TERASAKI
Innovators in Protection Technology

DC Air Circuit Breakers
Moulded Case Circuit Breakers

TemP2ower & TemB2reak

TERASAKI ELECTRIC CO., LTD.

www.terasaki.co.jp

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1 General

Introduction

In recent years, as part of the drive to reduce greenhouse gas emissions, significant attention is now being directed towards the energy produced by large-scale photovoltaic (solar), wind, and biomass energy power generation.
The total power generation capacity of facilities for these new energy sources is expected to exceed that produced by nuclear energy by approximately 2030. To aid and support these new technologies, Terasaki now offer a new, broad range of dedicated DC air circuit breakers and moulded case circuit breakers. The new range of Terasaki DC circuit breakers are ideally suited for all types of industries, buildings, as well as the information technology and communications sectors where highly reliable sources of electric power are required.

AR220S
DC
Air Circuit Breakers

Rated current 2000A
Rated breaking capacity DC600V 40kA

PVS400-NDL
DC
Moulded Case Circuit Breakers

Rated current 400A
Rated breaking capacity DC750V 10kA

General

DC power sources for the Uninterruptible Power Supply (UPS) market

Electrical and electronic equipment used in the advanced information and communications sectors requires a highly reliable power source. Should a power failure occur, and to assist with continuity of electrical power, it is standard practice to install an Uninterruptable Power Supply (UPS).

A data centre is where Internet servers and other systems for data communications, such as fixed, mobile, and IP telephones are installed. At the data centre, AC power from the main system power source is sent to the UPS, and is temporarily converted to DC power. A storage battery is then charged with this DC power, which is re-converted back into AC power and then sent to the information equipment.

Building and Industrial power back-up

A UPS is typically required for critical power systems in department stores, hotels, hospitals, theaters, and office buildings. For example, in semiconductor manufacturing plants that feature advanced automation as a part of their production processes, UPS systems with large battery capacities are used to take measures against any large-scale power outage affecting critical manufacturing facilities.

Photovoltaic power generation

Photovoltaic (or Solar) power generation, which is attracting attention as clean energy, ranges from simple generation of up to several kilowatts for home use, to larger systems of 100 kilowatts or greater for industrial use.

In the "School New Deal" program, one of the governmental measures during the economic crisis, were for eco-friendly modifications which advocated the use of photovoltaic power generation at schools. One example is a power distribution system linked to a source of photovoltaic power generation. The current produced from the photovoltaic solar cells is sent to a power conditioner via a diode with a DC circuit breaker in a junction box and then converted into AC, which can then be supplied to a load via a distribution board.

Rationalization of use of electric power via large-capacity storage battery

Energy from new power sources such as wind and photovoltaic power generation do not have a stable output. A lithium ion battery and a sodium-sulfur (NAS) battery can suppress such fluctuations by load leveling. The battery is charged at night using a lower electrical power rate at night and discharged at daytime when the electrical power usage rate is higher, and in addition, any new electrical power generated can also be saved. For this purpose, large-capacity storage battery systems are used at wind and photovoltaic power generation facilities. The use of these types of systems is expected to grow across all user sectors requiring large amounts of power, plus as an additional measure against possible power outages.

Selection Chart

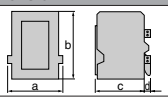
Voltage		Frame size (A) 160	250	400	800
Air Circuit Breakers	800V				
	600V				
Moulded Case Circuit Breakers	1000V	PVS160-SDH 4P 5kA/5kA	PVS250-SDH 4P 5kA/5kA	PVS400-NDH 4P 5kA/5kA	PVS800-NDH 4P 5kA/5kA
	750V	PVE160-SDL 3P 3kA/3kA	PVS160-SDL 3P 5kA/5kA	PVS250-SDL 3P 5kA/5kA	PVS400-NDL 3P 10kA/5kA	PVS800-NDL 3P 10kA/10kA
			PVS160-SDL 4P 10kA/5kA	PVS250-SDL 4P 10kA/5kA	PVS400-NDL 4P 10kA/10kA	PVS800-NDL 4P 10kA/10kA
	600V	S160-SD 3P 5kA/5kA	S160-GD 3P 10kA/5kA	S250-SD 3P 5kA/5kA	S250-GD 3P 10kA/5kA	S400-ND 3P 15kA/15kA	S800-ND 3P 20kA/10kA
	500V	S160-SD 3P 7.5kA/7.5kA	S160-GD 3P 15kA/7.5kA	S250-SD 3P 7.5kA/7.5kA	S250-GD 3P 15kA/7.5kA	
	350V	S160-SD 3P 10kA/10kA		S250-SD 3P 10kA/10kA		S400-ND 3P 20kA/20kA	S800-ND 3P 30kA/15kA
	250V				
Switch-disconnectors	1000V	PVS160-SNH 4P	PVS250-SNH 4P	PVS400-NNH 4P	PVS800-NNH 4P
	800V	PVS160-SNL 4P	PVS250-SNL 4P	PVS400-NNL 4P	PVS800-NNL 4P
	600V	S160-SDN 3P	S250-SDN 3P		

1000	1250	1600	2000	2500	3200	4000
				AR325-NDH 4P 30kA/30kA		
		AR216S 3P 40kA/40kA	AR220S 3P 40kA/40kA	AR325S 3P 40kA/40kA	AR332S 3P 40kA/40kA	AR440S 3P 40kA/40kA
S1000-ND 3P 20kA/10kA	XS1250ND 3P 20kA/15kA	XS1600ND 3P 20kA/15kA	XS2000ND 3P 20kA/15kA	XS2500ND 3P 20kA/15kA	XS3200ND 3P 20kA/15kA	
S1000-ND 3P 30kA/15kA	XS1250ND 3P 50kA/25kA	XS1600ND 3P 50kA/25kA	XS2000ND 3P 50kA/25kA	XS2500ND 3P 50kA/25kA	XS3200ND 3P 50kA/25kA	
S1000-ND 2P 50kA/20kA	XS1250ND 2P 50kA/30kA	XS1600ND 2P 50kA/30kA	XS2000ND 2P 50kA/30kA	XS2500ND 2P 50kA/30kA	XS3200ND 2P 50kA/30kA	

S160-SD
3P — Number of poles
5kA/5kA
I_{cu} — I_{cs}

2 Ratings and Specifications

Air Circuit Breakers for DC350V-800V

								Sale shortly	
Frame size (A)				1600	2000	2500	2500	3200	4000	4000
Type				**AR216S**	**AR220S**	**AR325S**	**AR325-NDH**	**AR332S**	**AR440SB**	**AR440S**
Rated current (max.) [I_n] A				1600	2000	2500	2500	3200	4000	4000
Number of poles				3	3	3	4	3	3	3
Rated insulation voltage [U_i] V			AC	1000	1000	1000	1000	1000	1000	1000
Rated operational voltage [U_e] V			DC	600	600	600	800	600	600	600
Rated impulse withstand voltage [U_{imp}] kV				12	12	12	12	12	12	12
■Rated breaking cap, kA										
JIS C 8201-2-1 Ann.1 Ann.2		DC	800V	—	—	—	30/30	—	—	—
IEC 60947-2			600V	40/40	40/40	40/40	—	40/40	40/40	40/40
I_{cu}/I_{cs} ①②			500V	40/40	40/40	40/40	—	40/40	40/40	40/40
			350V	40/40	40/40	40/40	—	40/40	40/40	40/40
Rated short time withstand current [I_{cw}] kA			1s	40	40	40	30	40	40	40
Latching current kA				65	65	85	85	85	85	100
Total breaking time (s)				0.04	0.04	0.04	0.04	0.04	0.04	0.04
■Closing operation time										
Spring charging time (s) max.				10	10	10	10	10	10	10
Close time (s) max.				0.08	0.08	0.08	0.08	0.08	0.08	0.08
■No. of operating cycles										
Mechanical life	with maintenance			30000	25000	20000	20000	20000	15000	15000
	without maintenance			15000	12000	10000	10000	10000	8000	8000
Electrical life	without maintenance	DC	600V	1000	1000	500	500	500	500	500
■Outline dimension mm										
Draw-out type 			a	354	354	460	580	460	460	631
			b	460	460	460	460	460	460	460
			c	345	345	345	345	345	345	375
			d	40	40	40	40	40	140	53
Weight kg				76	79	105	125	105	126	139
Reverse connection				Yes	Yes	Yes	Yes	Yes	Yes	Yes

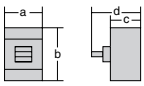
Notes:

— : "no" or "not available".

① : AGR over-current release can not be used for DC. Please prepare DC over-current relay and connect with shunt trip device.

② : The time constant (L/R) of the circuit should be,
less than 2.0ms nearby rated current
less than 15ms for short circuit

Moulded Case Circuit Breakers for DC350V-600V

Frame size (A)			160	160	250	250	400	800	1000	
Type			**S160-SD**	**S160-GD**	**S250-SD**	**S250-GD**	**S400-ND**	**S800-ND**	**S1000-ND**	
Number of poles			3	3	3	3	3	3	2＊	3
■Ratings										
Rated current, A			25 (16-25)	25 (16-25)	100 (63-100)	100 (63-100)	250 (160-250)	630 (400-630)	1000	
Calibrated at 45°C			32 (20-32)	32 (20-32)	125 (80-125)	125 (80-125)	400 (250-400)	800 (500-800)		
			40 (25-40)	40 (25-40)	160 (100-160)	160 (100-160)				
			63 (40-63)	63 (40-63)	200 (125-200)	200 (125-200)				
			80 (50-80)	80 (50-80)	250 (160-250)	250 (160-250)				
			100 (63-100)	100 (63-100)						
＊2 poles breaker is same outline dimensions as 3 poles breaker.			125 (80-125)	125 (80-125)						
			160 (100-160)	160 (100-160)						
Rated insulation voltage〔U_i〕 V			690	690	800	800	800	800	800	
Rated impulse withstand voltage〔U_{imp}〕 kV			8	8	8	8	8	8	8	
■Rated breaking capacity, kA										
JIS C 8201-2-1 Ann.1 Ann.2	DC	600V	5/5	10/5	5/5	10/5	15/15	20/10	—	20/10
IEC 60947-2		500V	7.5/7.5	15/7.5	7.5/7.5	15/7.5	15/15	20/10	—	20/10
I_{cu}/I_{cs} ④⑤		350V	10/10	—	10/10	—	20/20	30/15	—	30/15
		250V	—	—	—	—	—	—	50/20	—
■External dimensions, mm										
		a	75	75	105	105	140	210	210	
		b	130＋50 ⑰	130＋50 ⑰	165＋55 ⑰	165＋55 ⑰	260	273	273	
		c	68	68	68	68	103	103	103	
		d	95	95	95	95	145	145	145	
Weight (◉ marked standard type) kg			0.8	0.8	1.5	1.5	4.2	8.5	9.8	10.8
■Connections and Mountings										
Front-connected (FC)	Terminal screws		◉	◉	◉	◉	◉	—	—	
	With extension bars		○ (BAR)	○ (BAR)	○ (BAR)	○ (BAR)	○ (BAR)	◉	◉	
Rear-connected (RC)	Flat bar studs		○	○	○	○	○	○	○	
Plug-in (PM)	For switchboards		—	—	—	—	—	—	—	
	For distribution boards		—	—	—	—	—	—	—	
Draw-out type (DR)			—	—	—	—	—	—	—	
TemPlug70 (PG)			—	—	—	—	—	—	—	
TemPlug45B (PG4)			—	—	—	—	—	—	—	
DIN rail mount			○ ⑪	○ ⑪	—	—	—	—	—	
Clip-in chassis mount			—	—	—	—	—	—	—	
■Accessories (optional)		**Symbol**								
Interior: Auxiliary switch		A X	●	●	●	●	●	●	●	
Interior: Alarm switch		A L	●	●	●	●	●	●	●	
Interior: Shunt trips		S H	●	●	●	●	●	●	●	
Interior: Undervoltage trips		U V	●	●	●	●	●	●	●	
Exterior: Motor operator		M C	—	—	●	●	●	●	●	
Exterior: External operating handle	Breaker-mounted	H B	●	●	●	●	●	●	●	
	Door-mounted (variable depth)	H P	●	●	●	●	●	●	●	
Exterior: Toggle extension		H A	—	—	—	—	—	●	●	
Exterior: Mechanical interlock	Slide type	M S	●	●	●	●	●	●	●	
	Rear-connected type	M B	—	—	—	—	—	—	—	
	Link type	M L	—	—	●	●	●	●	●	
	Wire type	M W	—	—	●	●	●	●	●	
Exterior: Toggle holder		H H	●	●	●	●	●	●	●	
Exterior: Toggle lock		H L	●	●	●	●				
Exterior: Terminal cover	For front-connected	C F	● ⑫	● ⑫	● ⑫	● ⑫	●	●	●	
	For rear-connected and plug-in	C R	● ⑫	● ⑫	● ⑫	● ⑫	●	●	●	
Exterior: Interpole barrier		B A	● ⑬	● ⑬	● ⑬	● ⑬	● ③	● ③	● ③	
Exterior: Terminal block for lead		T F	●	●	●	●	●	●	●	
Exterior: Door flange		D F	●	●	●	●	●	●	●	
■Standard specifications										
Overcurrent trip mechanism			Adj. thermal, fixed magnetic	Adj. thermal, fixed magnetic	Adj. thermal, fixed magnetic	Adj. thermal, fixed magnetic	Adj. thermal, fixed magnetic	Adj. thermal, fixed magnetic	Fixed thermal, fixed magnetic	
Colour of cover			Grey	Grey	Grey	Grey	Grey	Grey	Grey	
Trip button (Colour)			Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	
Handle position indication (ON: Red, OFF: Green)			Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Suitability for isolation			Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Reverse connection			Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Notes:

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

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

④ : Connect 3pole or 4pole in series when over DC250V.

⑤ : The time constant (L/R) of the circuit should be,
less than 2.0ms nearby rated current
less than 5ms for short circuit ≦ 10KA
less than 10ms for short circuit ≦ 20KA
less than 15ms for short circuit ＞ 20KA

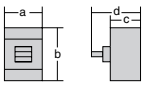
⑪ : Provided with DIN rail adaptor.

⑫ : Line side terminal cover is supplied as standard at any voltage.

⑬ : Possible to fit on load side (option).

⑰ : ＋ means the dimension of the terminal cover. See outline dimensions for details.

Moulded Case Circuit Breakers for DC350V-600V

Frame size (A)			1250		1600		2000		2500		3200			
Type			**XS1250ND**		**XS1600ND**		**XS2000ND**		**XS2500ND**		**XS3200ND**			
Number of poles			2＊	3	2＊	3	2＊	3	2＊	3	2＊	3		
■Ratings														
Rated current, A			1250 ①		1600 ①		2000 ①		2500 ①		3200 ①			
Calibrated at 45°C														
＊2 poles breaker is same outline dimensions as 3 poles breaker.														
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 breaking capacity, kA														
JIS C 8201-2-1 Ann.1 Ann.2	DC	600V	—	20/15	—	20/15	—	20/15	—	20/15	—	20/15		
IEC 60947-2		500V	—	50/25	—	50/25	—	50/25	—	50/25	—	50/25		
I_{cu}/I_{cs} ④⑤		350V	—	50/25	—	50/25	—	50/25	—	50/25	—	50/25		
		250V	50/30	—	50/30	—	50/30	—	50/30	—	50/30	—		
■External dimensions, mm														
		a	210		210		320		320		320			
		b	370		370		450		450		450			
		c	140		140		185		185		185			
		d	191		191		245		245		245			
Weight (◉ marked standard type) kg			23.8	26.0	24.0	27.0	50.0	54.0	55.7	62.5	55.7	62.5		
■Connections and Mountings														
Front-connected (FC)	Terminal screws		—		—		—		—		—			
	With extension bars		◉		○		○		—		—			
Rear-connected (RC)	Flat bar studs		○		◉		◉		◉		◉			
Plug-in (PM)	For switchboards		—		—		—		—		—			
	For distribution boards		—		—		—		—		—			
Draw-out type (DR)			—		○		○		—		—			
TemPlug70 (PG)			—		—		—		—		—			
TemPlug45B (PG4)			—		—		—		—		—			
DIN rail mount			—		—		—		—		—			
Clip-in chassis mount			—		—		—		—		—			
■Accessories (optional)		**Symbol**												
Interior: Auxiliary switch		A X	●		●		●		●		●			
Interior: Alarm switch		A L	●		●		●		●		●			
Interior: Shunt trips		S H	●		●		●		●		●			
Interior: Undervoltage trips		U V	●		●		—		—		—			
Motor operator		M C	●		●		●		●		●			
Exterior: External operating handle	Breaker-mounted	H B	●		●		—		—		—			
	Door-mounted (variable depth)	H P	●		●		● ⑦		● ⑦		● ⑦			
Toggle extension		H A	● ⑥		● ⑥		● ②		● ②		● ②			
Exterior: Mechanical interlock	Slide type	M S	●		●		●		●		●			
	Rear-connected type	M B	●		●		●		●		●			
	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	—		—		—		—		—			
Interpole barrier		B A	● ③		● ③		—		—		—			
Terminal block for lead		T F	●		●		●		●		●			
Door flange		D F	●		●		●		●		●			
■Standard specifications														
Overcurrent trip mechanism			Magnetic(adjustable) ①		Magnetic(adjustable) ①		Magnetic(adjustable) ①		Magnetic(adjustable) ①		Magnetic(adjustable) ①			
Colour of cover			Grey		Grey		Grey		Grey		Grey			
Trip button (Colour)			Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)		Yes (Red)			
Handle position indication (ON: Red, OFF: Green)			Yes		Yes		Yes		Yes		Yes			
Suitability for isolation			Yes		Yes		Non		Non		Non			
Reverse connection			Non		Non		Non		Non		Non			

Notes:

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

① : Instantaneous trip oinly.

② : Supplied as standard.

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

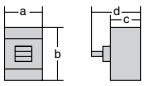
④ : Connect 3pole in series when over DC250V.

⑤ : The time constant (L/R) of the circuit should be,
less than 2.0ms nearby rated current
less than 5ms for short circuit ≦ 10KA
less than 10ms for short circuit ≦ 20KA
less than 15ms for short circuit ＞ 20KA

⑥ : One is supplied with every five breakers. Please specify if more are required.

⑦ : Fixed depth. (not adjustable)

Moulded Case Circuit Breakers for DC750V-1000V

Frame size (A)			160	160		160	250		250
Type			**PVE160-SDL**	**PVS160-SDL**		**PVS160-SDH**	**PVS250-SDL**		**PVS250-SDH**
Number of poles			3	3	4	4	3	4	4
■Ratings									
Rated current, A			25 (16-25)	50 (32-50)	50 (32-50)	50 (32-50)	100 (63-100)	100 (63-100)	100 (63-100)
Calibrated at 45°C			32 (20-32)	63 (40-63)	63 (40-63)	63 (40-63)	125 (80-125)	125 (80-125)	125 (80-125)
			40 (25-40)	100 (63-100)	100 (63-100)	100 (63-100)	160 (100-160)	160 (100-160)	160 (100-160)
			63 (40-63)	125 (80-125)	125 (80-125)	125 (80-125)	200 (125-200)	200 (125-200)	200 (125-200)
			80 (50-80)	160 (100-160)	160 (100-160)	160 (100-160)	250 (160-250)	250 (160-250)	250 (160-250)
			100 (63-100)						
＊2 poles breaker is same outline dimensions as 3 poles breaker.			125 (80-125)						
			160 (100-160)						
Rated insulation voltage〔U_i〕 V		AC	800	800	800	1000	800	800	1000
Rated impulse withstand voltage〔U_{imp}〕 kV			8	8	8	8	8	8	8
■Rated breaking capacity, kA									
JIS C 8201-2-1 Ann.1 Ann.2		DC 1000V	—	—	—	5/5	—	—	5/5
IEC 60947-2 I_{cu}/I_{cs} ①②		750V	3/3	5/5	10/5	—	5/5	10/5	—
■External dimensions, mm									
		a	75	105	140	140＋55×2 ⑰	105	140	140＋55×2 ⑰
		b	130＋50×2 ⑰	165＋55×2 ⑰	165＋55×2 ⑰	165	165＋55×2 ⑰	165＋55×2 ⑰	165
		c	68	68	68	68	68	68	68
		d	95	95	95	95	95	95	95
Weight (◉ marked standard type) kg			0.8	1.5	1.9	1.9	1.5	1.9	1.9
■Connections and Mountings									
Front-connected (FC)	Terminal screws		◉	◉	◉	◉	◉	◉	◉
	With extension bars		○ (BAR)	○ (BAR)	○ (BAR)	○ (BAR)	○ (BAR)	○ (BAR)	○ (BAR)
Rear-connected (RC)	Flat bar studs		○	○	○	○	○	○	○
Plug-in (PM)	For switchboards		—	—	—	—	—	—	—
	For distribution boards		—	—	—	—	—	—	—
Draw-out type (DR)			—	—	—	—	—	—	—
TemPlug70 (PG)			—	—	—	—	—	—	—
TemPlug45B (PG4)			—	—	—	—	—	—	—
DIN rail mount			—	—	—	—	—	—	—
Clip-in chassis mount			—	—	—	—	—	—	—
■Accessories (optional)		**Symbol**							
Interior: Auxiliary switch		A X	●	●	●	●	●	●	●
Interior: Alarm switch		A L	●	●	●	●	●	●	●
Interior: Shunt trips		S H	●	●	●	●	●	●	●
Interior: Undervoltage trips		U V	●	●	●	●	●	●	●
Exterior: Motor operator		M C	—	●	●	●	●	●	●
Exterior: External operating handle	Breaker-mounted	H B	●	●	●	●	●	●	●
	Door-mounted (variable depth)	H P	●	●	●	●	●	●	●
Exterior: Toggle extension		H A	—	—	—	—	—	—	—
Exterior: Mechanical interlock	Slide type	M S	●	●	●	●	●	●	●
	Rear-connected type	M B	—	—	—	—	—	—	—
	Link type	M L	—	●	●	●	●	●	●
	Wire type	M W	—	●	●	●	●	●	●
Exterior: Toggle holder		H H	●	●	●	●	●	●	●
Exterior: Toggle lock		H L	●	●	●	●	●	●	●
Exterior: Terminal cover	For front-connected	C F	● ⑧	● ⑧	● ⑧	● ⑧	● ⑧	● ⑧	● ⑧
	For rear-connected and plug-in	C R	● ⑧	● ⑧	● ⑧	● ⑧	● ⑧	● ⑧	● ⑧
Exterior: Interpole barrier		B A	—	—	—	—	—	—	—
Exterior: Terminal block for lead		T F	●	●	●	●	●	●	●
Exterior: Door flange		D F	●	●	●	●	●	●	●
■Standard specifications									
Overcurrent trip mechanism			Adj. thermal, fixed magnetic	Adj. thermal, fixed magnetic	Adj. thermal, fixed magnetic	Adj. thermal, fixed magnetic	Adj. thermal, fixed magnetic	Adj. thermal, fixed magnetic	Adj. thermal, fixed magnetic
Colour of cover			Grey	Grey	Grey	Grey	Grey	Grey	Grey
Trip button (Colour)			Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)
Handle position indication (ON: Red, OFF: Green)			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Suitability for isolation			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reverse connection			Yes	Yes	Yes	⑱	Yes	Yes	⑱

Notes:

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

① : Connect 3poles or 4poles in series.

② : The time constant (L/R) of the circuit should be,
less than 2.0ms nearby rated current
less than 5ms for short circuit ≦ 10KA
less than 10ms for short circuit ≦ 20KA
less than 15ms for short circuit ＞ 20KA

⑧ : Both line and load side terminal covers are supplied as standard.

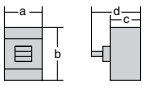
⑰ : ＋ means the dimension of the terminal cover. See outline dimensions for details.

⑱ : Two breakers are available, for ordlnary connection or for reverse connection. Please specify either.

Moulded Case Circuit Breakers for DC750V-1000V

Frame size (A)			400		400	800		800	
Type			**PVS400-NDL**		**PVS400-NDH**	**PVS800-NDL**		**PVS800-NDH**	
Number of poles			3	4	4	3	4	4	
■Ratings									
Rated current, A			250 (160-250)	250 (160-250)	250 (160-250)	630 (400-630)	630 (400-630)	630 (400-630)	
Calibrated at 45°C			400 (250-400)	400 (250-400)	400 (250-400)	800 (500-800)	800 (500-800)	800 (500-800)	

＊2 poles breaker is same outline dimensions as 3 poles breaker.

Rated insulation voltage〔U_i〕 V		AC	800	1150	1150	800	1150	1150	
Rated impulse withstand voltage〔U_{imp}〕 kV			8	8	8	8	8	8	
■Rated breaking capacity, kA									
JIS C 8201-2-1 Ann.1 Ann.2		DC 1000V	—	—	5/5	—	—	5/5	
IEC 60947-2 I_{cu}/I_{cs} ①②		750V	10/5	10/10	—	10/10	10/10	—	
■External dimensions, mm									
		a	140	185	185	210	280	280	
		b	260	260	260	273	273	273	
		c	103	103	103	103	103	103	
		d	145	145	145	145	145	145	
Weight (◉ marked standard type) kg			4.2	5.6	5.6	8.5	11.5	11.5	
■Connections and Mountings									
Front-connected (FC)	Terminal screws		◉	◉	◉	—	—	—	
	With extension bars		○(BAR)	○(BAR)	○(BAR)	◉	◉	◉	
Rear-connected (RC)	Flat bar studs		○	○	○	○	○	○	
Plug-in (PM)	For switchboards		—	—	—	—	—	—	
	For distribution boards		—	—	—	—	—	—	
Draw-out type (DR)			—	—	—	—	—	—	
TemPlug70 (PG)			—	—	—	—	—	—	
TemPlug45B (PG4)			—	—	—	—	—	—	
DIN rail mount			—	—	—	—	—	—	
Clip-in chassis mount			—	—	—	—	—	—	

■Accessories (optional)			**Symbol**							
Interior	Auxiliary switch			A X	●	●	●	●	●	●	
	Alarm switch			A L	●	●	●	●	●	●	
	Shunt trips			S H	●	●	●	●	●	●	
	Undervoltage trips			U V	●	●	●	●	●	●	
Exterior	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	—	—	—	—	—	—	
		Rear-connected type		M B	—	—	—	—	—	—	
		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	●	●	●	●	●	●	
	Interpole barrier			B A	● ⑯	● ⑨	● ⑨	● ⑯	● ⑩	● ⑩	
	Terminal block for lead			T F	●	●	●	●	●	●	
	Door flange			D F	—	—	—	—	—	—	

■Standard specifications							
Overcurrent trip mechanism	Adj. thermal, fixed magnetic	Adj. thermal, fixed magnetic	Adj. thermal, fixed magnetic	Adj. thermal, fixed magnetic	Adj. thermal, fixed magnetic	Adj. thermal, fixed magnetic	
Colour of cover	Grey	Grey	Grey	Grey	Grey	Grey	
Trip button (Colour)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	
Handle position indication (ON: Red, OFF: Green)	Yes	Yes	Yes	Yes	Yes	Yes	
Suitability for isolation	Yes	Yes	Yes	Yes	Yes	Yes	
Reverse connection	Yes	Yes	Yes	Yes	Yes	Yes	

Notes:

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

① : Connect 3poles or 4poles in series.

