



SMART BREAKER

Molded Case Circuit Breaker



DAERYUK Co., Ltd.

Head Office & Factory

530, Samkye-ri, Pogok-eup, Cheoin-gu, Yongin-si, Kyunggi-do, Korea

TEL : +82-31-334-3371~3 / FAX : +82-31-334-3374

E-Mail : sphan@e-daco.net / Website : http://e-daco.kr/

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DAERYUK CO., LTD.
www.e-daco.net

No matter where you are in the world or in which industrial field,
Daeryuk provides Total Solutions in order to deliver stable power for our customers.

In order to provide stable power and protection control, Daeryuk has provided all the best solutions demanded by our customers in the past and will continue to do so in the future.
We provide Total Solutions to wherever power is needed, from power stations, large-scale plants, factories, and subways to residential houses, offices, and department stores.



ISO 9001

SMART BREAKER

Molded Case Circuit Breakers



C o n t e n t s

SMART BREAKER

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NEXT SOLUTION

With an improved technology and aggressive investment in R&D, DAERYUK create differentiated value for each customer in order to provide state of the art service on electrical power system as a reliable Industrial Solution Partner.

- All Frame size (100/125/250/400/630AF) compliant to IEC standard
- Ui 750V, Uimp 8kV
- Visual isolation available (Optional)



SMART BREAKER

Molded Case Circuit Breakers

100% Compatible with existing MCCB



$I_{cs} = 100\% I_{cu}$
 $U_i = 750V$
 $U_{imp} = 8kV$

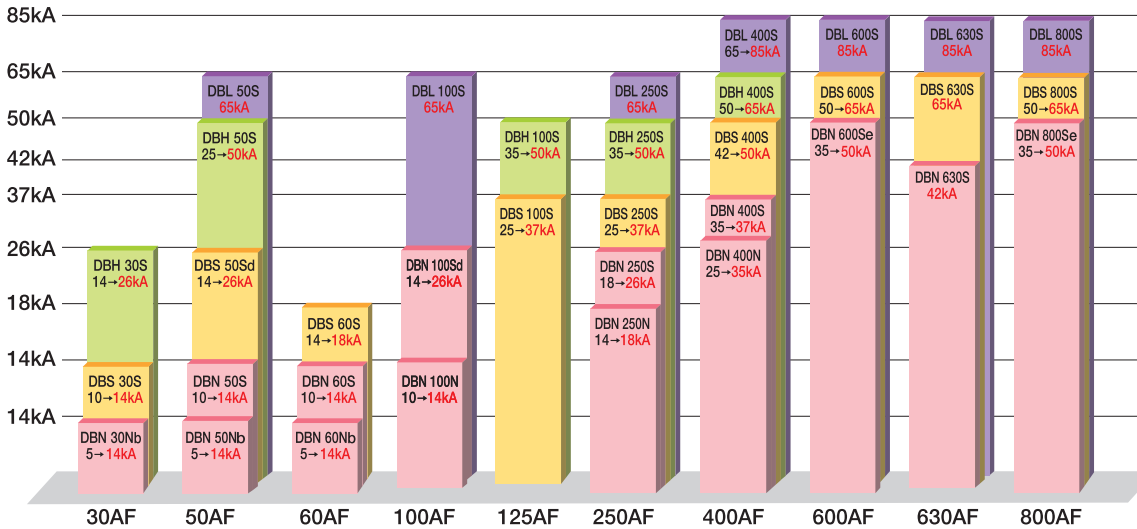
F Series



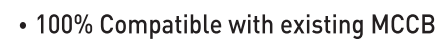
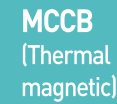
SMART Series



	50 kA	DBH
DBH	37 kA	DBS
DBS	26 kA 18 kA	DBN
DBE	14 kA	
Higher breaking capacity (460V standard)		



Method to mount the accessories

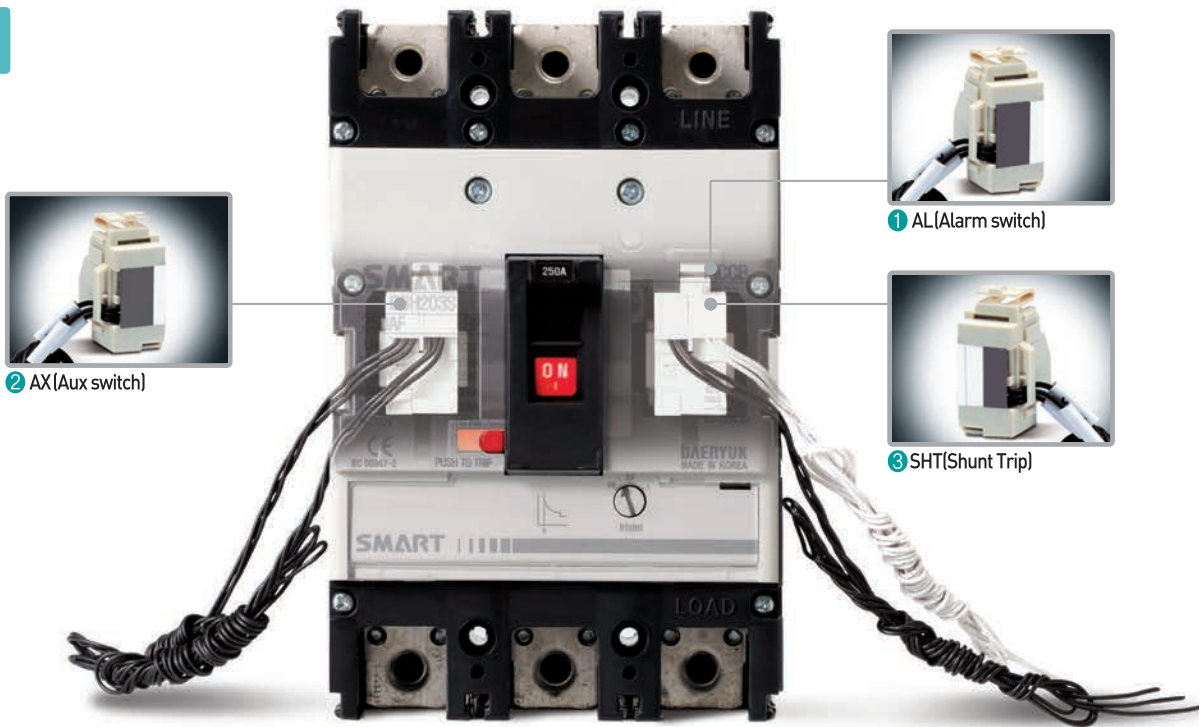


Type \ AF	30AF	50AF	60AF	100AF	125AF	250AF	400AF	600AF	630AF	800AF
DBN-N	14kA	14kA	14kA	14kA		18kA	35kA			
DBN-S		14kA	14kA	26kA		26kA	37kA	50kA	42kA	50kA
DBS	14kA	26kA	18kA		37kA	37kA	50kA	65kA	65kA	65kA
DBH	26kA	50kA			50kA	50kA	65kA			
DBL		65kA		65kA		65kA	85kA	85kA	85kA	85kA

Ordering Code[illegible]

Accessories

Accessories



1 Alarm switch, AL

This is a device to show the warning sign through the lamp or buzzer when the MCCB is tripped.

2 Auxiliary switch, AX

This is a device for the control of a circuit or various display lamps, etc., which will be used to show the ON/OFF state of the Circuit breaker.

3 Shunt Trip, SHT

This is a device that can operate the Trip of an MCCB in the distance.

Aux. switch(AX)/
Alarm switch(AL)

Operated condition (AX+AL)

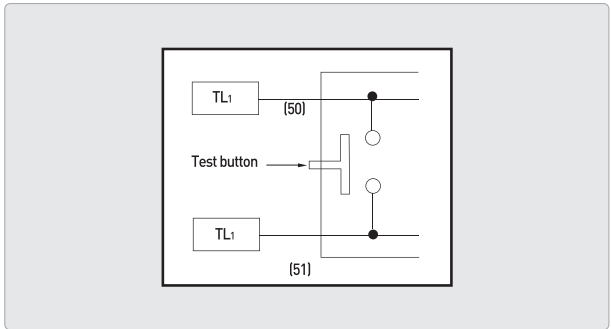
MCCB	ON	OFF	TRIP
AX			
AL			

Operating of (AX+AL)

Applying current	5A			
Rated current according to voltage	Rated voltage		Rated voltage(Ie)	
			Resistive load	Induced load
	AC 50/60Hz	125V	5	3
		250V	3	2
		500V	-	-
	DC	30V	4	3
		125V	0.4	0.4
		250V	0.2	0.2

Shunt Trip
(SHT)

Test lead wire (TL)



⚠ When the test lead wire directly contacts the human body with the power source being live, there is the possibility of electric shock.



