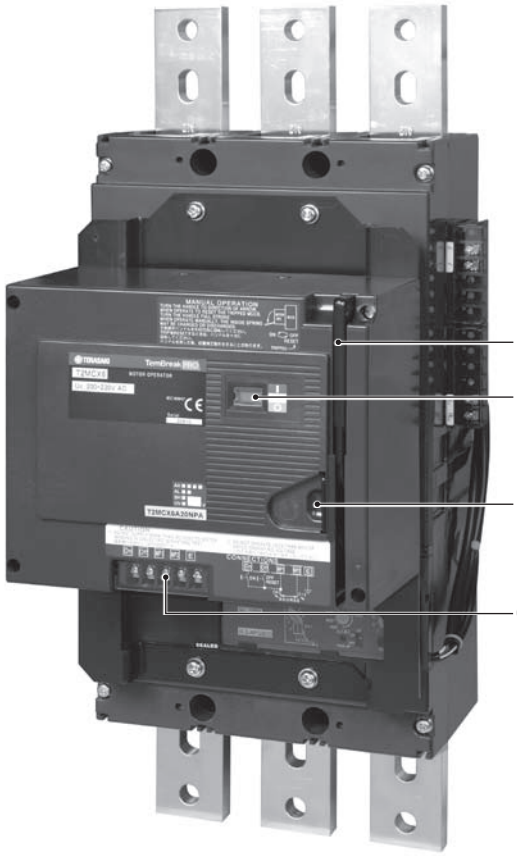


Spring charged type



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.

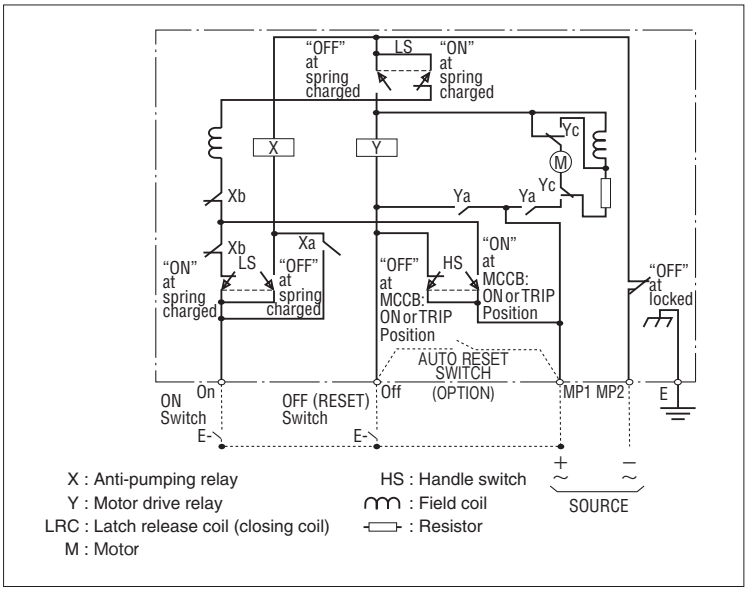
Notes: 1. For S1250 and S1600, installable alarm switch will be only 1 piece.
2. When the breaker is equipped with the auto-reset option, a signal self-hold circuit is required because the signal provided by the alarm switch is a pulse.
3. Not applicable to thermal-magnetic breakers

Manual operation ✻

■ Breaker ON . OFF (RESET)

Pulling down the manual operating handle turns the breaker ON and OFF/REST 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

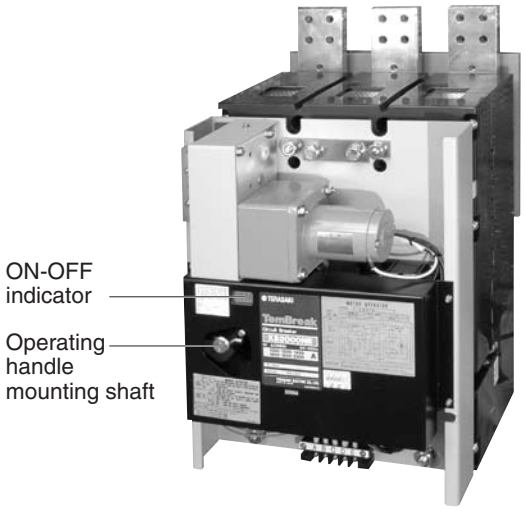


Operation Precautions

- 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).
- f 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.

3. Motor operators (MC)

(4) XMB large motor operators



Motor driven type

Ratings and Specifications

		XMB10	XMB12
Applicable breakers	XS	**XS2000NE, XS2000NN, XS2500NE, XS2500NN**	**XS3200NE, XS3200NN**
Rated operational voltage ①		●100-110V AC ●200-220V AC ●100-110V DC	●100-110V AC ●200-220V AC ●100-110V DC
Auto reset		Optional ②	Optional ②
Steady-state current / Starting current (Peak value) (A) ③	100-110V AC	0.85/3.5	0.85/3.5
	200-220V AC	1.3/2.1	1.3/2.1
	100V DC	1.1/2.5	1.1/2.5
	110V DC	1.2/3.0	1.2/3.0
Operation method		Motor driven	Motor driven
Operating time, (s)	ON	2.0 ③	2.0 ③
	OFF/ RESET	1.6 ④⑤	1.6 ④⑤
Operating switch ratings		250V, 5A	250V, 5A
Power supply required		300VA or higher	300VA or higher
Dielectric withstand voltage (for one minute)		1000V AC	1000V AC
Weight		16kg	16kg

Notes:

① Permissible operating range is 85 to 110%. A power transformer is available as option for 380V AC or 400-460V AC.

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

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

④ The operating time assume the motor operator is supplied with the rated operation voltage. Loss of the control power in this operating time may cause the motor operator to fail to work.

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

Operation mechanism

Motorized operation

■ **Breaker ON**

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

■ **Breaker OFF**

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

■ **Breaker RESET**

To reset the tripped breaker, close the OFF/RESET switch to make motoriged OFF operation.

■ **Breaker auto-reset (optional)**

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

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

Manual operation

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

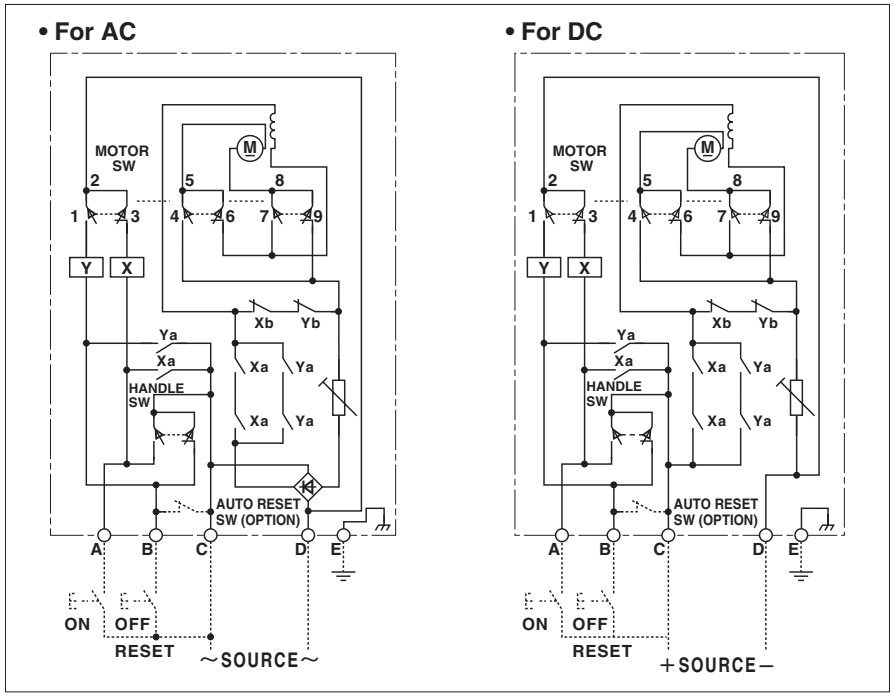
■ **Handle switch**

The switch is used to automatically operate the motor operator after manual operation.
The operating mechanism can be followed.

Operation precautions

- When the breaker is ON and is then tripped, the ON/OFF indicator on the motor operator will indicate ON until the breaker is reset. Note: The breaker's condition may differ.
- Use noise filters if the control power supply of the motor operator is shared by peripheral devices. Otherwise, power supply noise may cause malfunction of the peripheral devices.

Control circuit diagrams of motor operators



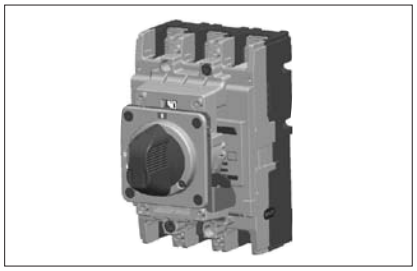
4. External operating handles

(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



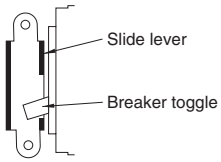
■ Mounting instructions

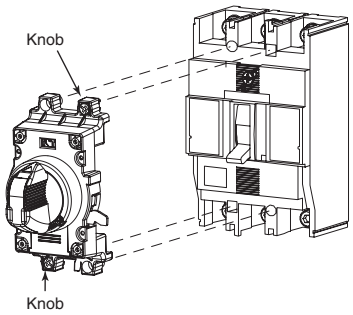
The external operating handle has not been mounted on the breakers.
For details on how to mount the handle, see the Operating Instructions packaged with the product.

[1] Mounting of external operating handle assembly

Install the circuit breakers and handles as follows.

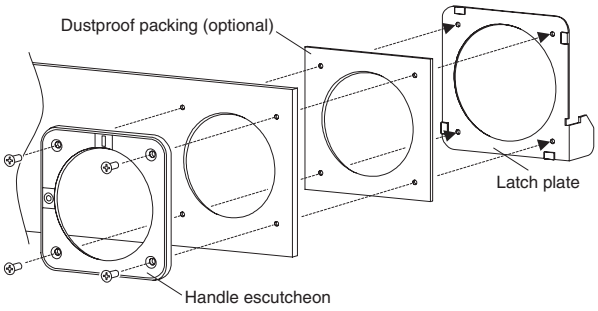
- Make sure that the breaker is in the OFF position.
- Put the external operating handle assembly onto the breaker in place so that the breaker toggle is engaged with the slide lever of the assembly. Rotate two knobs to secure the handle assembly.

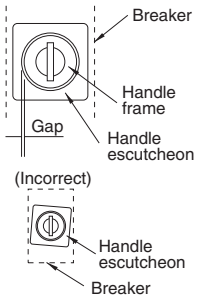




[2] Installation of handle escutcheon and latch plate

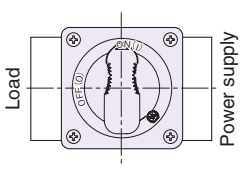
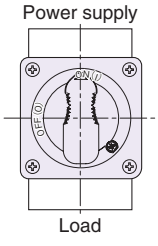
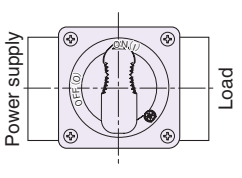
- Drill holes in the panel according to the panel cutout dimensions. Sandwich the panel between the handle escutcheon and latch plate and temporarily tighten using the supplied screws.
- Close the panel. Make adjustment so that the gap between the handle assembly and handle escutcheon is even and the 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.

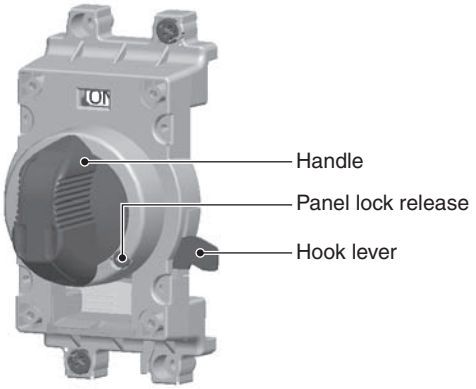
■Panel lock mechanism

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.

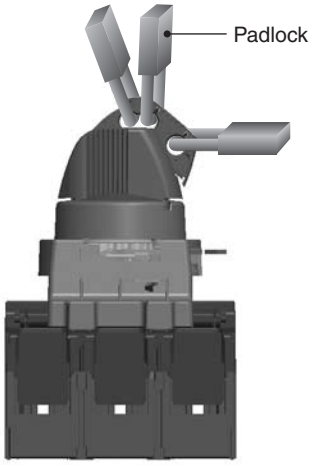


■Toggle lock mechanism

- **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).

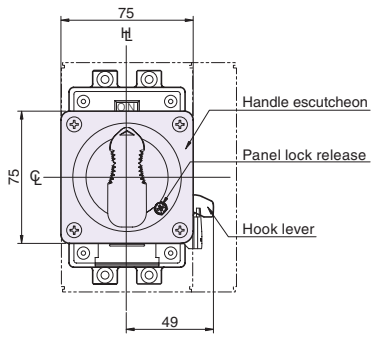
4. External operating handles

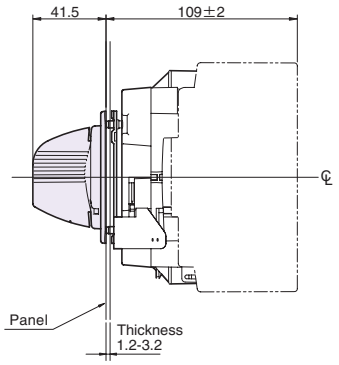
T2HB16L

Applicable breaker types
E160-SF/SJ, S160-SCF/SCJ/SF/SJ/SN

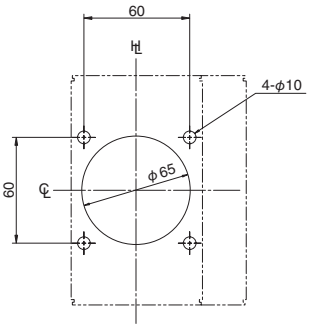
⋕ : Handle Frame Centre Line
℄ : Handle Centre Line

• Outline dimensions

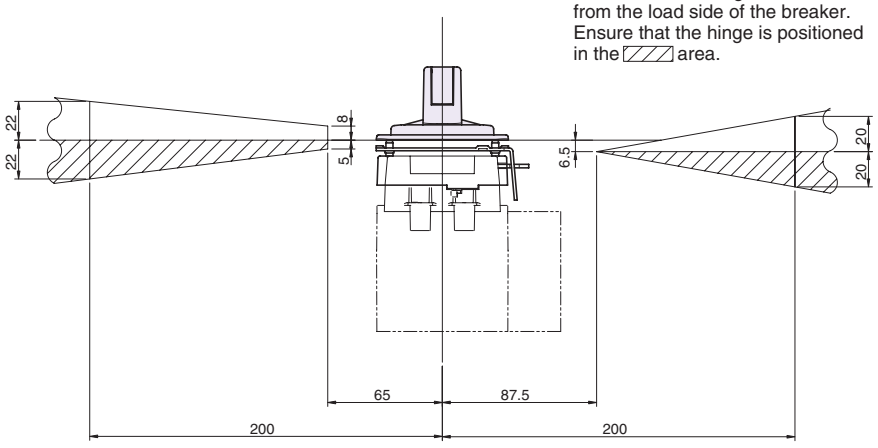




• Panel cutout dimensions



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

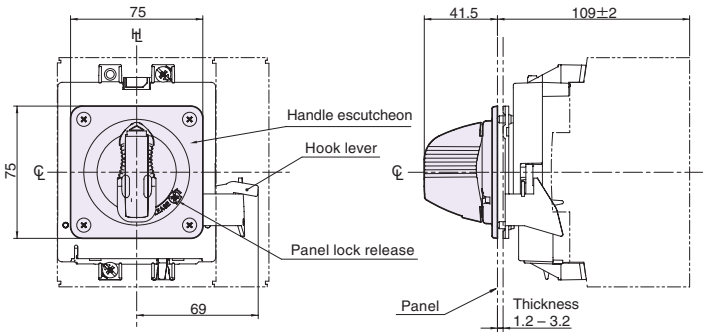


TPHB16S

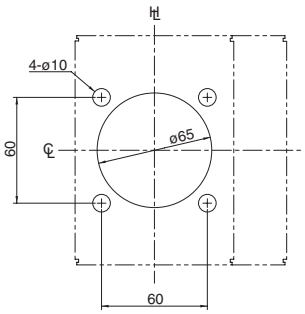
Applicable breaker types
P160F/N/H/D

HL : Handle Frame Centre Line
CL : Handle Centre Line

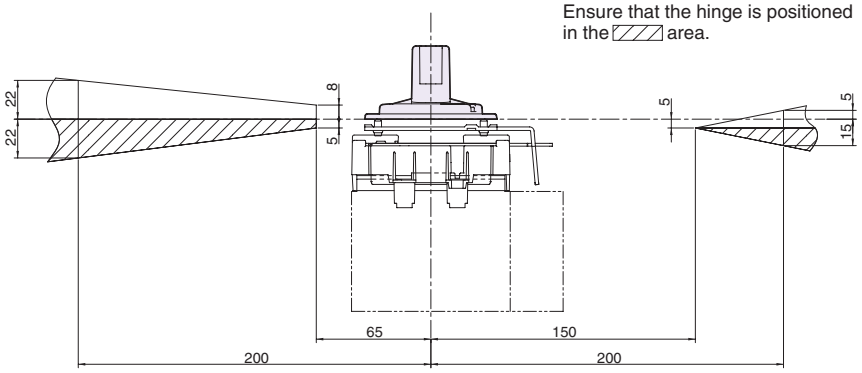
• Outline dimensions



• 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.



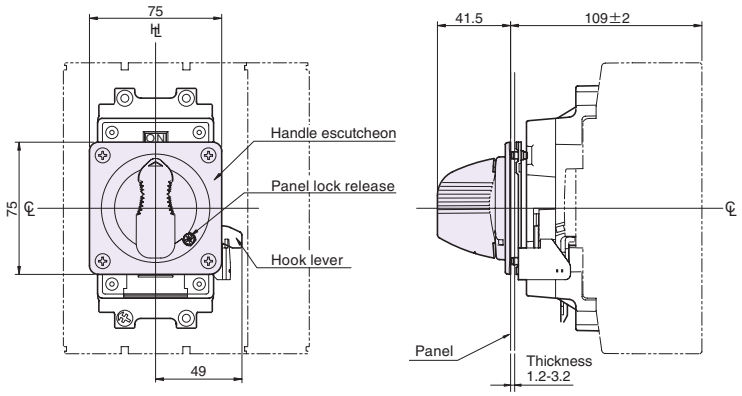
4. External operating handles

T2HB25L

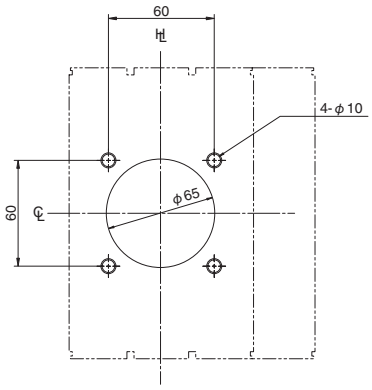
Applicable breaker types
E250-SCF/SCJ/SF/SJ, S250-SN

: Handle Frame Centre Line
: Handle Centre Line

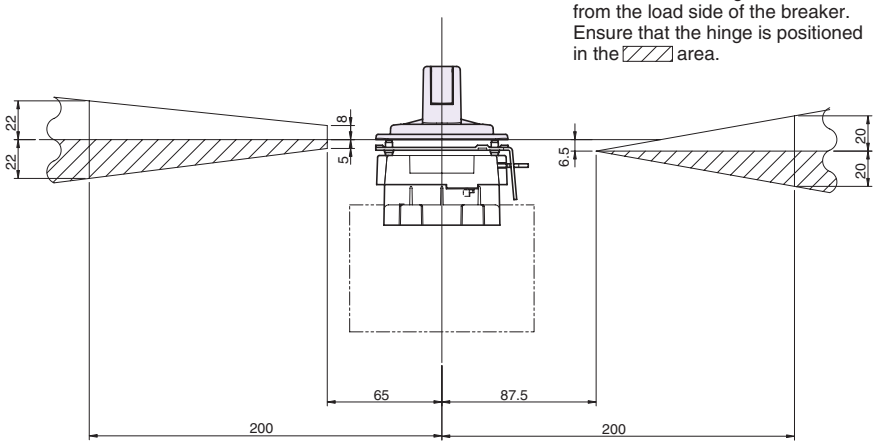
• Outline dimensions



• 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.

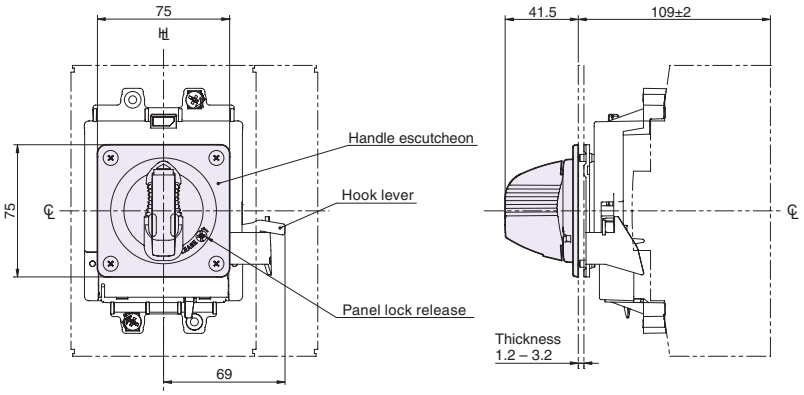


TPHB25S

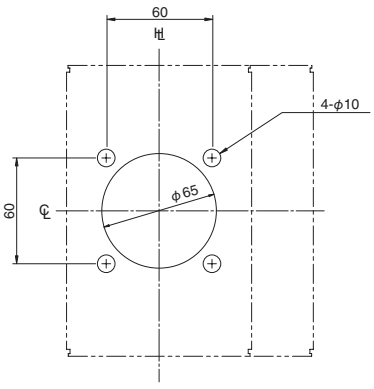
Applicable breaker types
P250F/N/H/D

HL : Handle Frame Centre Line
CL : Handle Centre Line

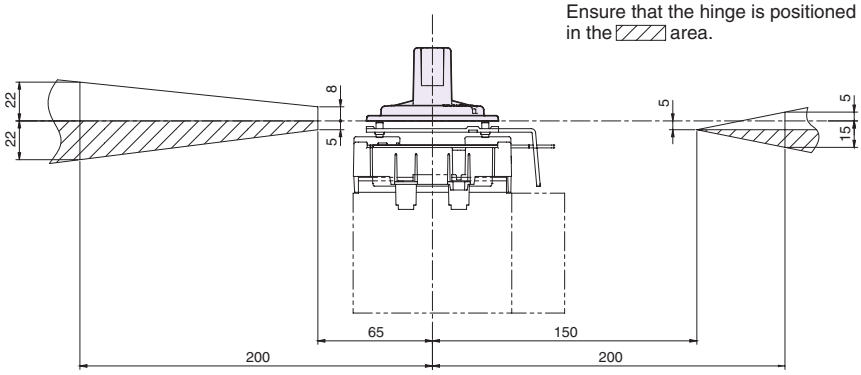
• Outline dimensions



• 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

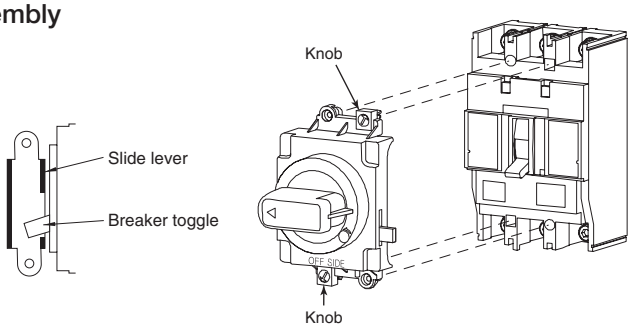
■ Mounting instructions

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

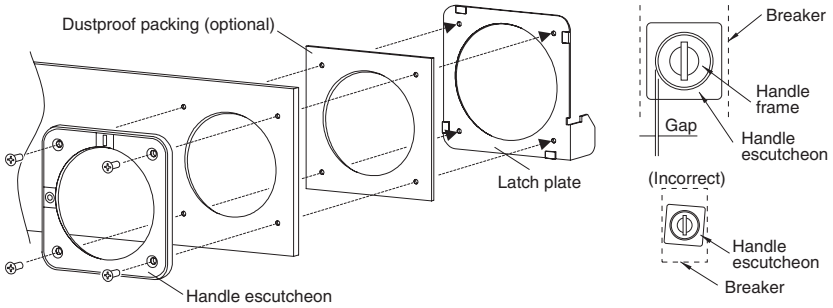
Install the circuit breakers and handles as follows.

- 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.



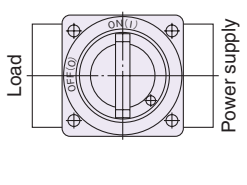
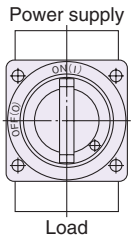
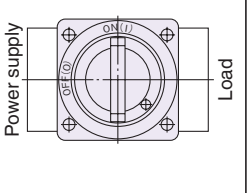
[2] Installation of handle escutcheon and latch plate

- 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 (○) 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.

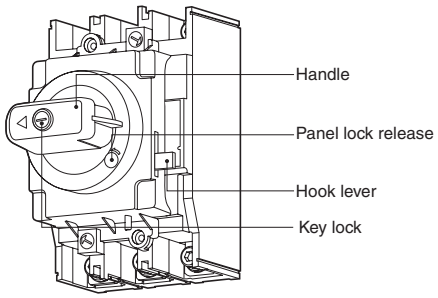
■Toggle lock mechanism

- **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						—

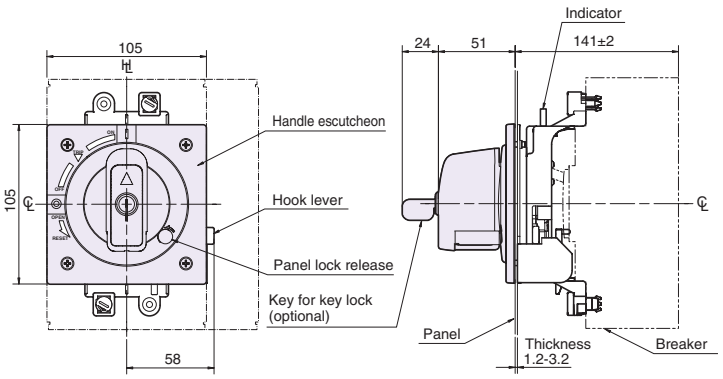
Note ①: For T2HB, specify "P". Do not specify anything in the case of TPHB (blank).

■ Outline dimensions

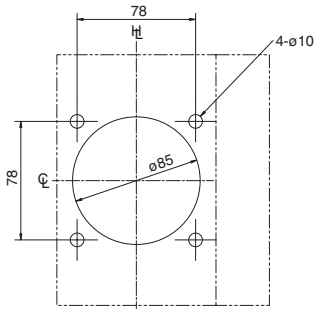
ASL : Arrangement Standard Line
H : Handle Frame Centre Line
℄ : Handle Centre Line

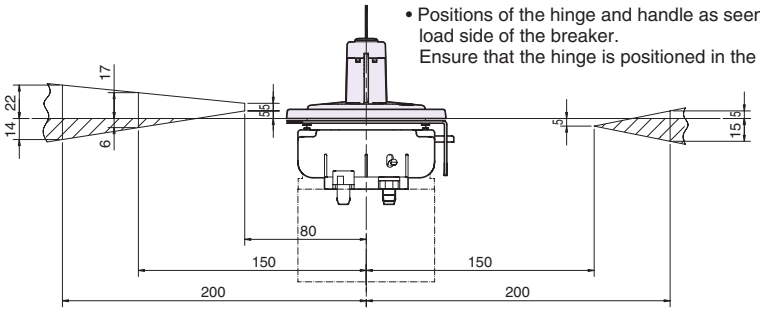
T2HB25

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



● Panel cutout dimensions



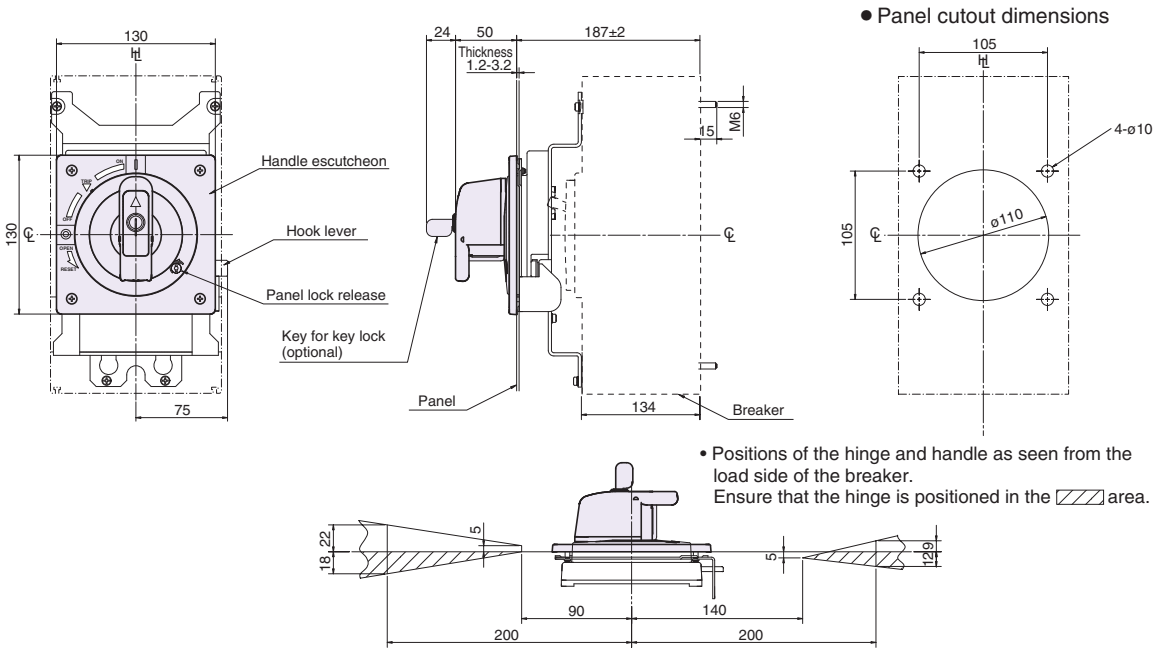


■ Outline dimensions

ASL : Arrangement Standard Line
℄ : Handle Frame Centre Line
℄ : Handle Centre Line

T2HB40

Applicable breaker types
H400-NE, L400-NE, L400-PE

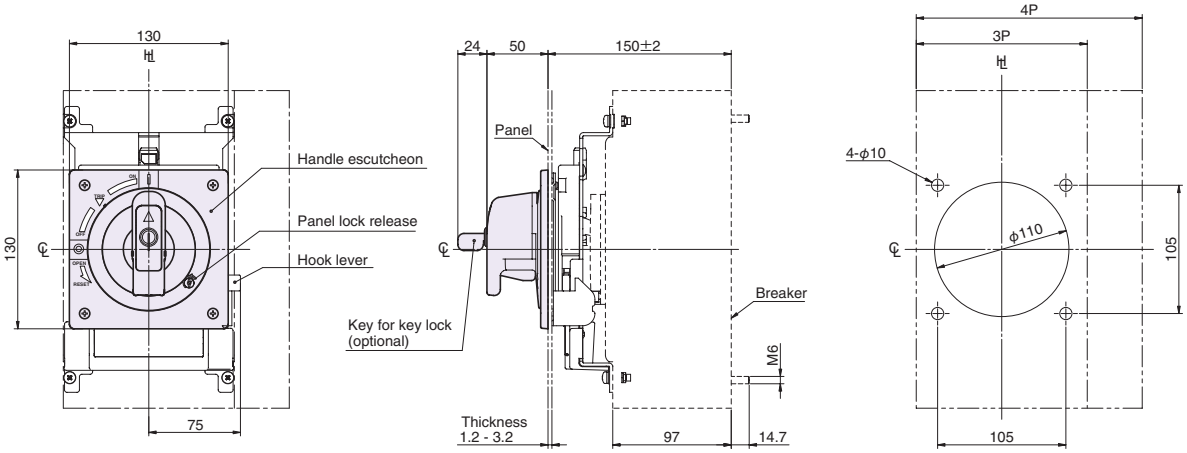


■ Outline dimensions

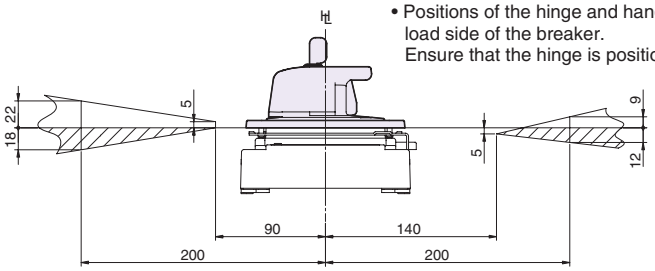
ASL : Arrangement Standard Line
⊢⊣ : Handle Frame Centre Line
℄ : Handle Centre Line

TPHB63S

Applicable breaker types
P400E/F/N/H/S/D, P630E/F/N/H/S/D



● Panel cutout dimensions



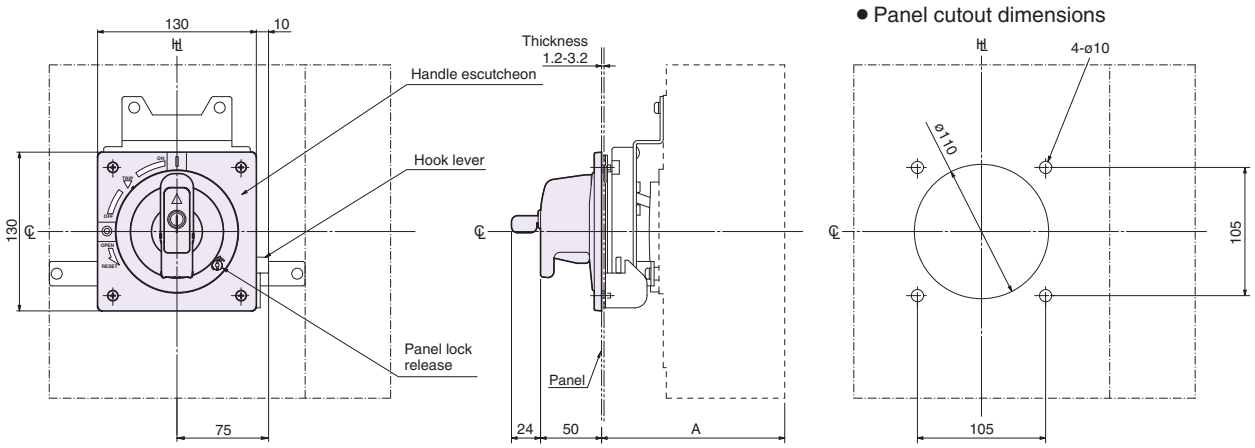
• Positions of the hinge and handle as seen from the load side of the breaker.
Ensure that the hinge is positioned in the ▨ area.

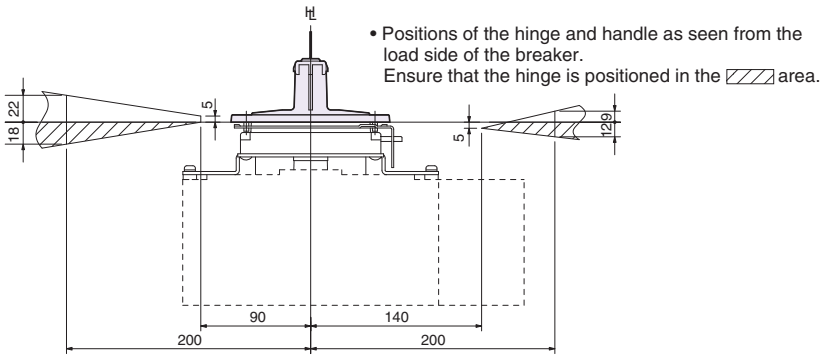
■ Outline dimensions

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

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





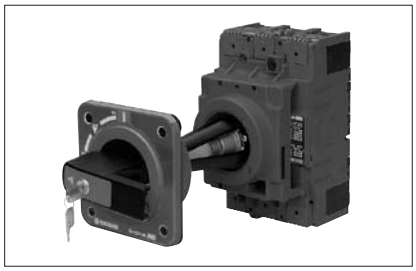
6 Accessories

4. External operating handles

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

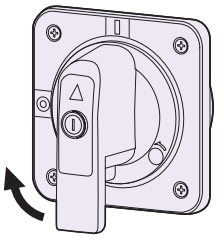
Door-mounted type external operating handles allow breakers installed in control centers or switchboards to be manually operated from outside and complies with IEC 60204-1.
This handle assembly consists of an operation mechanism section which is to be installed in the breaker body, a handle section which is to be installed in a panel and a square shaft which couples both the sections.

■ Outer view



■ Operation direction of handles

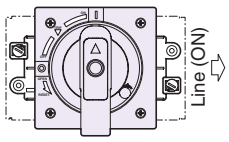
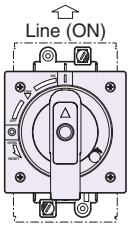
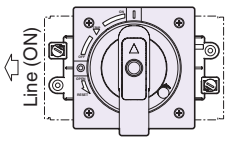
Rotate the operating handle
clockwise to turn the breaker ON.



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
		

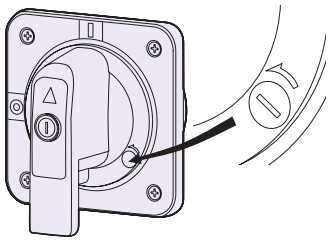
■ Panel lock mechanism

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.



■ 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

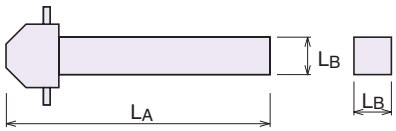
- **Key lock (Optional)**
  Key locking is possible in the OFF position.

■ Protection degree (IEC 60529)

IP54	Standard specification
IP65	Special specification

■ Dimensions of square shafts available

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



Shafts order codes	L_A(mm)	L_B(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					—

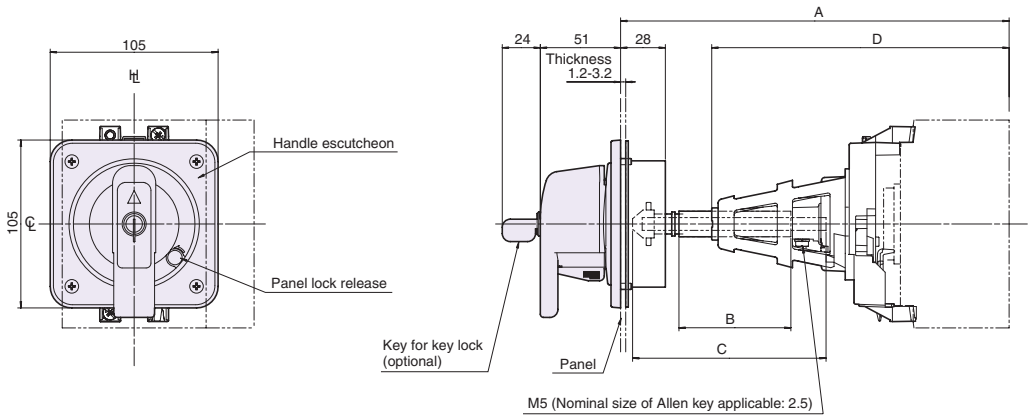
Note①: For T2HP, specify "P". Do not specify anything in the case of T1HP or TPHP (blank).

4. External operating handles

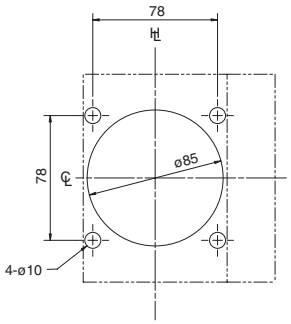
ASL : Arrangement Standard Line
: Handle Frame Centre Line
: Handle Centre Line

■ Outline dimensions

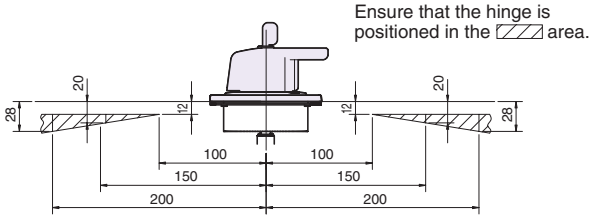
TPHP16S



● 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
P160F/N/H/D	229 min.	56	107	186	T2PS251	Yes
	243 max.	70	121	186		
	343 max.	170	221	186	T2PS252	
	443 max.	270	321	186	T2PS253	
	543 max.	370	421	186	T2PS254	

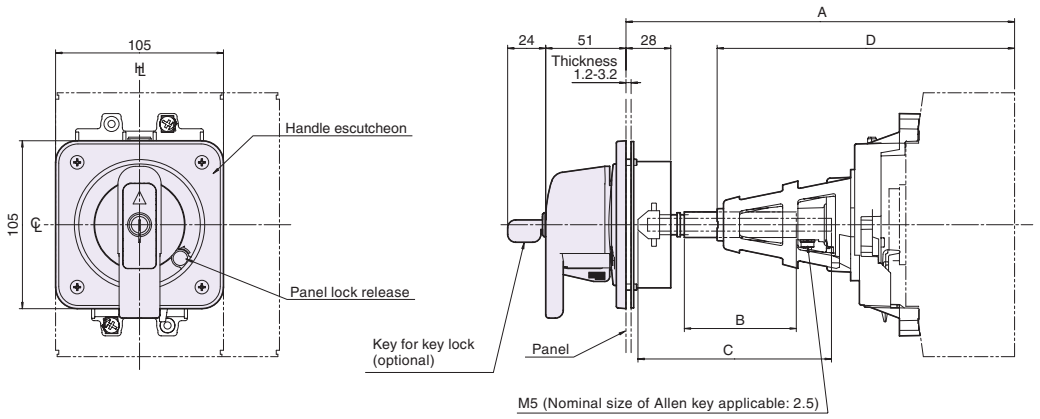
Notes:
①: "Min (minimum)" means the minimum possible distance from the panel surface to the breaker mounting surface, which can be formed by cutting the square shaft.
"Max (maximum)" means the maximum distance of the same section, which is formed with no cutting of the square shaft.

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

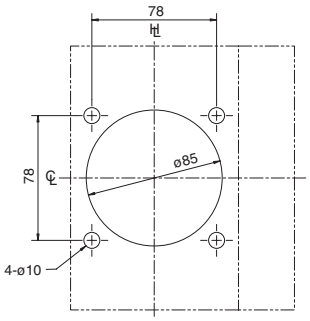
ASL : Arrangement Standard Line
HL : Handle Frame Centre Line
CL : Handle Centre Line

■ Outline dimensions

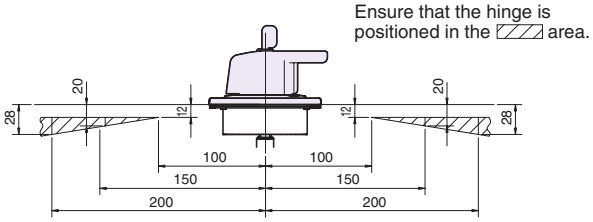
TPHP25S



● 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
P250F/N/H/D	229 min.	56	107	186	T2PS251	Yes
	243 max.	70	121	186		
	343 max.	170	221	186	T2PS252	
	443 max.	270	321	186	T2PS253	
	543 max.	370	421	186	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.

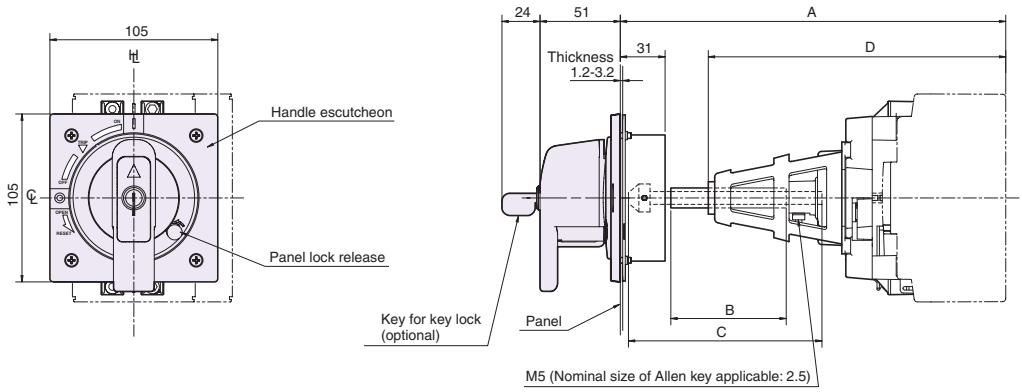
A: Distance from the panel surface to the breaker mounting surface
B: Length of the tube to cover the square shaft
C: Length of the square shaft
D: Distance from the tip of the shaft support to the breaker mounting surface

4. External operating handles

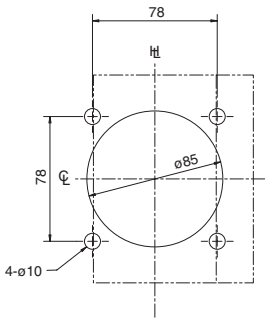
: Handle Frame Centre Line
: Handle Centre Line

■ Outline dimensions

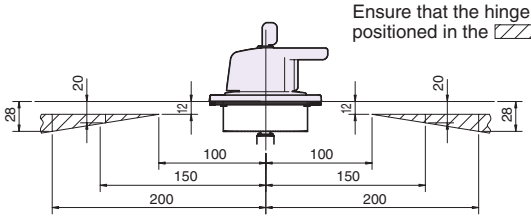
T2HP16L



● 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
E160-SF/SJ, S160-SCF/SCJ/SF/SJ/SN	229 min.	56	107	186	T2PS251	Yes
	243 max.	70	121	186		
	343 max.	170	221	186	T2PS252	
	443 max.	270	321	186	T2PS253	
	543 max.	370	421	186	T2PS254	

Notes:

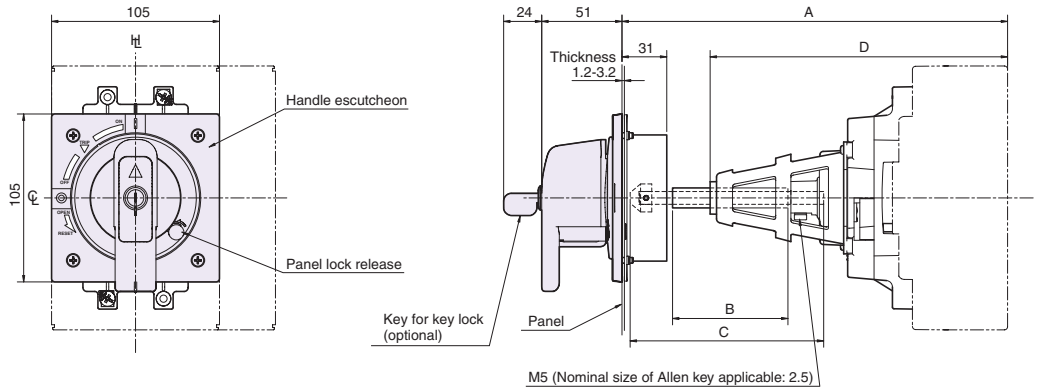
①: "Min (minimum)" means the minimum possible distance from the panel surface to the breaker mounting surface, which can be formed by cutting the square shaft.
"Max (maximum)" means the maximum distance of the same section, which is formed with no cutting of the square shaft.

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

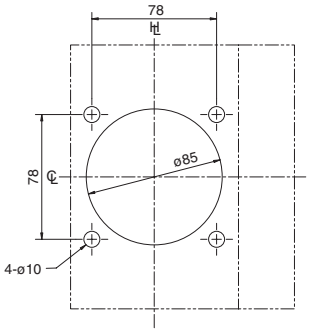
HL : Handle Frame Centre Line
℄ : Handle Centre Line

■ Outline dimensions

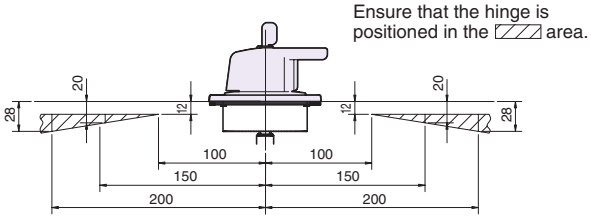
T2HP25L



● 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	Yes
	243 max.	70	121	186		
	343 max.	170	221	186	T2PS252	
	443 max.	270	321	186	T2PS253	
	543 max.	370	421	186	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.

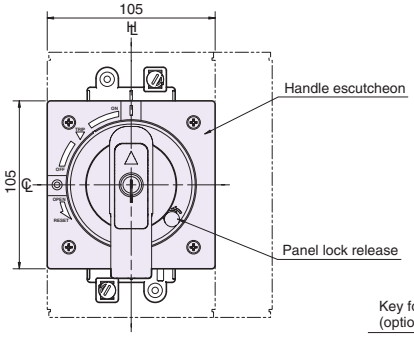
A: Distance from the panel surface to the breaker mounting surface
B: Length of the tube to cover the square shaft
C: Length of the square shaft
D: Distance from the tip of the shaft support to the breaker mounting surface

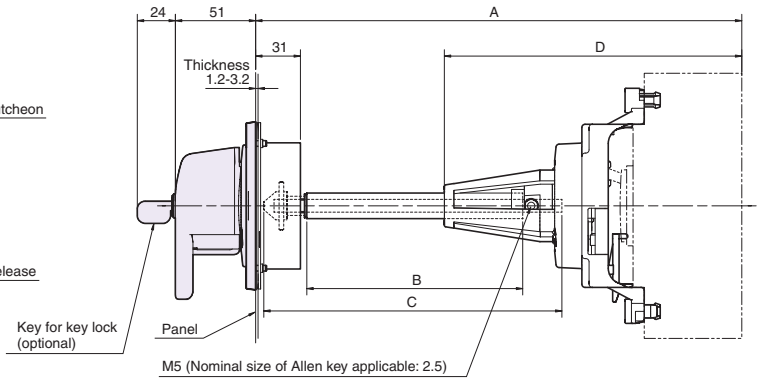
4. External operating handles

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

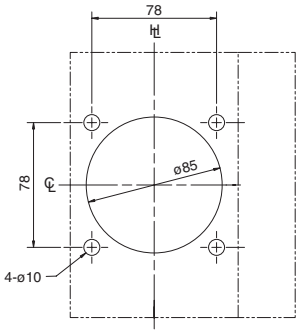
■ Outline dimensions

T2HP25

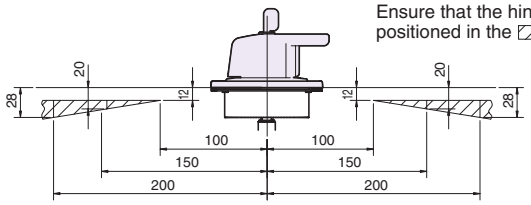




● Panel cutout dimensions



• 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
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:

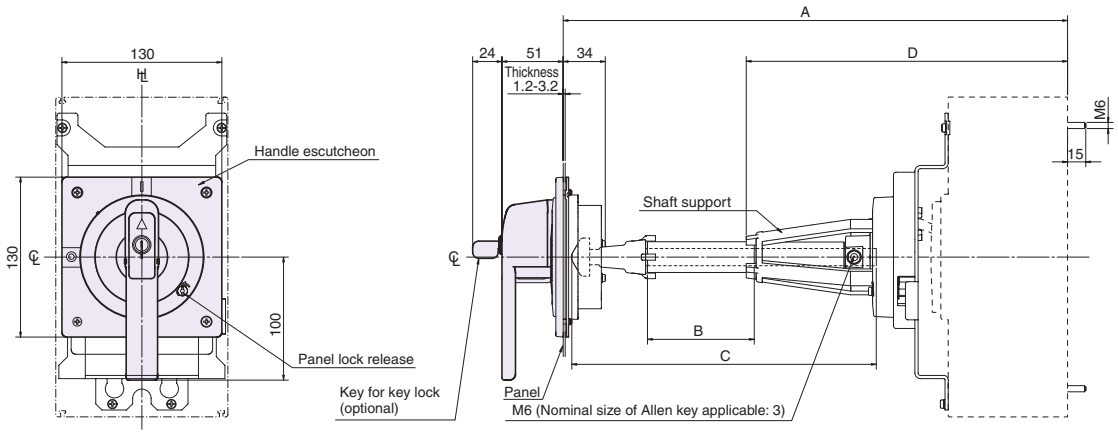
①: "Min (minimum)" means the minimum possible distance from the panel surface to the breaker mounting surface, which can be formed by cutting the square shaft.
"Max (maximum)" means the maximum distance of the same section, which is formed with no cutting of the square shaft.

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

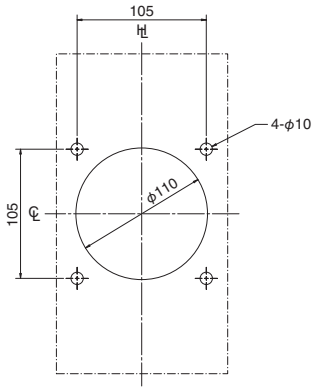
ASL : Arrangement Standard Line
⊬ : Handle Frame Centre Line
℄ : Handle Centre Line

■Outline dimensions

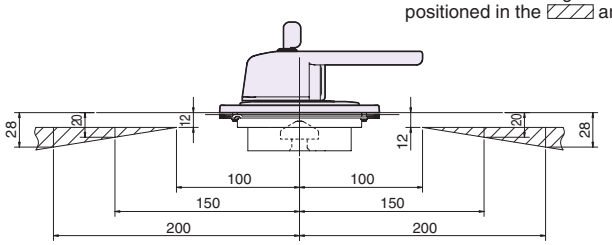
T2HP40



● 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
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		
	547 max.	180	347.5	298	T2PS403	
	647 max.	280	447.5	298	T2PS404	

Notes:

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

②: When dimension A is in a range of 347mm to 377mm, cut square shaft T2PS402 to an appropriate length and use the shaft without shaft support.

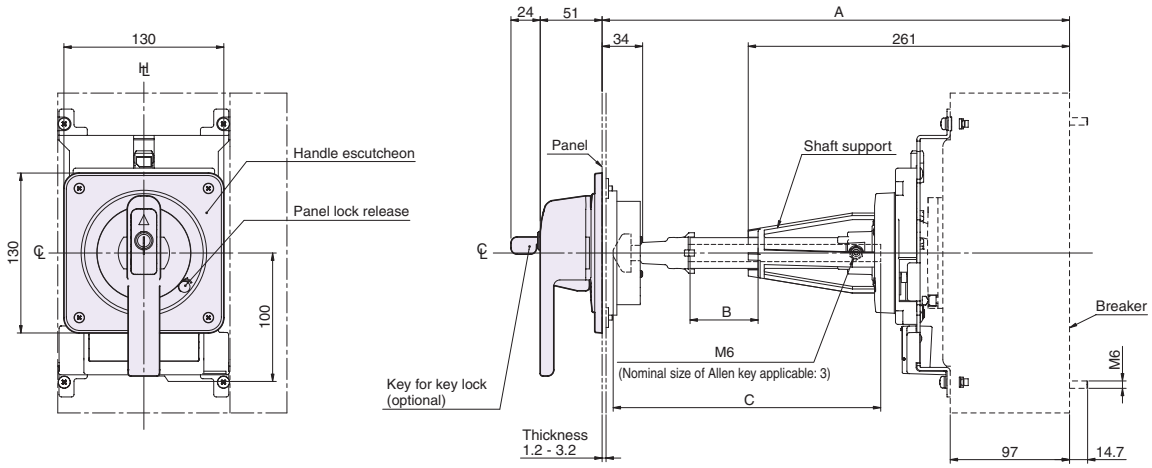
A: Distance from the panel surface to the breaker mounting surface
B: Length of the tube to cover the square shaft
C: Length of the square shaft
D: Distance from the tip of the shaft support to the breaker mounting surface

4. External operating handles

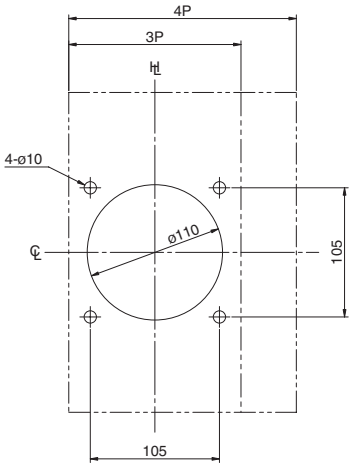
ASL : Arrangement Standard Line
⊢⊣ : Handle Frame Centre Line
℄ : Handle Centre Line

■ Outline dimensions

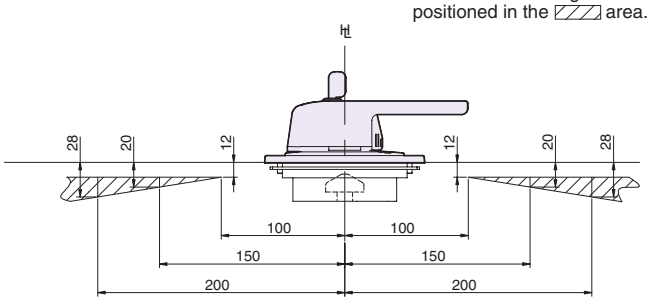
TPHP63S



● 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	T2PS403	
	610 max.	280	447.5	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.

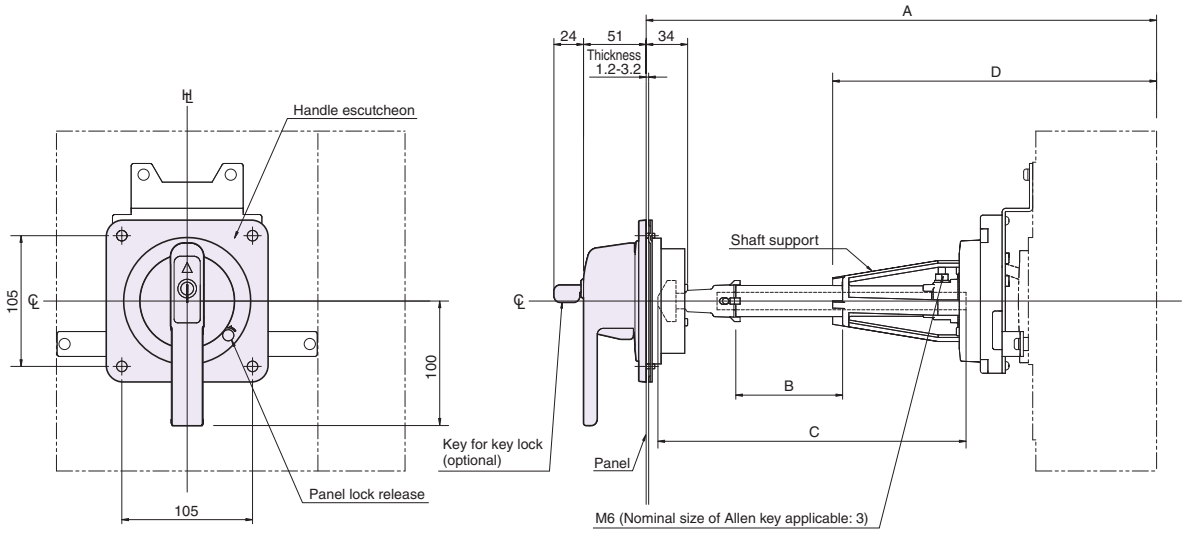
②: When dimension A is in a range of 310 mm to 340 mm, cut square shaft T2PS402 to an appropriate length and use the shaft without shaft support.

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

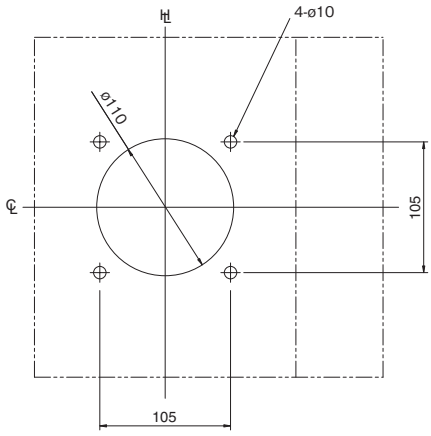
ASL : Arrangement Standard Line
⊬ : Handle Frame Centre Line
℄ : Handle Centre Line

■Outline dimensions

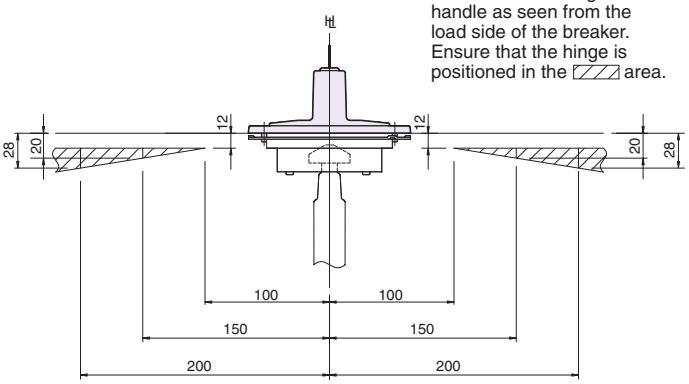
T2HP80



● 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
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	——		
	340 min.②	10	177.5	261	T2PS402	Yes
	410 max.	80	247.5	261		
	510 max.	180	347.5	261	T2PS403	
	610 max.	280	447.5	261	T2PS404	
H800-NE, L800-NE, L800-PE	307 min.	12	107.5	——	T2PS401	Non
	347 max.③	52	147.5	——		
	377 min.③	10	177.5	298	T2PS402	Yes
	447 max.	80	247.5	298		
	547 max.	180	347.5	298	T2PS403	
	647 max.	280	447.5	298	T2PS404	

Notes:

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

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

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

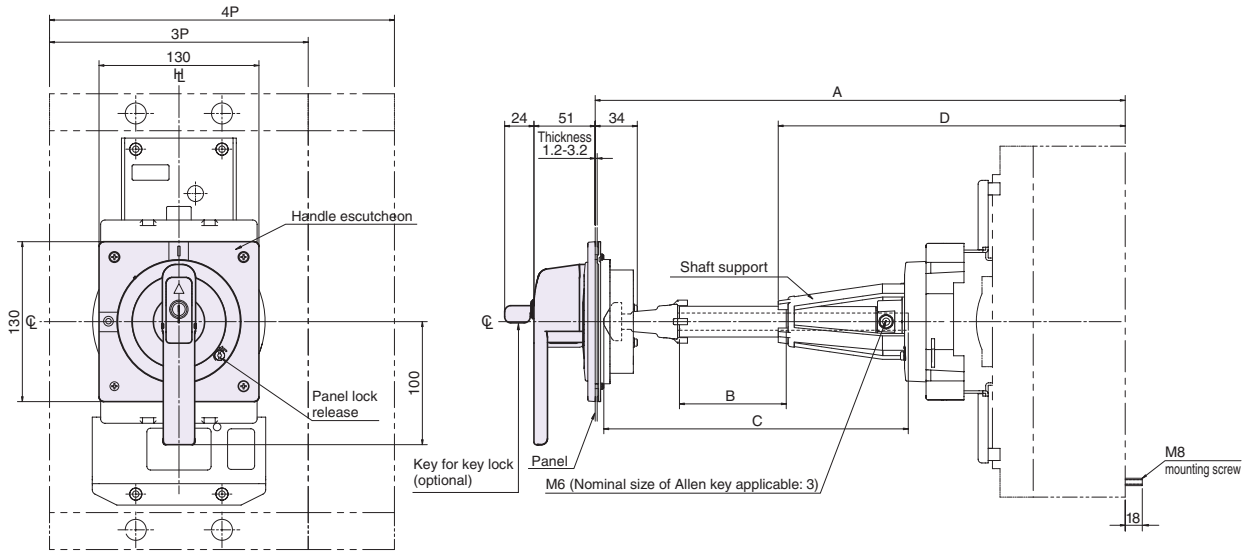
A: Distance from the panel surface to the breaker mounting surface
B: Length of the tube to cover the square shaft
C: Length of the square shaft
D: Distance from the tip of the shaft support to the breaker mounting surface

ASL : Arrangement Standard Line
⊢⊣ : Handle Frame Centre Line
℄ : Handle Centre Line

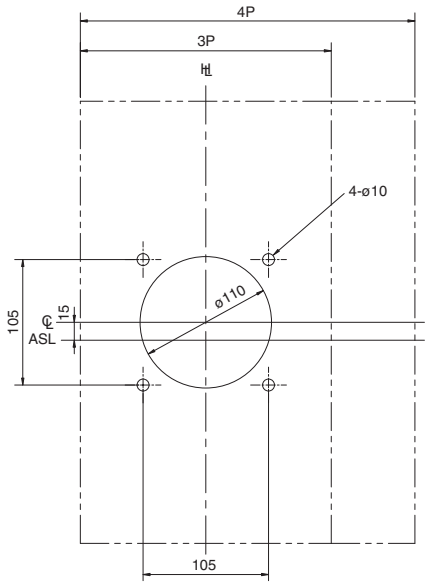
■ Outline dimensions

T2HPX6

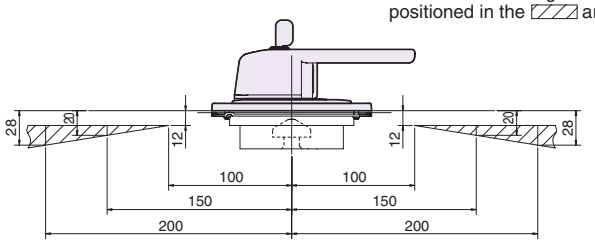
Type of external operating handle	Applicable breaker types
T2HPX6	**S1250-NE/GE/NN, S1600-NE/NN**



● 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 ▨ 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	Yes
	567 max.	180	347.5	317	T2PS403	
	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	Yes
	587 max.	180	347.5	337	T2PS403	
	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.

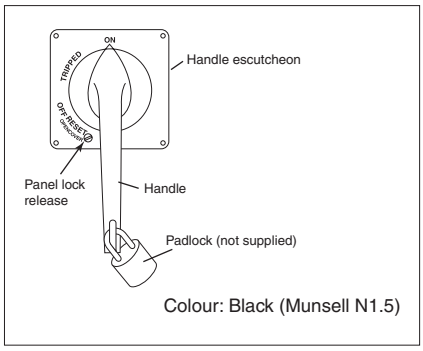
A: Distance from the panel surface to the breaker mounting surface
B: Length of the tube to cover the square shaft
C: Length of the square shaft
D: Distance from the tip of the shaft support to the breaker mounting surface

4. External operating handles

(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

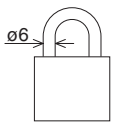
The external operating handle keeps the panel door locked when in the ON, OFF or TRIP position.
Hook holder shown in the outline dimension drawing should be provided.

- **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

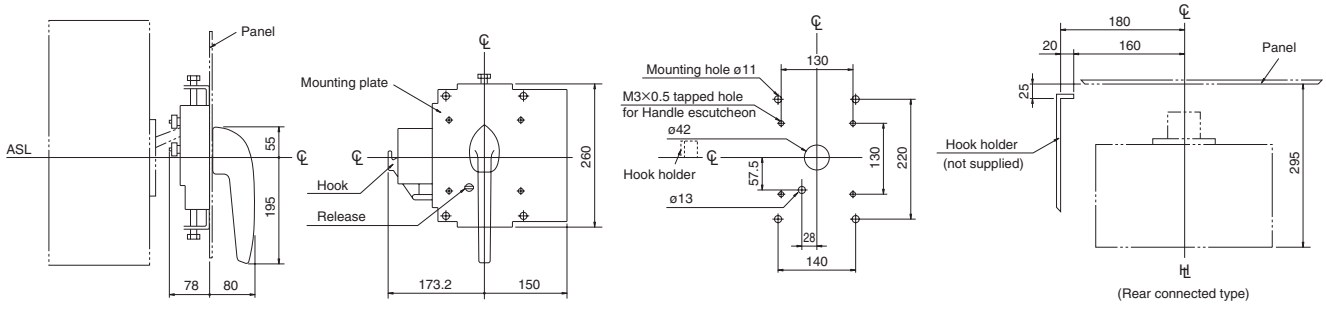


■Outline dimensions

ASL : Arrangement Standard Line
⊬ : Handle Frame Centre Line
℄ : Handle Centre Line

XFE10

Applicable breaker types
XS2000NE, XS2500NE, XS3200NE, XS2000NN, XS2500NN, XS3200NN



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)

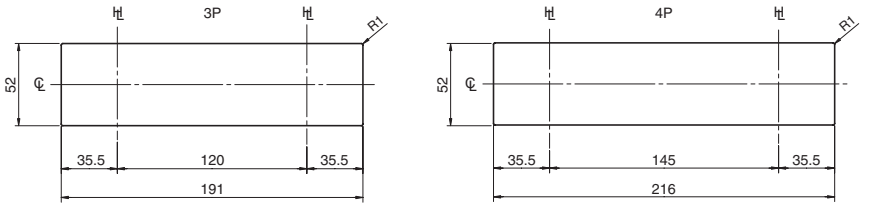
ASL : Arrangement Standard Line
⊬ : Handle Frame Centre Line
℄ : Handle Centre Line

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

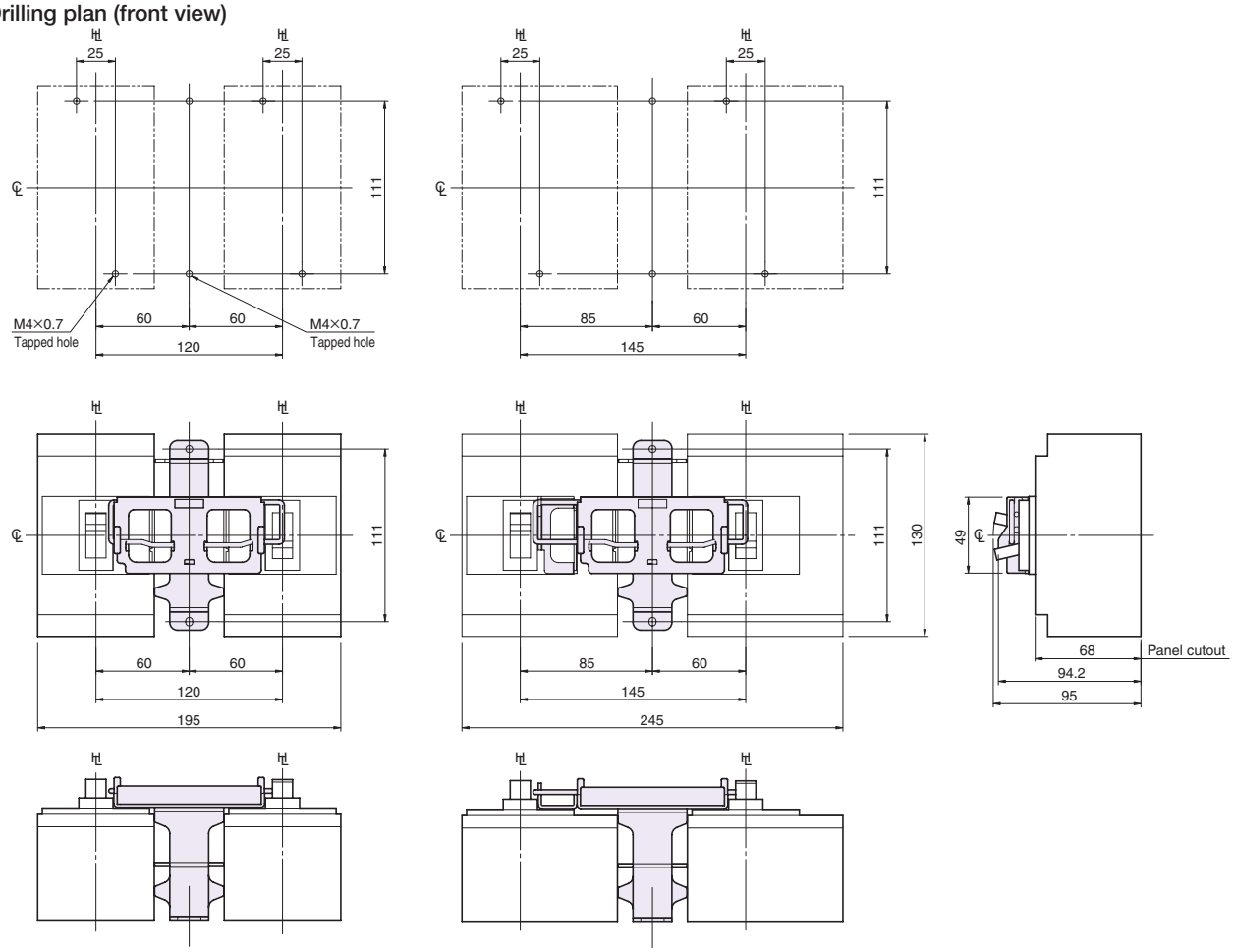
Notes:
1: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.
2: UVT with time-delay cannot be fitted to the left circuit breaker.

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)



ASL : Arrangement Standard Line
⊬ : Handle Frame Centre Line
℄ : 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:

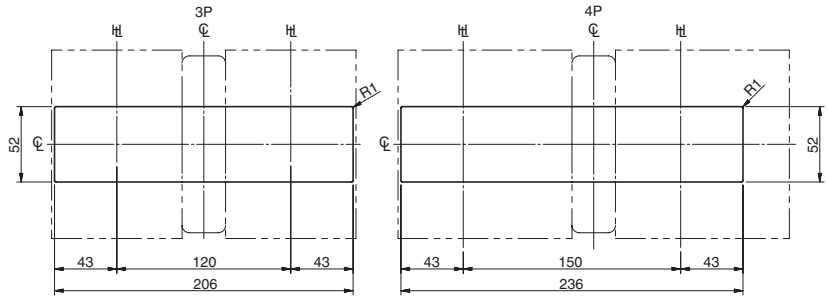
1: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.

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

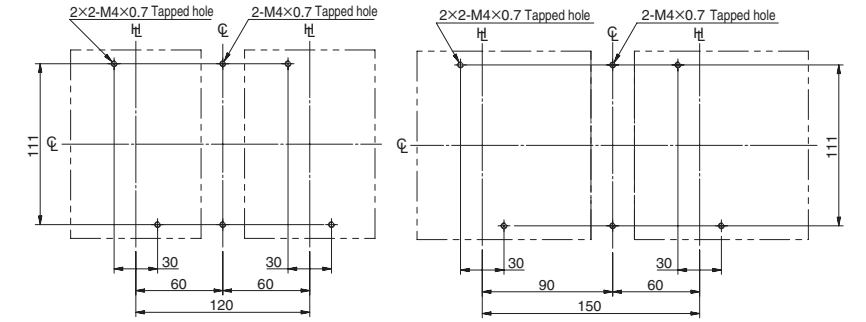
3: For high-performance electronic smart circuit breakers, the panel cutout dimensions will vary. Please contact us for details.