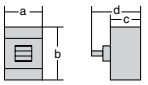
② : The time constant (L/R) of the circuit should be,
less than 2.0ms nearby rated current
less than 5ms for short circuit ≦ 10KA
less than 10ms for short circuit ≦ 20KA
less than 15ms for short circuit ＞ 20KA

⑨ : For front connection, both line and load side interpole barriers are supplied as standard.
For rear connection, line side interpole barriers are supplied as standard.

⑩ : For front connection, 5pcs line side interpole barriers and 3pcs load side interpole barriers are supplied as standard.
For rear connection, 5pcs line side interpole barriers are supplied as standard.

⑯ : For front connection and rear connection, 2pcs line side interpole barriers are supplied as standard.

Switch-disconnectors for DC600V-1000V

Frame size (A)			160	160	160	250	250	250	
Type			**S160-SDN**	**PVS160-SNL**	**PVS160-SNH**	**S250-SDN**	**PVS250-SNL**	**PVS250-SNH**	
Number of poles			3	4	4	3	4	4	
■Ratings									
Rated current, A			160	160	160	250	250	250	
Rated insulation voltage〔U_i〕 V			690	800	1000	800	800	1000	
Rated operational voltage V		DC	600	800	1000	600	800	1000	
Rated short time withstand current, kA			2 (0.3sec.)	3 (0.3sec.)	3 (0.3sec.)	3 (0.3sec.)	3 (0.3sec.)	3 (0.3sec.)	
Rated impulse withstand voltage〔U_{imp}〕 kV			8	8	8	8	8	8	
■Performance									
Utilization category ①②		DC	DC-22A	DC-22A	DC-22A	DC-22A	DC-22A	DC-22A	
JIS C 8201-3 IEC 60947-3									
■External dimensions, mm									
		a	75	140	140	105	140	140	
		b	130	165+55×2 ⑰	165+55×2 ⑰	165	165+55×2 ⑰	165+55×2 ⑰	
		c	68	68	68	68	68	68	
		d	95	95	95	95	95	95	
Weight (◉ marked standard type) kg			0.8	1.9	1.9	1.5	1.9	1.9	
■Connections and Mountings									
Front-connected (FC)	Terminal screws		◉	◉	◉	◉	◉	◉	
	With extension bars		○(BAR)	○(BAR)	○(BAR)	○(BAR)	○(BAR)	○(BAR)	
Rear-connected (RC)	Flat bar studs		○	○	○	○	○	○	
Plug-in (PM)	For switchboards		—	—	—	—	—	—	
	For distribution boards		—	—	—	—	—	—	
Draw-out type (DR)			—	—	—	—	—	—	
TemPlug70 (PG)			—	—	—	—	—	—	
TemPlug45B (PG4)			—	—	—	—	—	—	
DIN rail mount			○⑪	—	—	—	—	—	
Clip-in chassis mount			—	—	—	—	—	—	
■Accessories (optional)		**Symbol**							
Interior: Auxiliary switch		A X	●	●	●	●	●	●	
Interior: Alarm switch		A L	●	●	●	●	●	●	
Interior: Shunt trips		S H	●	●	●	●	●	●	
Interior: Undervoltage trips		U V	●	●	●	●	●	●	
Exterior: Motor operator		M C	—	●	●	●	●	●	
Exterior: External operating handle	Breaker-mounted	H B	●	●	●	●	●	●	
	Door-mounted (variable depth)	H P	●	●	●	●	●	●	
Exterior: Toggle extension		H A	—	—	—	—	—	—	
Exterior: Mechanical interlock	Slide type	M S	●	●	●	●	●	●	
	Rear-connected type	M B	—	—	—	—	—	—	
	Link type	M L	—	●	●	●	●	●	
	Wire type	M W	—	●	●	●	●	●	
Exterior: Toggle holder		H H	●	●	●	●	●	●	
Exterior: Toggle lock		H L	●	●	●	●	●	●	
Exterior: Terminal cover	For front-connected	C F	●⑫	●	●⑧	●⑫	●⑧	●⑧	
	For rear-connected and plug-in	C R	●⑫	●	●⑧	●⑫	●⑧	●⑧	
Exterior: Interpole barrier		B A	●⑬	●	—	●⑬	—	—	
Exterior: Terminal block for lead		T F	●	●	●	●	●	●	
Exterior: Door flange		D F	●	●	●	●	●	●	
■Standard specifications									
Colour of cover			Grey	Grey	Grey	Grey	Grey	Grey	
Trip button (Colour)			Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)	
Handle position indication (ON: Red, OFF: Green)			Yes	Yes	Yes	Yes	Yes	Yes	
Suitability for isolation			Yes	Yes	Yes	Yes	Yes	Yes	
Reverse connection			Yes	Yes	⑱	Yes	Yes	⑱	

Notes:

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

① : Connect 3poles or 4poles in series.

② : The time constant (L/R) of the circuit should be,
less than 2.0ms nearby rated current
less than 5ms for short circuit ≦ 10KA
less than 10ms for short circuit ≦ 20KA
less than 15ms for short circuit ＞ 20KA

⑧ : Both line and load side terminal covers are supplied as standard.

⑪ : Provided with DIN rail adaptor.

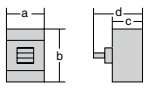
⑫ : Line side terminal cover is supplied as standard at any voltage.

⑬ : Possible to fit on load side (option).

⑰ : ＋ means the dimension of the terminal cover. See outline dimensions for details.

⑱ : Two breakers are available, for ordlnary connection or for reverse connection. Please specify either.

Switch-disconnectors for DC600V-1000V

Frame size (A)			400	400	800	800			
Type			**PVS400-NNL**	**PVS400-NNH**	**PVS800-NNL**	**PVS800-NNH**			
Number of poles			4	4	4	4			
■Ratings									
Rated current, A			400	400	630 800	630 800			
Rated insulation voltage〔U_i〕 V			1150	1150	1150	1150			
Rated operational voltage V		DC	800	1000	800	1000			
Rated short time withstand current, kA			5 (0.3sec.)	5 (0.3sec.)	10 (0.3sec.)	10 (0.3sec.)			
Rated impulse withstand voltage〔U_{imp}〕 kV			8	8	8	8			
■Performance									
Utilization category ①②		DC	DC-22A	DC-22A	DC-22A	DC-22A			
JIS C 8201-3 IEC 60947-3									
■External dimensions, mm									
		a	185	185	280	280			
		b	260	260	273	273			
		c	103	103	103	103			
		d	145	145	145	145			
Weight (◉ marked standard type) kg			5.6	5.6	11.5	11.5			
■Connections and Mountings									
Front-connected (FC)	Terminal screws		◉	◉	—	—			
	With extension bars		○ (BAR)	○ (BAR)	◉	◉			
Rear-connected (RC)	Flat bar studs		○	○	○	○			
Plug-in (PM)	For switchboards		—	—	—	—			
	For distribution boards		—	—	—	—			
Draw-out type (DR)			—	—	—	—			
TemPlug70 (PG)			—	—	—	—			
TemPlug45B (PG4)			—	—	—	—			
DIN rail mount			—	—	—	—			
Clip-in chassis mount			—	—	—	—			
■Accessories (optional)		**Symbol**							
Interior: Auxiliary switch		A X	●	●	●	●			
Interior: Alarm switch		A L	●	●	●	●			
Interior: Shunt trips		S H	●	●	●	●			
Interior: Undervoltage trips		U V	●	●	●	●			
Exterior: Motor operator		M C	●	●	●	●			
Exterior: External operating handle	Breaker-mounted	H B	●	●	●	●			
	Door-mounted (variable depth)	H P	●	●	●	●			
Exterior: Toggle extension		H A	—	—	●	●			
Exterior: Mechanical interlock	Slide type	M S	—	—	—	—			
	Rear-connected type	M B	—	—	—	—			
	Link type	M L	—	—	—	—			
	Wire type	M W	●	●	●	●			
Exterior: Toggle holder		H H	●	●	●	●			
Exterior: Toggle lock		H L							
Exterior: Terminal cover	For front-connected	C F	●	●	●	●			
	For rear-connected and plug-in	C R	●	●	●	●			
Exterior: Interpole barrier		B A	● ⑨	●⑨	● ⑩	● ⑩			
Exterior: Terminal block for lead		T F	●	●	●	●			
Exterior: Door flange		D F	—	—	—	—			
■Standard specifications									
Colour of cover			Grey	Grey	Grey	Grey			
Trip button (Colour)			Yes (Red)	Yes (Red)	Yes (Red)	Yes (Red)			
Handle position indication (ON: Red, OFF: Green)			Yes	Yes	Yes	Yes			
Suitability for isolation			Yes	Yes	Yes	Yes			
Reverse connection			Yes	Yes	Yes	Yes			

Notes:

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

① : Connect 4poles in series.

② : The time constant (L/R) of the circuit should be,
less than 2.0ms nearby rated current
less than 5ms for short circuit ≦ 10KA
less than 10ms for short circuit ≦ 20KA
less than 15ms for short circuit ＞ 20KA

⑨ : For front connection, both line and load side interpole barriers are supplied as standard. For rear connection, line side interpole barriers are supplied as standard.

⑩ : For front connection, 5pcs line side interpole barriers and 3pcs load side interpole barriers are supplied as standard. For rear connection, 5pcs line side interpole barriers are supplied as standard.

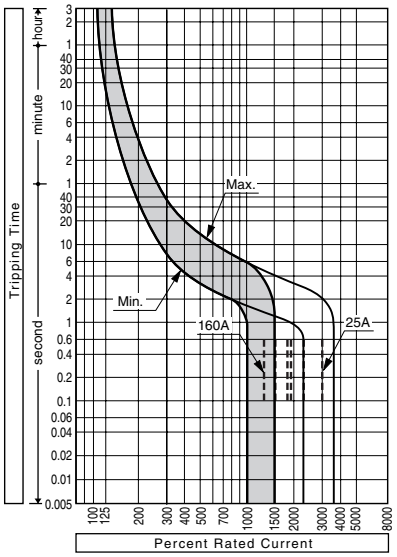
3 Characteristics

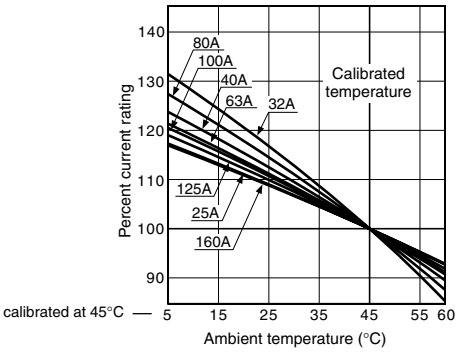
Time/Current characteristic curves, Ambient Compensating Curves

Time/Current characteristic curves, Ambient Compensating Curves

Type	Time/Current characteristic curves, Ambient Compensating Curves

S160-SD 3P
S160-GD 3P
PVE160-SDL 3P

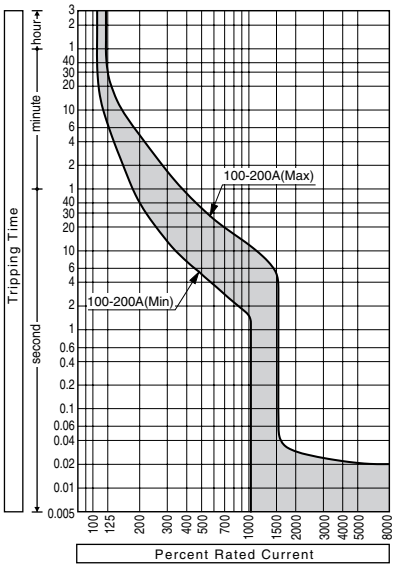


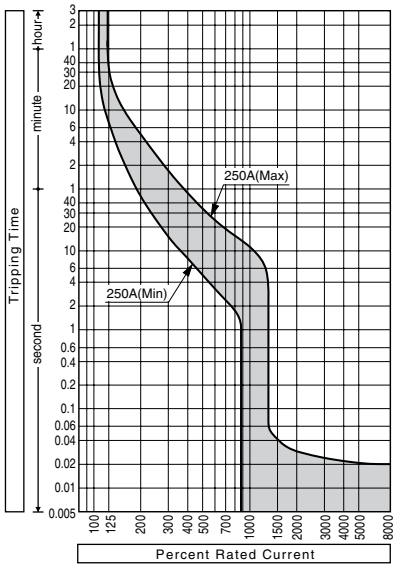


Rated current (A)	Magnetic trip current (A)
25	750
32	750
40	750
63	1220
80	1220
100	1940
125	1940
160	2070

Notes : Setting current ±20%

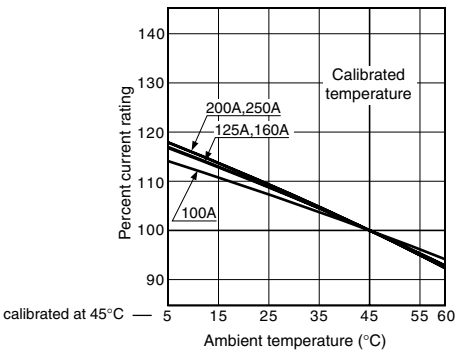
S250-SD 3P
S250-GD 3P





Rated current (A)	Magnetic trip current (A)
100	1300
125	1625
160	2080
200	2600
250	2750

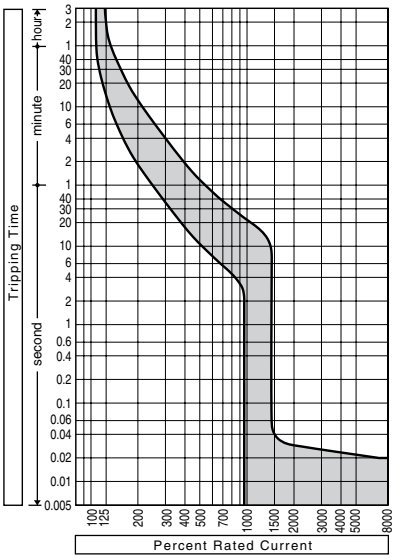
Notes : Setting tolerance ±20%

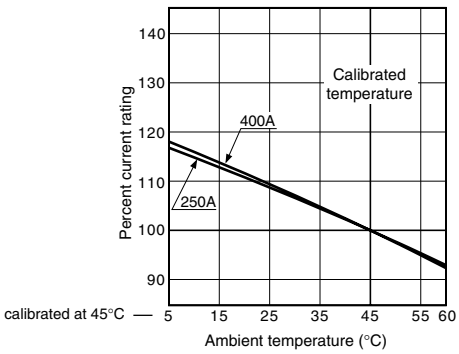


Time/Current characteristic curves, Ambient Compensating Curves

Type	Time/Current characteristic curves, Ambient Compensating Curves

S400-ND 3P

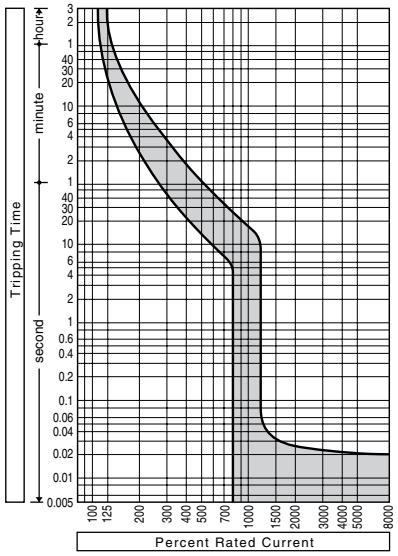


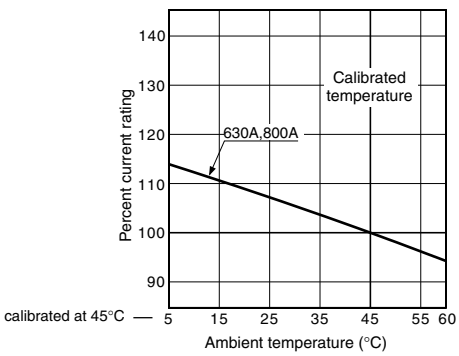


Rated current (A)	Magnetic trip current (A)
250	3000
400	4800

Notes : Setting tolerance ±20%

S800-ND 3P

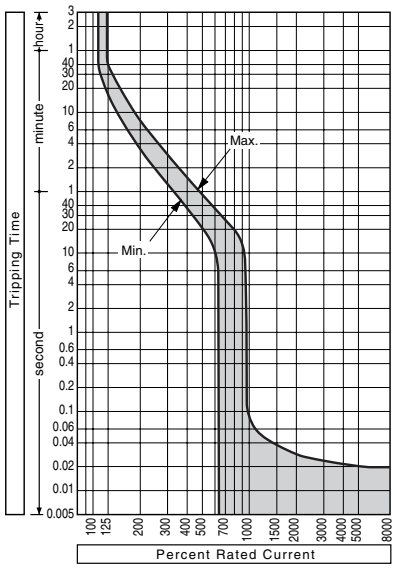


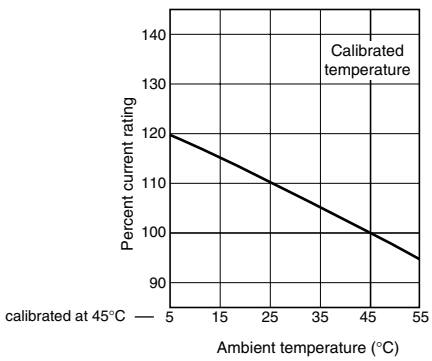


Rated current (A)	Magnetic trip current (A)
630	6300
800	8000

Notes : Setting tolerance ±20%

S1000-ND 2P, 3P

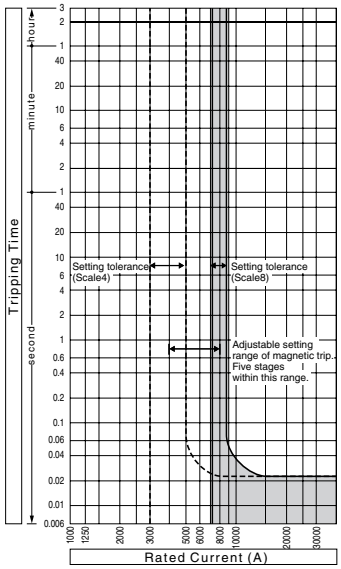
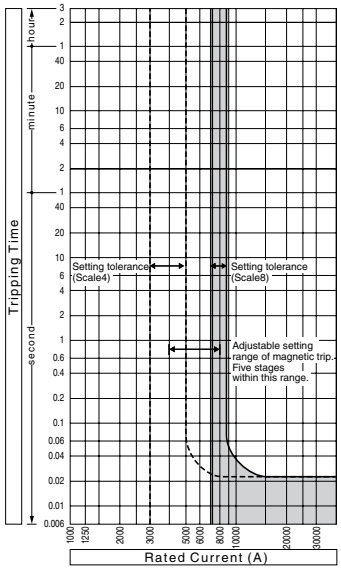
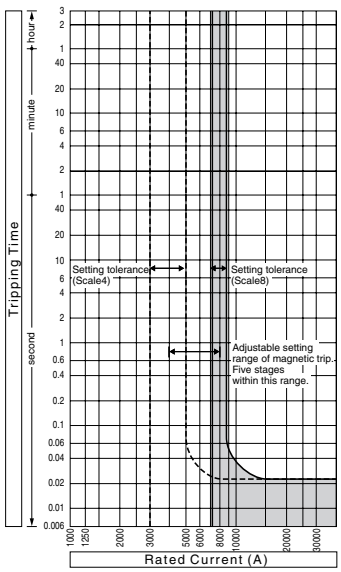




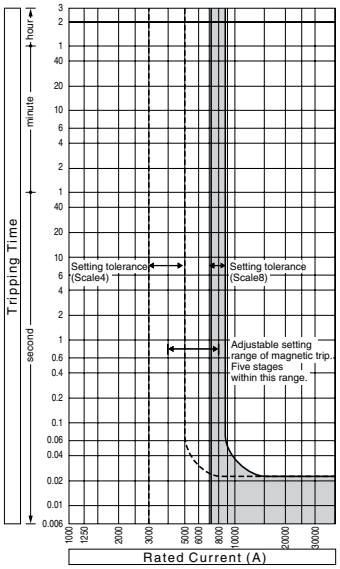
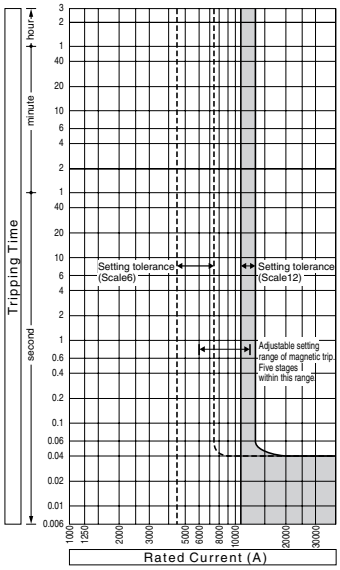
Rated current (A)	Magnetic trip current (A)
1000	8000

Notes : Setting tolerance ±20%

Time/Current characteristic curves, Ambient Compensating Curves

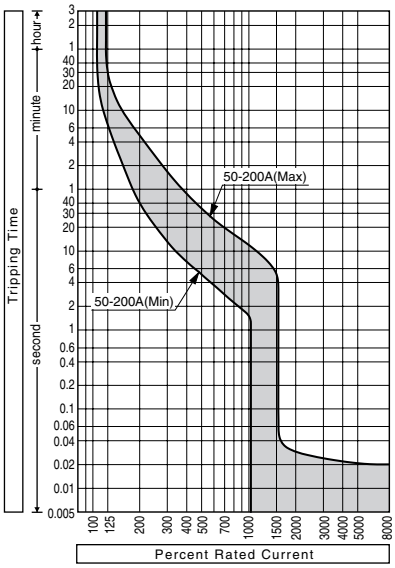
Type	Time/Current characteristic curves, Ambient Compensating Curves
XS1250ND 2P, 3P	 Rated current (A) Scale: Magnetic trip current (A) — 8 / 7.1 / 6.3 / 5 / 4 1250: 8000 / 7100 / 6300 / 5000 / 4000 **Notes :** Setting tolerance ±10% at 8000A and ±25% for other settings. Note: Magnetic trip only. Use the external over-current relay.
XS1600ND 2P, 3P	 Rated current (A) Scale: Magnetic trip current (A) — 8 / 7.1 / 6.3 / 5 / 4 1600: 8000 / 7100 / 6300 / 5000 / 4000 **Notes :** Setting tolerance ±10% at 8000A and ±25% for other settings. Note: Magnetic trip only. Use the external over-current relay.
XS2000ND 2P, 3P	 Rated current (A) Scale: Magnetic trip current (A) — 8 / 7.1 / 6.3 / 5 / 4 2000: 8000 / 7100 / 6300 / 5000 / 4000 **Notes :** Setting tolerance ±10% at 8000A and ±25% for other settings. Note: Magnetic trip only. Use the external over-current relay.

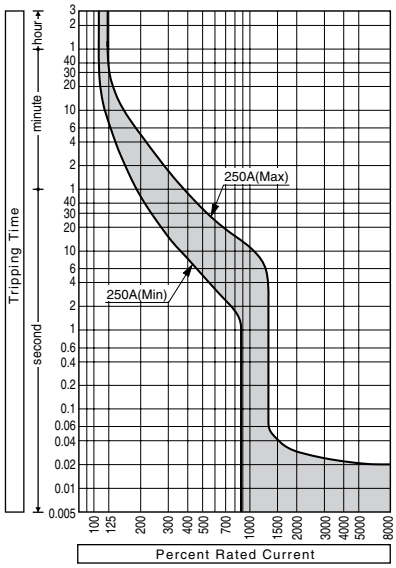
Time/Current characteristic curves, Ambient Compensating Curves

Type	Time/Current characteristic curves, Ambient Compensating Curves
XS2500ND 2P, 3P	 Rated current (A) Scale: 8 / 7.1 / 6.3 / 5 / 4 Magnetic trip current (A): 2500: 8000 / 7100 / 6300 / 5000 / 4000 **Notes :** Setting tolerance ±10% at 8000A and ±25% for other settings. Note: Magnetic trip only. Use the external over-current relay.
XS3200ND 2P, 3P	 Rated current (A) Scale: 12 / 11 / 10 / 8 / 6 Magnetic trip current (A): 3200: 12000 / 11000 / 10000 / 8000 / 6000 **Notes :** Setting tolerance ±10% at 12000A and ±25% for other settings. Note: Magnetic trip only. Use the external over-current relay.