Rating of SHT (30~250AF)

Rated voltage (Ue)		Consumption		
		AC(VA)	DC(W)	mA
Rated voltage and consumption	AC/DC 12V	0.35	0.36	30
	AC/DC 24V	0.64	0.65	27
	AC/DC 48V	1.09	1.1	23
	AC/DC 60V	1.2	1.22	20
	AC/DC 100~130V	0.73	0.75	5.8
	AC/DC 200~250V	1.21	1.35	5.4
	AC 380~450V	1.67	-	3.8
	AC 440~500V	1.68	-	3.5
Operating time		50ms(maximum)		
Torque of terminal screw		12 kgf · cm		

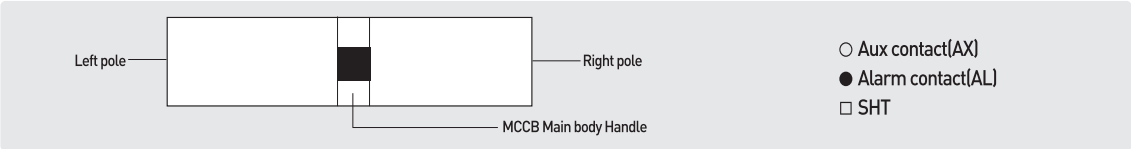
Note Operating condition : 70~110%, 45~65Hz

Rating of SHT (400~630AF)

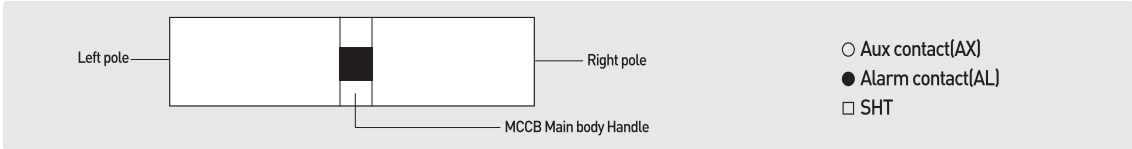
Rated voltage (Ue)	Consumption		
	Impressed voltage(V)	Current consumption(mA)	Power consumption(W)
AC/DC 24~48	AC24	14	0.3
AC 100~125/ DC 100~110	DC24	15.4	0.4
AC 200~240/ DC 200~220	AC48	14	0.7
AC 380~440	DC48	16	0.8
AC 480~550	AC110	6	0.7
Note Operating voltage - AC : 85~110% - DC : 75~125%	DC110	6.6	0.7
	AC220	6.8	1.5
	DC200	7.6	1.5
	AC440	4.3	1.9
	AC480	4.4	3.3
	AC550	4.6	2.4

Accessories

Table of internal attachment (MCCB)



Smart Series		30~250AF		400~630AF	600~800AF	1000~1200AF
Type	N-Type	DBN 52S, 62S, 102Sc, 102Sd	DBN 53S/54S DBN 63S/64S DBN 103Sd/104Sd DBN 202S/203/204S	DBN 402S/403S/404N DBN 632S/633S/634S	DBN 602S/603S/604S DBN 802S/803S/804S	-
	S-Type	DBS 32S, 52S, 62S, 102S	DBN 33S/34S DBN 53S/54Sc DBN 63S/64S DBN 103S/104S DBN 202S/203S/204S	DBS 402S/403S/404S DBS 632S/633S/634S	DBS 602S/603S/604S DBS 802S/803S/804S	DBS 1003S/1004S DBS 1203S/1204S
	H-Type	DBH 52S, 102S	DBH 53S/54S DBH 103S/104S DBH 202S/203S/204S	DBH 402S/403S/404S	-	-
	L-Type	DBL 52S, 102S	DBL 53S/54S, DBL 103S/104S, DBL 202S/203S/204S	DBL 402S/403S/404S DBL 632S/633S/634S	DBL 602S/603S/604S DBL 802S/803S/804S	-
Number of poles		2poles	2, 3, 4poles	2, 3, 4poles	2, 3, 4poles	3, 4poles
AX						
AX2						
AX3 (4)						
AL						
AL2						
AL3(4)						
SHT						
SHT2						
AX+AL						
AX+AL2						
AX+AL3(4)						
AX2+AL						
AX2+AL2						
AX2+AX3(4)						
AX3(4)+AL						
AX3(4)+AL2						
AX3(4)+AL3(4)						
AX+SHT						

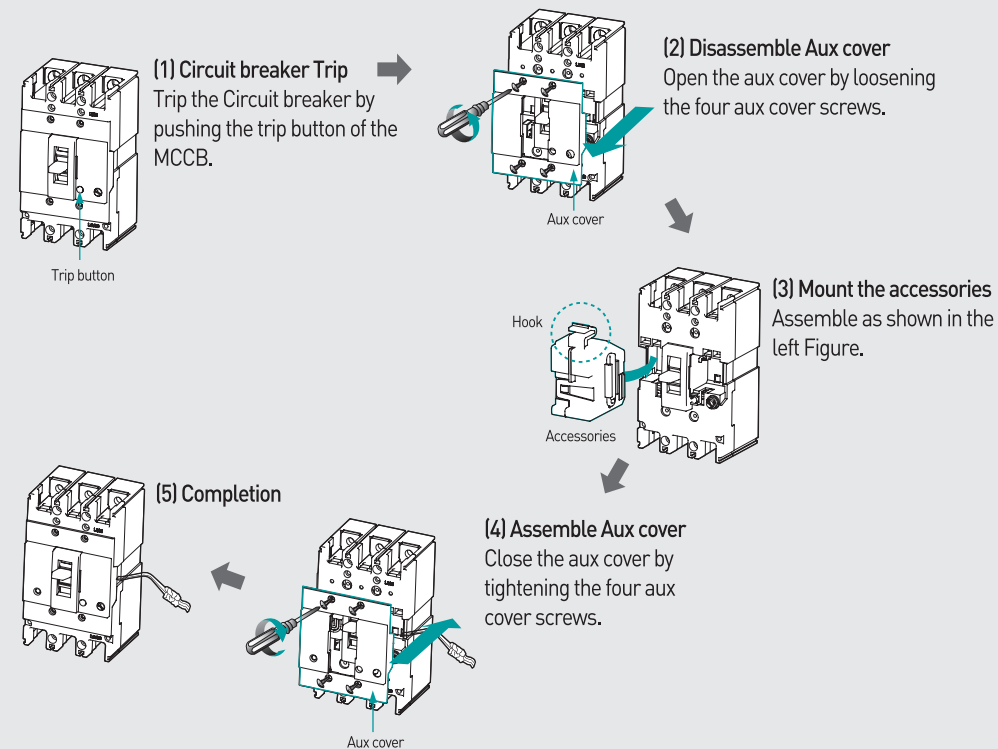


Smart Series		30~250AF		400~630AF	600~800AF	1000~1200AF
Type	N-Type	DBN 52S, 62S, 102Sd	DBN 53S/54S DBN 63S/64S DBN 103Sd/104Sd DBN 202S/203/204S	DBN 402S/403S/404N DBN 632S/633S/634S	DBN 602S/603S/604S DBN 802S/803S/804S	-
	S-Type	DBS 32S, 52S, 62S, 102S	DBN 33S/34S DBN 53S/54Sc DBN 63S/64S DBN 103S/104S DBN 202S/203S/204S	DBS 402S/403S/404S DBS 632S/633S/634S	DBS 602S/603S/604S DBS 802S/803S/804S	DBS 1003S/1004S DBS 1203S/1204S
	H-Type	DBH 52S, 102S	DBH 53S/54S DBH 103S/104S DBH 202S/203S/204S	DBH 402S/403S/404S	-	-
	L-Type	DBL 52S, 102S	DBL 53S/54S, DBL 103S/104S, DBL 202S/203S/204S	DBL 402S/403S/404S DBL 632S/633S/634S	DBL 602S/603S/604S DBL 802S/803S/804S	-
Number of poles		2poles	2, 3, 4poles	2, 3, 4poles	2, 3, 4poles	3, 4poles
AX2+SHT						
AX3(4)+SHT						
AL+SHT						
AL2+SHT						
AL3(4)+SHT						
AX+AL+SHT						
AX2+AL+SHT						
AX+AL2+SHT						
AX2+AL2+SHT						
AX3(4)+AL3(4)+SHT						