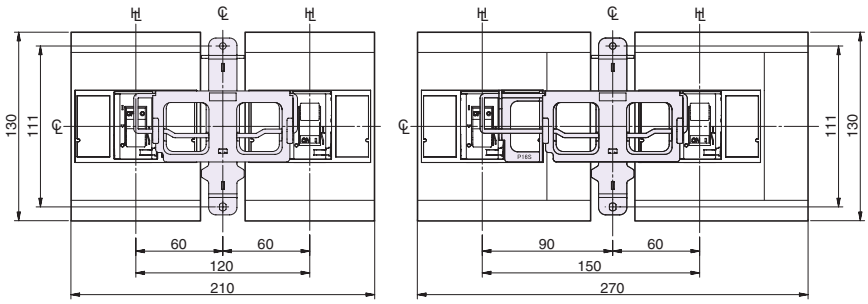
The cutout dimensions allow for a side clearance of 1.0mm from the bank of the breaker.

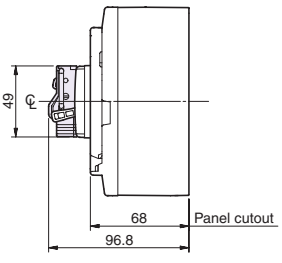
Panel cutout (front view)

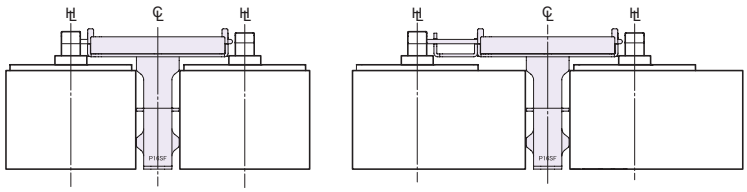


Drilling plan (front view)









(1) Slide interlock (MS)

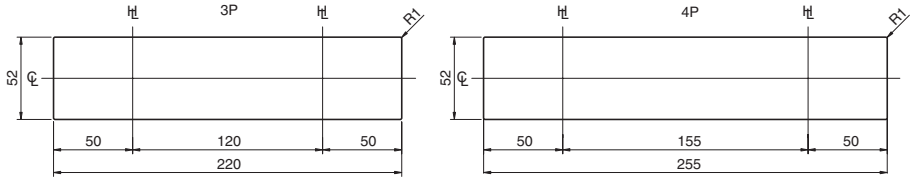
HL : Handle Frame Centre Line
℄ : Handle Centre Line

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

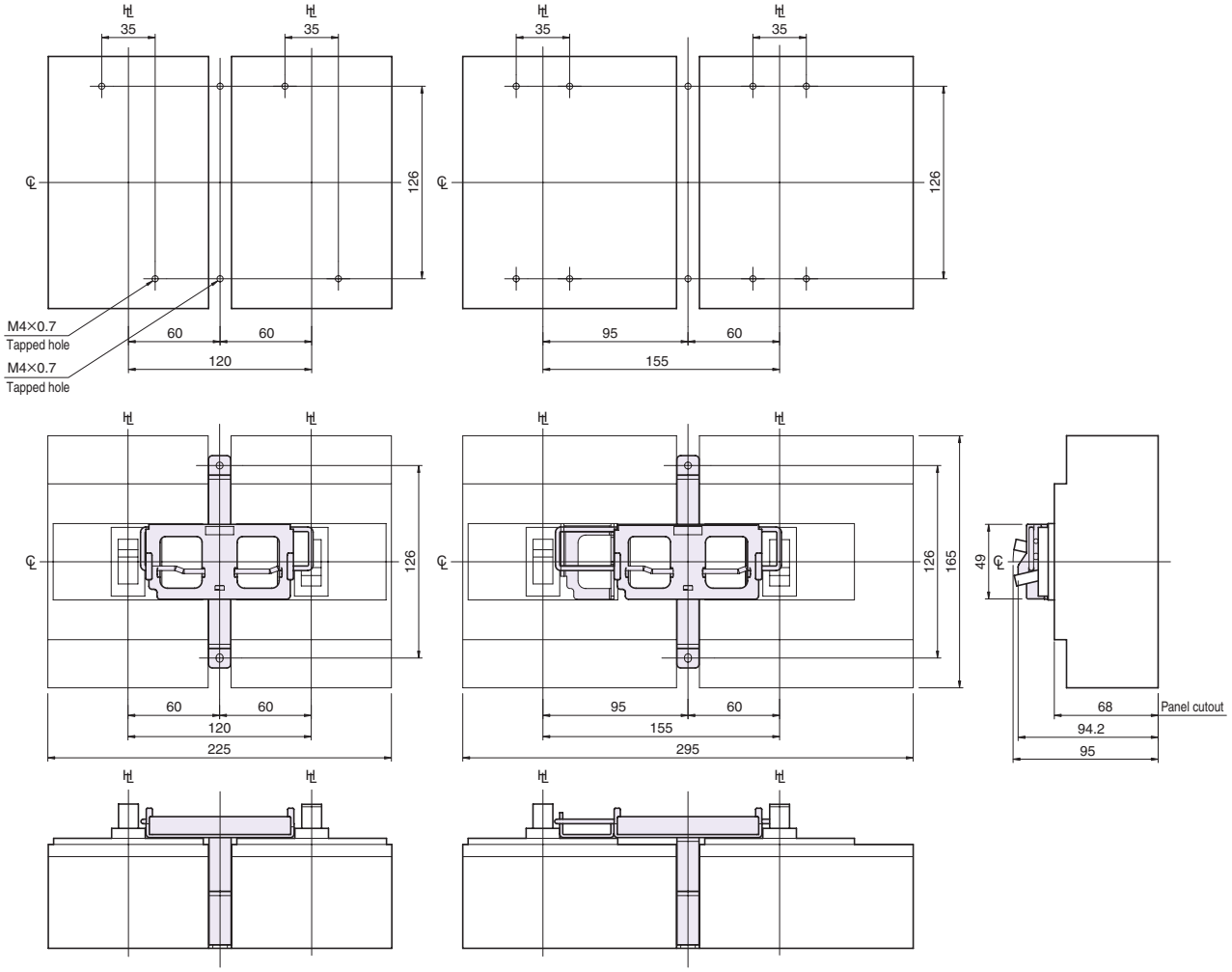
Notes:
1: If the insulation distance is insufficient due to the front-connected extension bars, be sure to insulate with insulating tape or the like.
2: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.
3: UVT with time-delay cannot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



ASL : Arrangement Standard Line
⊬ : Handle Frame Centre Line
℄ : 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:

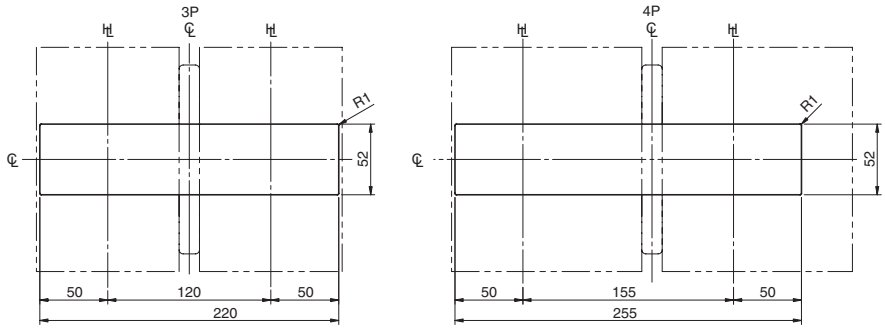
1: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.

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

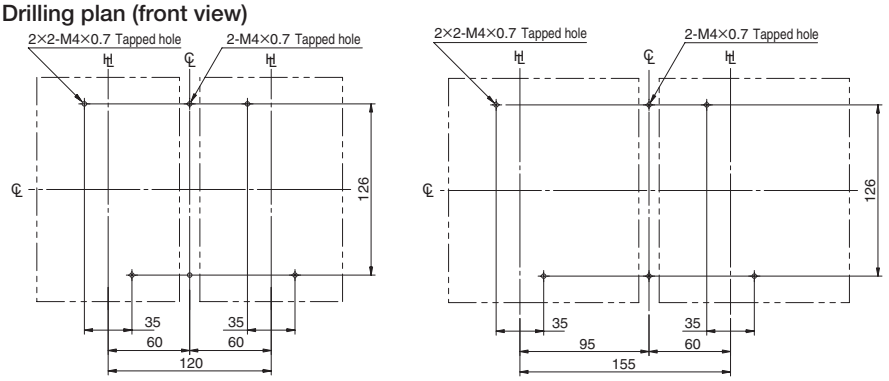
3: For high-performance electronic smart circuit breakers, the panel cutout dimensions will vary. Please contact us for details.

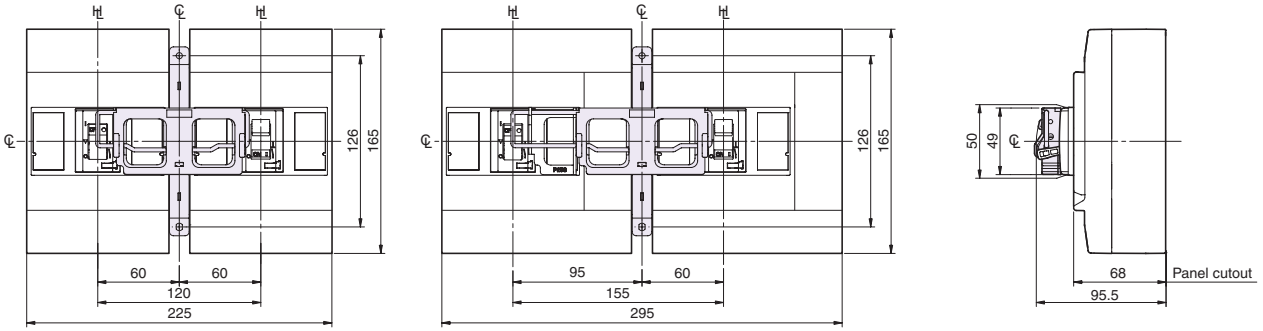
The cutout dimensions allow for a side clearance of 1.0mm from the bank of the breaker.

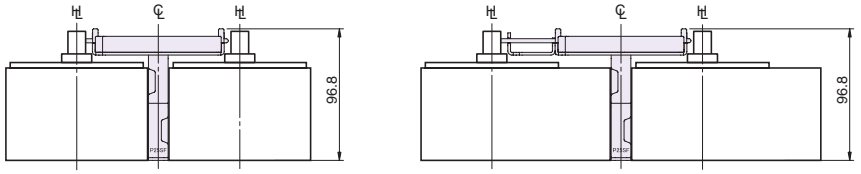
Panel cutout (front view)



Drilling plan (front view)







(1) Slide interlock (MS)

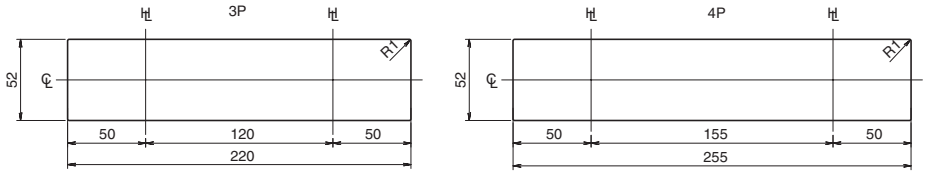
ASL : Arrangement Standard Line
⊬ : Handle Frame Centre Line
℄ : Handle Centre Line

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

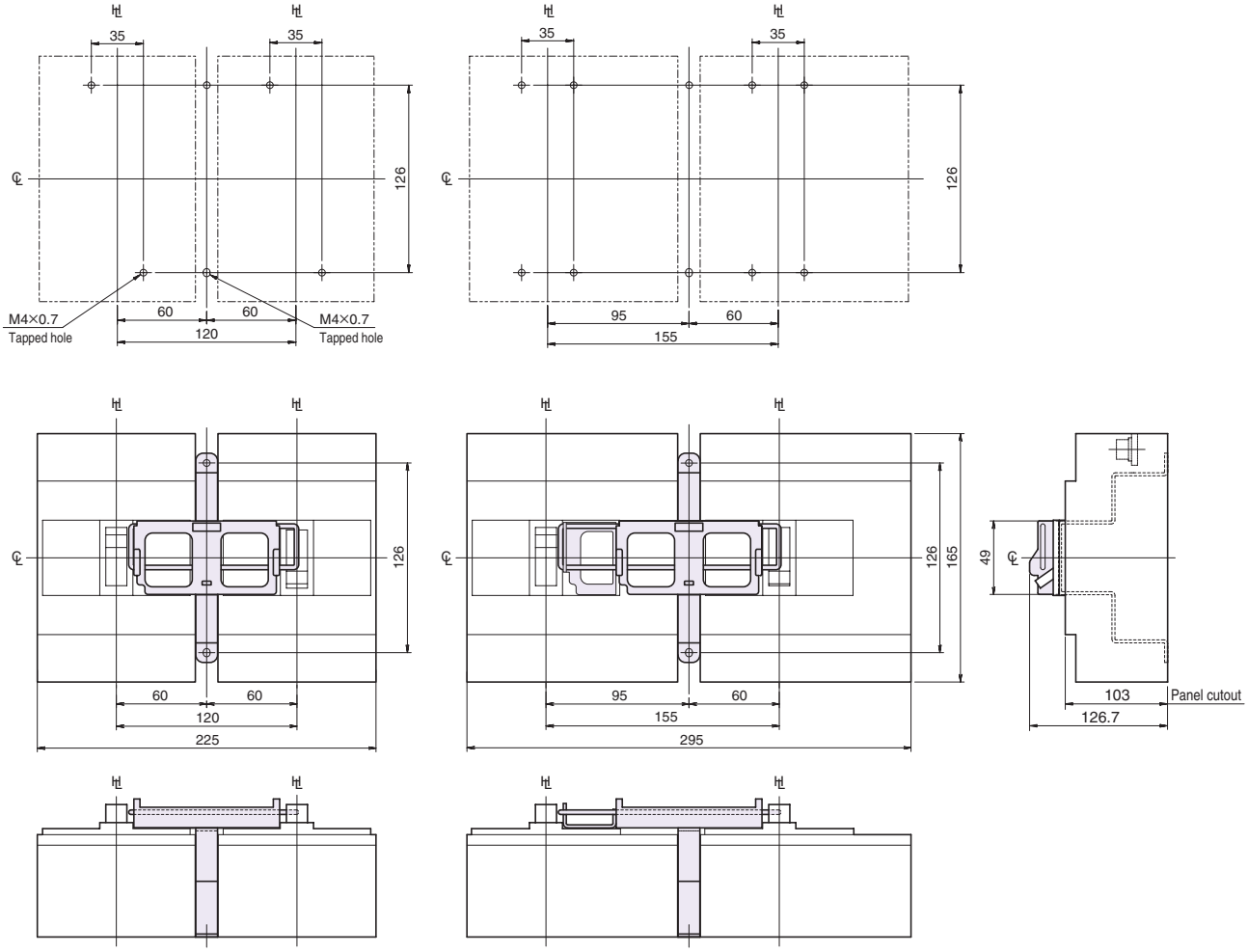
Notes:
1: If the insulation distance is insufficient due to the front-connected extension bars, be sure to insulate with insulating tape or the like.
2: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.
3: UVT with time-delay cannot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

Panel cutout (front view)



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
℄ : Handle Centre Line

Dimensions, mm

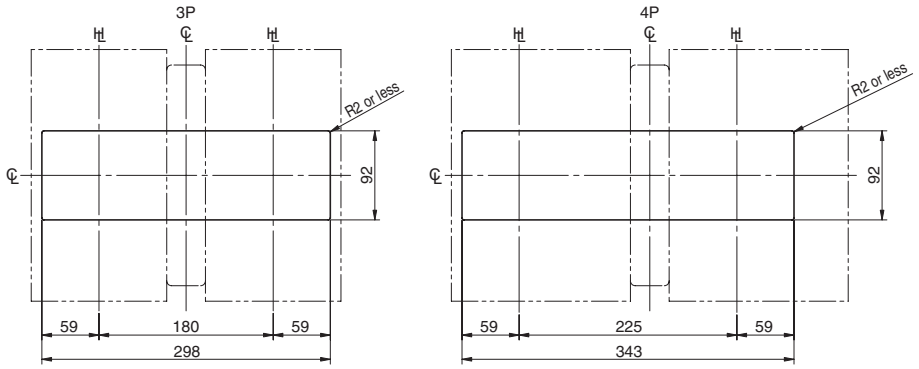
Frame size (A)	Types of MCCBs	Number of poles	Breaker connection method	Interlock Order codes
400, 630	**P400E/F/N/H/S/D, P630E/F/N/H/S/D**	3	FC、RC	TPMS633SF
		4	FC、RC	TPMS634SF

Notes:

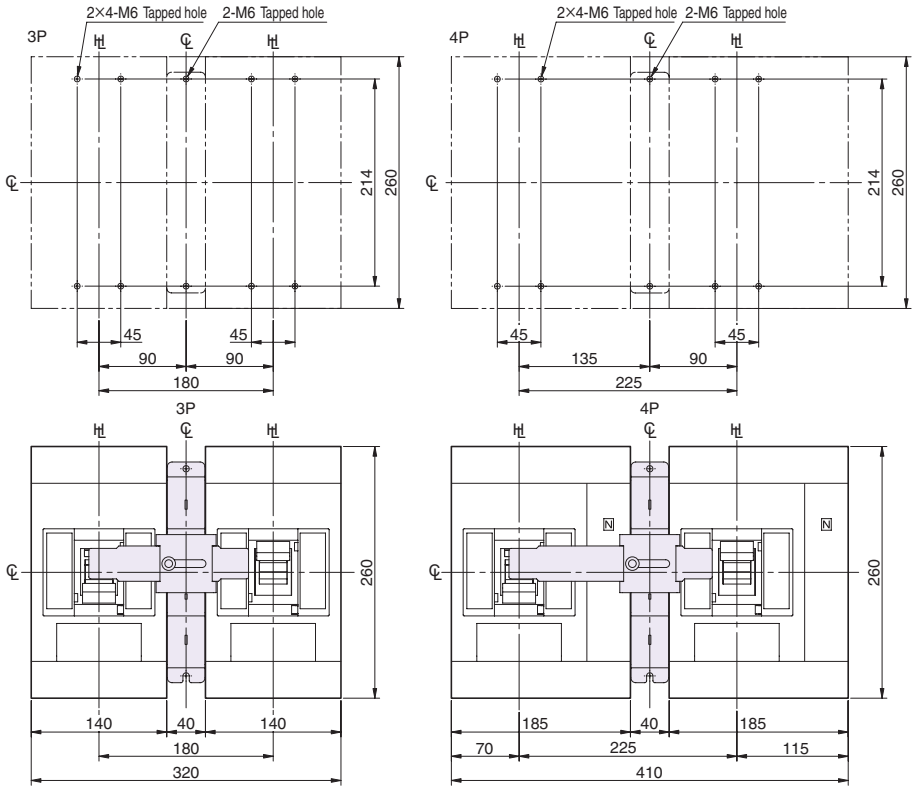
1: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.
2: UVT with time-delay cannot be fitted to the left circuit breaker.
3: For high-performance electronic smart circuit breakers, the panel cutout dimensions will vary. Please contact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

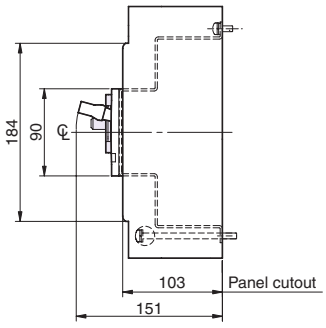
Panel cutout (front view)

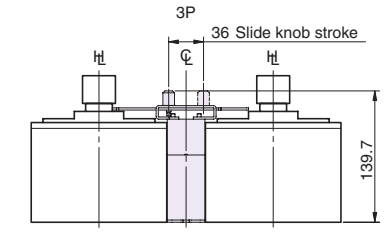
The cutout dimensions allow for a side clearance of 1.0mm from the bank of the breaker.

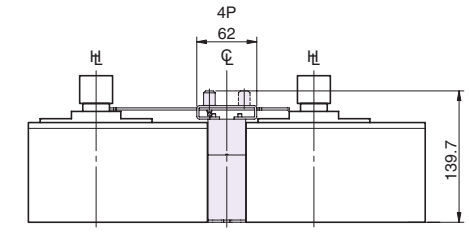


Drilling plan (front view)









(1) Slide interlock (MS)

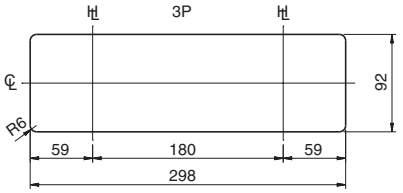
ASL : Arrangement Standard Line
HL : Handle Frame Centre Line
℄ : Handle Centre Line

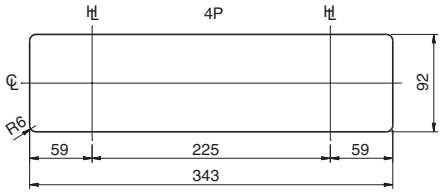
Dimensions, mm

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.

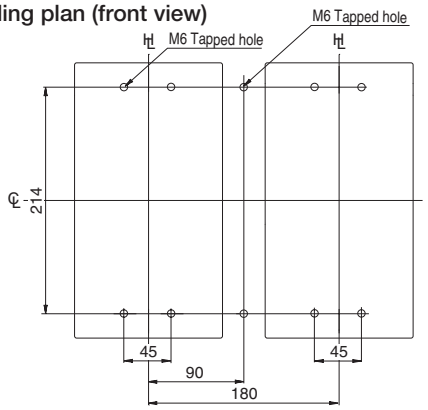
Panel cutout (front view)

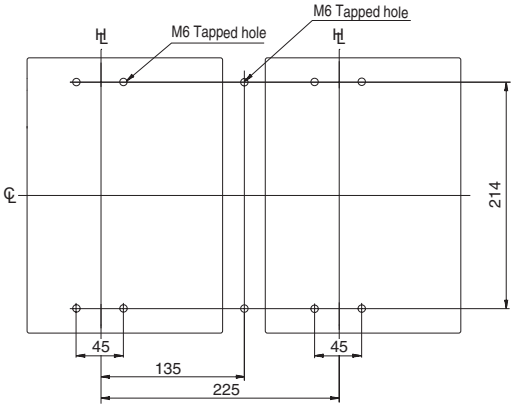


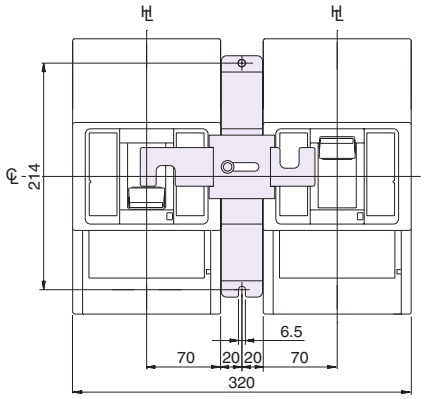


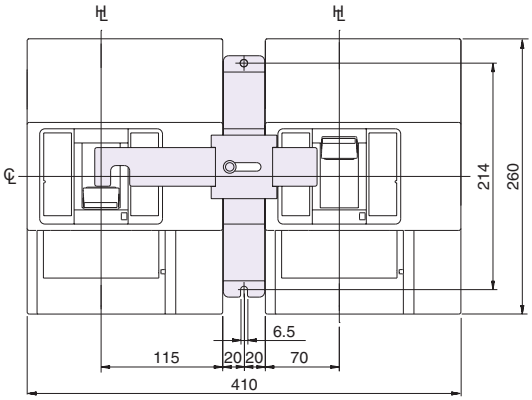
The cutout dimensions allow for a side clearance of 1.0mm from the bank of the breaker.

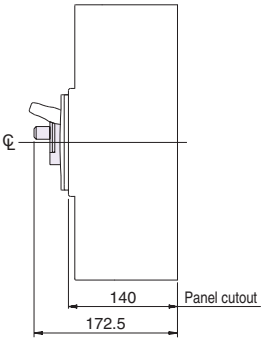
Drilling plan (front view)

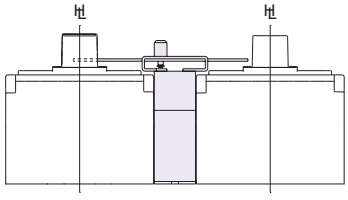


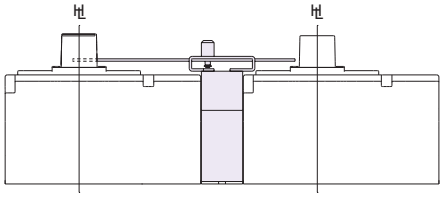












ASL : Arrangement Standard Line

⊬ : Handle Frame Centre Line

℄ : Handle 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		

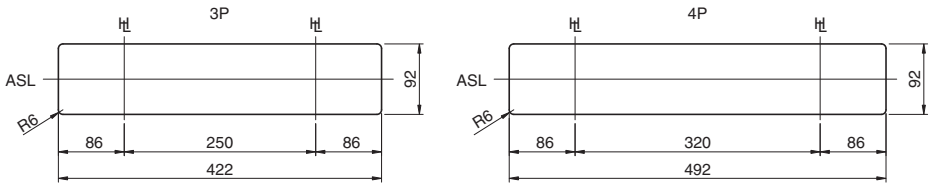
Notes:

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.

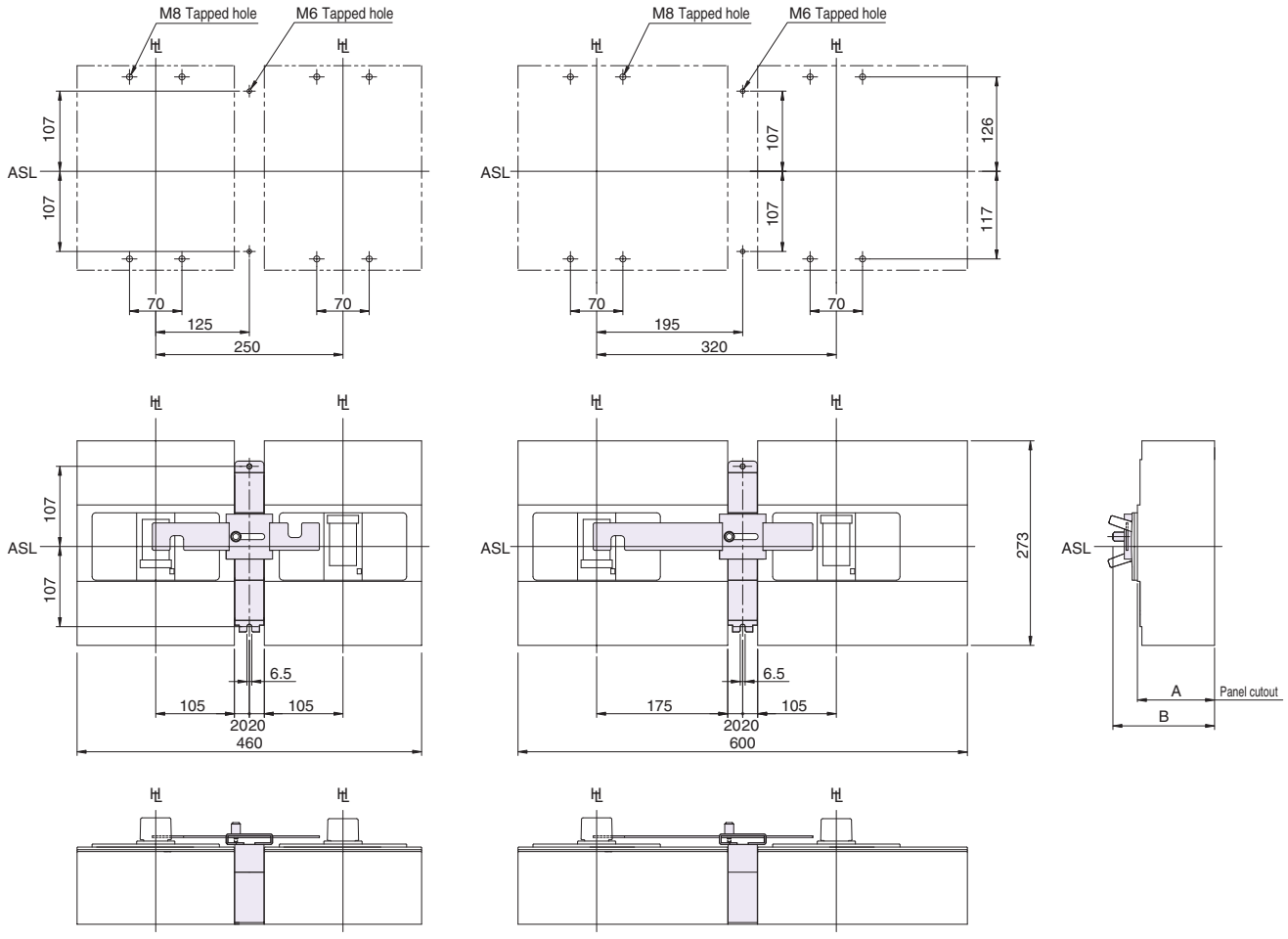
2: UVT with time-delay cannot be fitted to the left circuit breaker.

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)

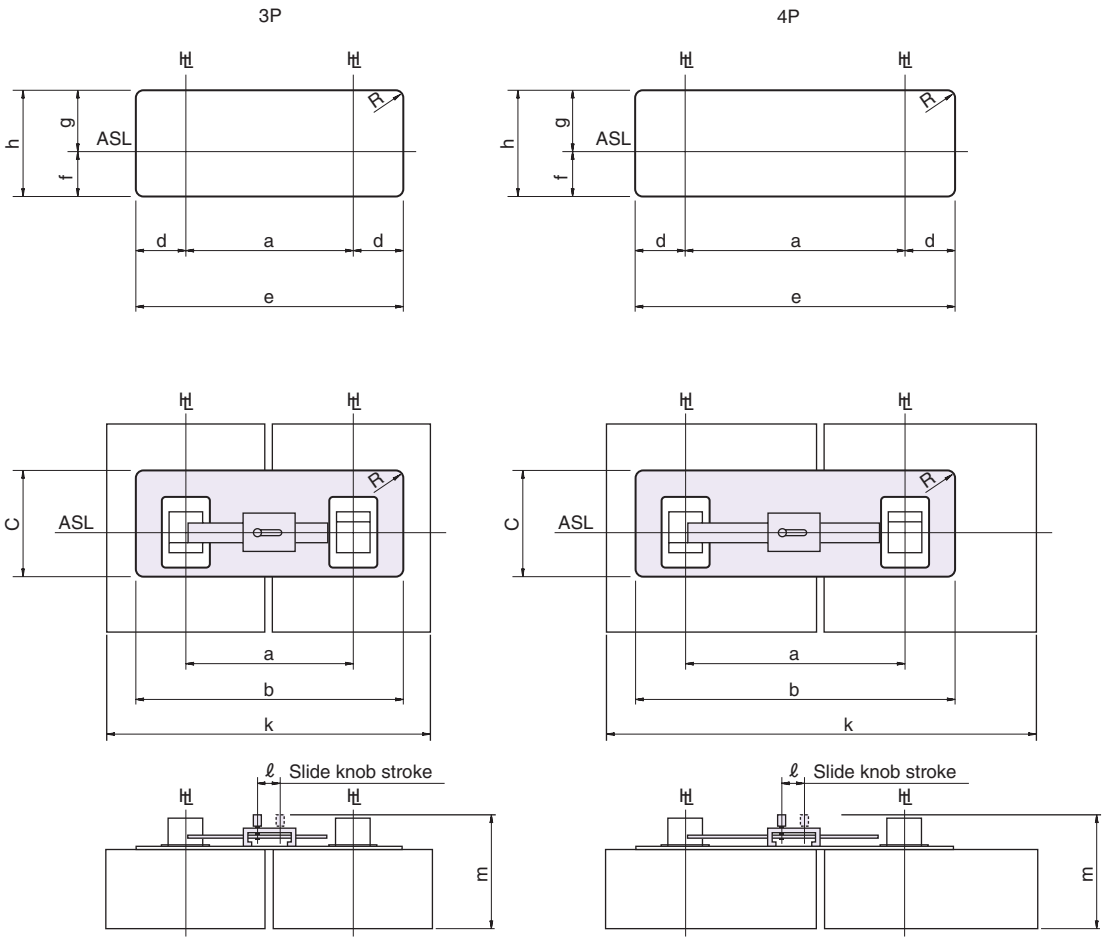
Dimensions, mm

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
2000, 2500, 3200	**XS2000NE, XS2000NN**	**XLF10** ①	3	Contact us for the detailed dimensions.											
			4												
	XS2500NE, XS2500NN, XS3200NE (3P only), XS3200NN (3P only)	**XLF10** ①	3												
			4												

Notes:
①: Please order with the breakers.
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
⊬ : Handle Frame Centre Line
℄ : Handle Centre Line

Panel cutout (front view)



5. Mechanical interlock

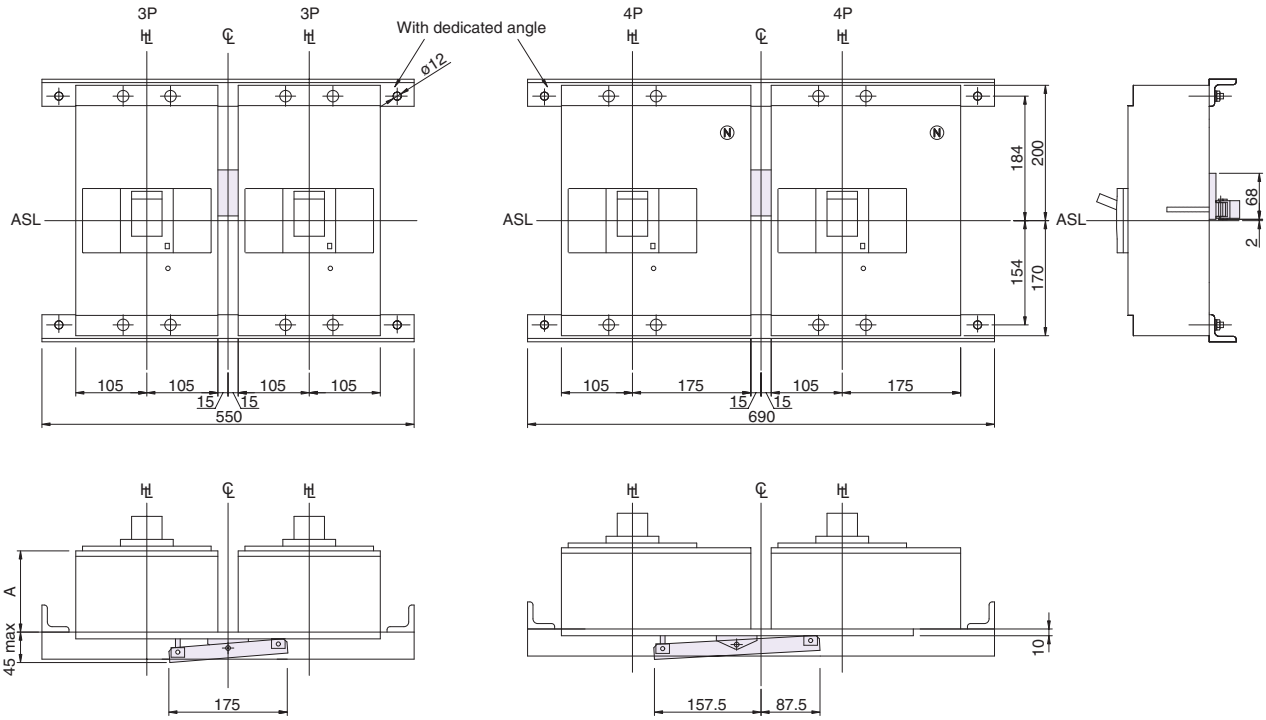
ASL : Arrangement Standard Line
℄ : Handle Frame Centre Line
℄ : Handle Centre Line

(2) Rear-connected interlock (MB)

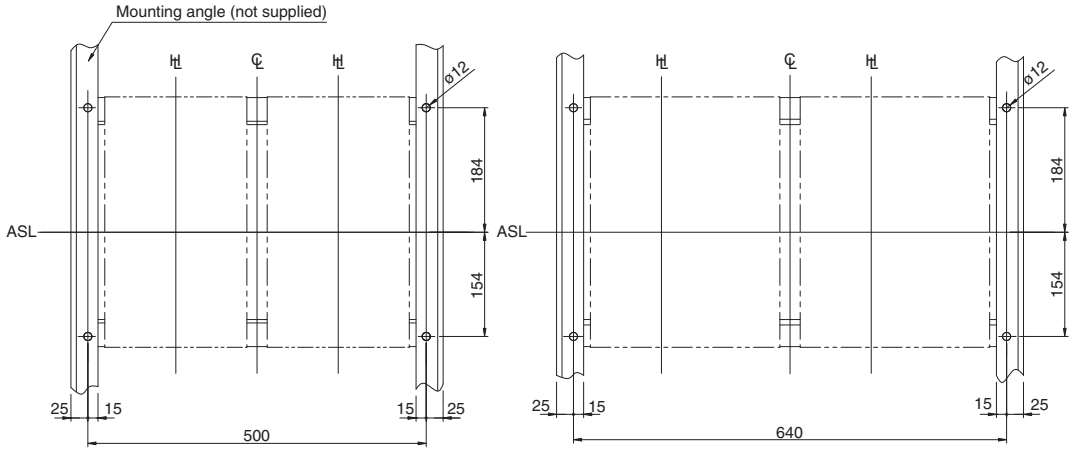
Dimensions, mm

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

: Handle Frame Centre Line
: Handle Centre Line

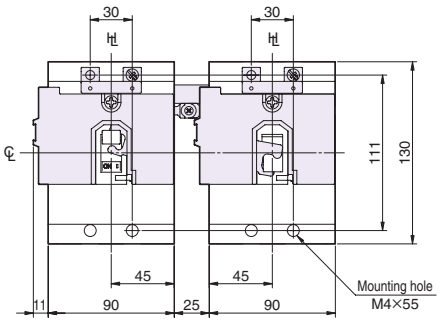
(3) Link Interlock (ML)

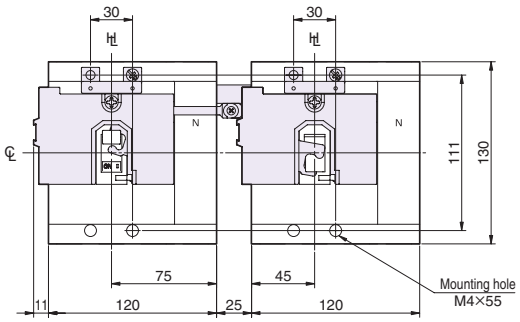
A type that interlocks the left and right circuit breakers with a link bar. It requires little space and is very easy to install.

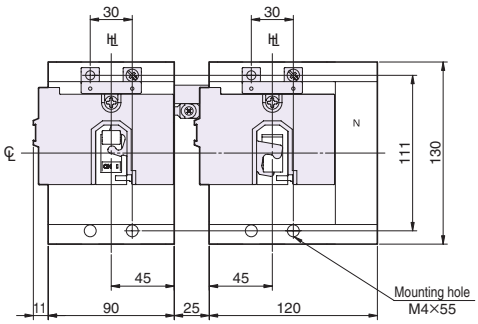
Dimensions, mm

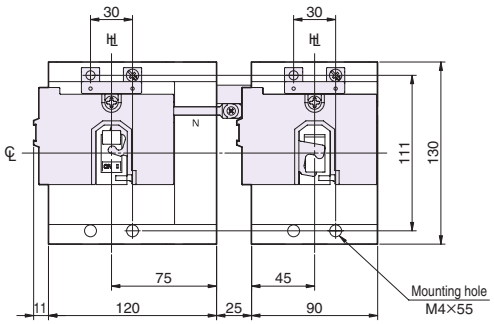
Frame size (A)	Types of MCCBs	Number of poles	Position	Interlock Order codes
160	**P160F/N/H/D**	3	Right	TPML16SR3N
		4		TPML16SR4N
		3	Left	TPML16SL3N
		4		TPML16SL4N

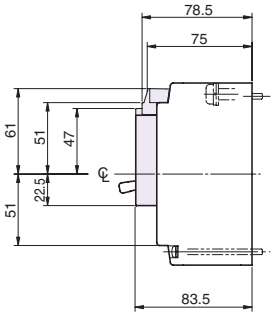
Notes:
1: The lead wire terminal block cannot be fitted to either side of the left circuit breaker or to the left side of the right circuit breaker.
2: UVT with time-delay cannot be fitted to the left circuit breaker.

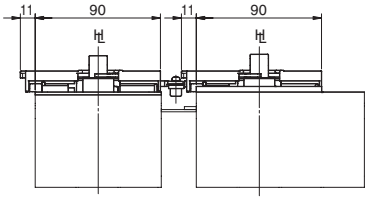


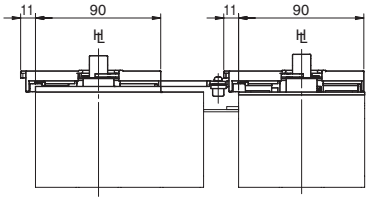












℄ : Handle Frame Centre Line
℄ : Handle Centre Line

Dimensions, mm

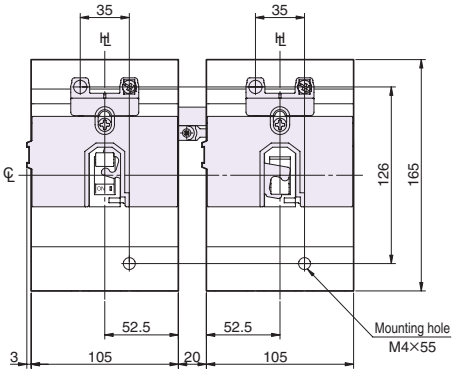
Frame size (A)	Types of MCCBs	Number of poles	Position	Interlock Order codes
250	**P250F/N/H/D**	3	Right	TPML25SR3N
		4		TPML25SR4N
		3	Left	TPML25SL3N
		4		TPML25SL4N

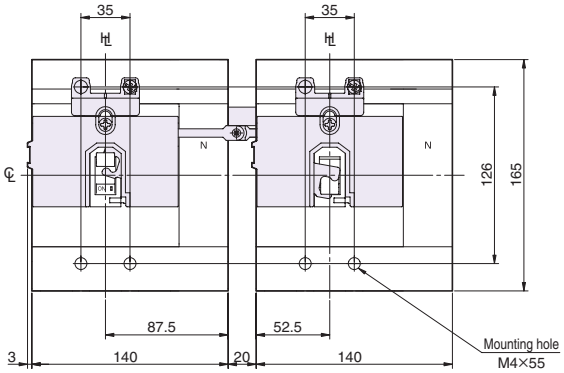
Notes:

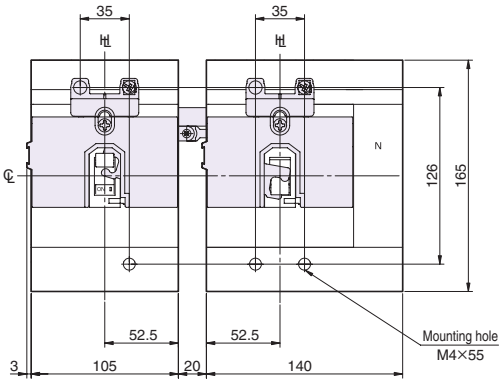
1: The extention bars for front connection cannot be applied due to insufficient insulation distance.

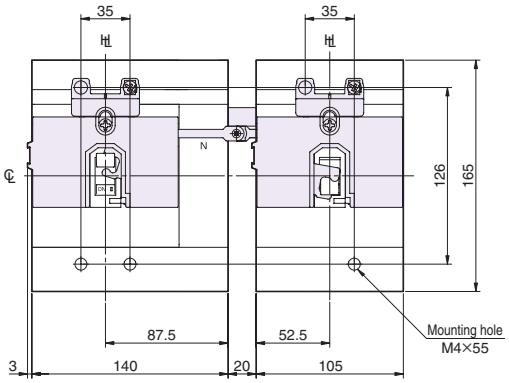
2: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.

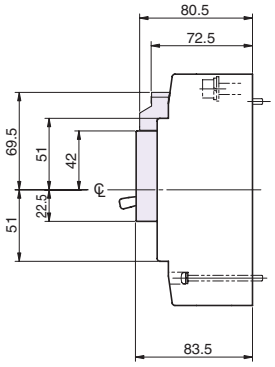
3: UVT with time-delay cannot be fitted to the left circuit breaker.

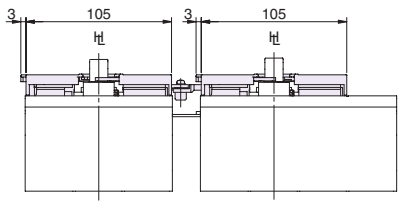


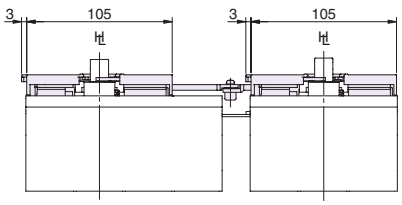












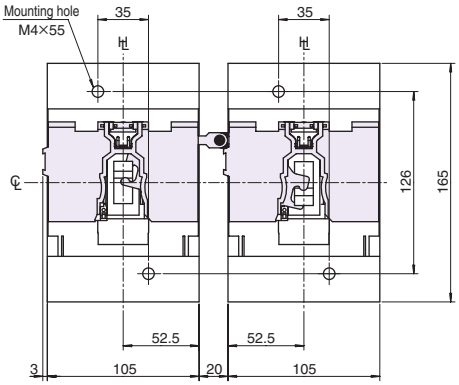
℄ : Handle Frame Centre Line
℄ : Handle Centre Line

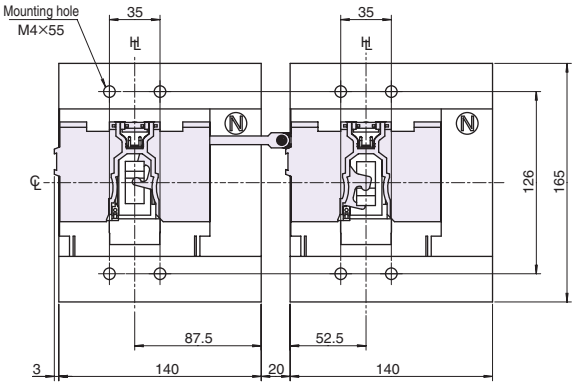
(3) Link Interlock (ML)

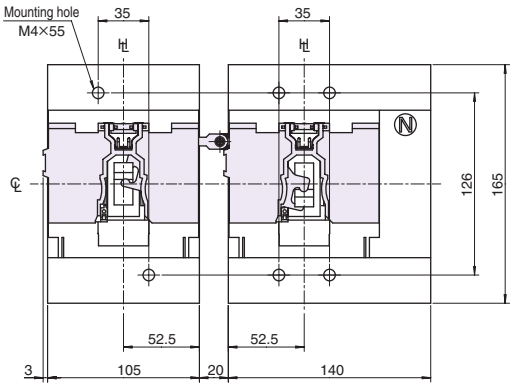
Dimensions, mm

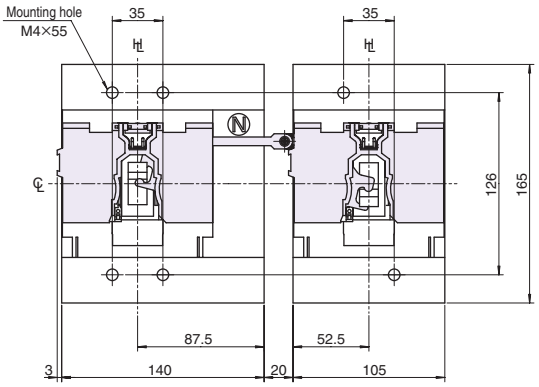
Frame size (A)	Types of MCCBs	Number of poles	Position	Interlock Order codes
250	**E250-SCF/SCJ/SF/SJ, S250-SN**	3	Right	T2ML25LRP
		4		
		3	Left	T2ML25LL3P
		4		T2ML25LL4P

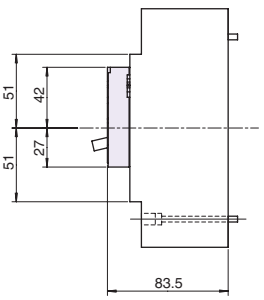
Notes:
1: The extention bars for front connection cannot be applied due to insufficient insulation distance.
2: The terminal block can not be fitted to the right side of the left breaker and to the left side of the right breaker.
3: UVT with time-delay cannot be fitted to the left circuit breaker.

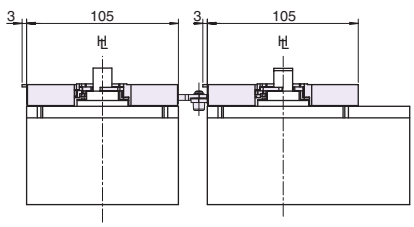


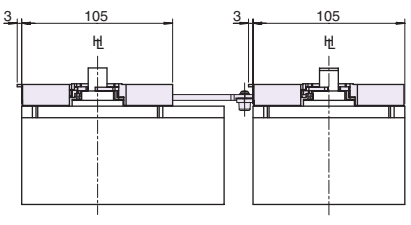












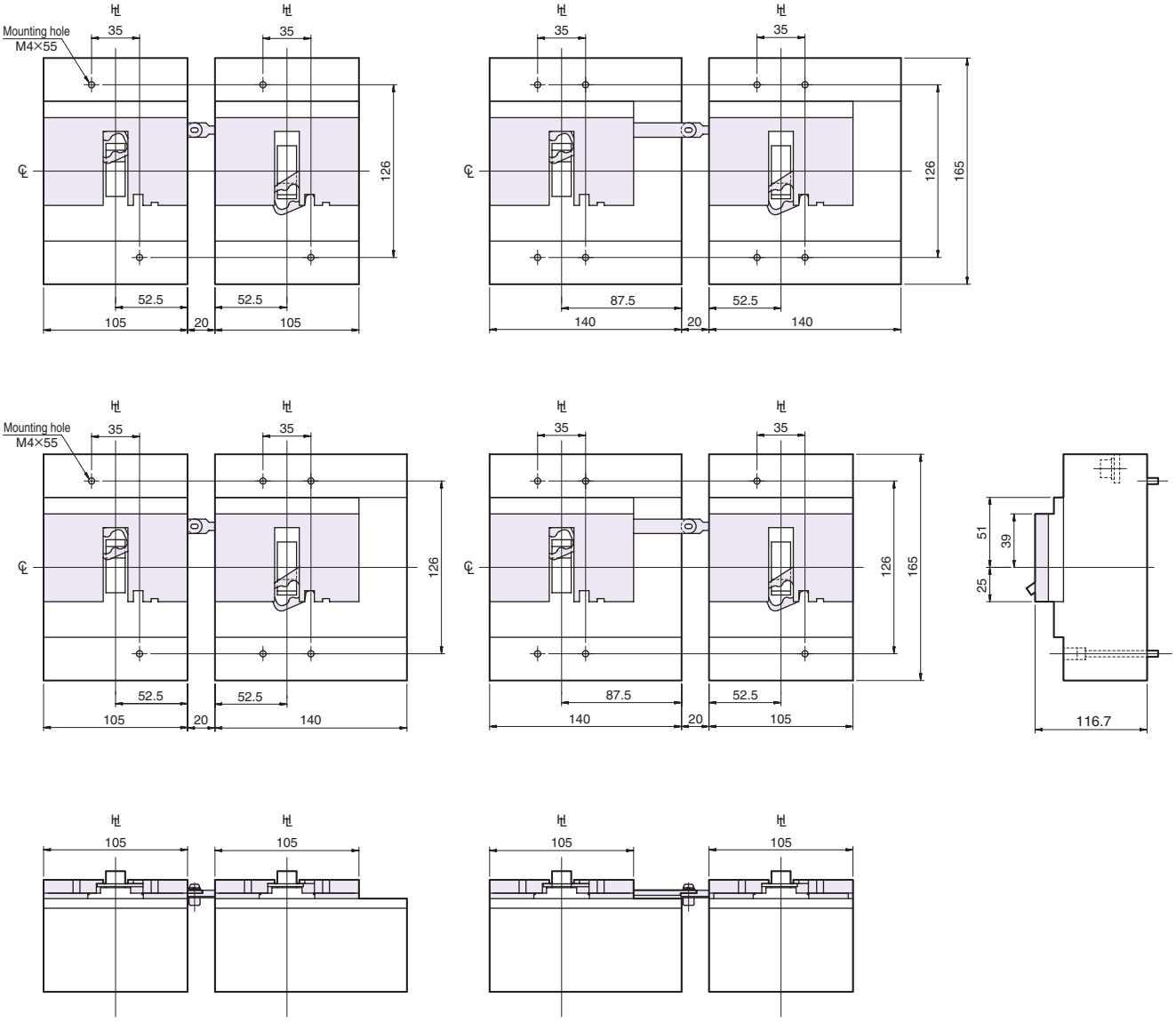
ASL : Arrangement Standard Line
⊬ : Handle Frame Centre Line
℄ : Handle Centre Line

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 extention 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.



ASL : Arrangement Standard Line
⊬ : Handle Frame Centre Line
℄ : Handle Centre Line

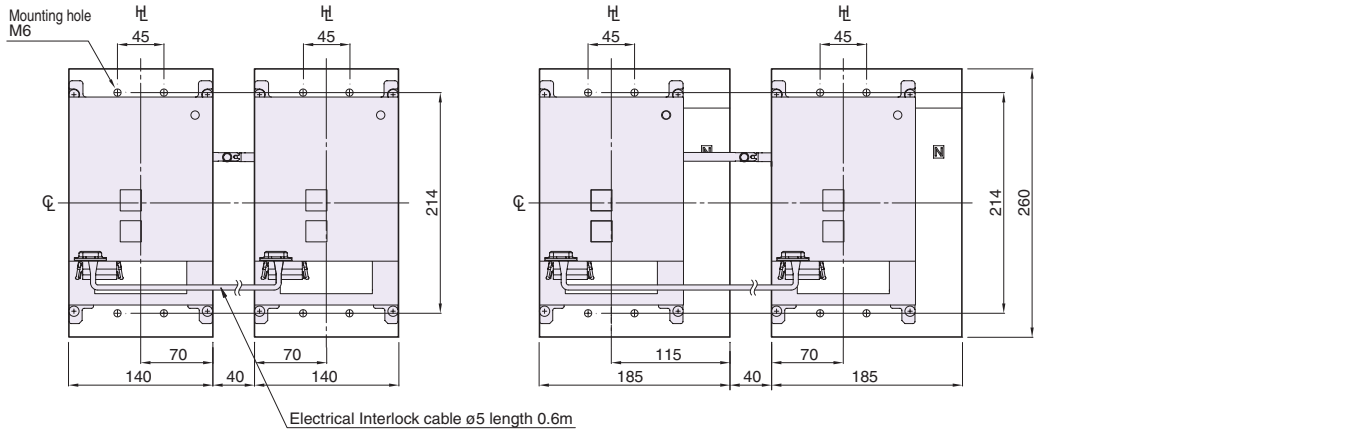
(3) Link Interlock (ML)

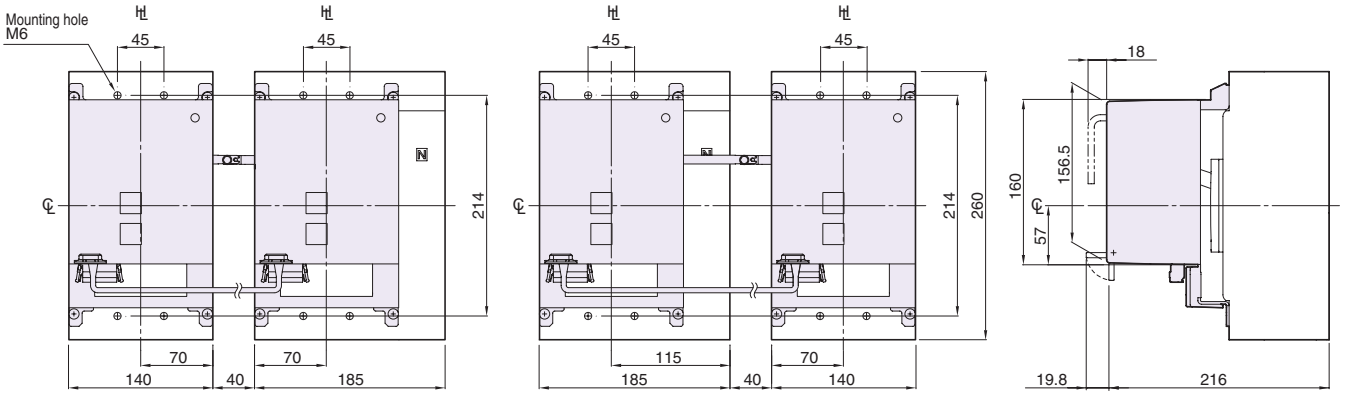
With motor operators

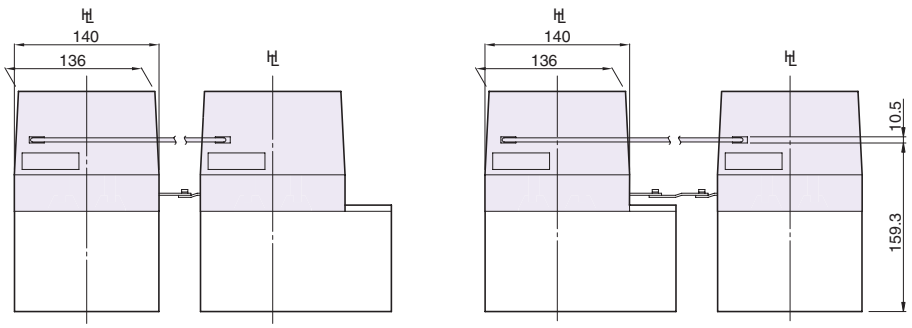
Dimensions, mm

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 extention 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.







ASL : Arrangement Standard Line
⊬ : Handle Frame Centre Line
℄ : Handle Centre Line

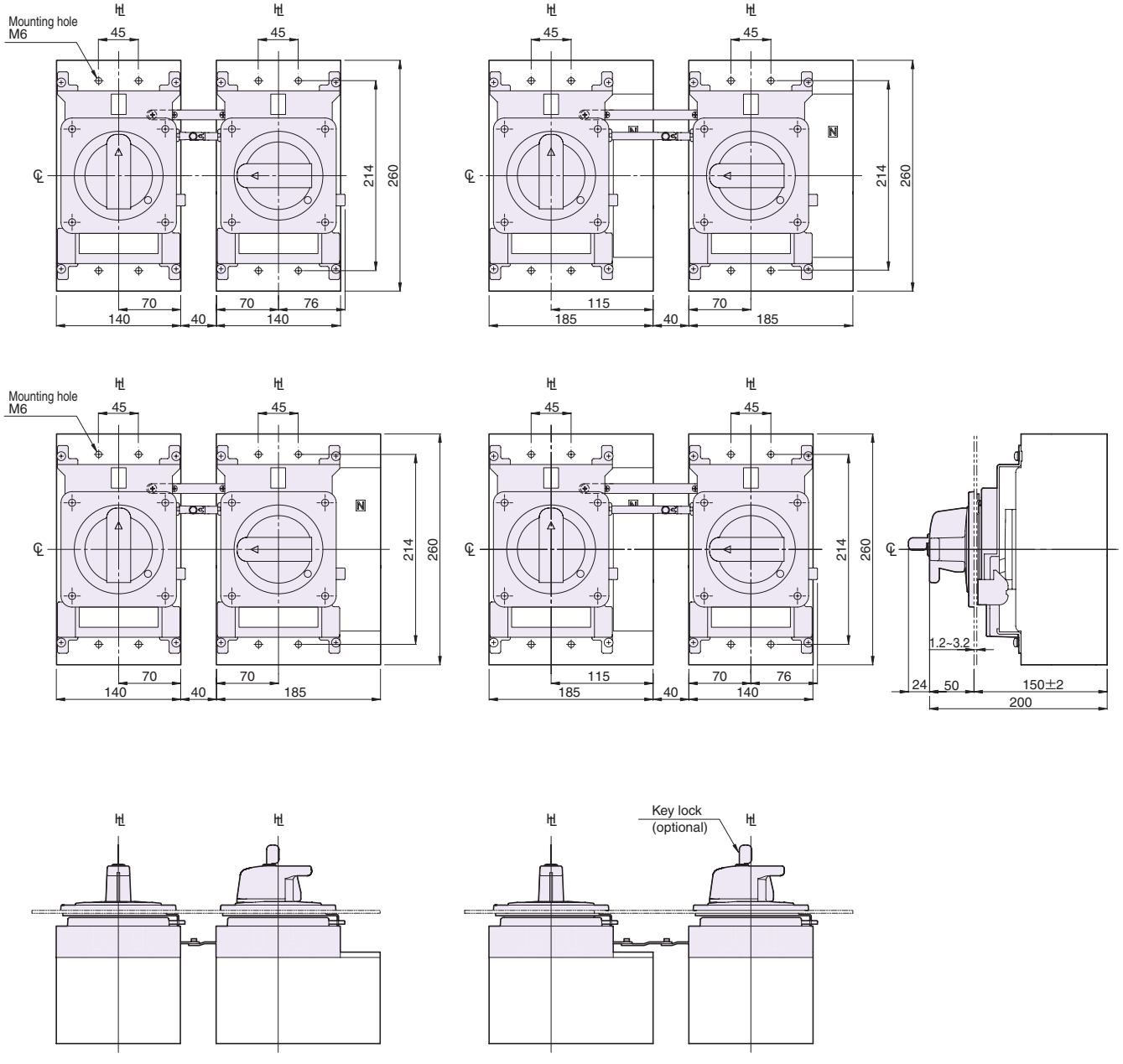
With external operating handle

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 extention 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.



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

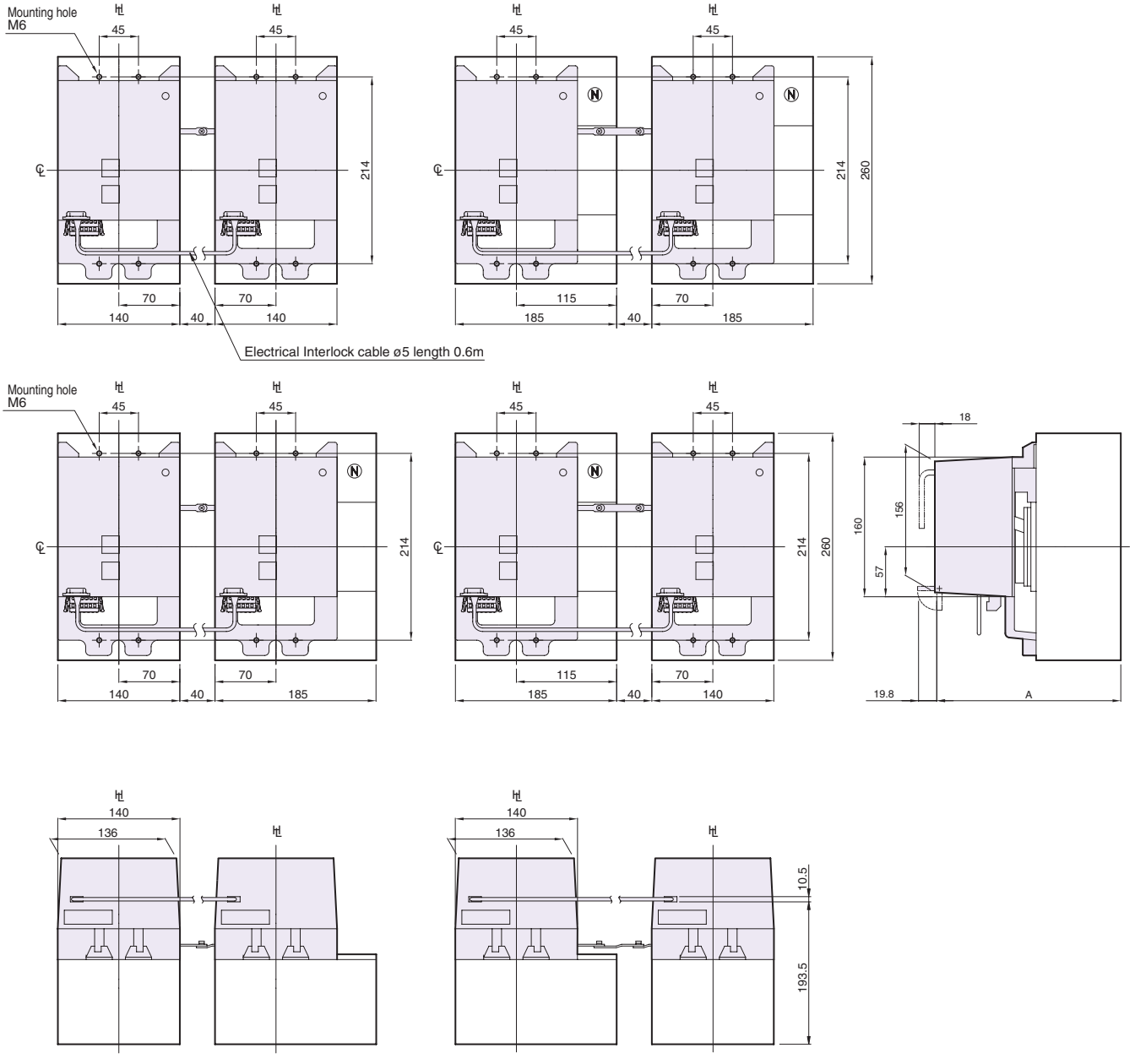
(3) Link Interlock (ML)

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 extention 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.



ASL : Arrangement Standard Line
⊬ : Handle Frame Centre Line
℄ : Handle Centre Line

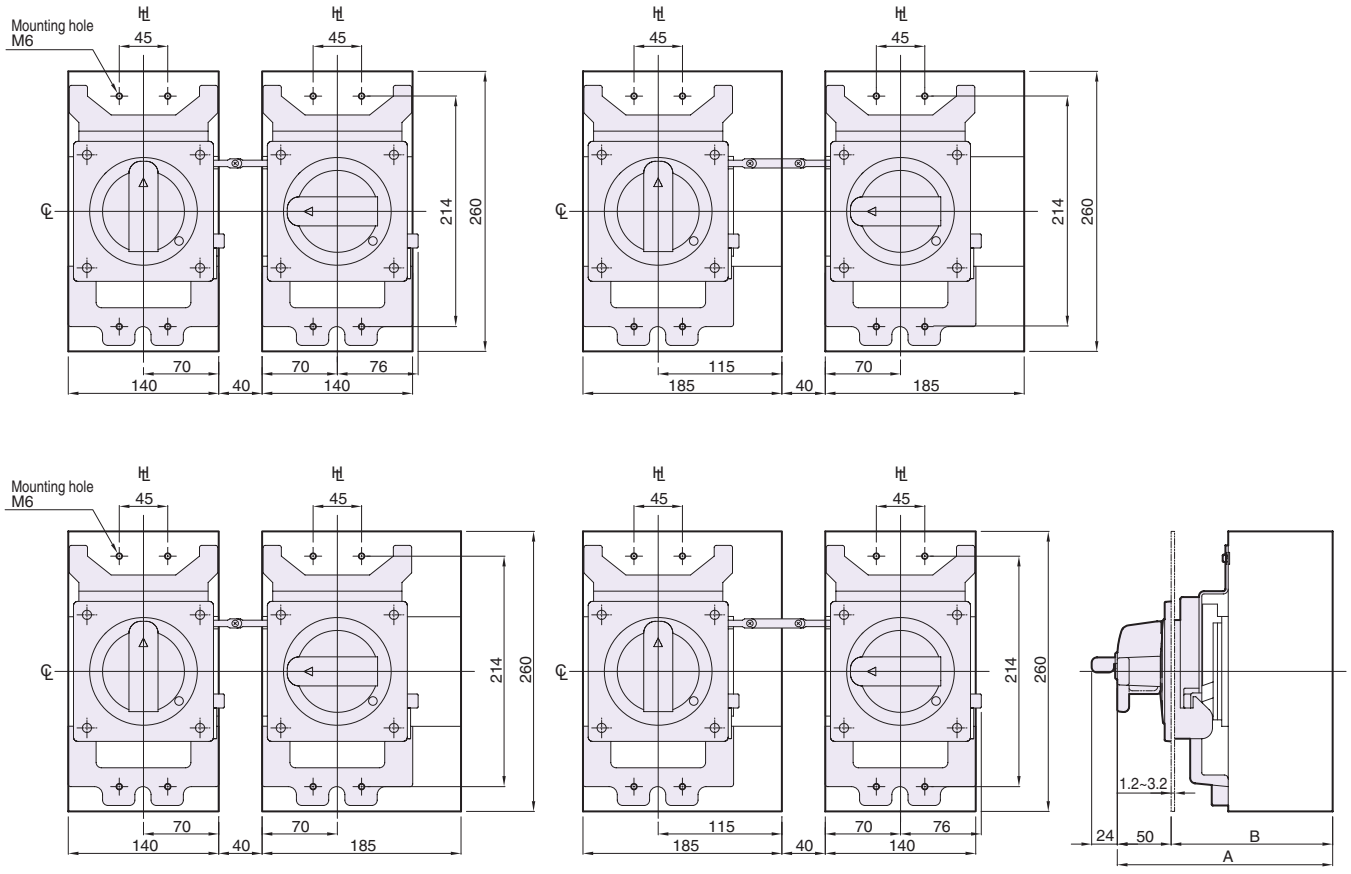
With external operating handle

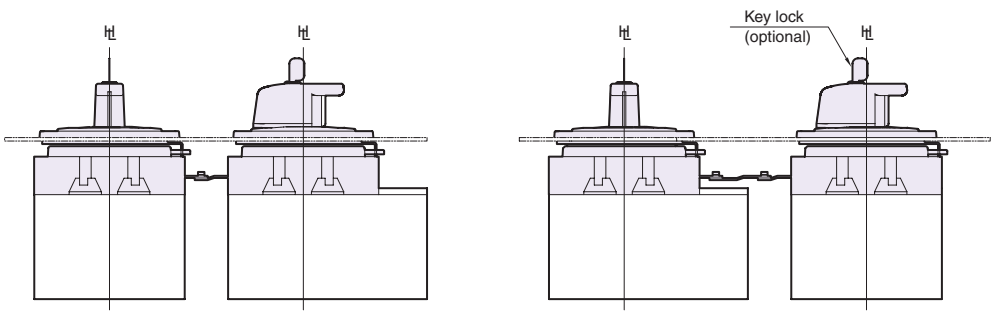
Dimensions, mm

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 extention 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.





ASL : Arrangement Standard Line
⊬ : Handle Frame Centre Line
℄ : Handle Centre Line

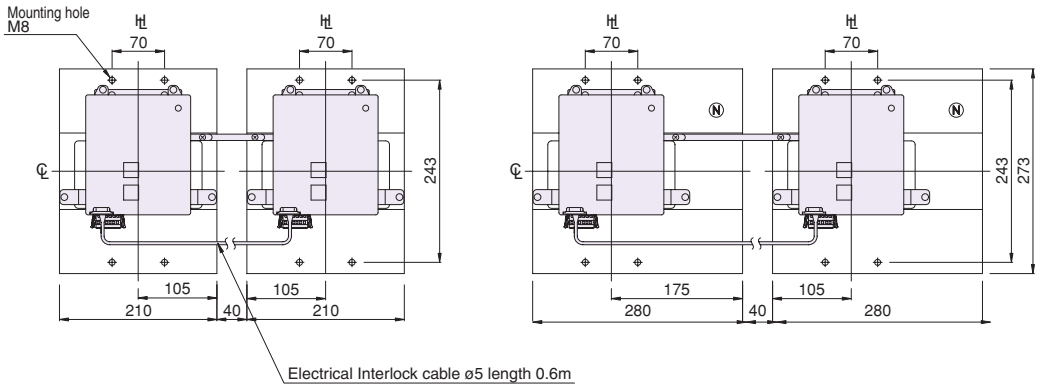
(3) Link Interlock (ML)

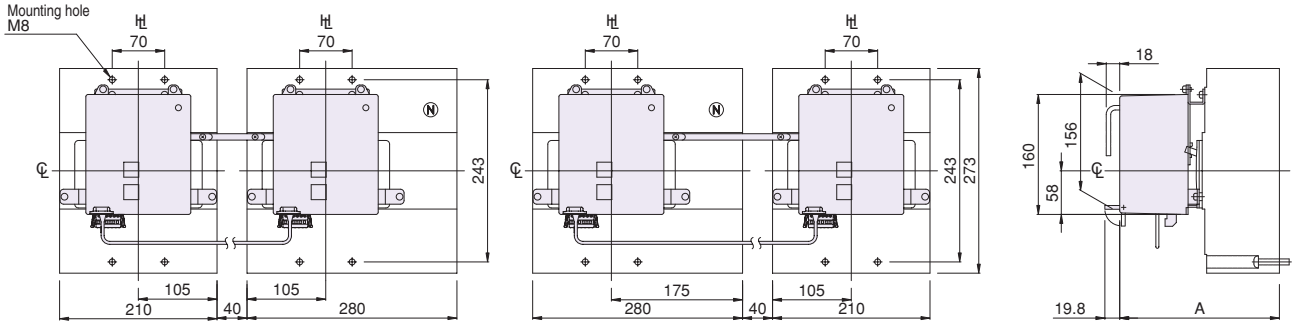
With motor operators

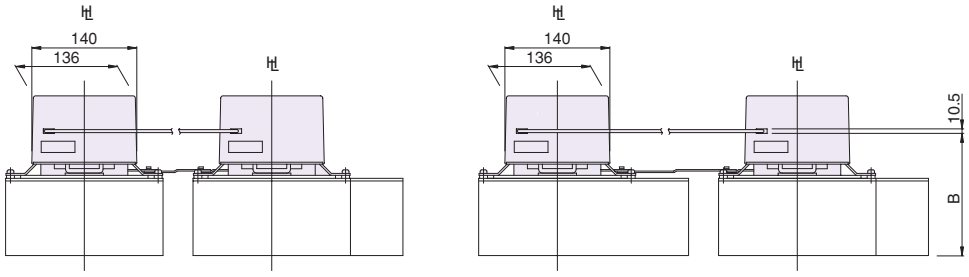
Dimensions, mm

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.