Time/Current characteristic curves, Ambient Compensating Curves

Type	Time/Current characteristic curves, Ambient Compensating Curves
PVS160-SDL 3P, 4P **PVS160-SDH 4P** **PVS250-SDL 3P, 4P** **PVS250-SDH 4P**	





PVS160-SDL, PVS160-SDH

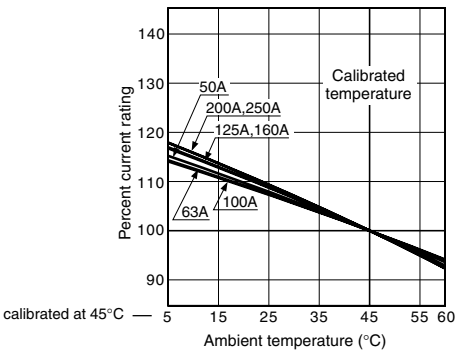
Rated current (A)	Magnetic trip current (A)
50	650
63	819
100	1300
125	1625
160	2080

Notes : Setting tolerance ±20%

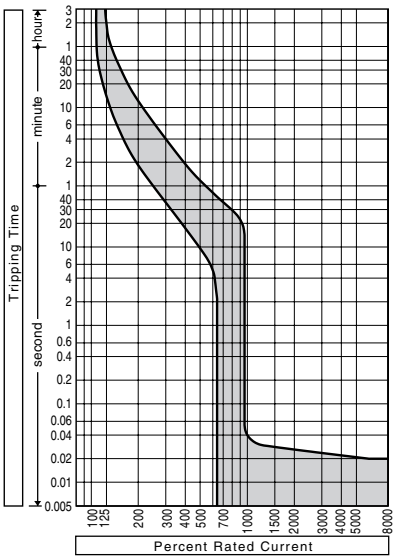
PVS250-SDL, PVS250-SDH

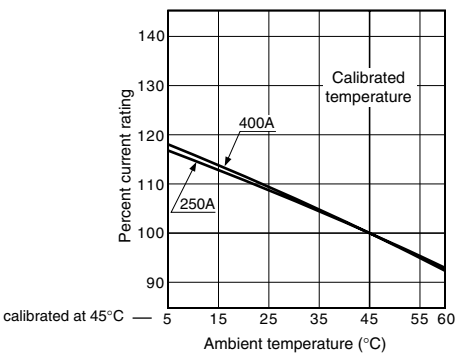
Rated current (A)	Magnetic trip current (A)
100	1300
125	1625
160	2080
200	2600
250	2750

Notes : Setting tolerance ±20%



PVS400-NDL 3P

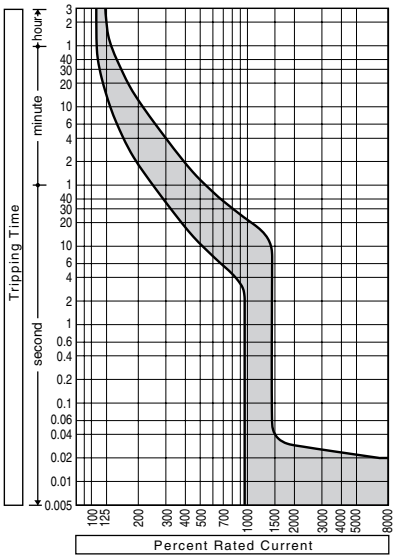
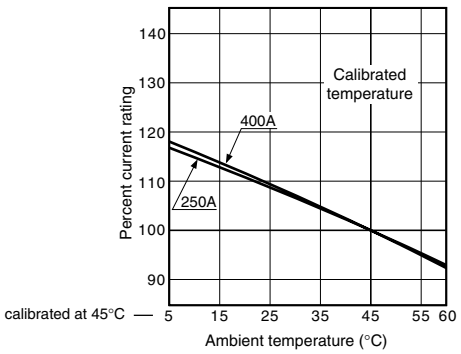
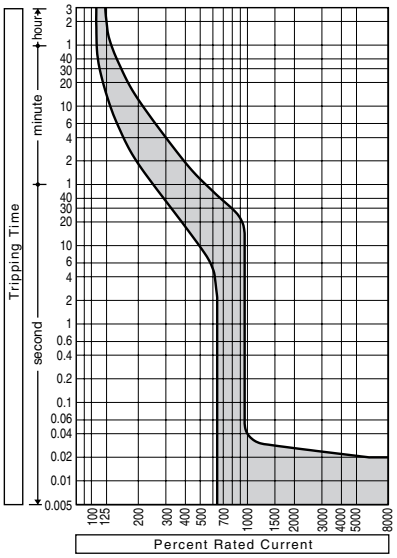
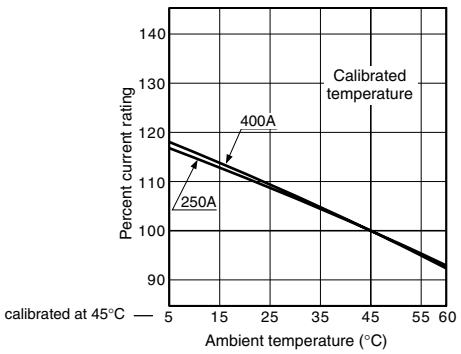
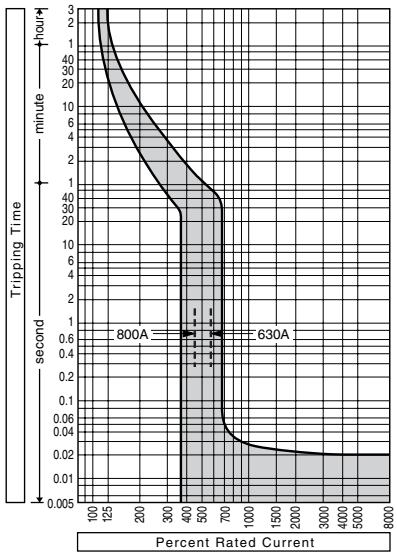
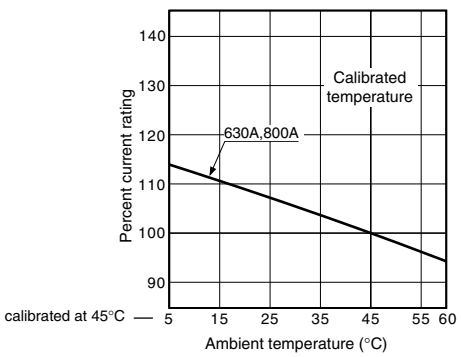




Rated current (A)	Magnetic trip current (A)
250	2000
400	3200

Notes : Setting tolerance ±20%

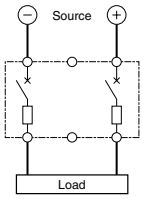
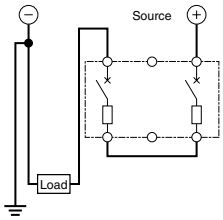
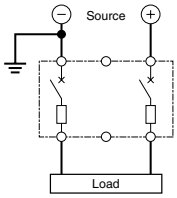
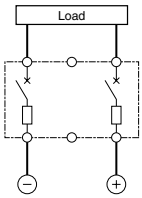
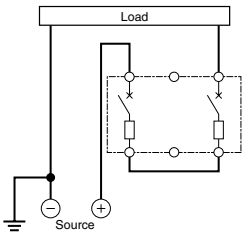
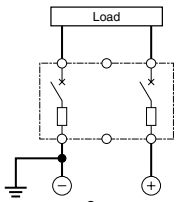
Time/Current characteristic curves, Ambient Compensating Curves

Type	Time/Current characteristic curves, Ambient Compensating Curves
PVS400-NDL 4P	  Rated current (A) / Magnetic trip current (A) 250 / 3000 400 / 4800 **Notes :** Setting tolerance ±20%
PVS400-NDH 4P	  Rated current (A) / Magnetic trip current (A) 250 / 2000 400 / 3200 **Notes :** Setting tolerance ±20%
PVS800-NDL 3P, 4P **PVS800-NDH 4P**	  Rated current (A) / Magnetic trip current (A) 630 / 3500 800 / 3500 **Notes :** Setting tolerance ±20%

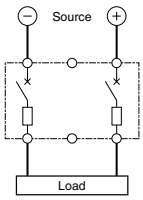
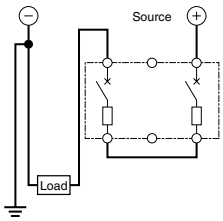
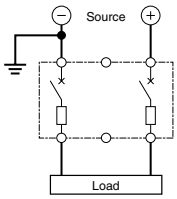
4 Mounting and Connection

Connection of conductors to DC circuit breakers

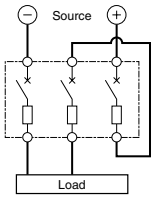
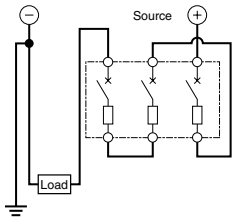
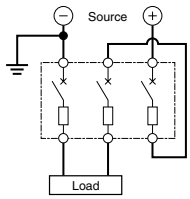
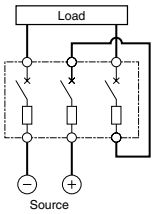
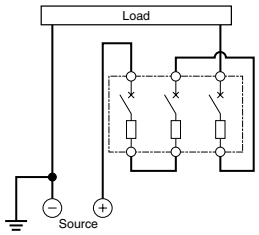
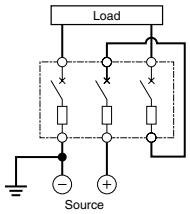
It is more difficult to interrupt DC current than AC current because DC current does not have a zero point. Therefore for high DC voltages, 3-pole or 4-pole circuit breaker main contacts are connected in series to ensure breaking performance. As illustrated below, the main power conductors for DC-use air circuit breakers, moulded case circuit breakers, and switch disconnectors shall be connected generally as shown below but also depending on the type of breaker, the number of poles, and the DC operating voltage.

		Non-grounded system (Protection + Isolation function)		Grounded system (Protection)		Grounded system (Protection + Isolation function)	
	Ordinally connection						
	Reverse connection						
Type of breakers	No.s of poles	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}
S1000-ND	2P	≦250	50kA/20kA	≦250	50kA/20kA	≦150	50kA/20kA

✻：2 poles breaker is a 3 pole breaker with the center pole omitted.

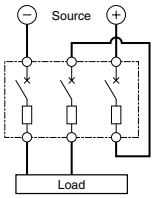
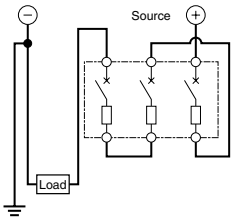
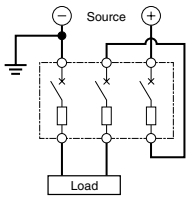
		Non-grounded system (Protection + Isolation function)		Grounded system (Protection)		Grounded system (Protection + Isolation function)	
	Ordinally connection						
Type of breakers	No.s of poles	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}
XS1250ND	2P	≦250	50kA/30kA	≦250	50kA/30kA	≦150	50kA/30kA
XS1600ND	2P	≦250	50kA/30kA	≦250	50kA/30kA	≦150	50kA/30kA
XS2000ND	2P	≦250	50kA/30kA	≦250	50kA/30kA	≦150	50kA/30kA
XS2500ND	2P	≦250	50kA/30kA	≦250	50kA/30kA	≦150	50kA/30kA
XS3200ND	2P	≦250	50kA/30kA	≦250	50kA/30kA	≦150	50kA/30kA

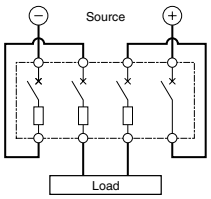
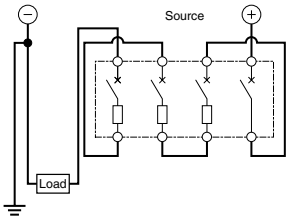
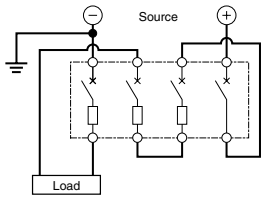
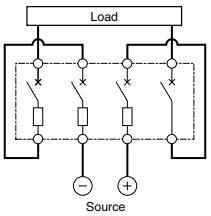
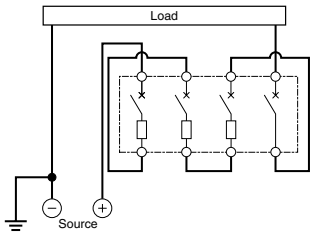
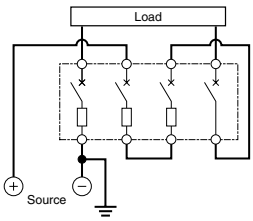
✻：2 poles breaker is a 3 pole breaker with the center pole omitted.

		Non-grounded system (Protection + Isolation function)		Grounded system (Protection)		Grounded system (Protection + Isolation function)	
	Ordinally connection						
	Reverse connection						
Type of breakers	No.s of poles	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}
S160-SD	3P	≦600	5kA/5kA	≦600	5kA/5kA	≦400	5kA/5kA
S160-SD	3P	≦500	7.5kA/7.5kA	≦500	7.5kA/7.5kA	≦350	7.5kA/7.5kA
S160-SD	3P	≦350	10kA/10kA	≦350	10kA/10kA	≦250	10kA/10kA
S160-GD	3P	≦600	10kA/5kA	≦600	10kA/5kA	≦400	10kA/5kA
S160-GD	3P	≦500	15kA/7.5kA	≦500	15kA/7.5kA	≦350	15kA/7.5kA
S250-SD	3P	≦600	5kA/5kA	≦600	5kA/5kA	≦400	5kA/5kA
S250-SD	3P	≦500	7.5kA/7.5kA	≦500	7.5kA/7.5kA	≦350	7.5kA/7.5kA
S250-SD	3P	≦350	10kA/10kA	≦350	10kA/10kA	≦250	10kA/10kA
S250-GD	3P	≦600	10kA/5kA	≦600	10kA/5kA	≦400	10kA/5kA
S250-GD	3P	≦500	15kA/7.5kA	≦500	15kA/7.5kA	≦350	15kA/7.5kA
S400-ND	3P	≦600	15kA/15kA	≦600	15kA/15kA	≦400	15kA/15kA
S400-ND	3P	≦350	20kA/20kA	≦350	20kA/20kA	≦250	20kA/20kA
S800-ND	3P	≦600	20kA/10kA	≦600	20kA/10kA	≦400	20kA/10kA
S800-ND	3P	≦350	30kA/15kA	≦350	30kA/15kA	≦250	30kA/15kA
S1000-ND	3P	≦600	20kA/10kA	≦600	20kA/10kA	≦400	20kA/10kA
S1000-ND	3P	≦350	30kA/15kA	≦350	30kA/15kA	≦250	30kA/15kA
PVE160-SDL	3P	≦750	3kA/3kA	≦750	3kA/3kA	≦500	3kA/3kA
PVS160-SDL ①	3P	≦750	5kA/5kA	≦750	5kA/5kA	≦500	5kA/5kA
PVS250-SDL ①	3P	≦750	5kA/5kA	≦750	5kA/5kA	≦500	5kA/5kA
PVS400-NDL	3P	≦750	10kA/5kA	≦750	10kA/5kA	≦500	10kA/5kA
PVS800-NDL	3P	≦750	10kA/10kA	≦750	10kA/10kA	≦500	10kA/10kA
S160-SDN	3P	≦600	—	≦600	—	≦400	—
S250-SDN	3P	≦600	—	≦600	—	≦400	—

Note ① : Two breakers are available for ordlnary connection and for reverse connection. Use the ordinally connected breakers for ordinal connection and the reverse connected breakers for reverse connection. Do not use contrary.

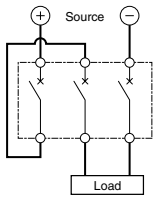
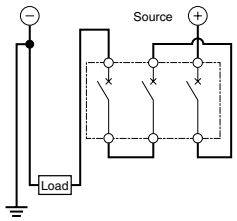
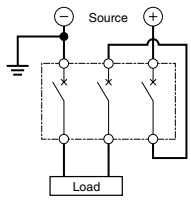
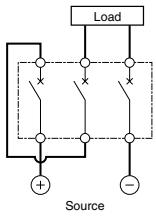
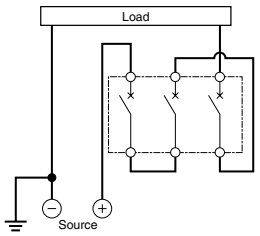
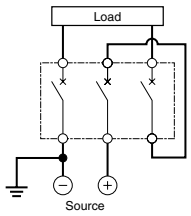
Connection of conductors to DC circuit breakers

		Non-grounded system (Protection + Isolation function)		Grounded system (Protection)		Grounded system (Protection + Isolation function)	
	Ordinally connection						
Type of breakers	No.s of poles	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}
XS1250ND	3P	≦600	20kA/15kA	≦600	20kA/15kA	≦400	20kA/15kA
XS1250ND	3P	≦500	50kA/25kA	≦500	50kA/25kA	≦350	50kA/25kA
XS1600ND	3P	≦600	20kA/15kA	≦600	20kA/15kA	≦400	20kA/15kA
XS1600ND	3P	≦500	50kA/25kA	≦500	50kA/25kA	≦350	50kA/25kA
XS2000ND	3P	≦600	20kA/15kA	≦600	20kA/15kA	≦400	20kA/15kA
XS2000ND	3P	≦500	50kA/25kA	≦500	50kA/25kA	≦350	50kA/25kA
XS2500ND	3P	≦600	20kA/15kA	≦600	20kA/15kA	≦400	20kA/15kA
XS2500ND	3P	≦500	50kA/25kA	≦500	50kA/25kA	≦350	50kA/25kA
XS3200ND	3P	≦600	20kA/15kA	≦600	20kA/15kA	≦400	20kA/15kA
XS3200ND	3P	≦500	50kA/25kA	≦500	50kA/25kA	≦350	50kA/25kA

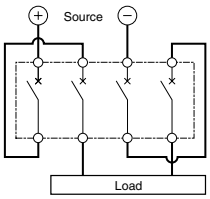
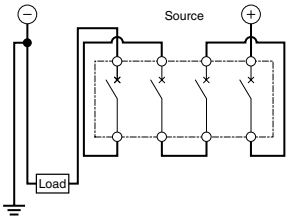
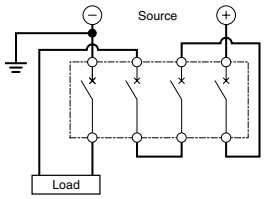
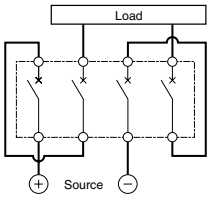
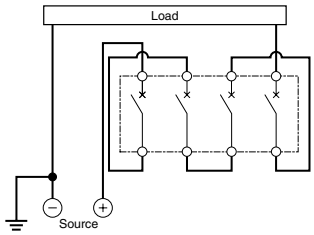
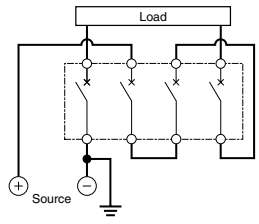
		Non-grounded system (Protection + Isolation function)		Grounded system (Protection)		Grounded system (Protection + Isolation function)	
	Ordinally connection						
	Reverse connection						
Type of breakers	No.s of poles	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}
PVS160-SDL	4P	≦750	10kA/5kA	≦750	10kA/5kA	≦550	10kA/5kA
PVS250-SDL	4P	≦750	10kA/5kA	≦750	10kA/5kA	≦550	10kA/5kA
PVS160-SDH	4P	≦1000	5kA/5kA	≦1000	5kA/5kA	≦750	5kA/5kA
PVS250-SDH	4P	≦1000	5kA/5kA	≦1000	5kA/5kA	≦750	5kA/5kA
PVS400-NDL	4P	≦750	10kA/10kA	≦750	10kA/10kA	≦750	10kA/10kA ②
PVS400-NDH	4P	≦1000	5kA/5kA	≦1000	5kA/5kA		
PVS800-NDL	4P	≦750	10kA/10kA	≦750	10kA/10kA	≦750	10kA/10kA
PVS800-NDH	4P	≦1000	5kA/5kA	≦1000	5kA/5kA	≦750	5kA/5kA
PVS160-SNL	4P	≦800	—	≦800	—	≦600	—
PVS250-SNL	4P	≦800	—	≦800	—	≦600	—
PVS160-SNH	4P	≦1000	—	≦1000	—	≦750	—
PVS250-SNH	4P	≦1000	—	≦1000	—	≦750	—
PVS400-NNL	4P	≦800	—	≦800	—	≦750	—
PVS400-NNH	4P	≦1000	—	≦1000	—		
PVS800-NNL	4P	≦800	—	≦800	—	≦750	—
PVS800-NNH	4P	≦1000	—	≦1000	—		

Note ② : The breaking capacity goes down to I_{cu}10kA / I_{cs}5kA for ground fault protection.

Connection of conductors to DC circuit breakers

		Non-grounded system (Protection + Isolation function)		Grounded system (Protection)		Grounded system (Protection + Isolation function)	
	Ordinally connection						
	Reverse connection						
Type of breakers	No.s of poles	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}
AR216S ③	3P	≦600	40kA/40kA	≦600	40kA/40kA	≦400	40kA/40kA
AR220S ③	3P	≦600	40kA/40kA	≦600	40kA/40kA	≦400	40kA/40kA
AR325S ③	3P	≦600	40kA/40kA	≦600	40kA/40kA	≦400	40kA/40kA
AR332S ③	3P	≦600	40kA/40kA	≦600	40kA/40kA	≦400	40kA/40kA
AR440S ③	3P	≦600	40kA/40kA	≦600	40kA/40kA	≦400	40kA/40kA

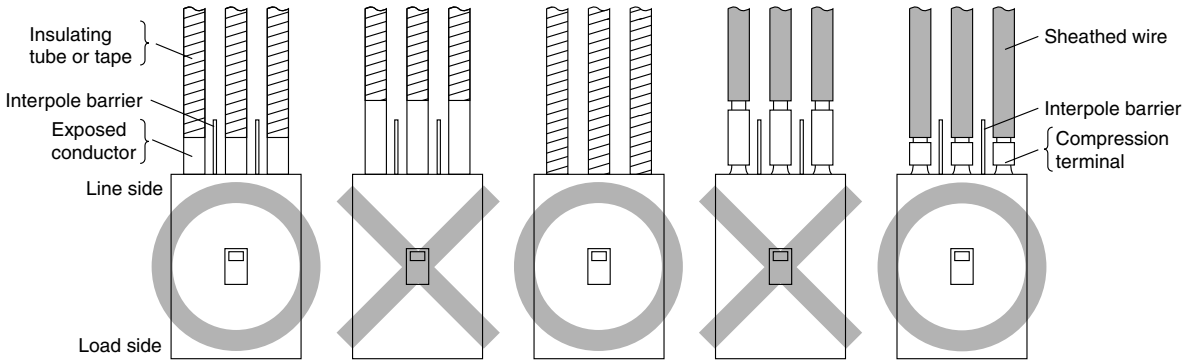
Note ③：AGR over-current release can not be used for DC. Please prepare DC over-current relay and connect with shunt trip device.

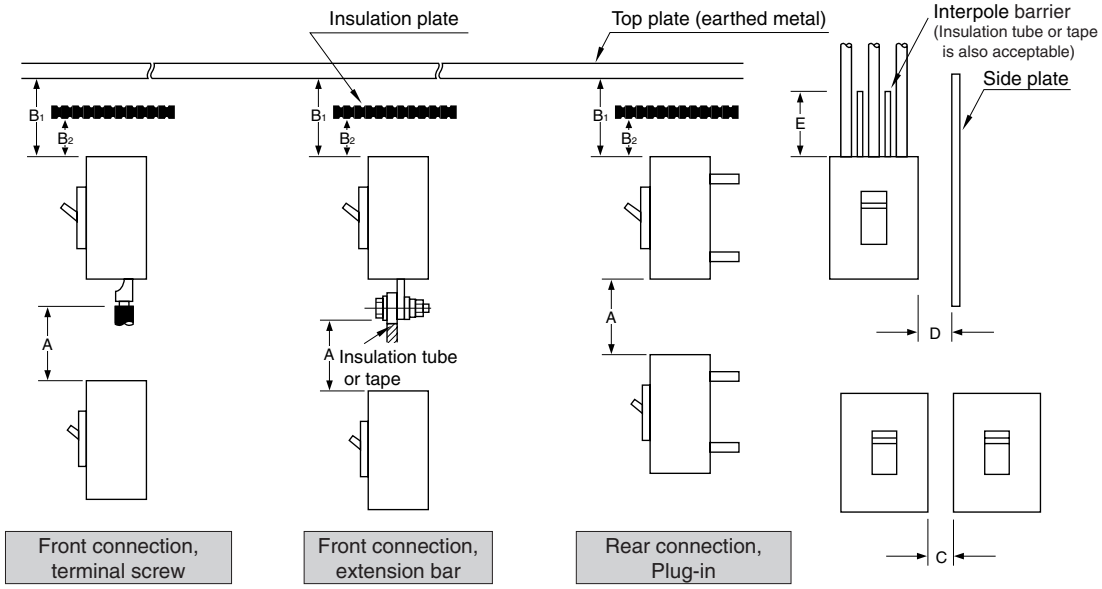
		Non-grounded system (Protection + Isolation function)		Grounded system (Protection)		Grounded system (Protection + Isolation function)	
	Ordinally connection						
	Reverse connection						
Type of breakers	No.s of poles	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}	Applicable voltage (V)	Rated breaking capacity I_{cu}/I_{cs}
AR325-NDH ③	4P	≦800	30kA/30kA	≦800	30kA/30kA	≦600	30kA/30kA

Note ③：AGR over-current release can not be used for DC. Please prepare DC over-current relay and connect with shunt trip device.

Insulation distance DC600V or less

The insulation distances between the breaker and earthed metal parts and insulators shown in the table below must be maintained to prevent arcing faults occurring due to conductive ionised gas. In addition, any exposed line-side conductors must be completely covered, right up the breaker casing or to below the height protected by any interpole barriers. This can done by using an 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. If terminal covers are not being used, the interpole barriers supplied with the breaker as standard must be used.





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

Insulation distance, mm (DC 600 V or less) Note ①

Moulded Case Circuit Breakers					A Note ②	B1	B2		C	D	E
S160-SD	**S160-GD**	**S160-SDN**	⑤		50	50	50	✻	Possible to set close Note ③	25	Not less than the length of the bare live part Note ④
S250-SD	**S250-GD**	**S250-SDN**	⑤		65	65	65	✻	〃	50	〃
S400-ND	**S800-ND**	**S1000-ND**			150	120	80		〃	80	〃
XS1250ND	**XS1600ND**	**XS2000ND**	**XS2500ND**	**XS3200ND**	150	150	100		〃	100	〃

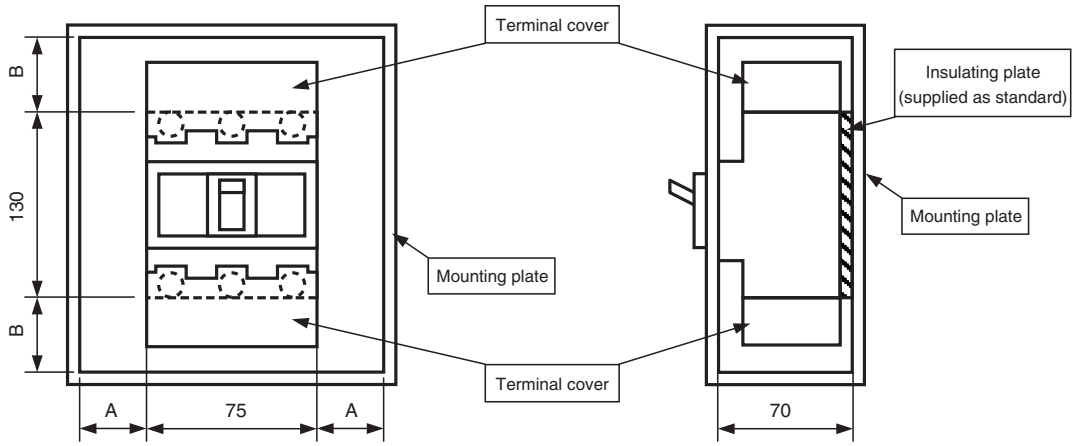
Notes:
①. Required to allow free and uninterrupted flow of arc gases. Ensure additional clearance or insulation distance if required to perform wiring, barrier installation or electrical work or to meet the need for more insulation distance between bare live parts and grounded metal members in a switchboard or the like.
②. The figures are for lower breakers.
③. When the accessories are fitted it is not possible to set close.
④. For front connected 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. Be sure to install the terminal covers (supplied as standard) on the line side of the breakers.
✻. If using extension bars (optional), ensure the insulation distance specified for the application.

Insulation distance DC750V-1000V

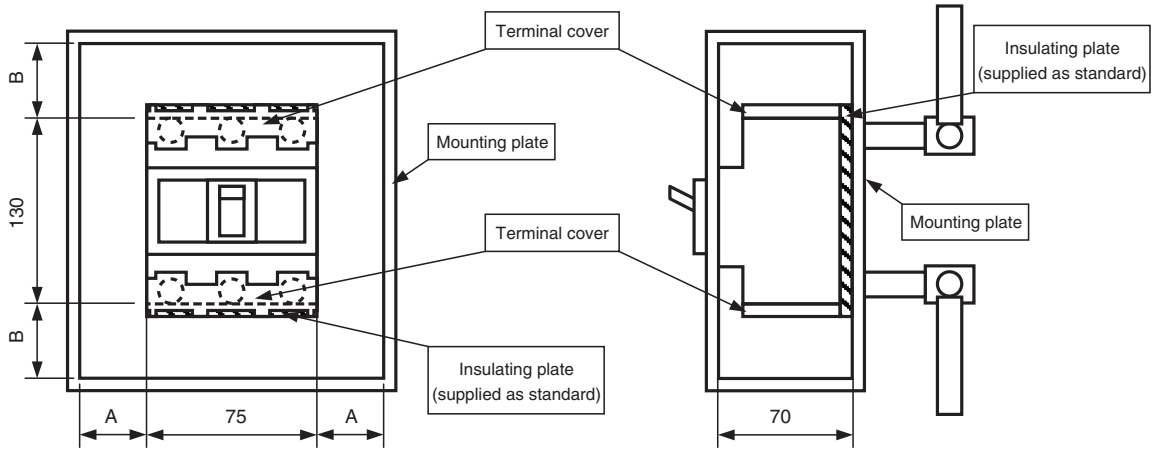
The insulation distances between the breaker and earthed metal parts and insulators shown in the table below must be maintained to prevent arcing faults occurring due to conductive ionised gas. In addition, any exposed line-side conductors must be completely covered, right up the breaker casing or to below the height protected by any terminal covers or interpole barriers. This can done by using an 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. The terminal covers or the interpole barriers supplied with the breaker as standard must be used. For DC750V-1000V breakers, the front and the rear insulating plates must also be installed.