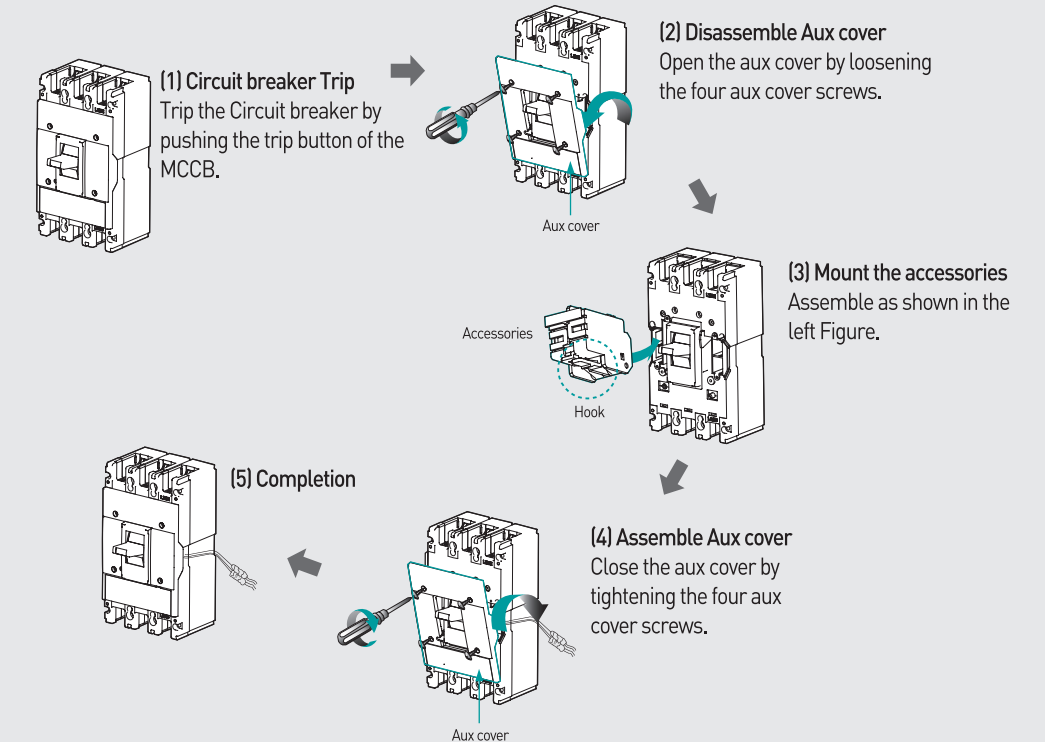
Accessories

Method to mount the accessories

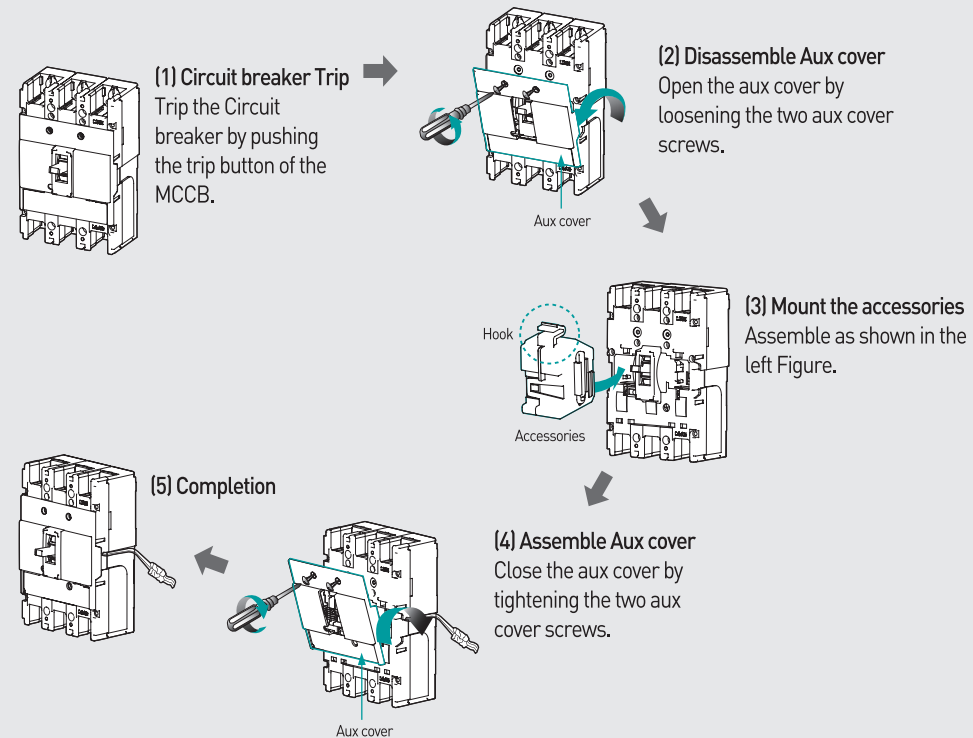
100/125AF



400/630AF



250AF



Accessories

Exterior
operating
handle

Code

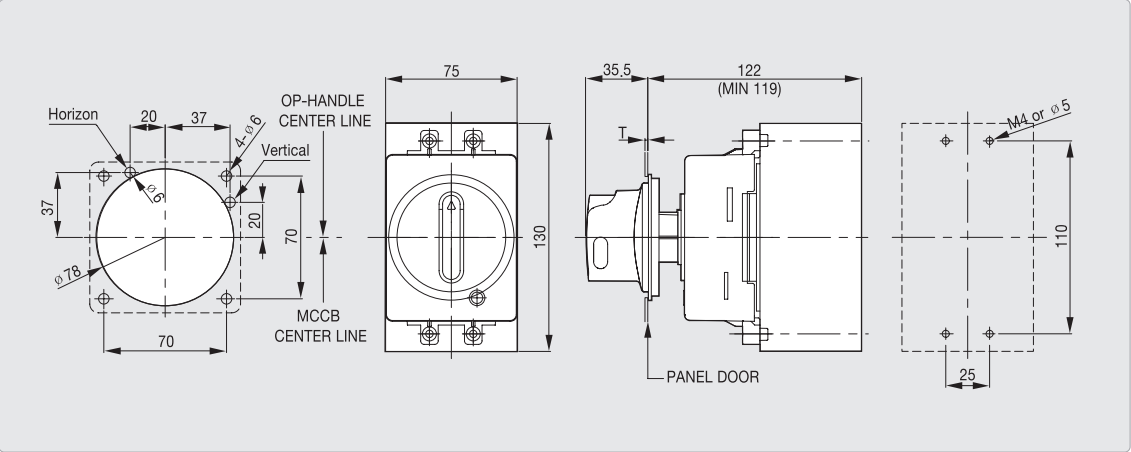
D	OH	100	H	S
DAERYUK	Operating Handle	Ampere Frame	Installation type	Operation system
		100 30~100AF	H Horizon	S Surface
		125 125AF	V Vertical	D Long Distance
		250 250AF		

Model

Type		30~100AF	125AF	250AF
S (Surface)	Horizon(H)	DOH 100HS	DOH 125HS	DOH 250HS
	Vertical(V)	DOH 100VS	DOH 125VS	DOH 250VS
D (Long Distance)	Horizon(H)	DOH 100HD	DOH 125HD	DOH 250HD
	Vertical(V)	DOH 100VD	DOH 125VD	DOH 250VD

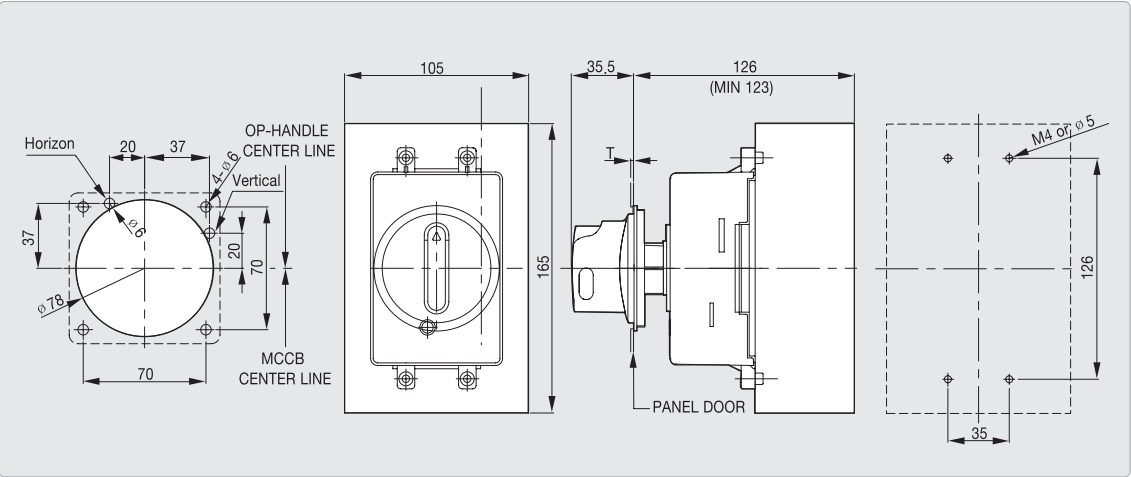
Dimension

100AF(Surface)



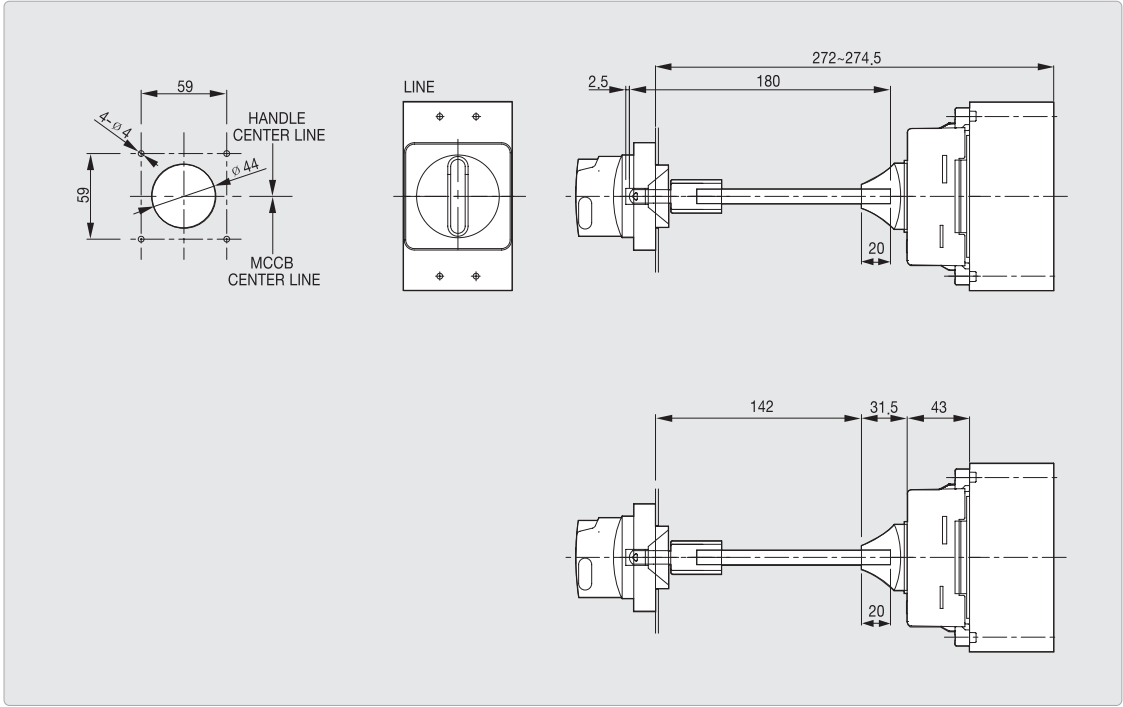
Note Applicable model : DBN-S, DBS-S, DBH-S, DBL-S