ASL : Arrangement Standard Line
⋕ : Handle Frame Centre Line
℄ : Handle Centre Line

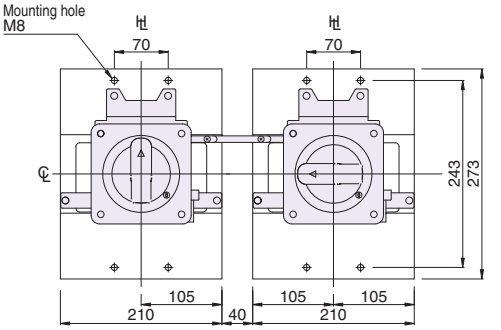
With external operating handle

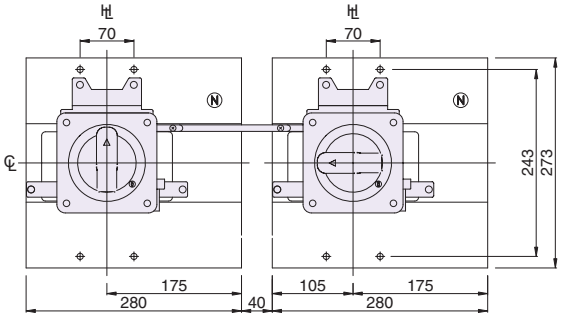
Dimensions, mm

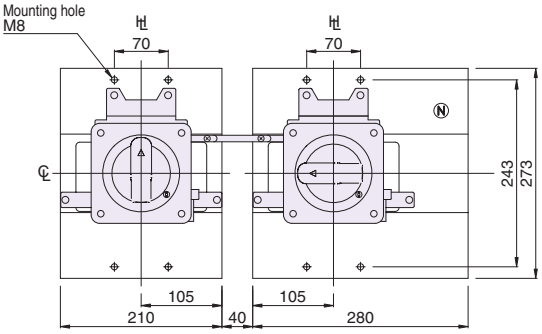
Frame size (A)	Types of MCCBs	Number of poles	Position	Interlock Order codes	A (mm)	B (mm)
800, 1000	**S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN**	3	Right	Factory-installed	200	150
		4				
		3	Left			
		4				
	H800-NE, L800-NE, L800-PE	3	Right	Factory-installed	237	187
		4				
		3	Left			
		4				

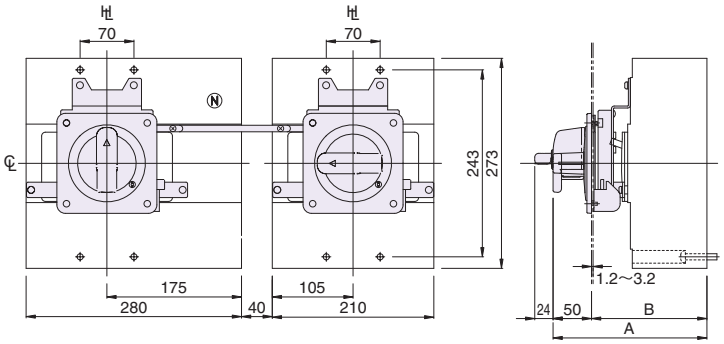
Notes:

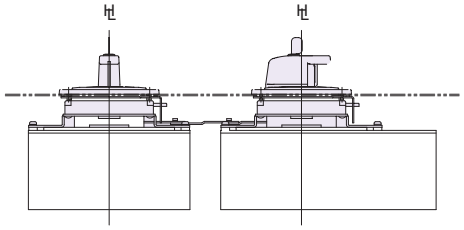
1: Due to space limitations between the circuit breakers, the lead wire terminal block can only be fitted to either the right side of the left breaker or the left side of the right breaker.
2: The 800AF to 1000AF link type interlock are only available with either the motor operator or external operating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

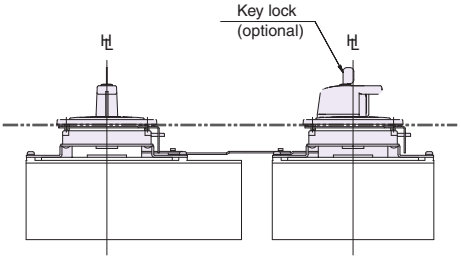












5. Mechanical interlock

: Handle Frame Centre Line
: 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.

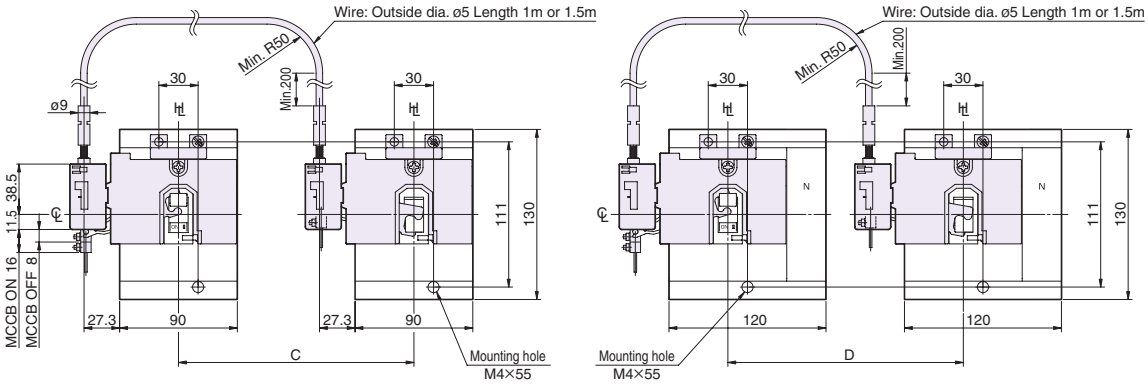
Dimensions, mm

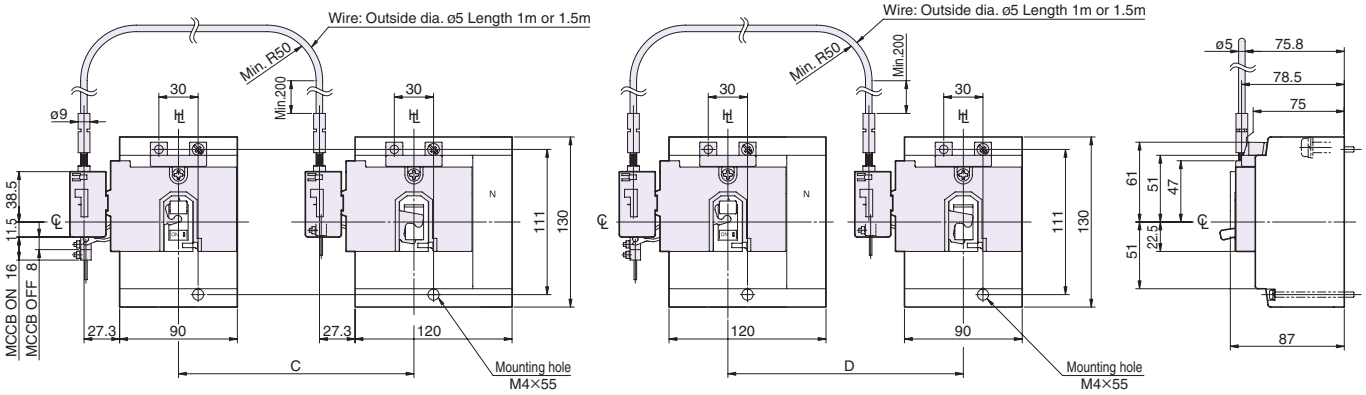
Frame size (A)	Types of MCCBs	Interlock Order codes
160	**P160F/N/H/D**	TPMW16SCN

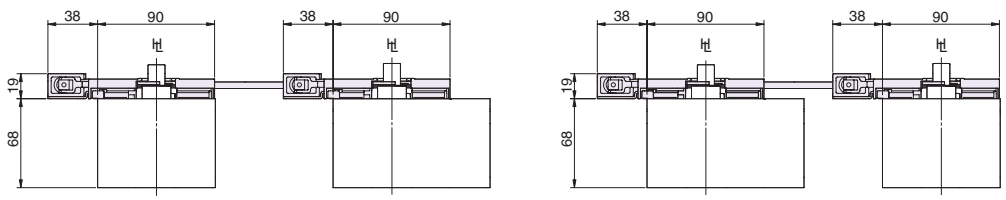
Interlock wire order codes (length)	C (mm)	D (mm)
TPMW00S(1m)	140min.-480max.	170min.-480max.
TPMW00L(1.5m)	140min.-980max.	170min.-980max.

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 Frame Centre Line
℄ : Handle Centre Line

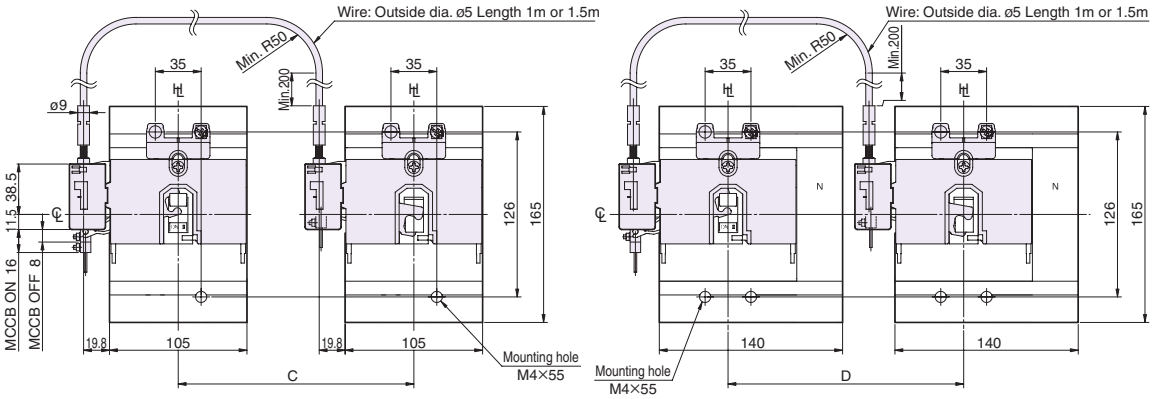
Dimensions, mm

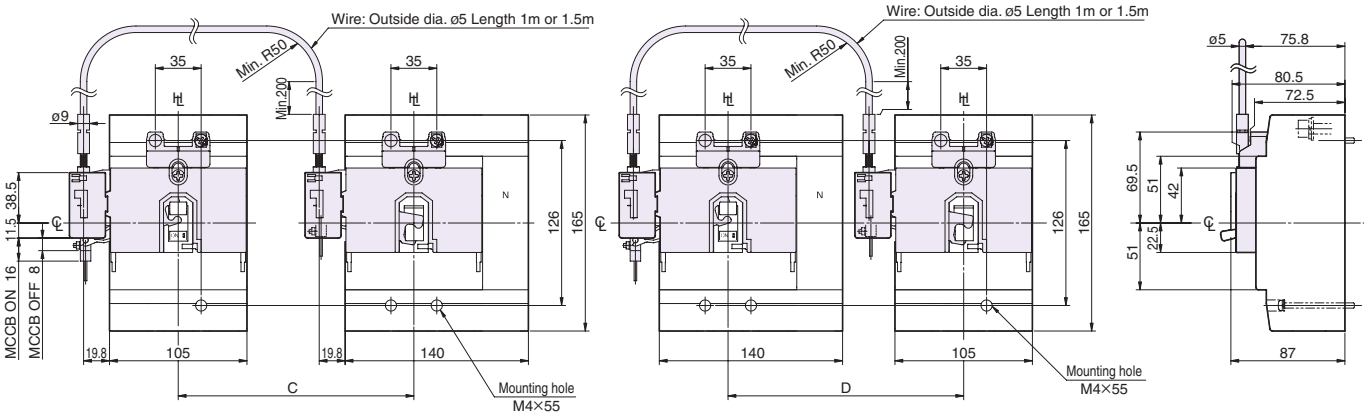
Frame size (A)	Types of MCCBs	Interlock Order codes
250	**P250F/N/H/D**	TPMW25SCN

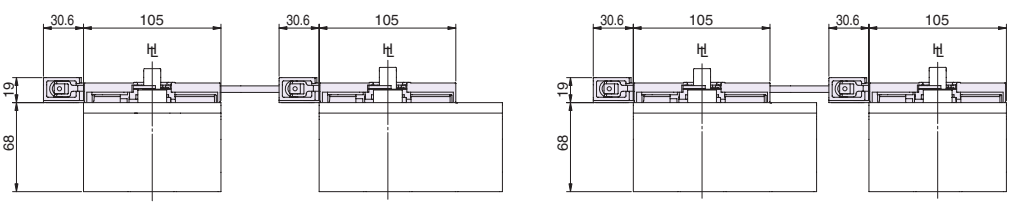
Interlock wire order codes (length)	C (mm)	D (mm)
TPMW00S(1m)	155min.-480max.	180min.-480max.
TPMW00L(1.5m)	155min.-980max.	180min.-980max.

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 Frame Centre Line
℄ : Handle Centre Line

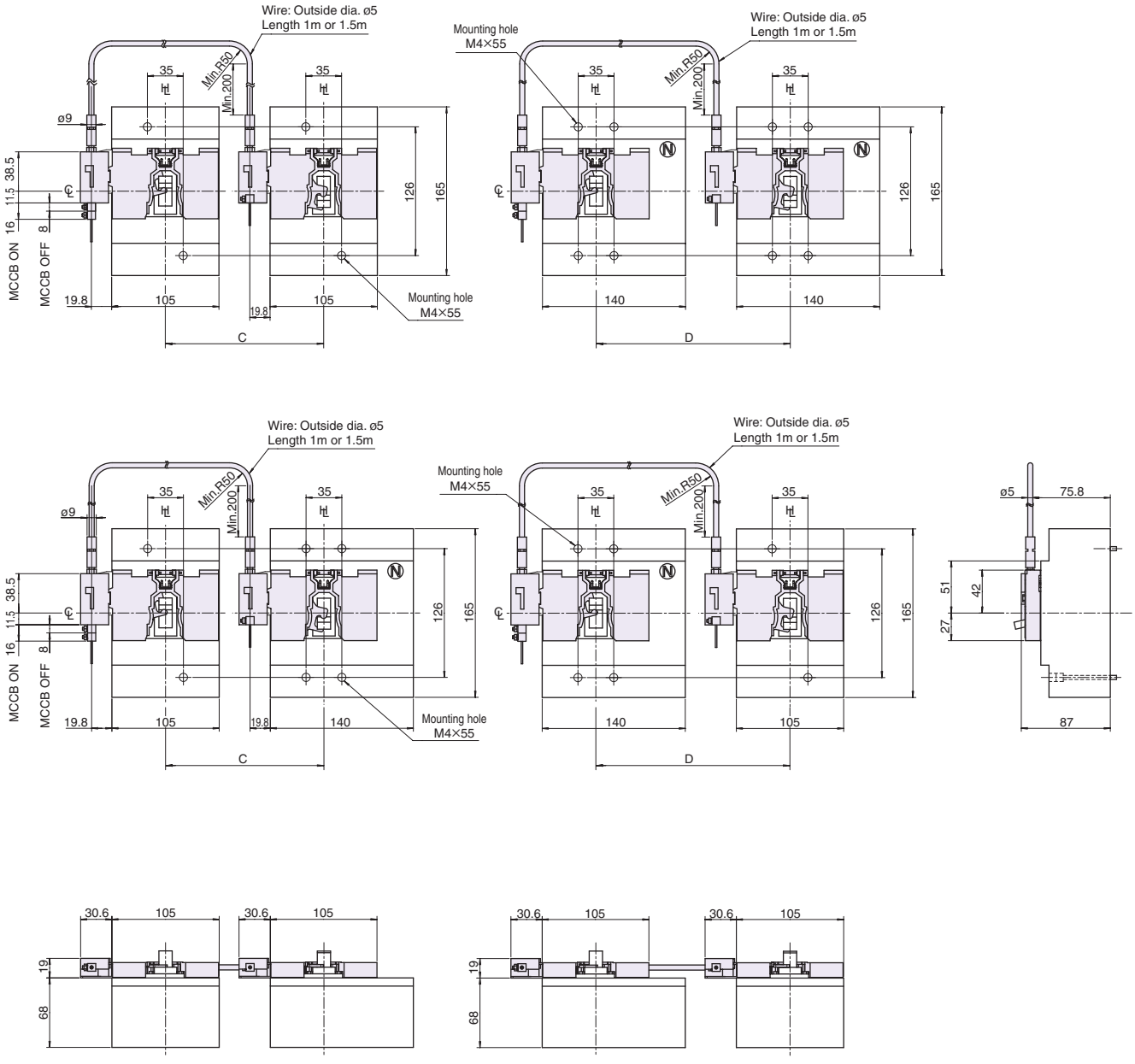
(4) Wire interlock (MW)

Dimensions, mm

Frame size (A)	Types of MCCBs	Interlock Order codes
250	**E250-SCF/SCJ/SF/SJ, S250-SN**	T2MW25LCP

Interlock wire order codes (length)	C (mm)	D (mm)
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.



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

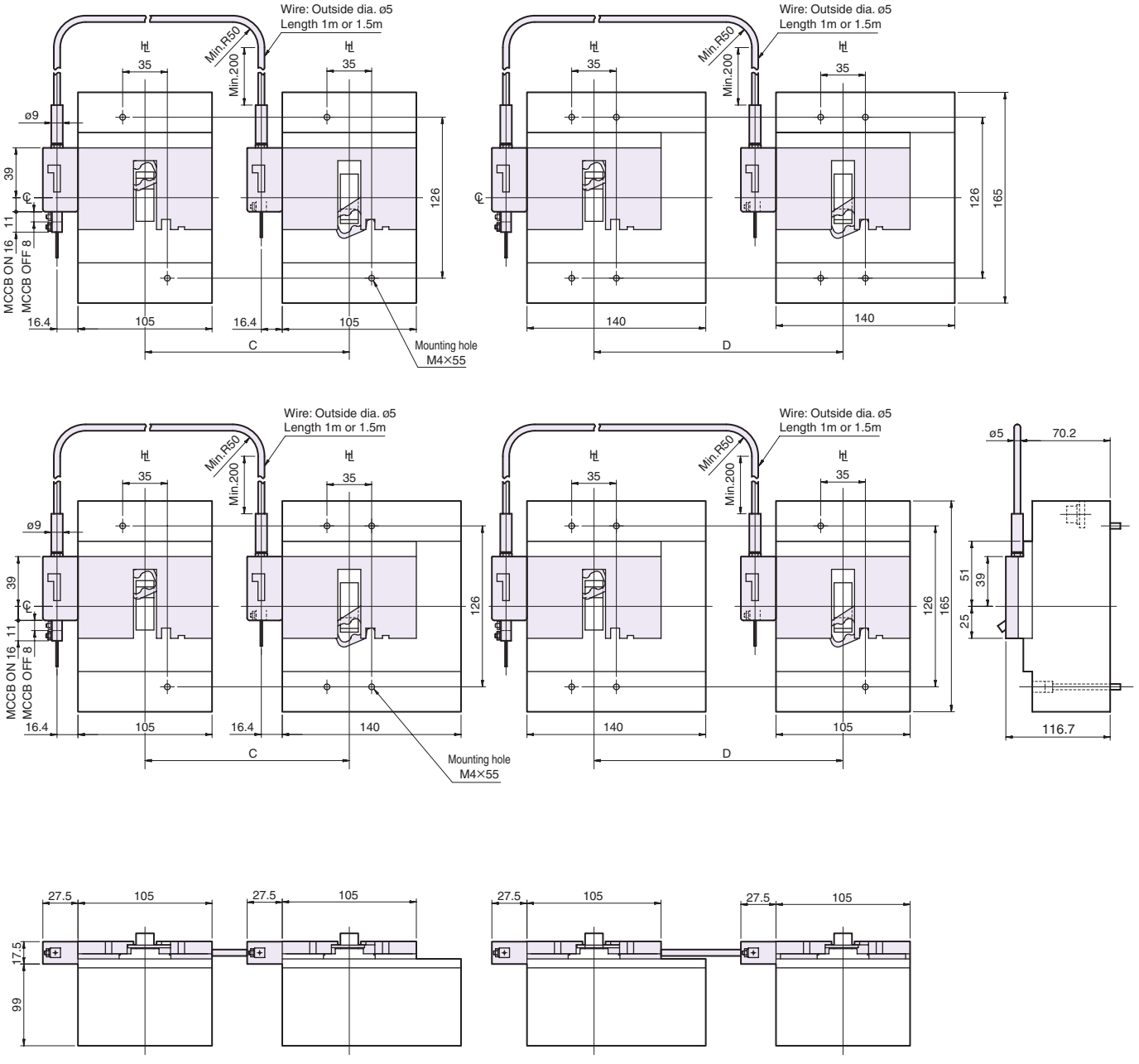
Dimensions, mm

Frame size (A)	Types of MCCBs	Interlock Order codes
125, 160, 250	**H125-NJ, H160-NJ, H250-NJ/NE, L125-NJ, L125-PJ, L160-NJ, L250-NJ**	T2MW25CP

Interlock wire order codes (length)	C (mm)	D (mm)
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.



ASL : Arrangement Standard Line
⊬ : Handle Frame Centre Line
℄ : Handle Centre Line

(4) Wire interlock (MW)

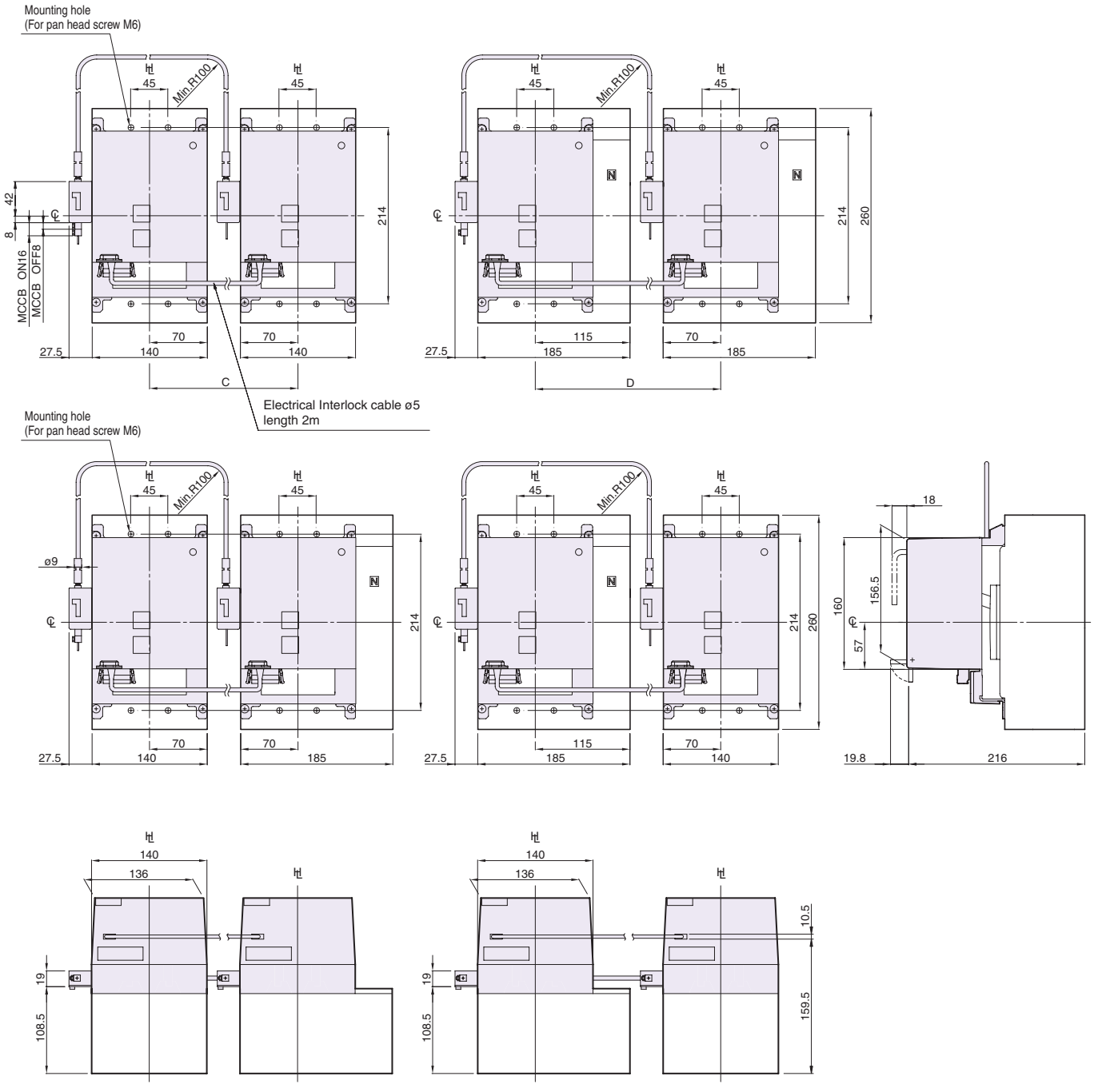
With motor operators

Dimensions, mm

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.

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.



ASL : Arrangement Standard Line
⊬ : Handle Frame Centre Line
℄ : Handle Centre Line

With external operating handle

Dimensions, mm

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

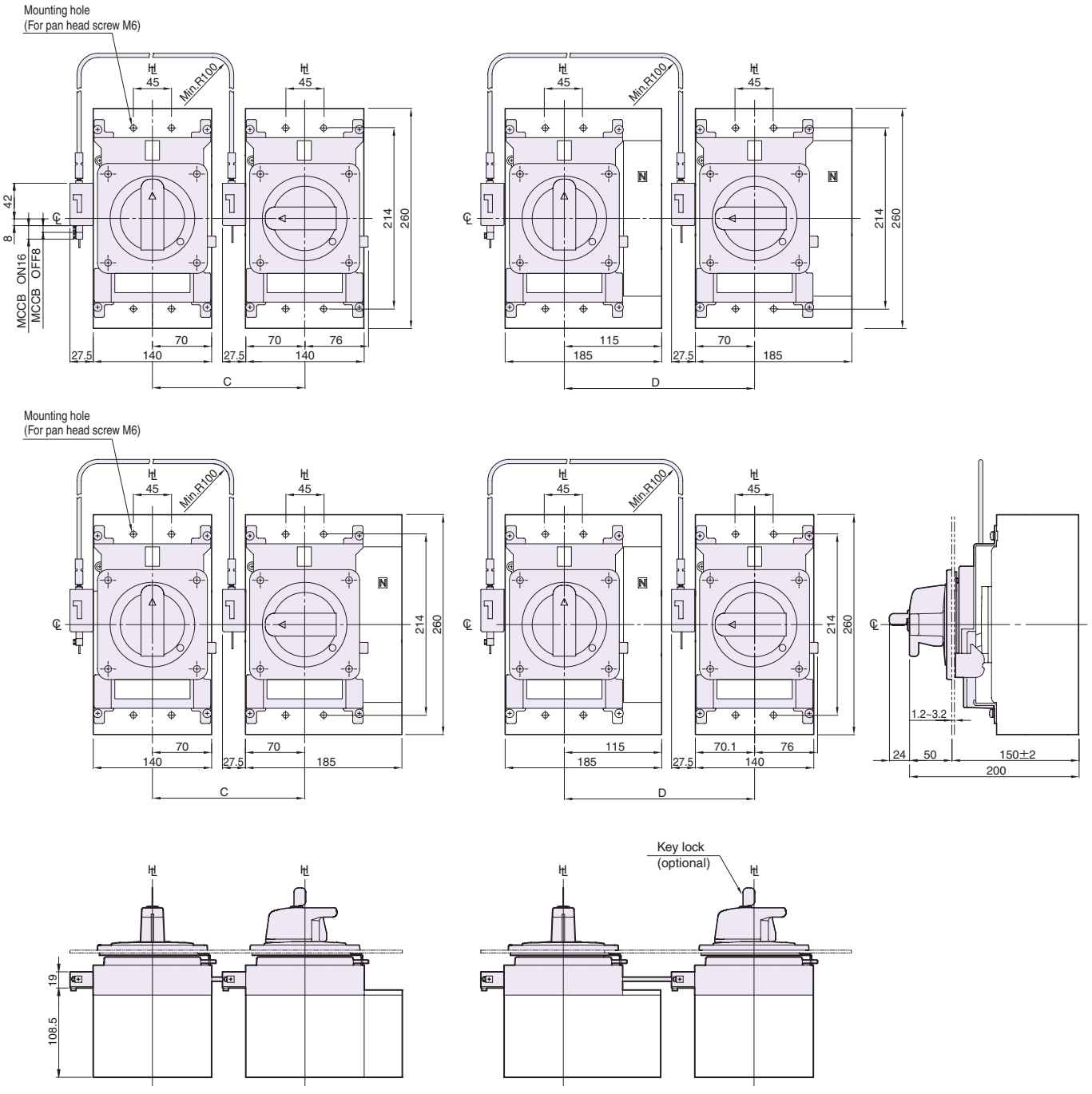
Interlock wire order codes (length)	C (mm)	D (mm)
TPMW00S(1m)	180min.-430max.	225min.-430max.
TPMW00L(1.5m)	180min.-930max.	225min.-930max.

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.



ASL : Arrangement Standard Line
⊬ : Handle Frame Centre Line
℄ : Handle Centre Line

(4) Wire interlock (MW)

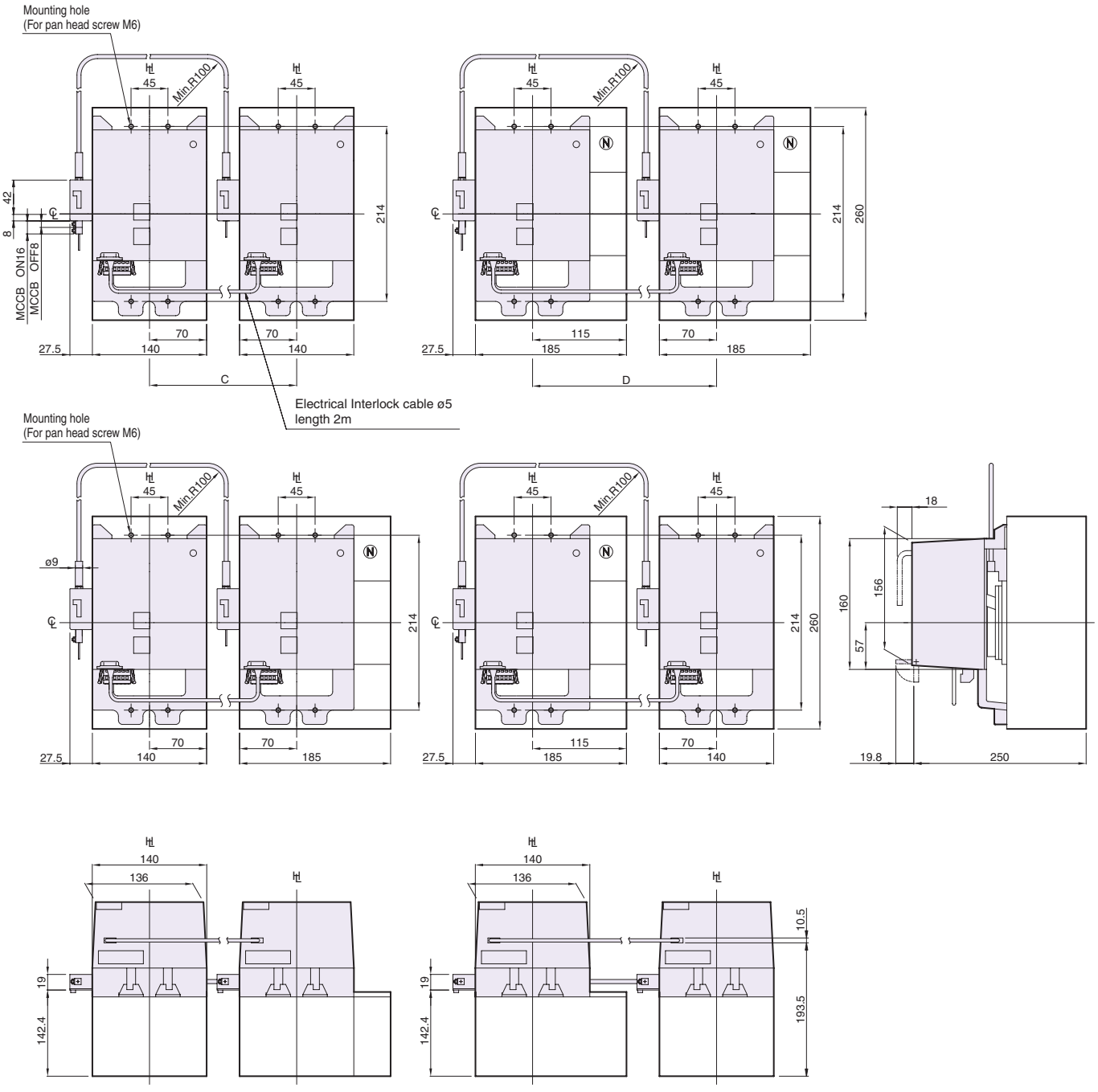
With motor operators

Dimensions, mm

Frame size (A)	Types of MCCBs	Interlock Order codes
400	**H400-NE, L400-NE, L400-PE**	Factory-installed

Interlock wire order codes (length)	C (mm)	D (mm)
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.



ASL : Arrangement Standard Line
℄ : Handle Frame Centre Line
℄ : Handle Centre Line

With external operating handle

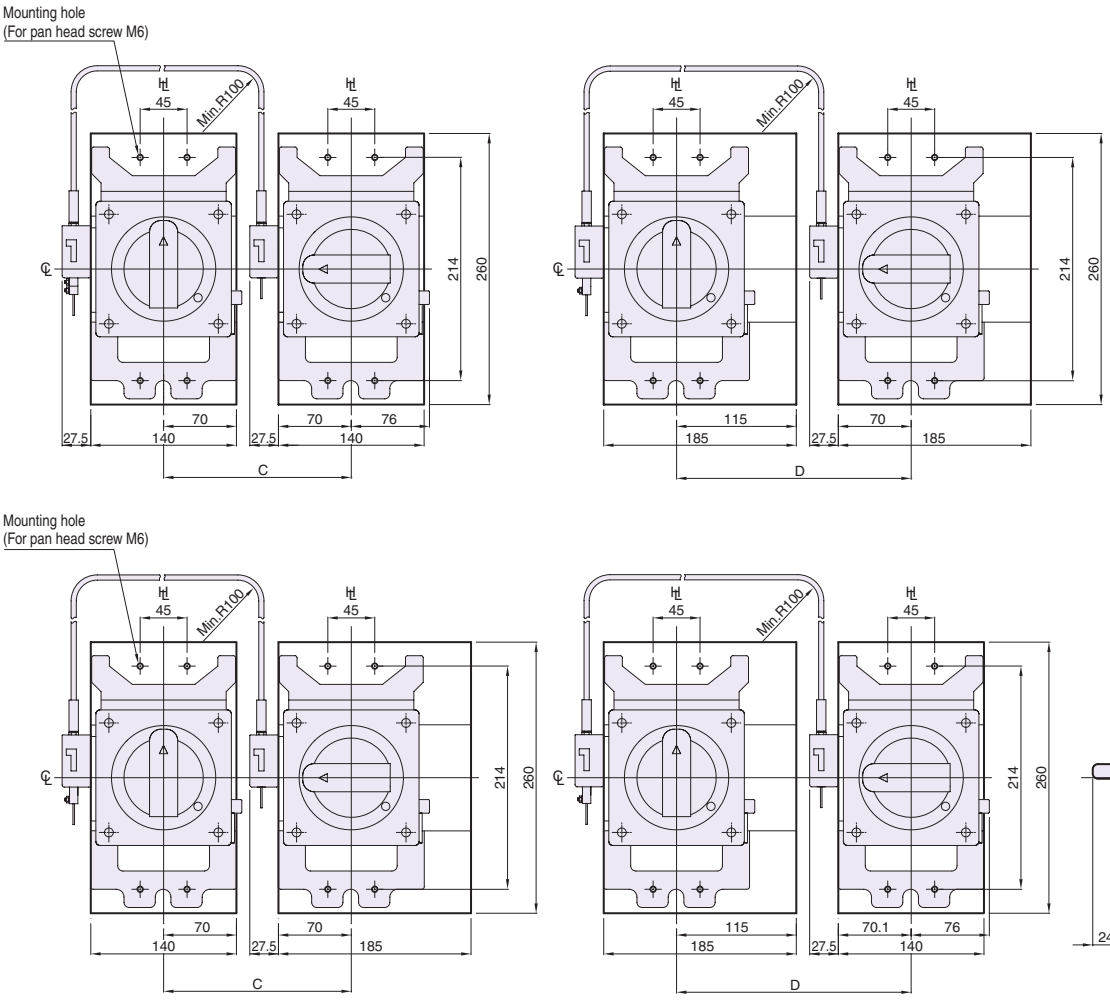
Dimensions, mm

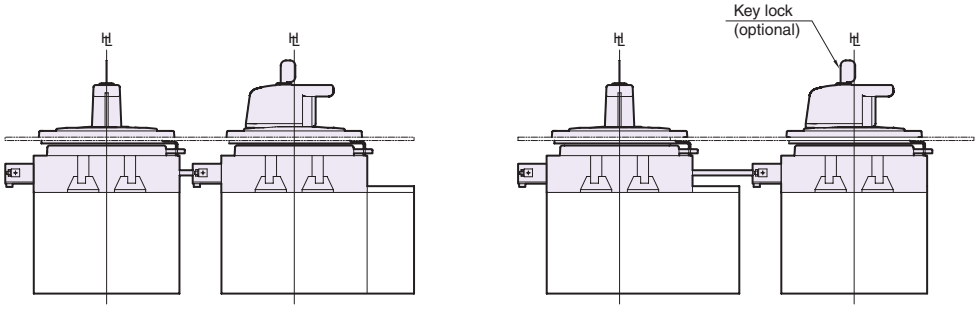
Frame size (A)	Types of MCCBs	Interlock Order codes
400	**H400-NE, L400-NE, L400-PE**	Factory-installed

Interlock wire order codes (length)	C (mm)	D (mm)
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.





ASL : Arrangement Standard Line
⊬ : Handle Frame Centre Line
℄ : Handle Centre Line

(4) Wire interlock (MW)

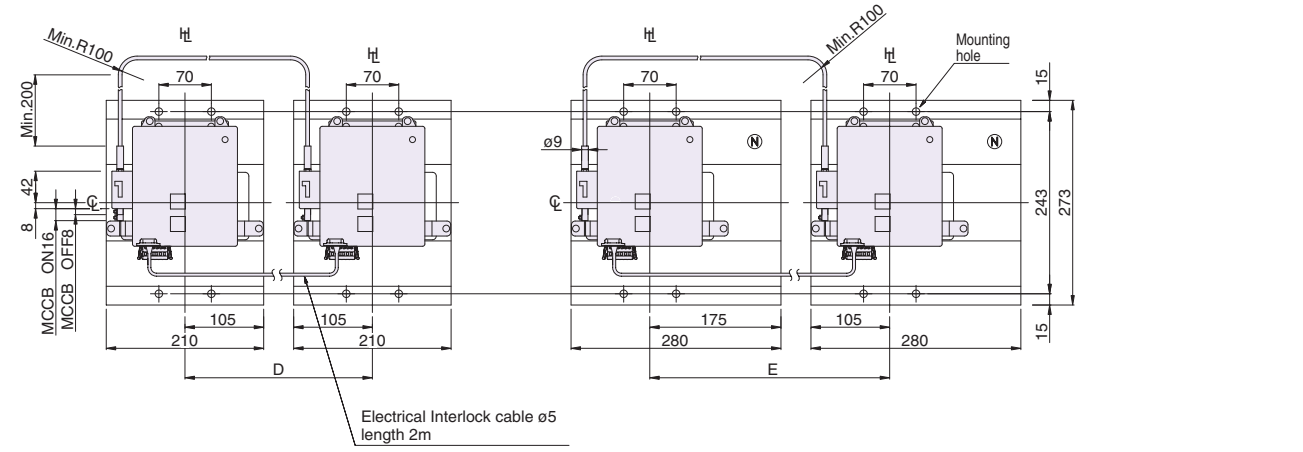
With motor operators

Dimensions, mm

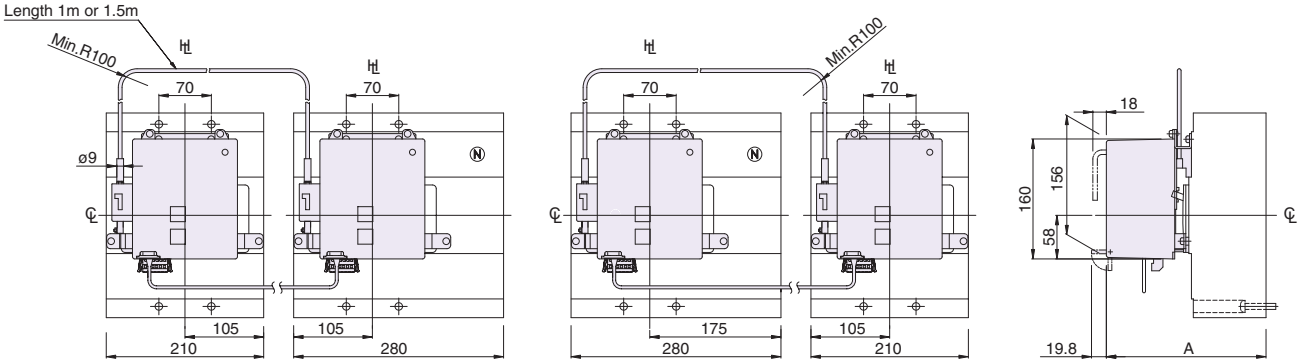
Frame size (A)	Types of MCCBs	Interlock Order codes	A (mm)	B (mm)	C (mm)
800, 1000	**S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN**	Factory-installed	213	124.5	156.5
	H800-NE, L800-NE, L800-PE	Factory-installed	250	161.5	193.5

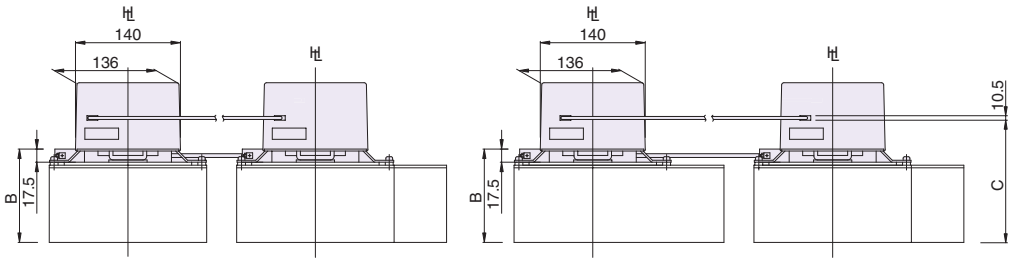
Interlock wire order codes (length)	D (mm)	E (mm)
T2MW00S(1m)	250min.-430max.	320min.-430max.
T2MW00L(1.5m)	250min.-930max.	320min.-930max.

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.



Wire:Outside dia. ø5
Length 1m or 1.5m





ASL : Arrangement Standard Line
⊬ : Handle Frame Centre Line
℄ : Handle Centre Line

With external operating handle

Dimensions, mm

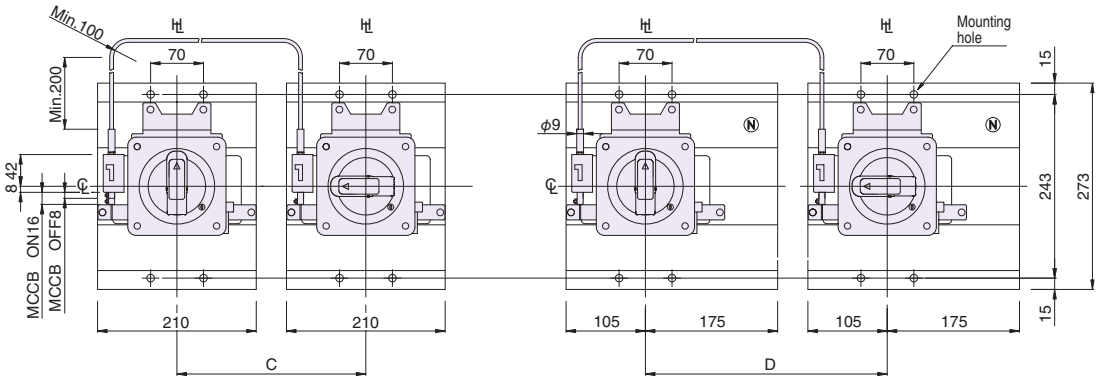
Frame size (A)	Types of MCCBs	Interlock Order codes	A (mm)	B (mm)
800, 1000	**S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN**	Factory-installed	200	150±2
	H800-NE, L800-NE, L800-PE	Factory-installed	237	187±2

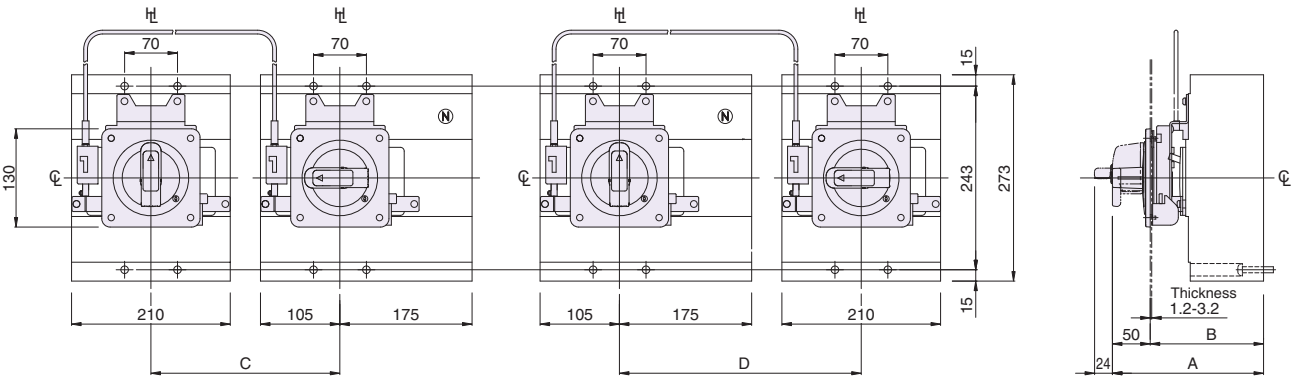
Interlock wire order codes (length)	C (mm)	D (mm)
T2MW00S(1m)	250min.-430max.	320min.-430max.
T2MW00L(1.5m)	250min.-930max.	320min.-930max.

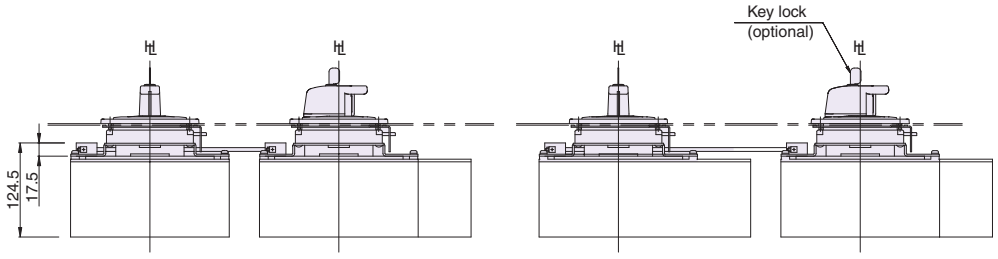
Notes:

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.







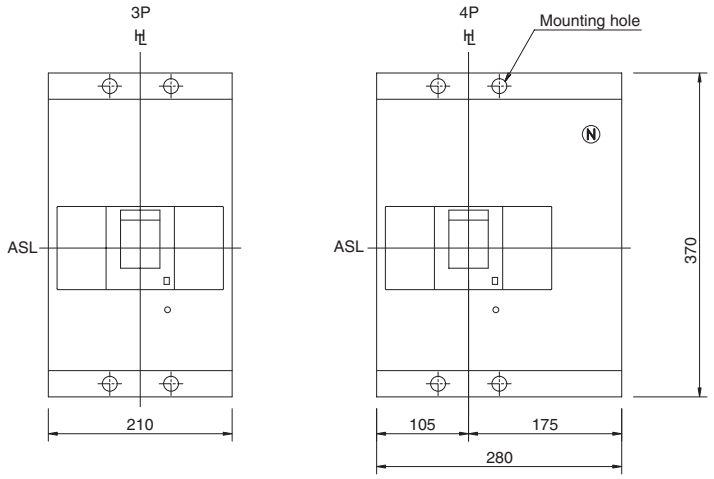
ASL : Arrangement Standard Line
⊬ : Handle Frame Centre Line
℄ : Handle Centre Line

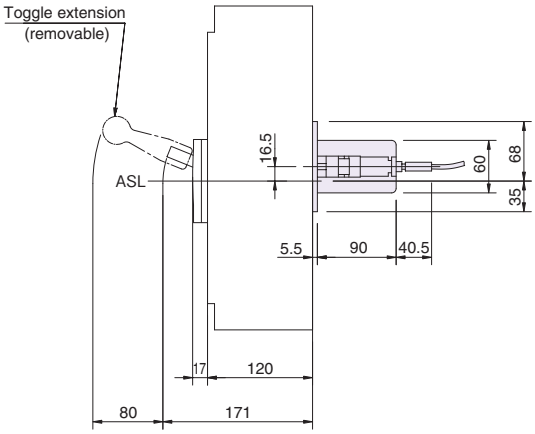
(4) Wire interlock (MW)

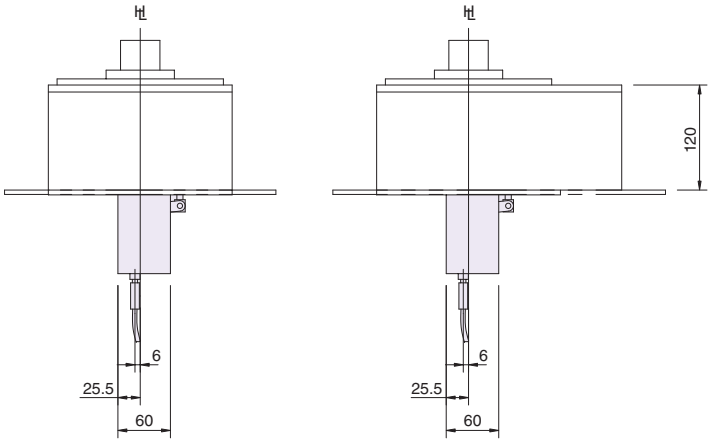
Dimensions, mm

Frame size (A)	Types of MCCBs	Interlock Order codes
1250	**S1250-SE/NE/GE/NN**	Factory-installed

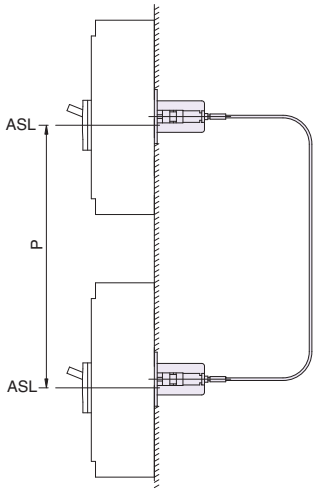
Interlock wire order codes (length)	P (mm)	L (mm)
1m	650-500-350	450-500-530 ±30
1.5m	1000-900-750	550-600-700 ±30



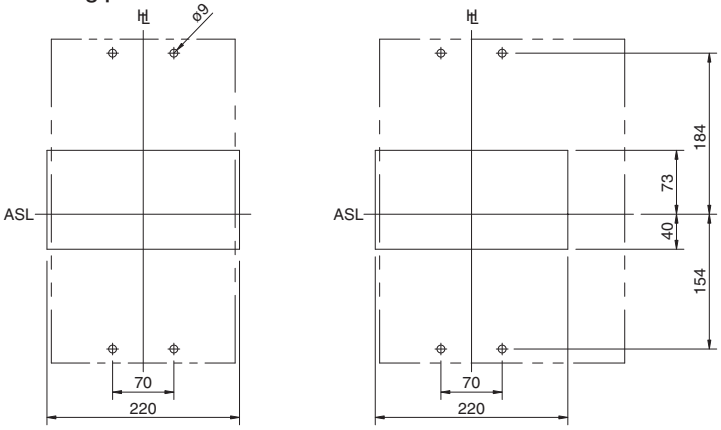




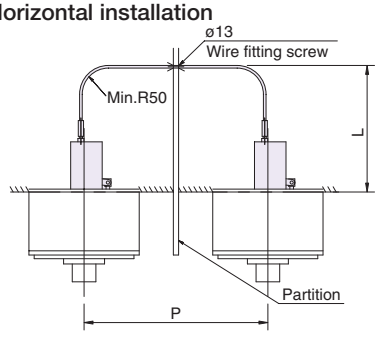
Vertical installation



Drilling plan



Horizontal installation

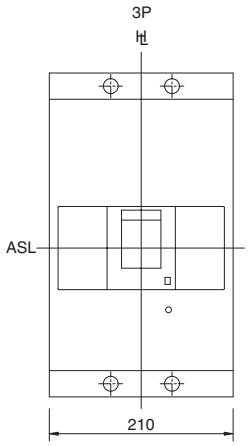


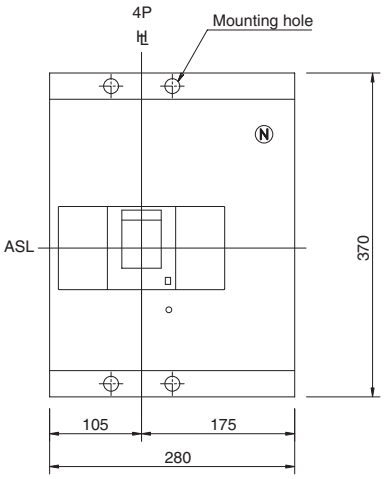
ASL : Arrangement Standard Line
⊬ : Handle Frame Centre Line
℄ : Handle Centre Line

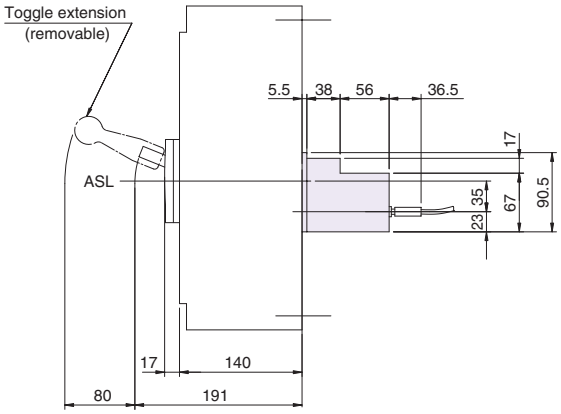
Dimensions, mm

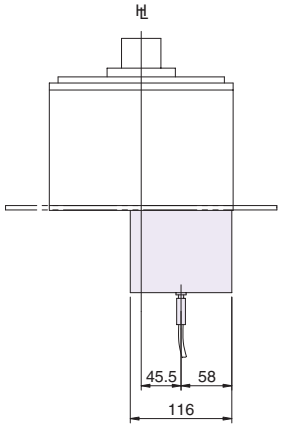
Frame size (A)	Types of MCCBs	Interlock Order codes
1600	**S1600-SE/NE/NN**	Factory-installed

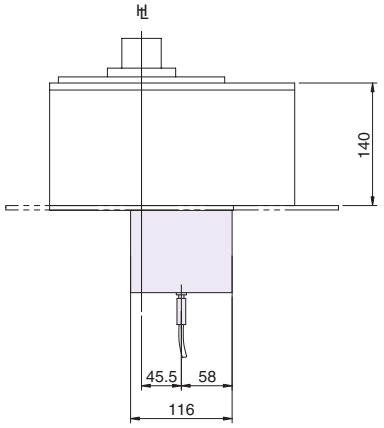
Interlock wire order codes (length)	P (mm)	L (mm)
1m	650-500-350	450-500-530 ±30
1.5m	1000-900-750	550-600-700 ±30



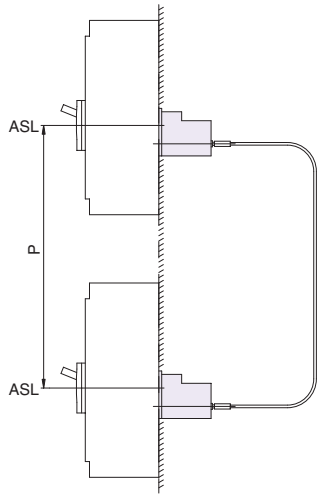




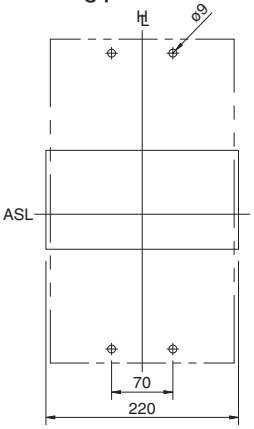


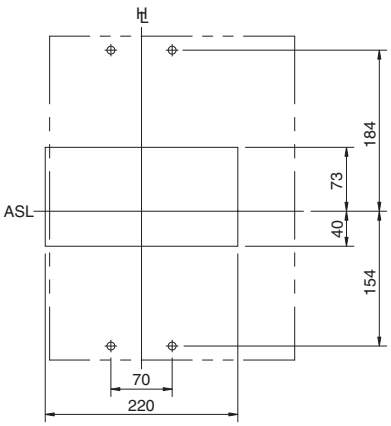


Vertical installation

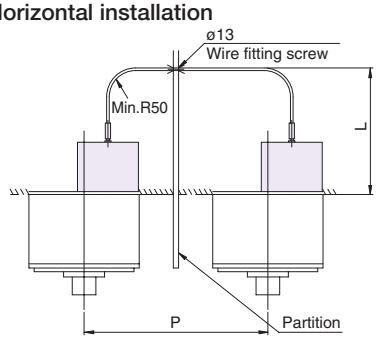


Drilling plan





Horizontal installation



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.

Fig. 1A

Red

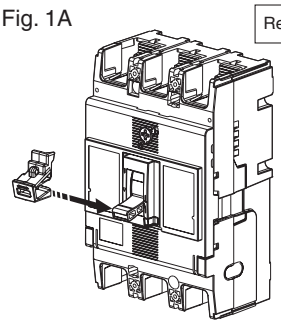


Fig. 1B

Red

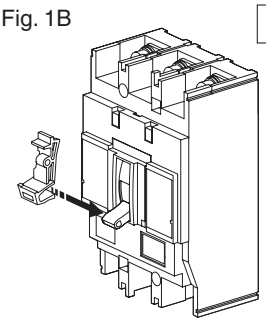


Fig. 2

Red

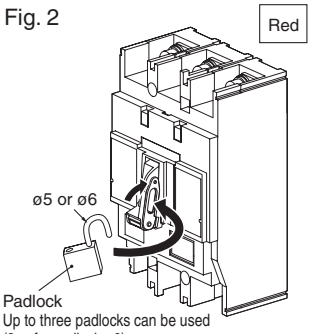


Fig. 3

Red

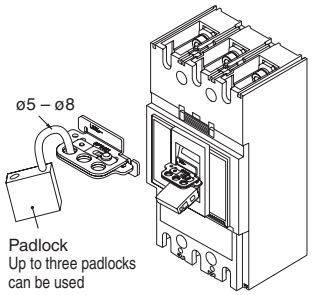
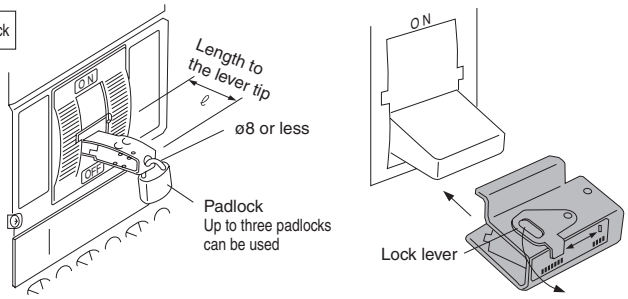


Fig. 4

Black

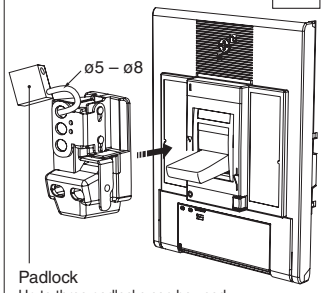


Toggle holder (HH):
Make sure the lock lever of the toggle holder is in the UNLOCK position, fit the toggle holder onto the toggle and swing the lock lever to the LOCK position. The toggle is now locked ON or OFF.

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

Fig. 5

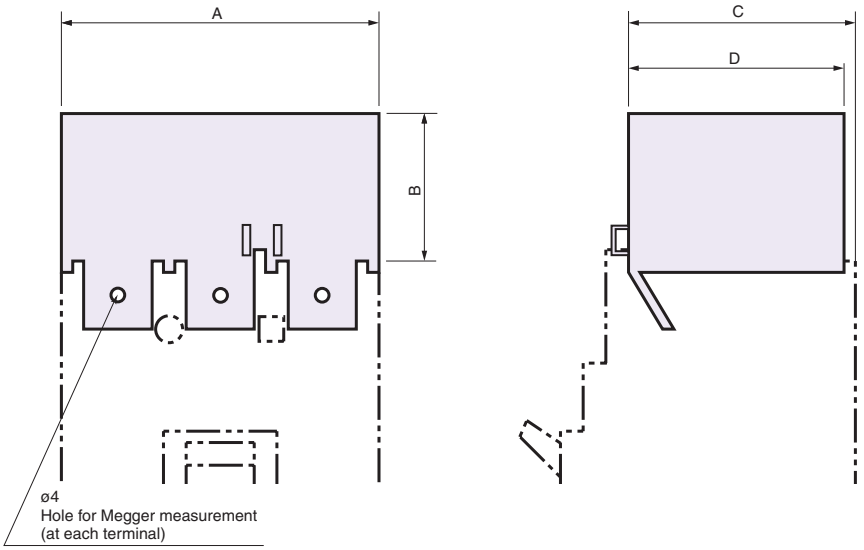
Red



7. Terminal covers

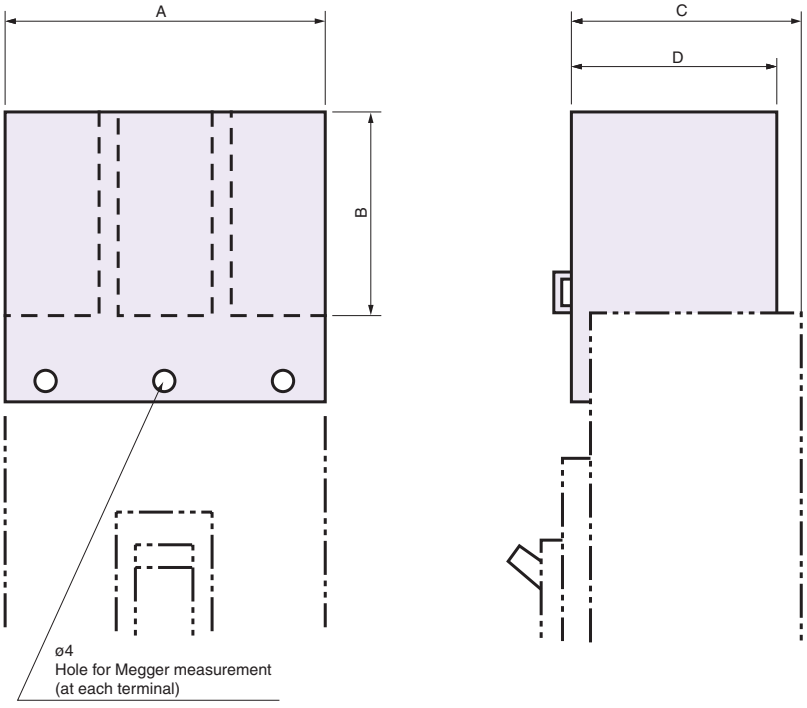
Terminal covers prevent live parts of the circuit breaker from being exposed to the external environment. There are three types of terminal covers: front-connected type, rear-connected and plug-in type, and cable clamps type. Select appropriate terminal covers depending on the type and application of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

(1) CF for front-connected breakers



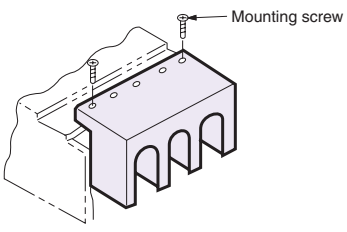
Plug-in mounted version

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 Straigt		TPCF16＊SLNPH	TPCF16＊SL	—	60	90	120	40	40	60.5	60.5	58.5	58.5	P	○	—
				TPCF16＊SLNCH												C		
		Short Straigt		TPCF16＊SSNPH	TPCF16＊SS	—	60	90	120	20	20	60.5	60.5	58.5	58.5	P		
				TPCF16＊SSNCH												C		
	E160-SF 1pole	Long Straigt		T2CF16L＊SLHP	—	25	—	—	—	50	—	61	—	60.3	—	P	○	—
	S160-NF 1pole	Long Straigt		T2CF16＊SLHP	—	35	—	—	—	40	—	48	—	46	—	P	○	—
				T2CF16＊SLHC												C		
	E160-SF S160-SCF	Long Straigt		T2CF16L＊SLHP	—	—	50	75	100	50	50	61	61	60.3	60.3	P		
				T2CF16L＊SLHC												C		
		Short Straigt		T2CF16L＊SSHP	—	—	50	75	100	25	25	61	61	60.3	60.3	P	○	—
				T2CF16L＊SSHC												C		
		Long Wide	④	T2CF16L＊SWHP	—	—	—	107	142	50	50	61	61	60.3	60.3	P		
				T2CF16L＊SWHC												C		
	E160-SJ, S160-SCJ/SF/SJ/SN	Long Straigt		T2CF16L＊SLHP	—	—	—	75	100	50	50	61	61	60.3	60.3	P		
				T2CF16L＊SLHC												C		
		Short Straigt		T2CF16L＊SSHP	—	—	—	75	100	25	25	61	61	60.3	60.3	P	○	—
				T2CF16L＊SSHC												C		
		Long Wide	④	T2CF16L＊SWHP	—	—	—	107	142	50	50	61	61	60.3	60.3	P		
				T2CF16L＊SWHC												C		
	E250-SCF/SCJ/SF/SJ, S250-SN, P250F/N/H/D	Long Straigt	⑨	T2CF25L＊SLHP	T2CF25L＊SL	—	105	105	140	55	55	59	59	57.5	57.5	P	○	—
				T2CF25L＊SLHC												C		
		Short Straigt	⑨	T2CF25L＊SSHP	T2CF25L＊SS	—	105	105	140	29	29	59	59	57.5	57.5	P	○	—
				T2CF25L＊SSHC												C		
		Long Wide	④, ⑨	T2CF25L＊SWHP	T2CF25L＊SW	—	147.5	147.5	196	55	55	59	59	57.5	57.5	P	○	—
				T2CF25L＊SWHC												C		
	H125-NJ, H160-NJ, H250-NJ/NE, L125-NJ, L125-PJ, L160-NJ, L250-NJ	Long Straigt	③, ⑨	T2CF25＊LLHP	T2CF25＊LL	—	—	105	140	55	55	89	89	87	87	P	○	—
				T2CF25＊LLHC												C		
400, 630	**P400E/F/N/H/S/D, P630E/F/N/H/S/D**	Long	⑤	TPCF63＊SLNPH	TPCF63＊SL	—	—	140	185	85	85	97	97	95.5	95.5	P	○	—
				TPCF63＊SLNCH												C		
		Long Wide	④, ⑩	TPCF63＊SWNPH	TPCF63＊SW	—	—	180	240	110	110	97	97	95.5	95.5	P	○	—
				TPCF63＊SWNCH												C		
	H400-NE, L400-NE	Long	⑤, ⑥	T2CF40＊SLHP	T2CF40＊SL	—	—	140	185	85	85	134	134	94.5	94.5	P	○	—
				T2CF40＊SLHC												C		
		Long Wide	④, ⑥	T2CF40＊SWHP	T2CF40＊SW	—	—	180	240	110	114	134	135	94.5	98	P	○	—
				T2CF40＊SWHC												C		
800	**S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN**	Long Straigt		T2CF80＊SLHP	TPR-5BA	—	—	215	285	130	130	99.5 (102)	99.5 (102)	99 (101.5)	99 (101.5)	P	—	○
				T2CF80＊SLHC												C		
	H800-NE, L800-NE	Long Straigt	⑥	T2CF80＊SLHP	TPR-5BA	—	—	215	285	130	130	136.5 (139)	136.5 (139)	99 (101.5)	99 (101.5)	P	—	○
				T2CF80＊SLHC												C		
1000	**S1000-SE/NE/NN**	Long Straigt		T2CF80＊SLHP	TPR-5BA	—	—	215	285	130	130	99.5 (102)	99.5 (102)	99 (101.5)	99 (101.5)	P	—	○
				T2CF80＊SLHC												C		
1250	**S1250-SE/NE/GE/NN**	Long Straigt	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 100mm^2 or less. If you use 150mm^2, the insulating sleeve will touch the terminal cover and cannot be attached.

⑩: Please use with a connection wire of 200mm^2 or less. If you use 325mm^2, the insulating sleeve will touch the terminal cover and cannot be attached.

7. Terminal covers

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

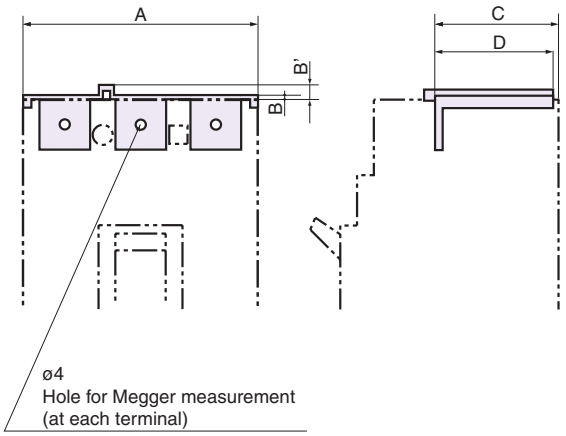


Fig. 1

Plug-in mounted version

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

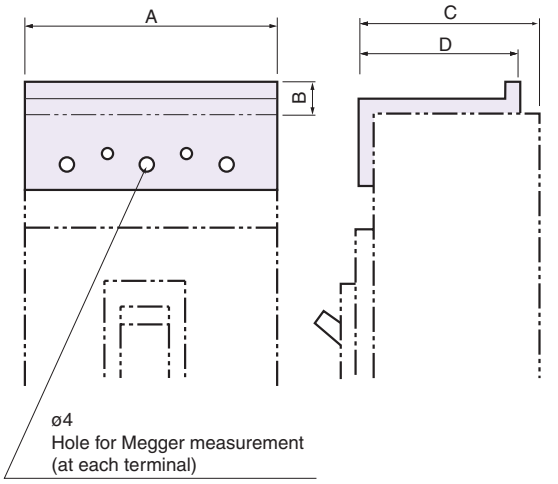
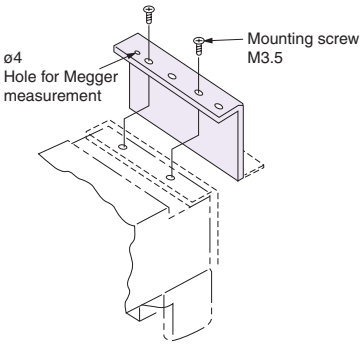


Fig. 2



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												B (4 poles)			
	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												B (4 poles)			

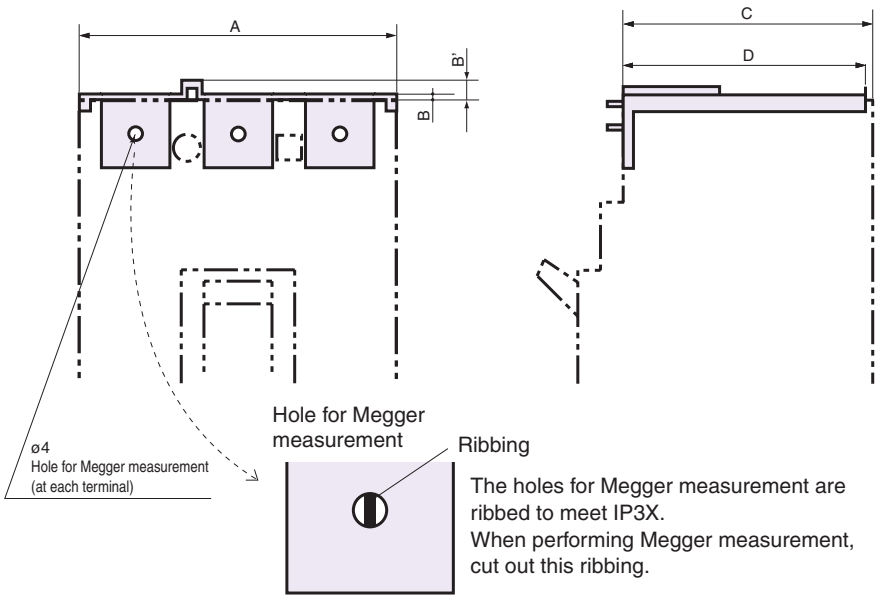
Notes:

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



The holes for Megger measurement are ribbed to meet IP3X.
When performing Megger measurement, cut out this ribbing.

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.

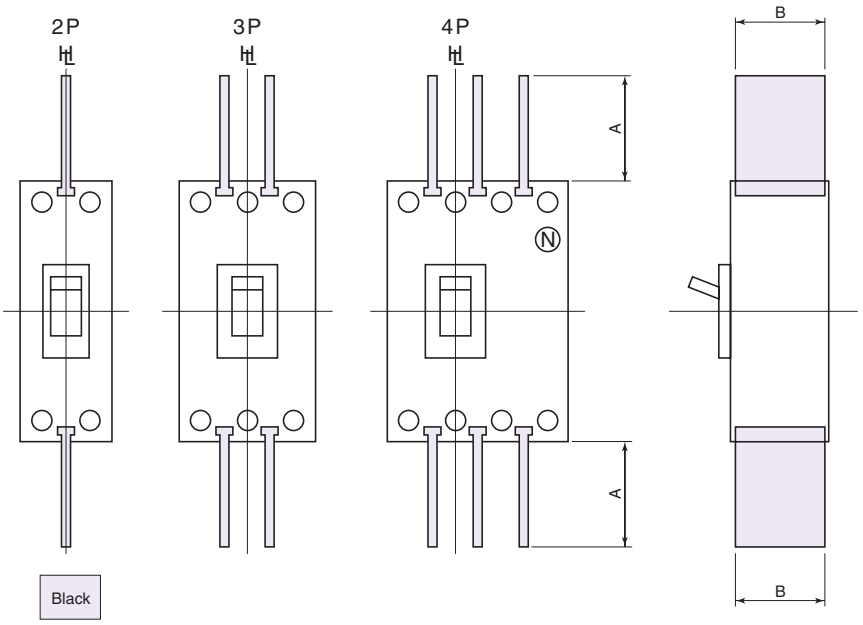
Dimensions, mm

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	○	—

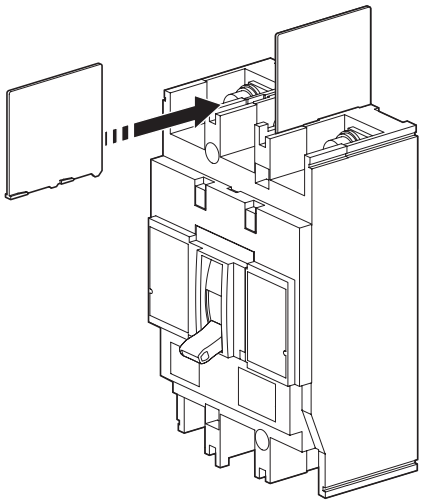
Notes:
① : The asterisk indicates the number of poles. Please state the number of poles at the asterisk position when ordering. One set includes 1 pc terminal cover.

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.



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



■ 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	T2BA253LH	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.