PVE160-SDL 3P

Front-connected



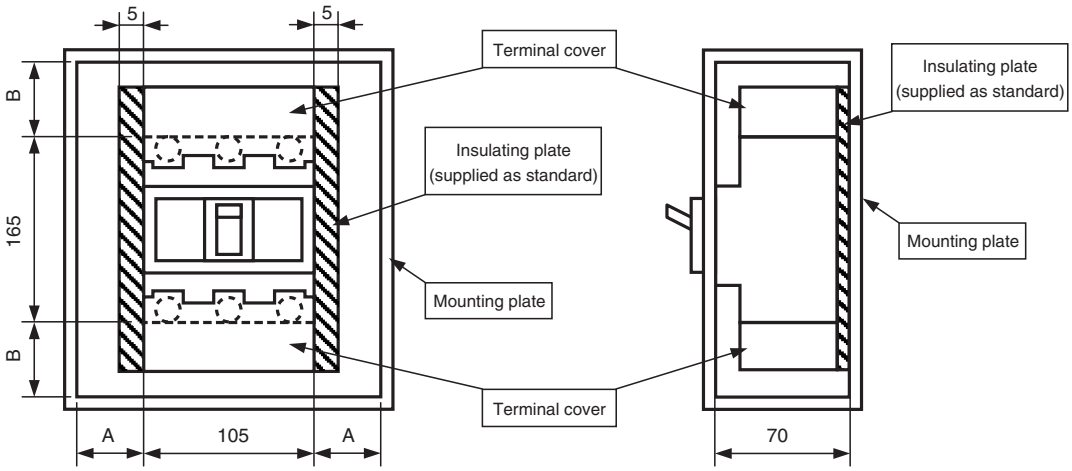
Rear-connected



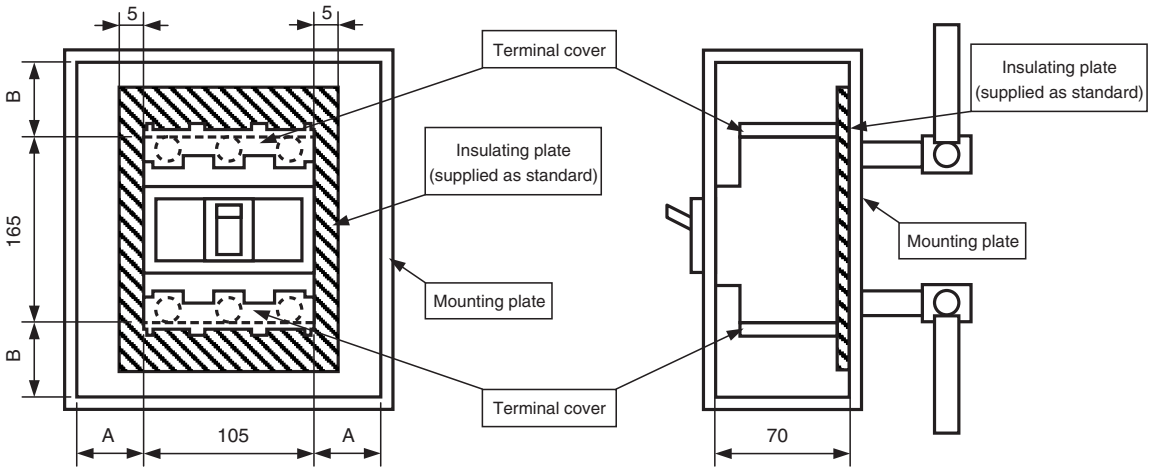
Type	Connection	Minimum insulation distance (mm)		Insulating plate	
		A	B	Terminal cover	Insulating plate
PVE160-SDL 3P	Front-connected Rear-connected	25	50	2pcs are supplied for line and load side as standard.	1pc of 130mm×75mm for F.C. or 140mm×75mm for R.C. is supplied as standard.

PVS160-SDL 3P, PVS250-SDL 3P

Front-connected



Rear-connected

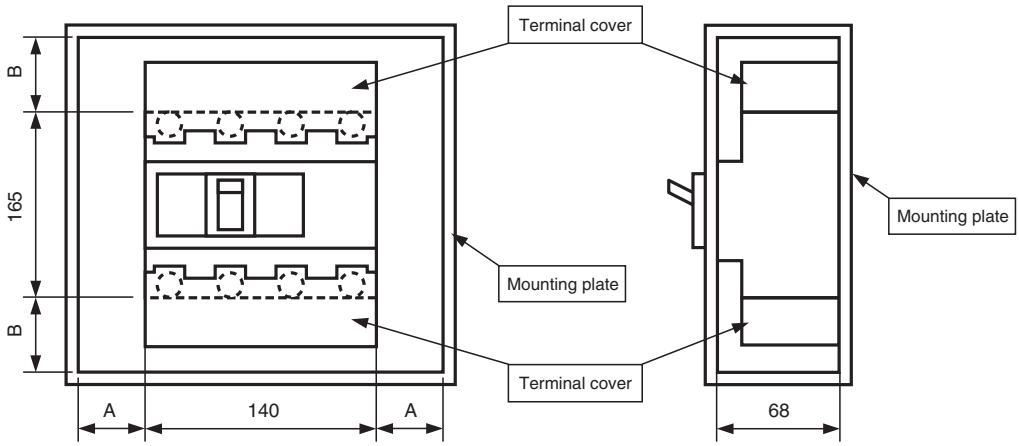


Type	Connection	Minimum insulation distance (mm)		Insulating plate	
		A	B	Terminal cover	Insulating plate
PVS160-SDL 3P PVS250-SDL 3P	Front-connected Rear-connected	50	65	2pcs are supplied for line and load side as standard.	2pcs of 115mm×137.5mm are supplied as standard.

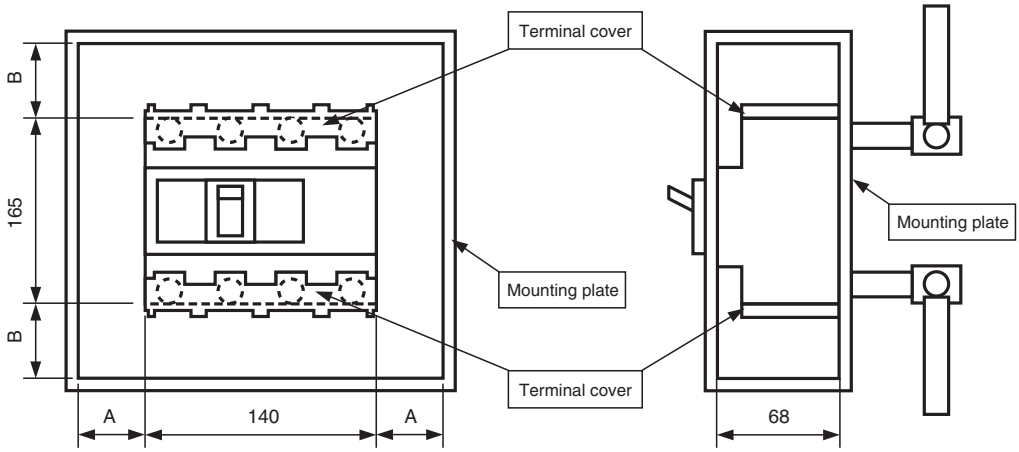
Insulation distance DC750V-1000V

PVS160-SDL 4P, PVS250-SDL 4P, PVS160-SNL 4P, PVS250-SNL 4P

Front-connected



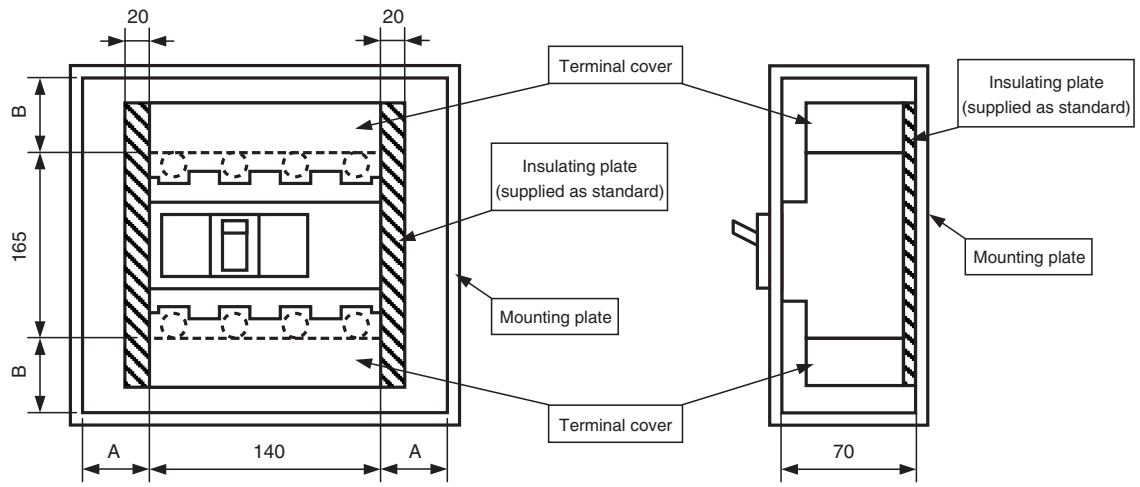
Rear-connected



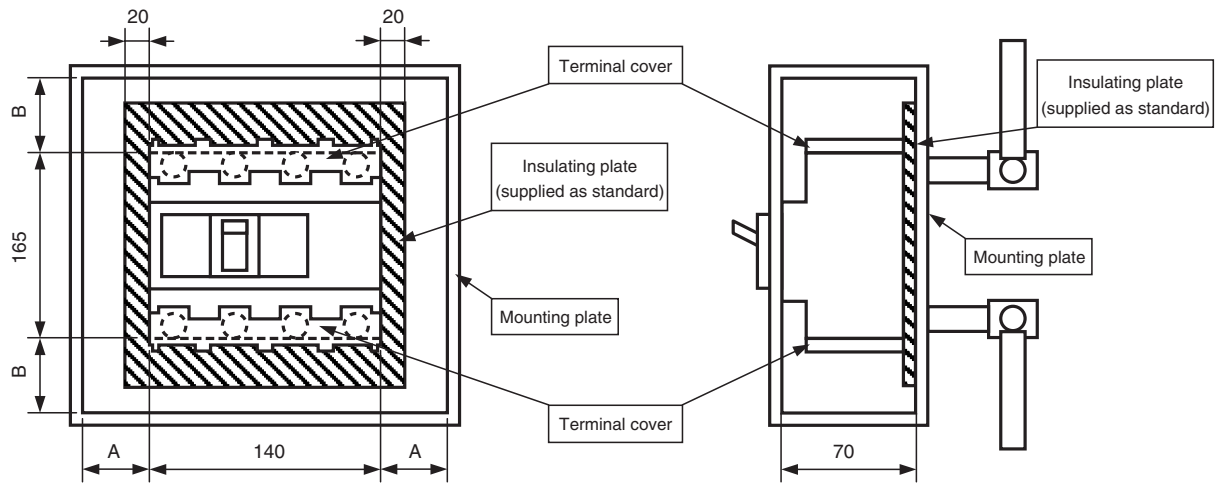
Type	Connection	Minimum insulation distance (mm)		Terminal cover
		A	B	
PVS160-SDL 4P PVS250-SDL 4P PVS160-SNL 4P PVS250-SNL 4P	Front-connected Rear-connected	50	65	2pcs are supplied for line and load side as standard.

PVS160-SDH 4P, PVS250-SDH 4P, PVS160-SNH 4P, PVS250-SNH 4P

Front-connected



Rear-connected

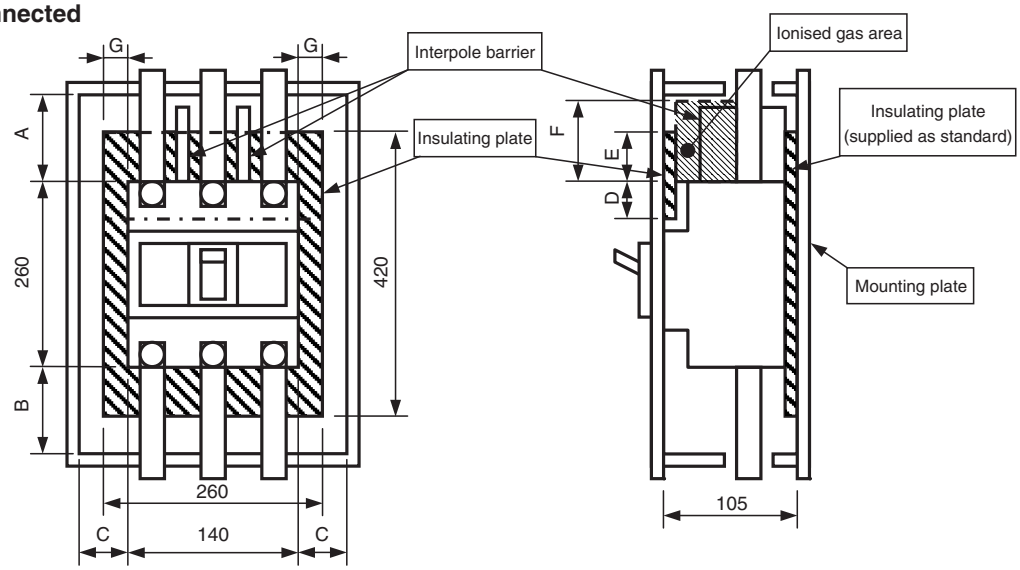


Type	Connection	Minimum insulation distance (mm)		Insulating plate	
		A	B	Terminal cover	Insulating plate
PVS160-SDH 4P PVS250-SDH 4P PVS160-SNH 4P PVS250-SNH 4P	Front-connected Rear-connected	50	65	2pcs are supplied for line and load side as standard.	2pcs of 180mm×137.5mm are supplied as standard.

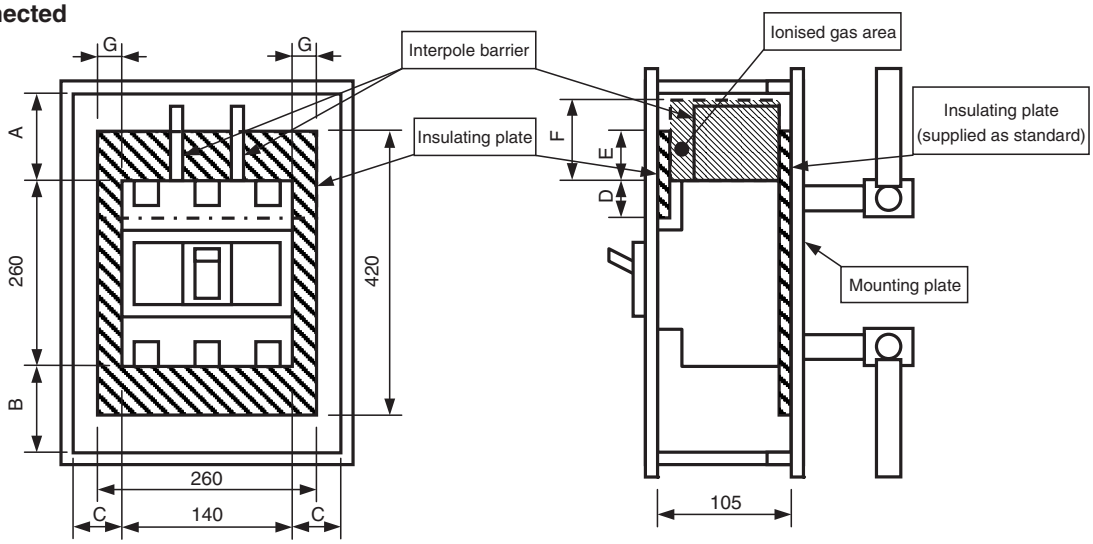
Insulation distance DC750V-1000V

PVS400-NDL 3P

Front-connected



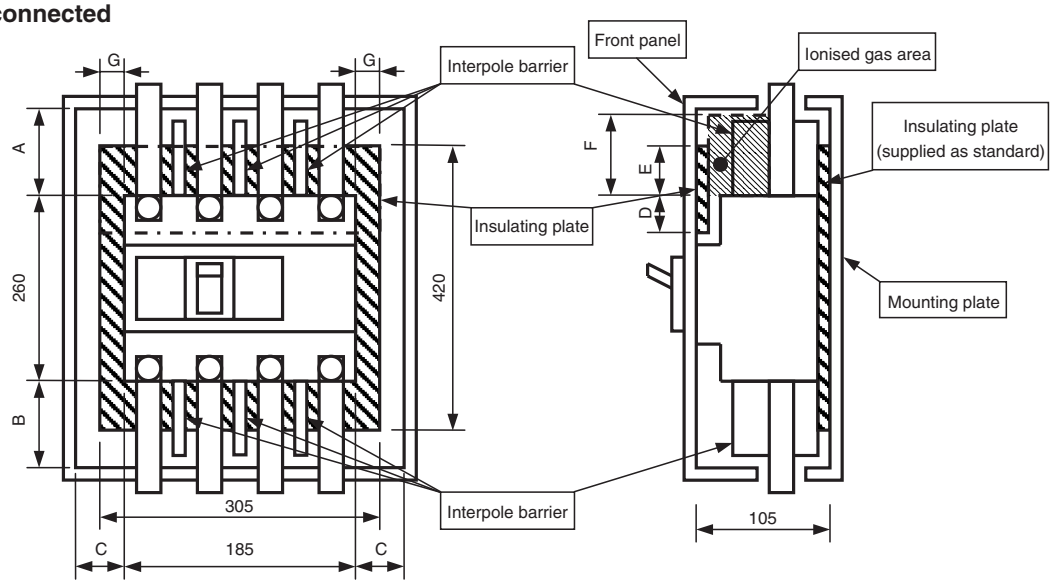
Rear-connected



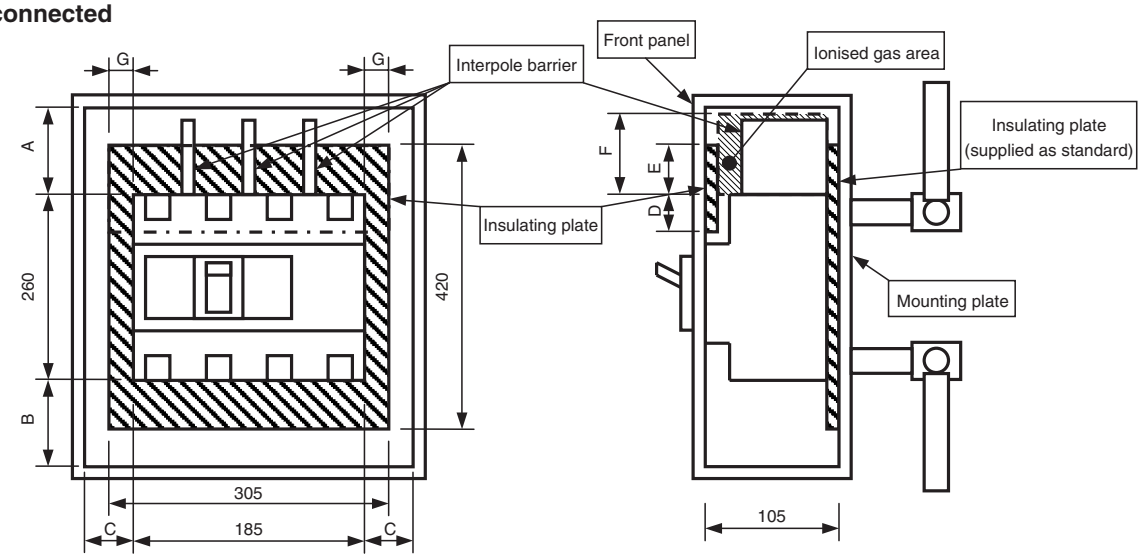
Type	Connection	Minimum insulation distance (mm)							Insulating plate	
		A	B	C	D	E	F	G	Front panel side	Mounting plate side
PVS400-NDL 3P	Front-connected Rear-connected	160	80	80	30	140	160	60	Not supplied	Supplied as standard

PVS400-NDL 4P, PVS400-NDH 4P

Front-connected



Rear-connected

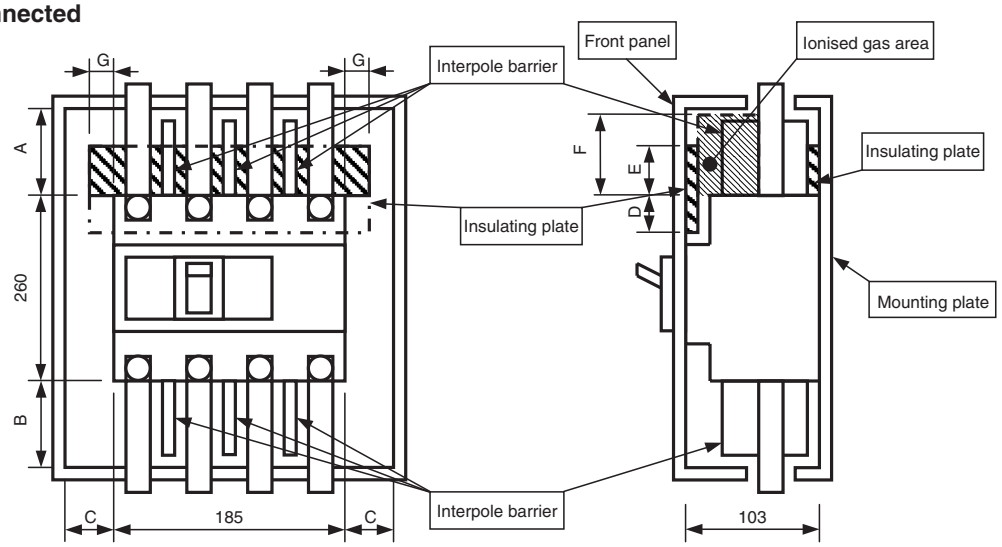


Type	Connection	Minimum insulation distance (mm)							Insulating plate	
		A	B	C	D	E	F	G	Front panel side	Mounting plate side
PVS400-NDL 4P PVS400-NDH 4P	Front-connected Rear-connected	160	80	80	30	140	160	60	Not supplied	Supplied as standard

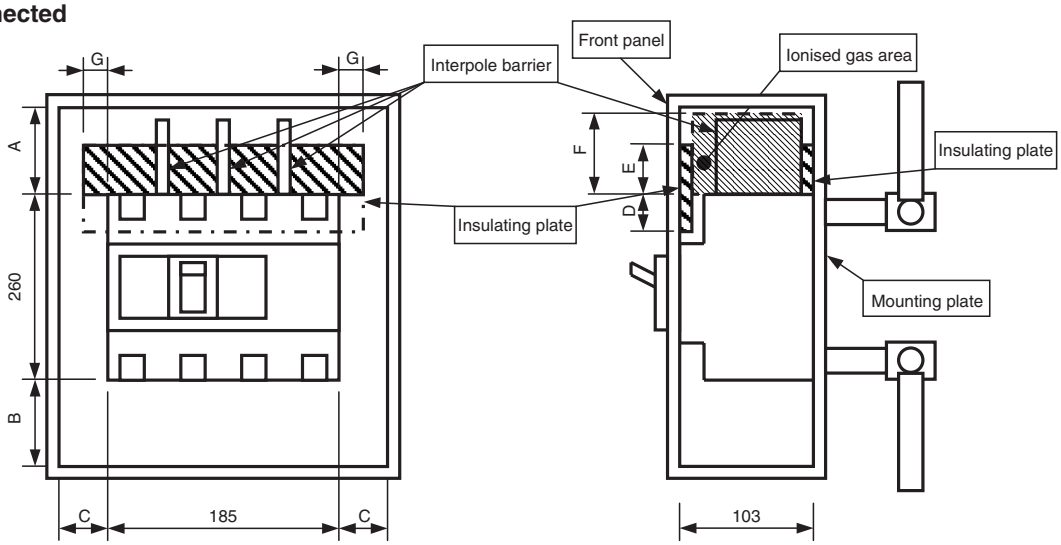
Insulation distance DC750V-1000V

PVS400-NNL 4P, PVS400-NNH 4P

Front-connected



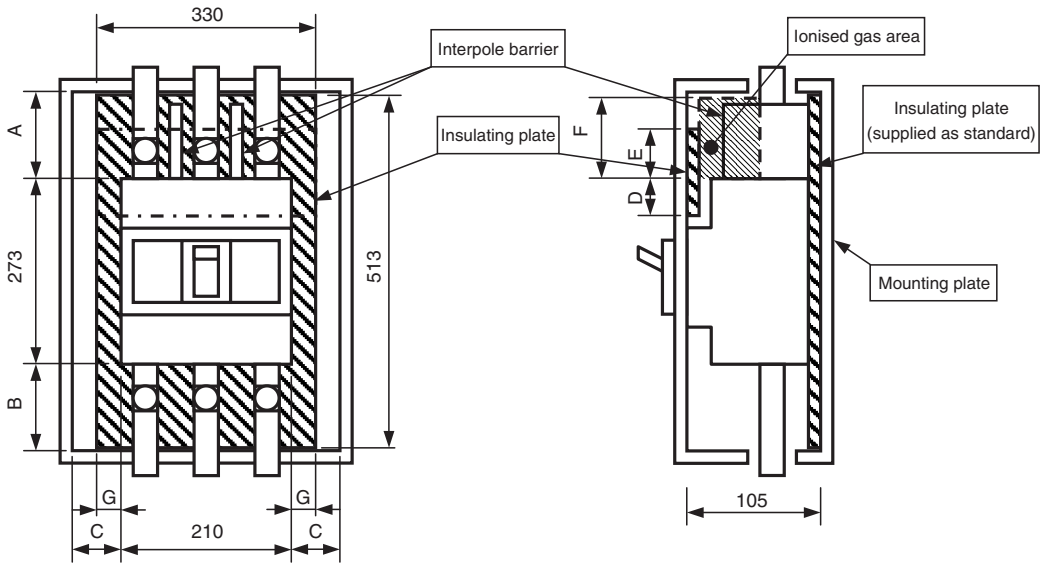
Rear-connected



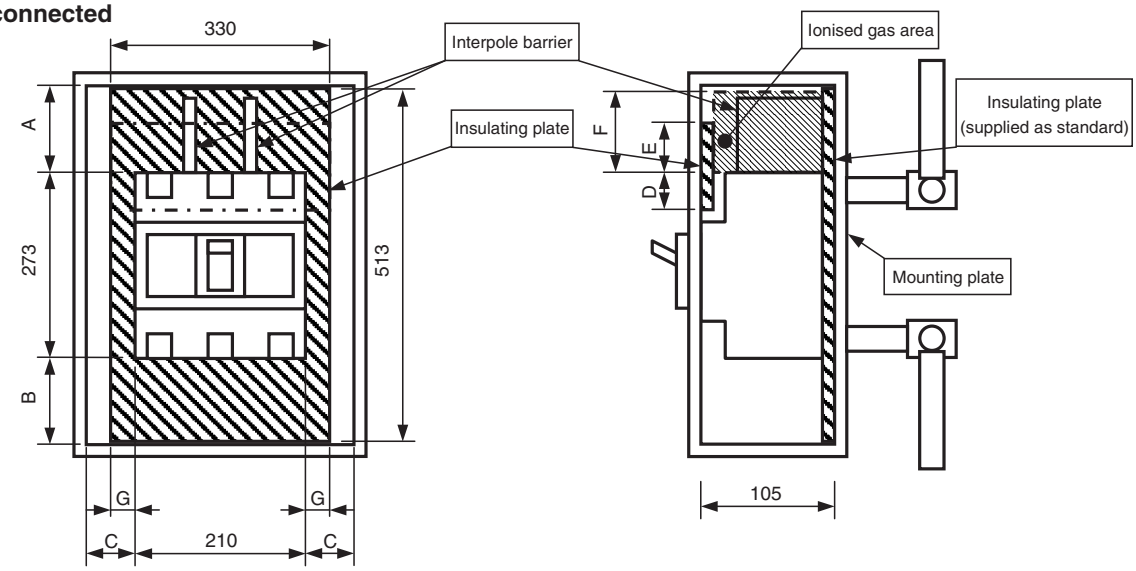
Type	Connection	Minimum insulation distance (mm)							Insulating plate	
		A	B	C	D	E	F	G	Front panel side	Mounting plate side
PVS400-NNL 4P PVS400-NNH 4P	Front-connected Rear-connected	120	80	80	30	80	80	40	Not supplied	Not supplied