250AF(Surface)

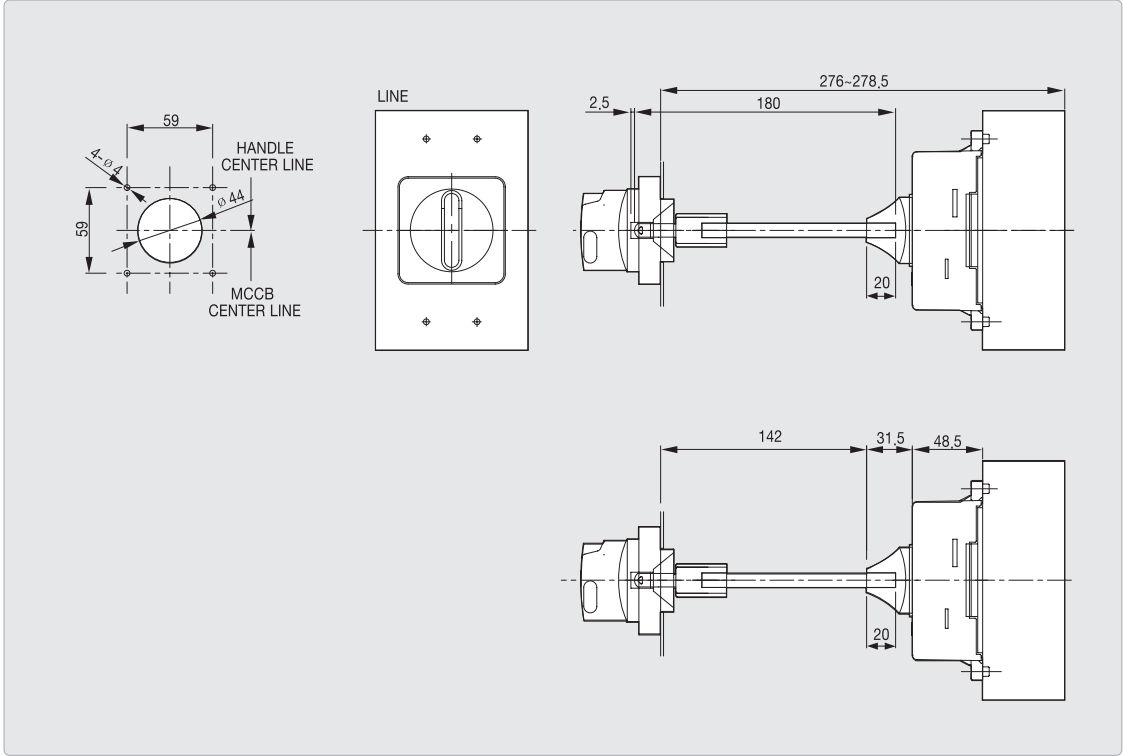


Note Applicable model : DBN-S, DBS-S, DBH-S, DBL-S

100AF(Long Distance)



250AF(Long Distance)



Molded Case Circuit Breakers (MCCB)



Frame size			30AF										50AF														
Type			N			S			H				N						S			H			L		
Model			DBN 32BNb	DBN 33BNb	DBN 34BNb	DBS 32S	DBS 33S	DBS 34S	DBH 32S	DBH 33S	DBH 34S		DBN 52Nb	DBN 53Nb	DBN 54Nb	DBN 52S	DBN 53S	DBN 54S	DBS 52Sd	DBS 53Sd	DBS 54Sd	DBH 52S	DBH 53S	DBH 54S	DBL 52S	DBL 53S	DBL 54S
Ratings	No. of Pole		2	3	4	2	3	4	2	3	4		2	3	4	2	3	4	2	3	4	2	3	4	2	3	4
	Rated Current (In) A		5,10,15,20,30			15,20,30			15,20,30				5,10,15,20,30,40,50			15,20,30,40,50			15,20,30,40,50			40,50			(15,20,30)40,50		
	Rated Voltage (Un)	AC V	690			690			690				690			690			690			690			690		
		DC V	250		-	500			500				250		-	500		500		500		500		500			
	Rated Insulation Voltage (Ui) V		750			750			750				750			750			750			750			750		
Impulse Withstand Voltage (Uimp) kV		6			8			8				6			8			8			8			6			
Rated Breaking Capacity(kA)	AC	690/600V	5			2.5			7.5				5			2.5			7.5			10			35		
		480/500V	7.5			7.5			14				7.5			7.5			14			35			42		
		415/460V	14			14			26				14			14			26			50			65		
		380V	14			18			30				14			18			30			50			65		
		220V/250V	25			30			50				25			30			50			100			125		
	DC	500V(3P)	-	-	-	-	5	5	-	10	10		-	-	-	-	5	5	-	10	10	-	30	30	-	40	40
		250V(2P)	2.5	2.5	-	5	-	-	5	-	-		2.5	2.5	-	5	-	-	10	-	-	30	-	-	40	-	-
Ics = % × Icu			50			100			50				50			100			100			100			50		
Over current trip type			Hydraulic Magnetic (ODP)			Thermal Magnetic			Thermal Magnetic				Hydraulic Magnetic (ODP)			Thermal Magnetic			Thermal Magnetic			Thermal Magnetic			Thermal Magnetic		
Trip type and protection feature (Option)	Adjustable Note1	Rating (Definite-time)	-			(0.8-0.9-1.0) × In			(0.8-0.9-1.0) × In				-			(0.8-0.9-1.0) × In			(0.8-0.9-1.0) × In			(0.8-0.9-1.0) × In			-		
	Fixed	Instantaneous	(8-12) × In			(8-12) × In			(8-12) × In				(8-12) × In			(8-12) × In			(8-12) × In			(8-12) × In			(8-12) × In		
Dimension(mm) W×H×D	2P		50×130×60			50×130×60			50×130×60				50×130×60			50×130×60			50×130×60			60×155×60			90×155×86		
	3P		75×130×60			75×130×60			75×130×60				75×130×60			75×130×60			75×130×60			90×155×60					
	4P		100×130×60			100×130×60			100×130×60				100×130×60			100×130×60			100×130×60			120×155×60			120×155×86		
Connection	Standard type		○			○			○				○			○			○			○			○		
	Rear Connection		-			-			-				-			-			-			-			-		
Mounting type			Screw			Screw			Screw				Screw			Screw			Screw			Screw			Screw		
Accessories	Aux. Switch (AX)		-			○			○				-			○			○			○			○		
	Alarm Switch (AL)		-			○			○				-			○			○			○			○		
	Shunt trip SHT		-			○			○				-			○			○			○			○		
	Under Voltage trip device UVT		-			-			-				-			-			-			-			-		
	Rotary Handle	Direct	○			○			○				○			○			○			○			○		
		Extended	○			○			○				○			○			○			○			○		
	Terminal Cover	Long Type	-			-			-				-			-			-			-			-		
		Short Type	○			○			○				○			○			○			○			-		
Insulation Barrier		○			○			○				○			○			○			○			○			
Weight(kg)	2P		0.45			0.45			0.45				0.45			0.45			0.45			0.45			0.45		
	3P		0.65			0.65			0.65				0.65			0.65			0.65			0.65			0.65		
	4P		0.85			0.85			0.85				0.85			0.85			0.85			0.85			0.85		
Standard	IEC60947-2		○			○			○				○			○			○			○			○		
Certificate Status	CE		-	15,20,30A		15,20,30A			15,20,30A				-	15-50A		○		○		-		-		-			
	TUV		-	15,20,30A		15,20,30A			15,20,30A				-	15-50A		○		○		-		-		-			
	KC		-			-			○				-			-			○			-			-		
	KS		15,20,30A			15,20,30A			15,20,30A				15-50A			○		○		○		40,50A					

Molded Case Circuit Breakers (MCCB)