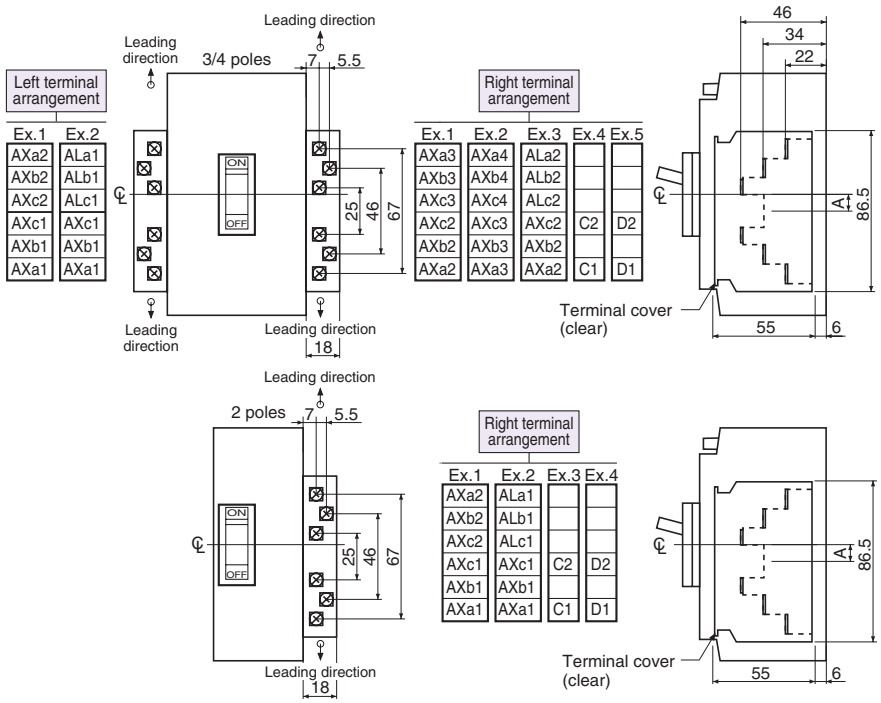
9. Terminal blocks (TF)

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: 2.0mm^2 max

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

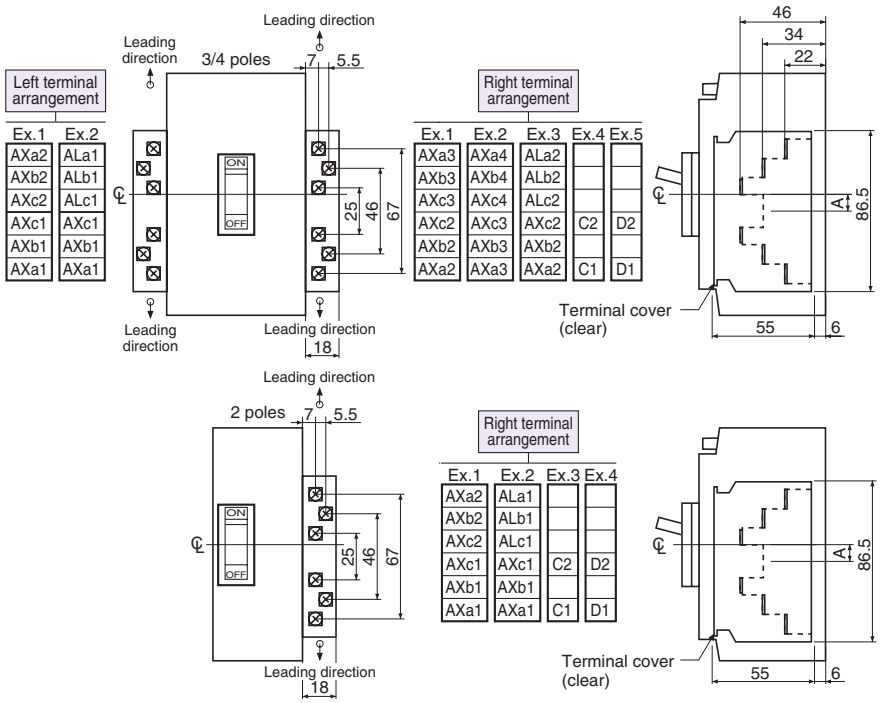
AX	AL	SH	UV	Left terminal	Right terminal
1C	1C	1	—	Ex.2	Ex.4
1C	1C	—	1	Ex.2	Ex.5
1C	2C	—	—	Ex.2	Ex.3
2C	—	1	—	Ex.1	Ex.4
2C	—	—	1	Ex.1	Ex.5
2C	2C	—	—	Ex.2	Ex.3
3C	1C	—	—	Ex.2	Ex.1
4C	—	—	—	Ex.1	Ex.2

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

Mounting position/typical terminal arrangement



Dimensions, mm

Frame size (A)	Types of breakers Thermal MCCB	Poles	A
160	**P160F/N/H/D (Thermal type)**	3/4 poles	8

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 Electronic MCCB

Mounting position/ typical terminal arrangement

Combination of terminal arrangement

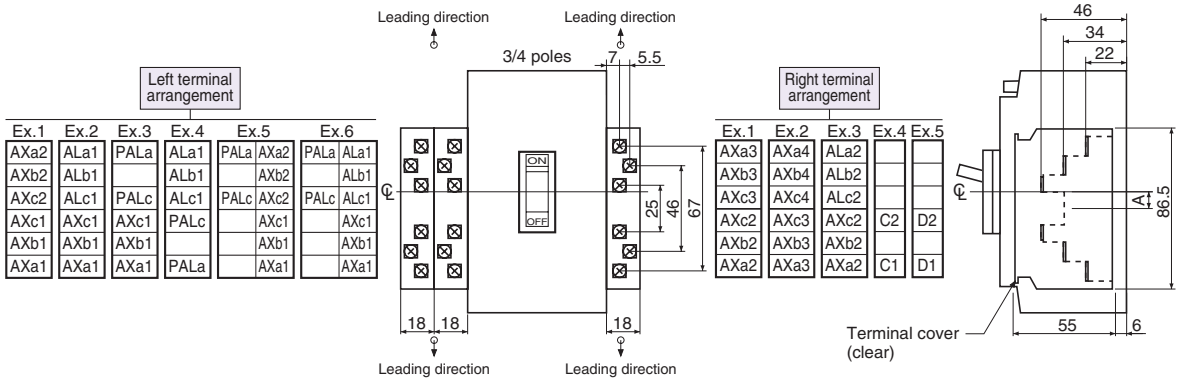
AX	AL	SH	UV	PTA	Left terminal	Right terminal
1C	1C	1	—	1	Ex.6	Ex.4
1C	1C	—	1	1	Ex.6	Ex.5
2C	—	1	—	1	Ex.5	Ex.4
2C	—	—	1	1	Ex.5	Ex.5
1C	2C	—	—	1	Ex.6	Ex.3
2C	2C	—	—	1	Ex.6	Ex.3
3C	1C	—	—	1	Ex.6	Ex.1
4C	—	—	—	1	Ex.5	Ex.2
1C	—	—	—	1	Ex.3	
—	1C	—	—	1	Ex.4	
—	—	—	—	1	Ex.3	

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.

Dimensions, mm

Frame size (A)	Types of breakers Electronic MCCB	A
160	**P160F/N/H (Electronic type)**	8

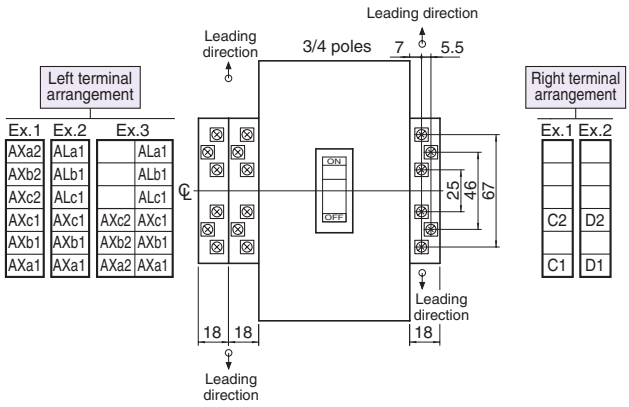
Notes:
1) Tightening torque of M3.5 terminal screws: 0.9 – 1.2 Nm
2) Applicable wire size: 2.0mm² max
3) The following SMART MCCB cables cannot be connected to the terminal blocks.
   Zone selective interlocking
   Optional alarm output contact
   Control power supply
   Communication module

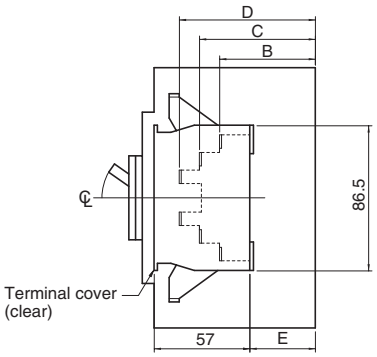


9. Terminal blocks (TF)

18mm width 6 terminals
Vertical leading type (T2TFX0) with 125/160/250A frame MCCB

Mounting position/typical terminal arrangement





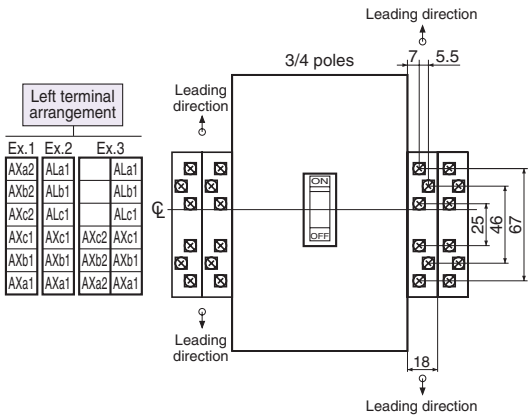
Dimensions, mm

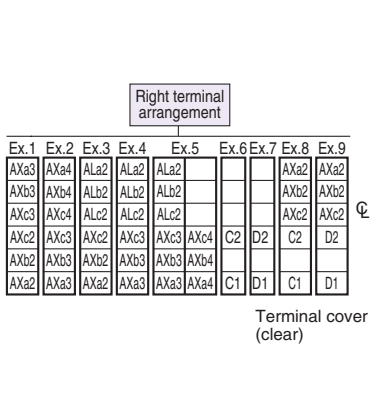
Frame size (A)	Types of breakers MCCB	B	C	D	E
125, 160, 250	**H125-NJ, H160-NJ, H250-NJ/NE, L125-NJ, L125-PJ, L160-NJ, L250-NJ**	57	69	81	39

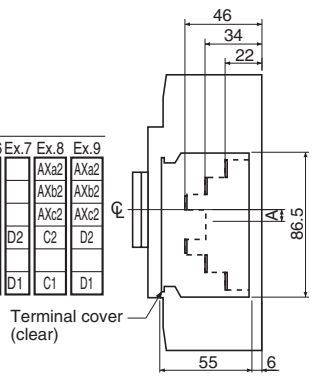
Notes:
1) Tightening torque of M3.5 terminal screws: 0.9 – 1.2 Nm
2) Applicable wire size: 2.0mm² max

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 MCCB	Number of poles	A
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

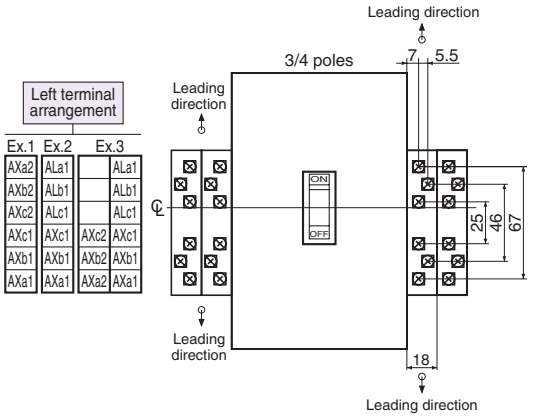
Combination of terminal arrangement

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

Mounting position/typical terminal arrangement



Dimensions, mm

Frame size (A)	Types of breakers	A
	Thermal MCCB	
250	**P250F/N/H/D (Thermal type)**	8

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.5
1C	1C	—	1	Ex.2	Ex.6
2C	1C	1	—	Ex.3	Ex.5
2C	1C	—	1	Ex.3	Ex.6
2C	2C	—	—	Ex.2	Ex.3
3C	1C	—	—	Ex.2	Ex.1
3C	2C	—	—	Ex.3	Ex.4
4C	—	—	—	Ex.1	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.

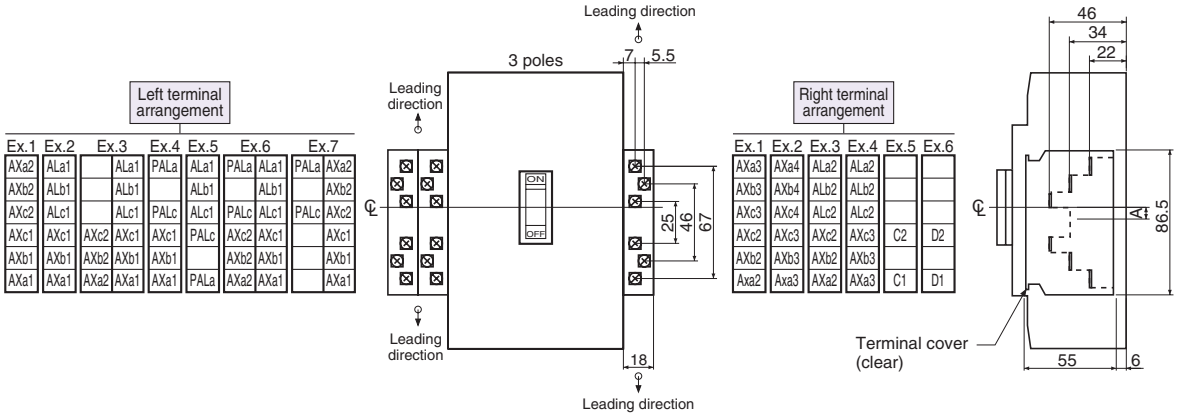
18mm width 6 terminals
Vertical leading type (T2TF00L) with 250A frame Electronic MCCB

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. 5
1C	1C	—	1	1	Ex. 6	Ex. 6
2C	1C	1	—	1	Ex. 6	Ex. 5
2C	1C	—	1	1	Ex. 6	Ex. 6
2C	2C	—	—	1	Ex. 6	Ex. 3
3C	1C	—	—	1	Ex. 6	Ex. 1
3C	2C	—	—	1	Ex. 6	Ex. 4
4C	—	—	—	1	Ex. 7	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 above.



Dimensions, mm

Frame size (A)	Types of breakers	A
	Electronic MCCB	
250	**P250F/N/H (Electronic type)**	8

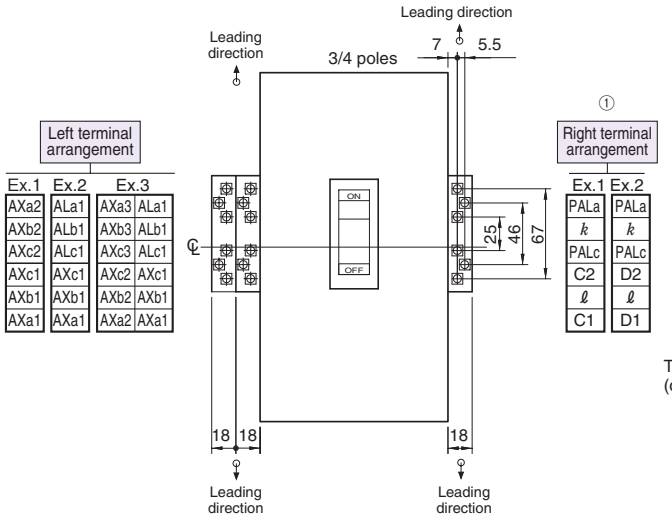
Notes:
1) Tightening torque of M3.5 terminal screws: 0.9 – 1.2 Nm
2) Applicable wire size: 2.0mm² max
3) The following SMART MCCB cables cannot be connected to the terminal blocks.
Zone selective interlocking
Optional alarm output contact
Control power supply
Communication module

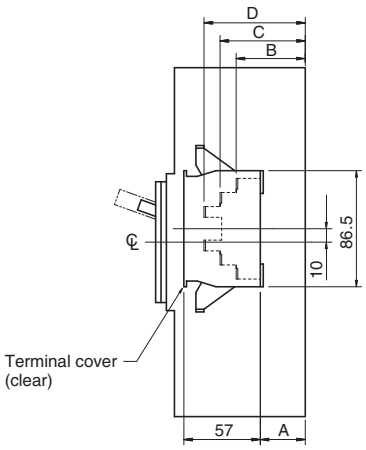
9. Terminal blocks (TF)

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 MCCB	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.

Note ①: In the case of providing pre-trip alarm terminals (PALa, PALc) to the terminal block,OCR controller will be installed external to the breaker.

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. 4
1C	1C	—	1	Ex. 2	Ex. 5
2C	—	1	—	Ex. 1	Ex. 4
2C	—	—	1	Ex. 1	Ex. 5
2C	2C	—	—	Ex. 2	Ex. 1
2C	1C	1	—	Ex. 2	Ex. 6
2C	1C	—	1	Ex. 2	Ex. 7
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.

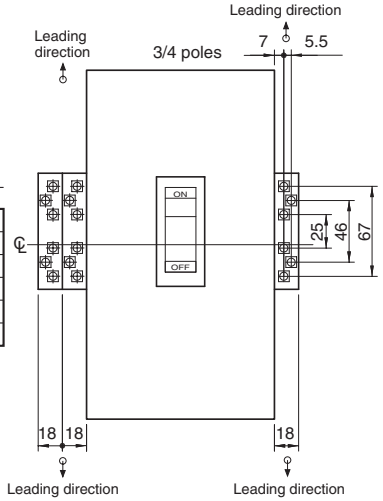
Contact TERASAKI for the combination other than the above.

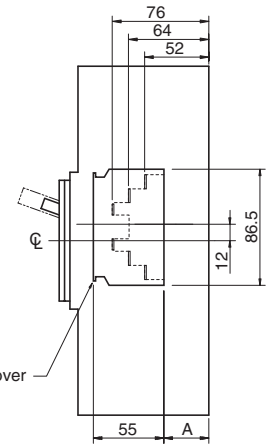
Left terminal arrangement

Ex.1	Ex.2	Ex.3	
AXa2	ALa1		ALa1
AXb2	ALb1		ALb1
AXc2	ALc1		ALc1
AXc1	AXc1	AXc2	AXc1
AXb1	AXb1	AXb2	AXb1
AXa1	AXa1	AXa2	AXa1

Right terminal arrangement

Ex.1	Ex.2	Ex.3	Ex.4	Ex.5	Ex.6
ALa2	ALa2	AXa3	AXa3	AXa2	AXa2
ALb2	ALb2	AXb3	AXb3	AXb2	AXb2
ALc2	ALc2	AXc3	AXc3	AXc2	AXc2
AXc2	AXc3	C2	D2	C2	D2
AXb2	AXb3				
AXa2	AXa3	C1	D1	C1	D1





Dimensions, mm

Frame size (A)	Types of breakers Thermal MCCB	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. 4
1C	1C	—	1	1	Ex. 6	Ex. 5
2C	—	1	—	1	Ex. 7	Ex. 4
2C	—	—	1	1	Ex. 7	Ex. 5
2C	2C	—	—	1	Ex. 6	Ex. 1
2C	1C	1	—	1	Ex. 8	Ex. 6
2C	1C	—	1	1	Ex. 8	Ex. 7
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.

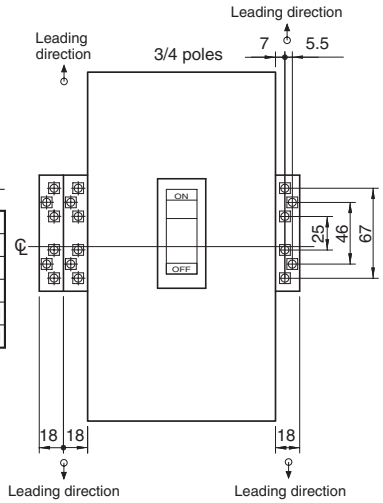
Contact TERASAKI for the combination other than the above.

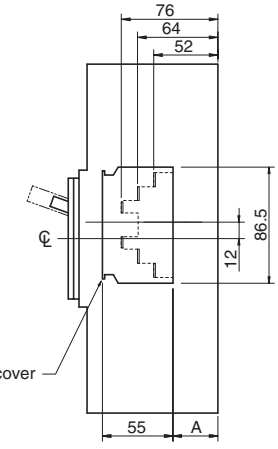
Left terminal arrangement

Ex.1	Ex.2	Ex.3		Ex.4	Ex.5	Ex.6		Ex.7		Ex.8	
AXa2	ALa1		ALa1	PALa	ALa1	PALa	ALa1	PALa	AXa2	PALa	ALa1
AXb2	ALb1		ALb1		ALb1		ALb1		AXb2		ALb1
AXc2	ALc1		ALc1	PALc	ALc1	PALc	ALc1	PALc	AXc2	PALc	ALc1
AXc1	AXc1	AXc2	AXc1	AXc1	PALc	AXc2	AXc1		AXc1		AXc1
AXb1	AXb1	AXb2	AXb1	AXb1		AXb2	AXb1		AXb1		AXb1
AXa1	AXa1	AXa2	AXa1	AXa1	PALa	AXa2	AXa1		AXa1		AXa1

Right terminal arrangement

Ex.1	Ex.2	Ex.3	Ex.4	Ex.5	Ex.6
ALa2	ALa2	AXa3	AXa3	AXa2	AXa2
ALb2	ALb2	AXb3	AXb3	AXb2	AXb2
ALc2	ALc2	AXc3	AXc3	AXc2	AXc2
AXc2	AXc3	C2	D2	C2	D2
AXb2	AXb3				
AXa2	AXa3	C1	D1	C1	D1





Dimensions, mm

Frame size (A)	Types of breakers Electronic MCCB	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

9. Terminal blocks (TF)

18mm width 6 terminals

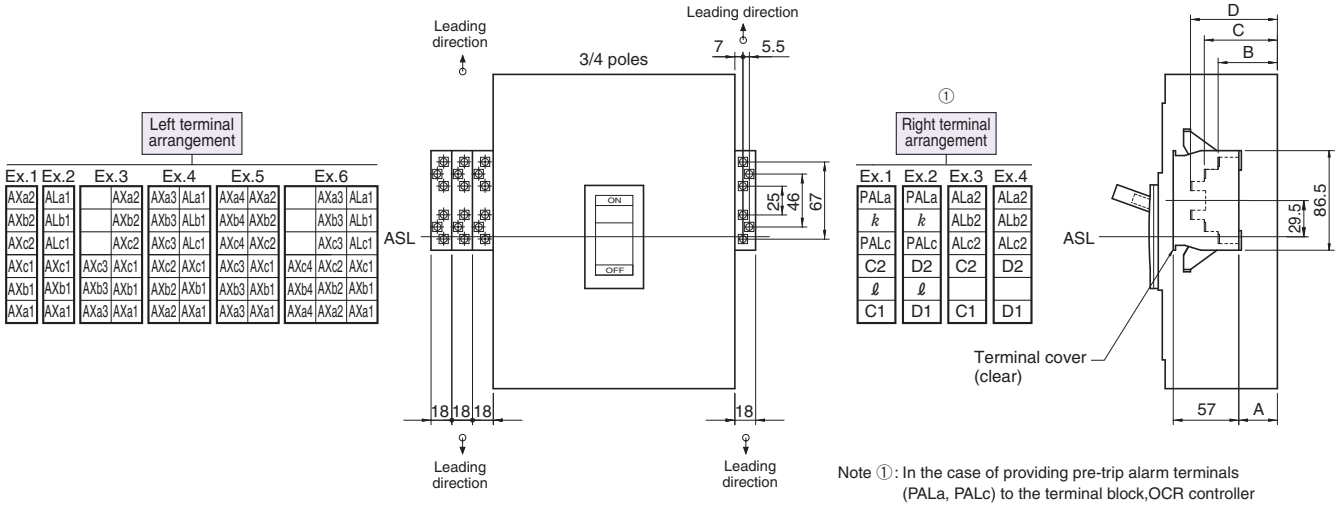
Vertical leading type (T2TFX0) with 800/1000A frame MCCB

Mounting position/ typical terminal arrangement

Dimensions, mm

Frame size (A)	Types of breakers: MCCB	A	B	C	D
800, 1000	**S800-CJ/NJ/NE/RJ/RE/PJ/PE/NN, S1000-SE/NE/NN**	33.5	51.5	63.5	75.5
	H800-NE, L800-NE, L800-PE	70.5	88.5	100.5	112.5

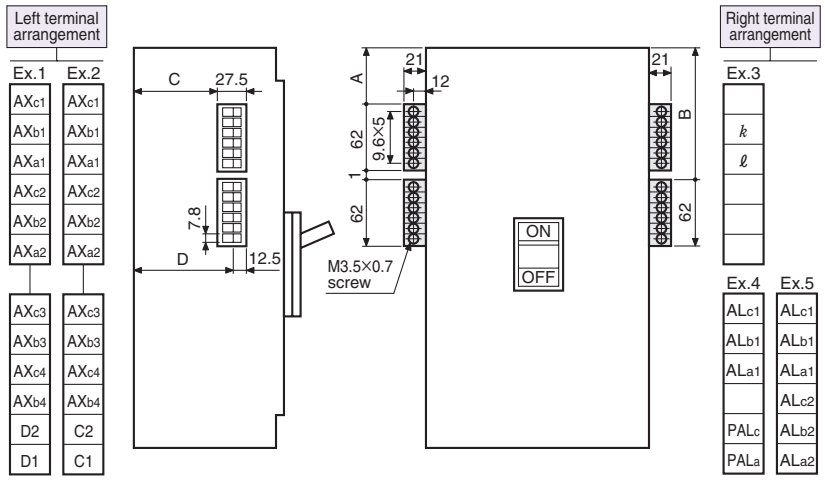
Notes:
1) Tightening torque of M3.5 terminal screws: 0.9 – 1.2 Nm
2) Applicable wire size: 2.0mm² max
3) k, ℓ are the terminals to connect to the CT for a separate neutral wire. Separate neutral wire CTs are required for 3-phase 4-wire system, when a 3-pole circuit breaker with ground fault trip function is used.



Note ①: In the case of providing pre-trip alarm terminals (PALa, PALc) to the terminal block,OCR controller will be installed external to the breaker.

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

Mounting position/typical terminal arrangement



Dimensions, mm

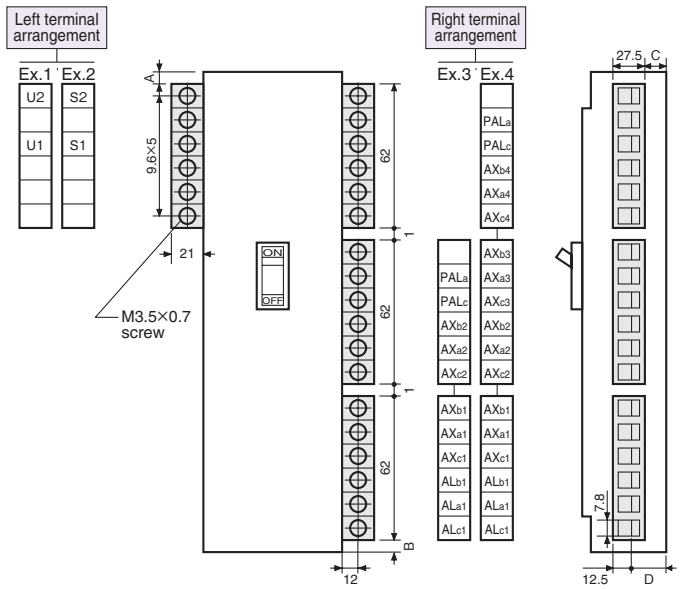
Frame size (A)	Types of breakers	A	B	C	D
1250	**S1250-SE/NE/GE/NN**	51	114 (124)	57	72
1600	**S1600-SE/NE/NN**	51	114 (124)	77	92

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: 2.0mm^2 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.

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

Mounting position/typical terminal arrangement



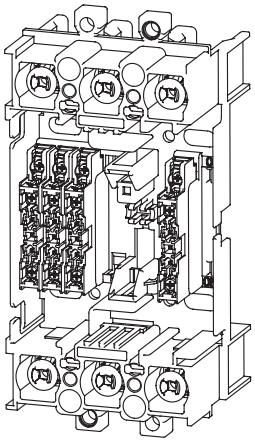
Dimensions, mm

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:

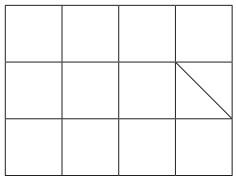
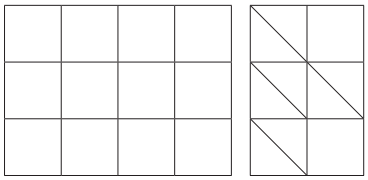
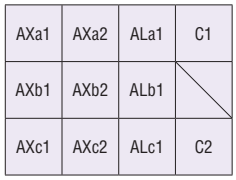
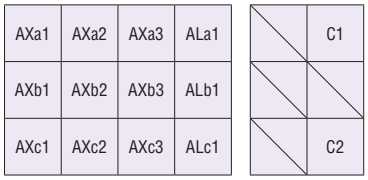
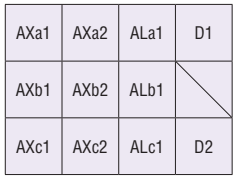
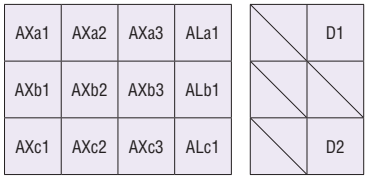
1) Values in parentheses applies to 4-pole breakers.
2) Tightening torque of M3.5 terminal screws: 0.9 – 1.2 Nm
3) Applicable wire size: 2.0mm^2 max × 2

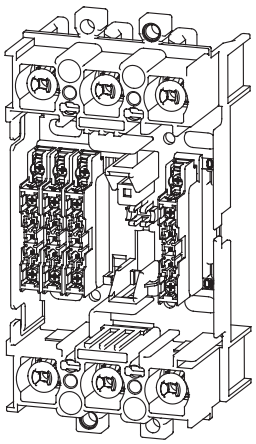
10. Plug-in auxiliary circuit terminal blocks (PMB)



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.

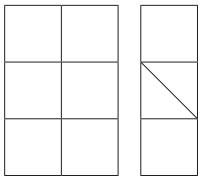
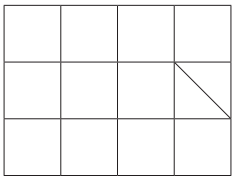
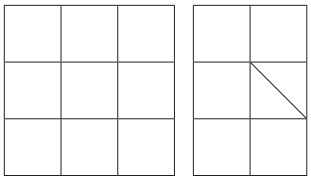
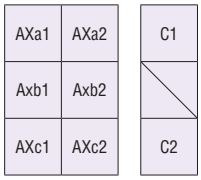
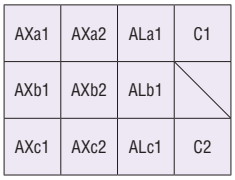
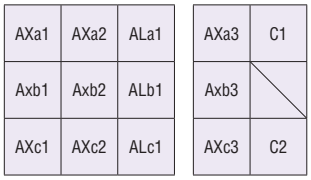
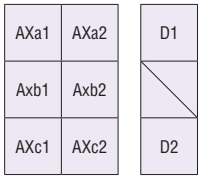
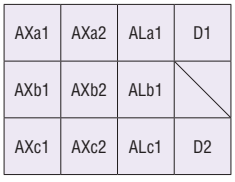
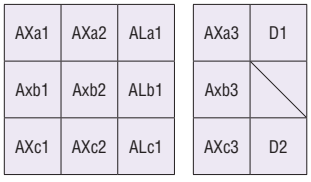
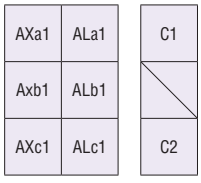
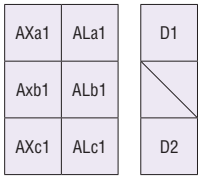
Terminal screw: M3.5
Suitable wire size: 0.5 – 0.75mm^2

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		
Arrangement 2		
Arrangement 3		
Arrangement 4		



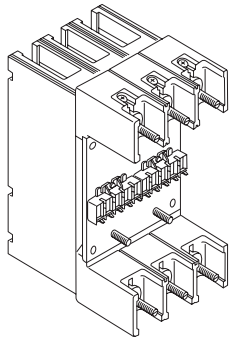
Auxiliary circuit terminals are of self-engaging type.
Shown in the table below are standard terminal arrangements as seen from the front of the plugin base.
Contact us for non-standard arrangements.

Terminal screw: M3.5
Suitable wire size: 0.5 – 0.75mm^2

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
Number of auxiliary circuit terminals (Max allowable)			
Arrangement 1			
Arrangement 2			
Arrangement 3			
Arrangement 4			

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	

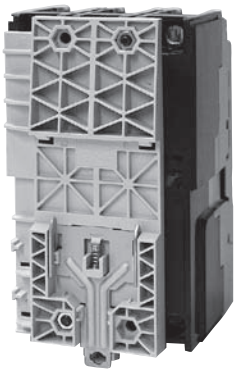
＊1: If the OCR controller is installed separately, substitute OS1 and OS2 for OP1 and OP2 and connect these terminals to the controller terminals having the same numbers.

11. DIN rail adapter (DA)

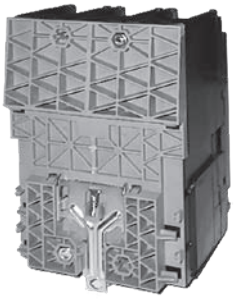
The circuit breaker can easily be mounted on a 35 mm wide DIN rail by mounting the DIN rail adapter on the rear of the circuit breaker.

■ Applicable breakers

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

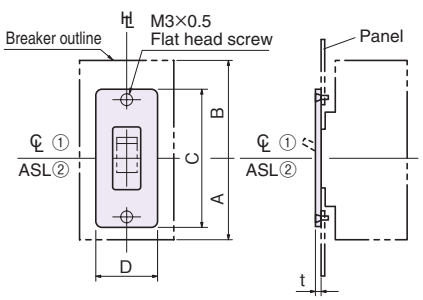
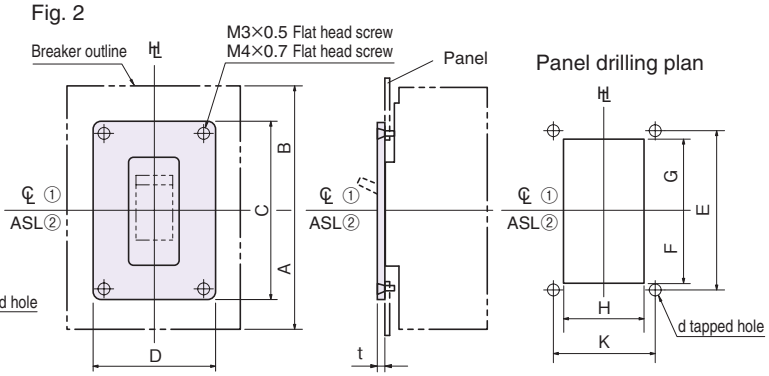


Fig. 2



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: ℄ Handle centre line is applied.
②: ASL Arrangement standard line is applied.

7 Characteristics and Outline Dimensions

Thermal Magnetic Characteristics

Electronic Characteristics

Let-Through Peak Current Characteristics

Thermal type

Electronic type

Let-Through Energy Characteristics

Thermal type

Electronic type

Outline Dimensions

Outline Dimensions (with motor operators)

Outline Dimensions (Special breakers)

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

High-Performance Electronic Circuit Breaker (XOW type OCR)

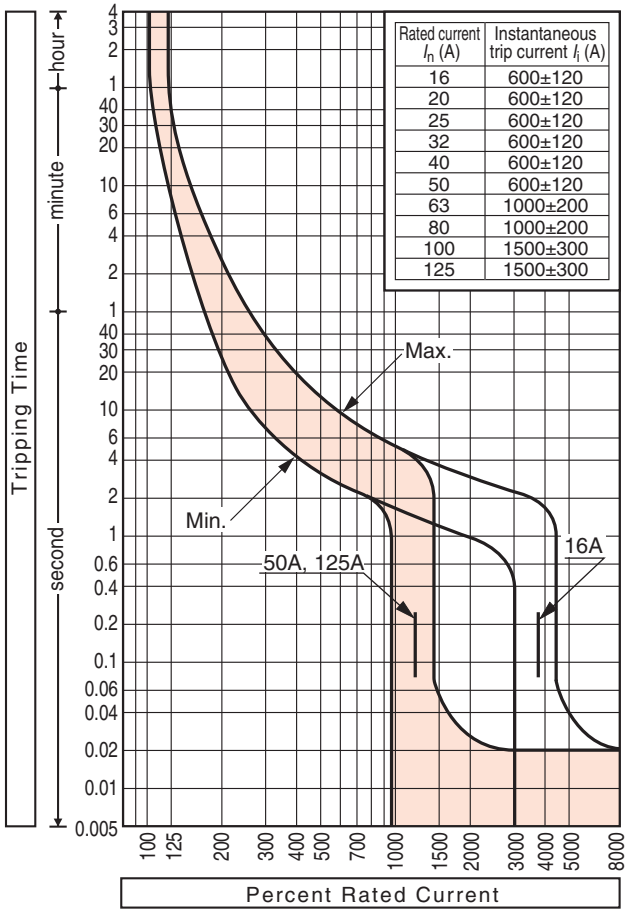
690V AC Circuit Breakers

Thermal Magnetic Characteristics

E160-SF, S160-NF 1pole

Time/Current characteristic curves

E160-SF 1pole



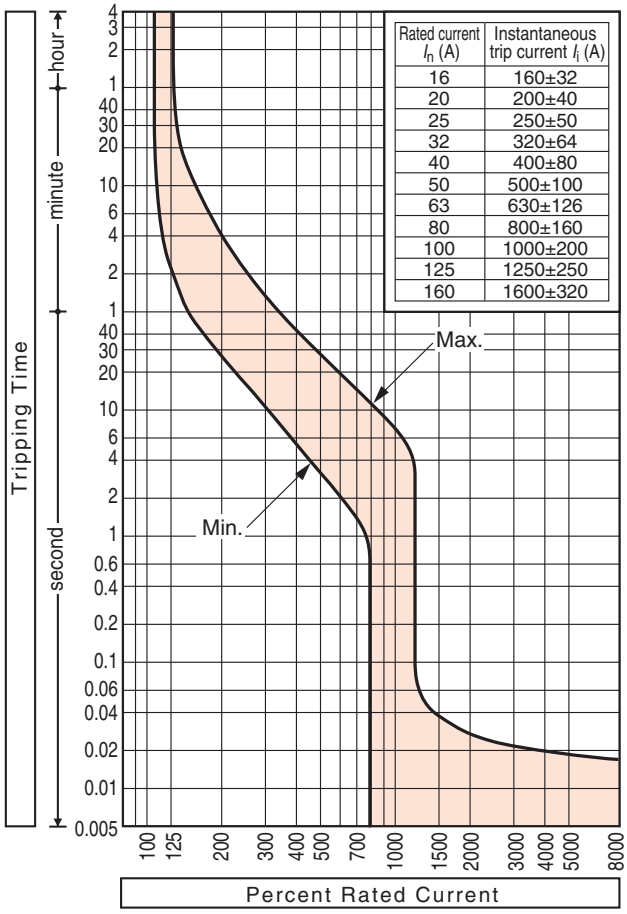
Rated current I_n (A)	Instantaneous trip current I_i (A)
16	600±120
20	600±120
25	600±120
32	600±120
40	600±120
50	600±120
63	1000±200
80	1000±200
100	1500±300
125	1500±300

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



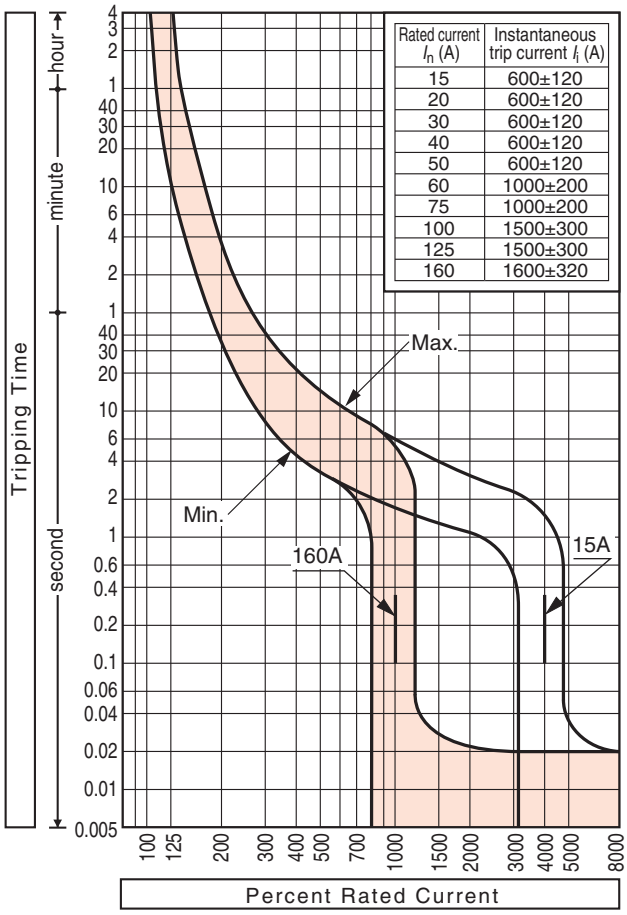
Rated current I_n (A)	Instantaneous trip current I_i (A)
16	160±32
20	200±40
25	250±50
32	320±64
40	400±80
50	500±100
63	630±126
80	800±160
100	1000±200
125	1250±250
160	1600±320

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

Time/Current characteristic curves

E160-SF 2poles, S160-SCF 2poles



Rated current I_n (A)	Instantaneous trip current I_i (A)
15	600±120
20	600±120
30	600±120
40	600±120
50	600±120
60	1000±200
75	1000±200
100	1500±300
125	1500±300
160	1600±320

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

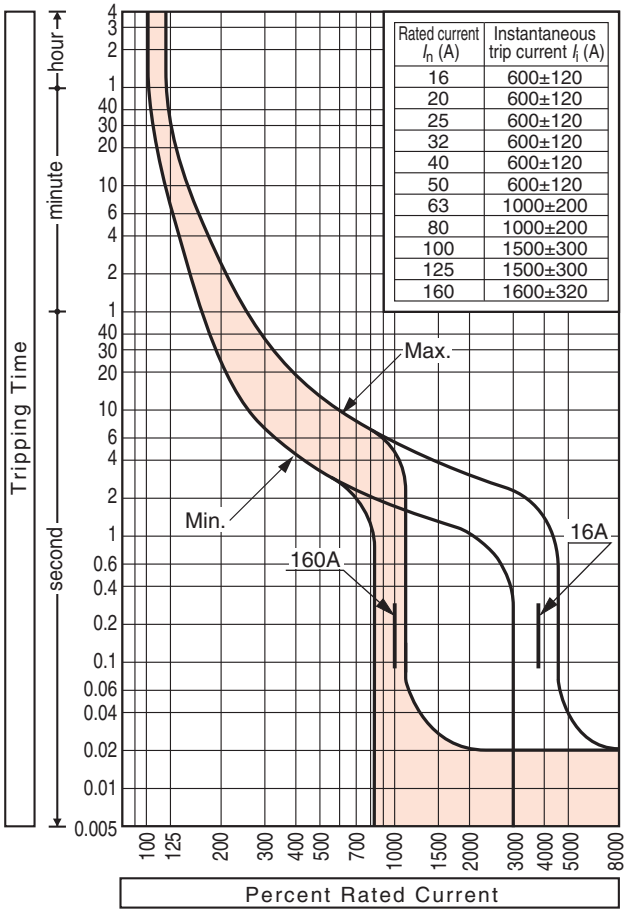
Rated current settings (A): (I_r)	Fixed thermal trip (I_r)= (I_n)
Instantaneous trip pick-up current (A): (I_i)	Fixed magnetic trip

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



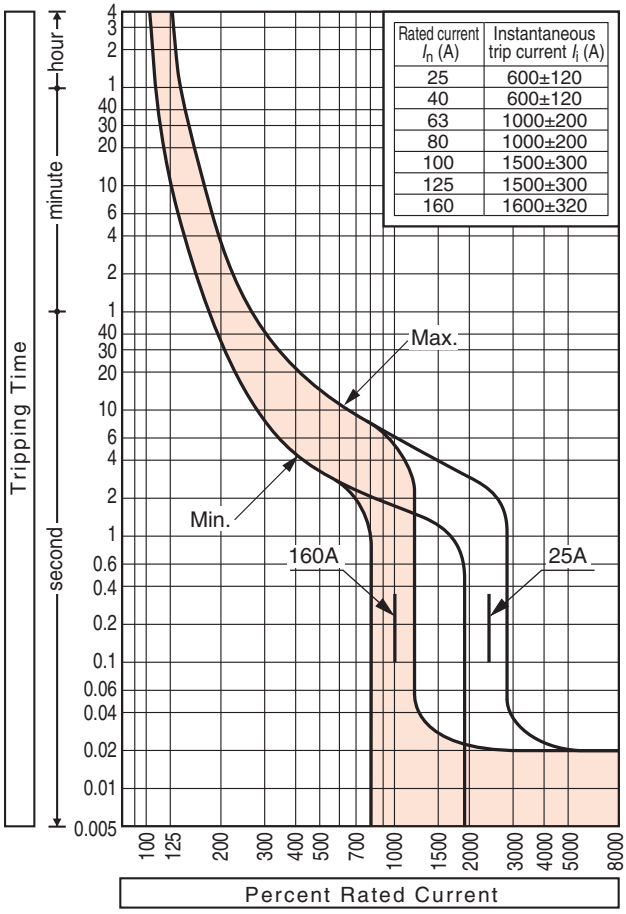
Rated current I_n (A)	Instantaneous trip current I_i (A)
16	600±120
20	600±120
25	600±120
32	600±120
40	600±120
50	600±120
63	1000±200
80	1000±200
100	1500±300
125	1500±300
160	1600±320

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

Time/Current characteristic curves

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



Rated current I_n (A)	Instantaneous trip current I_i (A)
25	600±120
40	600±120
63	1000±200
80	1000±200
100	1500±300
125	1500±300
160	1600±320

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

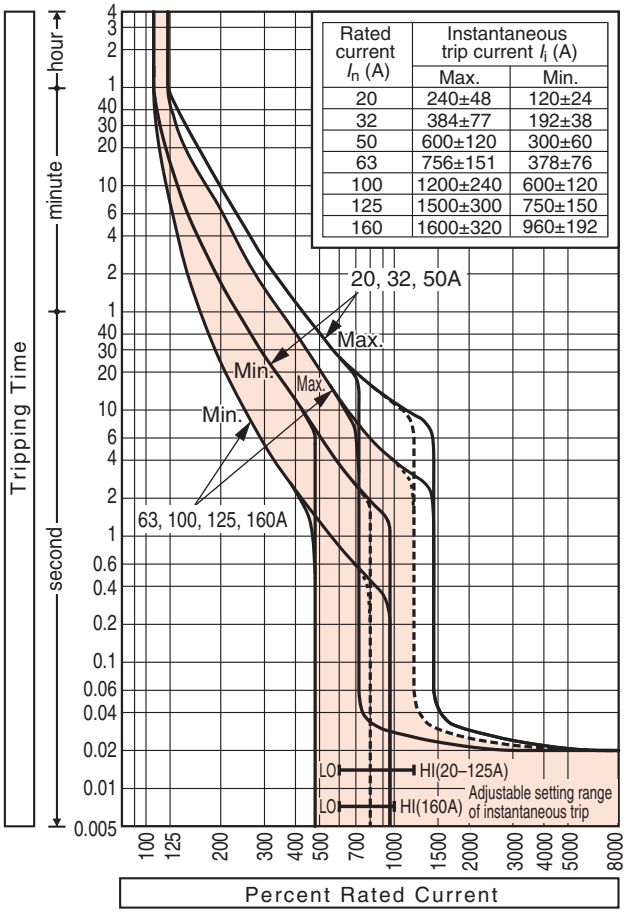
Rated current settings (A): (I_r)	Adjustable thermal trip (I_r)= 0.63-0.8-1.0×(I_n)
Instantaneous trip pick-up current (A): (I_i)	Fixed magnetic trip

Thermal Magnetic Characteristics

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

Time/Current characteristic curves

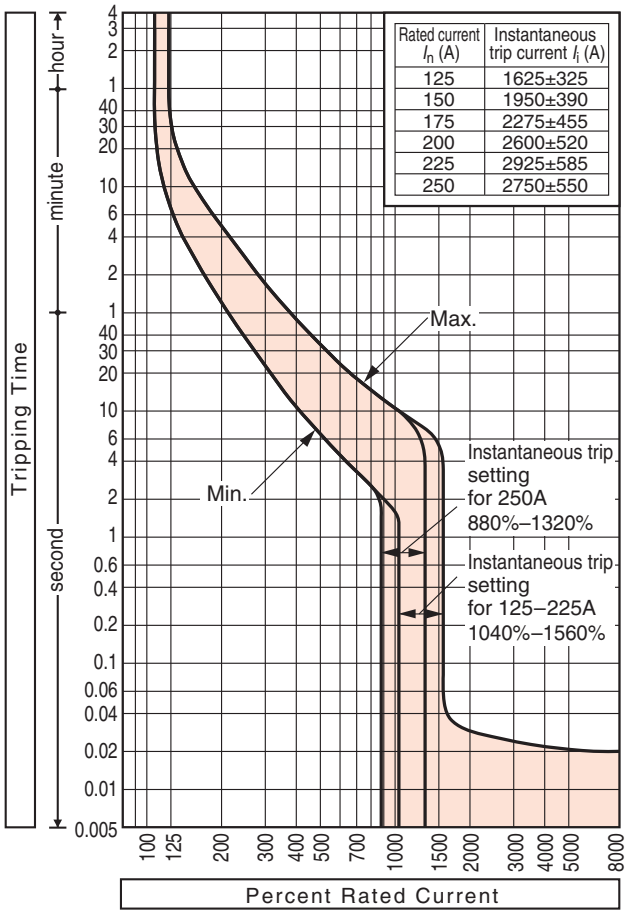
P160F, P160N, P160H



Rated current I_n (A)	Instantaneous trip current I_i (A)	
	Max.	Min.
20	240±48	120±24
32	384±77	192±38
50	600±120	300±60
63	756±151	378±76
100	1200±240	600±120
125	1500±300	750±150
160	1600±320	960±192

Time/Current characteristic curves

E250-SCF, E250-SF



Rated current I_n (A)	Instantaneous trip current I_i (A)
125	1625±325
150	1950±390
175	2275±455
200	2600±520
225	2925±585
250	2750±550

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)

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

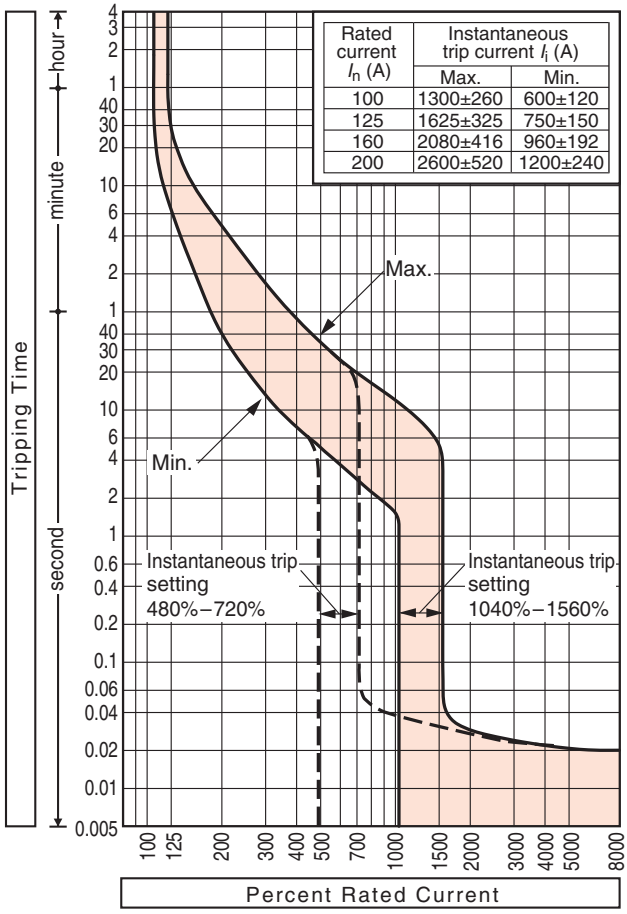
Rated current settings (A): (I_r)	Fixed thermal trip (I_r)= (I_n)
Instantaneous trip pick-up current (A): (I_i)	Fixed magnetic trip

Thermal Magnetic Characteristics

E250-SCJ, E250-SJ

Time/Current characteristic curves

E250-SCJ, E250-SJ 100–200A

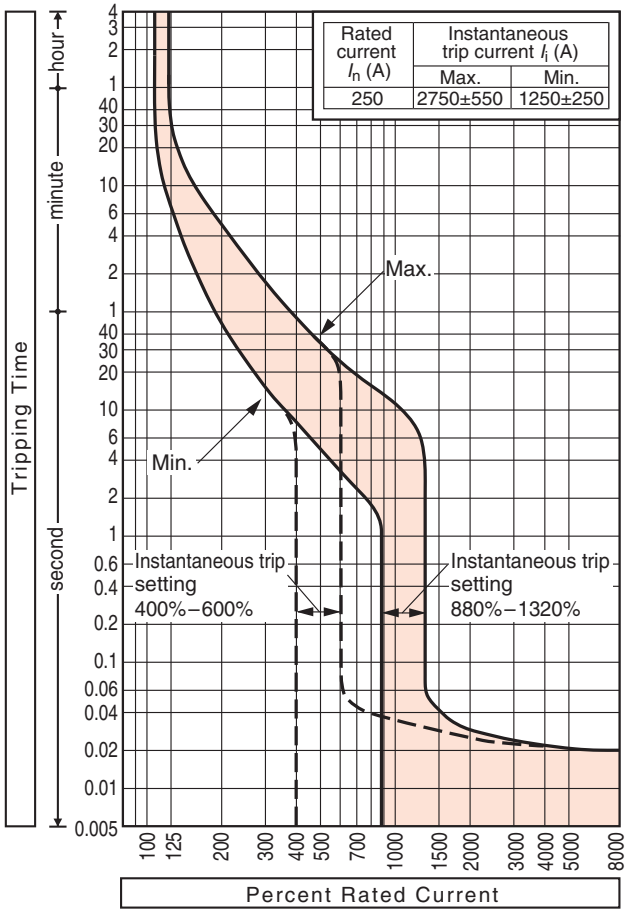


I_n=100, 125, 160, 200A

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

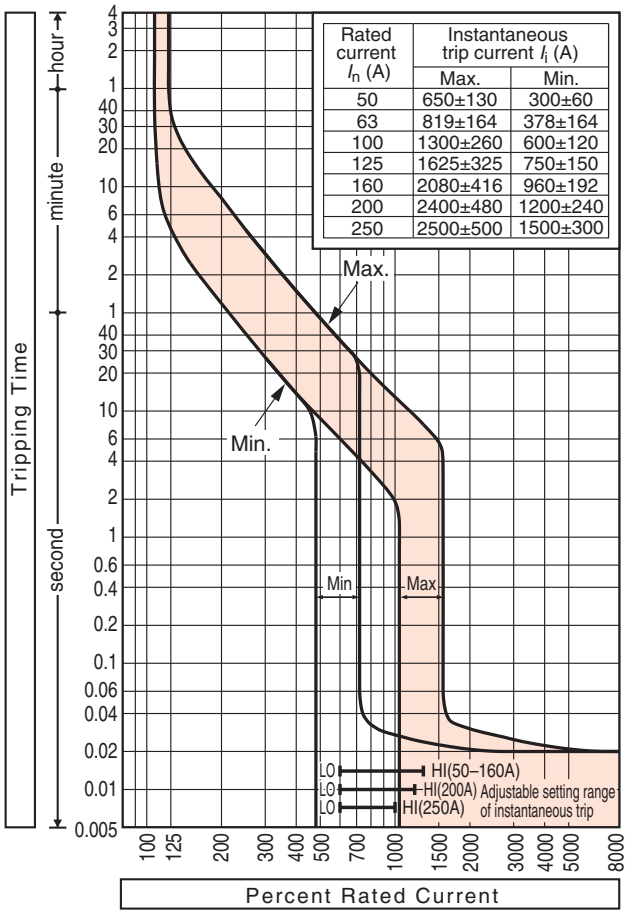
Rated current settings (A): (I_r)	Adjustable thermal trip (I_r)= 0.63-0.8-1.0×(I_n)
Instantaneous trip pick-up current (A): (I_i)	Adjustable magnetic trip (I_i)= 5-7-9-11×(I_n)

Thermal Magnetic Characteristics

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

Time/Current characteristic curves

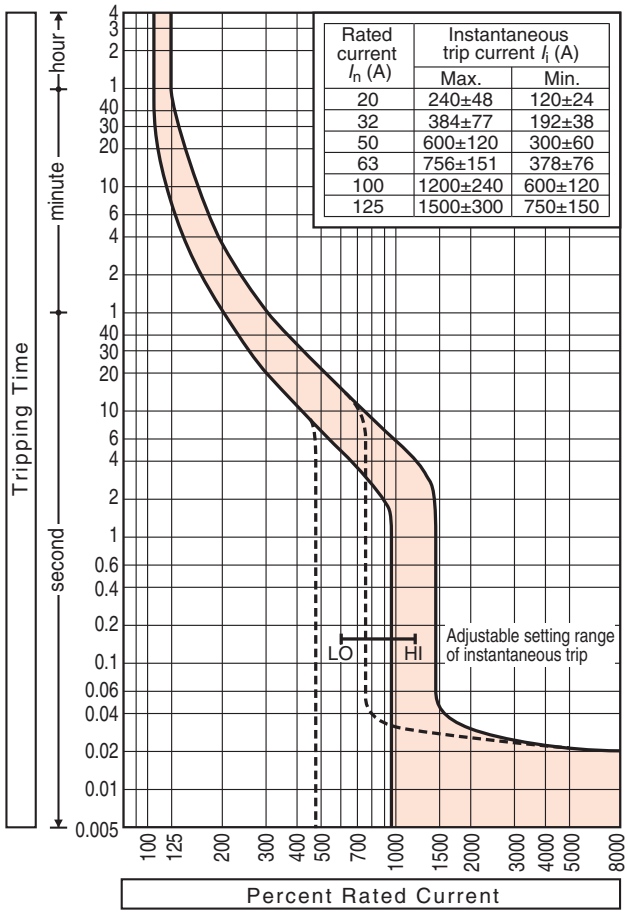
P250F, P250N, P250H



Rated current I_n (A)	Instantaneous trip current I_i (A)	
	Max.	Min.
50	650±130	300±60
63	819±164	378±164
100	1300±260	600±120
125	1625±325	750±150
160	2080±416	960±192
200	2400±480	1200±240
250	2500±500	1500±300

Time/Current characteristic curves

H125-NJ, L125-NJ, L125-PJ



Rated current I_n (A)	Instantaneous trip current I_i (A)	
	Max.	Min.
20	240±48	120±24
32	384±77	192±38
50	600±120	300±60
63	756±151	378±76
100	1200±240	600±120
125	1500±300	750±150

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

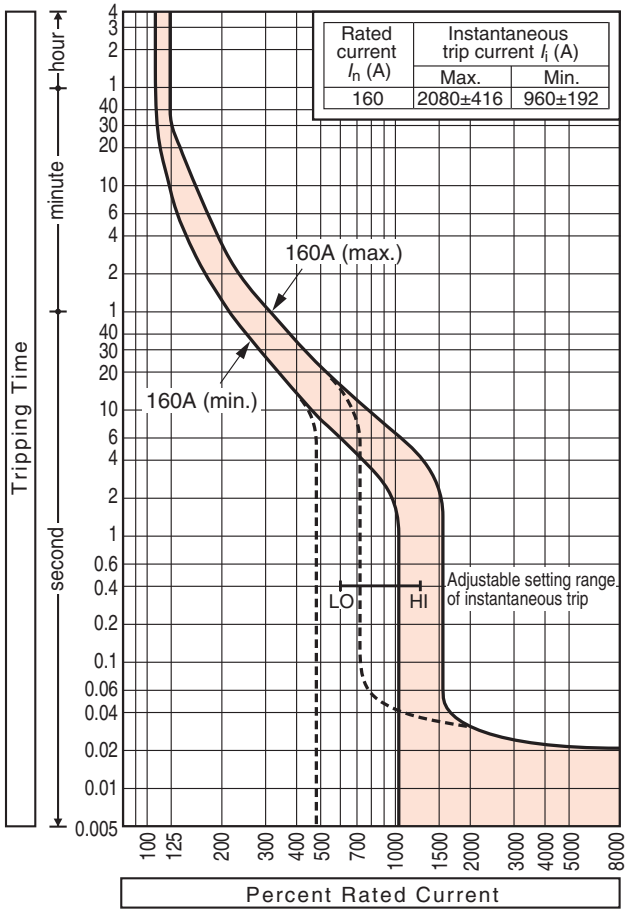
Rated current settings (A): (I_r)	Adjustable thermal trip (I_r)= 0.63-0.8-1.0×(I_n)
Instantaneous trip pick-up current (A): (I_i)	Adjustable magnetic trip (I_i)= 6-8-10-12×(I_n)

Thermal Magnetic Characteristics

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

Time/Current characteristic curves

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

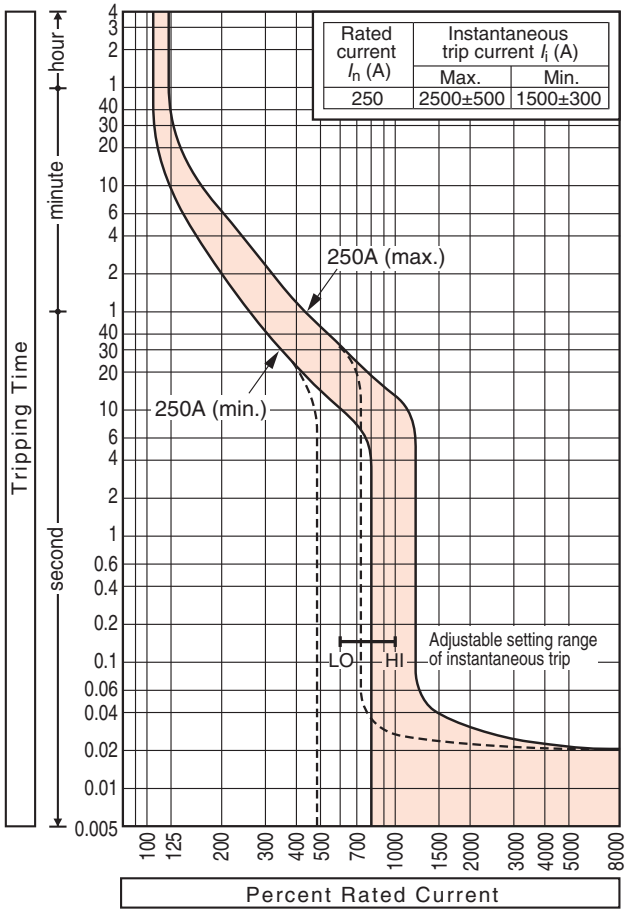


I_n=160A

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

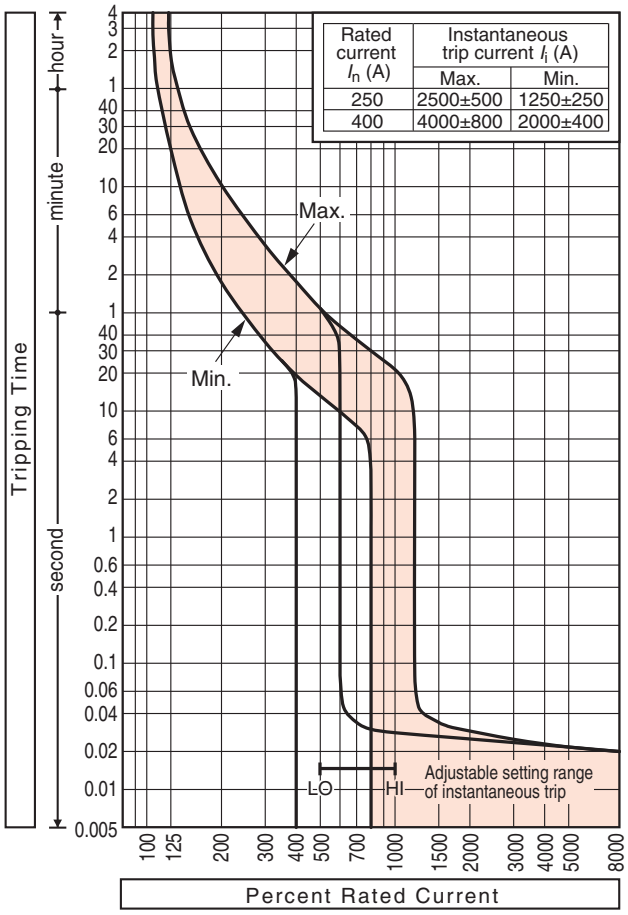
Rated current settings (A): (I_r)	Adjustable thermal trip (I_r)= 0.63-0.8-1.0×(I_n)
Instantaneous trip pick-up current (A): (I_i)	Adjustable magnetic trip (I_i)= 6-8-10×(I_n)

Thermal Magnetic Characteristics

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

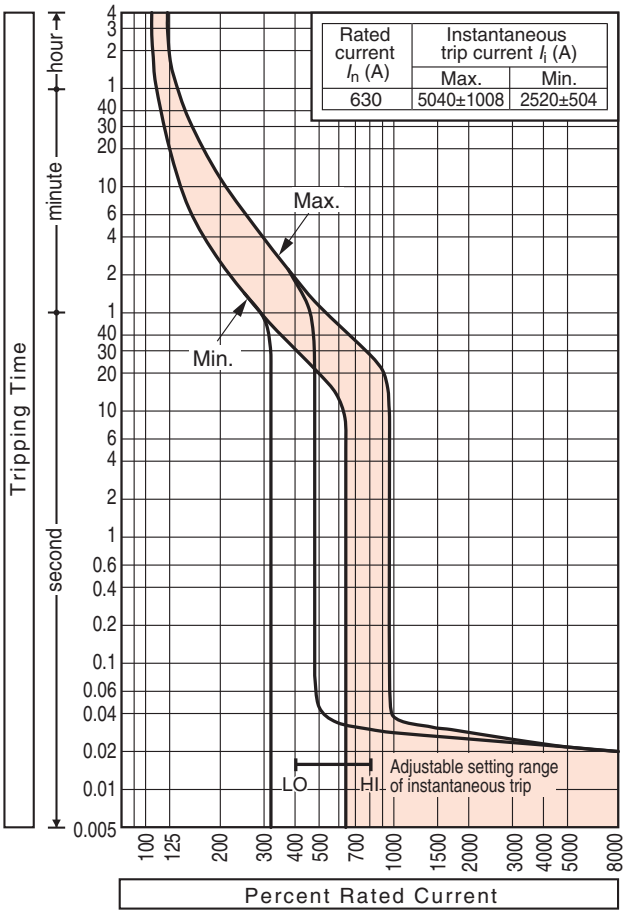
Time/Current characteristic curves

P400E, P400F, P400N, P400H, P400S



Time/Current characteristic curves

P630E, P630F, P630N, P630H, P630S



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)

I_n=630A

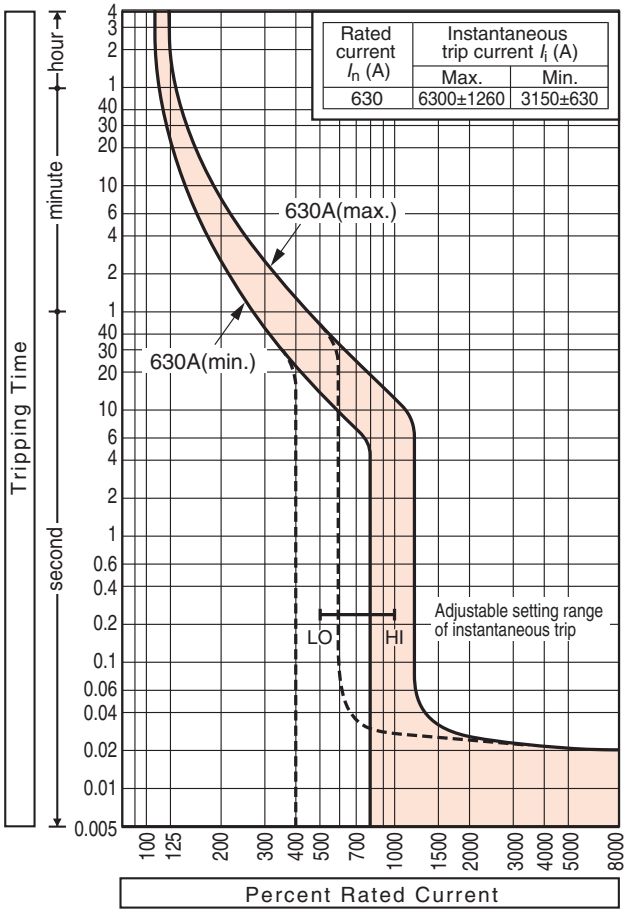
Rated current settings (A): (I_r)	Adjustable thermal trip (I_r)= 0.63-0.8-1.0×(I_n)
Instantaneous trip pick-up current (A): (I_i)	Adjustable magnetic trip (I_i)= 4-5-6-7-8×(I_n)

Thermal Magnetic Characteristics

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

Time/Current characteristic curves

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

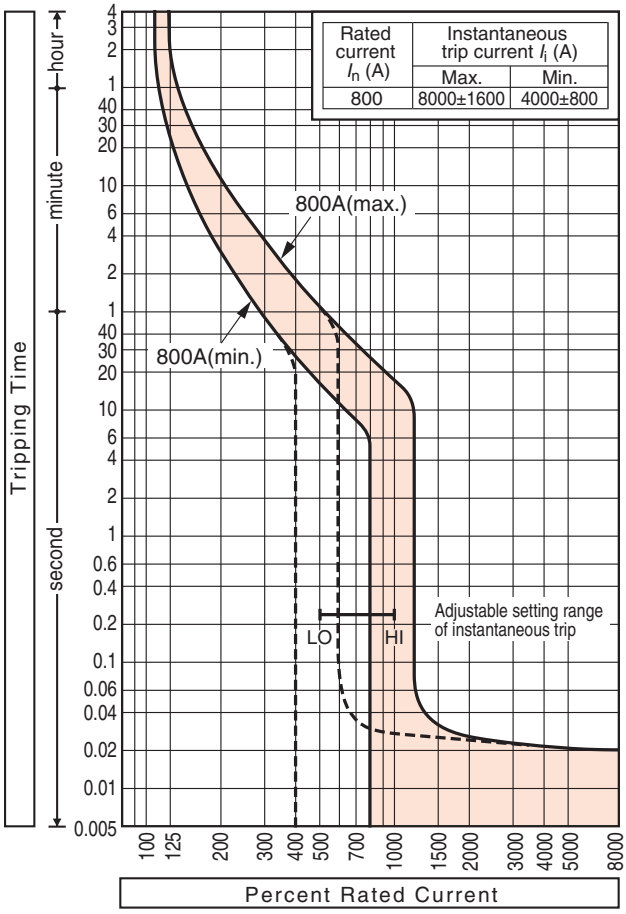


I_n=630A

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)

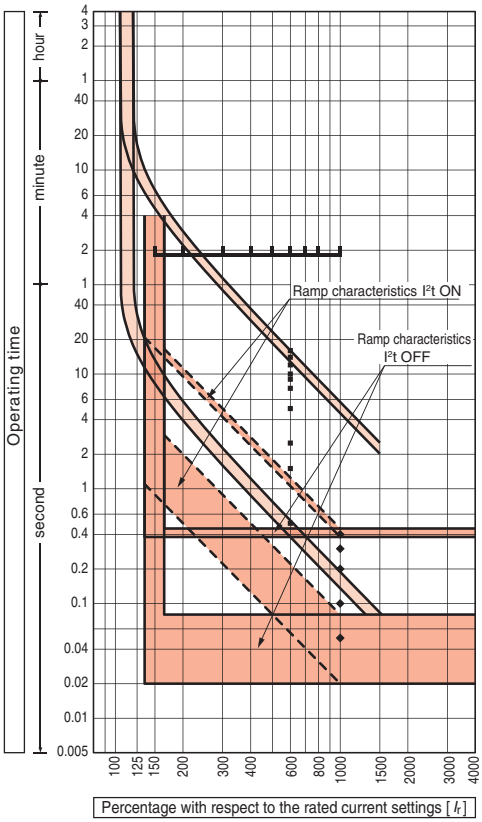
Electronic Characteristics

P160F, P160N, P160H

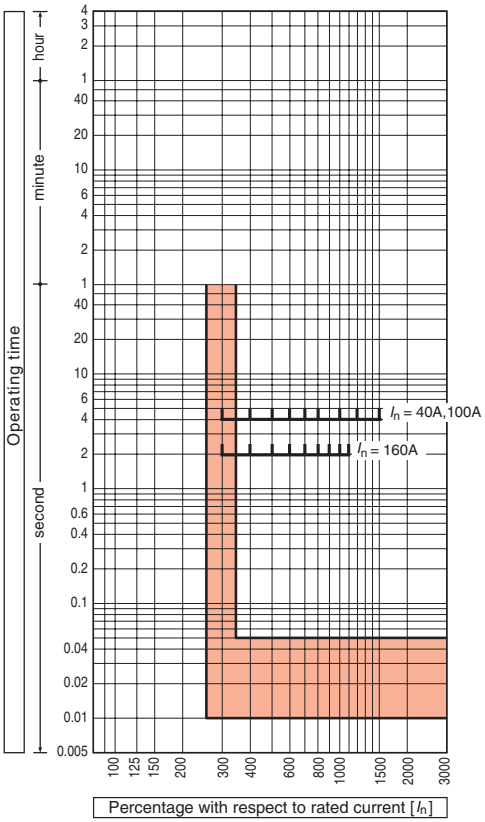
Time/Current characteristic curves

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_r1)×(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
	(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, 5, 7.5, 9, 10, 12, 14, 16 adjustable at (I_r)×600%
	Time-delay setting tolerance –20% –20ms or more +0% +30ms or less
Short time-delay pick- up current (A) : (I_{sd})	(I_r)×1.5, 2, 3, 4, 5, 6, 7, 8, 10 or OFF
	Current setting tolerance within ±10%
Short time-delay time settings (ms) : (t_{sd})	50, 100, 200, 300, 400 adjustable
	Ramp characteristics I²t: ON or OFF However, definite time-delay characteristics with (I_r)×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)×3, 4, 5, 6, 7, 8, 10, 12, 15 adjustable for I_n 40A, I_n 100A (I_n)×3, 4, 5, 6, 7, 8, 9, 10, 11 adjustable for I_n 160A
	Current setting tolerance within ±15%
N-phase protection pick-up current (A) : (I_N)	For 3P OFF fixed
	For 4P (I_r)×50%, 100% or OFF
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
Ground fault trip pick-up current (A) : (I_g)	Settings for 3P 3ø3W and 4P 3ø4W (3P 3ø4W not supported) (I_n)×40% for I_n 40A, (I_n)×20% for I_n 100A, 160A or OFF Current setting tolerance within ±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)×80% Current setting tolerance within ±10%
Preferential trip alarm time settings (s) : (t_p)	(t_r)×50% at (I_p)×600% Time-delay setting tolerance –20% –20ms or more +0% +30 ms or less

Notes:
①: When I_r=144A or more and tr=16s is set, the device operates with I_{sd}=I_r × 9 even if the max. I_{sd}=I_r × 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.