PVS800-NDL 3P

Front-connected



Rear-connected

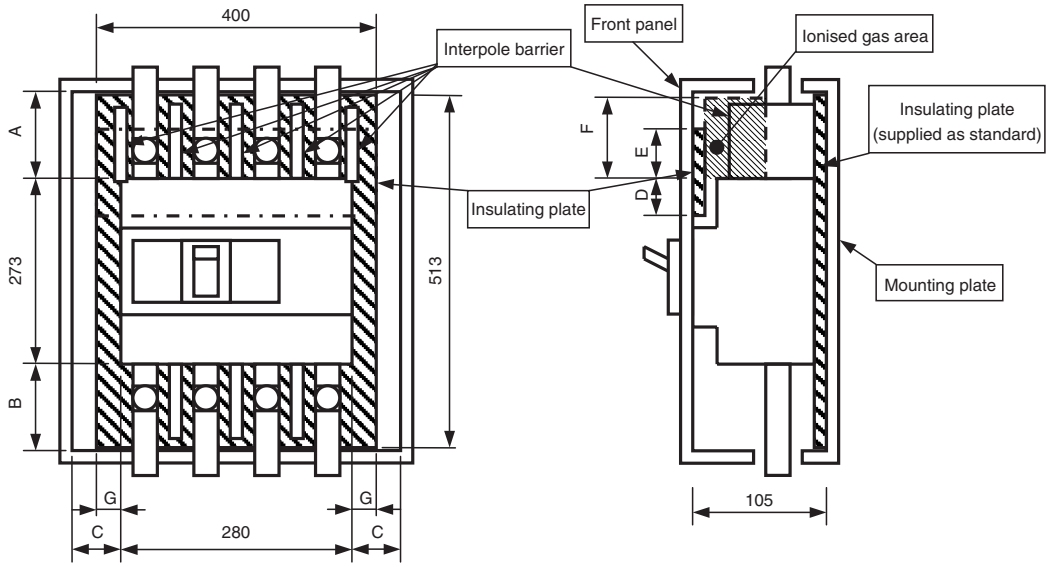


Type	Connection	Minimum insulation distance (mm)							Insulating plate	
		A	B	C	D	E	F	G	Front panel side	Mounting plate side
PVS800-NDL 3P	Front-connected Rear-connected	160	80	80	80	140	160	60	Not supplied	Supplied as standard

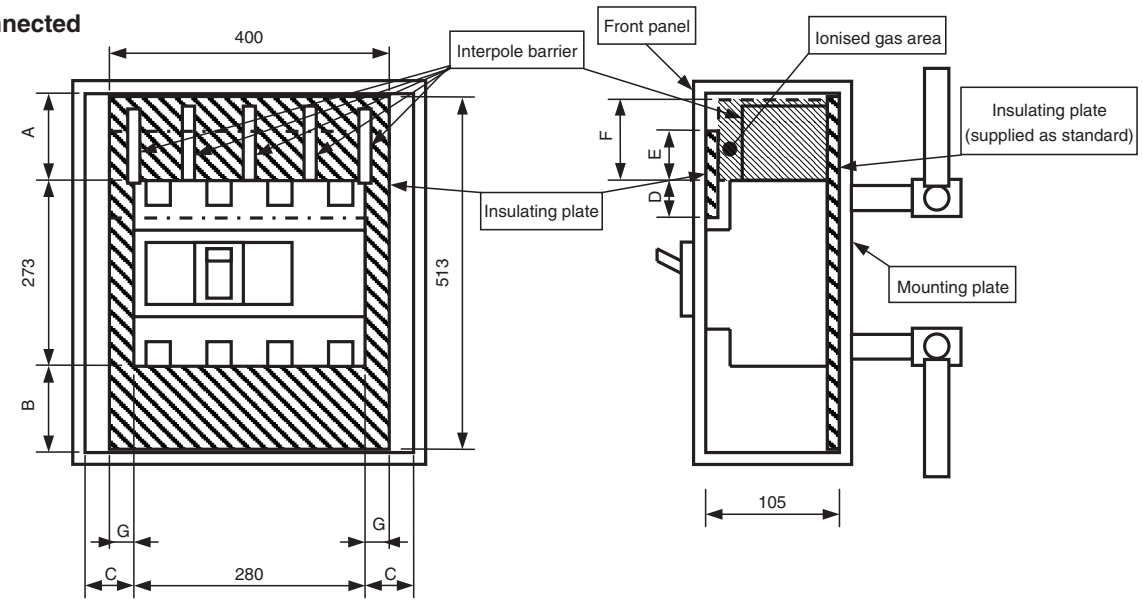
Insulation distance DC750V-1000V

PVS800-NDL 4P, PVS800-NDH 4P

Front-connected



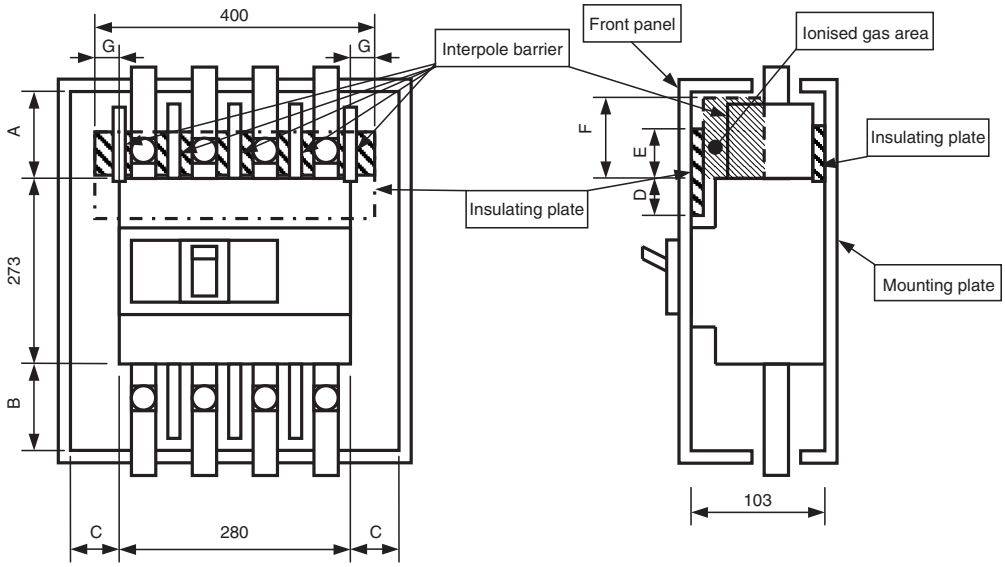
Rear-connected



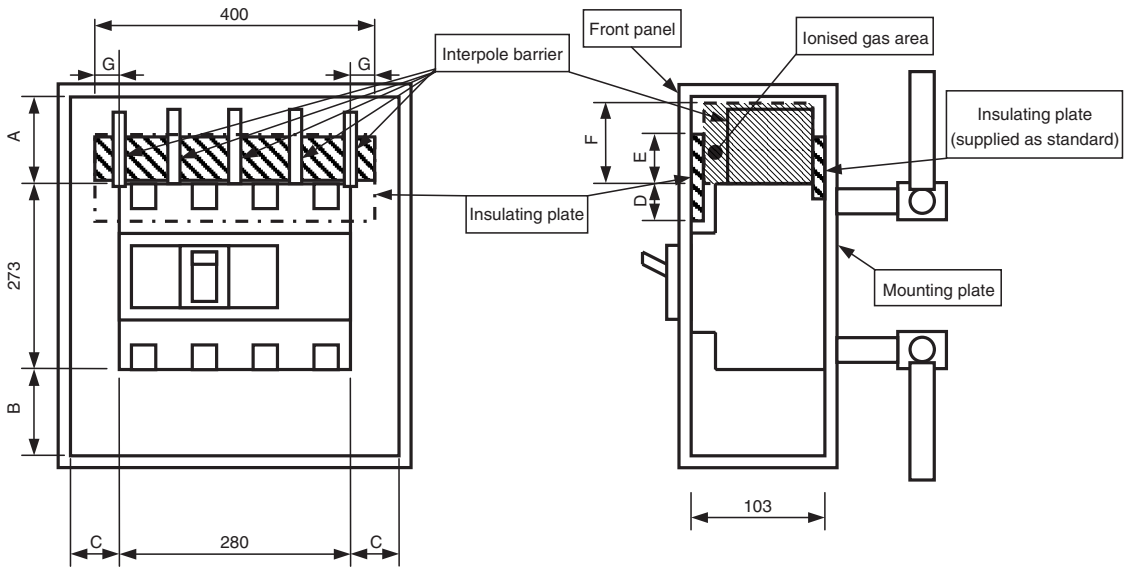
Type	Connection	Minimum insulation distance (mm)							Insulating plate	
		A	B	C	D	E	F	G	Front panel side	Mounting plate side
PVS800-NDL 4P PVS800-NDH 4P	Front-connected Rear-connected	160	80	80	80	140	160	60	Not supplied	Supplied as standard

PVS800-NNL 4P, PVS800-NNH 4P

Front-connected



Rear-connected



Type	Connection	Minimum insulation distance (mm)							Insulating plate	
		A	B	C	D	E	F	G	Front panel side	Mounting plate side
PVS800-NNL 4P PVS800-NNH 4P	Front-connected Rear-connected	120	80	80	80	80	80	60	Not supplied	Not supplied

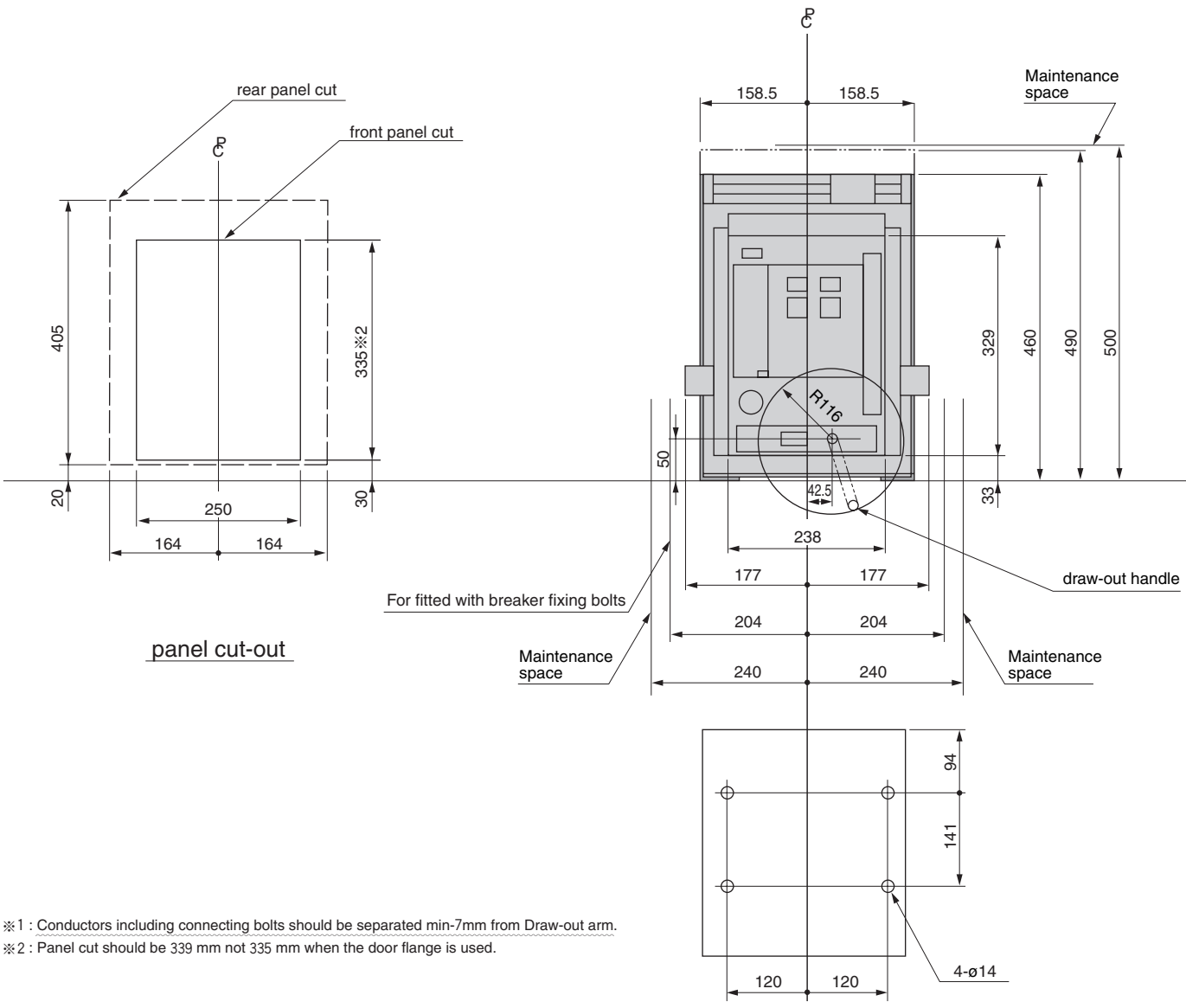
5 Outline Dimensions

Outline dimensions (mm)

● Type AR216S 3P, AR220S 3P Draw-out type

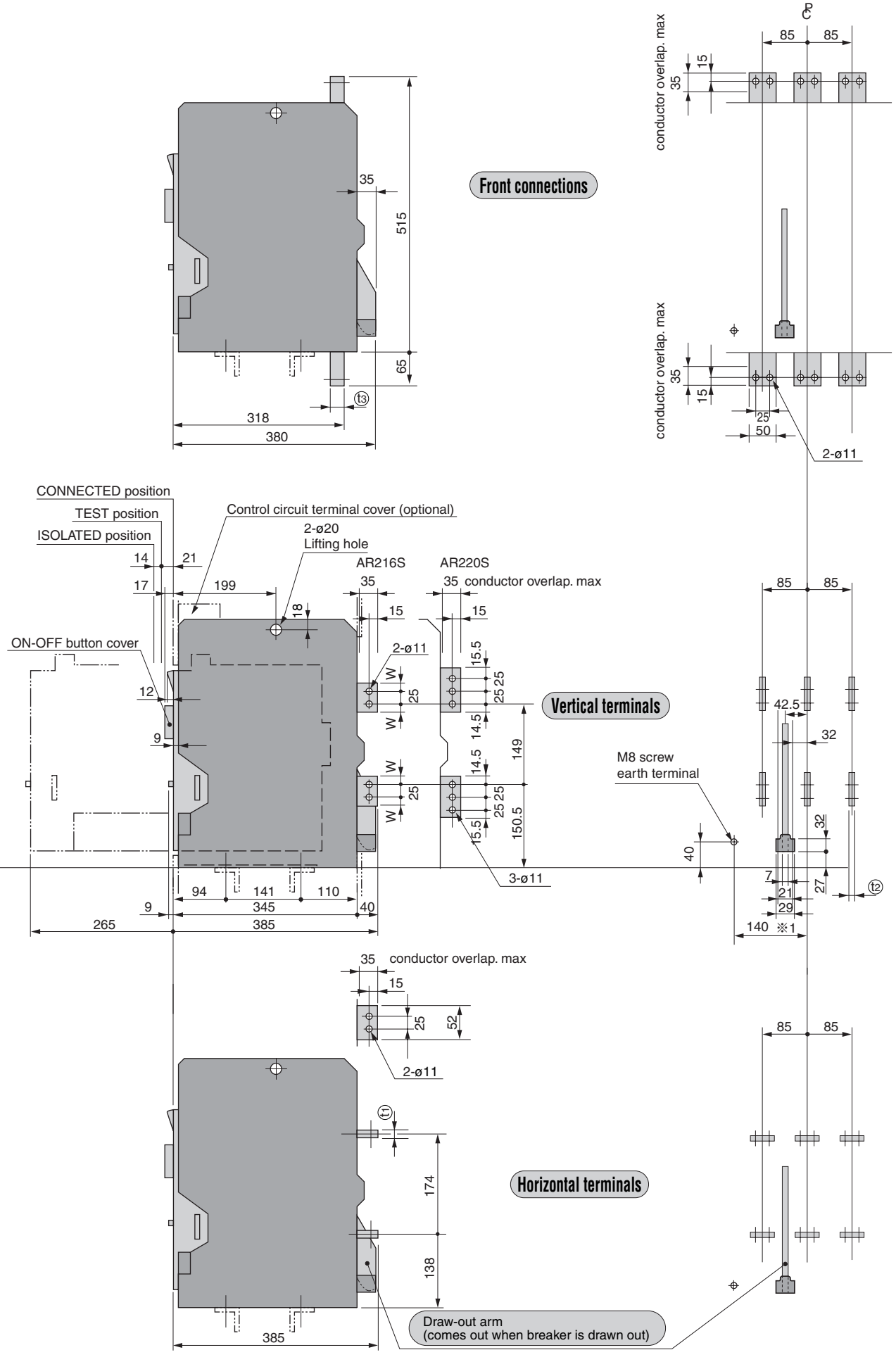
Terminal size

Type	ⓣ1	ⓣ2	ⓣ3	W
AR216S	20	15	25	22.5
AR220S	20	15	25	—



※1 : Conductors including connecting bolts should be separated min-7mm from Draw-out arm.
※2 : Panel cut should be 339 mm not 335 mm when the door flange is used.

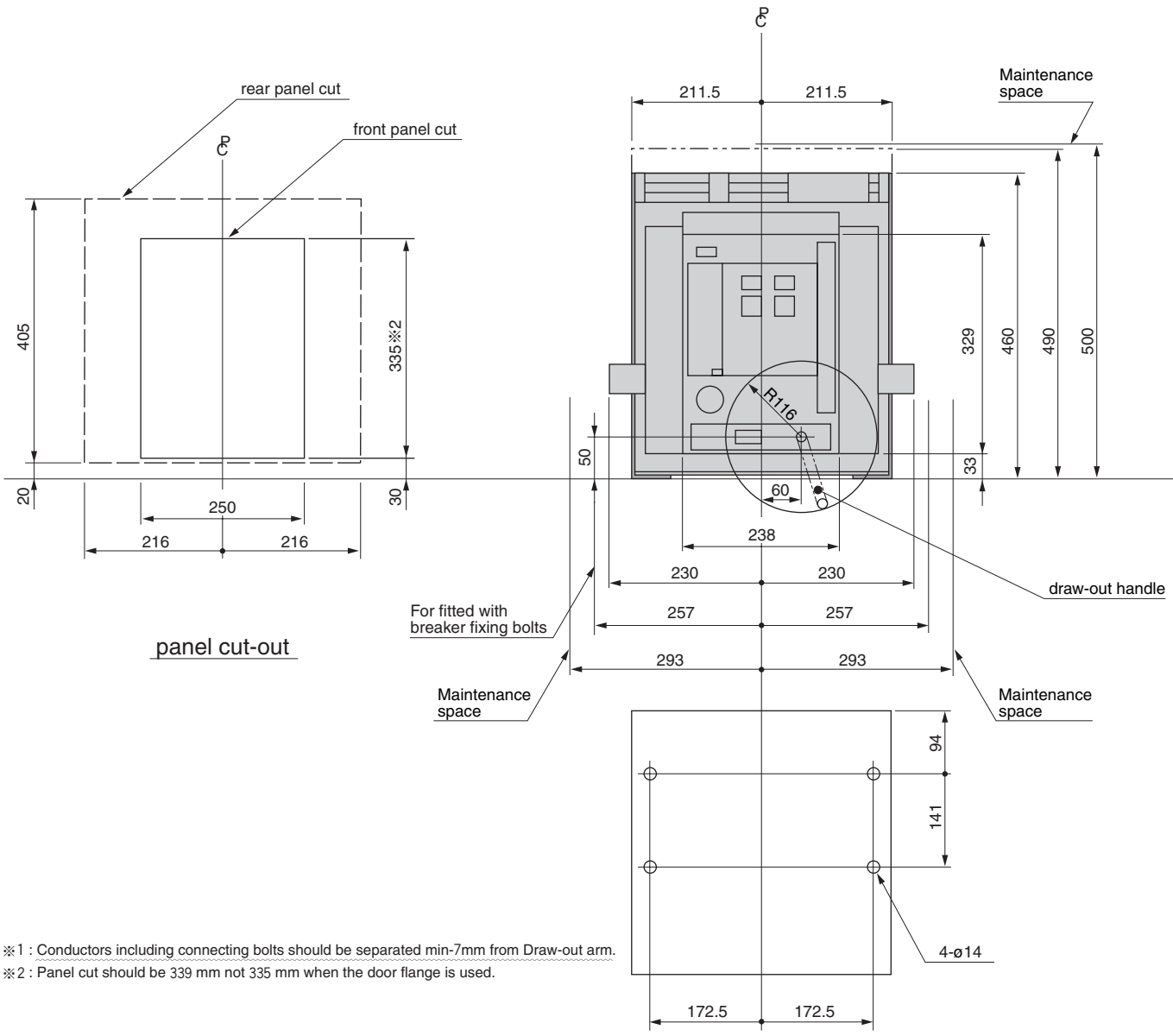
AR216S 3P, AR220S 3P



DC Air Circuit Breakers

Outline dimensions (mm)

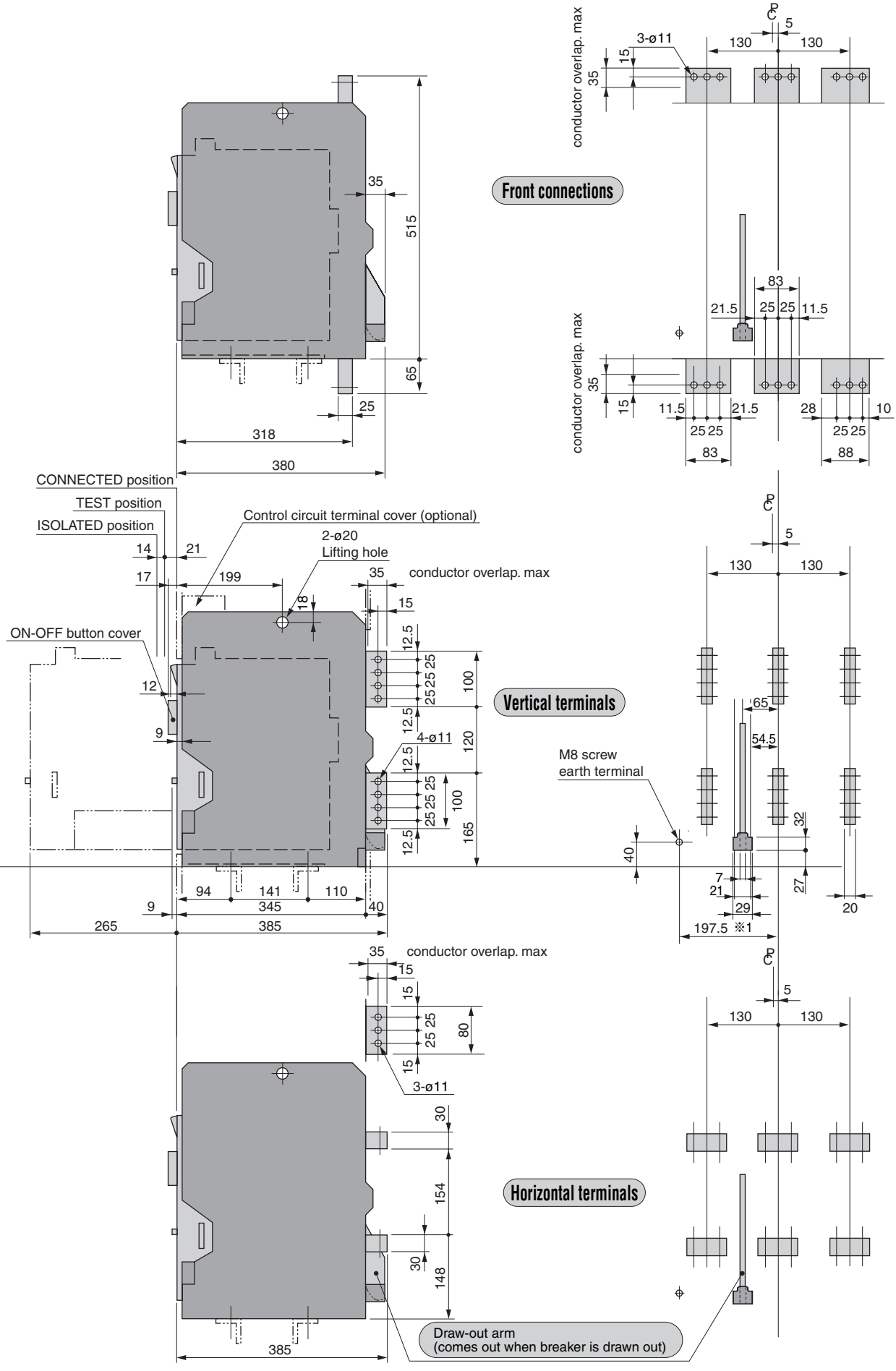
- **Type AR325S 3P, AR332S 3P Draw-out type**



※1 : Conductors including connecting bolts should be separated min-7mm from Draw-out arm.

※2 : Panel cut should be 339 mm not 335 mm when the door flange is used.