Frame size			60AF										100AF									125AF						
Type			N						S				N						L			S			H			
Model			DBN 62Nb	DBN 63Nb	DBN 64Nb	DBN 62S	DBN 63S	DBN 64S	DBS 62S	DBS 63S	DBS 64S		DBN102N	DBN103N	DBN104N	DBN102Sd	DBN103Sd	DBN104Sd	DBL102S	DBL103S	DBL104S	DBS102S	DBS103S	DBS104S	DBH102S	DBH103S	DBH104S	
Ratings	No. of Pole		2	3	4	2	3	4	2	3	4		2	3	4	2	3	4	2	3	4	2	3	4	2	3	4	
	Rated Current (In) A		60			60			60				15,20,30,40,50,60,75,100			15,20,30,40,50,60,75,100			[15,20,30]40,50,60,75,100			15,20,30,40,50,60,75,100,125			40,50,60,75,100,125			
	Rated Voltage (In)	AC V	690			690			690				690			690			600			690			690			
		DC V	250			500			500				250			500			250			500			500			
	Rated Insulation Voltage (Ui) V		750			750			750				750			750			690			750			750			
	Impulse Withstand Voltage (Uimp) kV		6			8			8				6			8			6			8			8			
Rated Breaking Capacity(kA)	AC	690/600V	5			2.5			5				5			7.5			35			8			10			
		480/500V	7.5			7.5			10				7.5			14			42			26			35			
		415/460V	14			14			18				14			26			65			37			50			
		380V	14			18			22				14			30			65			42			50			
		220V/250V	25			30			35				25			50			125			85			100			
	DC	500V(3P)	-	-	-	-	5	5	-	10	10		-	-	5	-	15	15	-	40	40	-	20	20	-	30	30	
		250V(2P)	2.5	2.5	-	5	-	-	10	-	-		5	5	-	15	-	-	40	-	-	20	-	-	30	-	-	
			50			100			100				50			100			50			100			100			
Over current trip type			Hydraulic Magnetic (ODP)			Thermal Magnetic			Thermal Magnetic				Hydraulic Magnetic (ODP)			Thermal Magnetic			Thermal Magnetic			Thermal Magnetic			Thermal Magnetic			
Trip type and protection feature (Option)	Adjustable Note1	Rating (Definite-time)	-			(0.8-0.9-1.0)×In			(0.8-0.9-1.0)×In				-			(0.8-0.9-1.0)×In			-			(0.8-0.9-1.0)×In			(0.8-0.9-1.0)×In			
	Fixed	Instantaneous	{8~12}×In			{8~12}×In			{8~12}×In				{8~12}×In			{8~12}×In			{8~12}×In			{8~12}×In			{8~12}×In			
Dimension(mm) W×H×D		2P	50×130×60			50×130×60			50×130×60				50×130×60			50×130×60			90×155×86			60×155×60			60×155×60			
		3P	75×130×60			75×130×60			75×130×60				75×130×60			75×130×60						90×155×60			90×155×60			
		4P	100×130×60			100×130×60			100×130×60				100×130×60			100×130×60			120×155×86			120×155×60			120×155×60			
Connection		Standard type	○			○			○				○			○			○			○			○			
		Rear Connection	-			-			-				-			-			-			-			-			
Mounting type			Screw			Screw			Screw				Screw			Screw			Screw			Screw			Screw			
Accessories	Aux. Switch (AX)		-			○			○				-			○			○			○			○			
	Alarm Switch (AL)		-			○			○				-			○			○			○			○			
	Shunt trip SHT		-			○			○				-			○			○			○			○			
	Under Voltage trip device UVT		-			-			-				-			-			-			-			-			
	Rotary Handle	Direct	○			○			○				○			○			○			○			○			
		Extended	○			○			○				○			○			○			○			○			
	Terminal Cover	Long Type	-			-			-				-			-			-			-			-			
		Short Type	○			○			○				○			○			-			○			○			
Insulation Barrier		○			○			○				○			○			○			○			○				
Weight(kg)	2P		0.45			0.45			0.45				0.45			0.45			0.45			0.45			0.45			
	3P		0.65			0.65			0.65				0.65			0.65			0.65			0.65			0.65			
	4P		0.85			0.85			0.85				0.85			0.85			0.85			0.85			0.85			
Standard	IEC60947-2		○			○			○				○			○			○			○			○			
Certificate Status	CE		○			○			○				○			○			-			○			-			
	TUV		○			○			○				○			○			-			○			-			
	KC		-			-			○				-			○			-			○			-			
	KS		○			○			○				○			○			40-100A			○			○			

Note1) Adjustable type available according to ordering code on P.9.

Molded Case Circuit Breakers (MCCB)



Frame size			250AF													250AF			400AF																	
Type			N						S			H				L			N						S			H			L					
Model			DBN202N	DBN203N	DBN204N	DBN202S	DBN203S	DBN204S	DBS202S	DBS203S	DBS204S	DBH202S	DBH203S	DBH204S		DBL202S	DBL203S	DBL204S	DBN402N	DBN403N	DBN404N	DBN402S	DBN403S	DBN404S	DBS402S	DBS403S	DBS404S	DBH402S	DBH403S	DBH404S	DBL402S	DBL403S	DBL404S			
Ratings	No. of Pole		2	3	4	2	3	4	2	3	4	2	3	4		2	3	4	2	3	4	2	3	4	2	3	4	2	3	4	2	3	4			
	Rated Current (In) A		100,125,150,175,200,225				100,125,150,175,200,225,250				100,125,150,175,200,225,250				100,125,150,175,200,225,250				100,125,150,175, 200, 225			250,300,350,400			250,300,350,400			250,300,350,400			250,300,350,400					
	Rated Voltage (Un)	AC V	690				690				690				690				600			690			690			690			690					
		DC V	500				500				500				500				250		-	500			500			500			500					
	Rated Insulation Voltage (Ui) V		750				750				750				750				690			750			750			750			750					
	Impulse Withstand Voltage (Uimp) kV		8				8				8				8				6			8			8			8			8					
Rated Breaking Capacity(kA)	AC	690/600V	8				8				8				10				35			8			5			8			10			14		
		480/500V	14				18				26				35				42			14			18			35			50			65		
		415/460V	18				26				37				50				65			35			37			50			65			85		
		380V	25				30				42				50				65			35			42			65			70			100		
		220V/250V	50				65				85				100				125			42			50			75			85			125		
	DC	500V(3P)	-	10	10	-	10	10	-	20	20	-	30	30		40		-	-	10	10	-	10	10	-	20	20	-	40	40	-	40	40			
		250V(2P)	10	-	-	10	-	-	20	-	-	30	-	-		50		-	10	-	-	10	-	-	20	-	-	40	-	-	40	-	-			
		Ics = % × Icu		100				100				100				100				50			100			100			100			100			100	
Over current trip type		Thermal Magnetic				Thermal Magnetic				Thermal Magnetic				Thermal Magnetic				Thermal Magnetic			Thermal Magnetic			Thermal Magnetic			Thermal Magnetic			Thermal Magnetic						
Trip type and protection feature (Option)	Adjustable Note1)	Rating (Definite-time)	(0.8-0.9-1.0)×In				(0.8-0.9-1.0)×In				(0.8-0.9-1.0)×In				(0.8-0.9-1.0)×In				-			(0.8-0.9-1.0)×In			(0.8-0.9-1.0)×In			(0.8-0.9-1.0)×In			(0.8-0.9-1.0)×In					
	Fixed	Instantaneous	(8~12)×In				(8~12)×In				(8~12)×In				(8~12)×In				(8~14)×In			(8~12)×In			(8~12)×In			(8~12)×In			(8~12)×In					
Dimension(mm) W×H×D	2P		105×165×60				105×165×60				105×165×60				105×165×60				105×165×86			140×257×103			140×257×103			140×257×103			140×257×103			140×257×103		
	3P		140×165×60				140×165×60				140×165×60				140×165×60				140×165×86			184×257×103			184×257×103			184×257×103			184×257×103					
	4P		140×165×60				140×165×60				140×165×60				140×165×60				140×165×86			184×257×103			184×257×103			184×257×103			184×257×103					
Connection		Standard type	○				○				○				○				○			○			○			○			○			○		
		Rear Connection	-				-				-				-				-			-			-			-			-					
Mounting type			Screw				Screw				Screw				Screw				Screw			Screw			Screw			Screw			Screw					
Accessories	Aux. Switch (AX)		○				○				○				○				○			○			○			○			○			○		
	Alarm Switch (AL)		○				○				○				○				○			○			○			○			○					
	Shunt trip SHT		○				○				○				○				○			○			○			○			○					
	Under Voltage trip device UVT		-				-				-				-				-			-			-			-			-					
	Rotary Handle	Direct	○				○				○				○				○			-			-			-			-					
		Extended	○				○				○				○				○			-			-			-			-					
	Terminal Cover	Long Type	-				-				-				-				-			-			-			-			-					
		Short Type	○				○				○				○				-			○			○			○			○					
Insulation Barrier		○				○				○				○				○			○			○			○			○						
Weight(kg)	2P		1.19				1.19				1.19				1.19				2.10			4.20			4.20			4.20			4.20			4.20		
	3P		1.36				1.36				1.36				1.36				2.30			4.80			4.80			4.80			4.80					
	4P		1.77				1.77				1.77				1.77				2.50			6.02			6.02			6.02			6.02					
Standard	IEC60947-2		○				○				○				○				○			○			○			○			○			○		
Certificate Status	CE		-				○				○				-				-			-			○			-			-			○		
	TUV		-				○				○				-				-			-			○			-			-			○		
	KC		-				○				○				-				-			-			○			-			-			○		
	KS		125~225A				○				○				○				-			-			○			○			○			○		

Molded Case Circuit Breakers (MCCB)