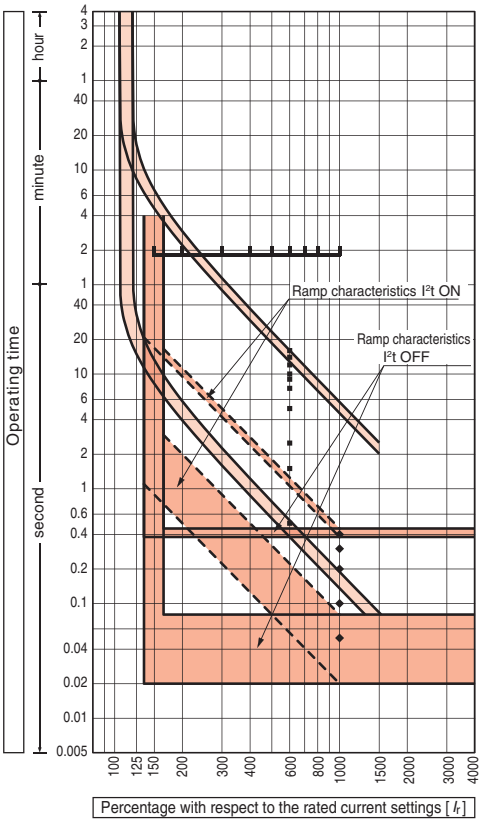
Electronic Characteristics

P250F, P250N, P250H

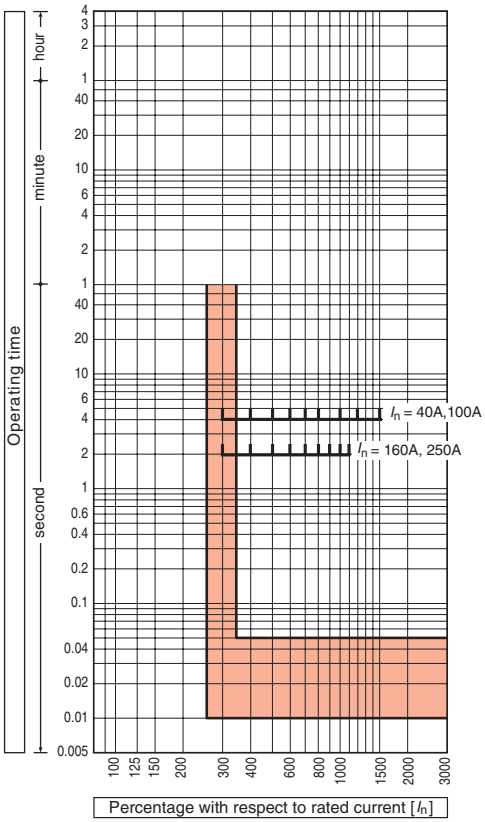
Time/Current characteristic curves

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

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

Rated current settings (A) (I_r) = (I_r1)×(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_r)	0.5, 1.5, 2.5, 5, 7.5, 9, 10, 12, 14, 16 adjustable at (I_r)×600%
	Time-delay setting tolerance –20% –20ms or more +0% +30ms or less
Short time-delay pick- up current (A) : (I_{sd})	(I_r)×1.5, 2, 3, 4, 5, 6, 7, 8, 10 or OFF
	Current setting tolerance within ±10%
Short time-delay time settings (ms) : (t_{sd})	50, 100, 200, 300, 400 adjustable
	Ramp characteristics I²t: ON or OFF However, definite time-delay characteristics with (I_r)×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)×3, 4, 5, 6, 7, 8, 10, 12, 15 adjustable for I_n 40A, I_n 100A (I_n)×3, 4, 5, 6, 7, 8, 9, 10, 11 adjustable for I_n 160A, I_n 250A
	Current setting tolerance within ±15%
N-phase protection pick-up current (A) : (I_N)	For 3P OFF fixed
	For 4P (I_r)×50%, 100% or OFF
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
Ground fault trip pick-up current (A) : (I_g)	Settings for 3P 3ø3W and 4P 3ø4W (3P 3ø4W not supported) (I_n)×40% for I_n 40A, (I_n)×20% for I_n 100A, 160A, 250A or OFF Current setting tolerance within ±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)×80% Current setting tolerance within ±10%
Preferential trip alarm time settings (s) : (t_p)	(t_r)×50% at (I_P)×600% Time-delay setting tolerance –20% –20ms or more +0% +30 ms or less

Notes:

①: When I_r=225A or more and t_r=16s is set, the device operates with I_{sd}=I_r × 9 even if the max. I_{sd}=I_r × 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.

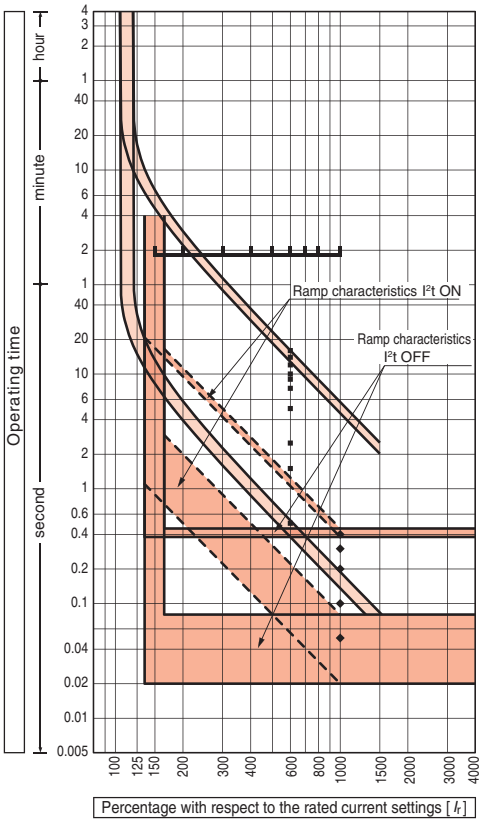
Electronic Characteristics

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

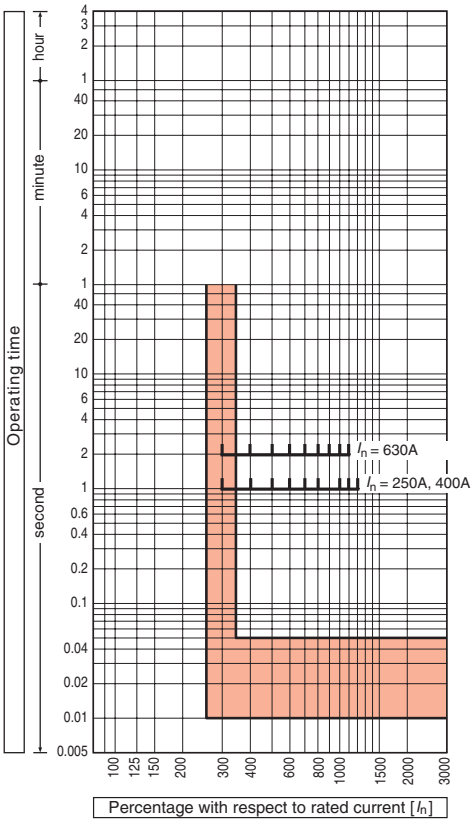
Time/Current characteristic curves

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_r1)×(I_r2)	When (I_n)=250A, (I_r1) (A)=100, 110, 125, 140, 160, 180, 200, 225, 250 adjustable When (I_n)=400A, (I_r1) (A)=160, 180, 200, 225, 250, 300, 350, 370, 400 adjustable When (I_n)=630A, (I_r1) (A)=250, 300, 350, 370, 400, 500, 600, 630 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, 5, 7.5, 9, 10, 12, 14, 16 adjustable at (I_r)×600%
	Time-delay setting tolerance –20% –20ms or more +0% +30ms or less
Short time-delay pick- up current (A) : (I_{sd})	(I_r)×1.5, 2, 3, 4, 5, 6, 7, 8, 10 or OFF
	Current setting tolerance within ±10%
Short time-delay time settings (ms) : (t_{sd})	50, 100, 200, 300, 400 adjustable
	Ramp characteristics I²t: ON or OFF However, definite time-delay characteristics with (I_r)×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)×3, 4, 5, 6, 7, 8, 10, 11, 12 adjustable for I_n 250A, I_n 400A (I_n)×3, 4, 5, 6, 7, 8, 9, 10, 11 adjustable for I_n 630A
	Current setting tolerance within ±15%
N-phase protection pick-up current (A) : (I_N)	For 3P OFF fixed
	For 4P (I_r)×50%, 100% or OFF
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
Ground fault trip pick-up current (A) : (I_g)	Settings for 3P 3ø3W and 4P 3ø4W (3P 3ø4W not supported) (I_n)×20% for I_n 250A, 400A, 630A or OFF Current setting tolerance within ±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)×80% Current setting tolerance within ±10%
Preferential trip alarm time settings (s) : (t_p)	(t_r)×50% at (I_P)×600% Time-delay setting tolerance –20% –20ms or more +0% +30 ms or less

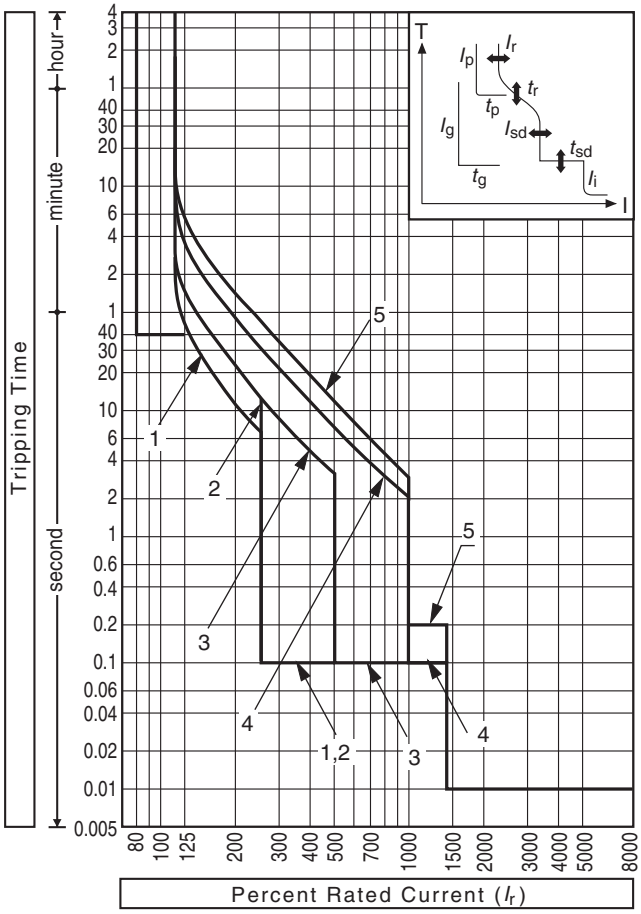
Remarks:
1: If not otherwise specified, the product will be delivered with the underlined standard setting values.
2: The TPOT type OCR (LSI) only has long time-delay trip, short time-delay trip, instantaneous trip, and preferential trip alarm.

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)×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)×200%			at (I_r)×600%	
		Setting tolerance ±20%				
Short time-delay pick-up current (A) : (I_{sd})	(I_r)×	2.5	2.5	5	10	10
		Setting tolerance ±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)×1400% Max. (I_n)×1300% Setting tolerance ±20%				
Option	Preferential trip alarm					
	Pick-up current (A) : (I_p)	(I_r)×80% Setting tolerance ±10%				
	Time settings (s) : (t_p)	Definite time-delay characteristic, 40sec. Setting tolerance ±10%				
	Neutral protection					
	Pick-up current (A) : (I_N)	(I_r)×100%				
	Time settings (s) : (t_N)	(t_N)=(t_r) Same as Long time-delay time settings				

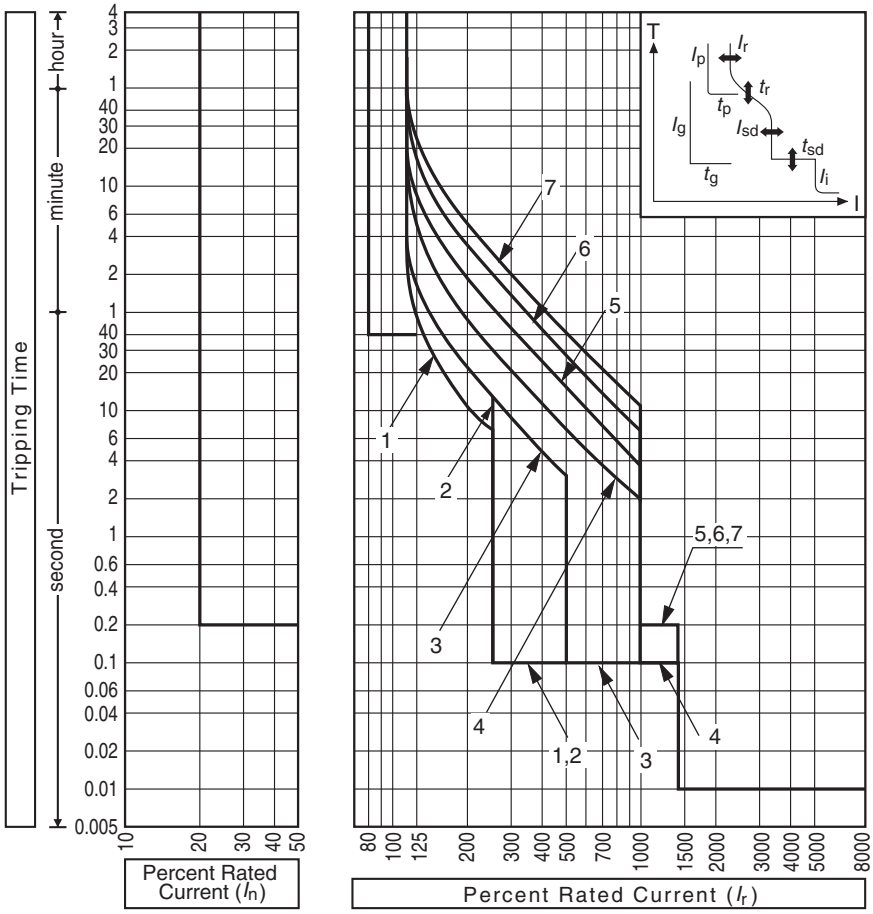
Remark: Characteristic No.4 will be applied as standard setting unless otherwise specified.

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)×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)×200%			at (I_r)×600%			
		Setting tolerance ±20%						
Short time-delay pick-up current (A) : (I_{sd})	(I_r)×	2.5	2.5	5	10	10	10	10
		Setting tolerance ±15%						
Short time-delay time settings (s) : (t_{sd})		0.1	0.1	0.1	0.1	0.2	0.2	0.2
		Total clearing time +50ms, resettable time –20ms						
Instantaneous trip pick-up current (A) : (I_i)		(I_r)×1400% Max. (I_n)×1300% Setting tolerance ±20%						
Option	Preferential trip alarm							
	Pick-up current (A) : (I_p)	(I_r)×80% Setting tolerance ±10%						
	Time settings (s) : (t_p)	Definite time-delay characteristic, 40sec. Setting tolerance ±10%						
	Ground falut trip							
	Pick-up current (A) : (I_g)	(I_n)×20% Setting tolerance ±15% ①						
	Time settings (s) : (t_g)	Difinite time-delay characteristic, 0.2sec. Total tripping time +50ms, resettable time –20ms.						
	Neutral protection							
	Pick-up current (A) : (I_N)	(I_r)×100% or 50% selectable ②						
	Time settings (s) : (t_N)	(t_N)=(t_r) Same as Long time-delay time settings						

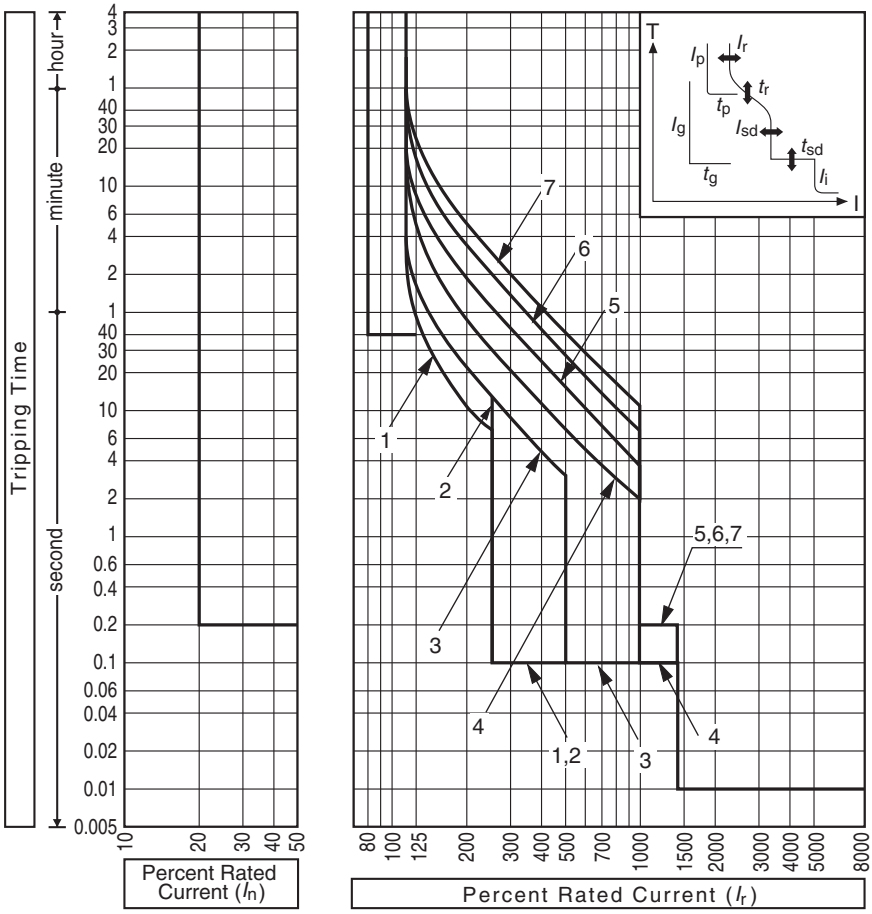
Note ①: When (I_n)=250A, ground fault trip cannot be used.
Note ②: When (I_r) < (I_n), the pick-up current tolerance becomes large when (I_N)=(I_r)×50% is set.
Note ③: When you specify GF on MCCBs with 3 poles the terminal block is automatically fitted to connect with the external neutral CT for 3 phases 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)×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)×200%			at (I_r)×600%			
		Setting tolerance ±20%						
Short time-delay pick-up current (A) : (I_{sd})	(I_r)×	2.5	2.5	5	10	10	10	10
		Setting tolerance ±15%						
Short time-delay time settings (s) : (t_{sd})		0.1	0.1	0.1	0.1	0.2	0.2	0.2
		Total clearing time +50ms, resettable time –20ms						
Instantaneous trip pick-up current (A) : (I_i)		(I_r)×1400% Max. (I_n)×1200% Setting tolerance ±20%						
Option	Preferential trip alarm							
	Pick-up current (A) : (I_p)	(I_r)×80% Setting tolerance ±10%						
	Time settings (s) : (t_p)	Definite time-delay characteristic, 40sec. Setting tolerance ±10%						
	Ground falut trip							
	Pick-up current (A) : (I_g)	(I_n)×20% Setting tolerance ±15%						
	Time settings (s) : (t_g)	Difinite time-delay characteristic, 0.2sec. Total tripping time +50ms, resettable time –20ms.						
	Neutral protection							
	Pick-up current (A) : (I_N)	(I_r)×100% or 50% selectable ②						
	Time settings (s) : (t_N)	(t_N)=(t_r) Same as Long time-delay time settings						

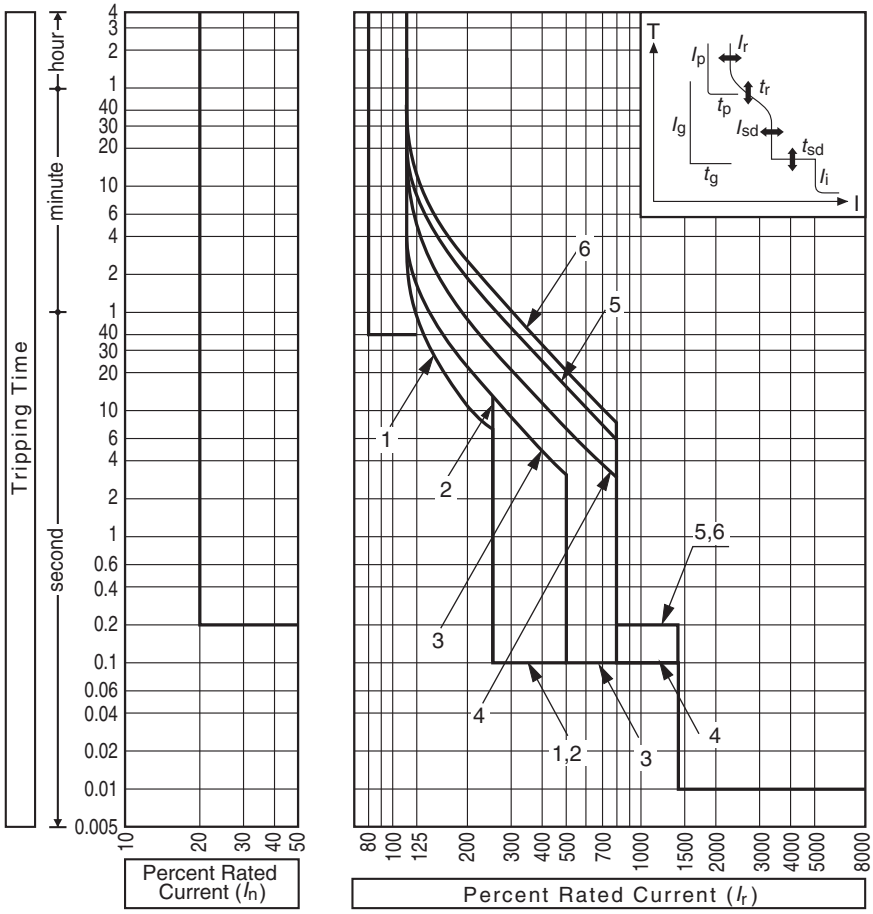
Note ②: When (I_r) < (I_n), the pick-up current tolerance becomes large when (I_N)=(I_r)×50% is set.
Note ③: When you specify GF on MCCBs with 3 poles the terminal block is automatically fitted to connect with the external neutral CT for 3 phases 4 wires system. See terminal blocks in section 6.
Remark: 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)×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)×200%			at (I_r)×600%		
		Setting tolerance ±20%					
Short time-delay pick-up current (A) : (I_{sd})	(I_r)×	2.5	2.5	5	8	8	8
		Setting tolerance ±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_r)×1400% Max. (I_n)×1000% Setting tolerance ±20%					
Option	Preferential trip alarm						
	Pick-up current (A) : (I_p)	(I_r)×80% Setting tolerance ±10%					
	Time settings (s) : (t_p)	Definite time-delay characteristic, 40sec. Setting tolerance ±10%					
	Ground falut trip						
	Pick-up current (A) : (I_g)	(I_n)×20% Setting tolerance ±15%					
	Time settings (s) : (t_g)	Difinite time-delay characteristic, 0.2sec. Total tripping time +50ms, resettable time –20ms.					
	Neutral protection						
	Pick-up current (A) : (I_N)	(I_r)×100% or 50% selectable ②					
	Time settings (s) : (t_N)	(t_N)=(t_r) Same as Long time-delay time settings					

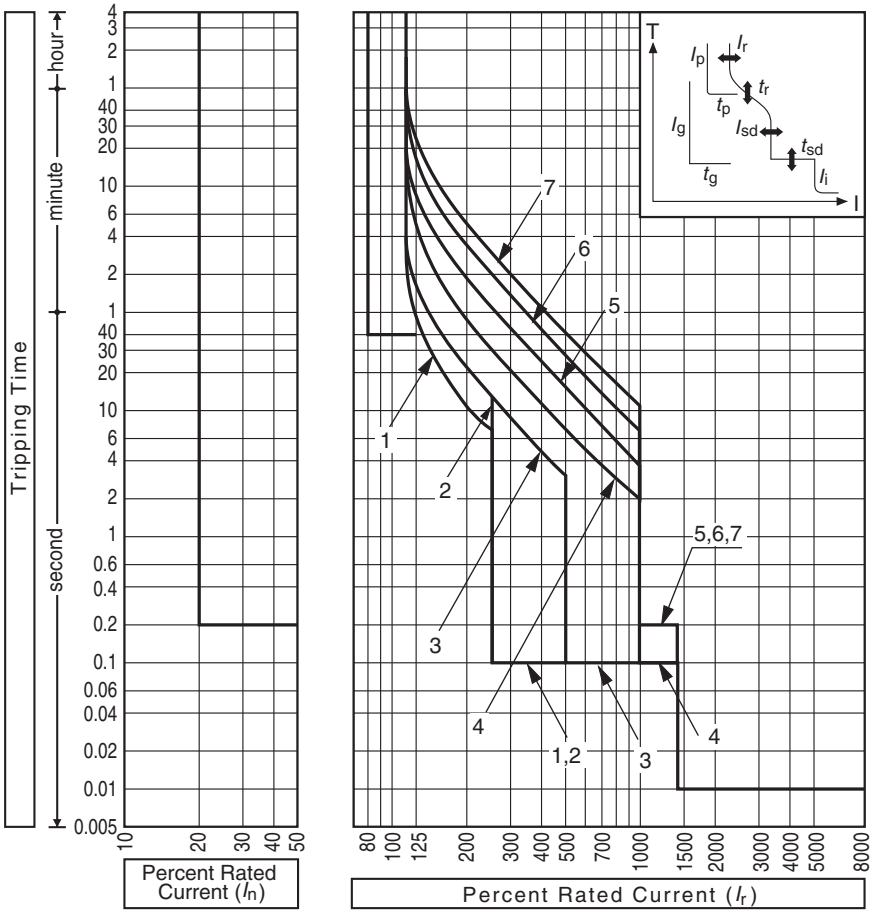
Note ②: When (I_r) < (I_n), the pick-up current tolerance becomes large when (I_N)=(I_r)×50% is set.
Note ③: When you specify GF on MCCBs with 3 poles the terminal block is automatically fitted to connect with the external neutral CT for 3 phases 4 wires system. See terminal blocks in section 6.
Remark: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

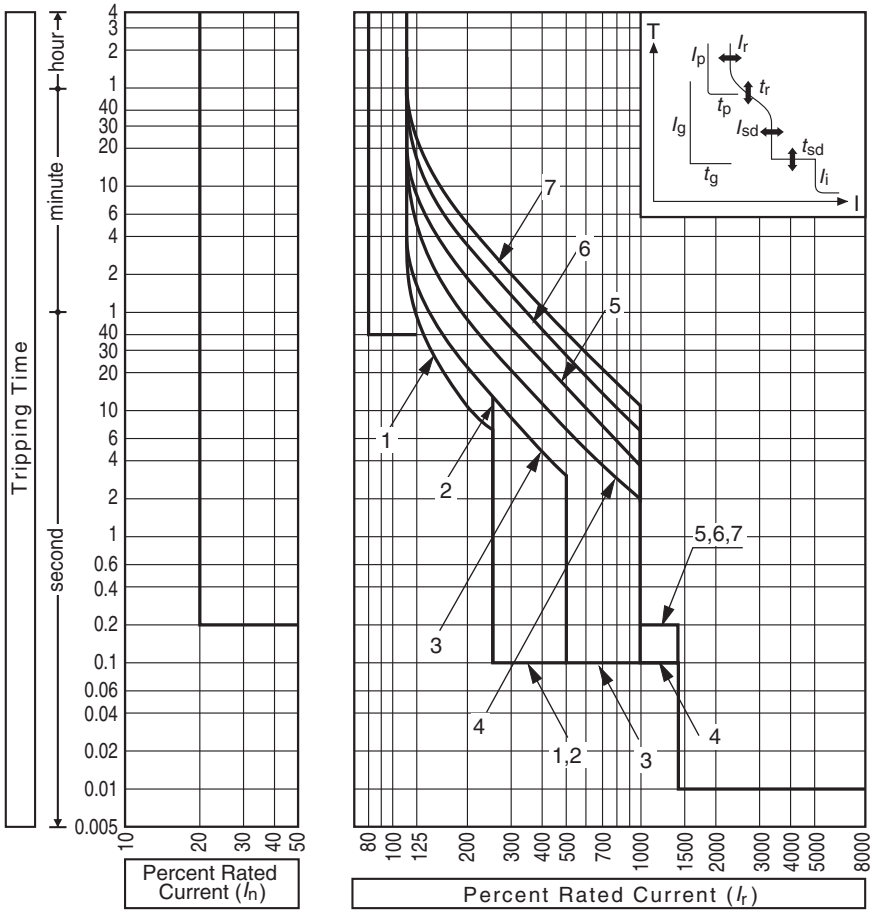
XOU OCR (LSIG) I_n=800A, 1250A

Characteristics No.		1	2	3	4	5	6	7
Rated current settings (A) : (I_r)		(I_r) = (I_n)×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)×200%			at (I_r)×600%			
		Setting tolerance ±20%						
Short time-delay pick-up current (A) : (I_{sd})	(I_r)×	2.5	2.5	5	10	10	10	10
		Setting tolerance ±15%						
Short time-delay time settings (s) : (t_{sd})		0.1	0.1	0.1	0.1	0.2	0.2	0.2
		Total clearing time +50ms, resettable time –20ms						
Instantaneous trip pick-up current (A) : (I_i)		(I_r)×1400% Max. (I_n)×1200% Setting tolerance ±20%						
Option	Preferential trip alarm							
	Pick-up current (A) : (I_p)	(I_r)×80% Setting tolerance ±10%						
	Time settings (s) : (t_p)	Definite time-delay characteristic, 40sec. Setting tolerance ±10%						
	Ground falut trip							
	Pick-up current (A) : (I_g)	(I_n)×20% Setting tolerance ±15%						
	Time settings (s) : (t_g)	Difinite time-delay characteristic, 0.2sec. Total tripping time +50ms, resettable time –20ms.						
	Neutral protection							
	Pick-up current (A) : (I_N)	(I_r)×100% or 50% selectable ②						
	Time settings (s) : (t_N)	(t_N)=(t_r) Same as Long time-delay time settings						

Note ②: When (I_r) < (I_n), the pick-up current tolerance becomes large when (I_N)=(I_r)×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.

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)×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)×200%			at (I_r)×600%			
		Setting tolerance ±20%						
Short time-delay pick-up current (A) : (I_{sd})	(I_r)×	2.5	2.5	5	10	10	10	10
		Setting tolerance ±15%						
Short time-delay time settings (s) : (t_{sd})		0.1	0.1	0.1	0.1	0.2	0.2	0.2
		Total clearing time +50ms, resettable time –20ms						
Instantaneous trip pick-up current (A) : (I_i)		(I_r)×1400% Max. (I_n)×1200% Setting tolerance ±20%						
Option	Preferential trip alarm							
	Pick-up current (A) : (I_p)	(I_r)×80% Setting tolerance ±10%						
	Time settings (s) : (t_p)	Definite time-delay characteristic, 40sec. Setting tolerance ±10%						
	Ground falut trip							
	Pick-up current (A) : (I_g)	(I_n)×20% Setting tolerance ±15%						
	Time settings (s) : (t_g)	Difinite time-delay characteristic, 0.2sec. Total tripping time +50ms, resettable time –20ms.						
	Neutral protection							
	Pick-up current (A) : (I_N)	(I_r)×100% or 50% selectable ②						
	Time settings (s) : (t_N)	(t_N)=(t_r) Same as Long time-delay time settings						

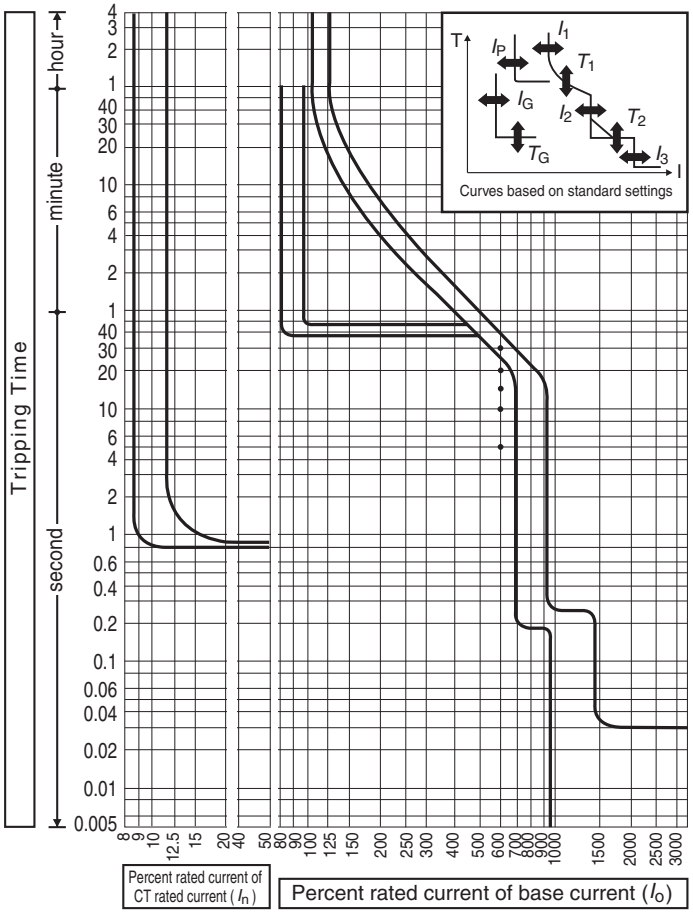
Note ②: When (I_r) < (I_n), the pick-up current tolerance becomes large when (I_N)=(I_r)×50% is set.
Note ③: When you specify GF on MCCBs with 3 poles the terminal block is automatically fitted to connect with the external neutral CT for 3 phases 4 wires system. See terminal blocks in section 6.
Remark: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



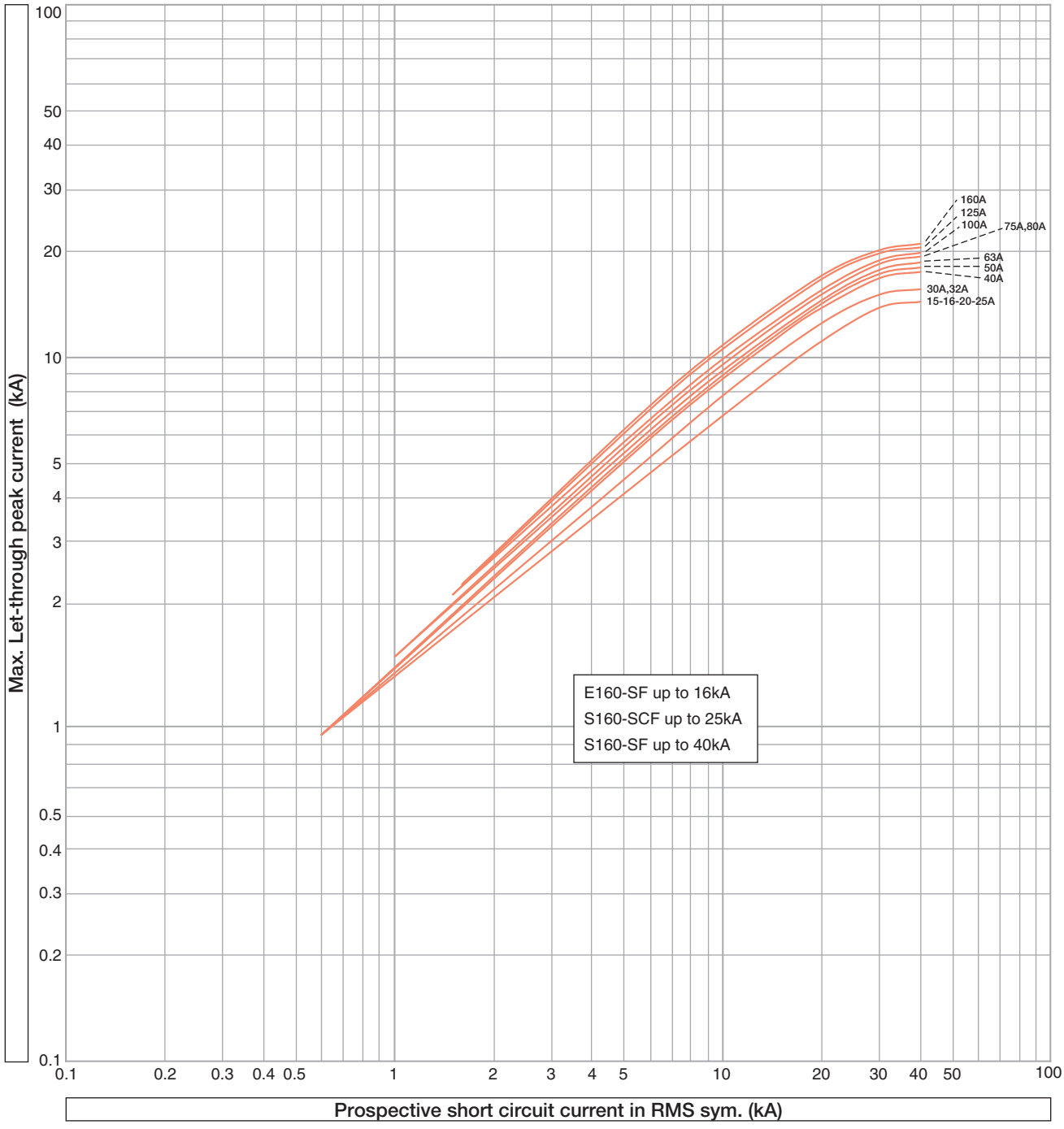
Overcurrent tripping characteristics

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) x (0.63-0.8-1.0)
	Long time-delay pick-up current (A): (I_1)	(I_o) x (0.8-0.85-0.9-0.95-1.0) Non-tripping at (I_1) setting x 105% and below. Tripping at 125% & above.
	Long time-delay time settings (S) (T_1)	(5–10–15–20–30) at (I_1) x 600% current. Setting tolerance ± 20%
	Short time-delay pick-up current (A): (I_2)	(I_o) x (2-4-6-8-10) Setting tolerance ±15%
	Short time-delay time settings (S) (T_2)	Opening time (0.1, 0.15, 0.2, 0.25, 0.3) in the definite time-delay. Total clearing time is +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) x (3 to 12) Setting tolerance ±20%
Option	Pre-trip alarm pick-up current (A) (I_P)	(I_1) x (0.7, 0.8, 0.9, 1.0) Setting tolerance ±10%
Option	Pre-trip alarm time setting (S) (T_P)	40 fixed definite time-delay. Setting tolerance ±10%
Option	Ground fault trip pick-up current (A): (I_G) ①	Continiuously adjustable from (I_n) x (0.1 to 0.4) Setting tolerance ±15%
Option	Ground fault trip time setting (S): (T_G) ①	Opening time (0.1-0.2-0.3-0.4-0.8) in the definite time-delay. Total clearing time is +50ms and resettable time is –20ms for the time-delay settings
Option	Trip indicators	See page 6-12

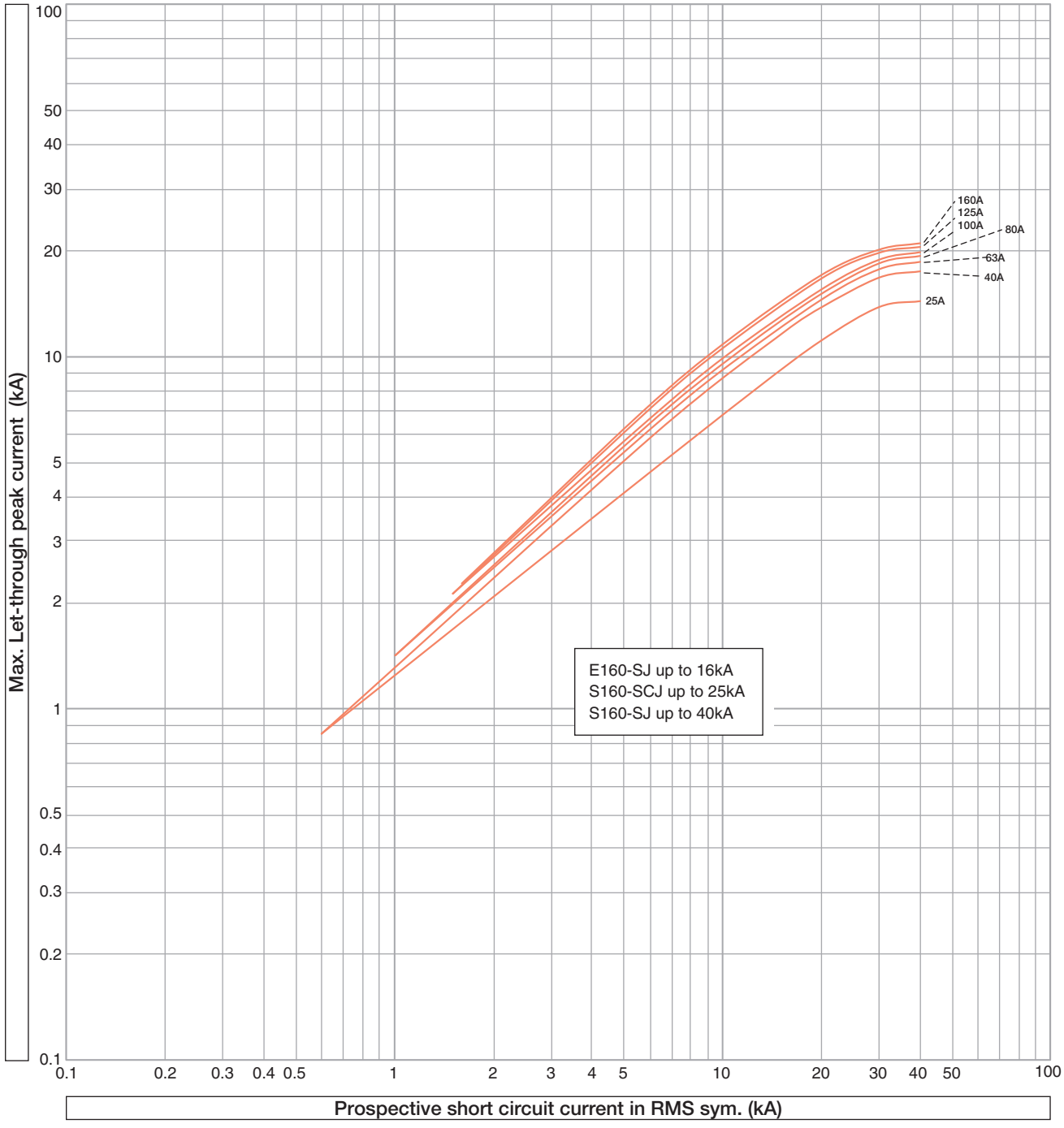
Note ①: Cannot be used with the preferential trip alarm.
Remark: If not otherwise specified, the product will be delivered with the underlined standard setting values.

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



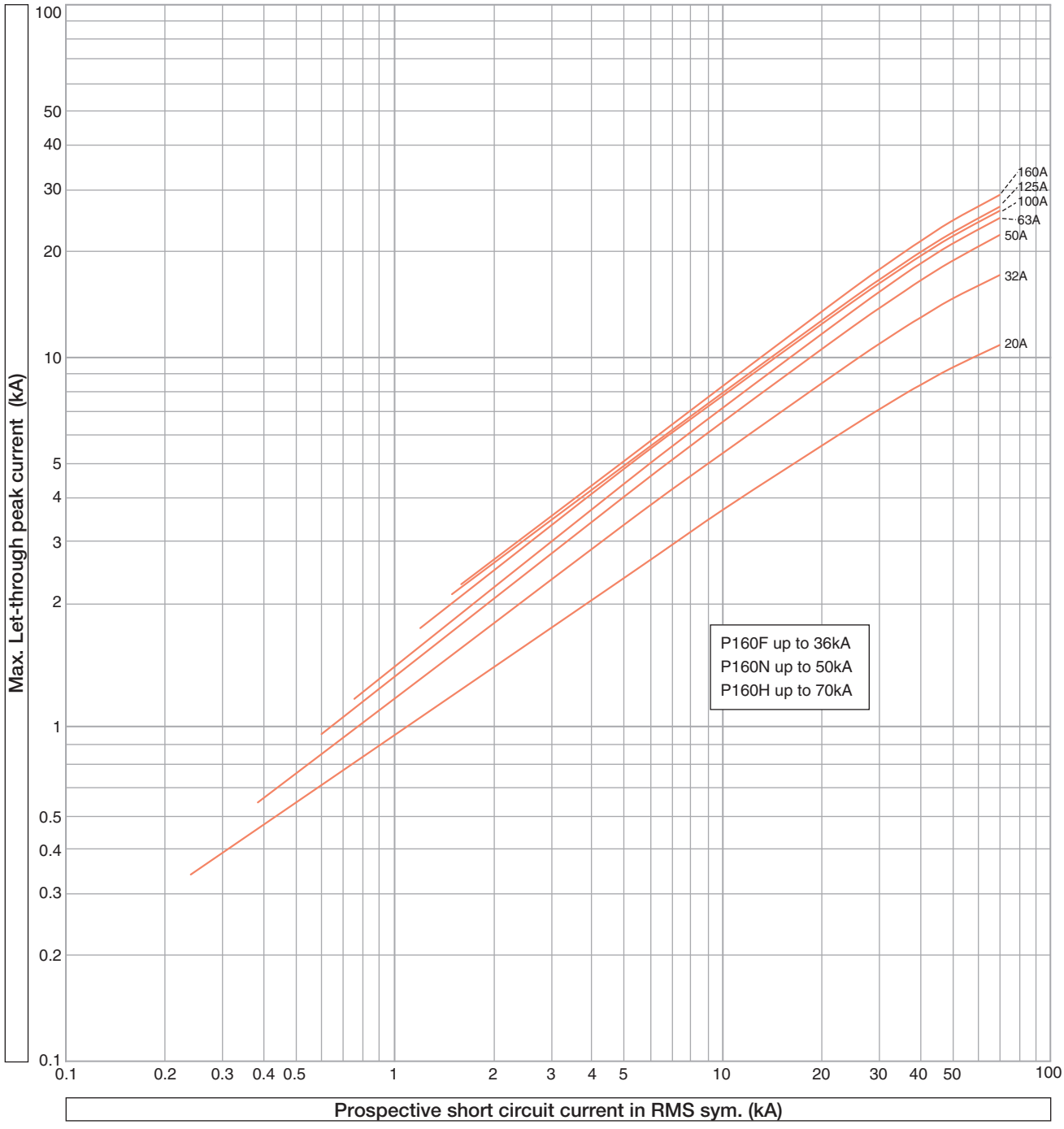
Let-Through Peak Current Characteristics

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



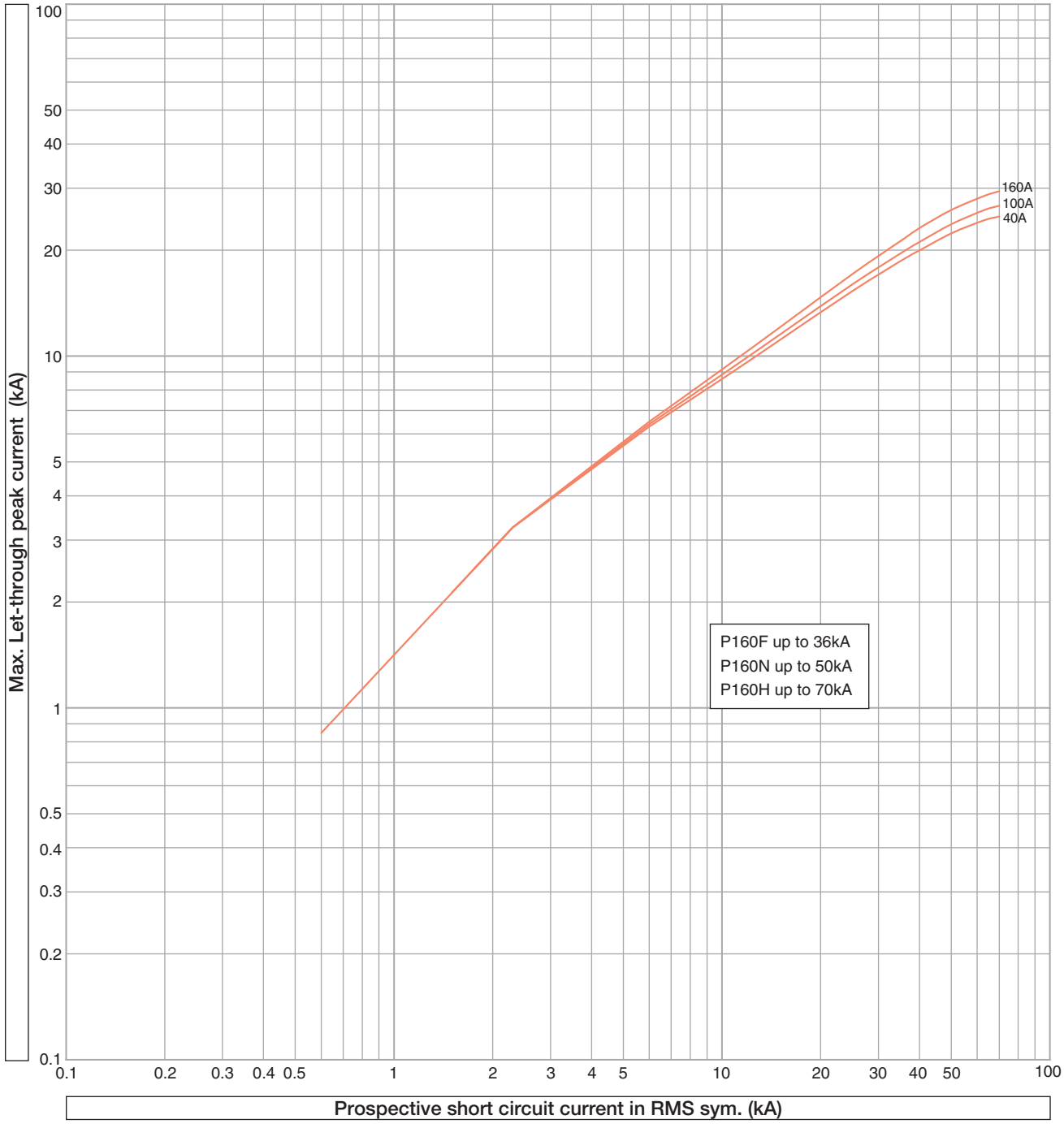
Let-Through Peak Current Characteristics

P160F, P160N, P160H Thermal type 415V AC



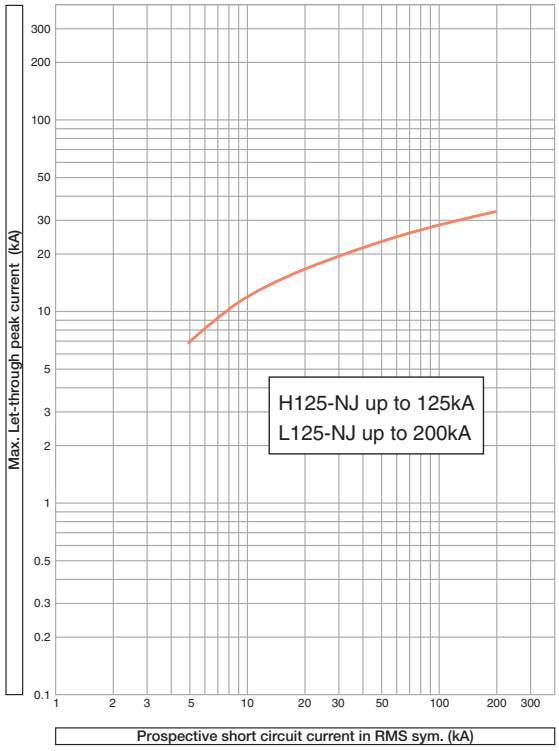
Let-Through Peak Current Characteristics

P160F, P160N, P160H Electronic type 415V AC

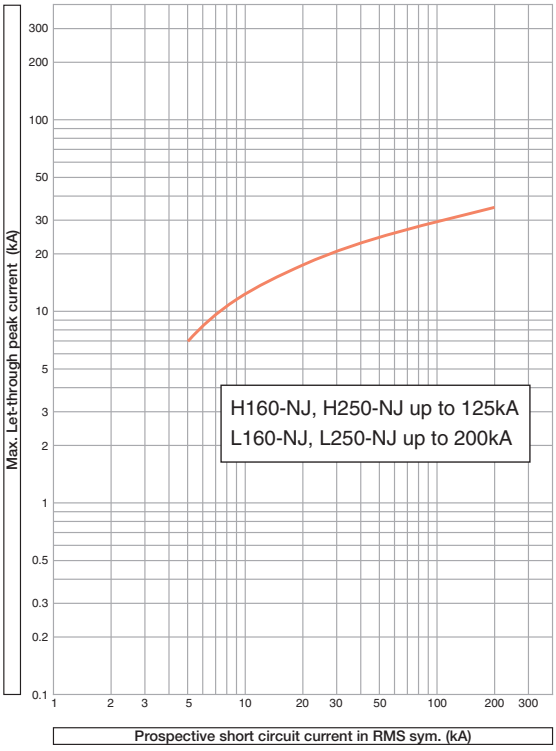


Let-Through Peak Current Characteristics

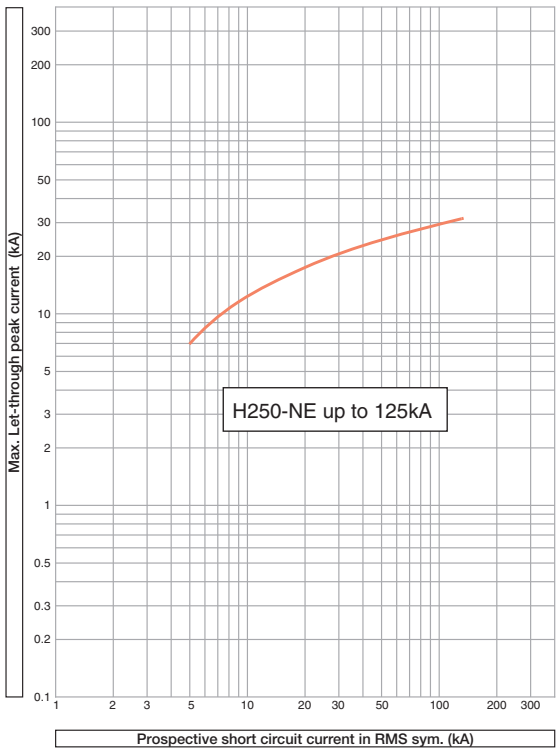
H125-NJ, L125-NJ Thermal type 415V AC



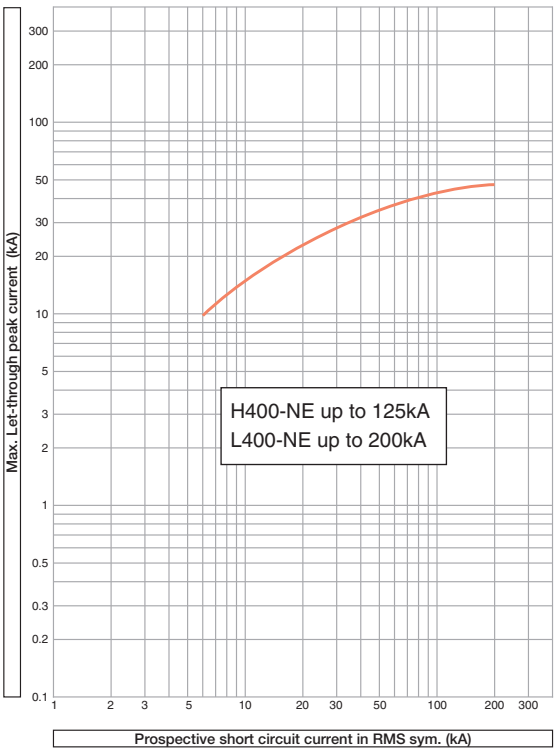
H160-NJ, L160-NJ, H250-NJ, L250-NJ Thermal type 415V AC



H250-NE Electronic type 415V AC

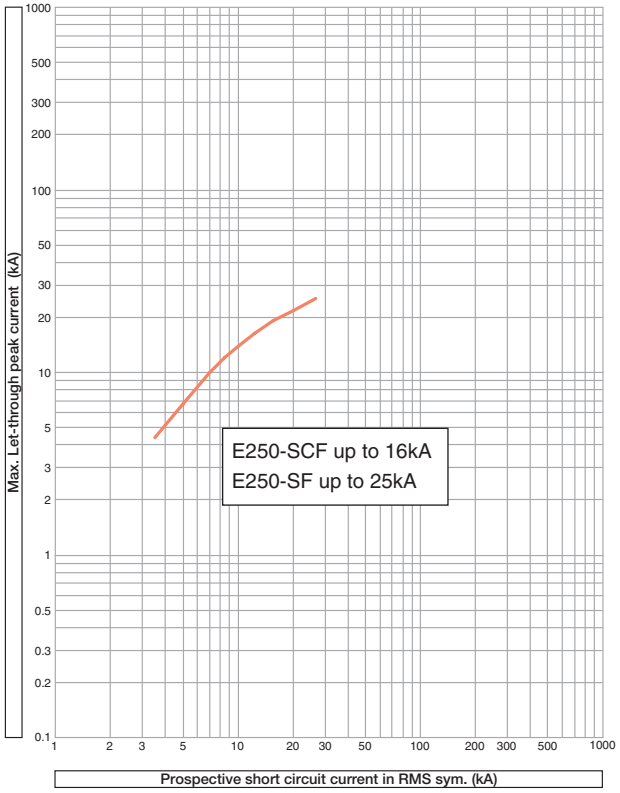


H400-NE, L400-NE Electronic type 415V AC

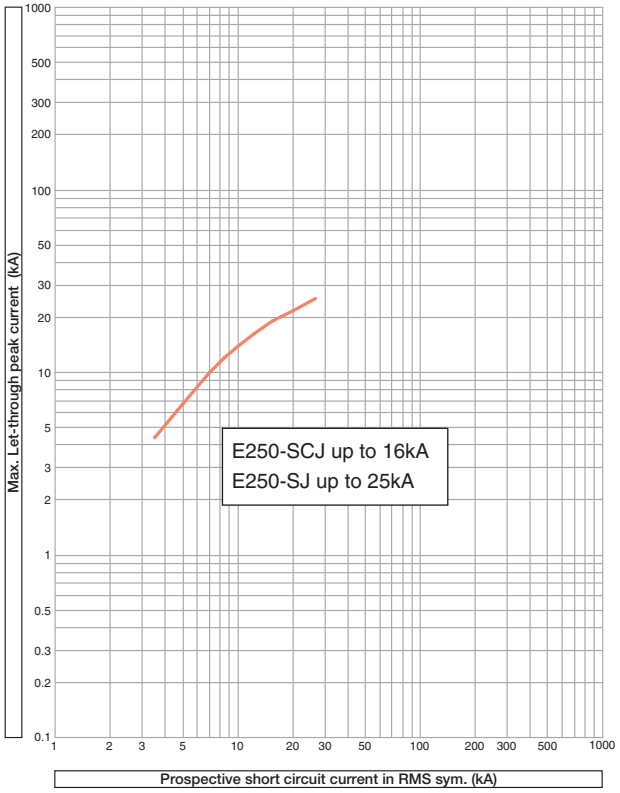


Let-Through Peak Current Characteristics

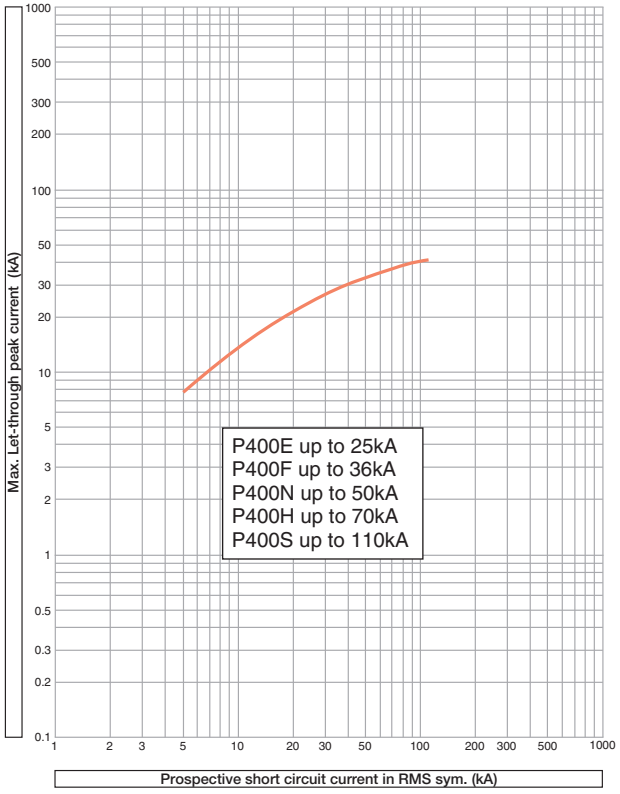
E250-SCF, E250-SF Thermal type 415V AC



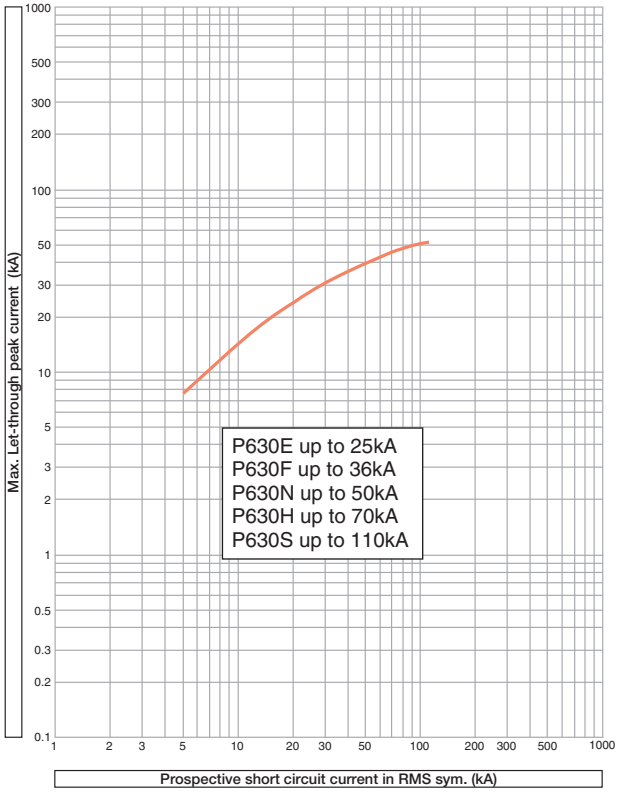
E250-SCJ, E250-SJ Thermal type 415V AC



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

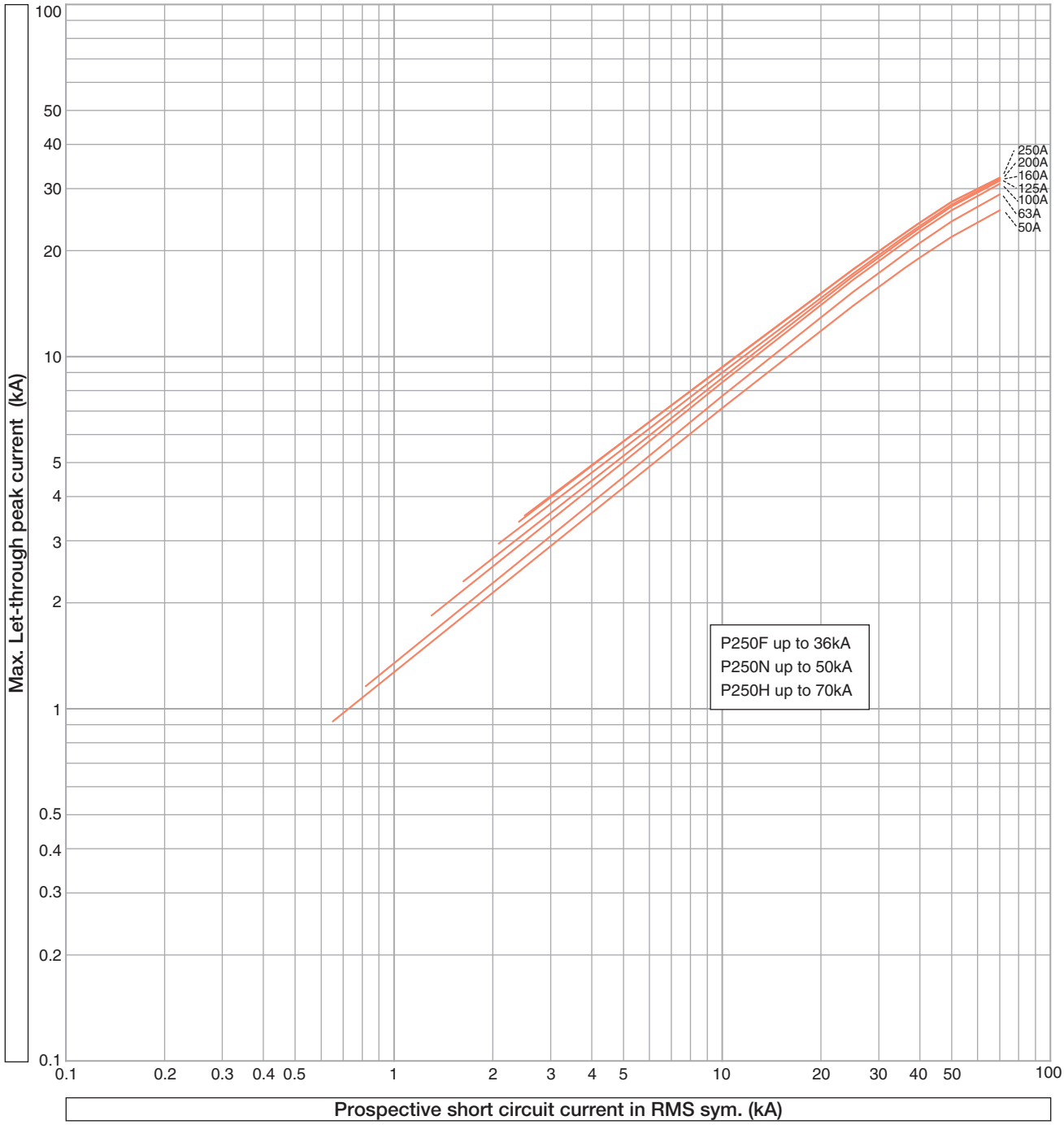


P630E, P630F, P630N, P630H, P630S Thermal type 415V AC
P630F, P630N, P630H, P630S Electronic type 415V AC



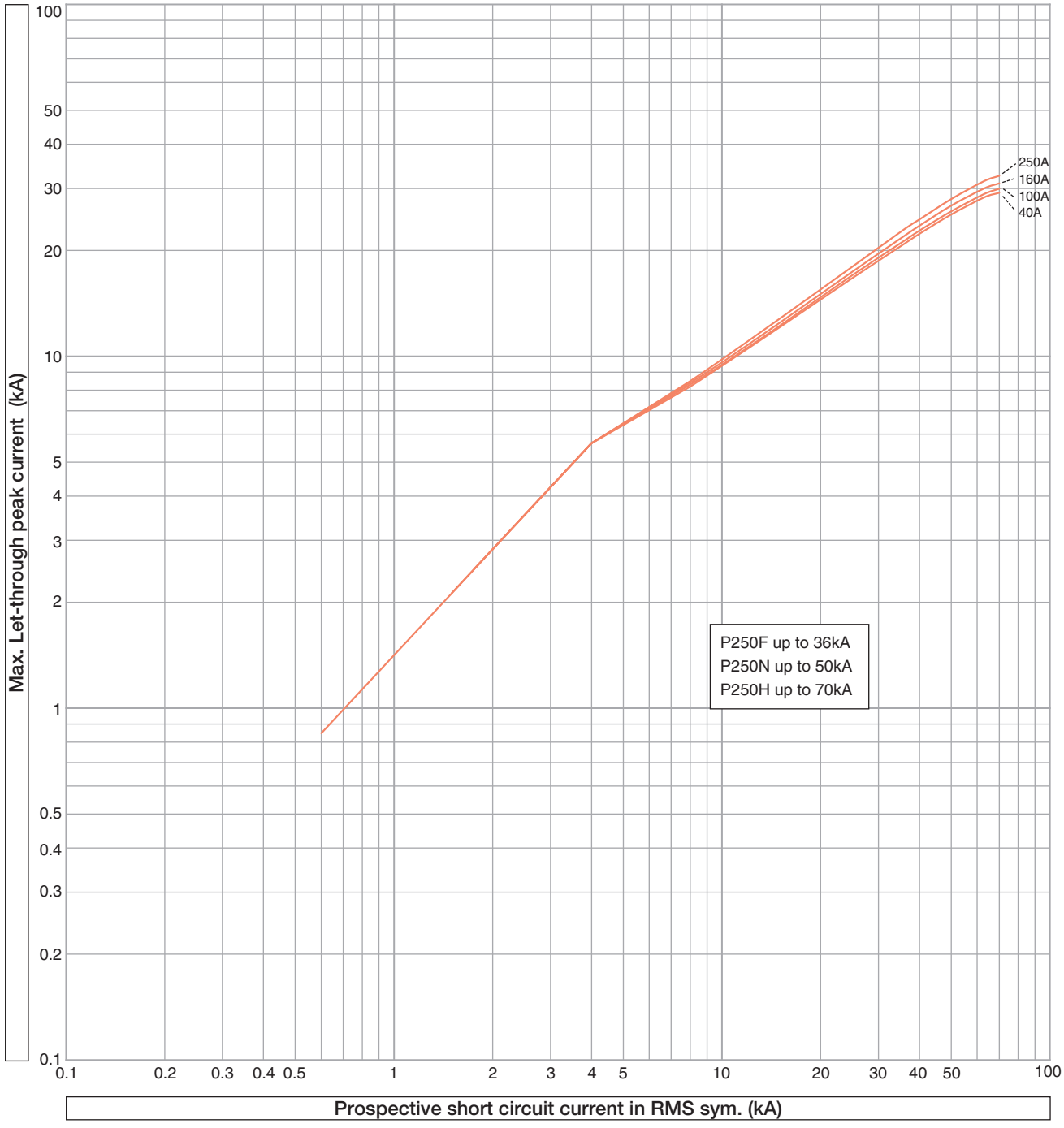
Let-Through Peak Current Characteristics

P250F, P250N, P250H Thermal type 415V AC



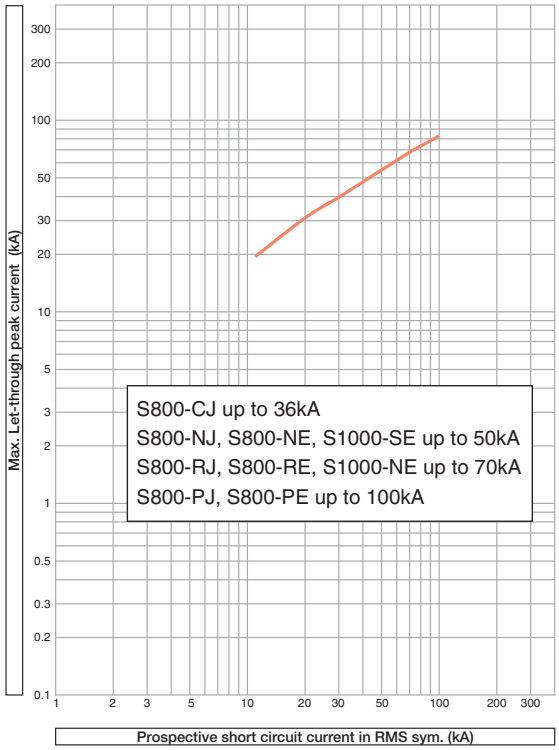
Let-Through Peak Current Characteristics

P250F, P250N, P250H Electronic type 415V AC

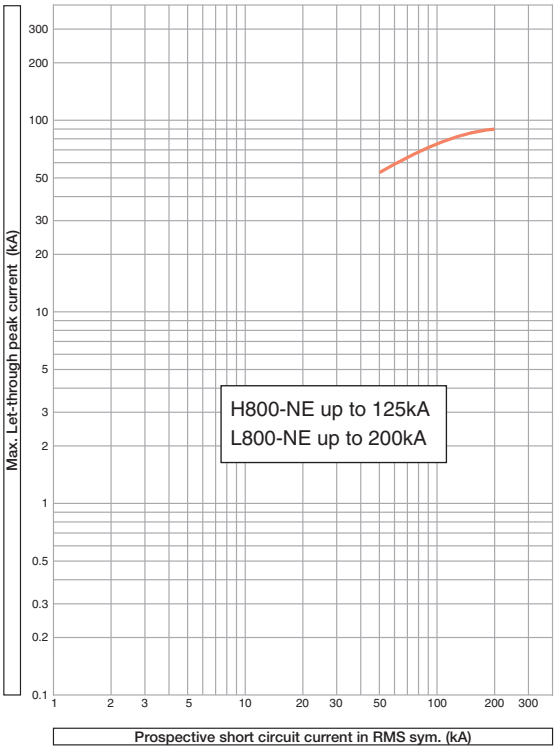


Let-Through Peak Current Characteristics

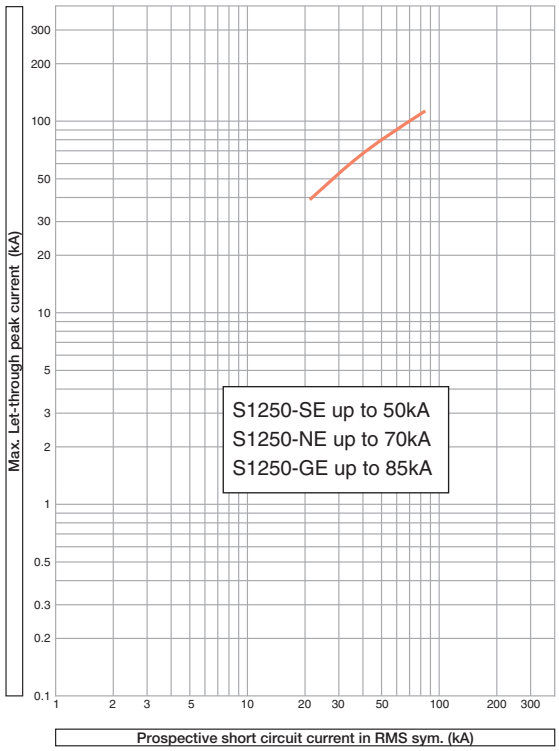
S800-CJ, S800-NJ, S800-RJ, S800-PJ Thermal type 415V AC
S800-NE, S800-RE, S800-PE Electronic type 415V AC
S1000-SE, S1000-NE Electronic type 415V AC



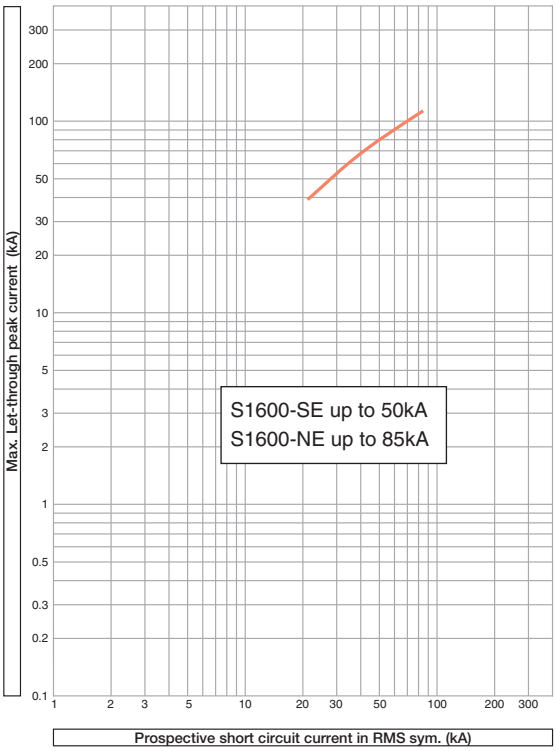
H800-NE, L800-NE Electronic type 415V AC