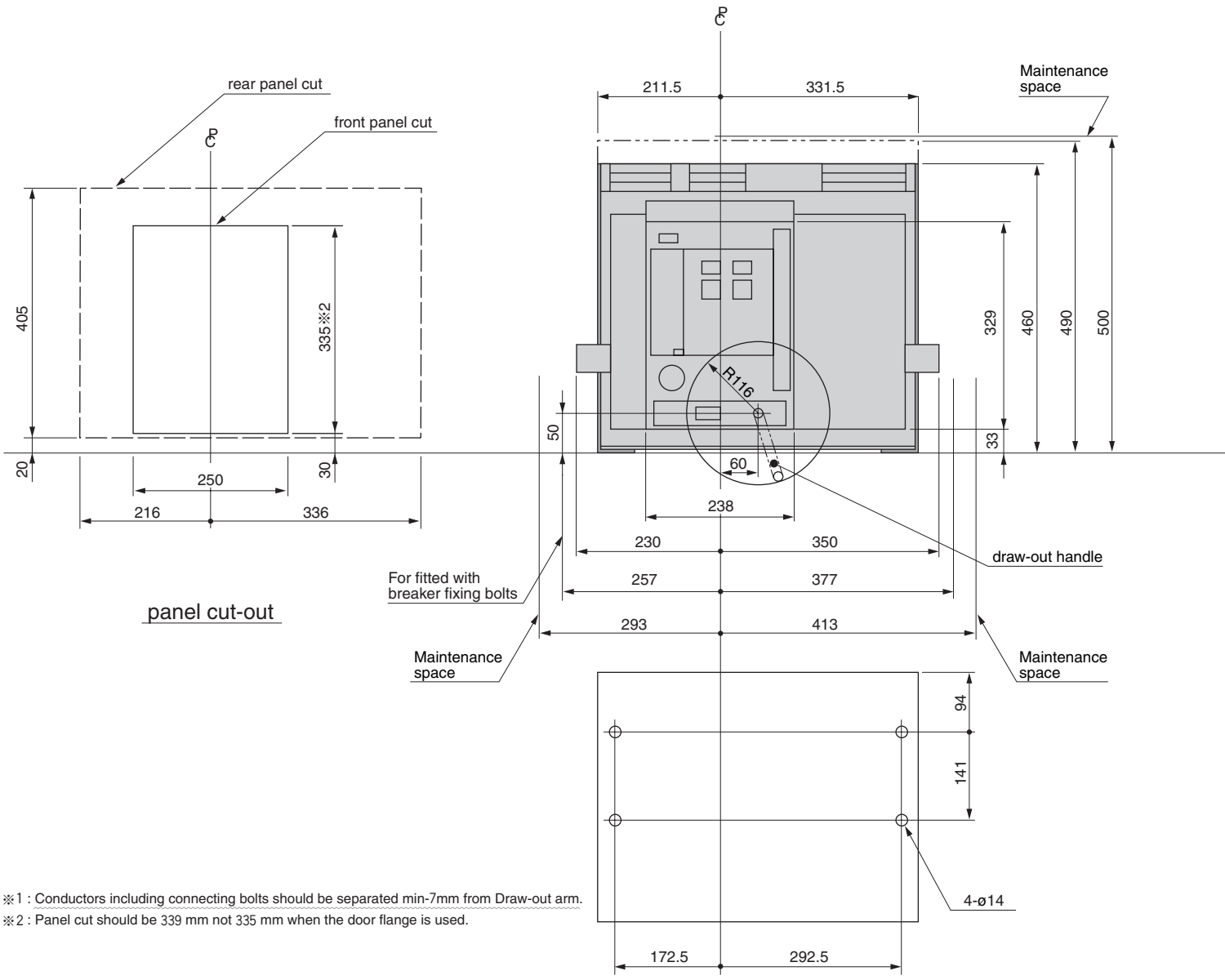
AR325S 3P, AR332S 3P



DC Air Circuit Breakers

Outline dimensions (mm)

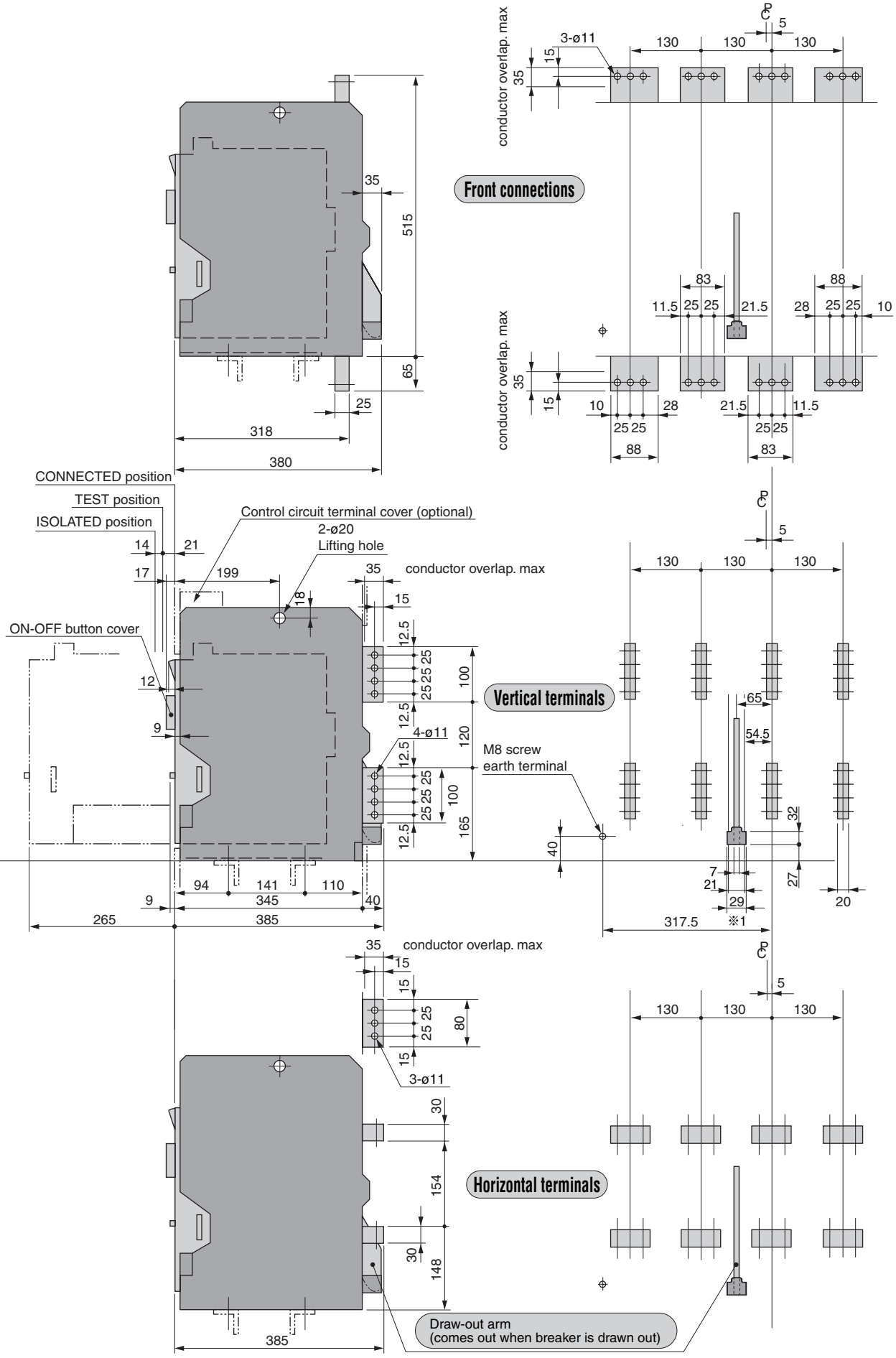
- **Type AR325-NDH 4P Draw-out type**



※1 : Conductors including connecting bolts should be separated min-7mm from Draw-out arm.

※2 : Panel cut should be 339 mm not 335 mm when the door flange is used.

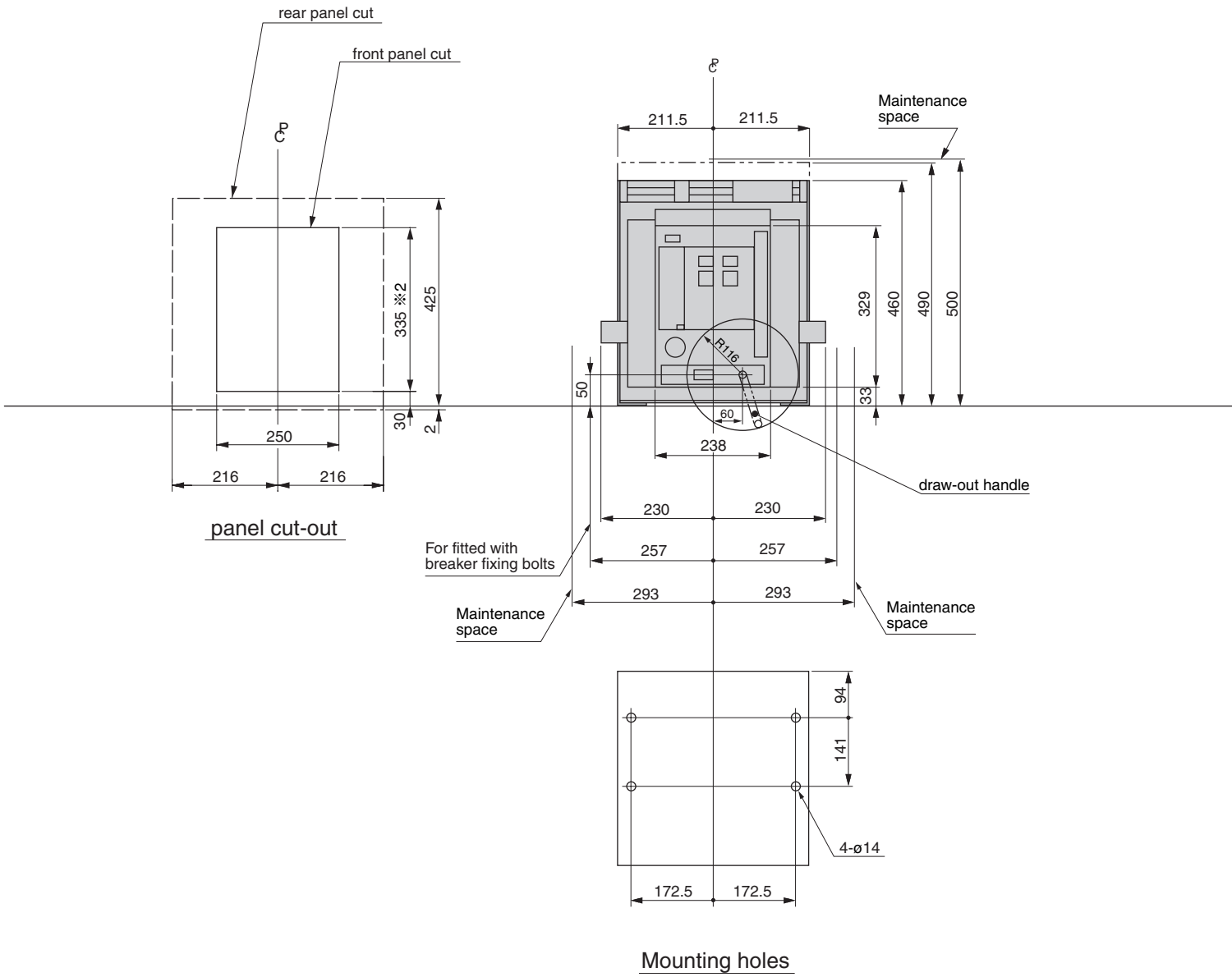
AR325-NDH 4P


Front connections
conductor overlap. max
3-ø11
130
130
130
5
15
35
83
88
11.5
25
25
21.5
28
10
515
65
25
318
380
CONNECTED position
TEST position
ISOLATED position
Control circuit terminal cover (optional)
2-ø20
Lifting hole
14
21
17
199
18
ON-OFF button cover
12
9
12.5
100
120
4-ø11
165
M8 screw
earth terminal
Vertical terminals
65
54.5
32
40
7
21
29
27
20
317.5
※1
94
141
110
345
265
385
80
30
154
148
Horizontal terminals
Draw-out arm
(comes out when breaker is drawn out)

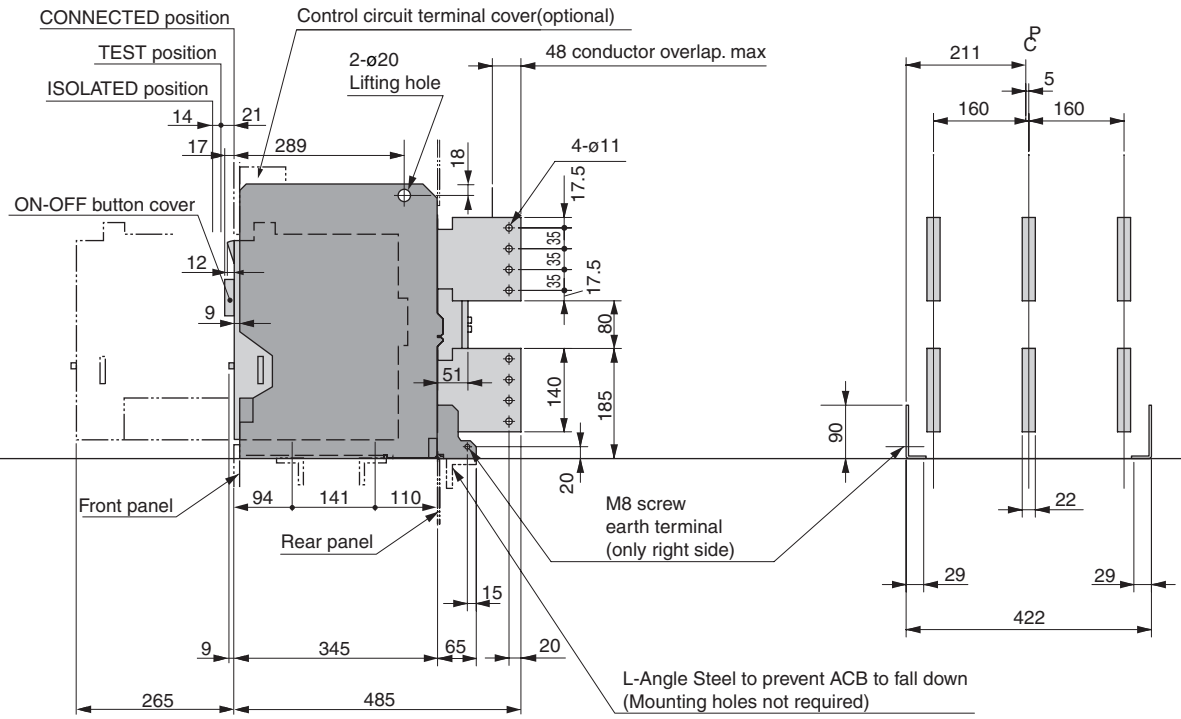
DC Air Circuit Breakers

Outline dimensions (mm)

● Type AR440SB 3P Draw-out type



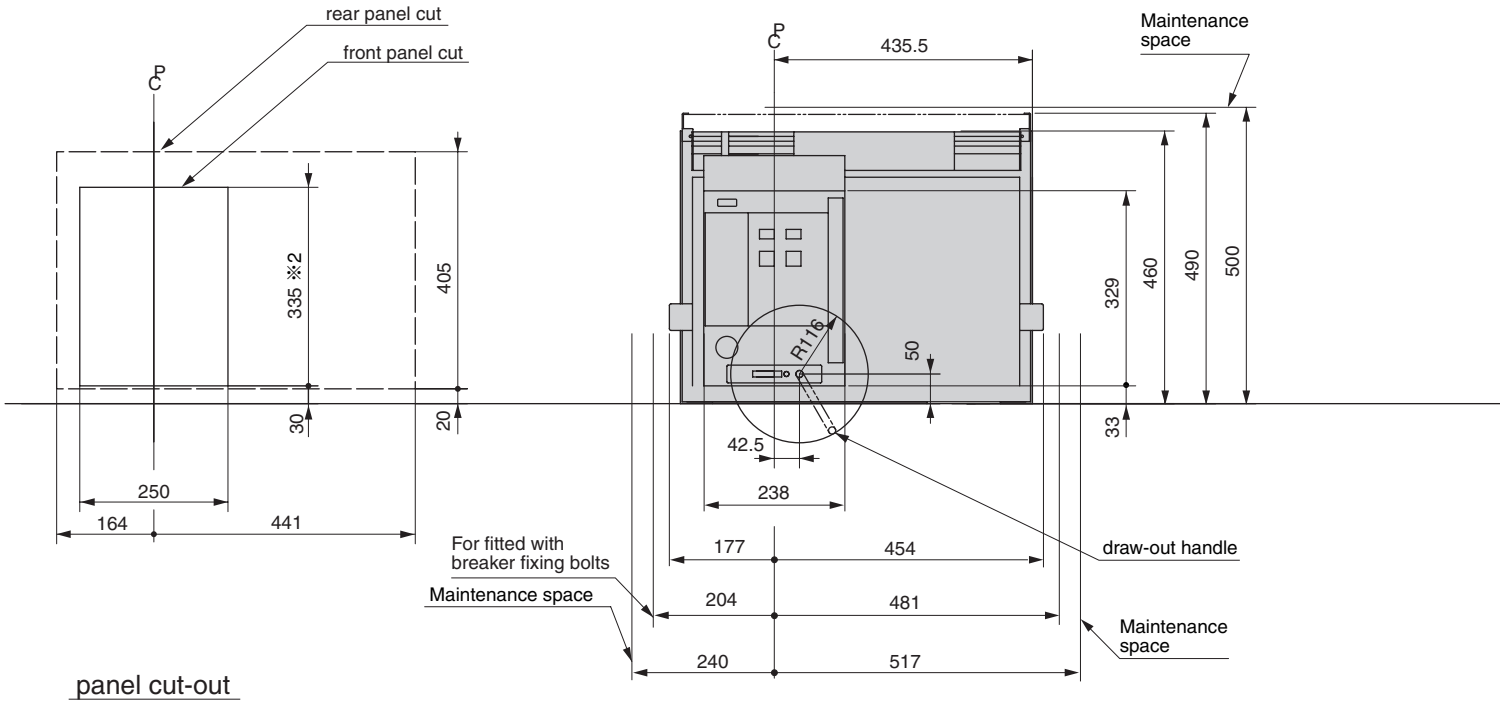
※2 : Panel cut should be 339 mm not 335 mm when the door flange is used.


CONNECTED position
TEST position
ISOLATED position
Control circuit terminal cover(optional)
2-ø20
Lifting hole
48 conductor overlap. max
4-ø11
ON-OFF button cover
Front panel
Rear panel
M8 screw
earth terminal
(only right side)
L-Angle Steel to prevent ACB to fall down
(Mounting holes not required)
14
21
17
289
18
17.5
35
35
35
17.5
12
9
80
51
140
185
20
94
141
110
15
9
345
65
20
265
485
211
5
160
160
90
22
29
29
422

DC Air Circuit Breakers

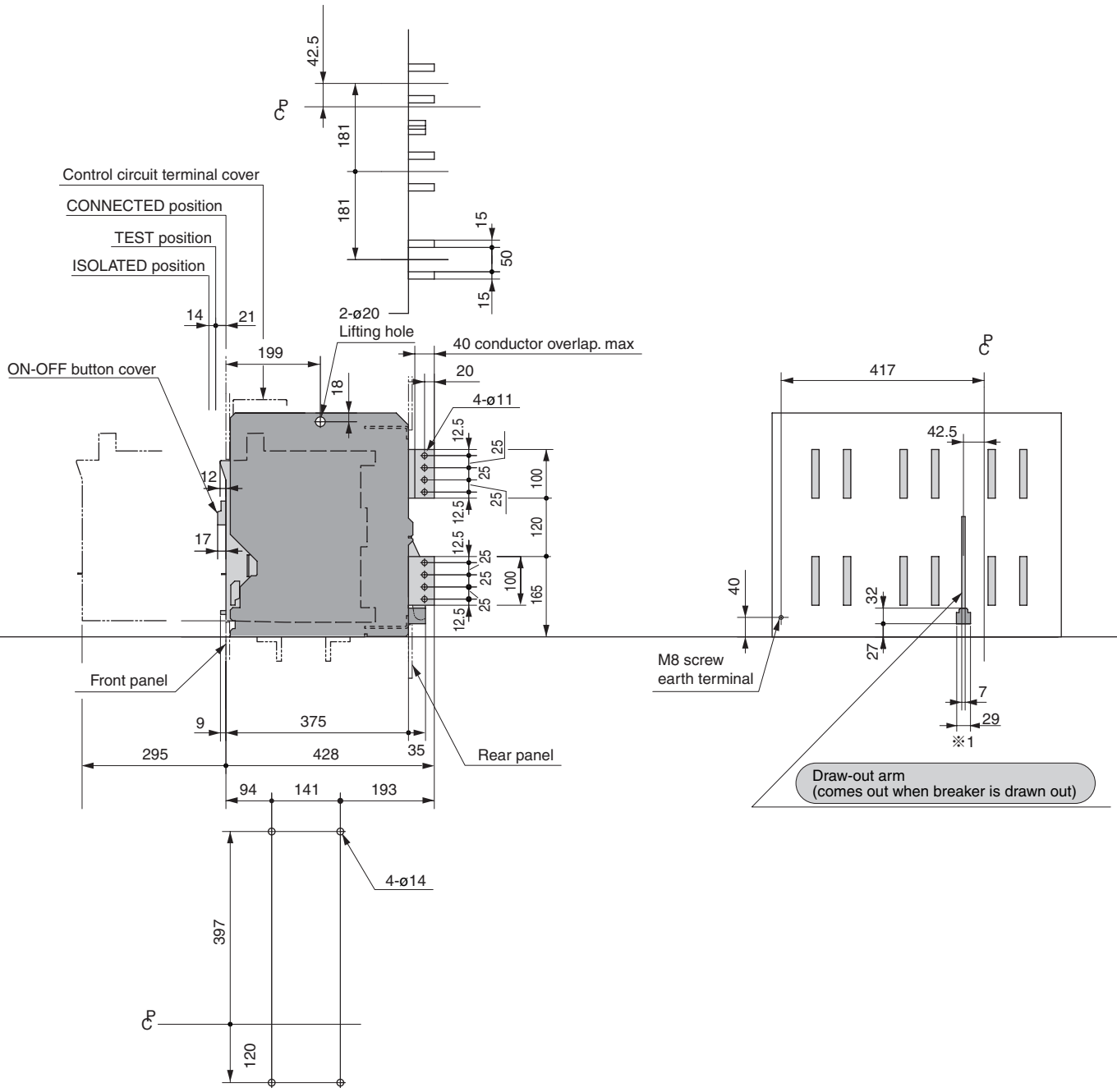
Outline dimensions (mm)

● Type AR440S 3P Draw-out type



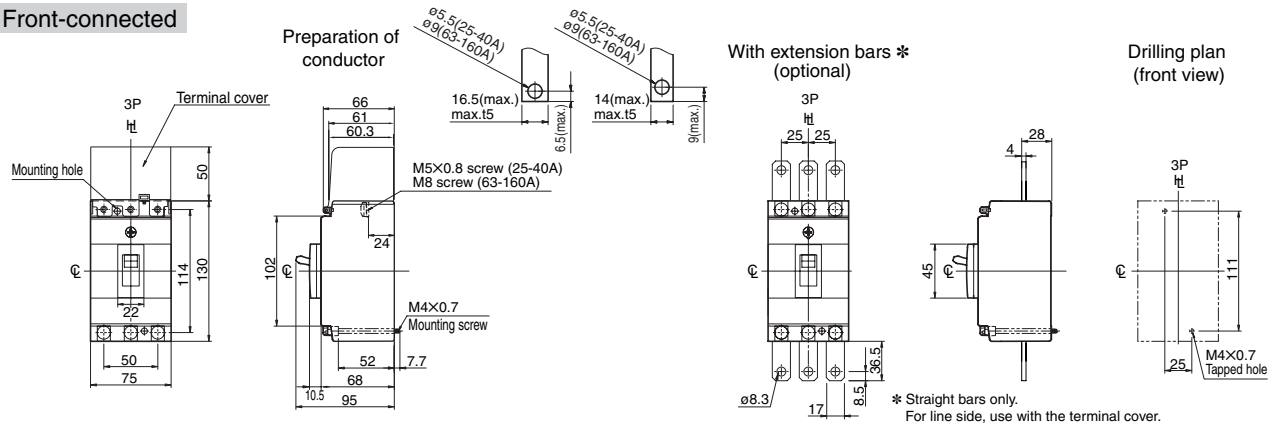
※1 : Conductors including connecting bolts should be separated min-7mm from Draw-out arm.

※2 : Panel cut should be 339 mm not 335 mm when the door flange is used.


42.5
℄
181
181
15
50
15
Control circuit terminal cover
CONNECTED position
TEST position
ISOLATED position
14
21
2-ø20
Lifting hole
40 conductor overlap. max
199
20
18
4-ø11
ON-OFF button cover
12.5
25
25
25
12.5
100
120
12.5
25
25
25
100
165
12.5
12
17
Front panel
9
375
295
428
35
Rear panel
94
141
193
4-ø14
397
℄
120
℄
417
42.5
40
32
27
M8 screw
earth terminal
7
29
※1
Draw-out arm
(comes out when breaker is drawn out)

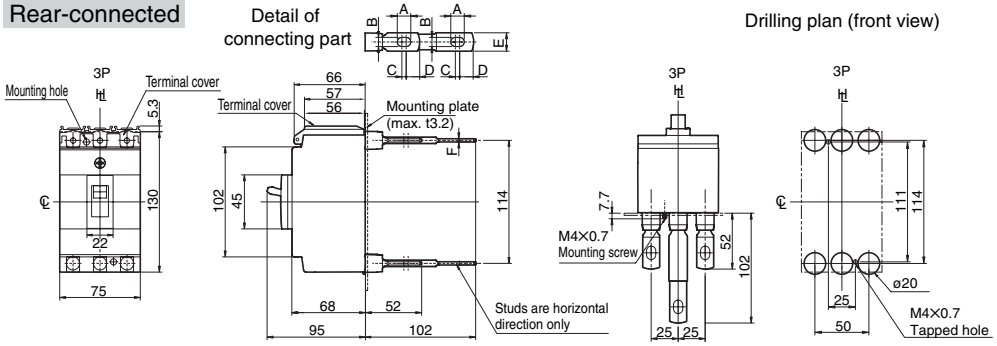
Outline dimensions (mm) — S160-SD 3P, S160-GD 3P, S160-SDN 3P

Front-connected



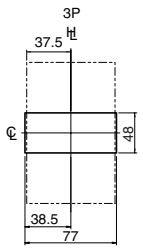
✻ Straight bars only.
For line side, use with the terminal cover.