Frame size				600AF								630AF											
Type				N			S			L				N			S			L			
Model				DBN 602Se	DBN 603Se	DBN 604Se	DBS 602S	DBS 603S	DBS 604S	DBL 602S	DBL 603S	DBL 604S		DBN 632S	DBN 633S	DBN 634S	DBS 632S	DBS 633S	DBS 634S	DBL 632S	DBL 633S	DBL 634S	
Ratings	No. of Pole			2	3	4	2	3	4	2	3	4		2	3	4	2	3	4	2	3	4	
	Rated Current (In) A			500,600			500,600			500,600				500,630			500,630			500,630			
	Rated Voltage (In)	AC V			690			690			690				690			690			690		
		DC V			500			500			500				500			500			500		
	Rated Insulation Voltage (Ui) V			750			750			750				750			750			750			
	Impulse Withstand Voltage (Uimp) kV			6			6			6				8			8			8			
Rated Breaking Capacity(kA)	AC	690/600V			8			10			30				5			8			14		
		480/500V			25			45			65				18			35			65		
		415/460V			50			65			85				42			65			85		
		380V			55			75			100				45			75			100		
		220V/250V			60			85			125				60			85			125		
	DC	500V(3P)			-	10	10	-	20	20	-	40	40		-	10	10	-	20	20	-	40	40
		250V(2P)			10	-	-	20	-	-	40	-	-		10	-	-	20	-	-	40	-	-
		Ics = % × Icu			50			50			50				100			100			100		
Over current trip type				Thermal Magnetic			Thermal Magnetic			Thermal Magnetic				Thermal Magnetic			Thermal Magnetic			Thermal Magnetic			
Trip type and protection feature (Option)	Adjustable Note1)	Rating (Definite-time)		-			-			-				(0.8-0.9-1.0)×In			(0.8-0.9-1.0)×In			(0.8-0.9-1.0)×In			
	Fixed	Instantaneous		(8~12)×In			(8~12)×In			(8~12)×In				(8~12)×In			(8~12)×In			(8~12)×In			
Dimension(mm) W×H×D		2P		210×275×103			210×275×103			210×275×103				140×257×103			140×257×103			140×257×103			
		3P		210×275×103			210×275×103			210×275×103				140×257×103			140×257×103			140×257×103			
		4P		280×275×103			280×275×103			280×275×103				184×257×103			184×257×103			184×257×103			
Connection		Standard type		○			○			○				○			○			○			
		Rear Connection		-			-			-				-			-			-			
Mounting type				Screw			Screw			Screw				Screw			Screw			Screw			
Accessories	Aux. Switch (AX)			○			○			○				○			○			○			
	Alarm Switch (AL)			○			○			○				○			○			○			
	Shunt trip SHT			○			○			○				○			○			○			
	Under Voltage trip device UVT			-			-			-				-			-			-			
	Rotary Handle	Direct		-			-			-				-			-			-			
		Extended		-			-			-				-			-			-			
	Terminal Cover	Long Type		-			-			-				-			-			-			
		Short Type		○			○			○				○			○			○			
Insulation Barrier			○			○			○				○			○			○				
Weight(kg)	2P			11.00			11.00			11.00				4.37			4.37			4.37			
	3P			11.50			11.50			11.50				5.20			5.20			5.20			
	4P			18.20			18.20			18.20				6.54			6.54			6.54			
Standard	IEC60947-2			○			○			○				○			○			○			
Certificate Status	CE			○			-			-				-			-			-			
	TUV			○			-			-				-			-			-			
	KC			-			-			-				-			-			-			
	KS			○			○			-				○			○			-			

Note1) Adjustable type available according to ordering code on P.9.

Molded Case Circuit Breakers (MCCB)

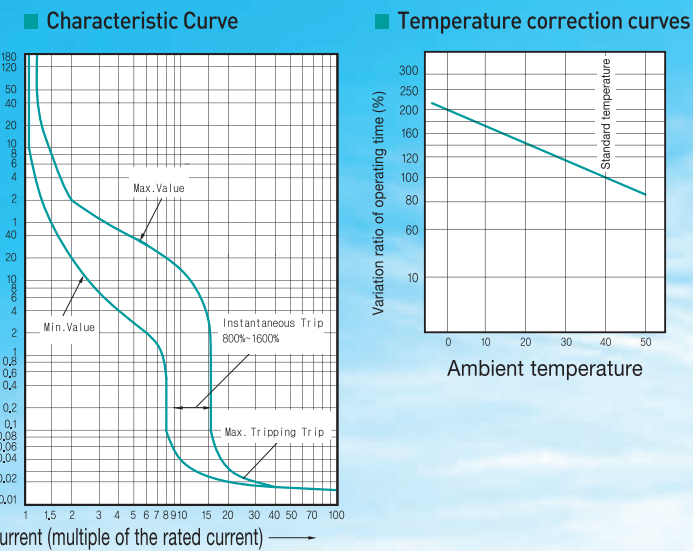
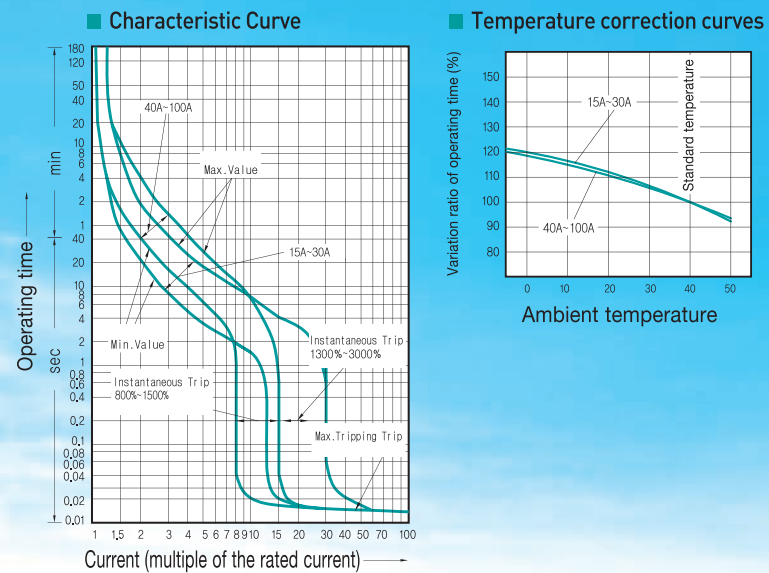


Frame size		800AF										1000AF		1200AF	
Type		N			S			L				S		S	
Model		DBN 802Se	DBN 803Se	DBN 804Se	DBS 802S	DBS 803S	DBS 804S	DBL 802S	DBL 803S	DBL 804S		DBS 1003S	DBS 1004S	DBS 1203S	DBS 1204S
Ratings	No. of Pole	2	3	4	2	3	4	2	3	4		3	4	3	4
	Rated Current (In) A	700, 800			700, 800			700, 800				1000		1200	
	Rated Voltage (Un) V	AC	690			690			690			690		690	
		DC	500			500			500			-		-	
	Rated Insulation Voltage (Ui) V	750			750			750				750		750	
Rated Breaking Capacity (kA)	Impulse Withstand Voltage (Uimp) kV		6			6			6			6		6	
	AC	690/600V	8			10			30			45		45	
		480/500V	25			45			65			50		50	
		415/460V	50			65			85			65		65	
		380V	55			75			100			65		65	
		220V/250V	60			85			125			100		100	
	DC	500V(3P)	-	10	10	-	20	20	-	40	40	-		-	
		250V(2P)	10	-	-	20	-	-	40	-	-	-		-	
	Ics = % × Icu		50			50			50			50		50	
Over current trip type		Thermal Magnetic			Thermal Magnetic			Thermal Magnetic				Thermal Magnetic		Thermal Magnetic	
Trip type and protection feature (Option)	Adjustable Note1	Rating (Definite-time)	-			-			-			-		-	
	Fixed	Instantaneous	(8~12) × In			(8~12) × In			(8~12) × In			(3 × 6) × In		(3 × 6) × In	
Dimension(mm) W×H×D	2P		210×275×103			210×275×103			210×275×103			-		-	
	3P		210×275×103			210×275×103			210×275×103			210×400×103		210×400×105	
	4P		280×275×103			280×275×103			210×275×103			280×400×105		280×400×105	
Connection	Standard type		○			○			○			○		○	
	Rear Connection		-			-			-			-		-	
Mounting type		Screw			Screw			Screw				Screw		Screw	
Accessories	Aux. Switch (AX)		○			○			○			○		○	
	Alarm Switch (AL)		○			○			○			○		○	
	Shunt trip SHT		○			○			○			○		○	
	Under Voltage trip device UVT		-			-			-			-		-	
	Rotary Handle	Direct	-			-			-			-		-	
		Extended	-			-			-			-		-	
	Terminal Cover	Long Type	-			-			-			-		-	
		Short Type	○			○			○			-		-	
Weight(kg)	Insulation Barrier		○			○			○			-		-	
	2P		11.00			11.00			11.00			-		-	
	3P		11.50			11.50			11.50			19.40		19.40	
	4P		18.20			18.20			18.20			27.00		27.00	
Standard	IEC60947-2		○			○			○			-		-	
Certificate Status	CE		○			-			-			-		-	
	TUV		○			-			-			-		-	
	KC		-			-			-			-		-	
	KS		○			○			-			-		-	

Note1) Adjustable type available according to ordering code on P.9.