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

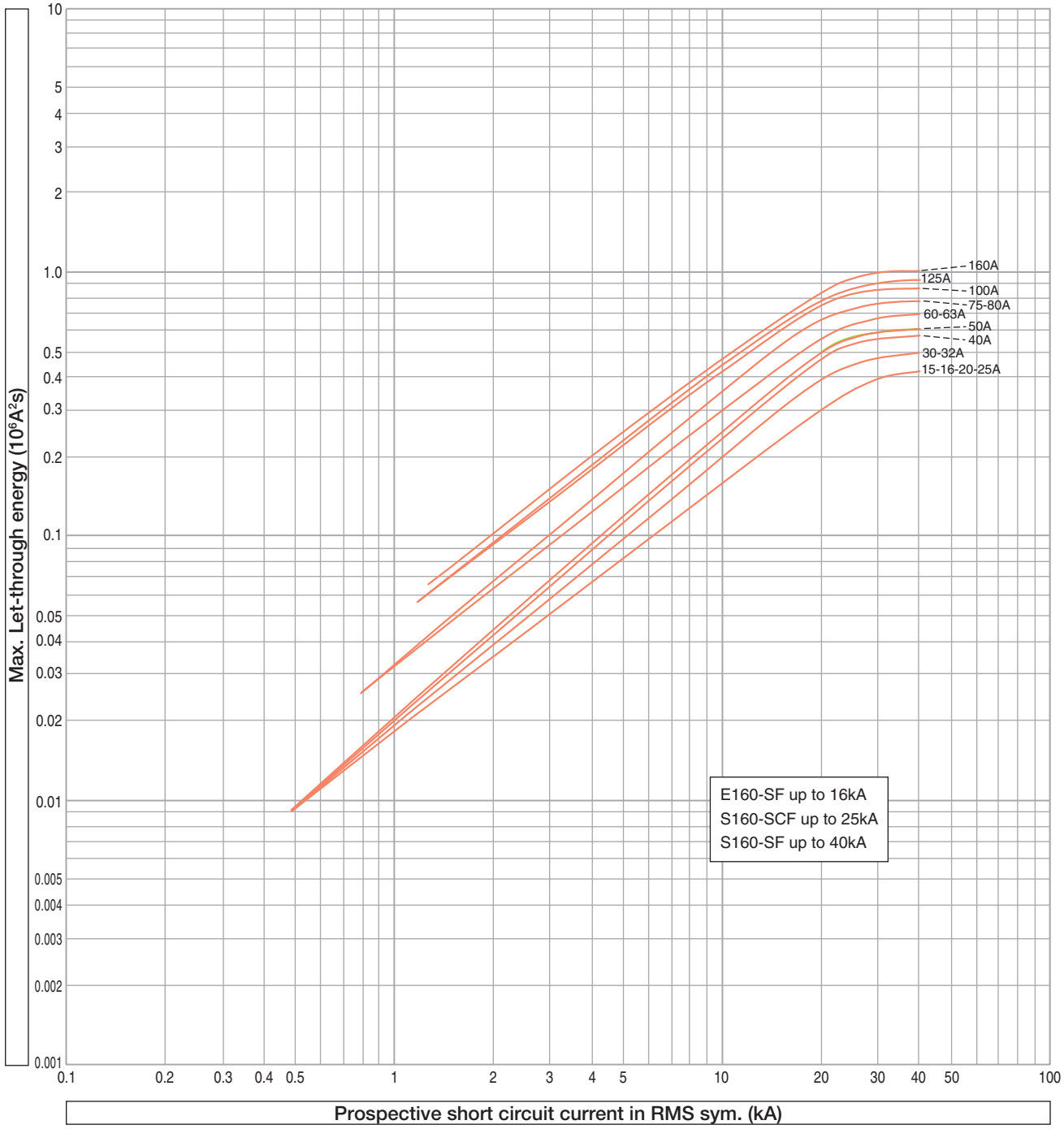


S1600-SE, S1600-NE Electronic type 415V AC

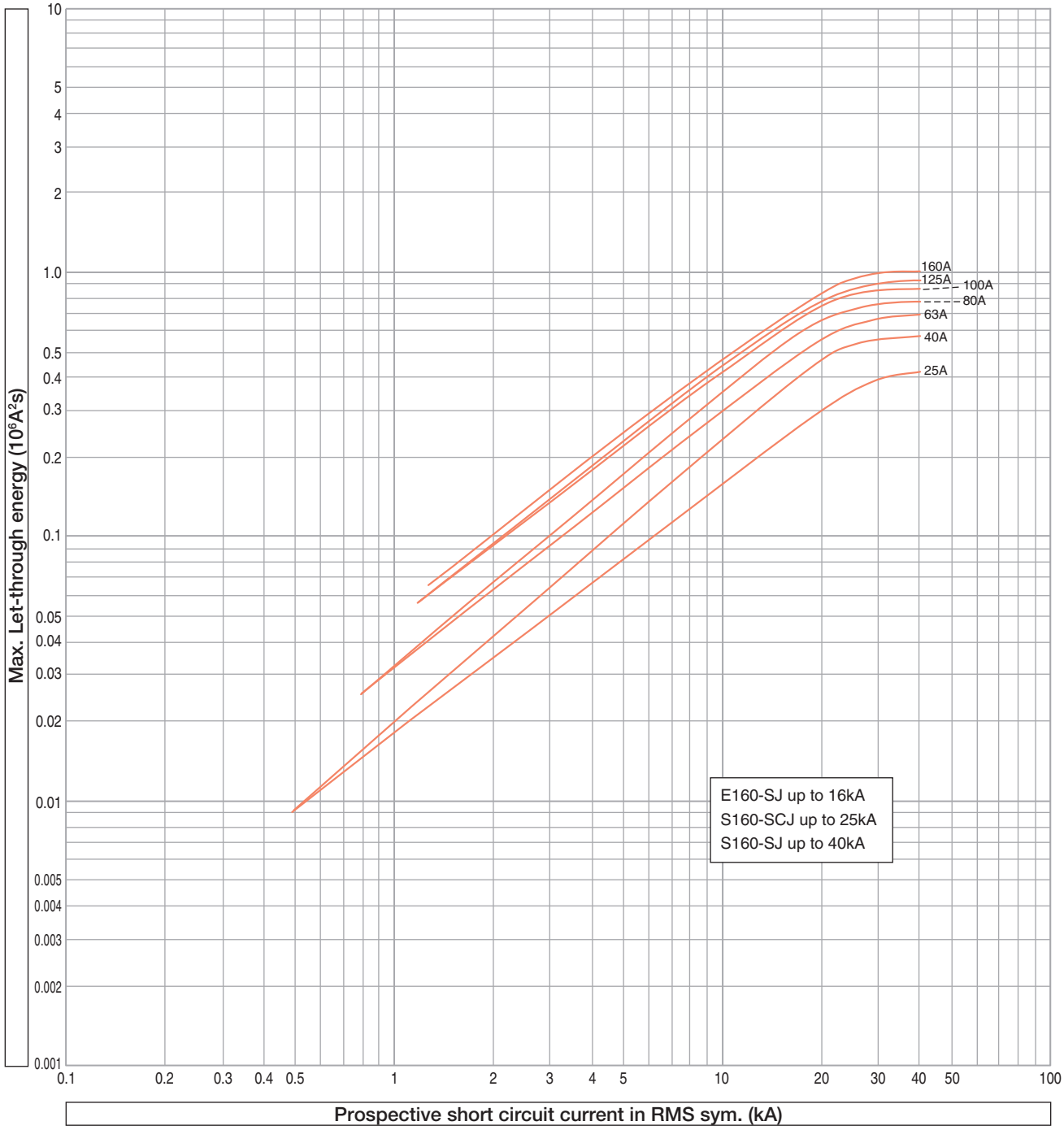


Let-Through Energy Characteristics

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

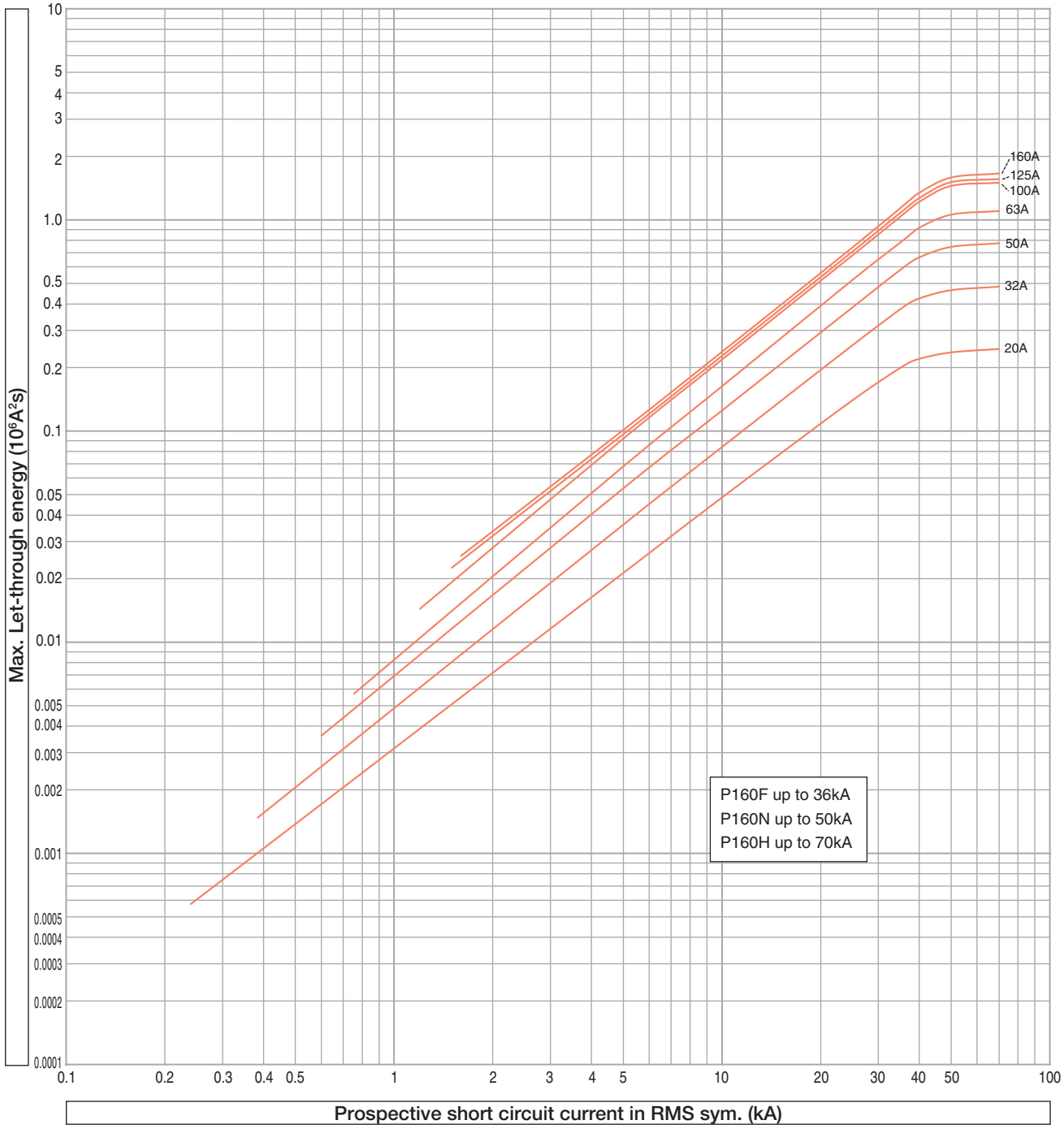


E160-SJ, S160-SCJ, S160-SJ Thermal type 415V AC



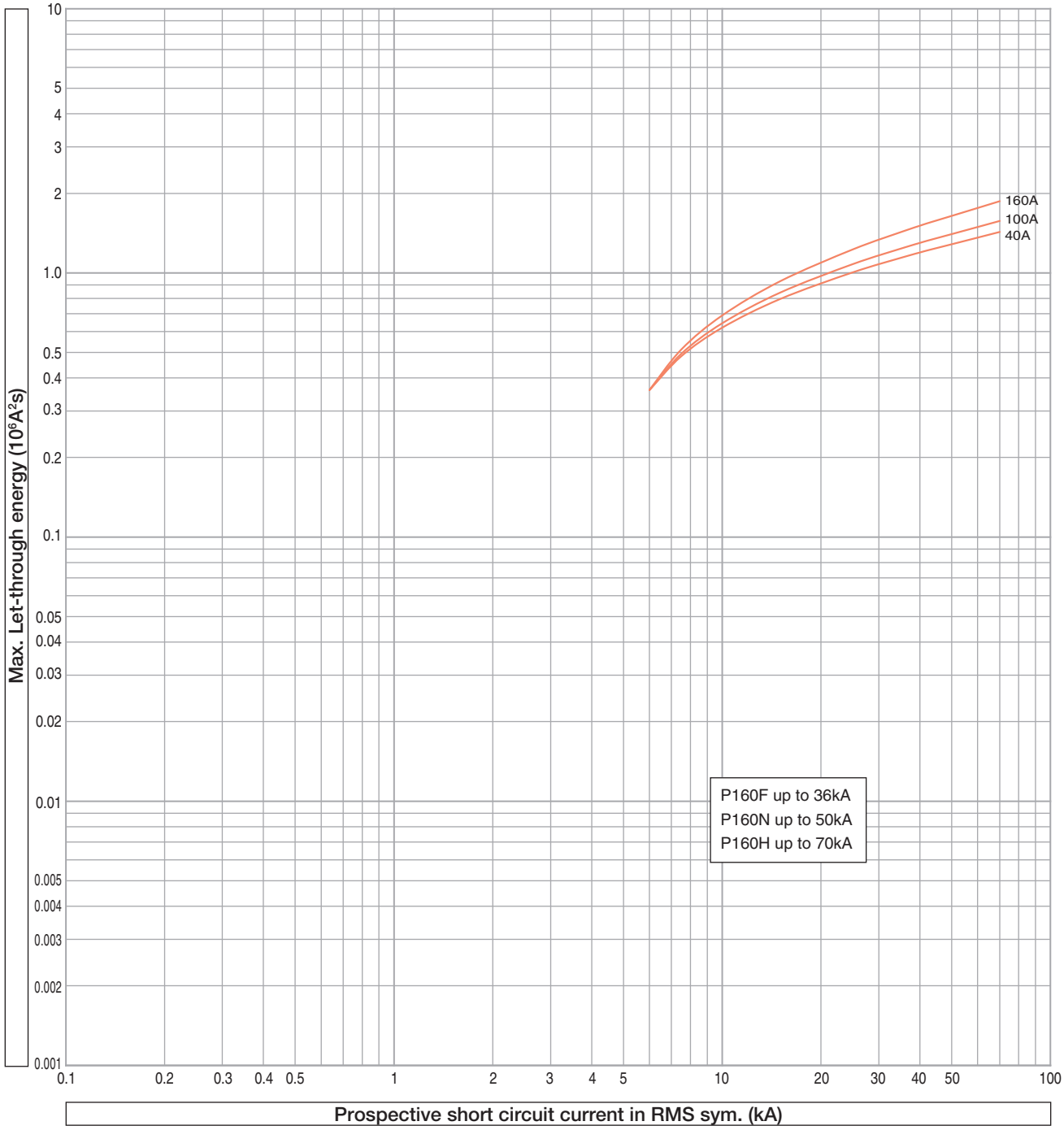
Let-Through Energy Characteristics

P160F, P160N, P160H Thermal type 415V AC



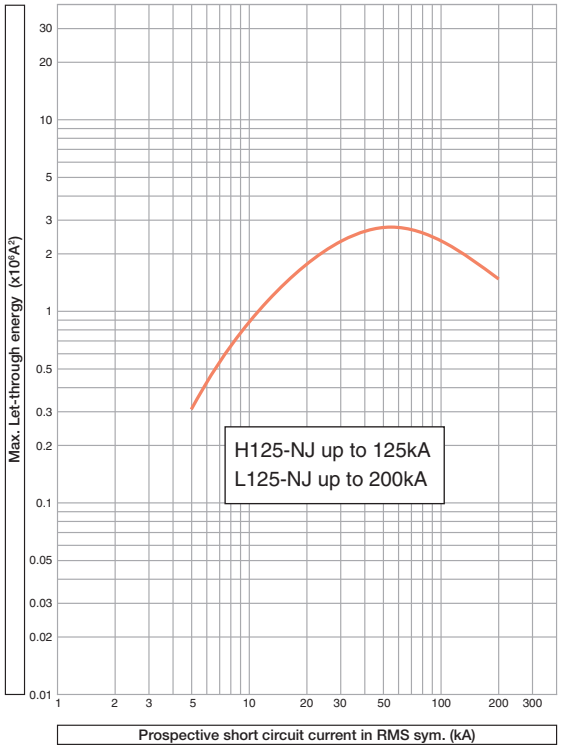
Let-Through Energy Characteristics

P160F, P160N, P160H Electronic type 415V AC

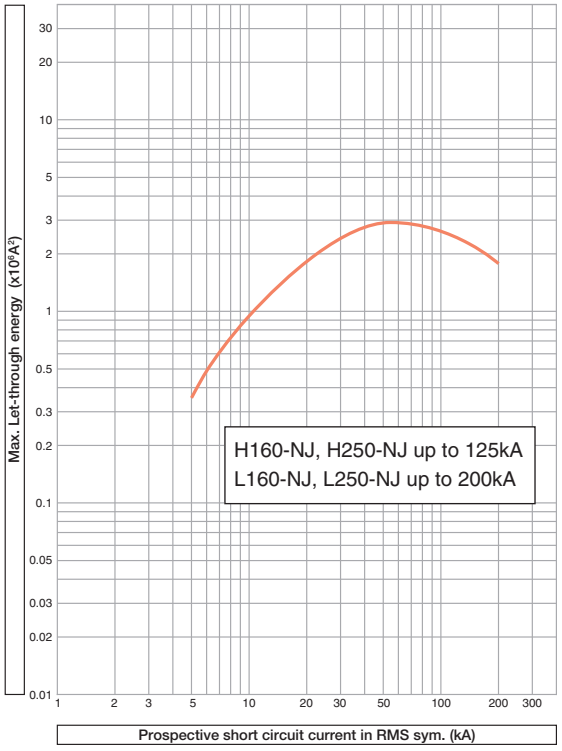


Let-Through Energy Characteristics

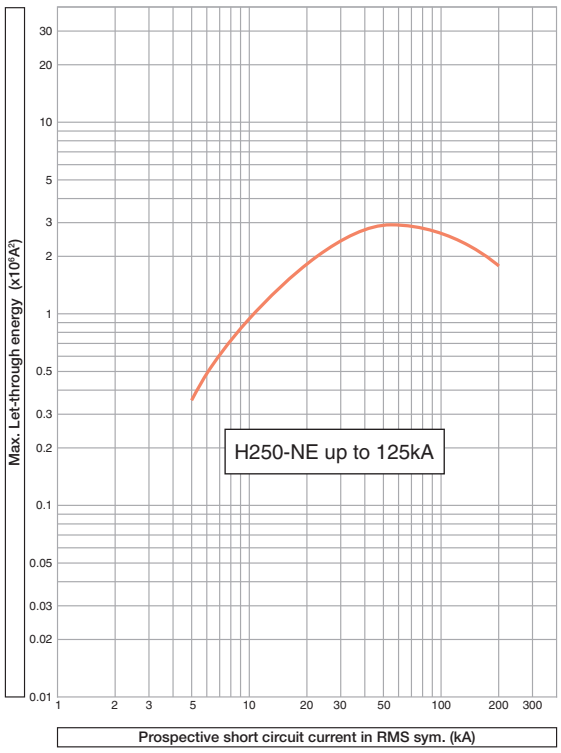
H125-NJ, L125-NJ Thermal type 415V AC



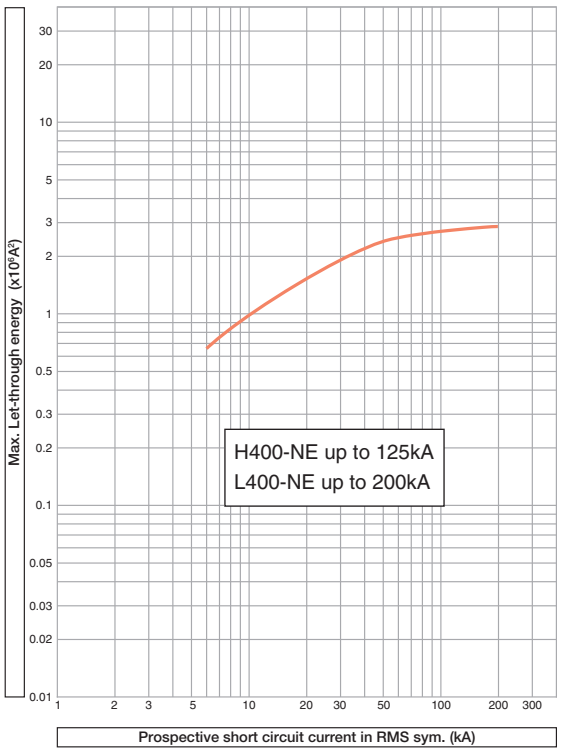
H160-NJ, L160-NJ, H250-NJ, L250-NJ Thermal type 415V AC



H250-NE Electronic type 415V AC

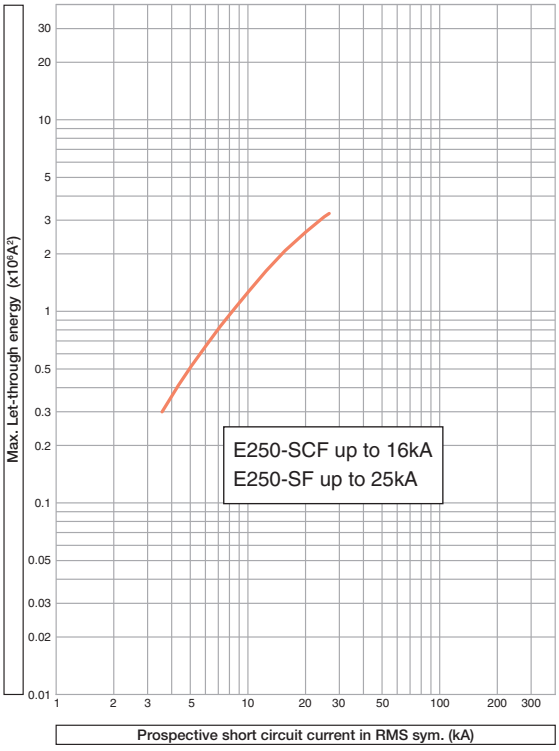


H400-NE, L400-NE Electronic type 415V AC

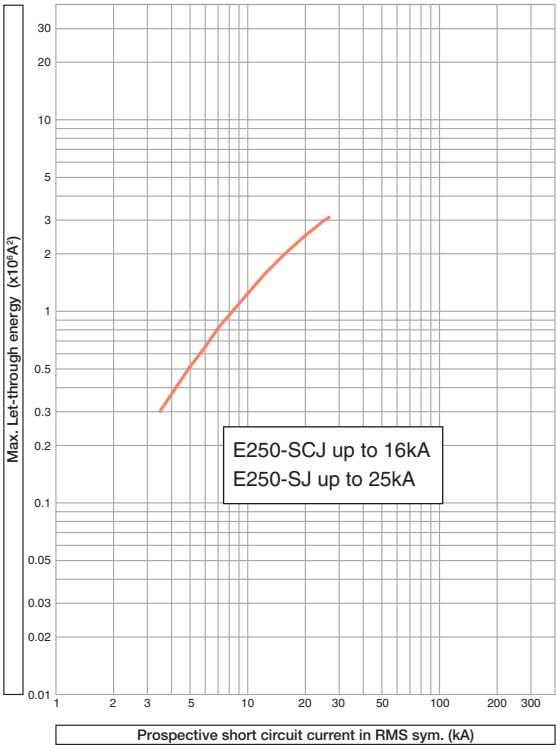


Let-Through Energy Characteristics

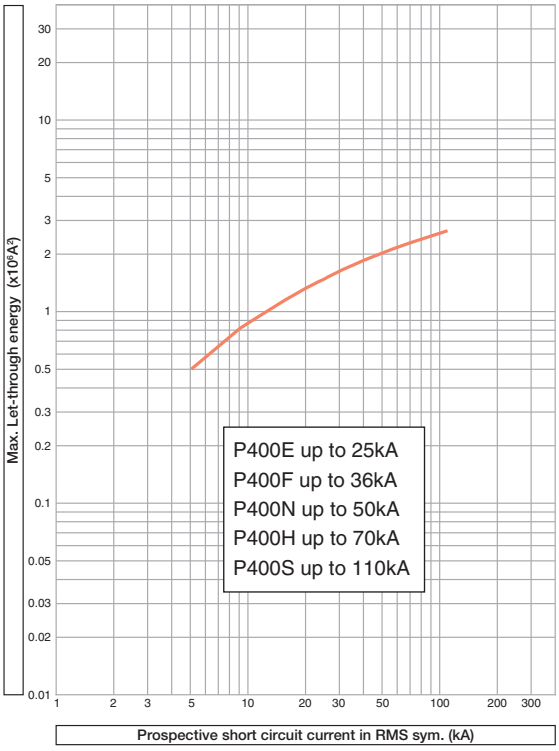
E250-SCF, E250-SF Thermal type 415V AC



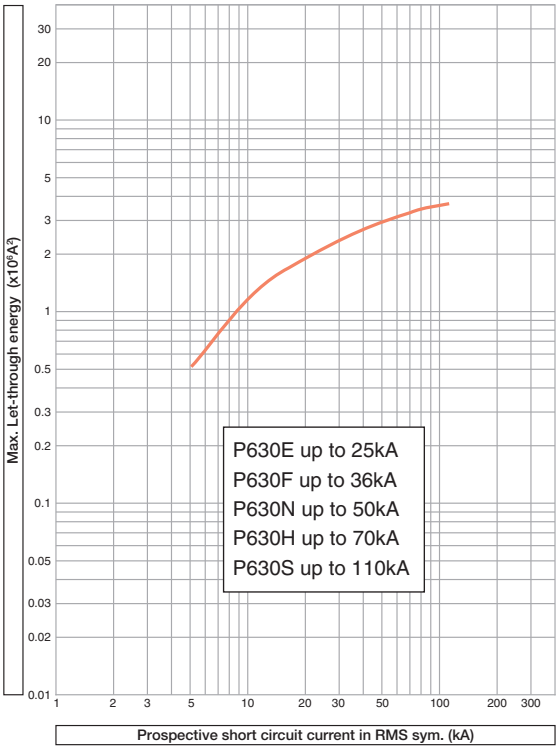
E250-SCJ, E250-SJ Thermal type 415V AC



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

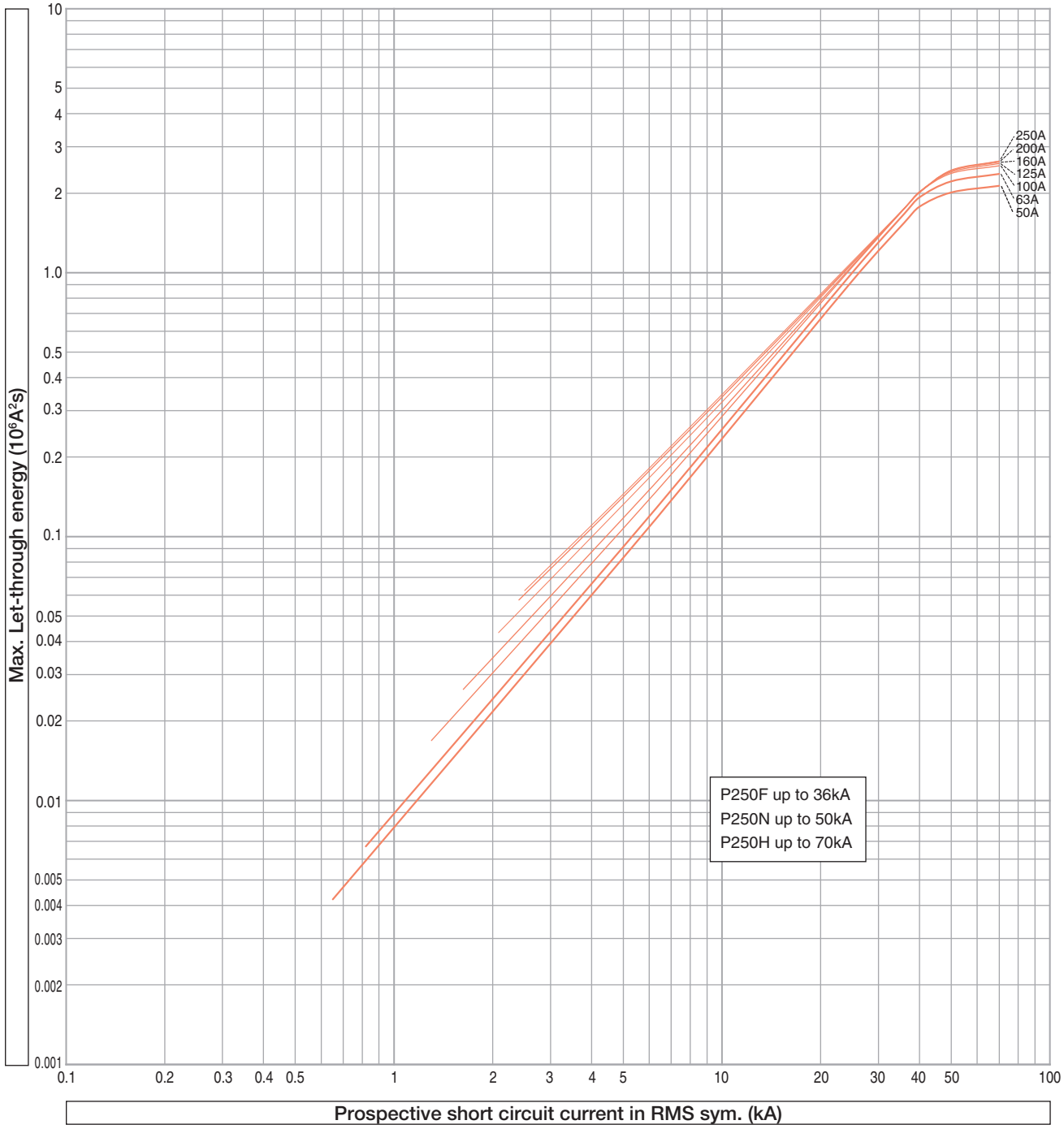


P630E, P630F, P630N, P630H, P630S Thermal type 415V AC
P630F, P630N, P630H, P630S Electronic type 415V AC

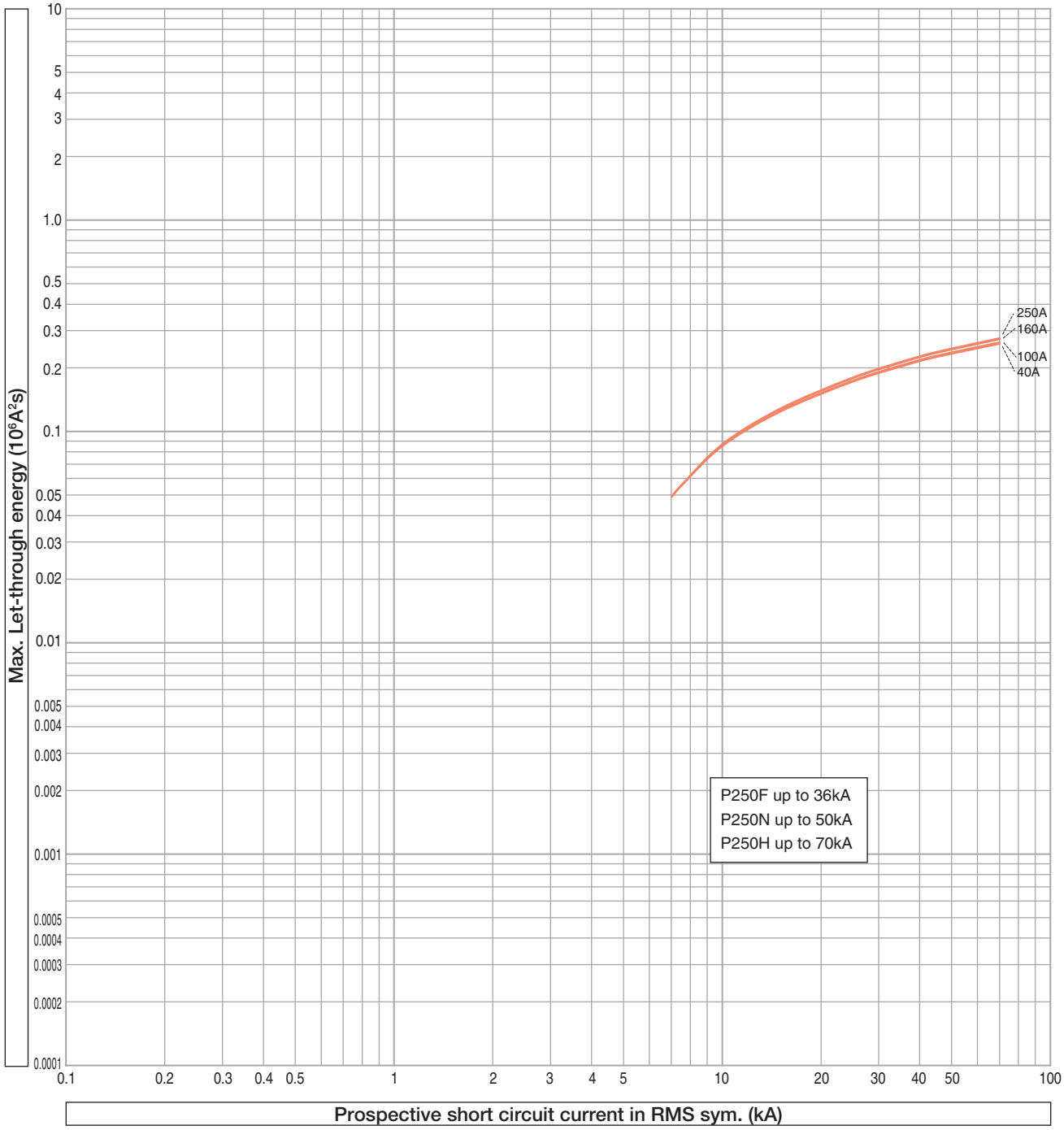


Let-Through Energy Characteristics

P250F, P250N, P250H Thermal type 415V AC

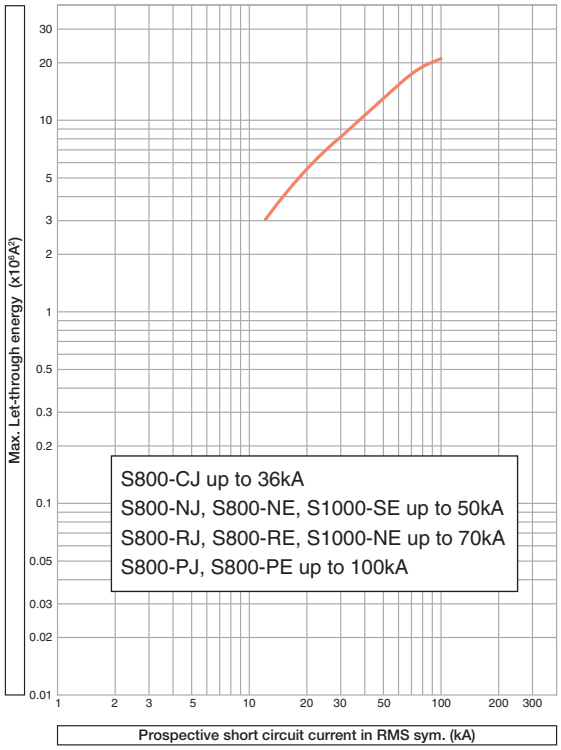


P250F, P250N, P250H Electronic type 415V AC

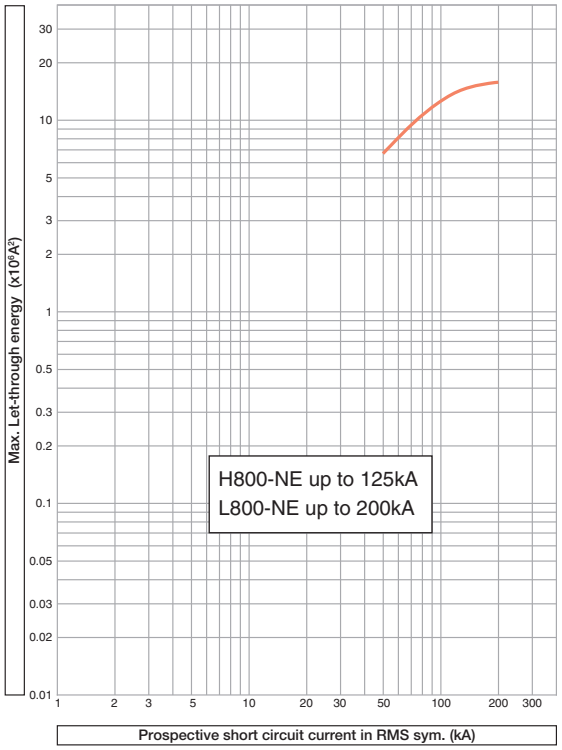


Let-Through Energy Characteristics

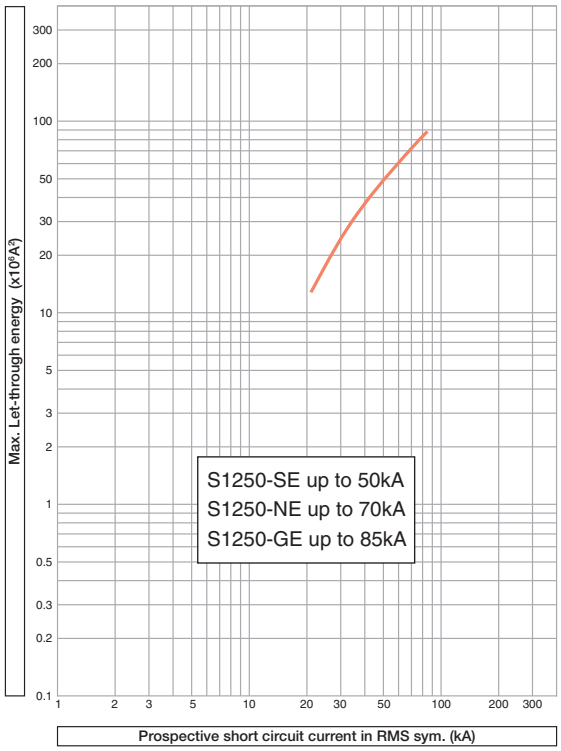
S800-CJ, S800-NJ, S800-RJ, S800-PJ Thermal type 415V AC
S800-NE, S800-RE, S800-PE Electronic type 415V AC
S1000-SE, S1000-NE Electronic type 415V AC



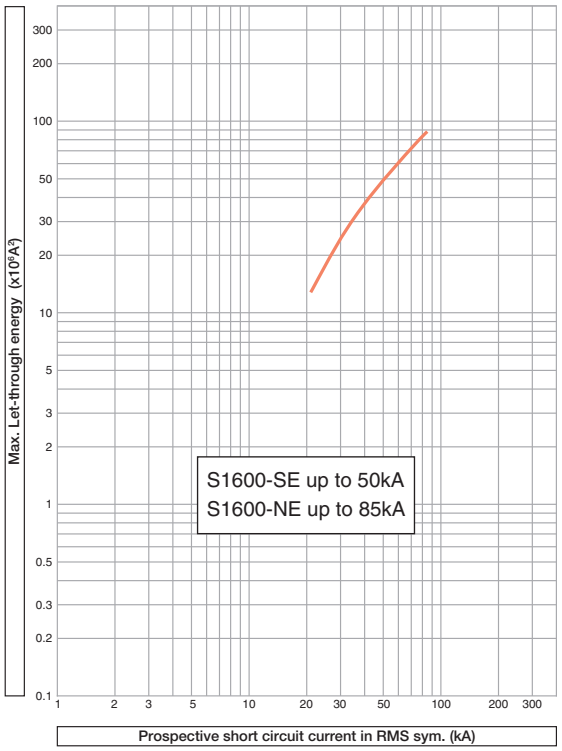
H800-NE, L800-NE Electronic type 415V AC



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



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



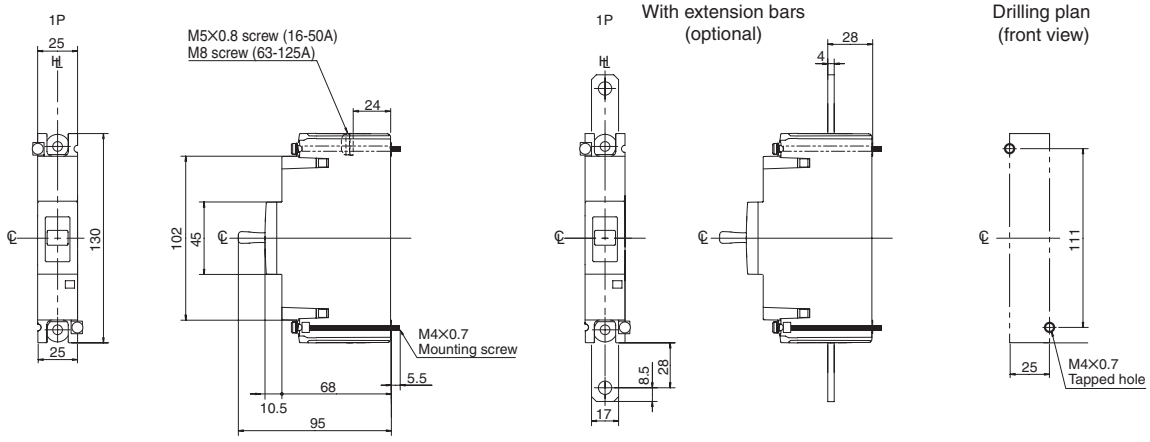
Outline Dimensions

E160-SF 1pole

Outline dimensions (mm) — E160-SF 1pole

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

Front-connected



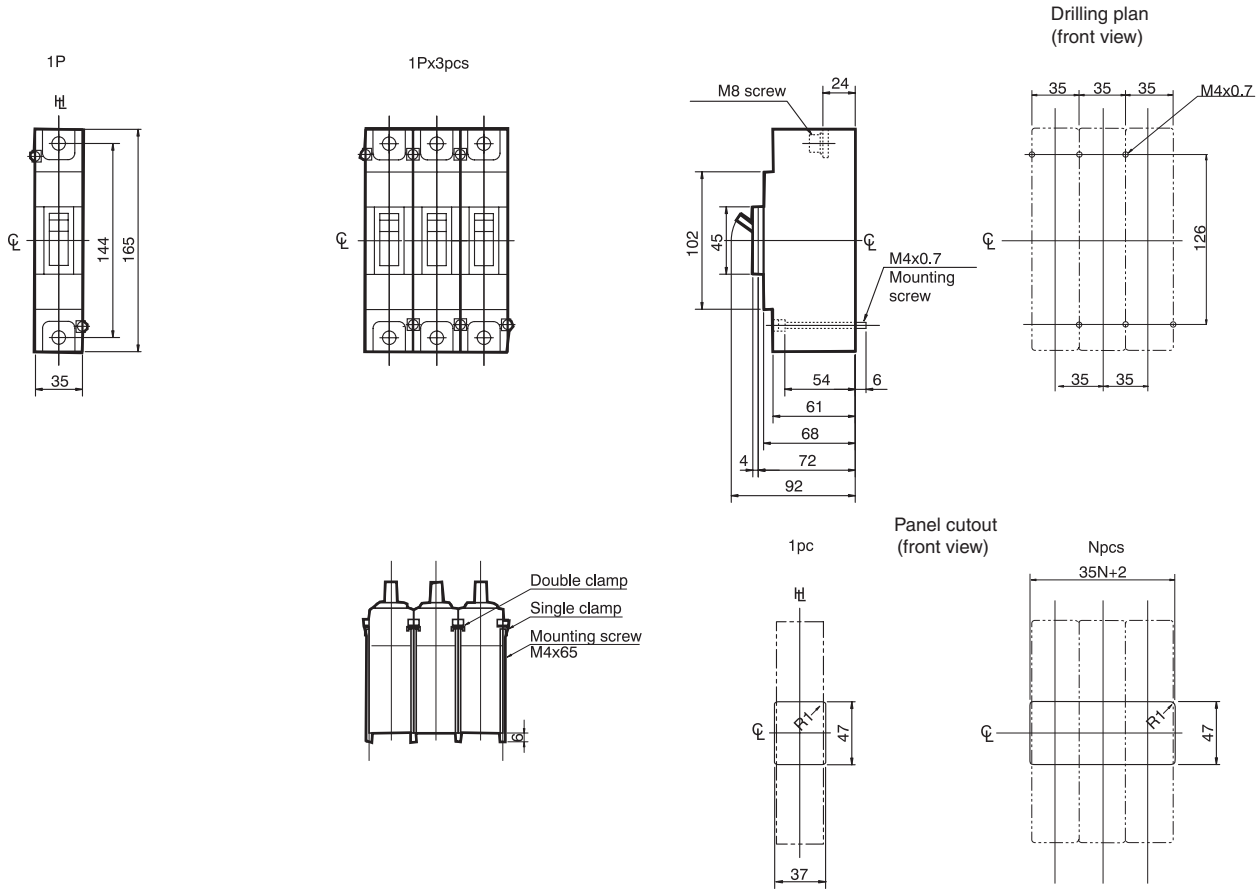
Outline Dimensions

S160-NF 1pole

Outline dimensions (mm) S160-NF 1pole

ASL : Arrangement Standard Line ℄ : Handle Centre Line ⊬ : Handle Frame Centre Line

Front-connected



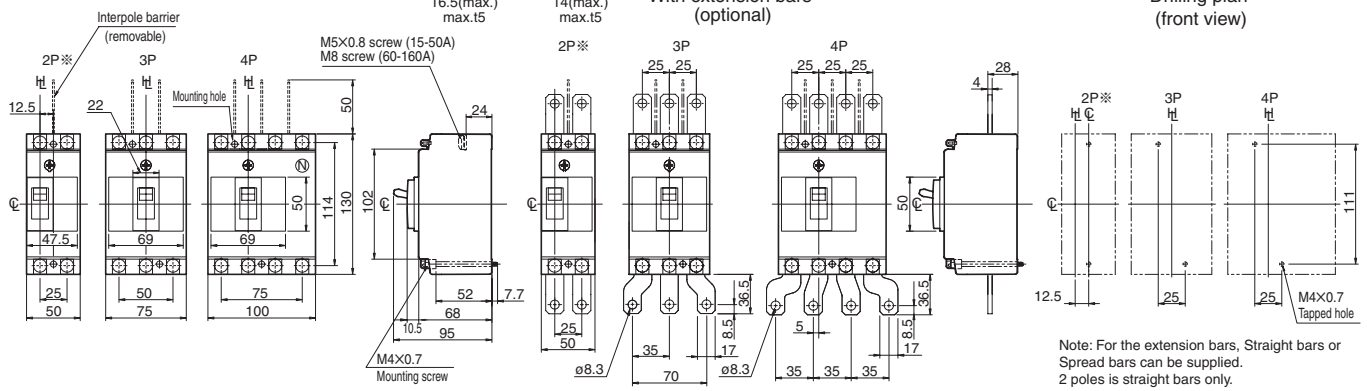
Outline Dimensions

E160-SF, S160-SCF, S160-SF

Outline dimensions (mm) — E160-SF, S160-SCF, S160-SF

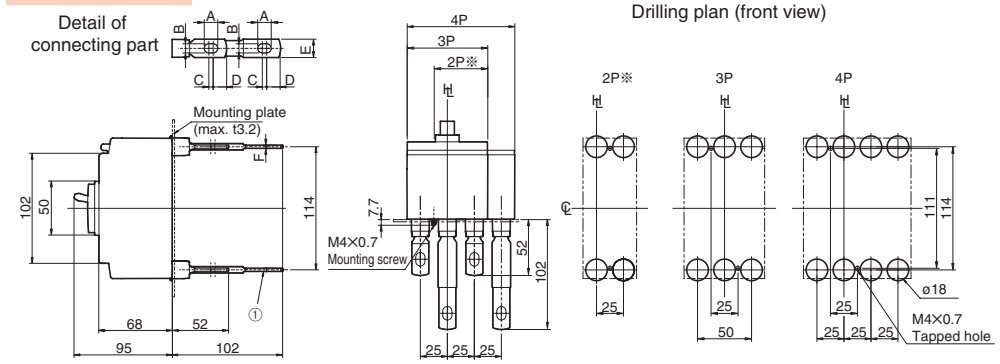
ASL : Arrangement Standard Line ℄ : Handle Centre Line ℍ : Handle Frame Centre Line

Front-connected



Note: For the extension bars, Straight bars or Spread bars can be supplied.
2 poles is straight bars only.

Rear-connected

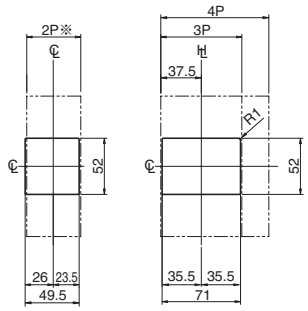


①: Studs are horizontal direction as standard. They will be factory installed in the horizontal direction unless otherwise specified. Vertical position is a special specification. Please specify this when ordering.

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 (front view)



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

※: 2 poles is not available for S160-SF.

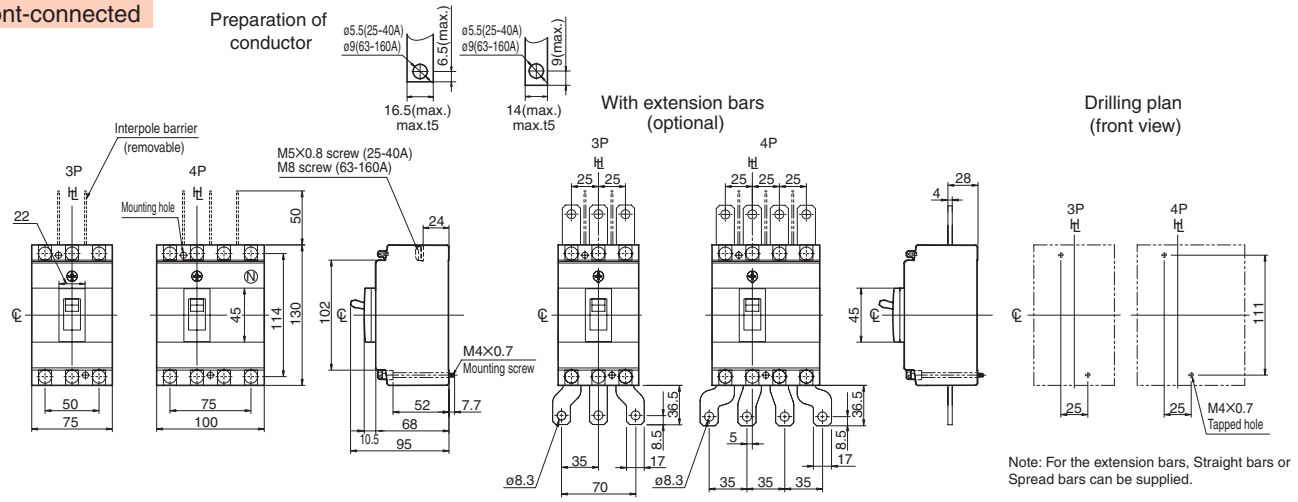
Outline Dimensions

E160-SJ, S160-SCJ, S160-SJ, S160-SN

Outline dimensions (mm) — E160-SJ, S160-SCJ, S160-SJ, S160-SN

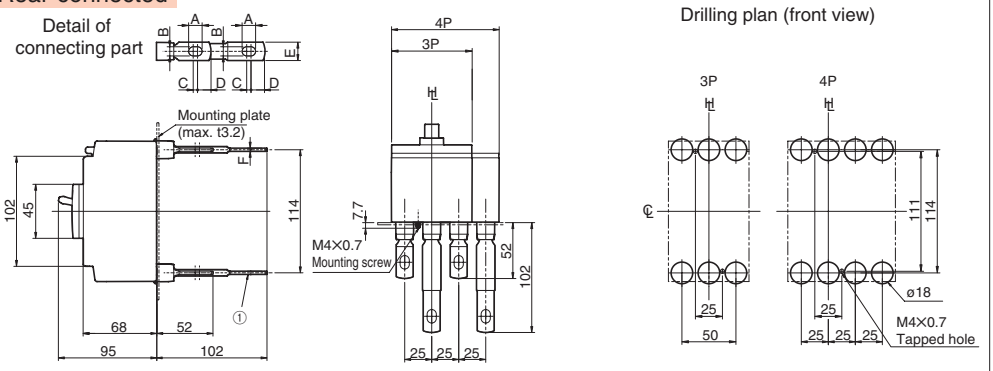
ASL : Arrangement Standard Line ℄ : Handle Centre Line 卄 : Handle Frame Centre Line

Front-connected



Note: For the extension bars, Straight bars or Spread bars can be supplied.

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
25-40	10.5	6.5	4	13	16	4
63-160	12.5	8.5	4	13	16	5

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

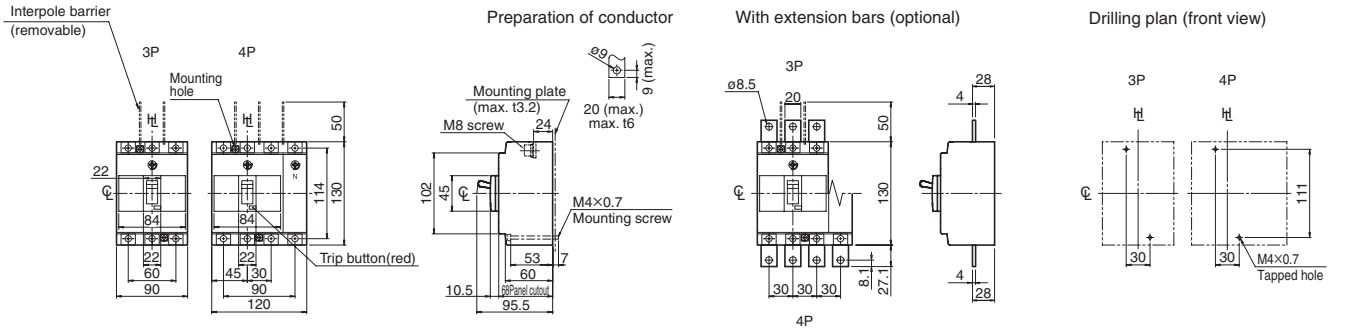
Outline Dimensions

P160F, P160N, P160H, P160D

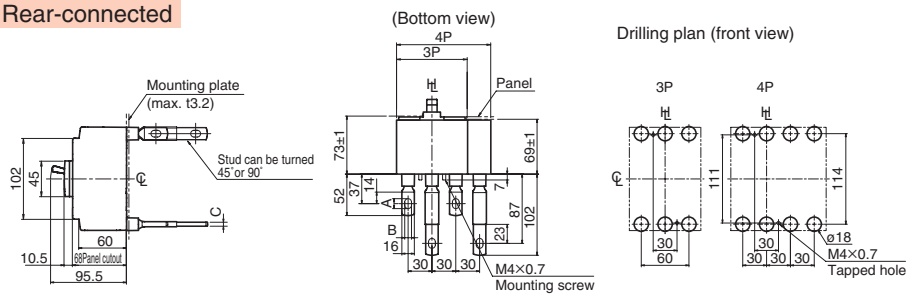
Outline dimensions (mm) — P160F, P160N, P160H, P160D

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

Front-connected



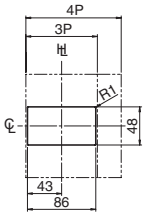
Rear-connected



Rated current [A]	A	B	C
15 — 50	12.5	ø8.5	4
60 — 125	12.5	ø8.5	5

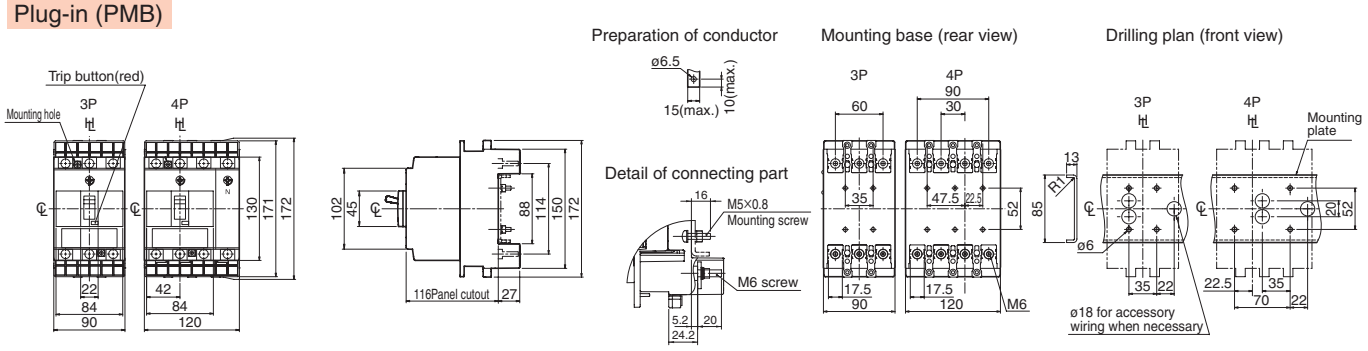
Note) For 2P, the distance between ℍ and ℄ is 14.2mm. The distance between the stud centreline and ℄ is 15mm.
Note) Studs are factory installed in horizontal direction both on the line and load sides.

Panel cutout (front view)



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

Plug-in (PMB)



Note: 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.

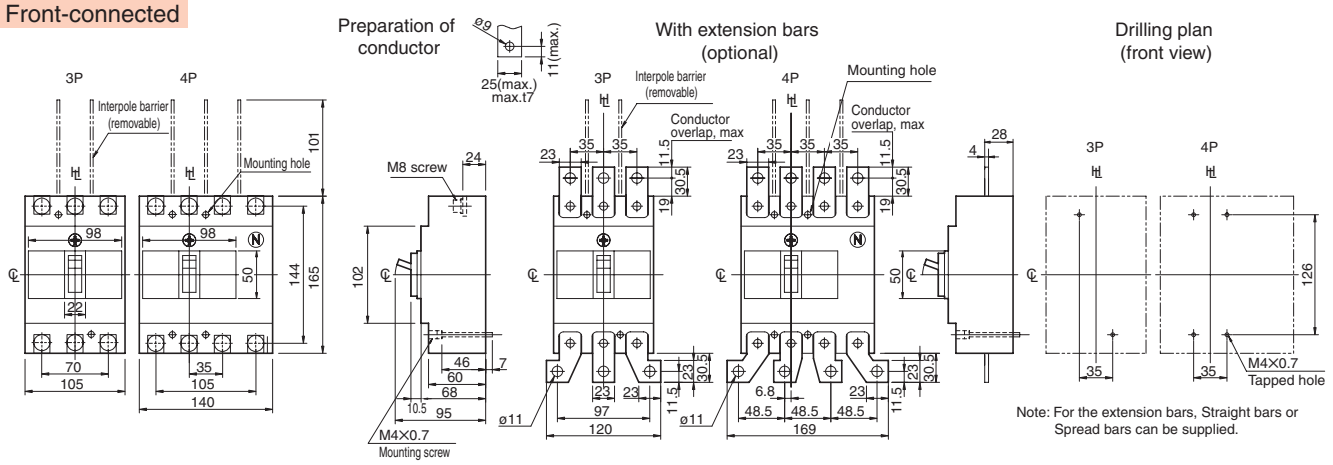
Outline Dimensions

E250-SCF, E250-SF

Outline dimensions (mm) — E250-SCF, E250-SF

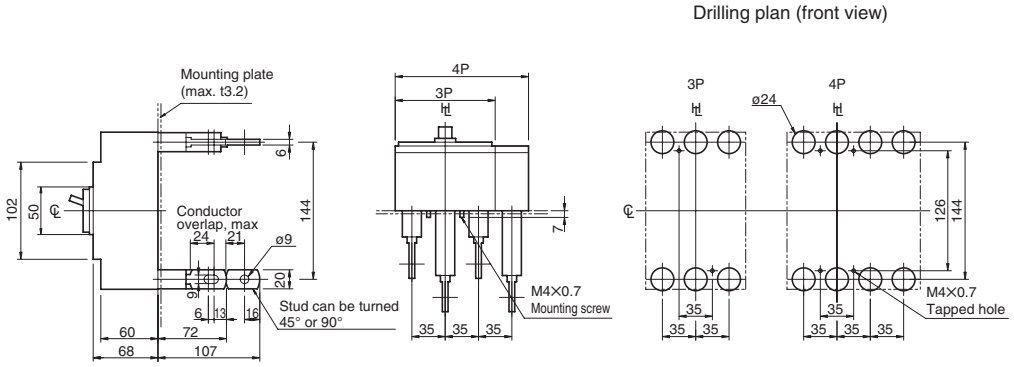
ASL : Arrangement Standard Line ℄ : Handle Centre Line ⊢ : Handle Frame Centre Line

Front-connected



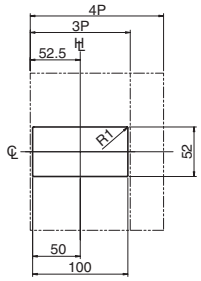
Note: For the extension bars, Straight bars or Spread bars can be supplied.

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.

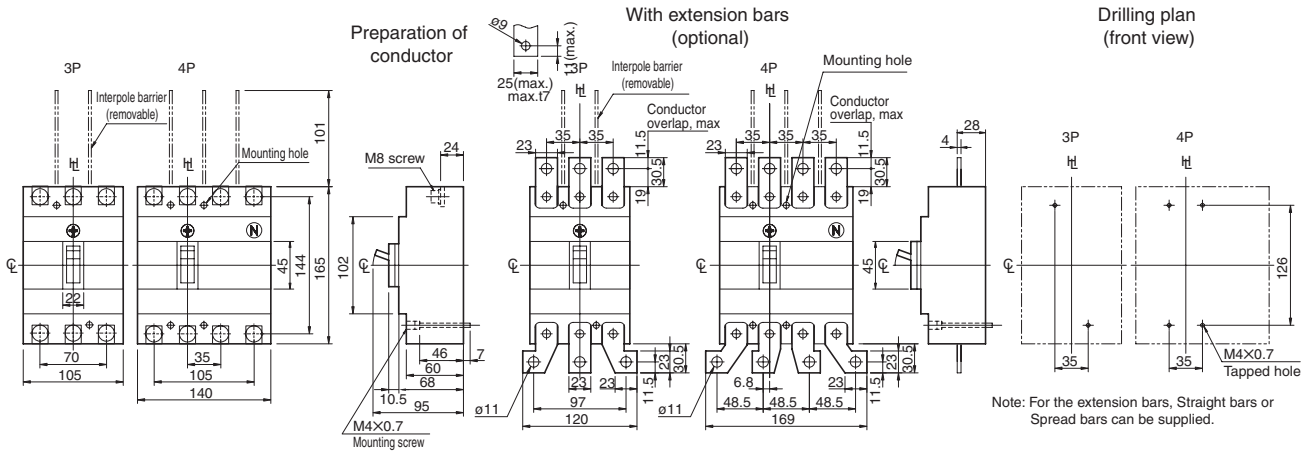
Outline Dimensions

E250-SCJ, E250-SJ, S250-SN

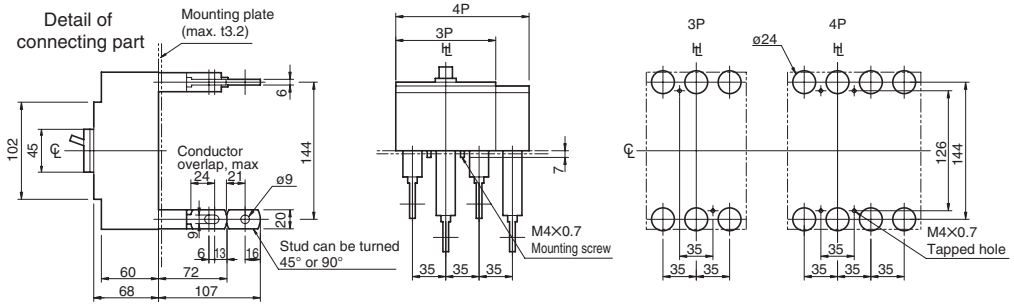
Outline dimensions (mm) — E250-SCJ, E250-SJ, S250-SN

ASL : Arrangement Standard Line ℄ : Handle Centre Line ⊢ : Handle Frame Centre Line

Front-connected

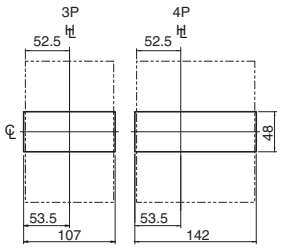


Rear-connected



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

Panel cutout (front view)



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

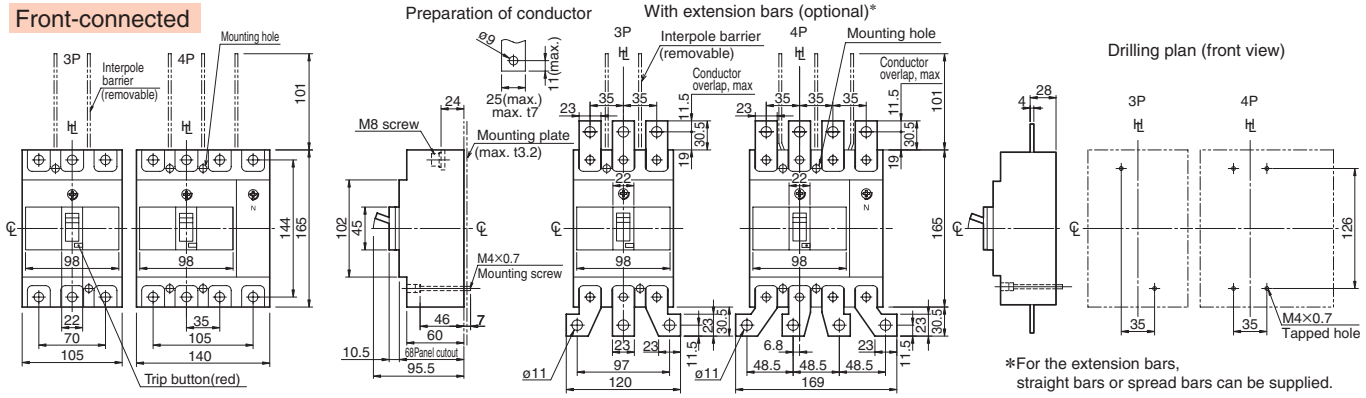
Outline Dimensions

P250F, P250N, P250H, P250D

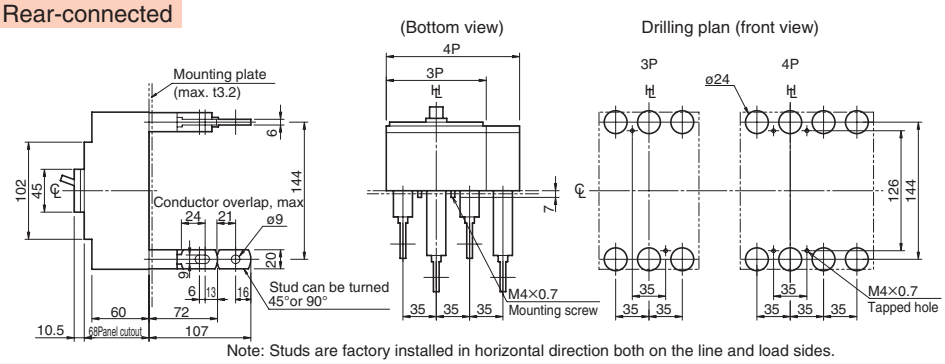
Outline dimensions (mm) — P250F, P250N, P250H, P250D

ASL : Arrangement Standard Line ℄ : Handle Centre Line ⊬ : Handle Frame Centre Line

Front-connected

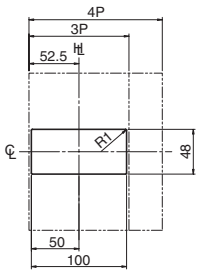


Rear-connected



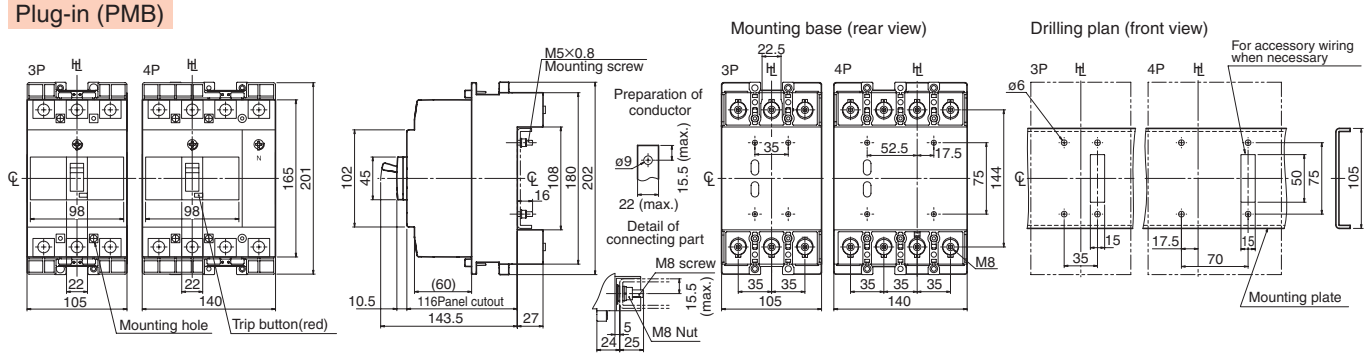
Note: Studs are factory installed in horizontal direction both on the line and load sides.

Panel cutout (front view)



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

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.

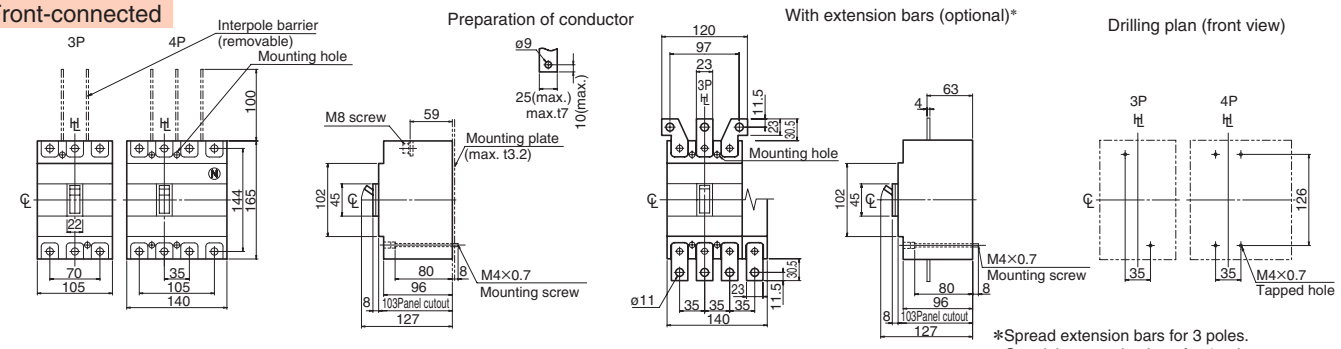
Outline Dimensions

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

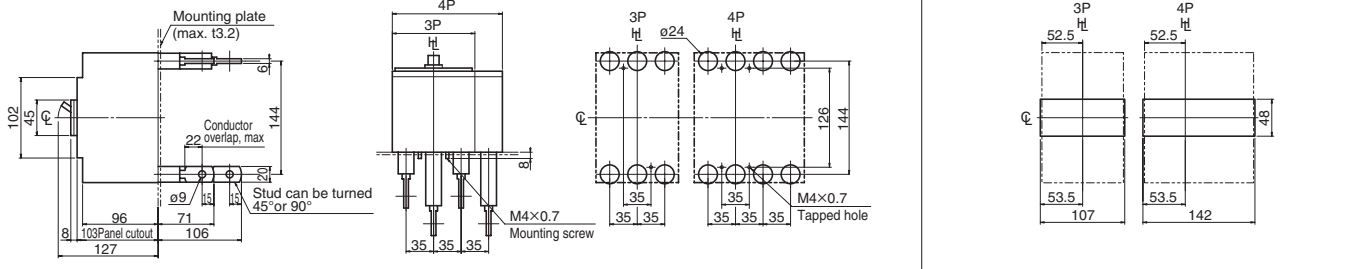
Outline dimensions (mm) — H125-NJ, H160-NJ, H250-NJ, H250-NE, L125-NJ, L160-NJ, L250-NJ

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

Front-connected



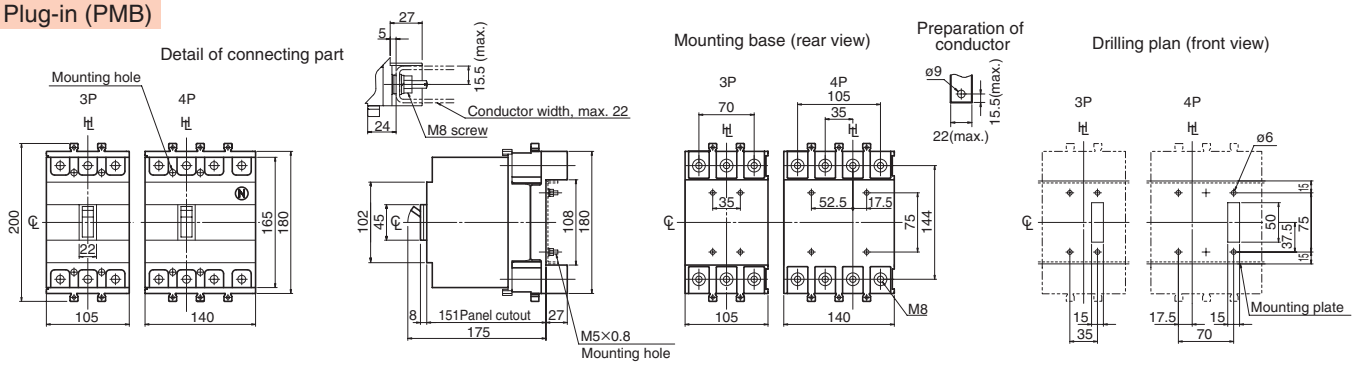
Rear-connected



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.

Plug-in (PMB)



Note:
1) Above outline dimensions are for the electronic type of XOU OCR and for the thermal magnetic type.
2) Plug-in type is not available for H250-NE.