Rear-connected



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

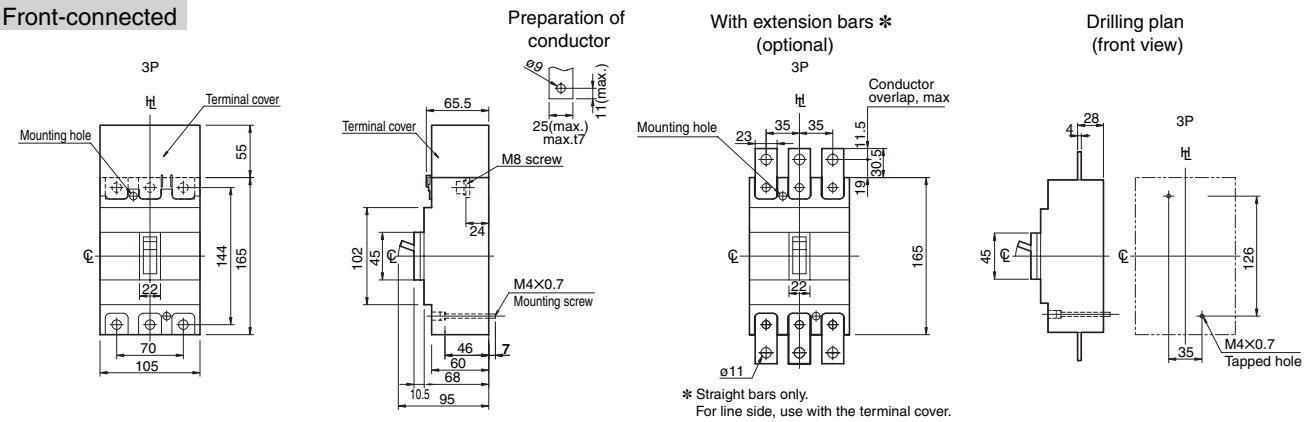
Panel cutout (front view)



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

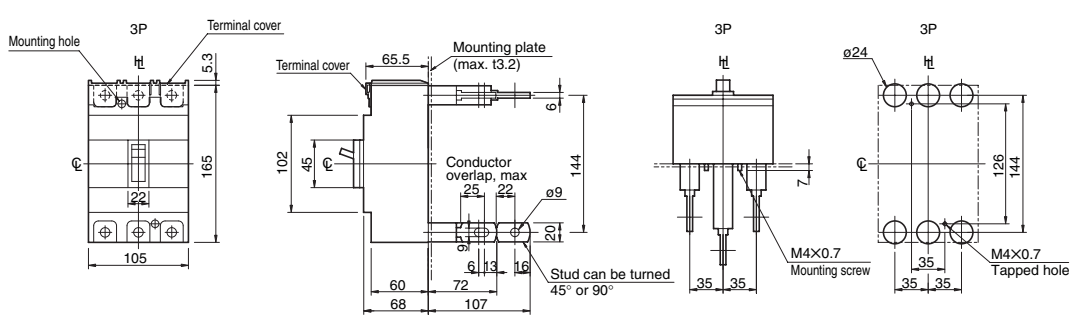
Outline dimensions (mm) — S250-SD 3P, S250-GD 3P, S250-SDN 3P

Front-connected

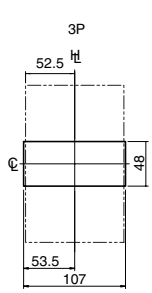


✻ Straight bars only.
For line side, use with the terminal cover.

Rear-connected



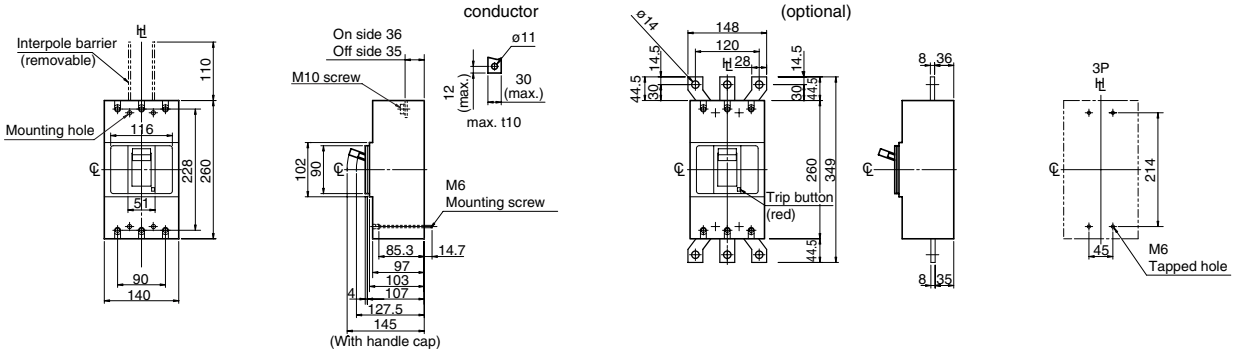
Panel cutout (front view)



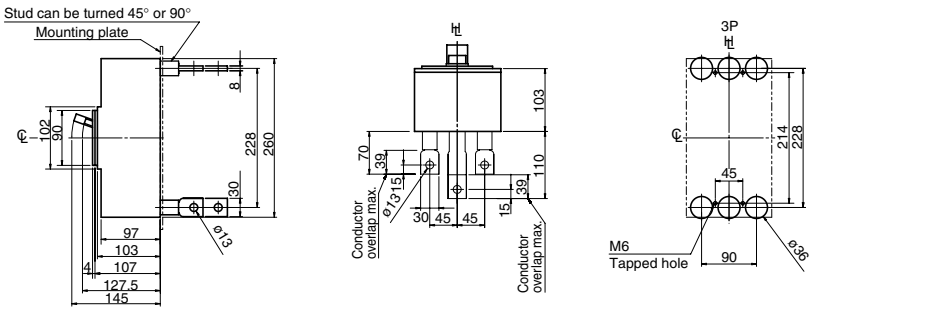
Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

Outline dimensions (mm) S400-ND 3P

Front-connected

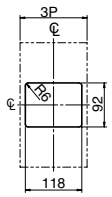


Rear-connected



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

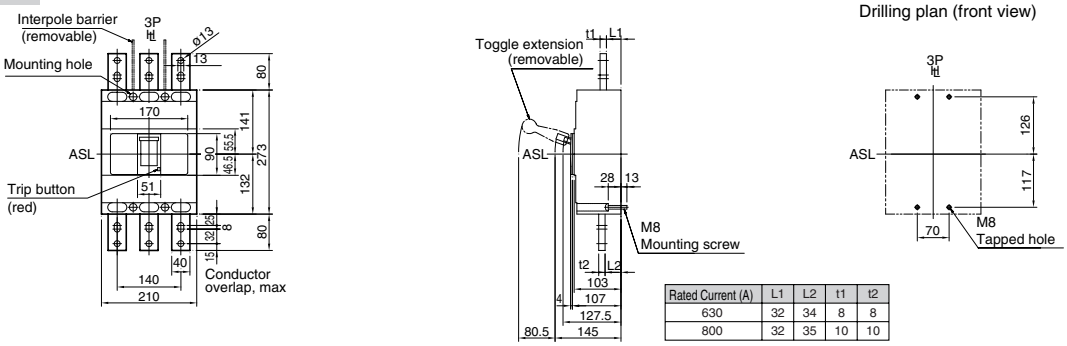
Panel cutout (front view)



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

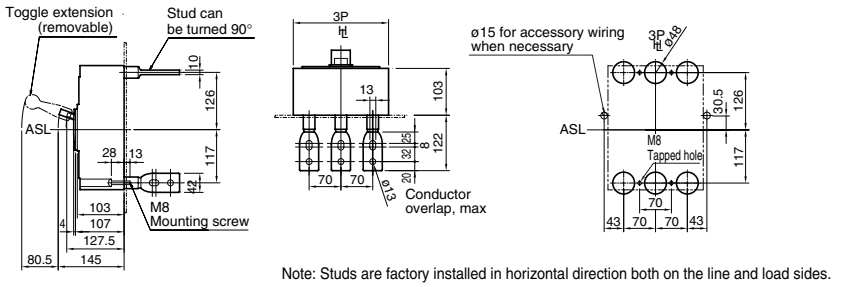
Outline dimensions (mm) S800-ND 3P

Front-connected



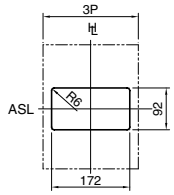
Rated Current (A)	L1	L2	t1	t2
630	32	34	8	8
800	32	35	10	10

Rear-connected



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

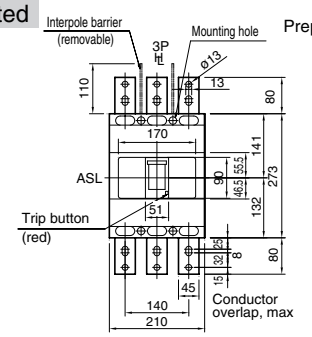
Panel cutout (front view)



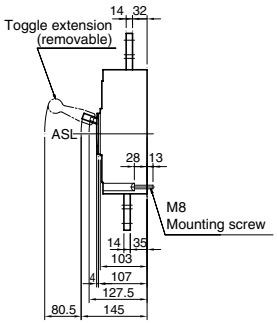
Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

Outline dimensions (mm) — S1000-ND 2P, 3P

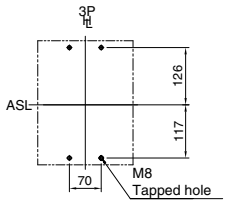
Front-connected



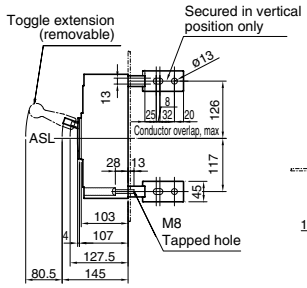
Preparation of conductor

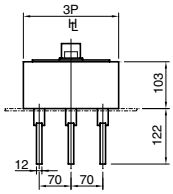


Drilling plan (front view)

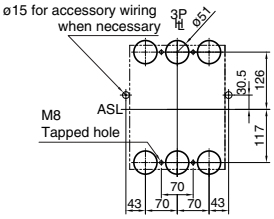


Rear-connected

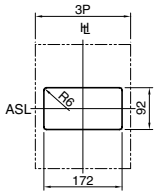




Drilling plan (front view)



Panel cutout (front view)

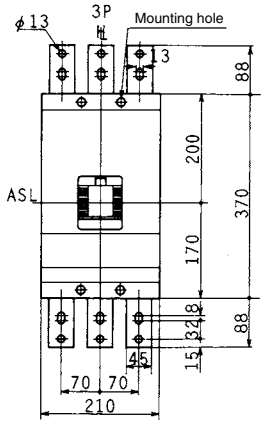


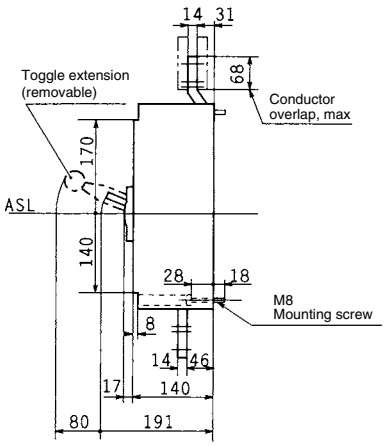
Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

Note: 2 poles breaker is same outline dimensions as 3 poles breaker.

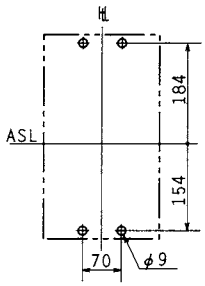
Outline dimensions (mm) XS1250ND 2P, 3P

Front-connected

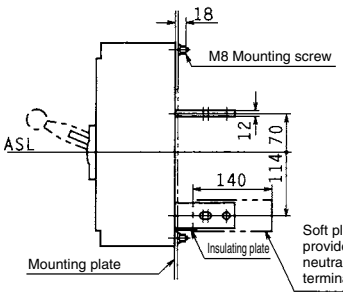




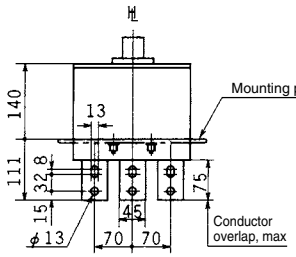
Drilling plan (front view)



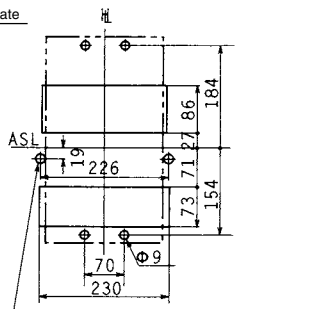
Rear-connected



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



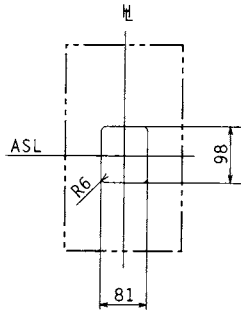
Drilling plan (front view)



ø15 for accessory wiring when necessary

Note: Studs are factory installed in horizontal direction both on the line and load sides. Please specify when ordering if vertical direction is reqired.

Panel cutout (front view)

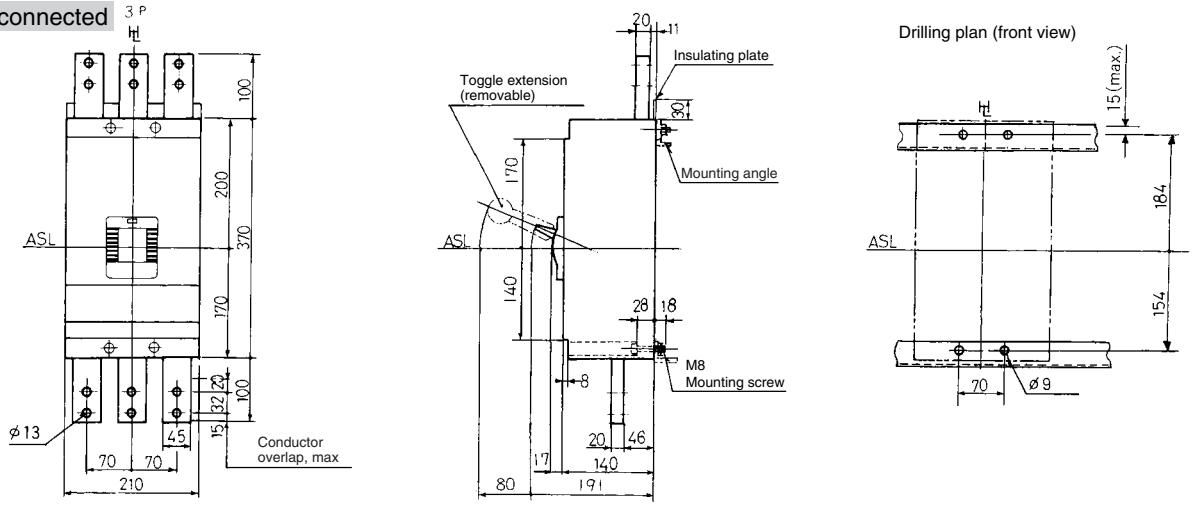


Panel cutout dimensions shown give an allowance of 1.5mm around the handle escutcheon.

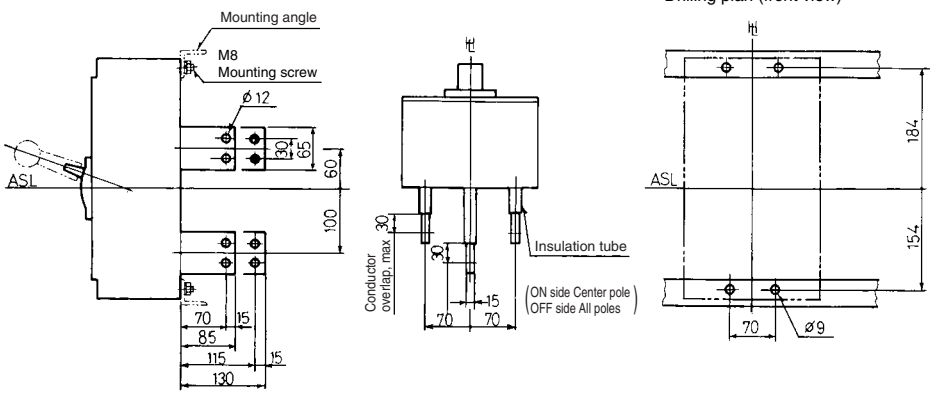
Note: 2 poles breaker is same outline dimensions as 3 poles breaker.

Outline dimensions (mm) XS1600ND 2P, 3P

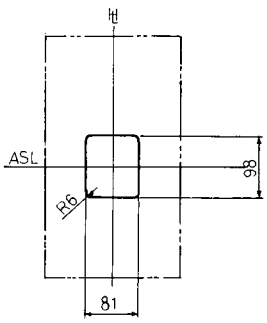
Front-connected



Rear-connected

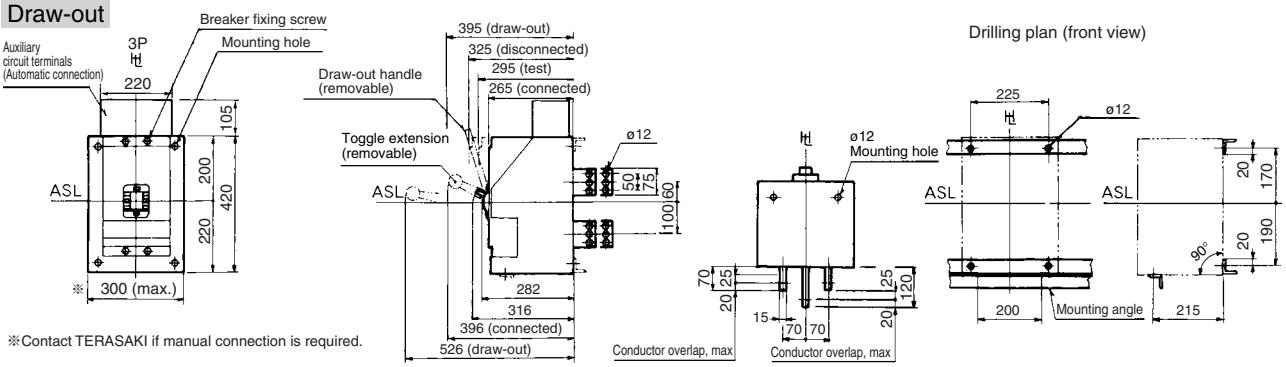


Panel cutout (front view)



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

Draw-out

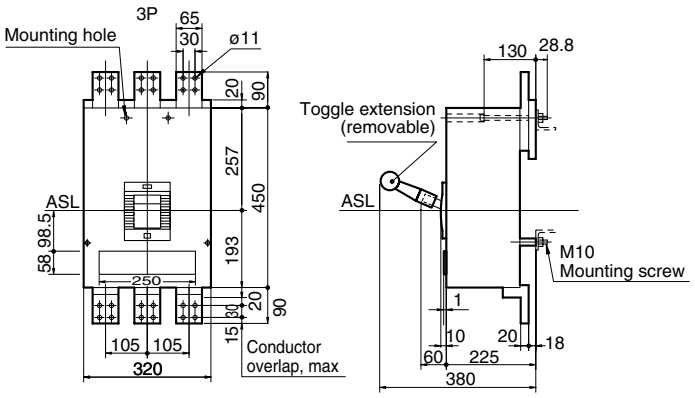


※Contact TERASAKI if manual connection is required.

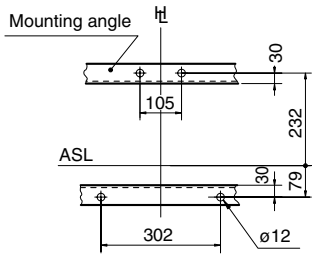
Note: 2 poles breaker is same outline dimensions as 3 poles breaker.

Outline dimensions (mm) XS2000ND 2P, 3P

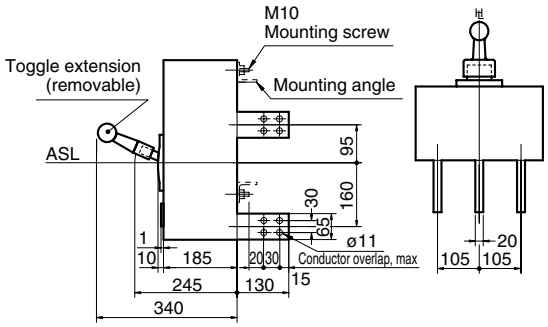
Front-connected



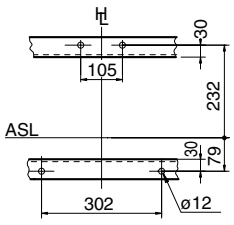
Drilling plan (front view)



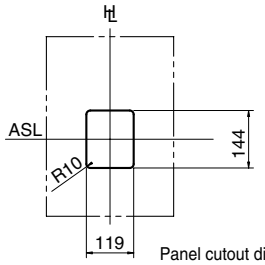
Rear-connected



Drilling plan (front view)

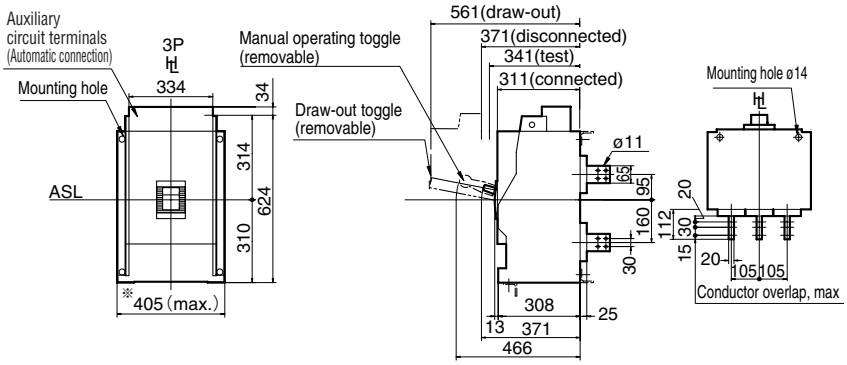


Panel cutout (front view)



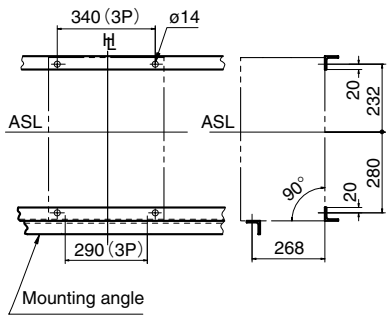
Panel cutout dimensions shown give an allowance of 2mm around the handle escutcheon.

Draw-out



※Contact TERASAKI if manual connection is required.

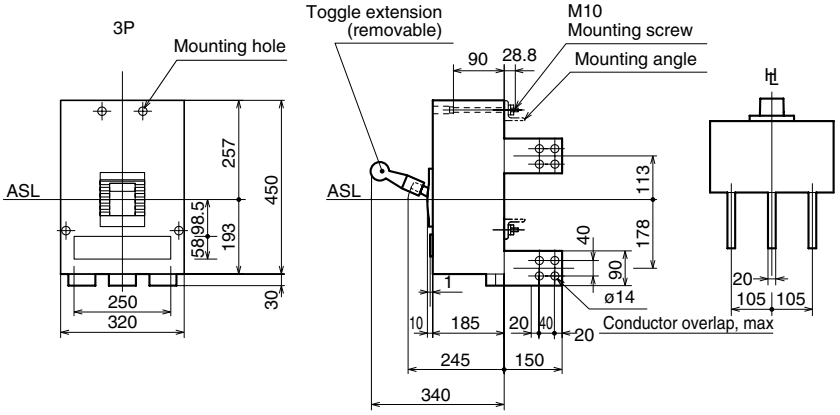
Drilling plan (front view)

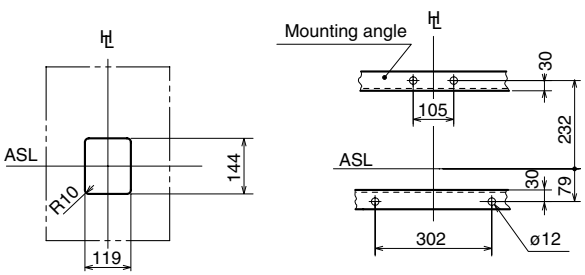


Note: 2 poles breaker is same outline dimensions as 3 poles breaker.

Outline dimensions (mm) XS2500ND 2P, 3P, XS3200ND 2P, 3P

Rear-connected



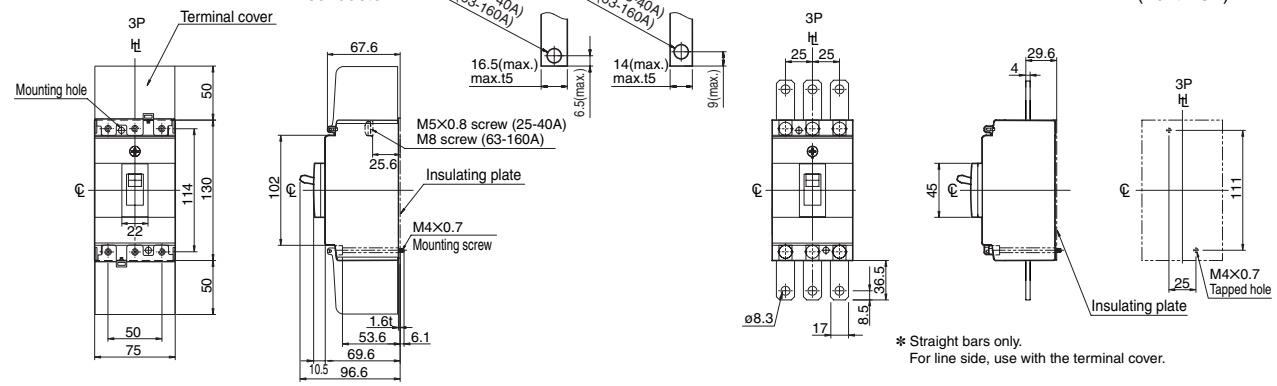


Panel cutout dimensions shown give an allowance of 2mm around the handle escutcheon.

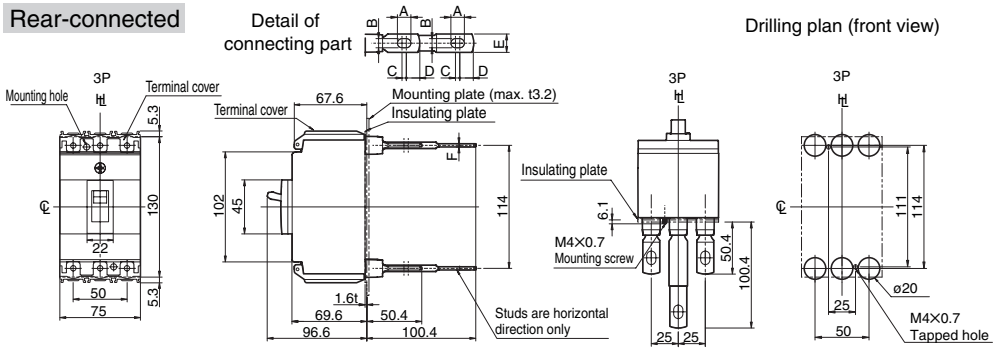
Note: 2 poles breaker is same outline dimensions as 3 poles breaker.