Characteristic Curves and Exterior Dimensions (MCCB)

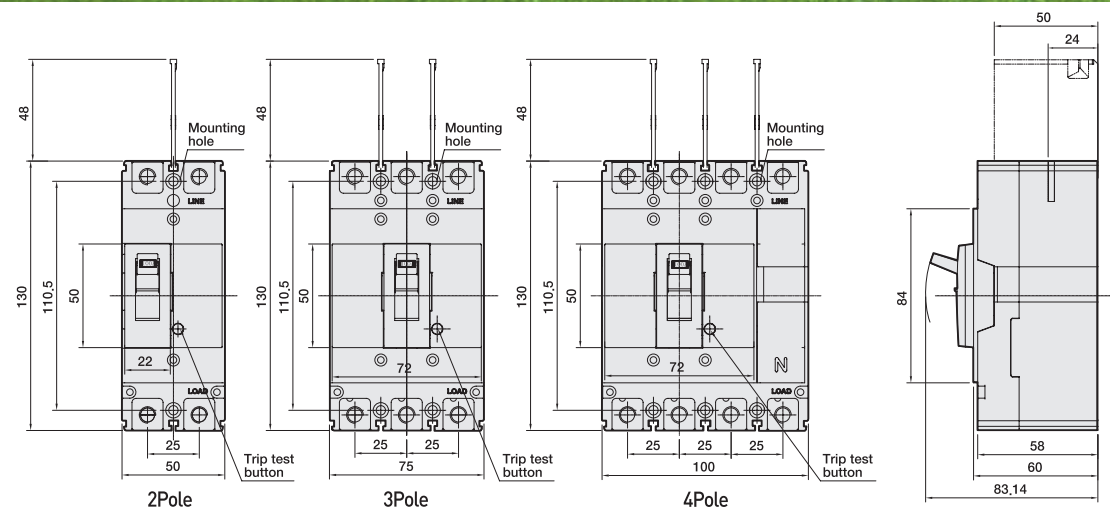
DBS 32S
DBS 33S
DBS 34S
DBN 52S
DBN 53S
DBS 52S
DBS 53S
DBN 62S
DBN 63S
DBN 64S
DBS 62S
DBS 63S
DBS 64S
DBN 102Sd
DBN 103Sd
DBN 104Sd



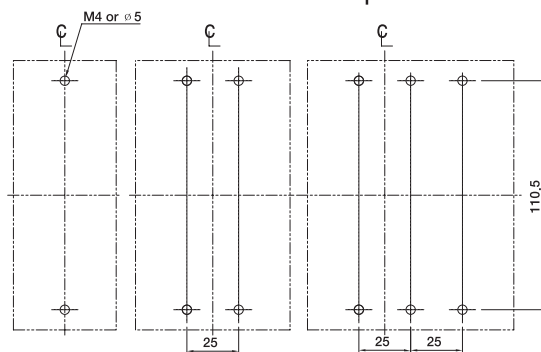
DBN 32Nb
DBN 33Nb
DBN 34Nb
DBN 52Nb
DBN 53Nb
DBN 54Nb
DBN 62Nb
DBN 63Nb
DBN 64Nb
DBN 102N
DBN 103N
DBN 104N

Dimensions

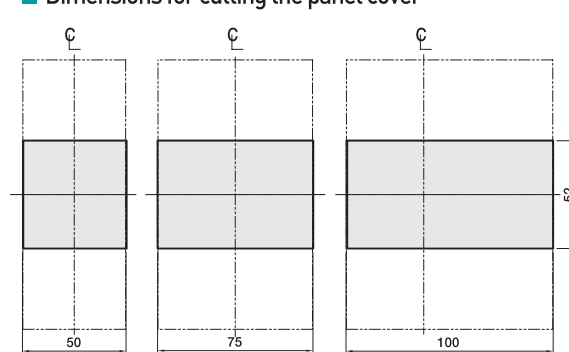
Unit:mm



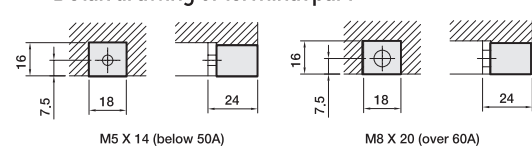
Dimensions for installation of the panel



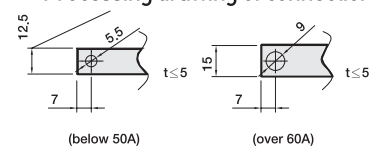
Dimensions for cutting the panel cover



Detail drawing of terminal part

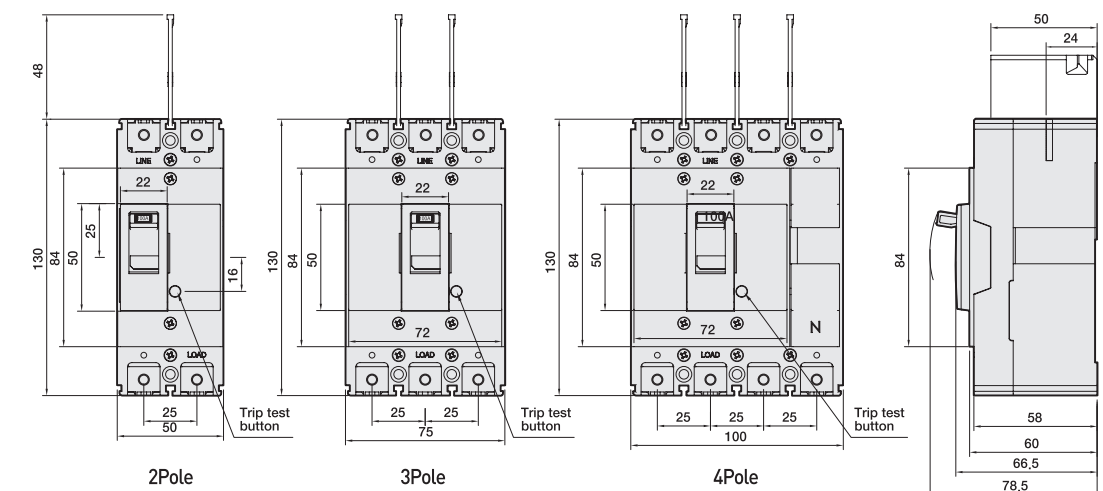


Processing drawing of connection conductor

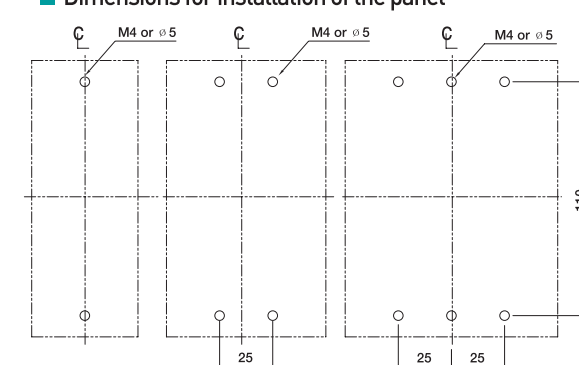


Dimensions

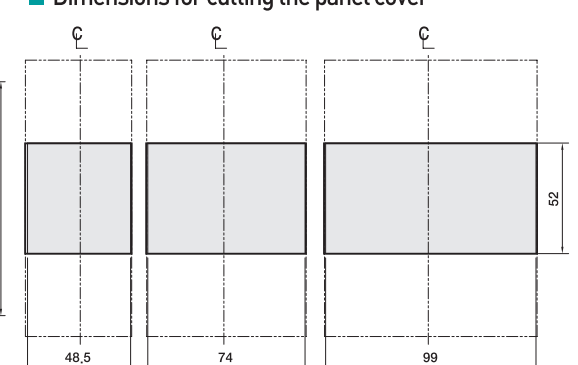
Unit:mm



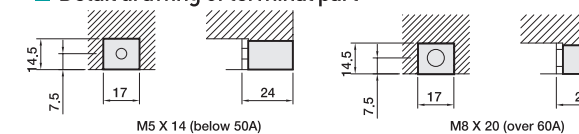
Dimensions for installation of the panel