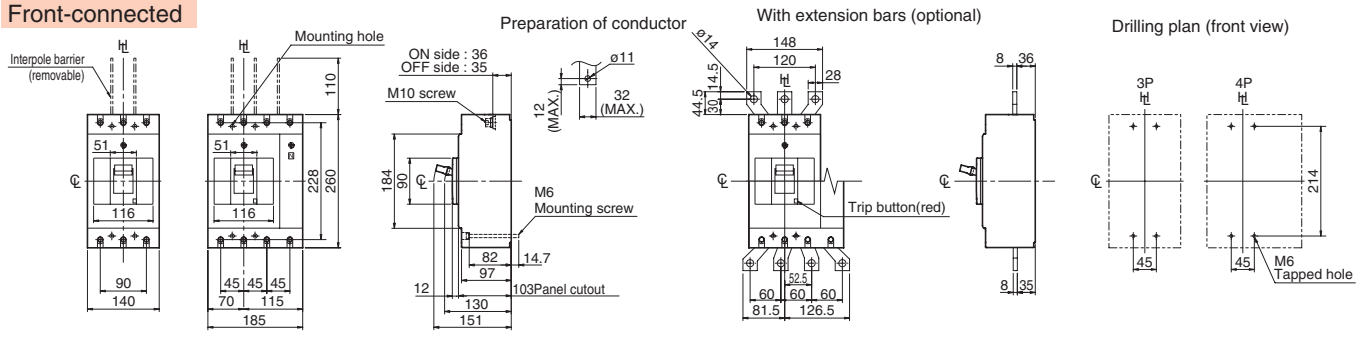
Outline Dimensions

P400E, P400F, P400N, P400H, P400S, P400D

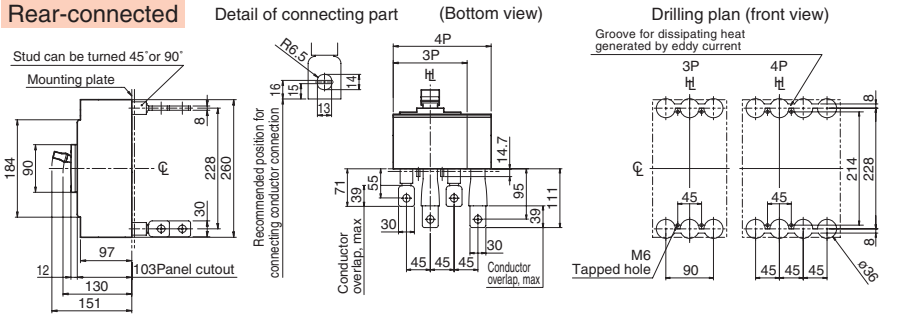
Outline dimensions (mm) — P400E, P400F, P400N, P400H, P400S, P400D

ASL : Arrangement Standard Line ℄ : Handle Centre Line ╪ : Handle Frame Centre Line

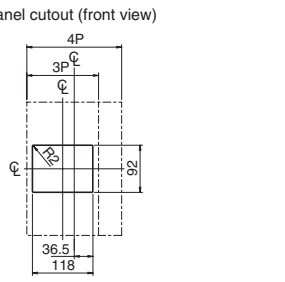
Front-connected



Rear-connected

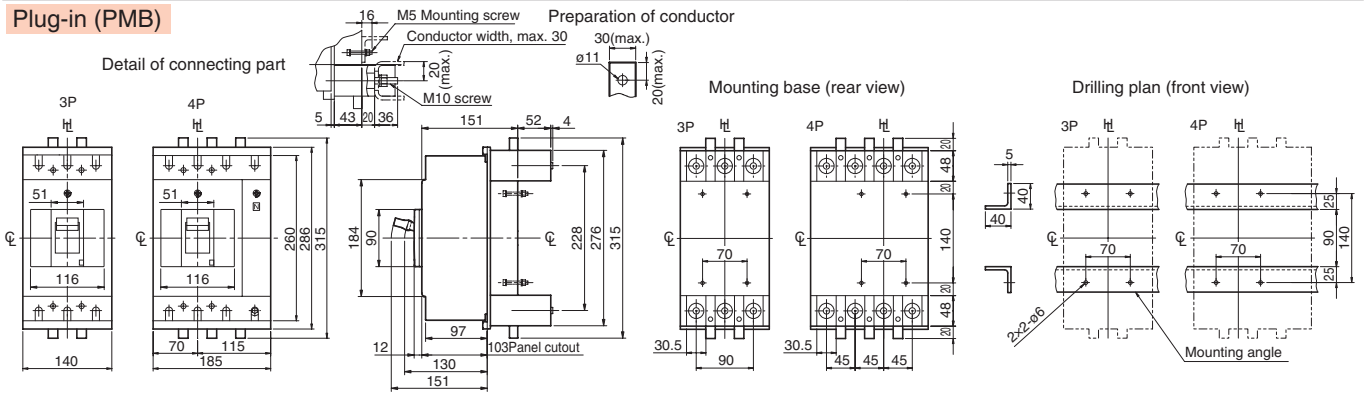


Note: Studs are factory installed in horizontal direction both on the line and load sides.



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

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 7-75.

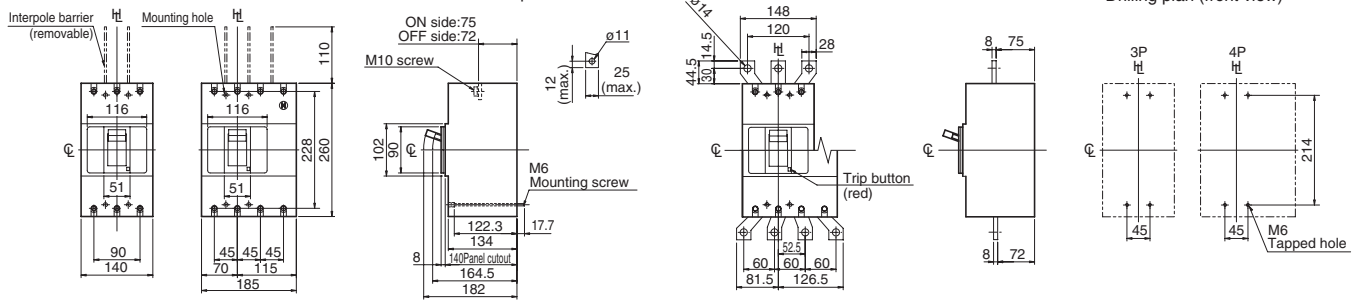
Outline Dimensions

H400-NE, L400-NE

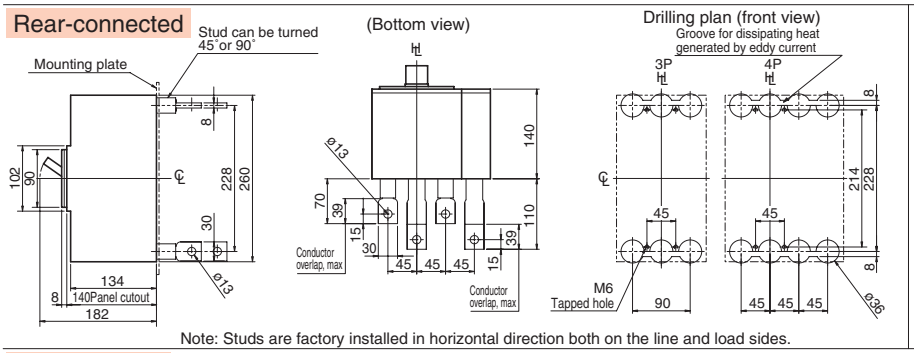
Outline dimensions (mm) — H400-NE, L400-NE

ASL : Arrangement Standard Line ℄ : Handle Centre Line ⊬ : Handle Frame Centre Line

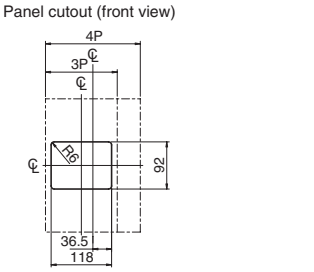
Front-connected



Rear-connected

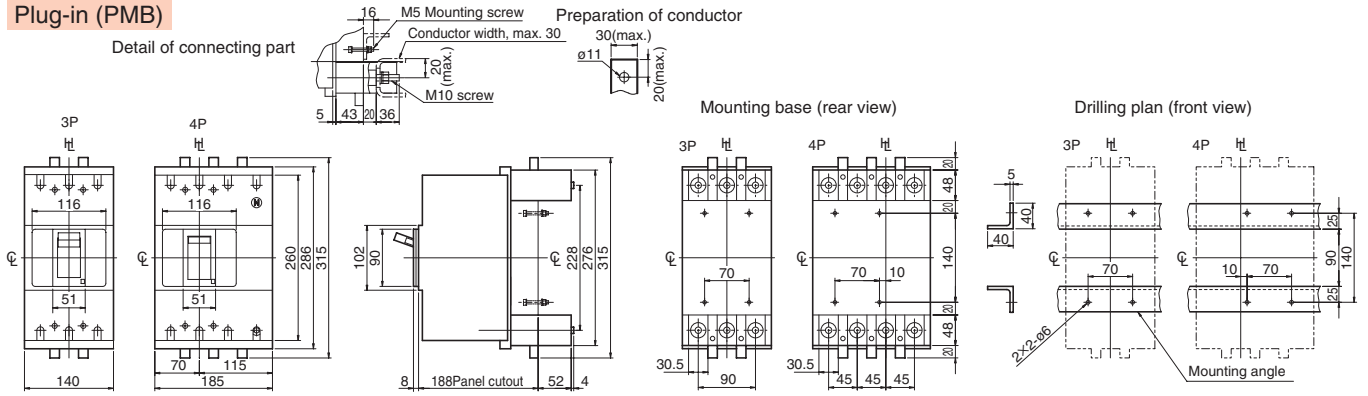


Note: Studs are factory installed in horizontal direction both on the line and load sides.



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

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.

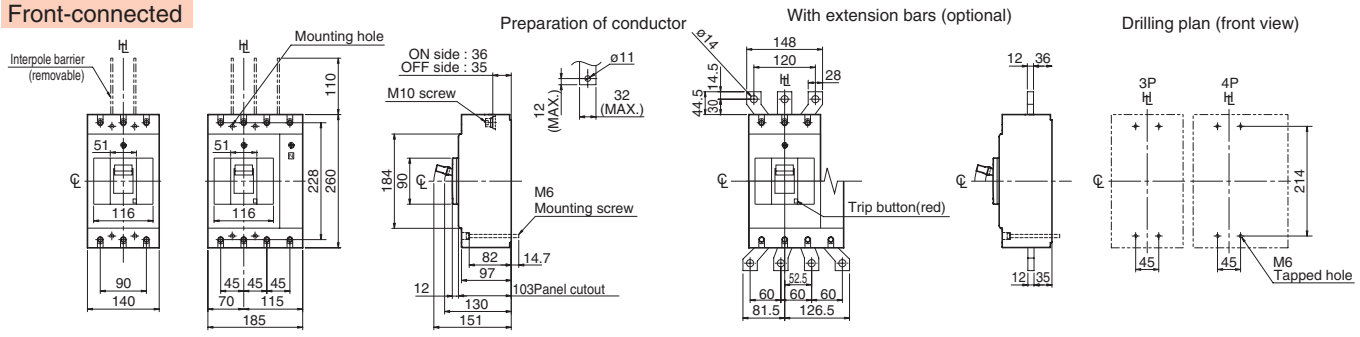
Outline Dimensions

P630E, P630F, P630N, P630H, P630S, P630D

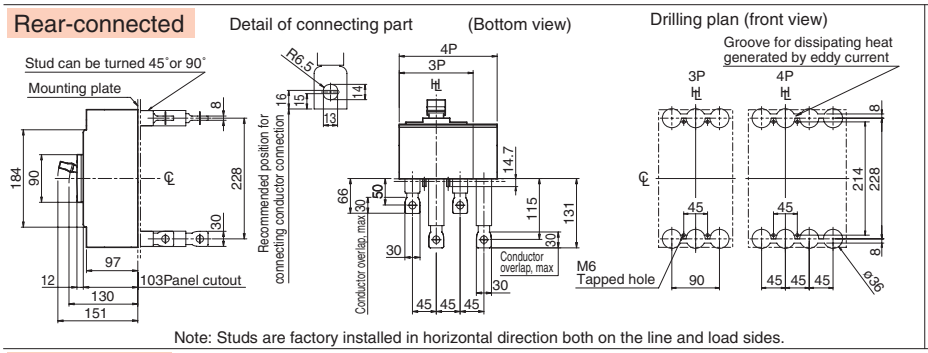
Outline dimensions (mm) — P630E, P630F, P630N, P630H, P630S, P630D

ASL : Arrangement Standard Line ℄ : Handle Centre Line ⊢ : Handle Frame Centre Line

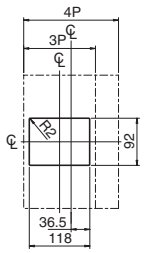
Front-connected



Rear-connected

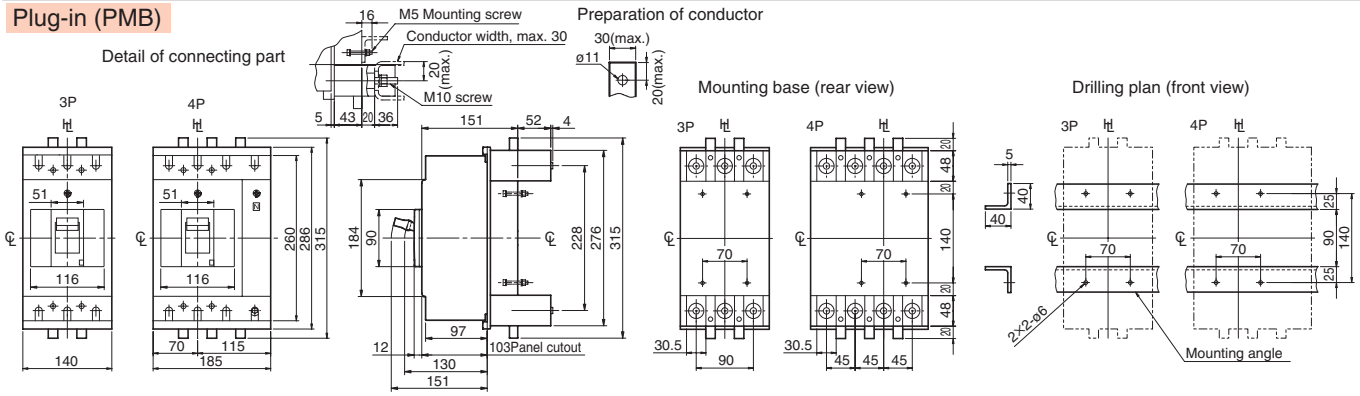


Note: Studs are factory installed in horizontal direction both on the line and load sides.



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

Plug-in (PMB)



Note:
1) 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 7-75.
2) The thermal magnetic type is not available for Plug-in connection.

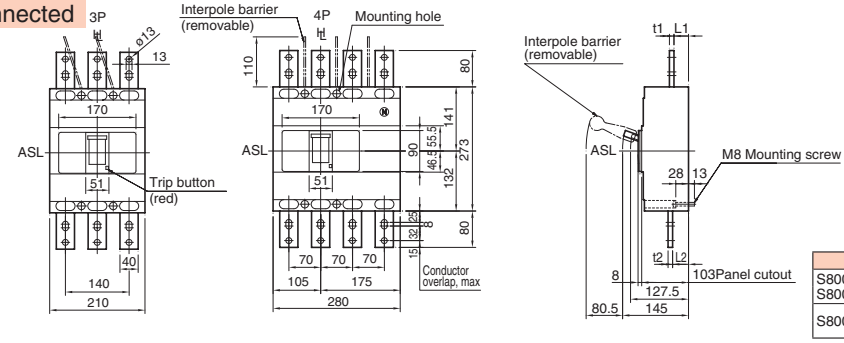
Outline Dimensions

S800-CJ, S800-NJ, S800-RJ, S800-PJ, S800-NN, S800-NE, S800-RE, S800-PE

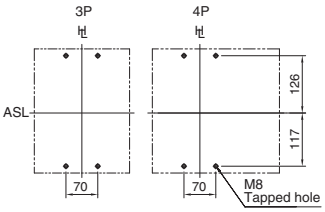
Outline dimensions (mm) S800-CJ, S800-NJ, S800-RJ, S800-PJ, S800-NN, S800-NE, S800-RE, S800-PE

ASL : Arrangement Standard Line ℄ : Handle Centre Line ⊬ : Handle Frame Centre Line

Front-connected



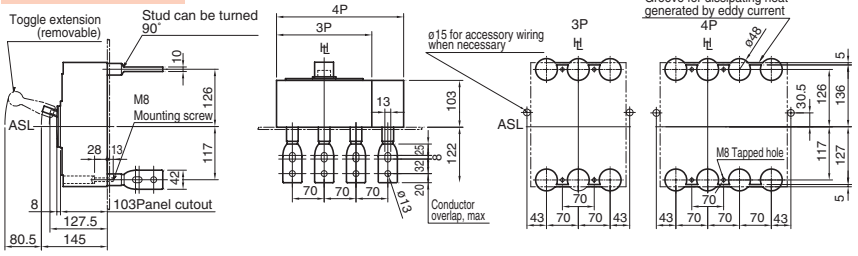
Drilling plan (front view)



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

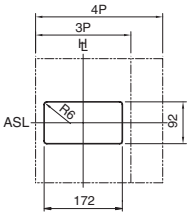
(Bottom view)



Drilling plan (front view)

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

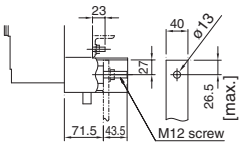
Panel cutout (front view)

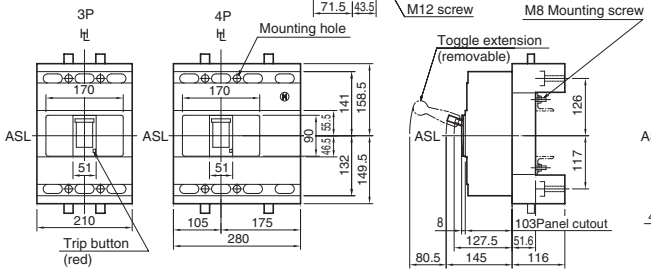


Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

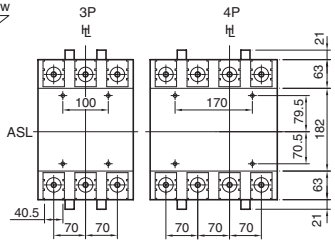
Plug-in (PMB)

Detail of connecting part / Preparation of conductor

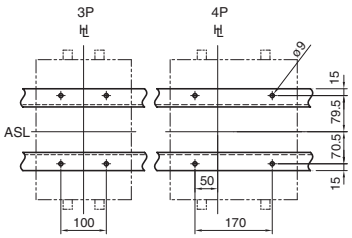




Mounting base (rear view)



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.

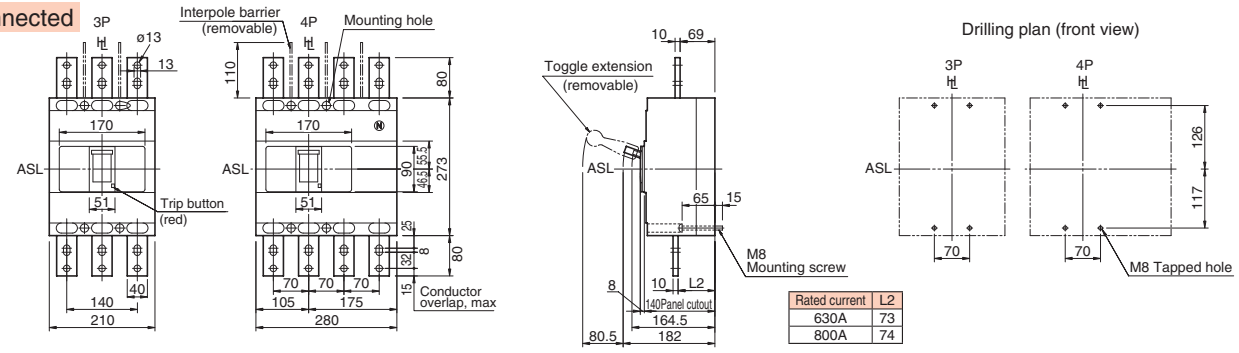
Outline Dimensions

H800-NE, L800-NE

Outline dimensions (mm) — H800-NE, L800-NE

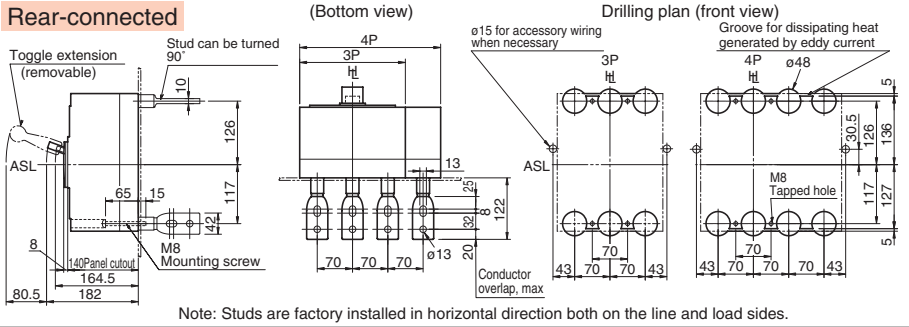
ASL : Arrangement Standard Line ℄ : Handle Centre Line 卄 : Handle Frame Centre Line

Front-connected



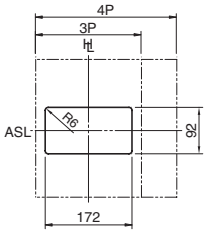
Rated current	L2
630A	73
800A	74

Rear-connected



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

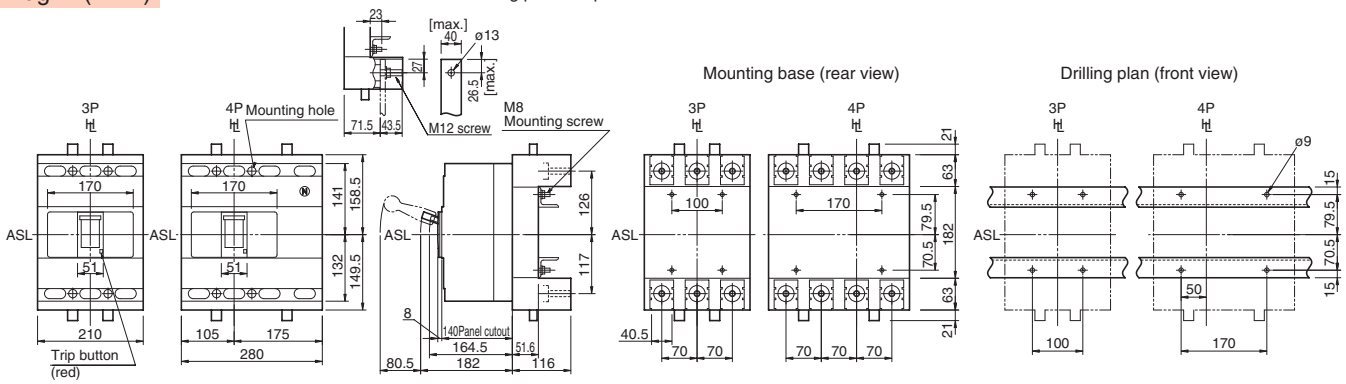
Panel cutout (front view)



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

Plug-in (PMB)

Detail of connecting part / Preparation of conductor



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 7-77.

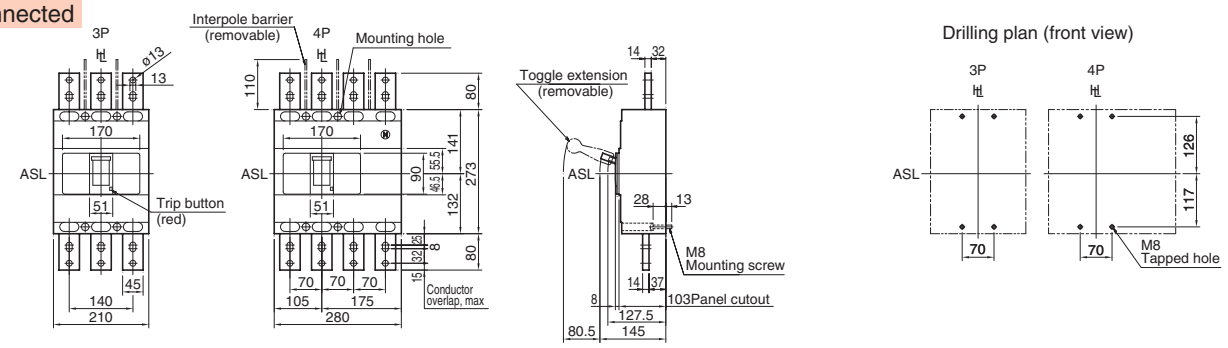
Outline Dimensions

S1000-SE, S1000-NE, S1000-NN

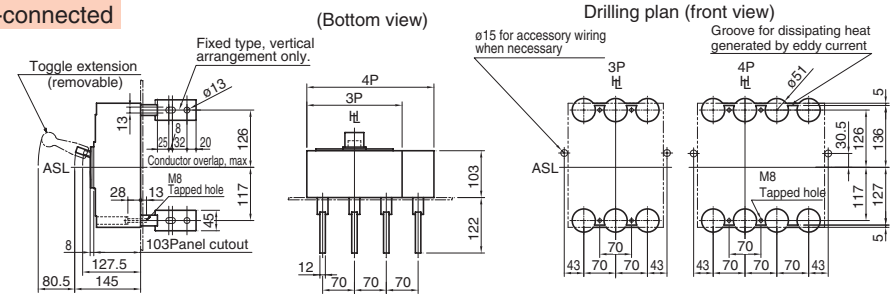
Outline dimensions (mm) — S1000-SE, S1000-NE, S1000-NN

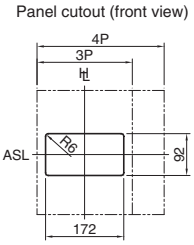
ASL : Arrangement Standard Line ℄ : Handle Centre Line ℍ : Handle Frame Centre Line

Front-connected



Rear-connected





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.

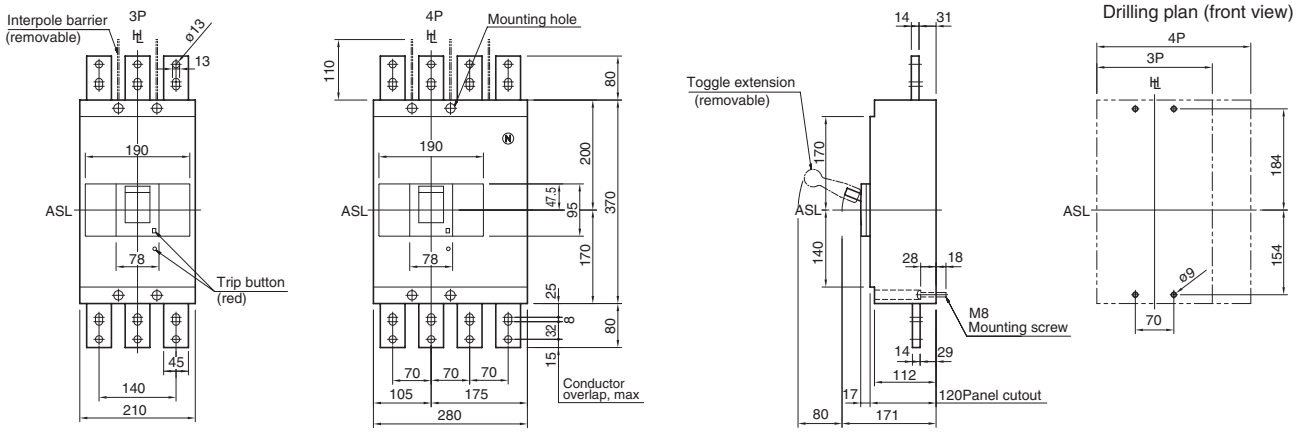
Outline Dimensions

S1250-SE, S1250-NE, S1250-GE, S1250-NN

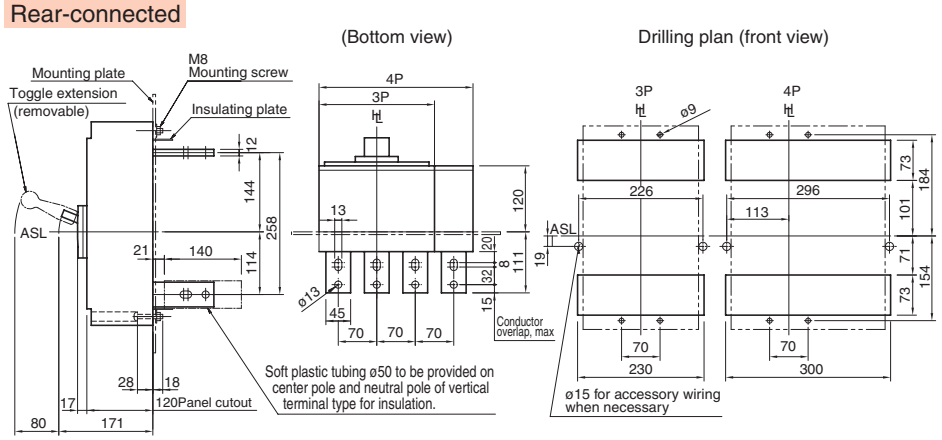
Outline dimensions (mm) — S1250-SE, S1250-NE, S1250-GE, S1250-NN

ASL : Arrangement Standard Line ℄ : Handle Centre Line 卄 : Handle Frame Centre Line

Front-connected

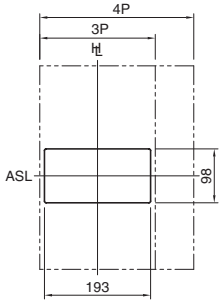


Rear-connected



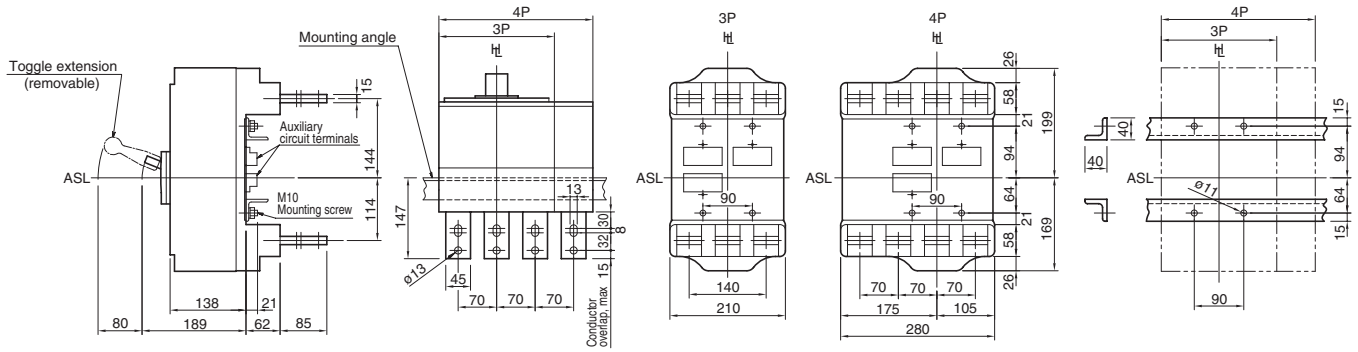
Note: Studs are factory installed in horizontal direction both on the line and load sides.

Panel cutout (front view)



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

Plug-in (PMC)



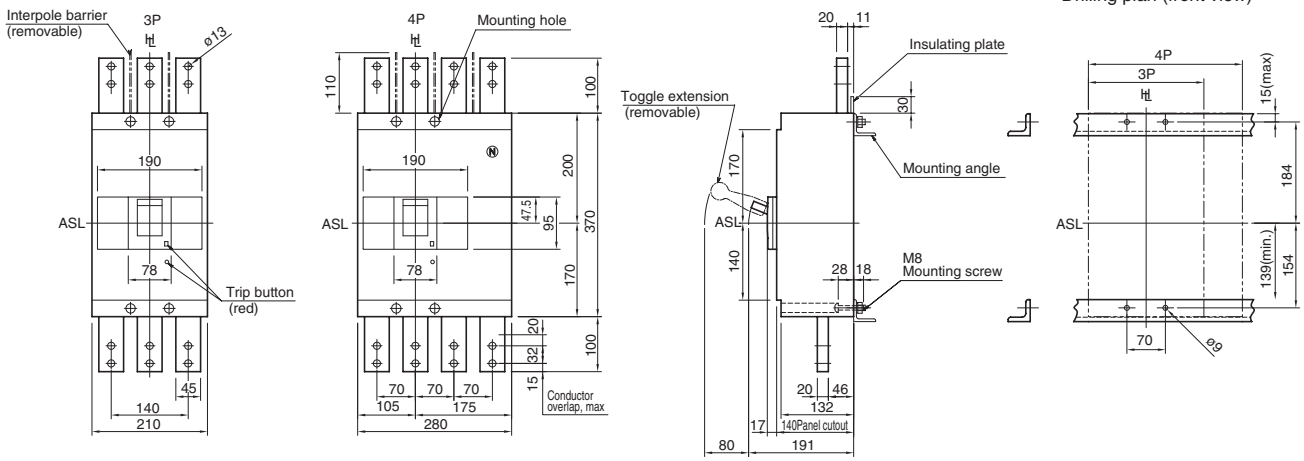
Outline Dimensions

S1600-SE, S1600-NE, S1600-NN

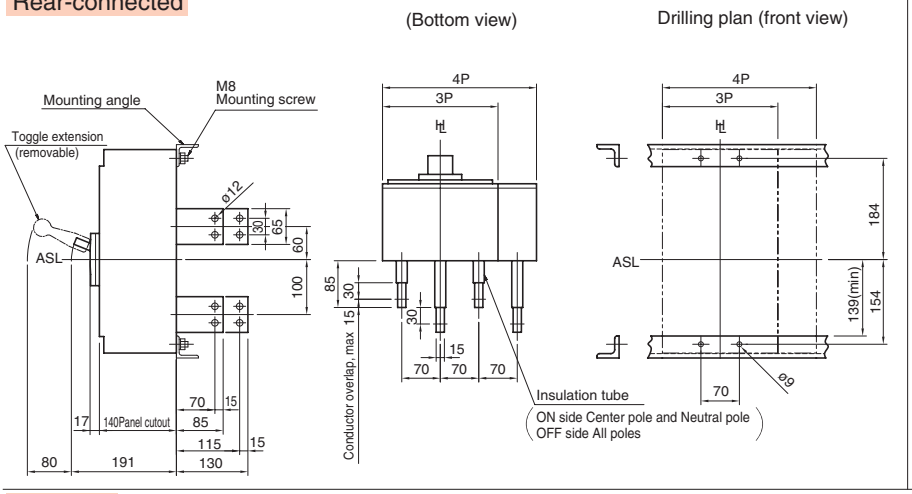
Outline dimensions (mm) S1600-SE, S1600-NE, S1600-NN

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

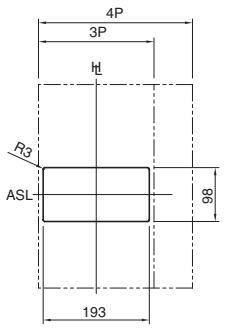
Front-connected



Rear-connected

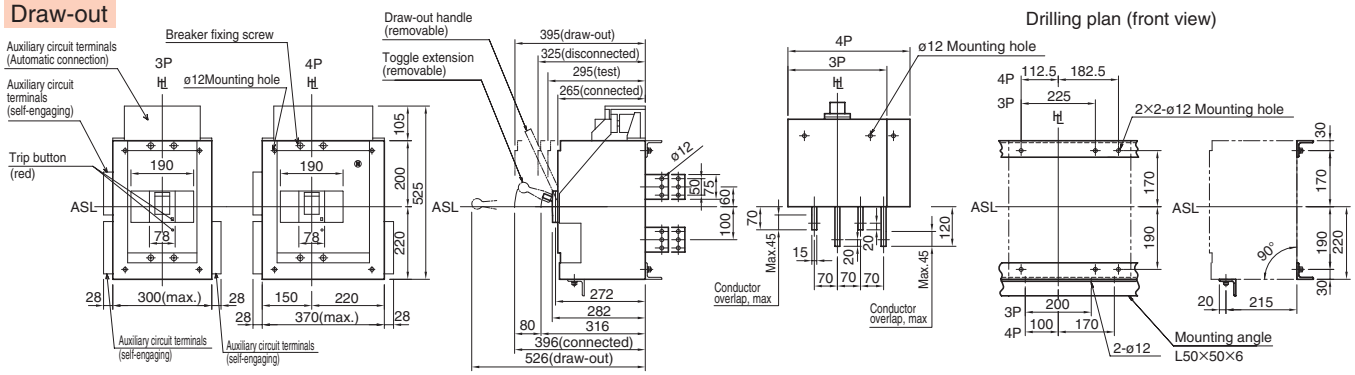


Panel cutout (front view)



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

Draw-out



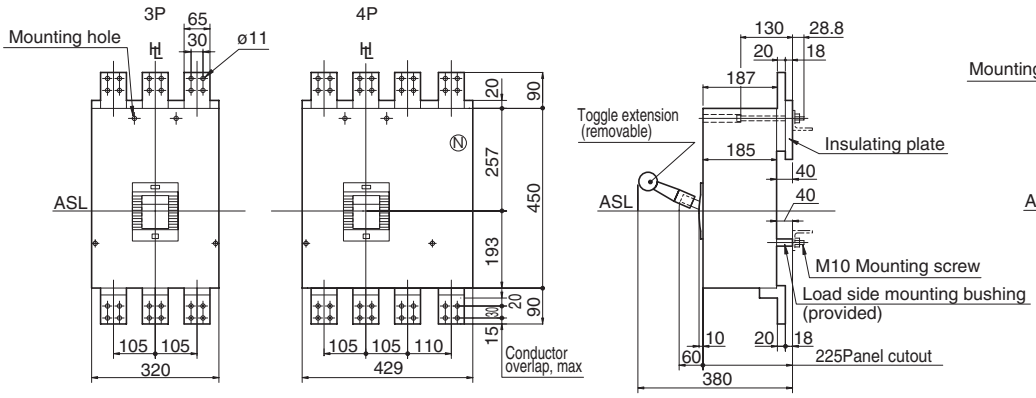
Outline Dimensions

XS2000NE, XS2000NN

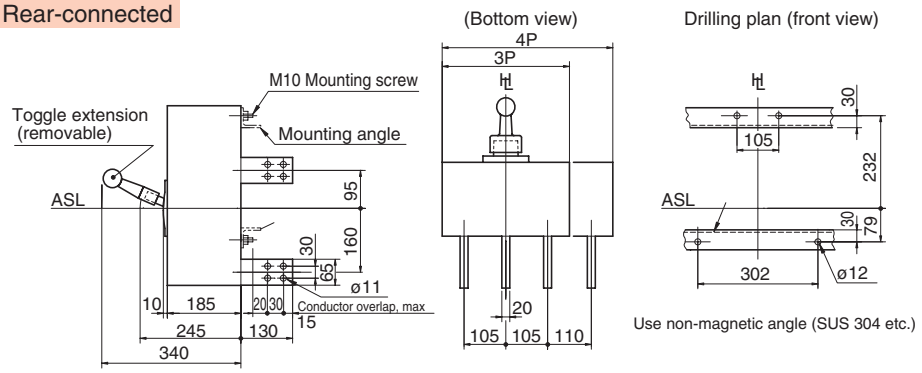
Outline dimensions (mm) — XS2000NE, XS2000NN

ASL : Arrangement Standard Line ℄ : Handle Centre Line 卄 : Handle Frame Centre Line

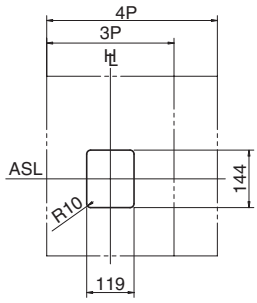
Front-connected



Rear-connected

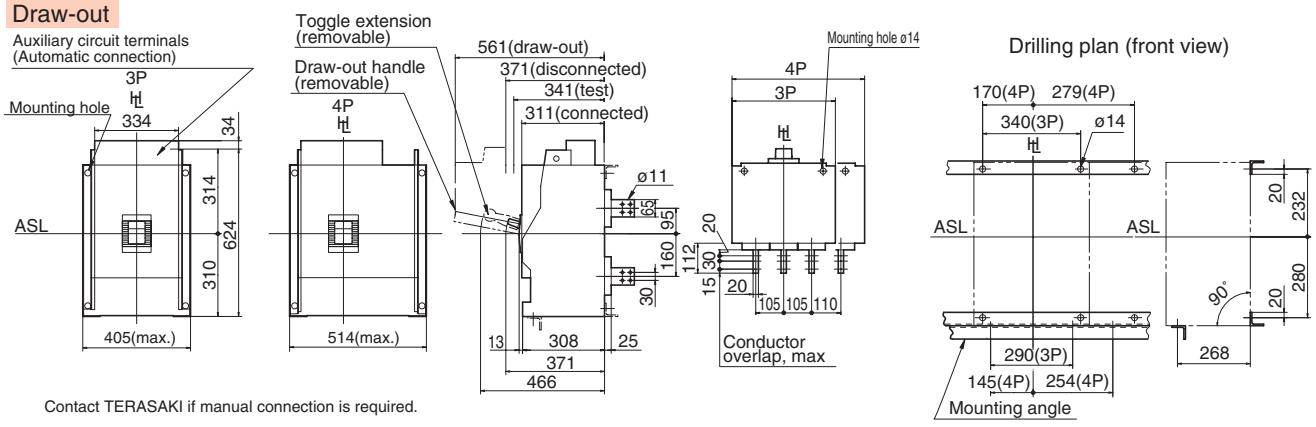


Panel cutout (front view)



Panel cutout dimensions shown give an allowance of 2mm aroundthe handle escutcheon.

Draw-out



Contact TERASAKI if manual connection is required.

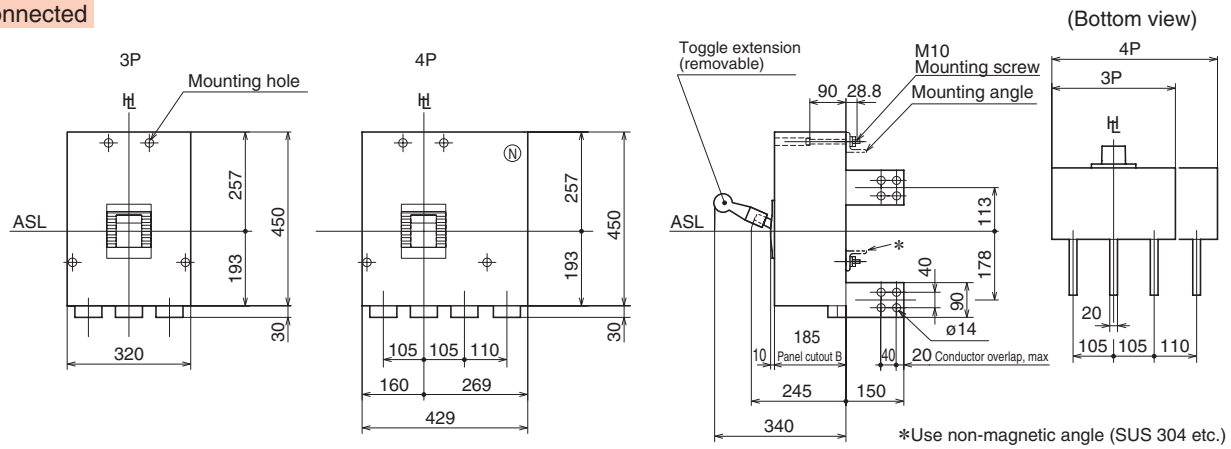
Outline Dimensions

XS2500NE, XS2500NN

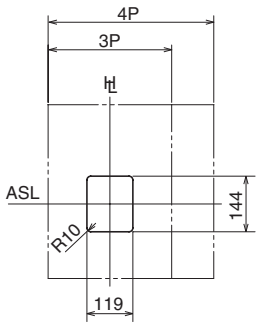
Outline dimensions (mm) — XS2500NE, XS2500NN

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

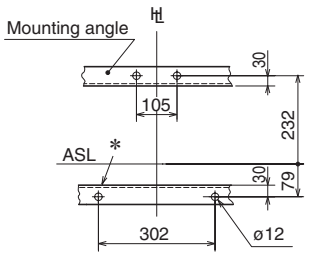
Rear-connected



Panel cutout B (front view)



Drilling plan (front view)



*Use non-magnetic angle (SUS 304 etc.)

Panel cutout dimensions shown give an allowance of 2mm around the handle escutcheon.

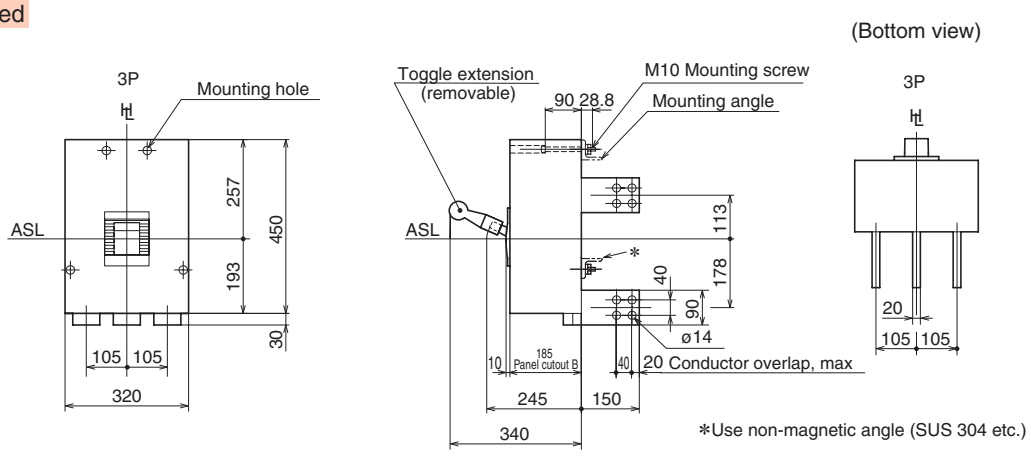
Outline Dimensions

XS3200NE, XS3200NN

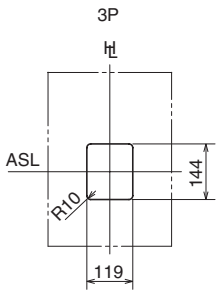
Outline dimensions (mm) — XS3200NE, XS3200NN

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

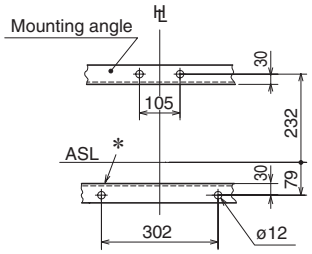
Rear-connected



Panel cutout B (front view)



Drilling plan (front view)



*Use non-magnetic angle (SUS 304 etc.)

Panel cutout dimensions shown give an allowance of 2mm around the handle escutcheon.

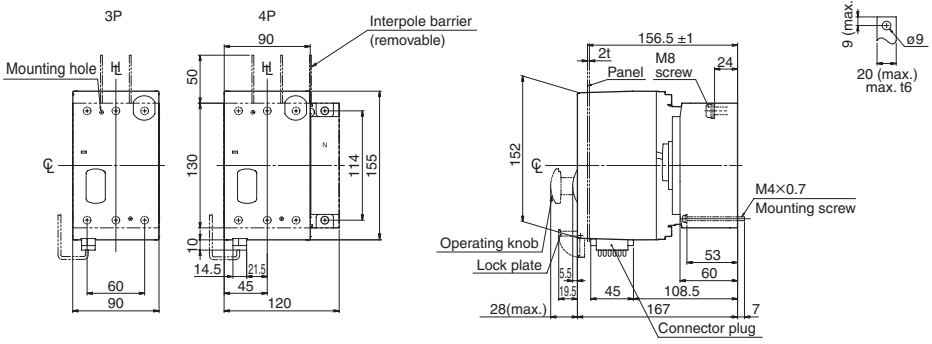
Outline Dimensions (with motor operators)

P160F, P160N, P160H, P160D

Outline dimensions (mm) (TPMC16S) — P160F, P160N, P160H, P160D

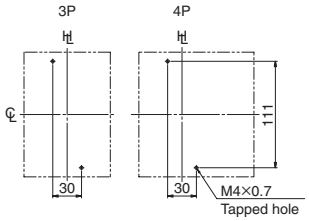
ASL : Arrangement Standard Line ℄ : Handle Centre Line ⊬ : Handle Frame Centre Line

Front-connected



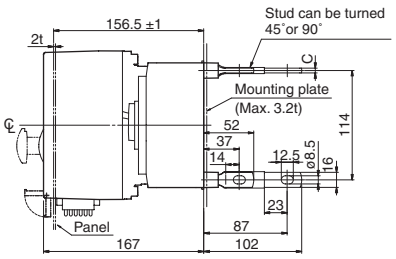
Preparation of conductor

Drilling plan (front view)

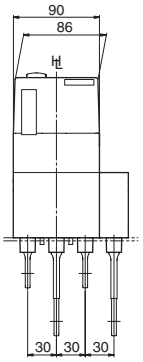


Rear-connected

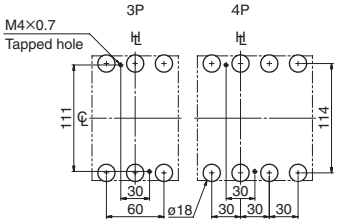
Rated current [A]	C
15 ~ 50	4
60 ~ 125	5



(Bottom view)

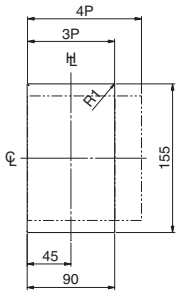


Drilling plan (front view)



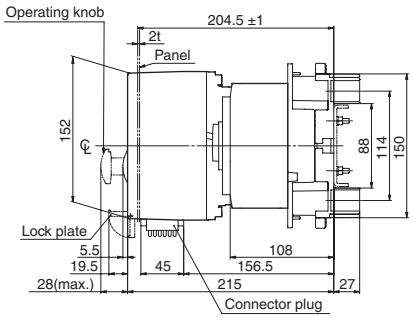
Note: Studs are factory installed in horizontal direction both on the line and load sides.

Panel cutout (front view)

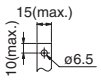


Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

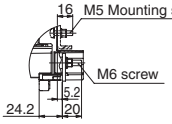
Plug-in (PMB)



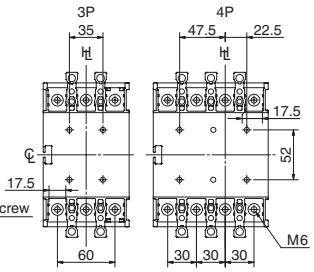
Preparation of conductor



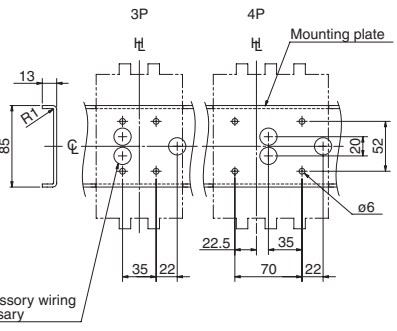
Detail of connecting part



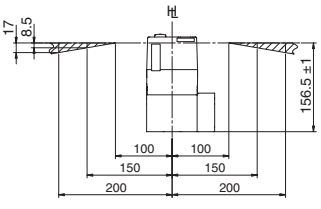
Mounting base (rear view)



Drilling plan (front view)



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.

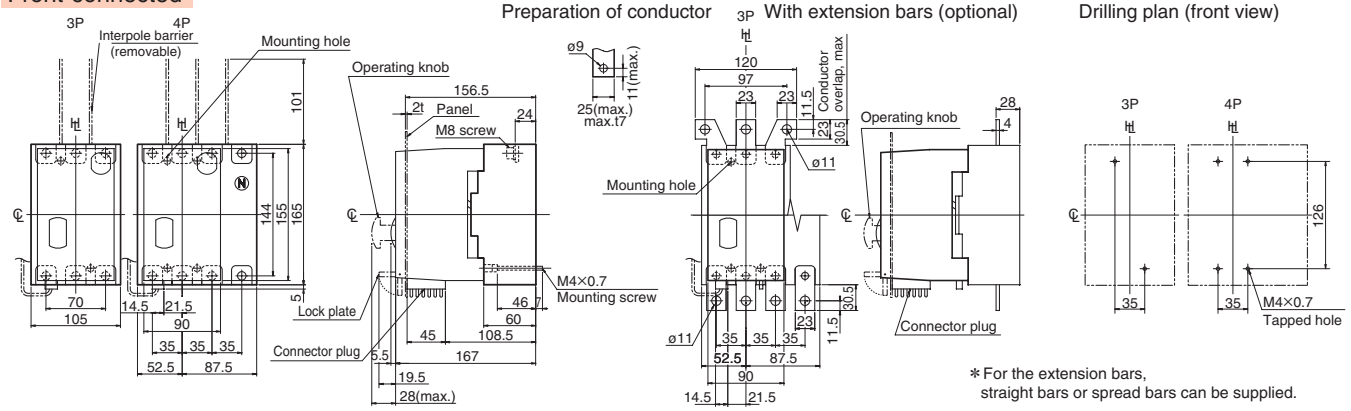
Outline Dimensions (with motor operators)

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

Outline dimensions (mm) (T2MC25L) — E250-SCF, E250-SCJ, E250-SF, E250-SJ, S250-SN

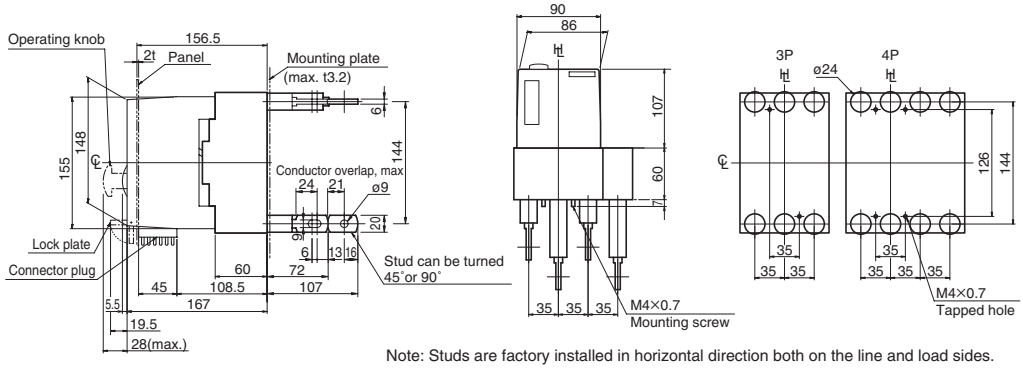
ASL : Arrangement Standard Line ℄ : Handle Centre Line ⊬ : Handle Frame Centre Line

Front-connected



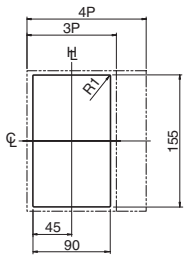
＊For the extension bars, straight bars or spread bars can be supplied.

Rear-connected



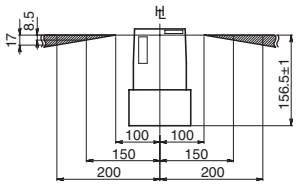
Note: Studs are factory installed in horizontal direction both on the line and load sides.

Panel cutout (front view)



Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

Panel hinge position (hatching area) (bottom view)



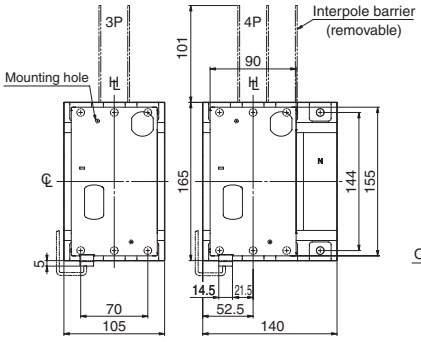
Outline Dimensions (with motor operators)

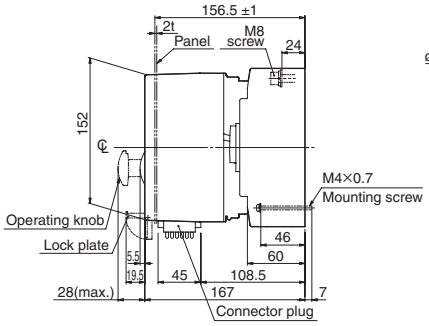
P250F, P250N, P250H, P250D

Outline dimensions (mm) (TPMC25S) — P250F, P250N, P250H, P250D

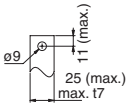
ASL : Arrangement Standard Line ℄ : Handle Centre Line 卄 : Handle Frame Centre Line

Front-connected

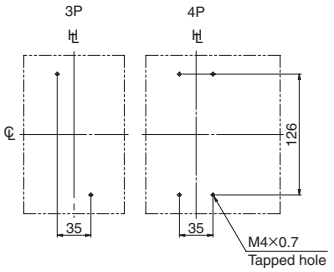




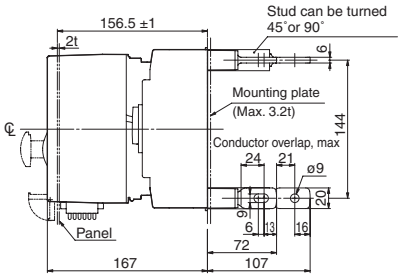
Preparation of conductor



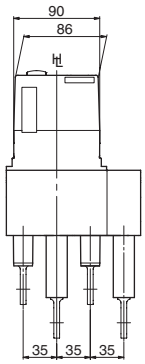
Drilling plan (front view)



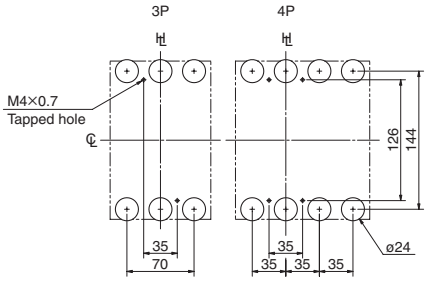
Rear-connected



(Bottom view)

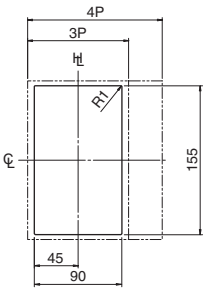


Drilling plan (front view)



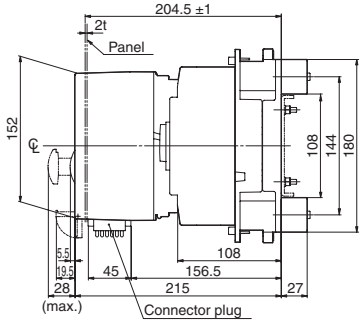
Note: Studs are factory installed in horizontal direction both on the line and load sides.

Panel cutout (front view)



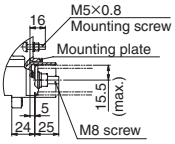
Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

Plug-in (PMB)

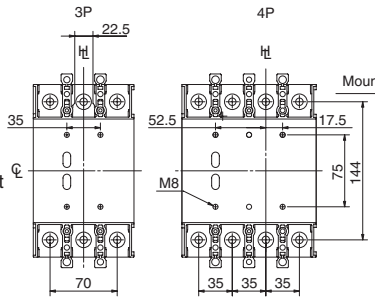


Preparation of conductor

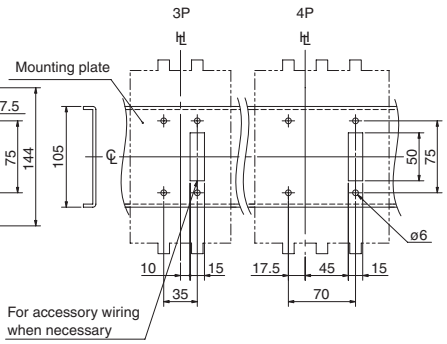
Detail of connecting part



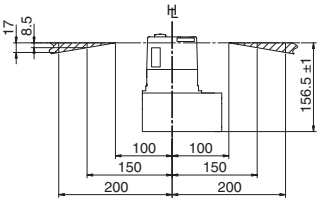
Mounting base (rear view)



Drilling plan (front view)



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.

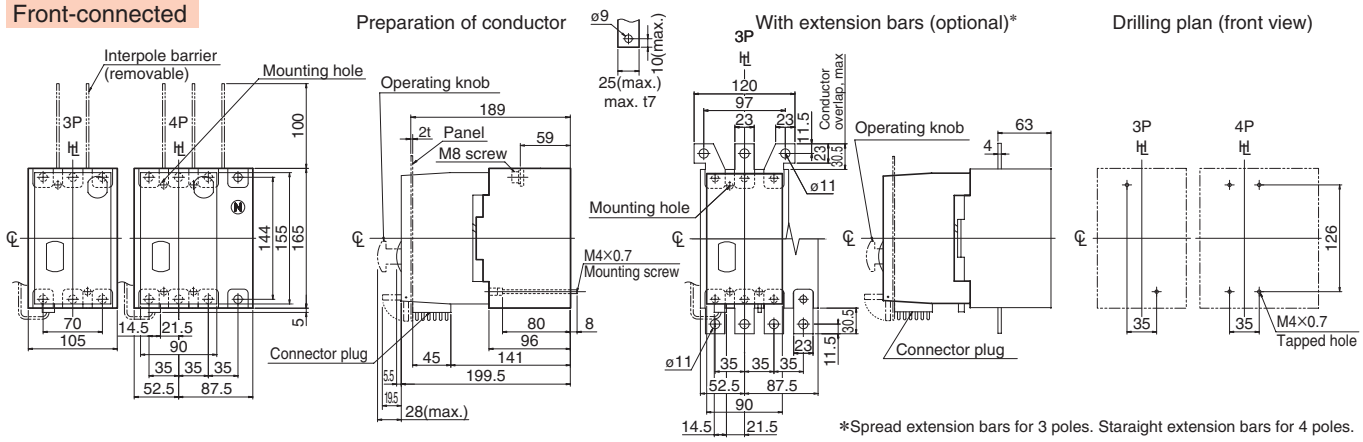
Outline Dimensions (with motor operators)

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

Outline dimensions (mm) (T2MC25) — H125-NJ, H160-NJ, H250-NJ, H250-NE, L125-NJ, L160-NJ, L250-NJ

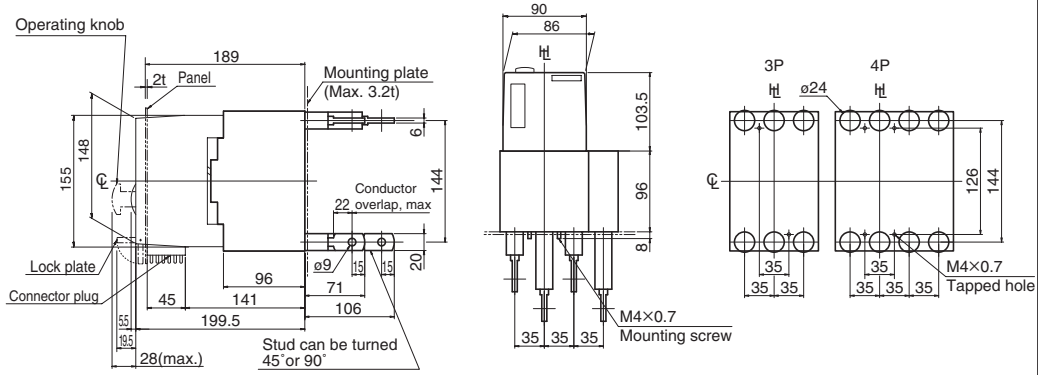
ASL : Arrangement Standard Line ℄ : Handle Centre Line ⊬ : Handle Frame Centre Line

Front-connected



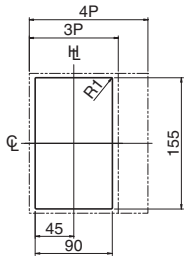
*Spread extension bars for 3 poles. Staraight extension bars for 4 poles.

Rear-connected



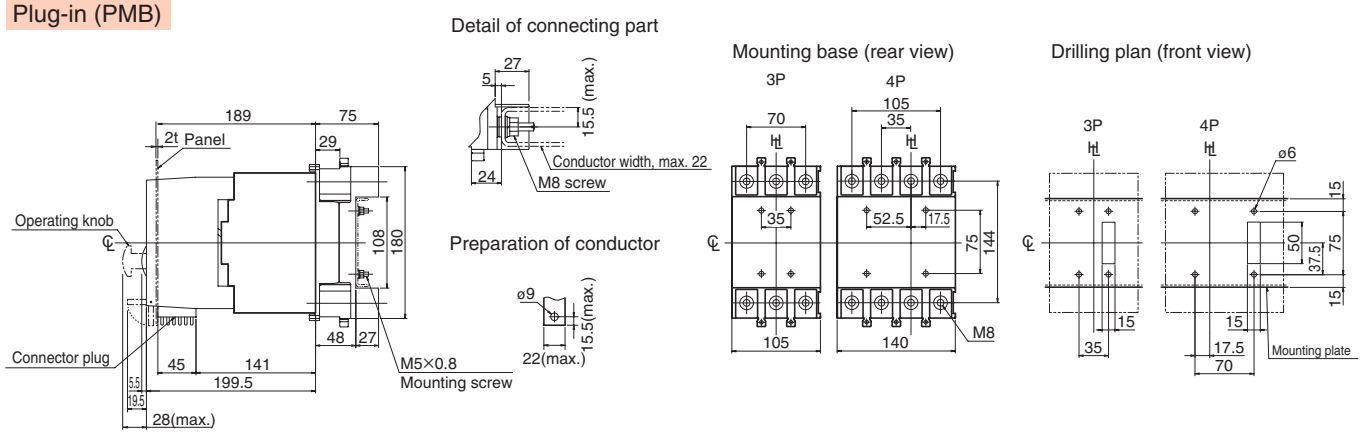
Note: Studs are factory installed in horizontal direction both on the line and load sides.

Panel cutout (front view)

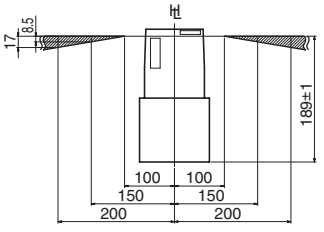


Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

Plug-in (PMB)



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.
2) Plug-in type is not available for H250-NE.

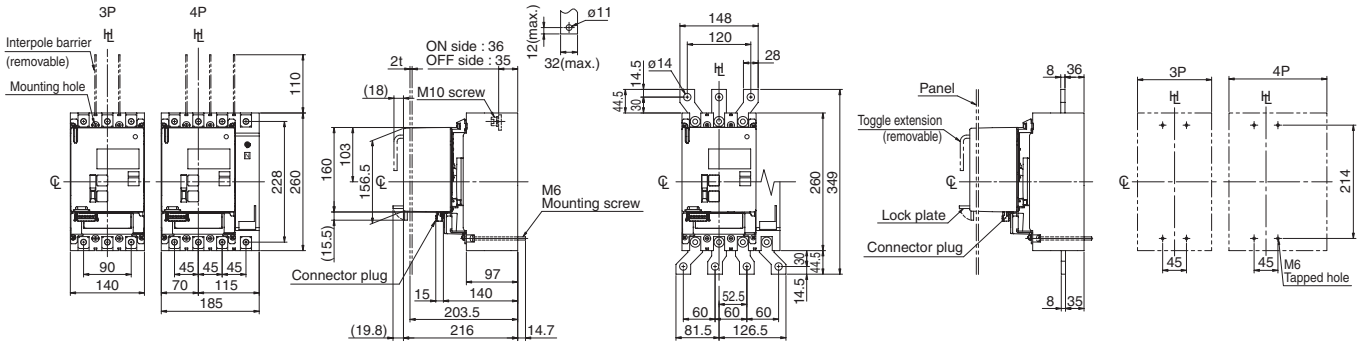
Outline Dimensions (with motor operators)

P400E, P400F, P400N, P400H, P400S, P400D

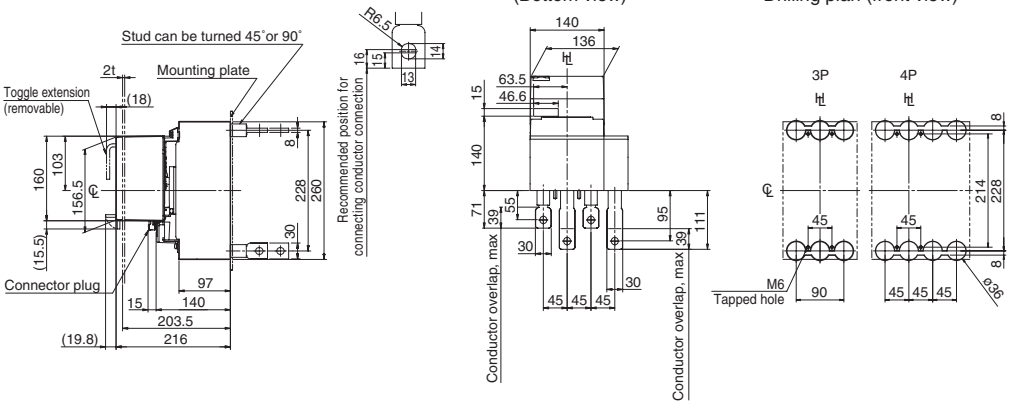
Outline dimensions (mm) (TPMC63S) — P400E, P400F, P400N, P400H, P400S, P400D

ASL : Arrangement Standard Line ℄ : Handle Centre Line ⊬ : Handle Frame Centre Line

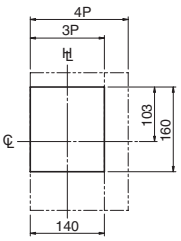
Front-connected



Rear-connected

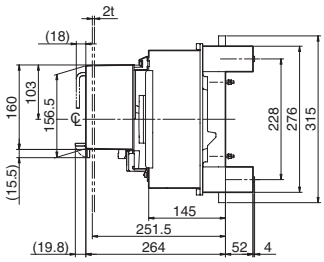


Panel cutout (front view)

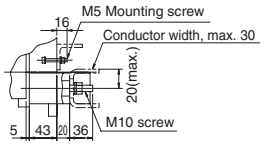


Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

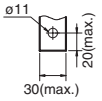
Plug-in (PMB)



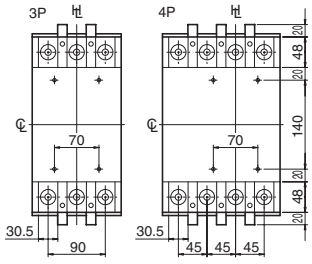
Detail of connecting part



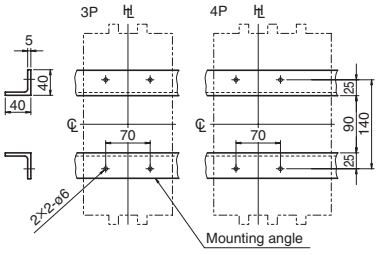
Preparation of conductor



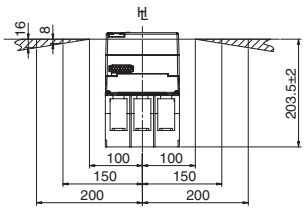
Mounting base (rear view)



Drilling plan (front view)



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.

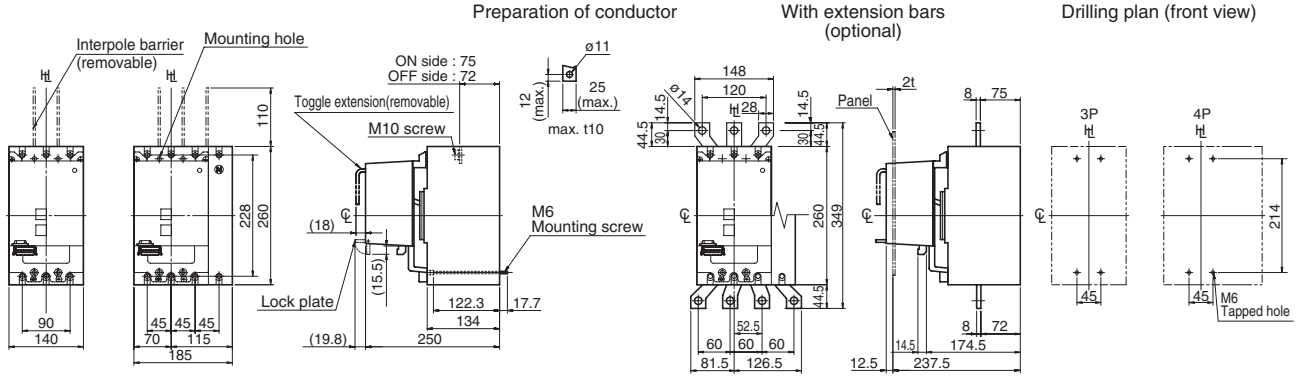
Outline Dimensions (with motor operators)

H400-NE, L400-NE

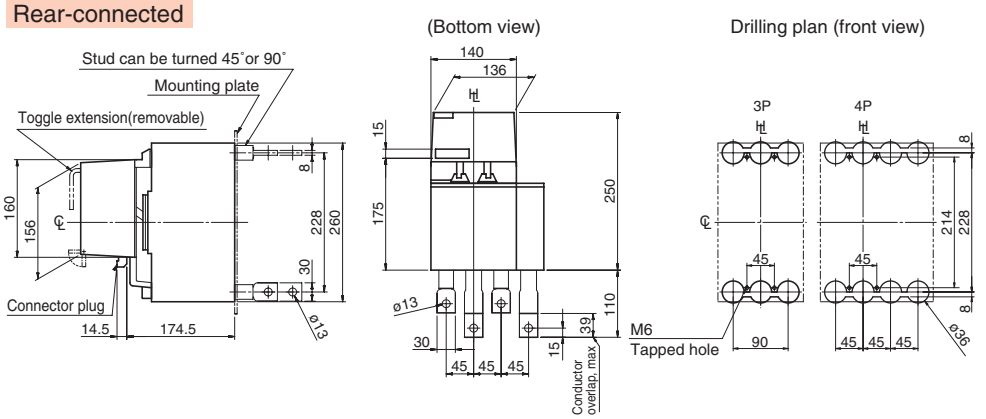
Outline dimensions (mm) (T2MC40) — H400-NE, L400-NE

ASL : Arrangement Standard Line ℄ : Handle Centre Line ⊢ : Handle Frame Centre Line

Front-connected

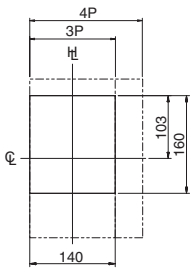


Rear-connected



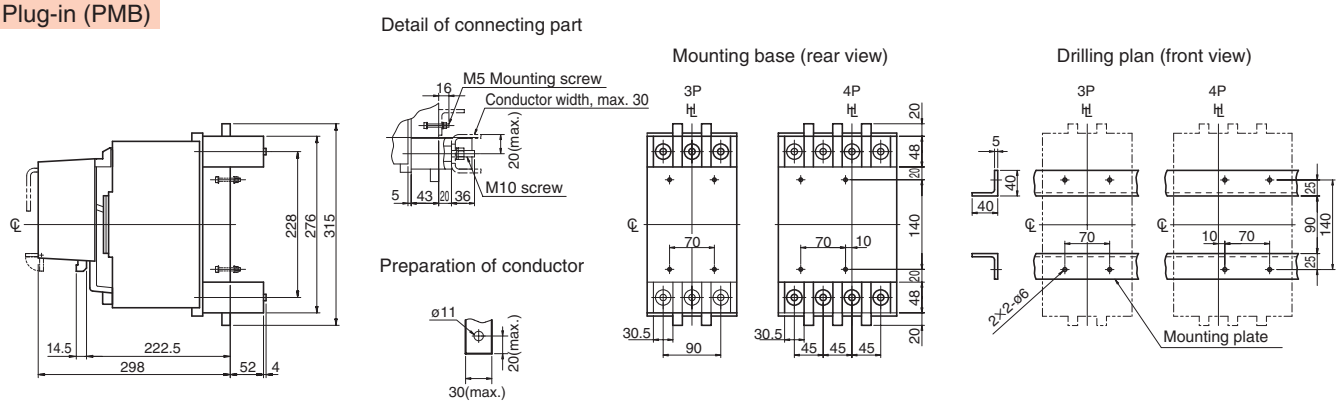
Note: Studs are factory installed in horizontal direction both on the line and load sides.