Outline dimensions (mm) PVE160-SDL 3P

Front-connected

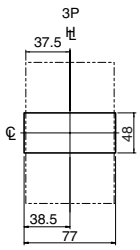


Rear-connected



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

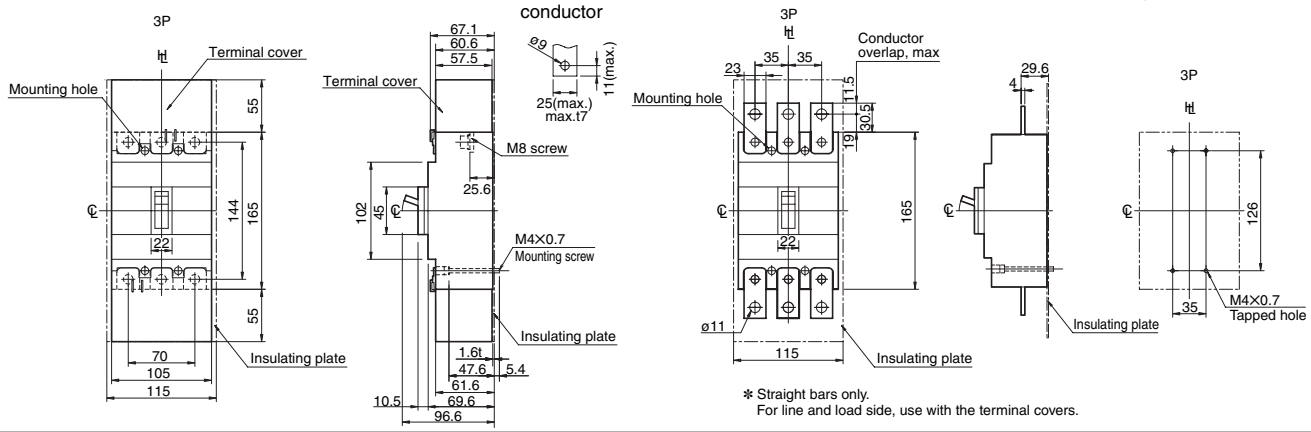
Panel cutout (front view)



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

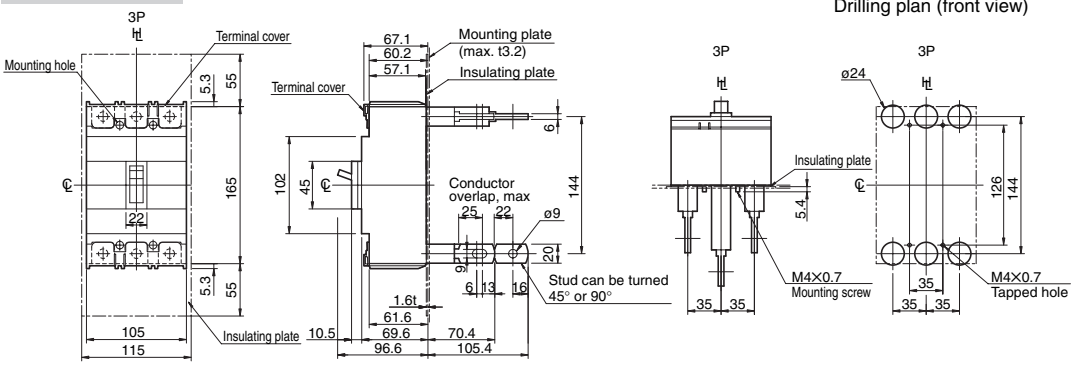
Outline dimensions (mm) — PVS160-SDL 3P, PVS250-SDL 3P

Front-connected

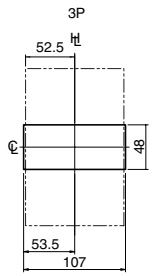


✻ Straight bars only.
For line and load side, use with the terminal covers.

Rear-connected



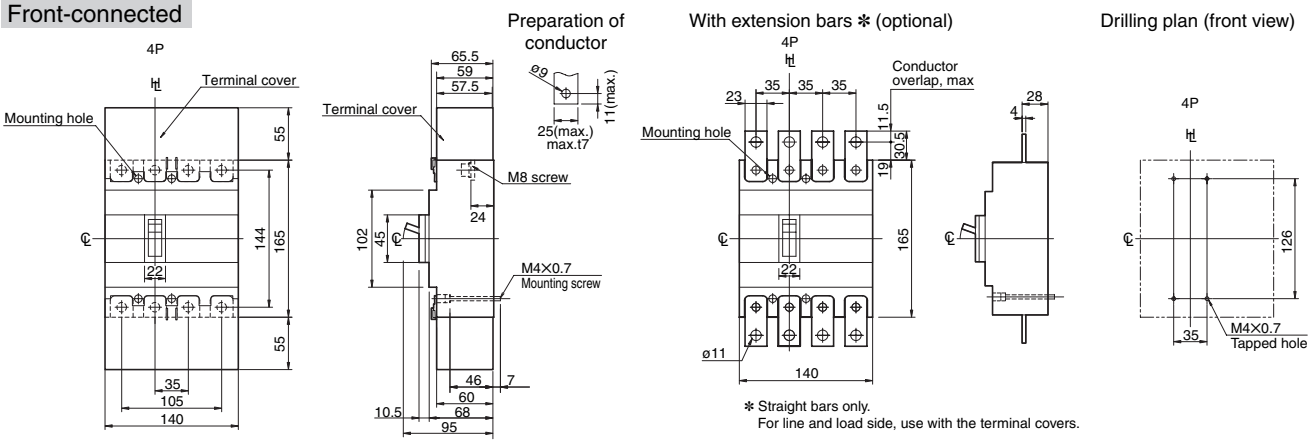
Panel cutout (front view)



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

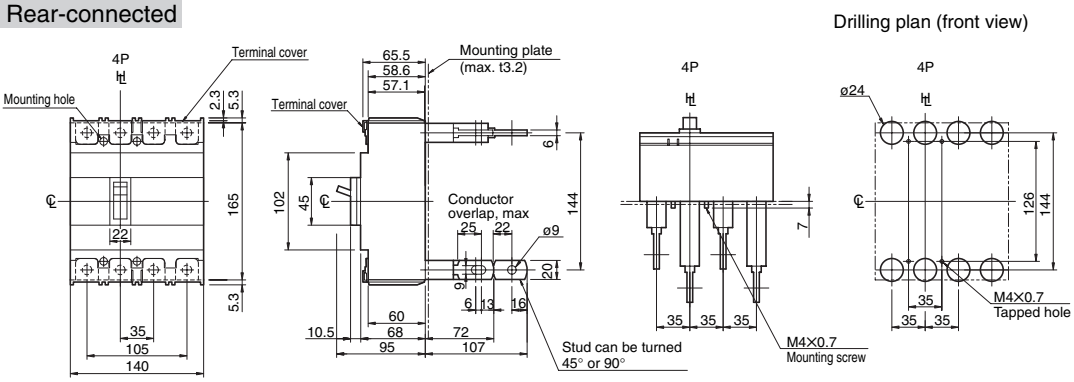
Outline dimensions (mm) — PVS160-SDL 4P, PVS250-SDL 4P, PVS160-SNL 4P, PVS250-SNL 4P

Front-connected

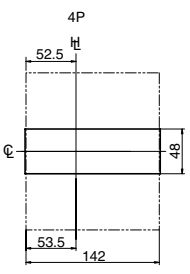


✻ Straight bars only.
For line and load side, use with the terminal covers.

Rear-connected



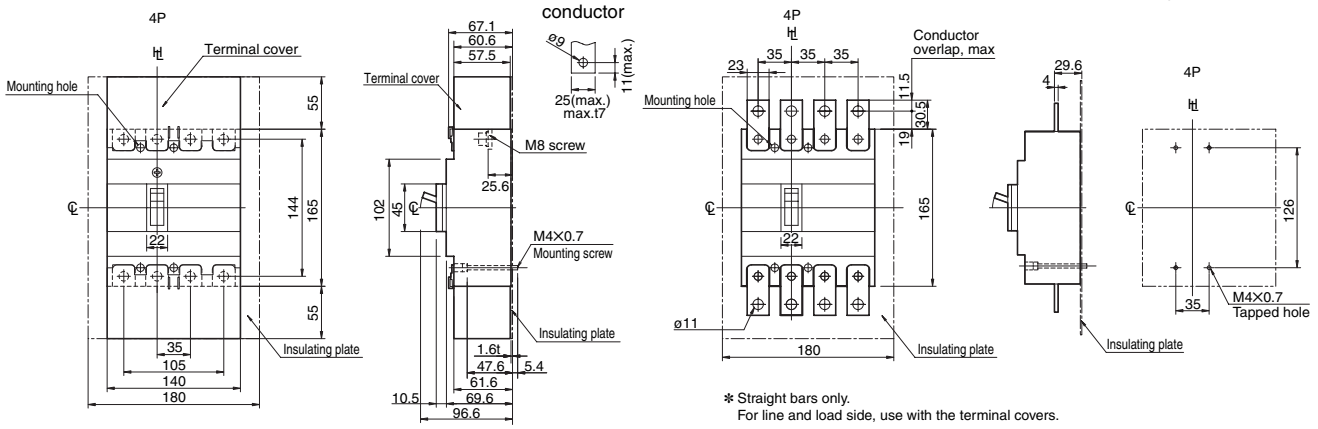
Panel cutout (front view)



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

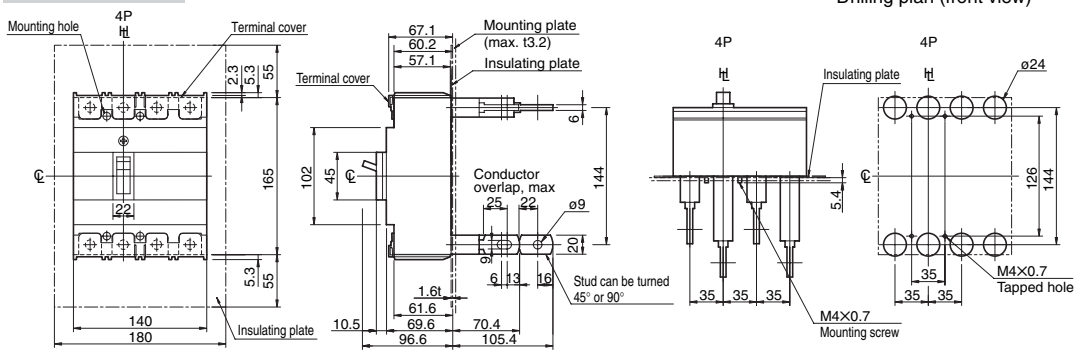
Outline dimensions (mm) PVS160-SDH 4P, PVS250-SDH 4P, PVS160-SNH 4P, PVS250-SNH 4P

Front-connected

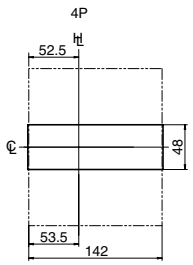


✻ Straight bars only.
For line and load side, use with the terminal covers.

Rear-connected



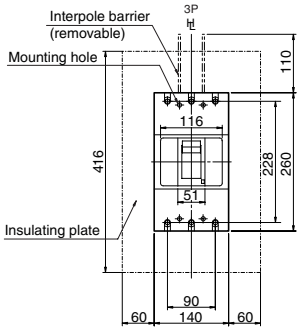
Panel cutout (front view)



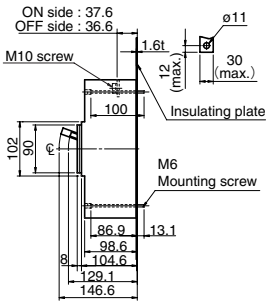
Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

Outline dimensions (mm) PVS400-NDL 3P

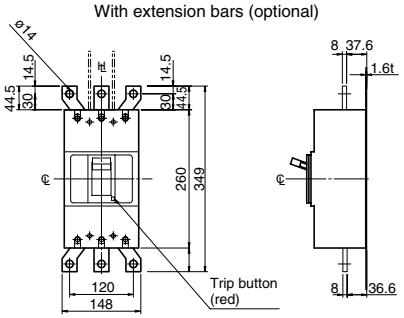
Front-connected



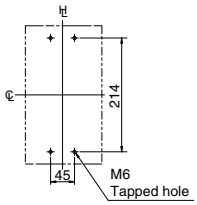
Preparation of conductor



With extension bars (optional)

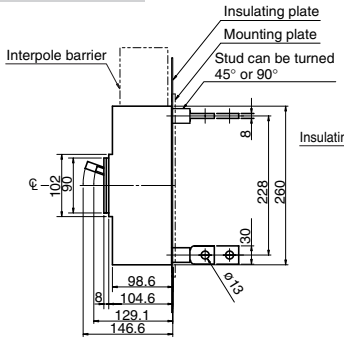


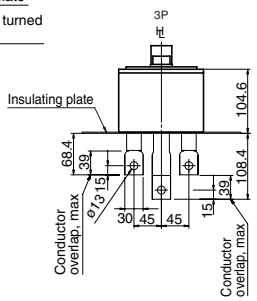
Drilling plan (front view)



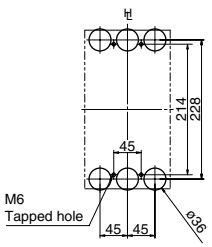
Note: See section 4 for the installation of the insulating plate.

Rear-connected



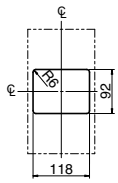


Drilling plan (front view)



Note: Studs are factory installed in horizontal direction both on the line and load sides.
See section 4 for the installation of the insulating plate.

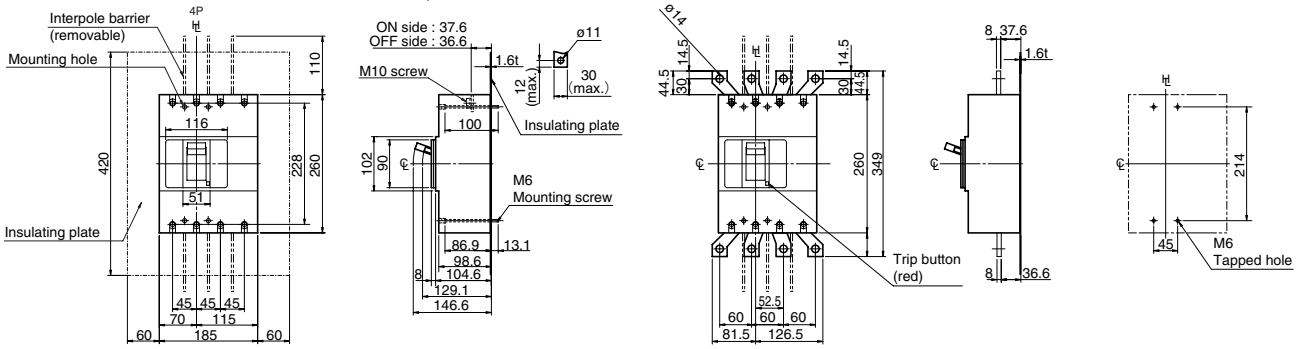
Panel cutout (front view)



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

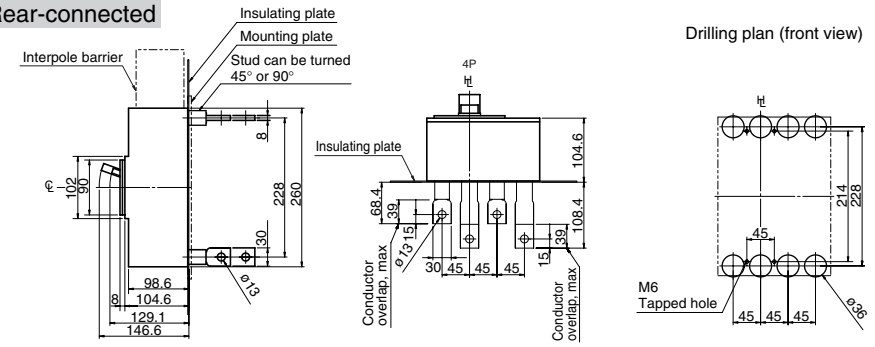
Outline dimensions (mm) — PVS400-NDL 4P, PVS400-NDH 4P

Front-connected



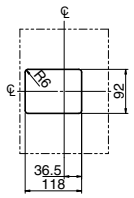
Note: See section 4 for the installation of the insulating plate.

Rear-connected



Note: Studs are factory installed in horizontal direction both on the line and load sides.
See section 4 for the installation of the insulating plate.

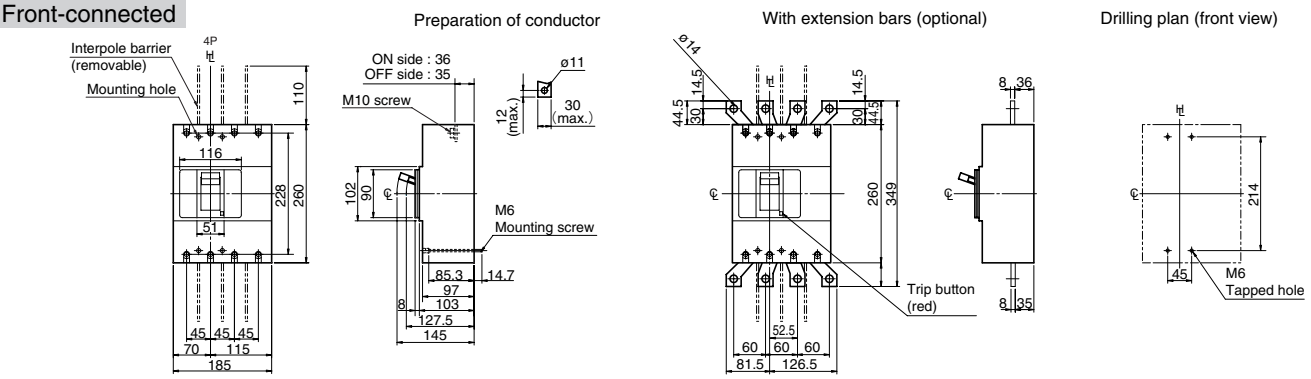
Panel cutout (front view)



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

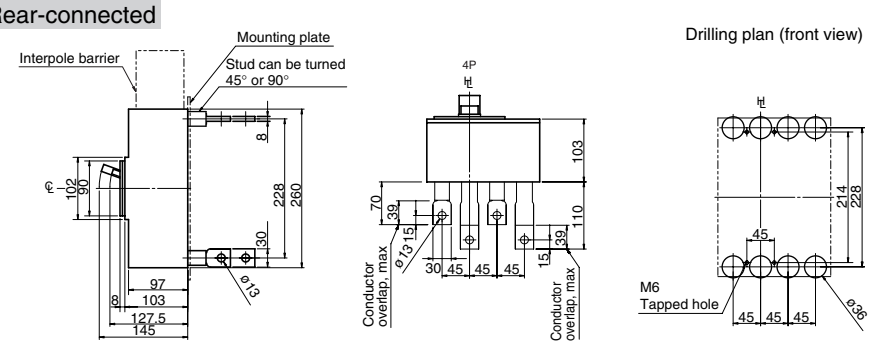
Outline dimensions (mm) — PVS400-NNL 4P, PVS400-NNH 4P

Front-connected



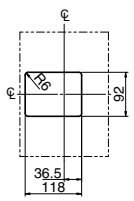
Note: See section 4 for the installation of the insulating plate.

Rear-connected



Note: Studs are factory installed in horizontal direction both on the line and load sides.
See section 4 for the installation of the insulating plate.

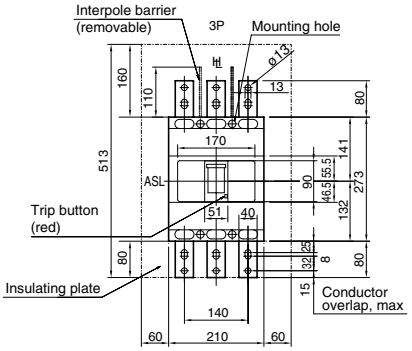
Panel cutout (front view)

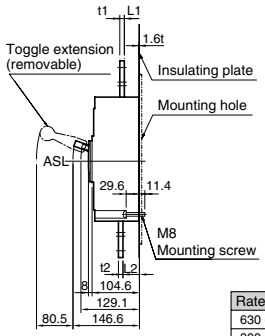


Panel cutout dimensions shown give an allowance of 1.0mm around the handle escutcheon.

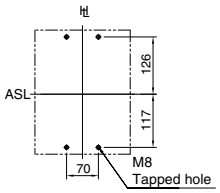
Outline dimensions (mm) — PVS800-NDL 3P

Front-connected





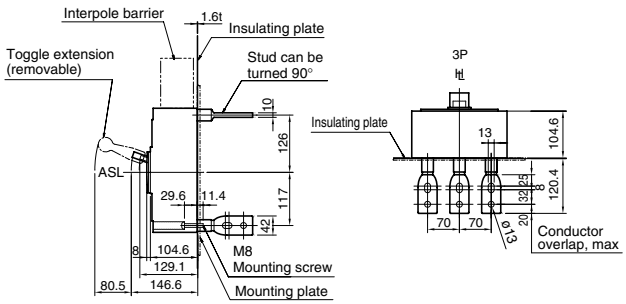
Drilling plan (front view)



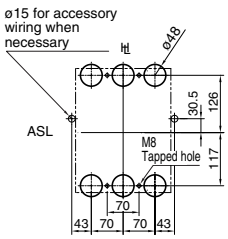
Rated Current (A)	L1	L2	t1	t2
630 (400-630)	33.6	35.6	8	8
800 (500-800)	33.6	36.6	10	10

Note: See section 4 for the installation of the insulating plate.

Rear-connected

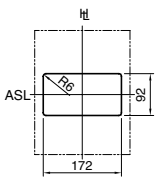


Drilling plan (front view)



Note: Studs are factory installed in horizontal direction both on the line and load sides.
See section 4 for the installation of the insulating plate.

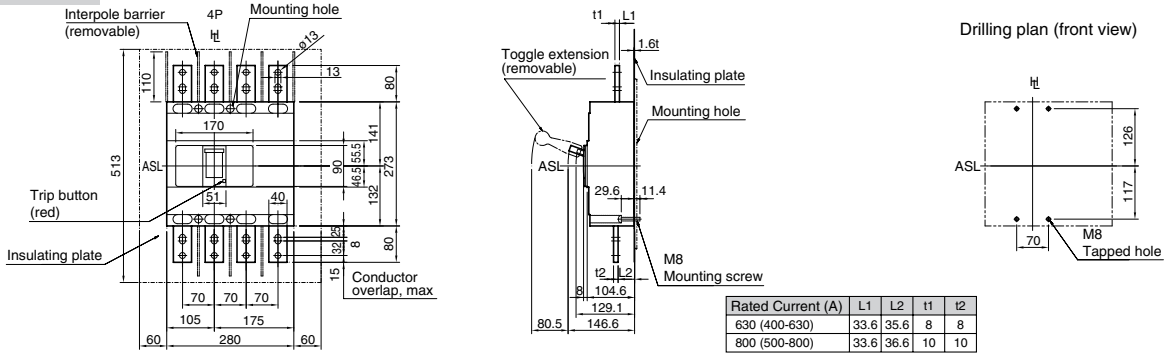
Panel cutout (front view)



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

Outline dimensions (mm) — PVS800-NDL 4P, PVS800-NDH 4P

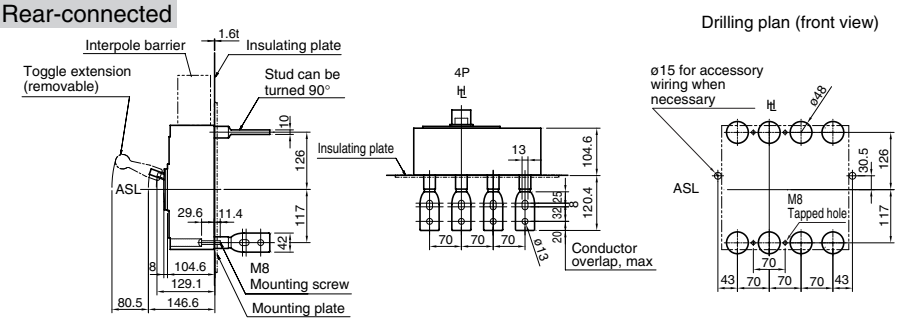
Front-connected



Rated Current (A)	L1	L2	t1	t2
630 (400-630)	33.6	35.6	8	8
800 (500-800)	33.6	36.6	10	10

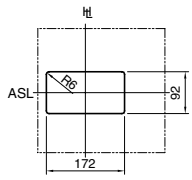
Note: See section 4 for the installation of the insulating plate.

Rear-connected



Note: Studs are factory installed in horizontal direction both on the line and load sides.
See section 4 for the installation of the insulating plate.

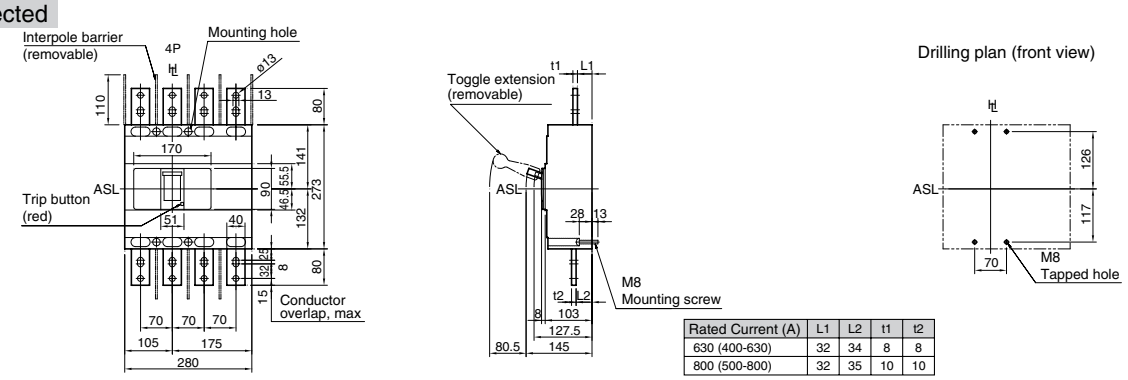
Panel cutout (front view)



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

Outline dimensions (mm) — PVS800-NNL 4P, PVS800-NNH 4P

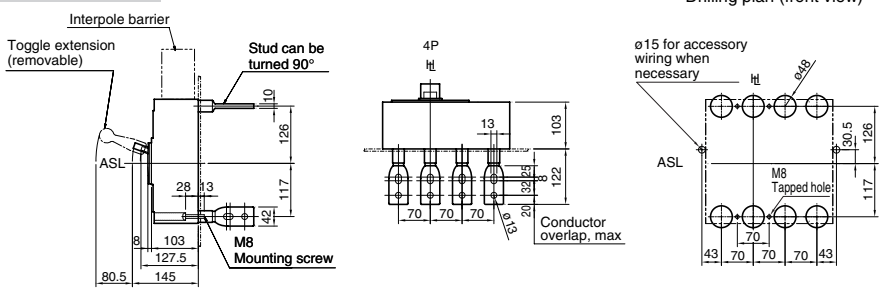
Front-connected



Rated Current (A)	L1	L2	t1	t2
630 (400-630)	32	34	8	8
800 (500-800)	32	35	10	10

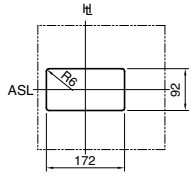
Note: See section 4 for the installation of the insulating plate.

Rear-connected



Note: Studs are factory installed in horizontal direction both on the line and load sides.
See section 4 for the installation of the insulating plate.

Panel cutout (front view)



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

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