Panel cutout (front view)

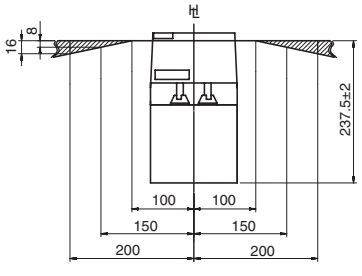


Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

Plug-in (PMB)



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.

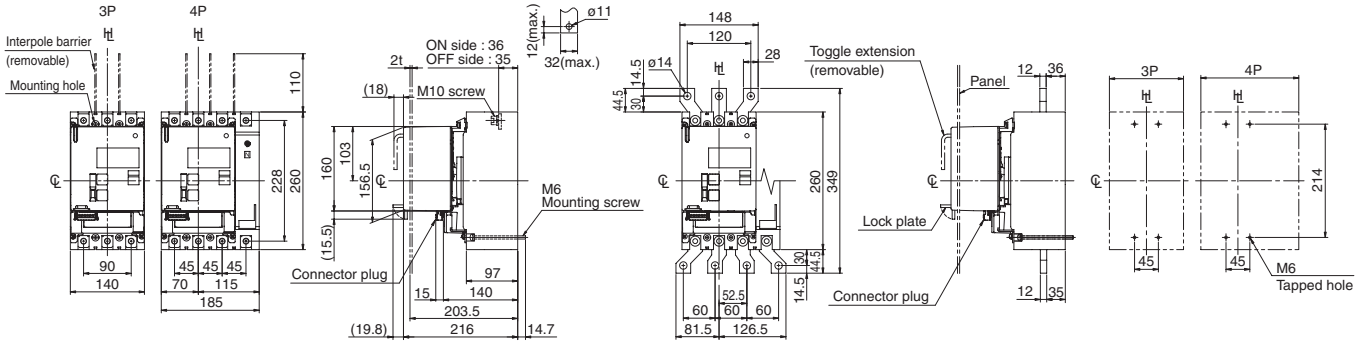
Outline Dimensions (with motor operators)

P630E, P630F, P630N, P630H, P630S, P630D

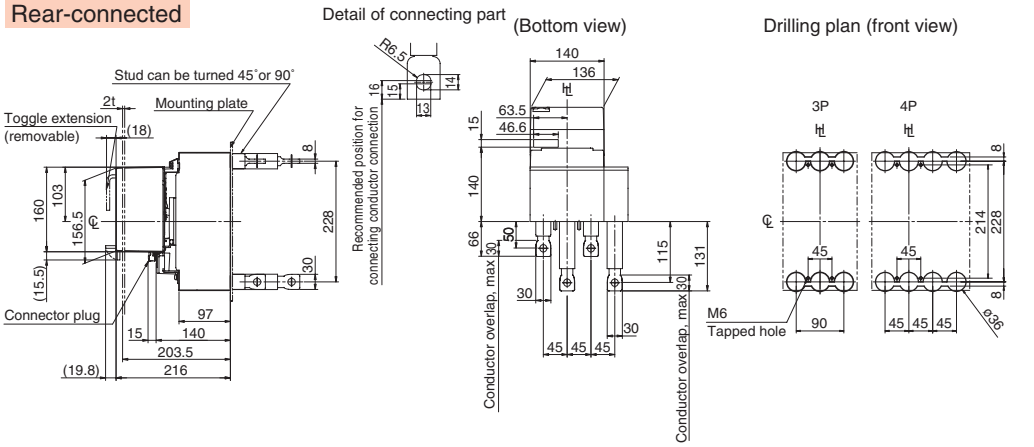
Outline dimensions (mm) (TPMC63S) — P630E, P630F, P630N, P630H, P630S, P630D

ASL : Arrangement Standard Line ℄ : Handle Centre Line ⊬ : Handle Frame Centre Line

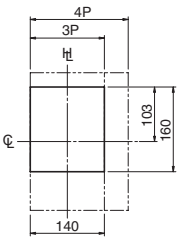
Front-connected



Rear-connected

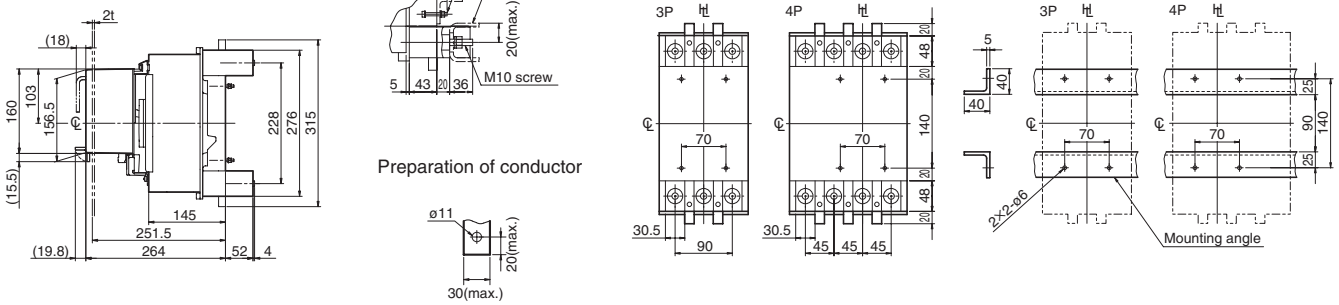


Panel cutout (front view)

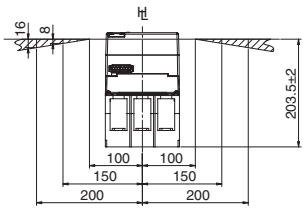


Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

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.

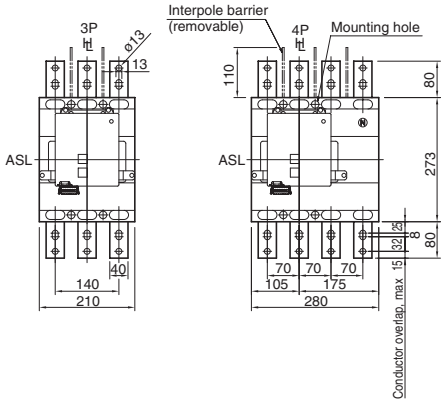
Outline Dimensions (with motor operators)

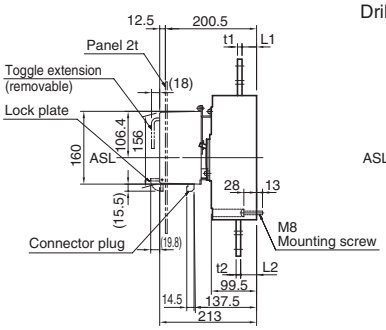
S800-CJ, S800-NJ, S800-RJ, S800-PJ, S800-NN, S800-NE, S800-RE, S800-PE

Outline dimensions (mm) (T2MC80) S800-CJ, S800-NJ, S800-RJ, S800-PJ, S800-NN, S800-NE, S800-RE, S800-PE

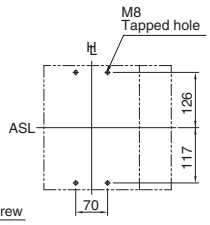
ASL : Arrangement Standard Line ℄ : Handle Centre Line 卄 : Handle Frame Centre Line

Front-connected





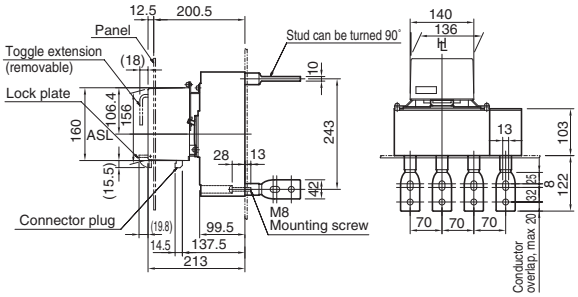
Drilling plan (front view)



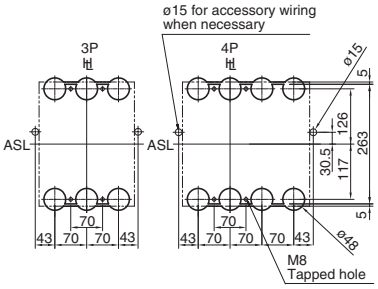
Breaker type	Rated current	t1	t2	L1	L2	W
S800-CJ, S800-NJ, S800-RJ, S800-PJ, S800-NN	630A	8	8	32	34	40
	800A	10	10	32	35	40
S800-NE, S800-RE, S800-PE	630A	8	8	32	36	40
	800A	10	10	32	36	40

Rear-connected

(Bottom view)

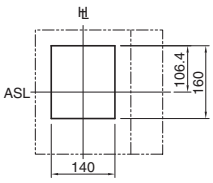


Drilling plan (front view)



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

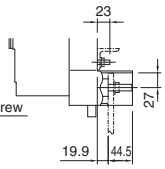
Panel cutout (front view)

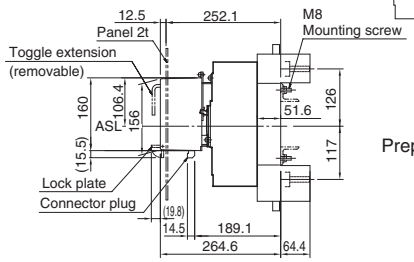


Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

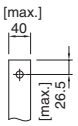
Plug-in (PMB)

Detail of connecting part

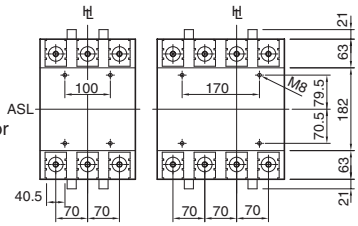




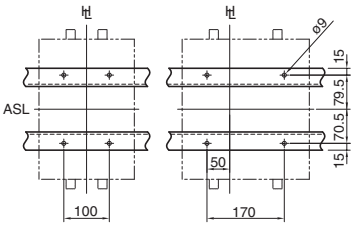
Preparation of conductor



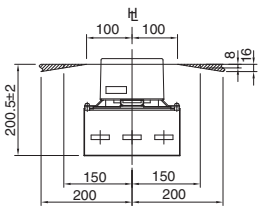
Mounting base (rear view)



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.

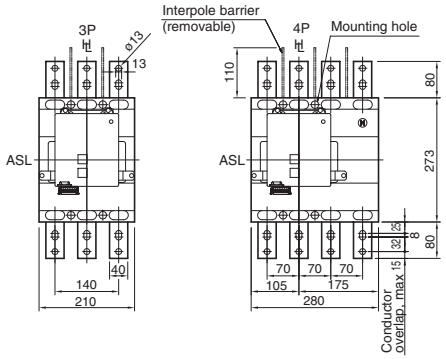
Outline Dimensions (with motor operators)

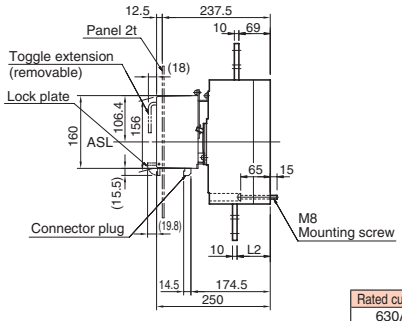
H800-NE, L800-NE

Outline dimensions (mm) (T2MC80) — H800-NE, L800-NE

ASL : Arrangement Standard Line ℄ : Handle Centre Line 卄 : Handle Frame Centre Line

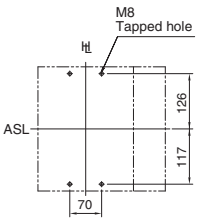
Front-connected





Rated current	L2
630A	73
800A	74

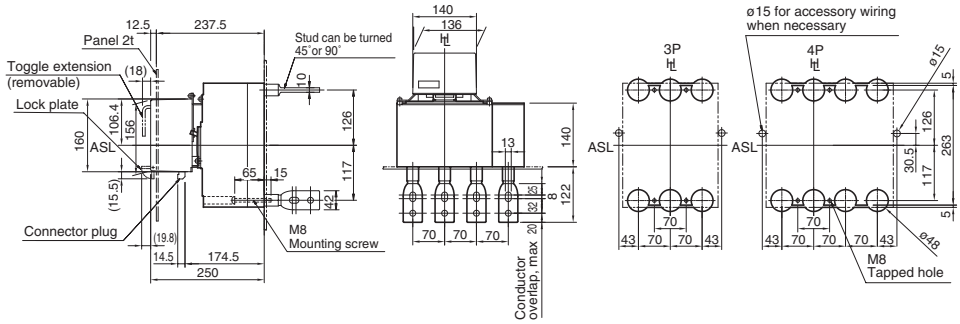
Drilling plan (front view)



Rear-connected

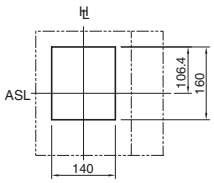
(Bottom view)

Drilling plan (front view)



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

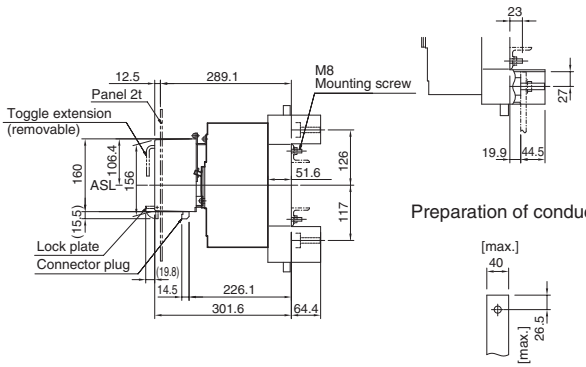
Panel cutout (front view)



Panel cutout dimensions shown give an allowance of 1.5mm around motor operator.

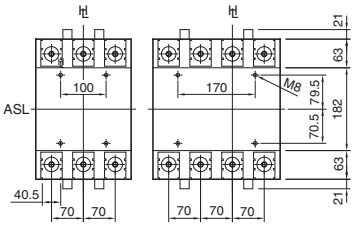
Plug-in (PMB)

Detail of connecting part

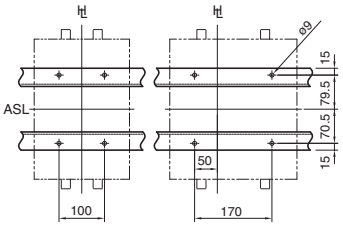


Preparation of conductor

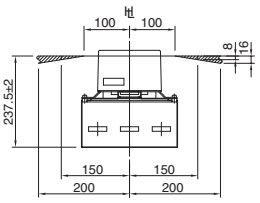
Mounting base (rear view)



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.

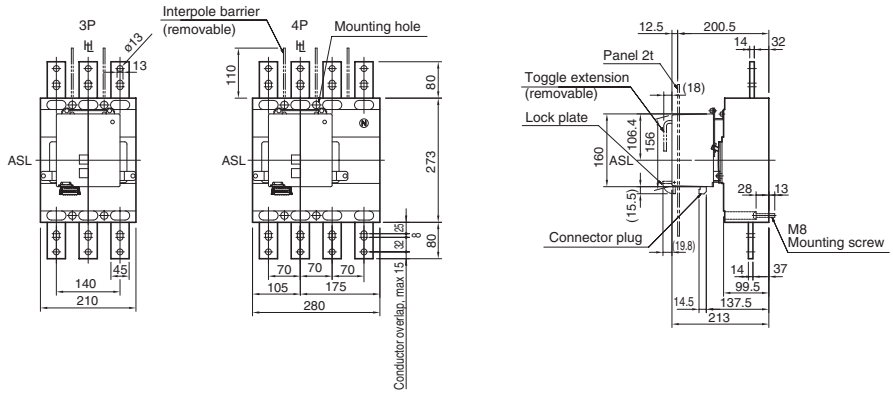
Outline Dimensions (with motor operators)

S1000-SE, S1000-NE, S1000-NN

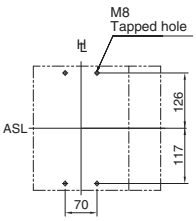
Outline dimensions (mm) (T2MC80) — S1000-SE, S1000-NE, S1000-NN

ASL : Arrangement Standard Line ℄ : Handle Centre Line 卄 : Handle Frame Centre Line

Front-connected



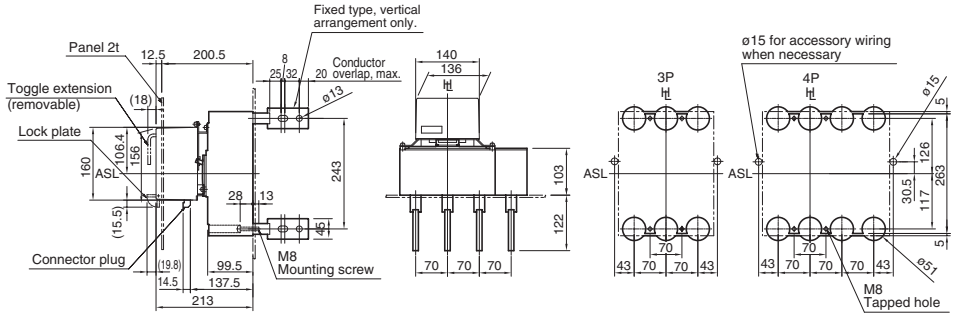
Drilling plan (front view)



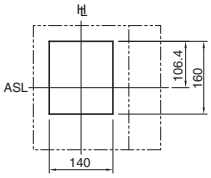
Rear-connected

(Bottom view)

Drilling plan (front view)

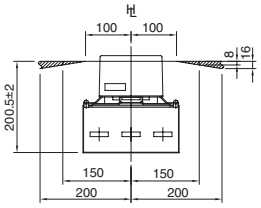


Panel cutout (front view)



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.

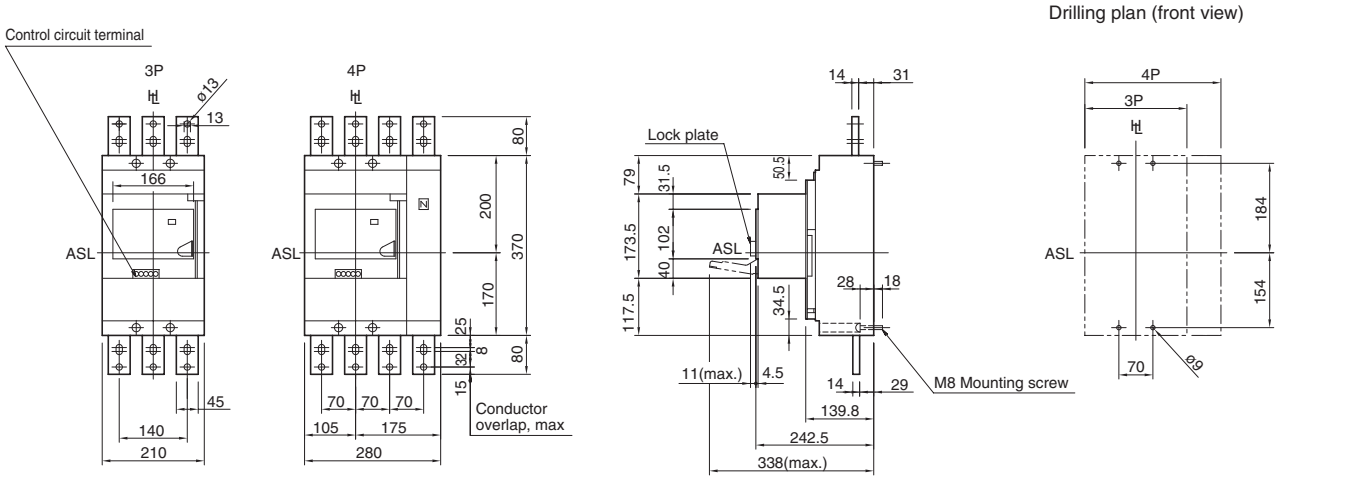
Outline Dimensions (with motor operators)

S1250-SE, S1250-NE, S1250-GE, S1250-NN

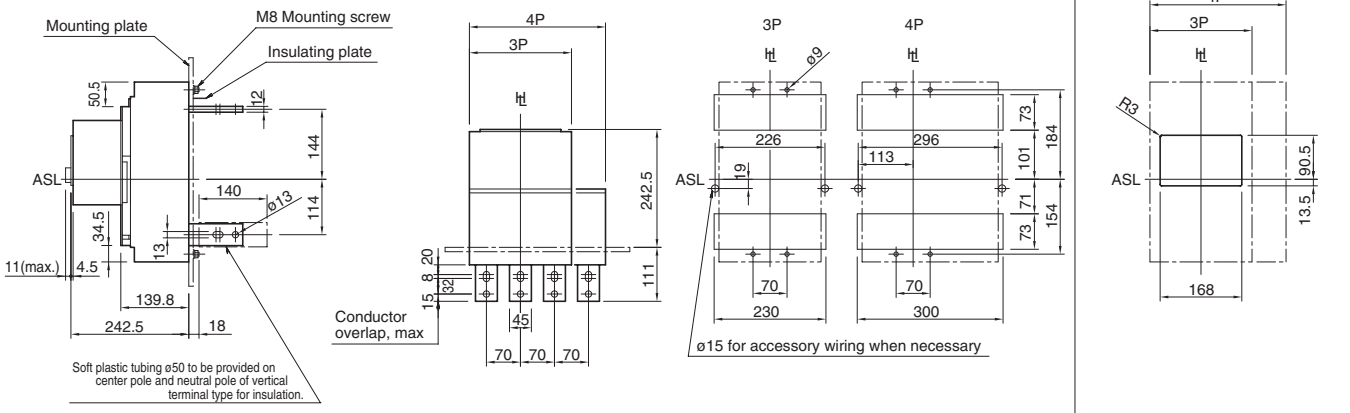
Outline dimensions (mm) (T2MCX6) — S1250-SE, S1250-NE, S1250-GE, S1250-NN

ASL : Arrangement Standard Line ℄ : Handle Centre Line 卄 : Handle Frame Centre Line

Front-connected



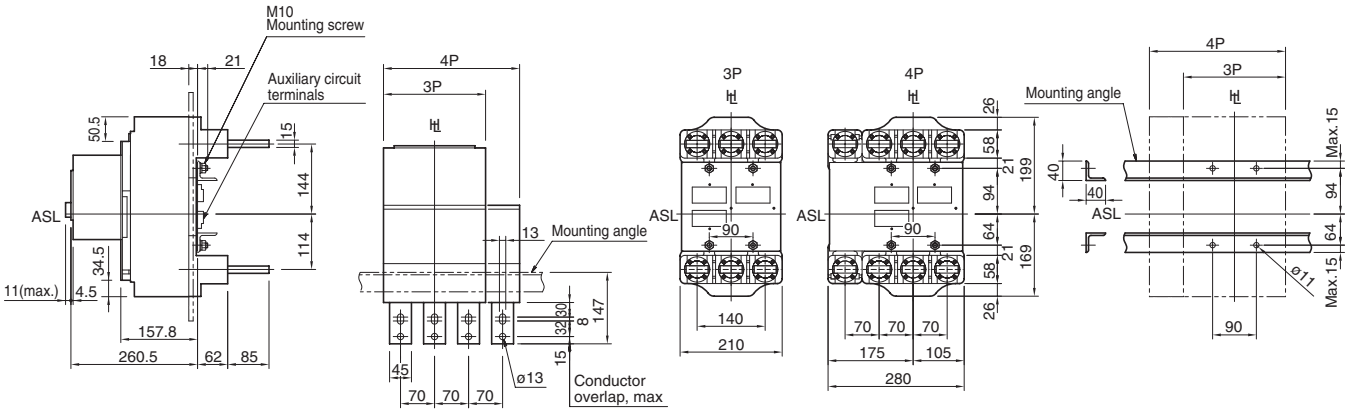
Rear-connected



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)



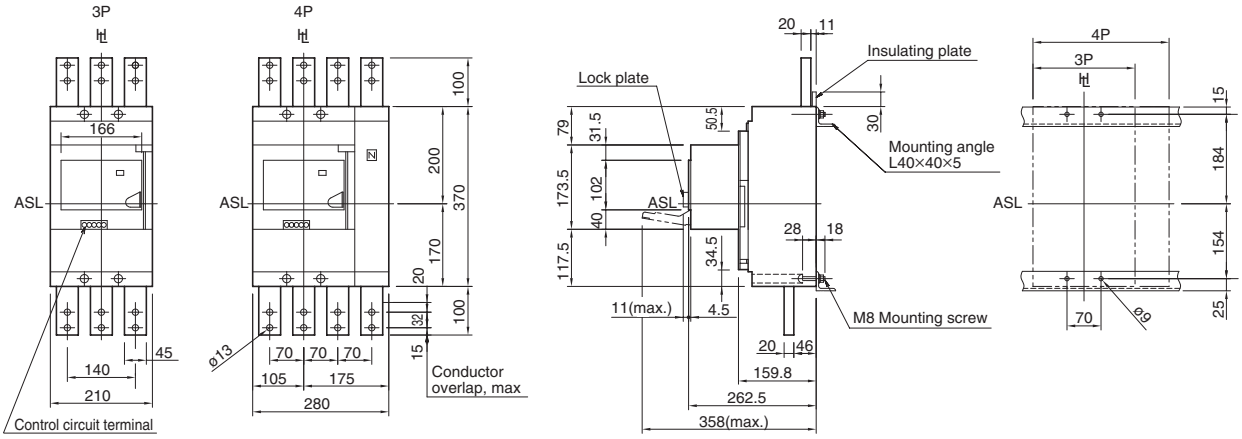
Outline Dimensions (with motor operators)

S1600-SE, S1600-NE, S1600-NN

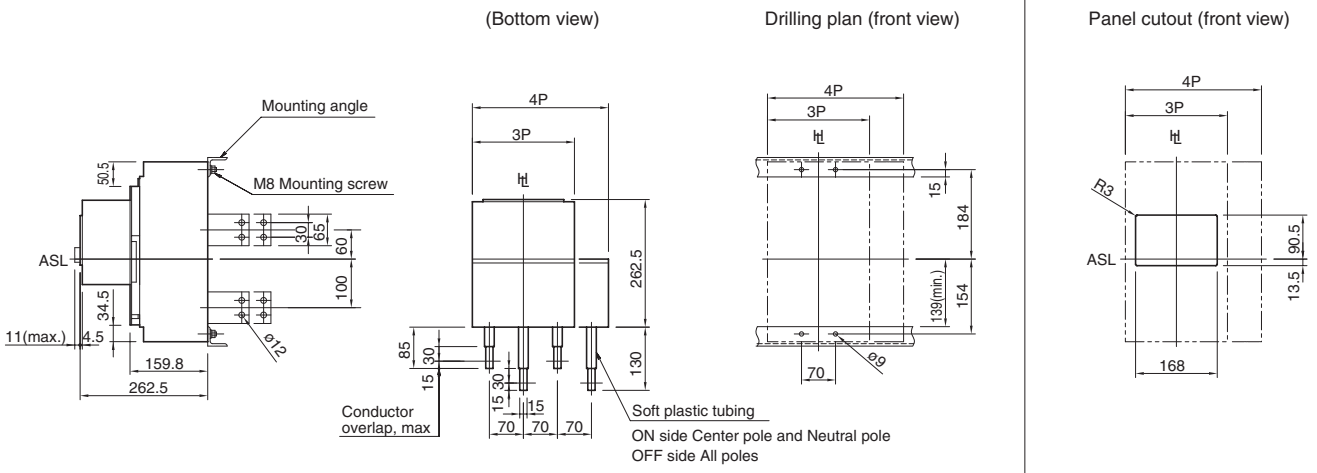
Outline dimensions (mm) (T2MCX6) — S1600-SE, S1600-NE, S1600-NN

ASL : Arrangement Standard Line ℄ : Handle Centre Line 卄 : Handle Frame Centre Line

Front-connected

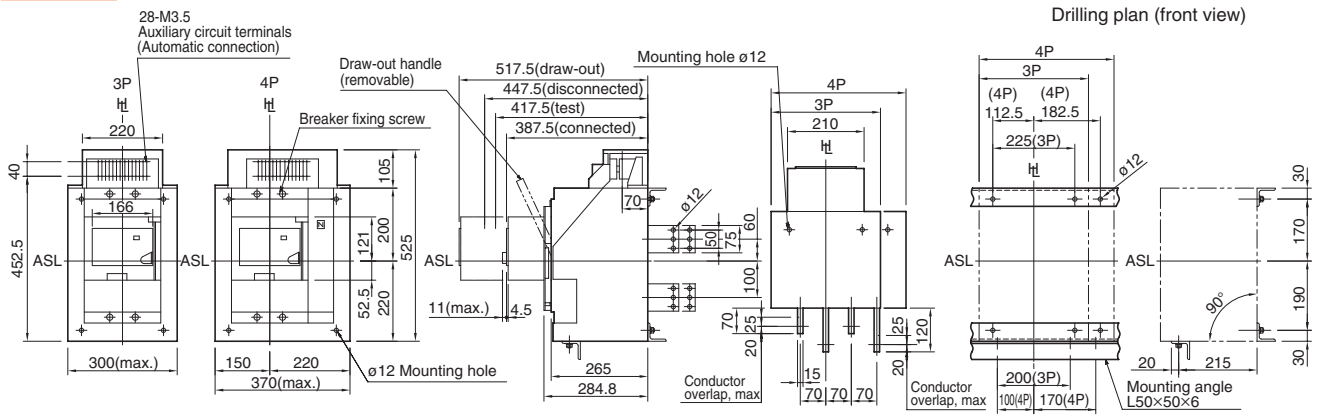


Rear-connected



Panel cutout dimensions shown give an allowance of 1.0mm around motor operator.

Draw-out



∗ Contact TERASAKI if manual connection is required.
The external dimensions are different.

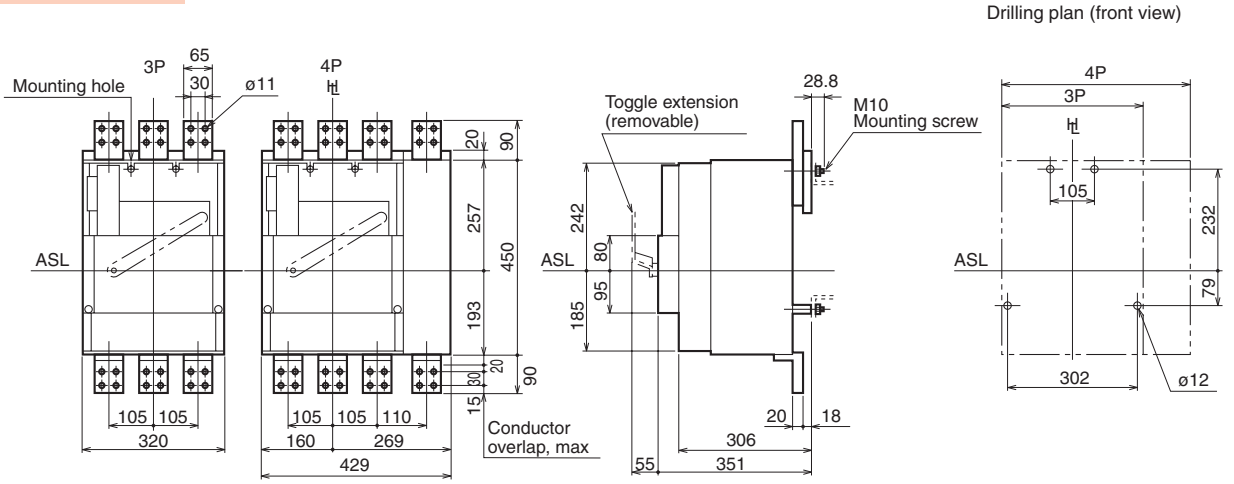
Outline Dimensions (with motor operators)

XS2000NE, XS2000NN

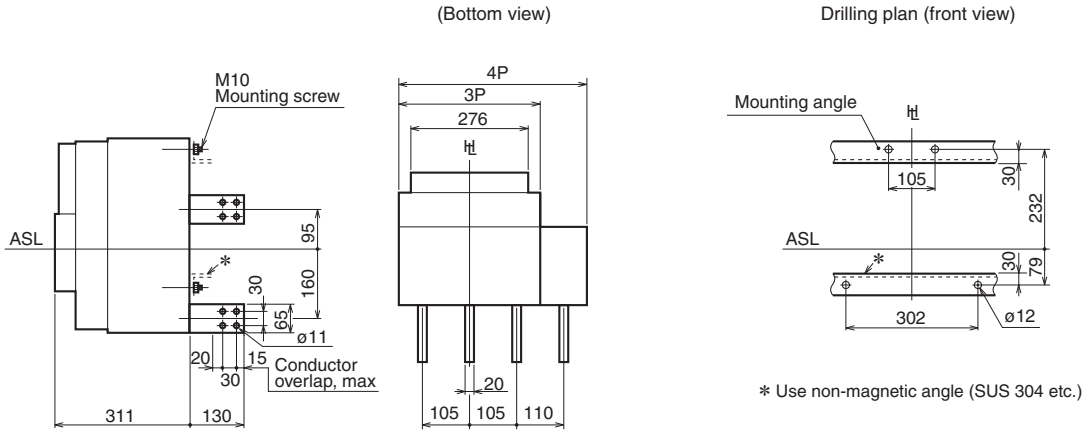
Outline dimensions (mm) (XMB10) — XS2000NE, XS2000NN

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

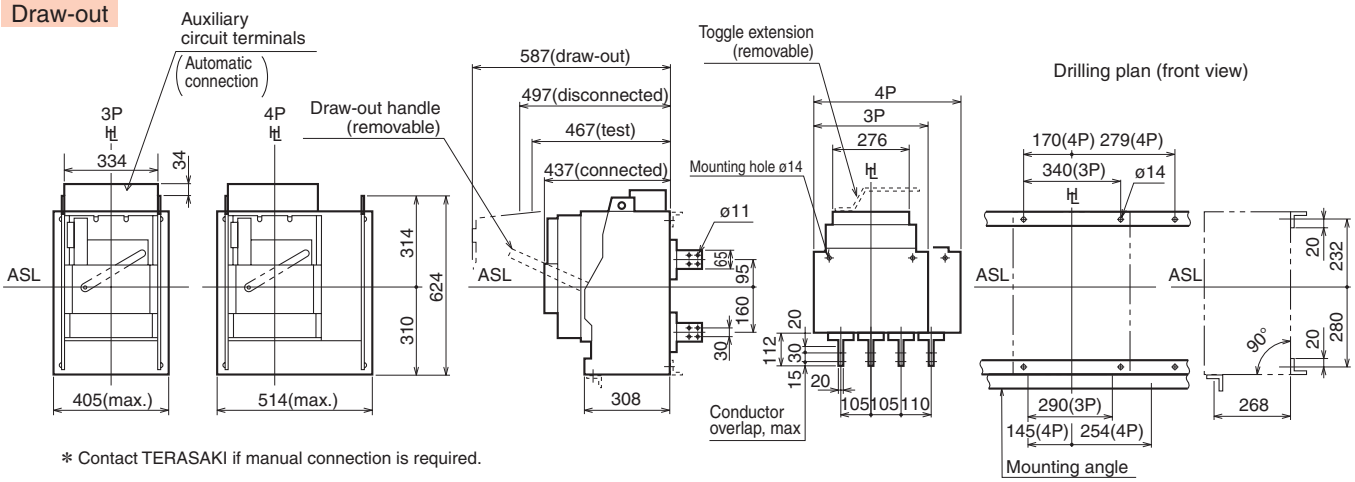
Front-connected



Rear-connected



Draw-out



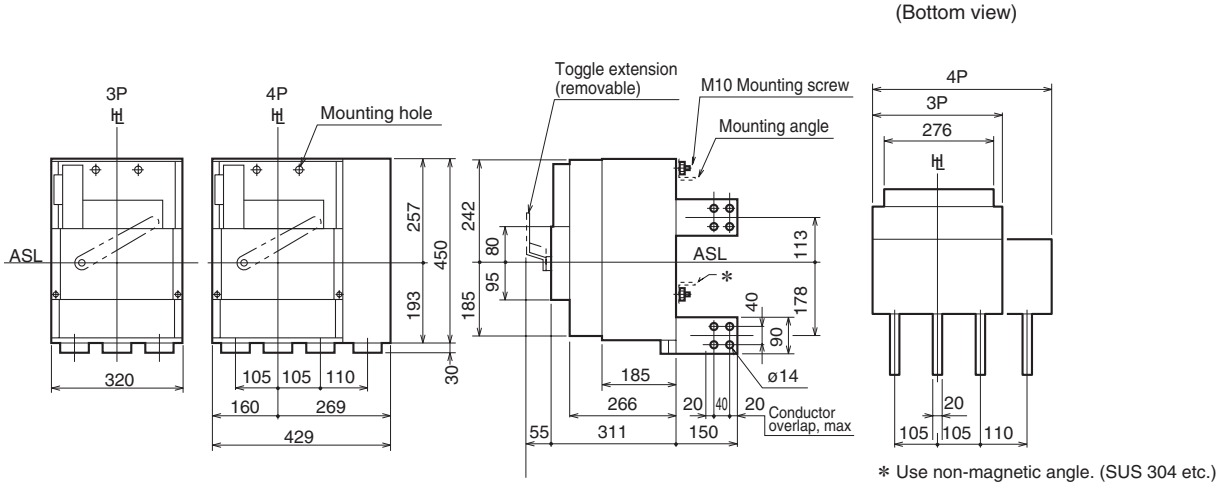
Outline Dimensions (with motor operators)

XS2500NE, XS2500NN, XS3200NE, XS3200NN

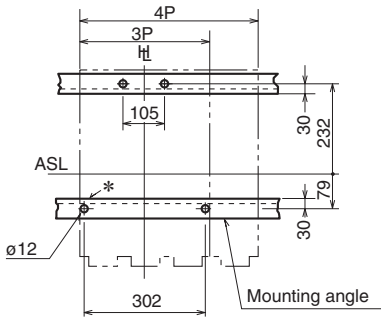
Outline dimensions (mm) (XMB10, XMB12) — XS2500NE, XS2500NN, XS3200NE, XS3200NN

ASL : Arrangement Standard Line ℄ : Handle Centre Line ⊬ : Handle Frame Centre Line

Rear-connected



Drilling plan (front view)



Note: 4-poles type is not available for XS3200NE or XS3200NN.

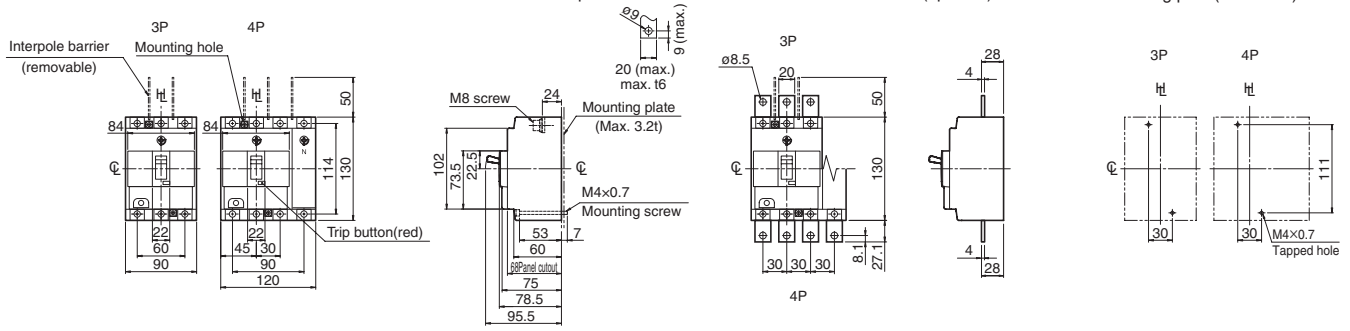
Outline Dimensions (Special breakers)

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

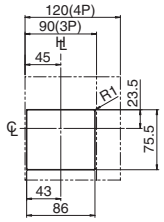
Outline dimensions (mm) — P160F, P160N, P160H

ASL : Arrangement Standard Line ℄ : Handle Centre Line 卄 : Handle Frame Centre Line

Front-connected



Panel cutout (front view)



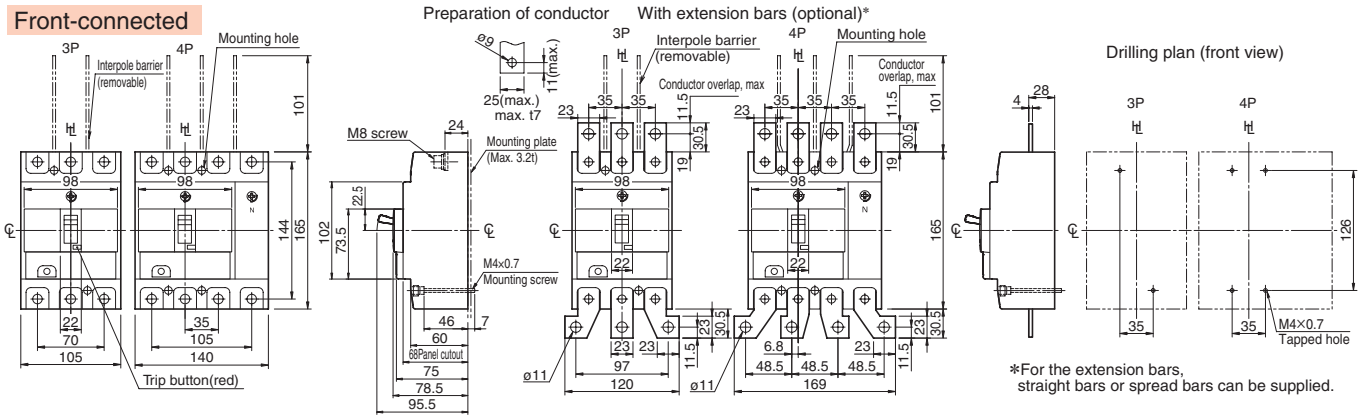
Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

Note: The panel cutout differs from the standard type electronic circuit breaker.

Outline dimensions (mm) — P250F, P250N, P250H

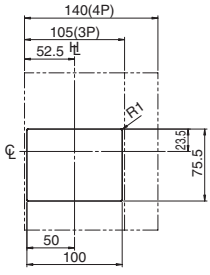
ASL : Arrangement Standard Line ℄ : Handle Centre Line 卄 : Handle Frame Centre Line

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.

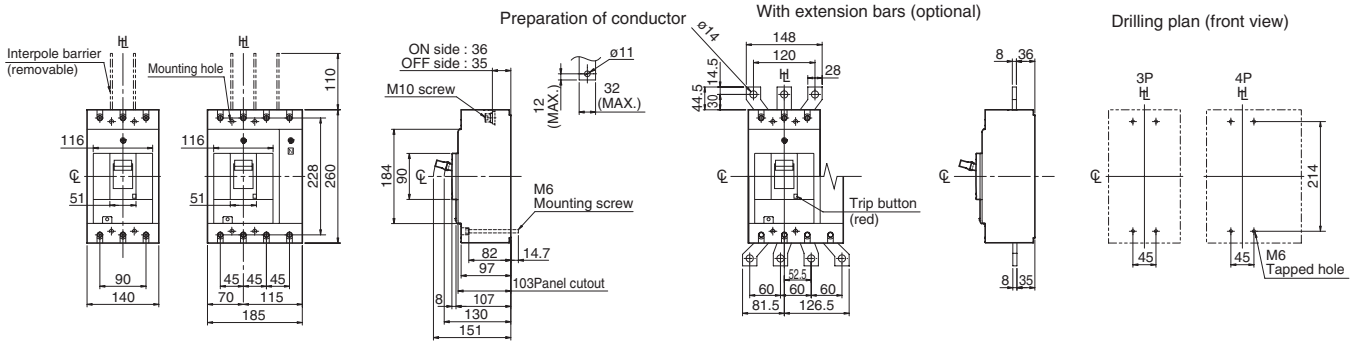
Outline Dimensions (Special breakers)

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

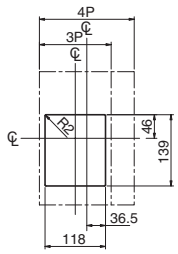
Outline dimensions (mm) — P400F, P400N, P400H, P400S

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

Front-connected



Panel cutout (front view)



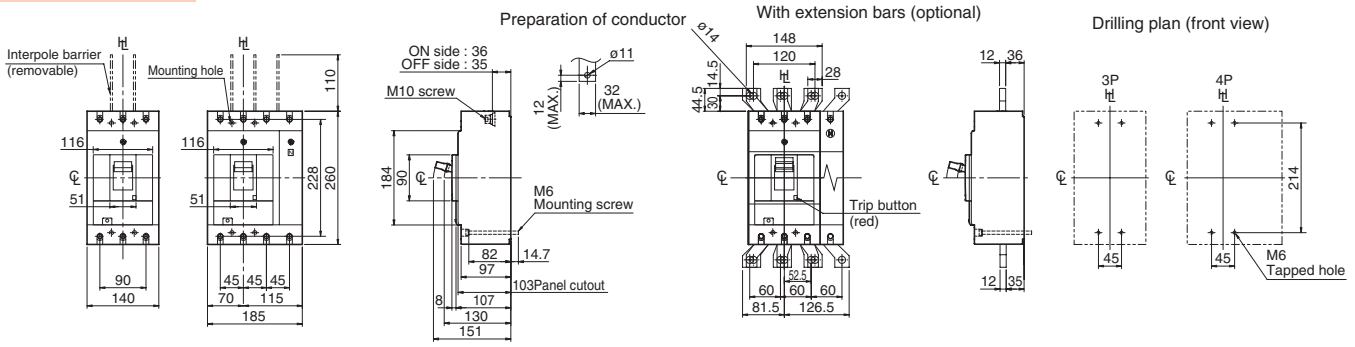
Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

Note: The panel cutout differs from the standard type electronic circuit breaker.

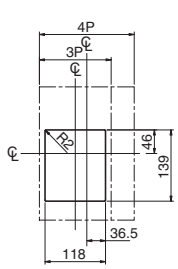
Outline dimensions (mm) — P630F, P630N, P630H, P630S

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.

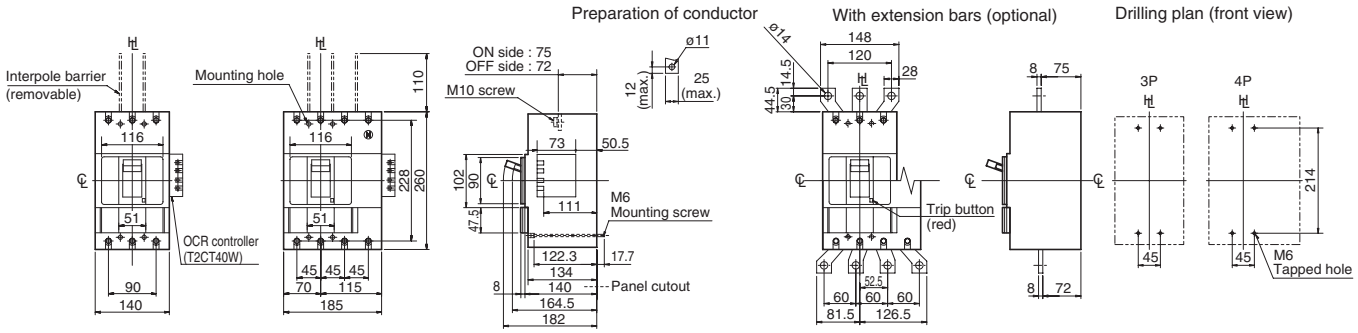
Outline Dimensions (Special breakers)

High-Performance Electronic Circuit Breaker (XOW type OCR)

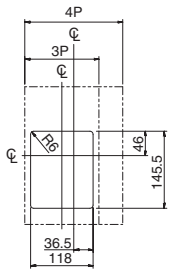
Outline dimensions (mm) — H400-NE, L400-NE

ASL : Arrangement Standard Line ℄ : Handle Centre Line ⊬ : Handle Frame Centre Line

Front-connected



Panel cutout (front view)



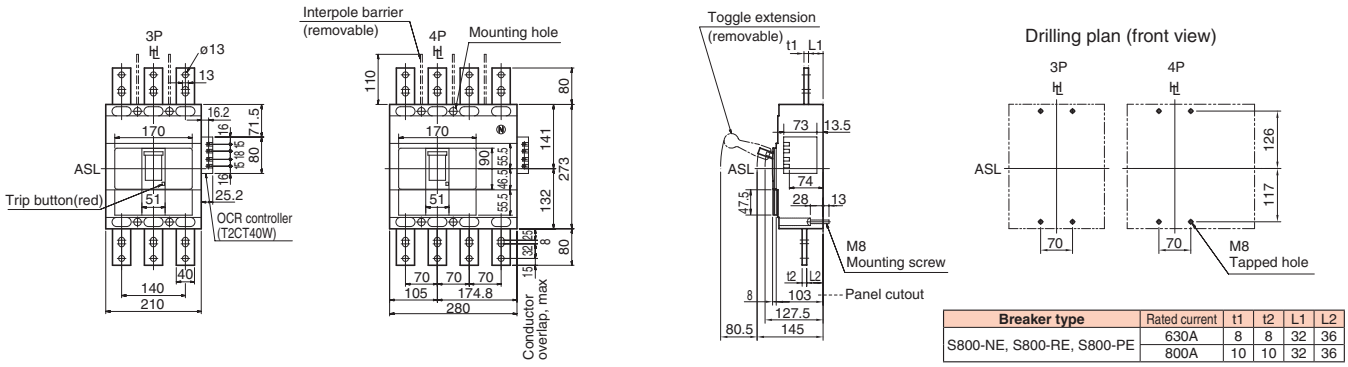
Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

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

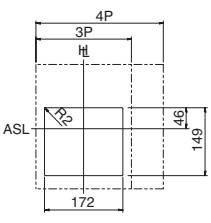
ASL : Arrangement Standard Line ℄ : Handle Centre Line ⊬ : Handle Frame Centre Line

Front-connected



Breaker type	Rated current	t1	t2	L1	L2
S800-NE, S800-RE, S800-PE	630A	8	8	32	36
	800A	10	10	32	36

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.

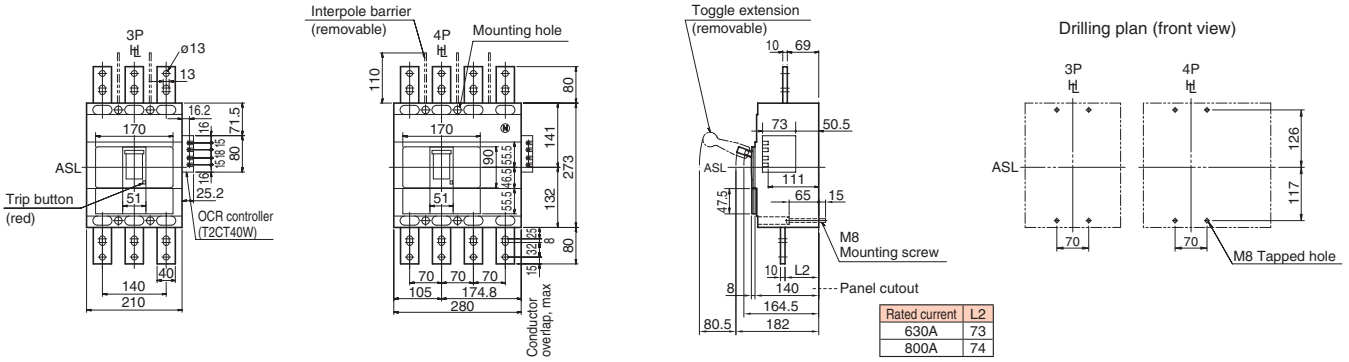
Outline Dimensions (Special breakers)

High-Performance Electronic Circuit Breaker (XOW type OCR)

Outline dimensions (mm) — H800-NE, L800-NE

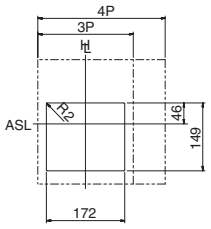
ASL : Arrangement Standard Line ℄ : Handle Centre Line 卄 : Handle Frame Centre Line

Front-connected



Rated current	L2
630A	73
800A	74

Panel cutout (front view)



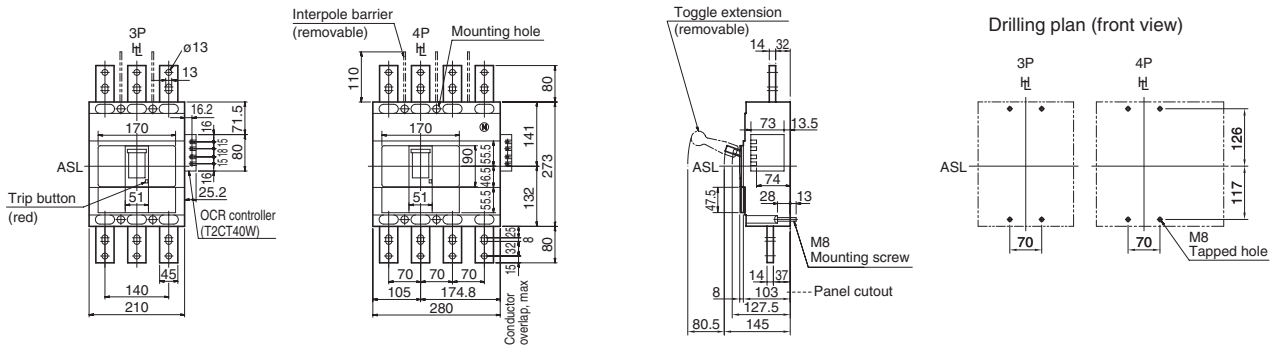
Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

Note: All high-performance electronic circuit breakers are supplied with an OCR controller. The panel cutout differs from the standard type electronic circuit breaker.

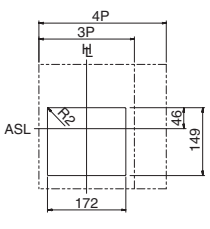
Outline dimensions (mm) — S1000-SE, S1000-NE

ASL : Arrangement Standard Line ℄ : Handle Centre Line 卄 : 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.

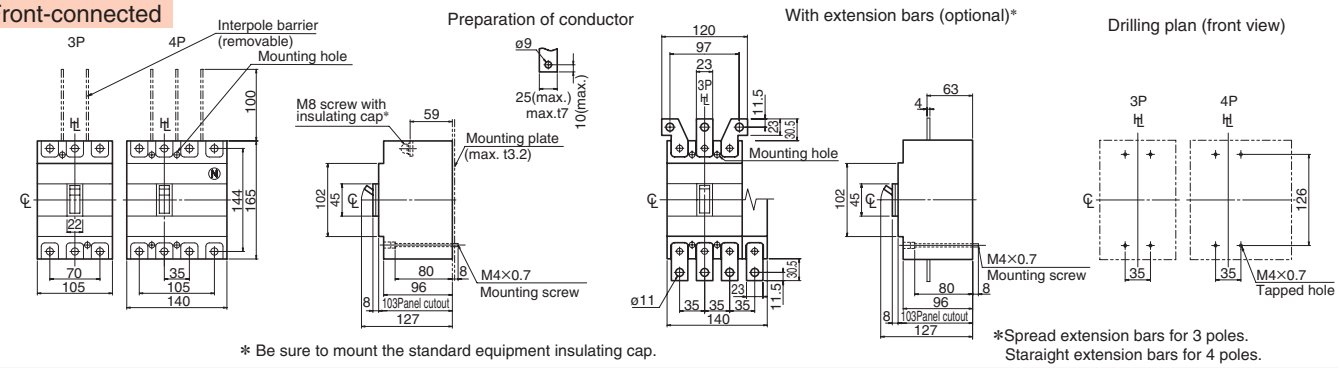
Outline Dimensions (Special breakers)

690V AC Circuit Breakers

Outline dimensions (mm) L125-PJ

ASL : Arrangement Standard Line ℄ : Handle Centre Line ⊩ : Handle Frame Centre Line

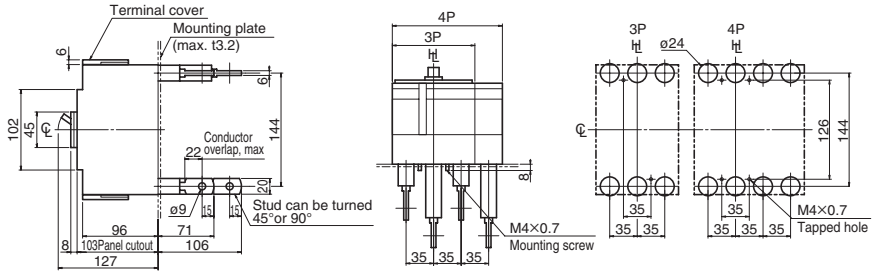
Front-connected



* Be sure to mount the standard equipment insulating cap.

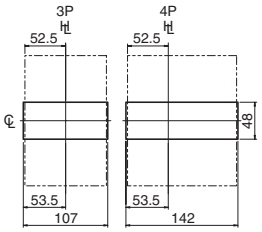
*Spread extension bars for 3 poles.
Staraight extension bars for 4 poles.

Rear-connected



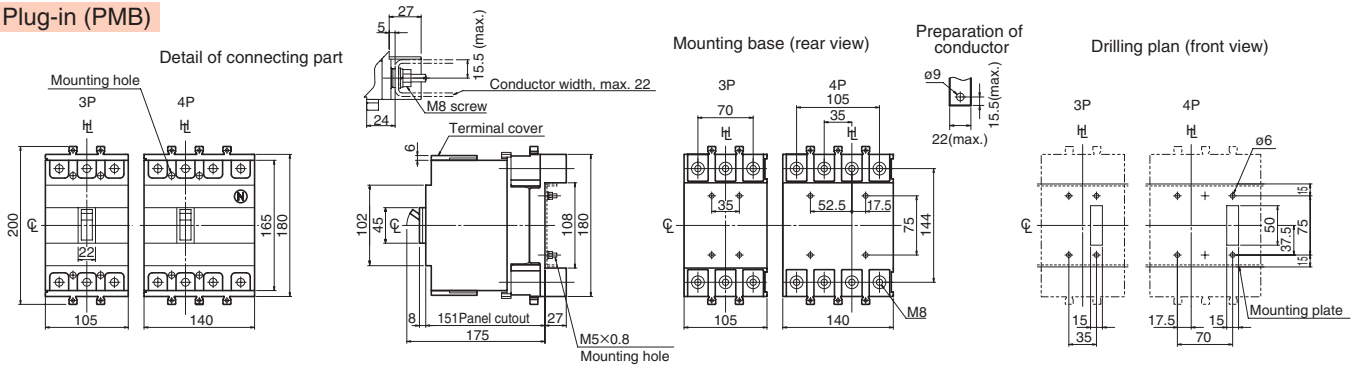
Note: Studs are factory installed in horizontal direction both on the line and load sides.

Panel cutout (front view)



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

Plug-in (PMB)



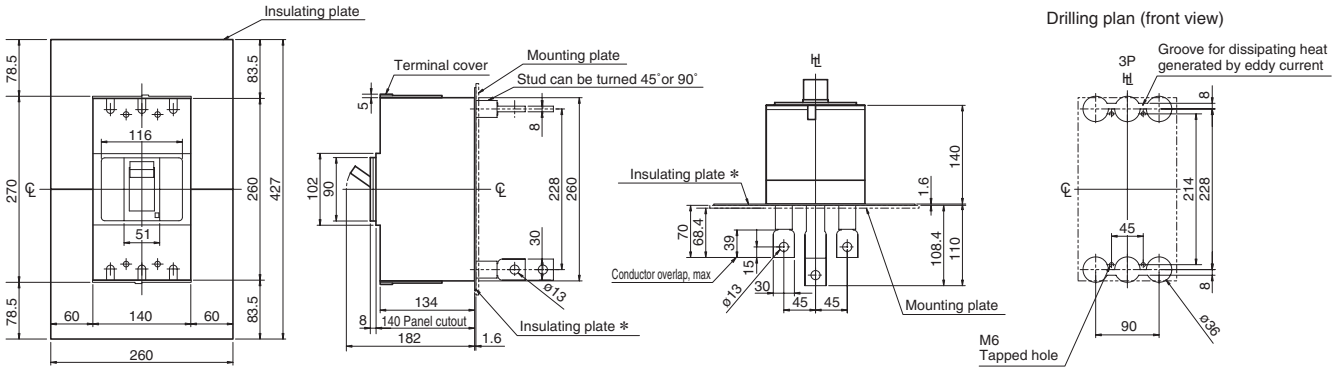
Outline Dimensions (Special breakers)

690V AC Circuit Breakers

Outline dimensions (mm) — L400-PE

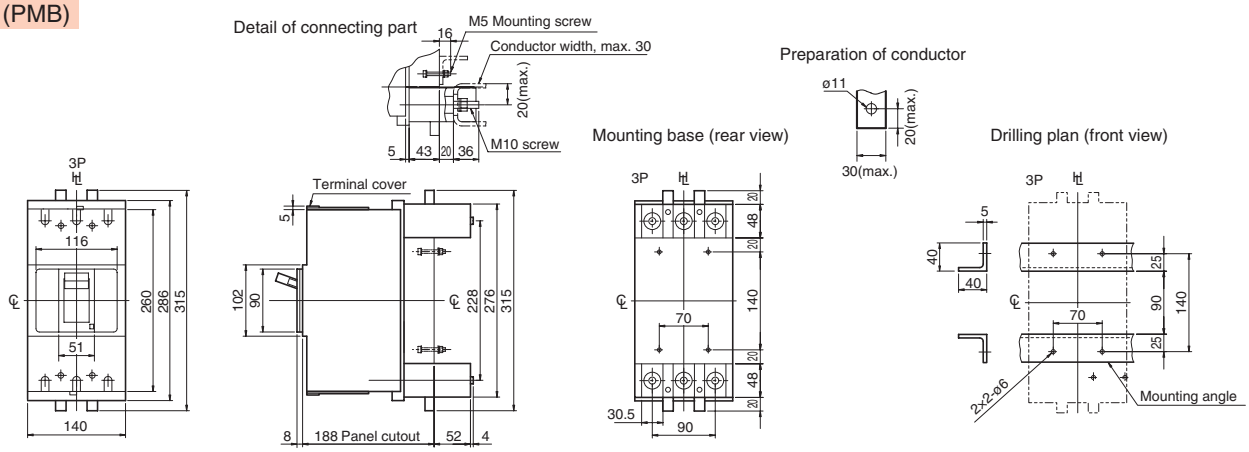
ASL : Arrangement Standard Line ℄ : Handle Centre Line ⊬ : Handle Frame Centre Line

Rear-connected

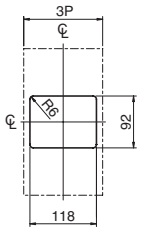


∗ Be sure to mount the standard equipment insulating cap.
Note: Studs are factory installed in horizontal direction both on the line and load sides.

Plug-in (PMB)



Panel cutout (front view)



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

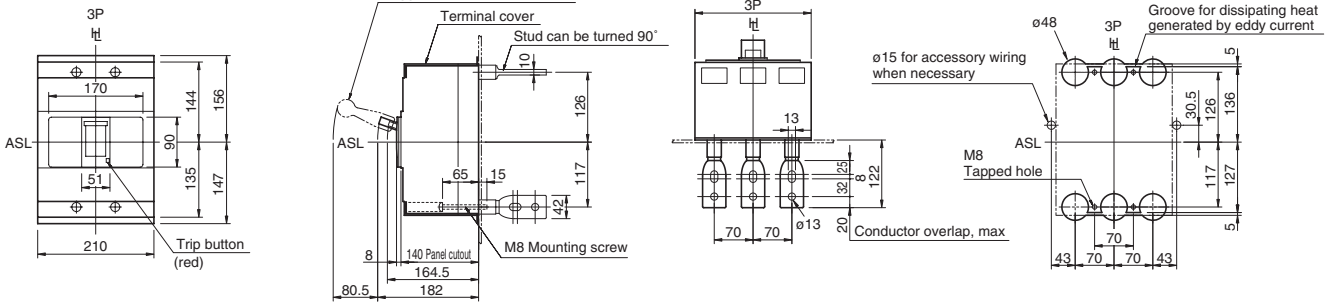
Outline Dimensions (Special breakers)

690V AC Circuit Breakers

Outline dimensions (mm) — L800-PE

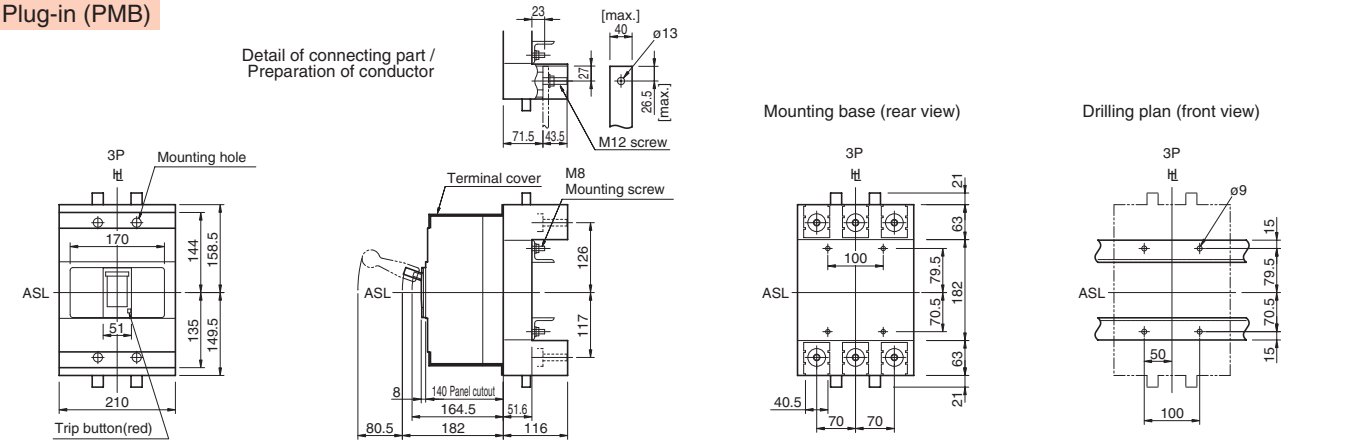
ASL : Arrangement Standard Line ℄ : Handle Centre Line ℍ : Handle Frame Centre Line

Rear-connected

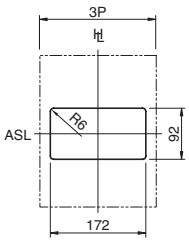


Note: Studs are factory installed in horizontal direction both on the line and load sides.

Plug-in (PMB)



Panel cutout (front view)



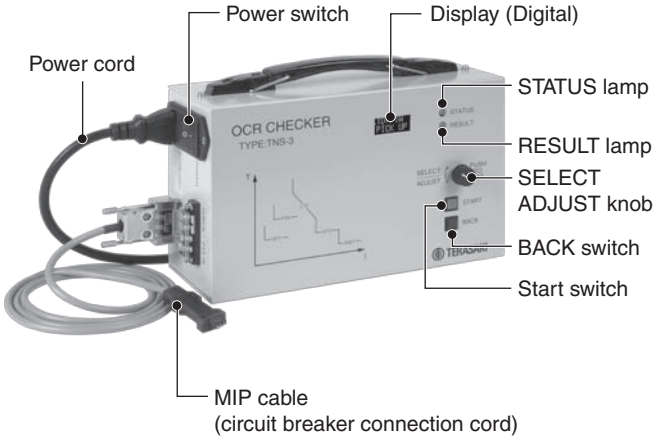
Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

8 Appendix

8 Appendix

1 Maintenance and Inspection Checker

TNS-3 OCR Checker



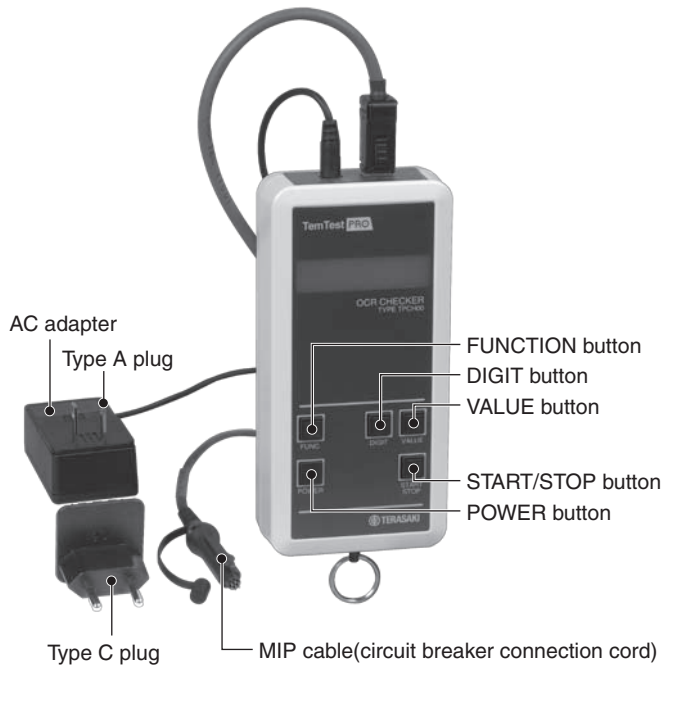
The TNS-3 type OCR checker can be used to easily check the trip function of XOU type OCR and XOS type OCR electronic circuit breakers and AGR12BL type OCR AR-E type air circuit breakers in the field. The types of check are the set current value and tripping time of each of Long Time Delay (LTD), Short 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 (Set current and trip time values) ●STD function check (Set trip time value) ●INST function check (Set trip time value) ●GFT function check (Set trip time value)
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 ①	Order codes 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.

TPCH00 OCR Checker



The TPCH00 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	TPCH00
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 (Set current and tripping time values) ●STD function check (Set current and tripping time values) ●INST function check (Set current value) ●Preferential trip alarm function check (Set current and tripping time values) ●GF function check (Set current and tripping time values) ●N-phase protection function check (Set current and tripping time values)
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

2 Internal Resistance and Power Consumption

■ Moulded Case Circuit Breakers

Frame size(A)	Breaker	Rated current (A)	Internal resistance (DCmΩ) ① ・Value per pole		DC Power consumption (W) ② ・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
		125	0.73	0.87	11.4	13.6
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
250	**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
		250	0.26	0.4	16.25	25
	E250-SCJ E250-SJ	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
		250	0.26	0.4	16.3	25
	P250F TM P250N TM P250H TM	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
		250	0.41	0.68	25.6	42.5
	P250F ELE P250N ELE P250H ELE	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
		250	0.6	0.87	37.5	54.4
	H250NJ L250NJ	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
	P400F TM P400N TM P400H TM P400S TM	250	0.16	0.3	10	19
		400	0.16	0.25	26	40
	H400-NE L400-NE	250	0.19	0.23	11.9	14.4
		400	0.19	0.23	30.4	36.8
	L400-PE	250	0.19	0.23	11.9	14.4
		400	—	0.23	—	36.8
630	**P630E TM P630F TM P630N TM P630H TM P630S TM**	630	0.13	—	52	—
	P630F ELE P630N ELE P630H ELE P630S ELE	630 (FC)	0.09	—	36	—
		570 (Plug-in)	—	0.2	—	65
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
	S800-NE S800-RE S800-PE	630	0.08	0.09	31.8	35.7
		800	0.08	0.1	51.2	64
	H800-NE L800-NE	630	0.1	0.12	39.7	47.6
		800	0.1	0.12	64	76.8
	L800-PE	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

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

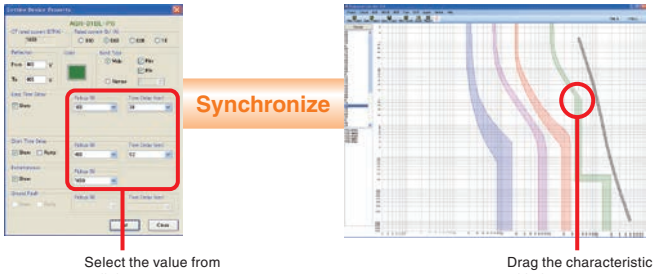
can carry out the selectivity studies for Terasaki low-voltage air circuit breakers and moulded case circuit breakers very simply and quickly.

Comprehensive device database

Included in the software are high-voltage and low-voltage fuses, Terasaki air circuit breakers, Terasaki moulded case circuit breakers, Terasaki miniature breakers for distribution boards and overcurrent relays, etc. Moreover, it is possible to input thermal resistant characteristics of generators if needed, and to have a look at generator protections coordination.

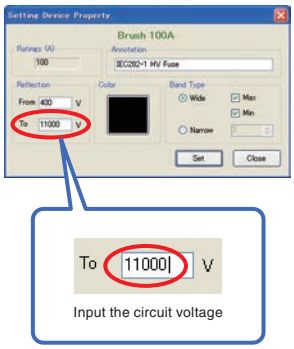
Time-current curves can be adjusted easily

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.



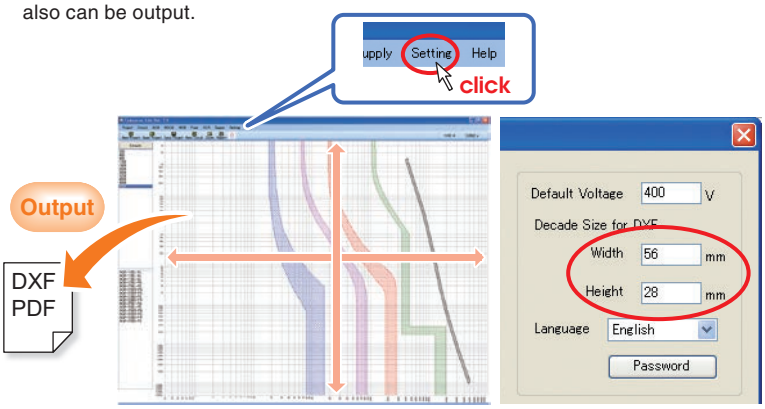
Simple coordination with high-voltage devices

It is possible to coordinate between high-voltage and low-voltage devices by inputting the voltage of the high-voltage side.



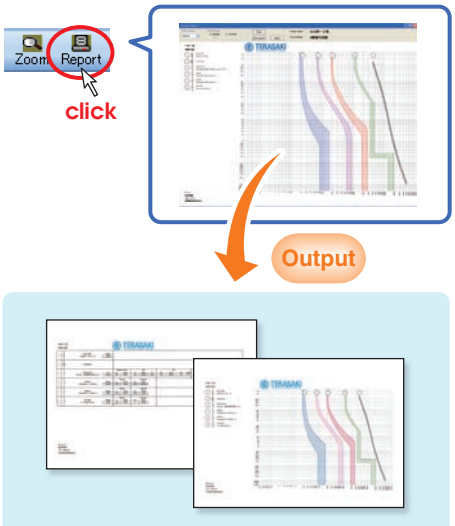
Output the coordination characteristics curves into CAD

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 graph for 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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⚠ Safety Notice

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

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