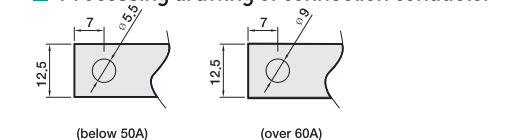
Dimensions for cutting the panel cover



Detail drawing of terminal part

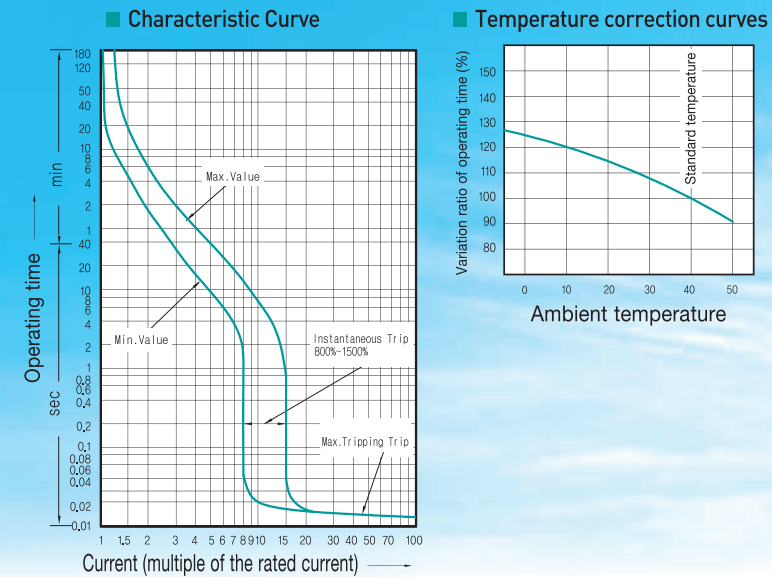
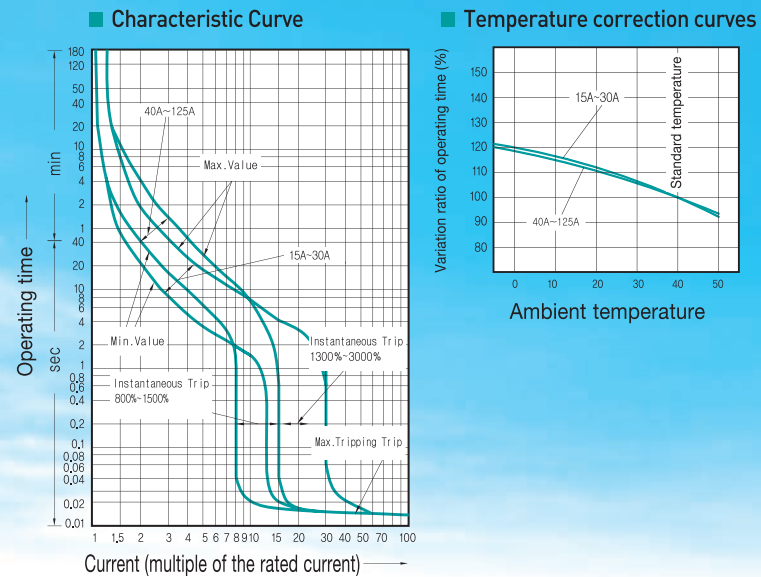


Processing drawing of connection conductor



Characteristic Curves and Exterior Dimensions (MCCB)

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DBS 103S
DBS 104S
DBH 52S
DBH 53S
DBH 54S
DBH 102S
DBH 103S
DBH 104S

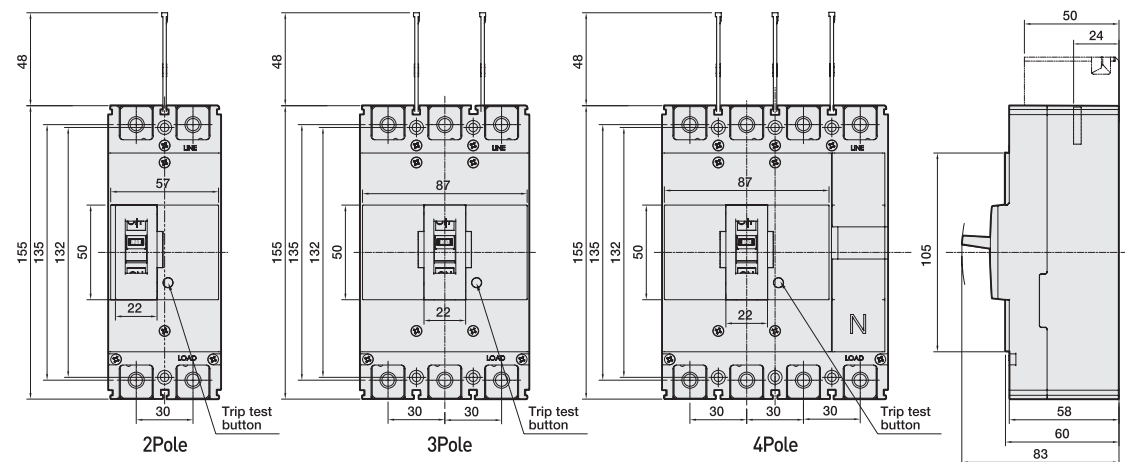


DBN 202S
DBN 203S
DBN 204S
DBS 202S
DBS 203S
DBS 204S
DBH 202S
DBH 203S
DBH 204S
DBN 202N
DBN 203N
DBN 204N

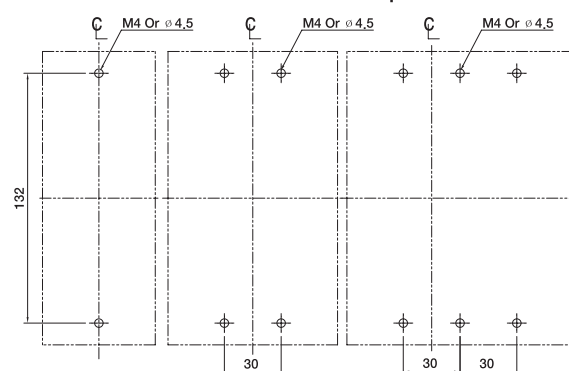


Dimensions

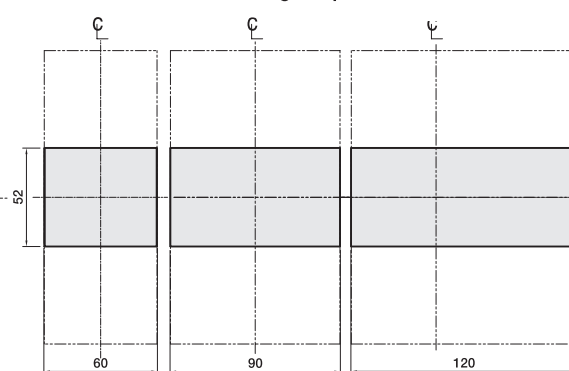
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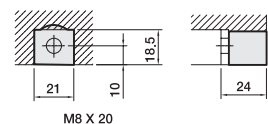
■ Dimensions for installation of the panel



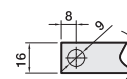
■ Dimensions for cutting the panel cover



■ Detail drawing of terminal part

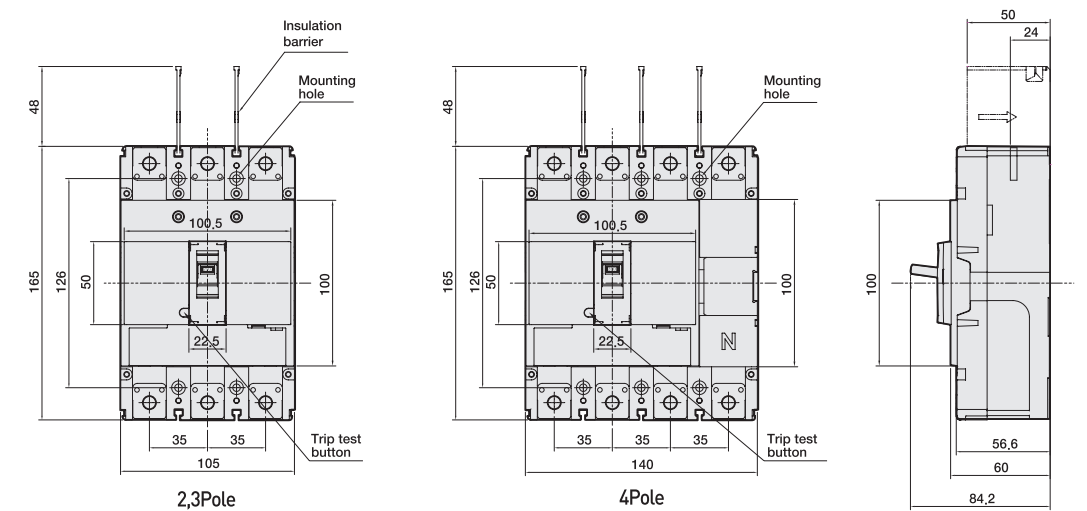


■ Processing drawing of connection conductor

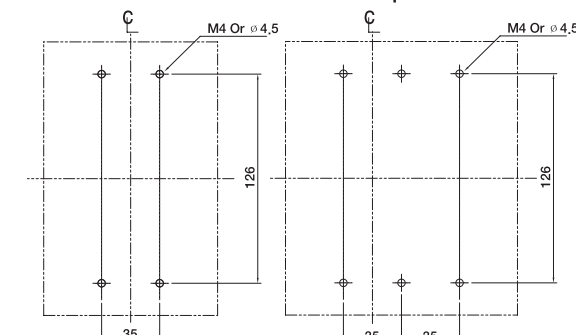


Dimensions

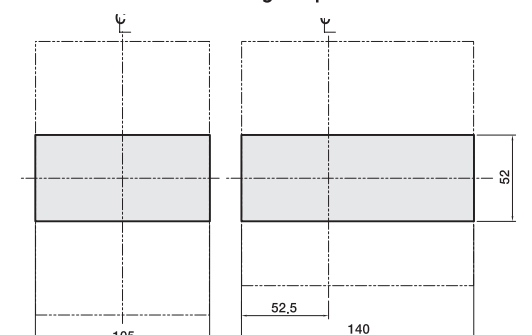
Unit:mm



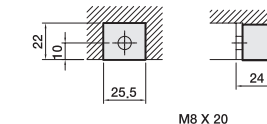
■ Dimensions for installation of the panel



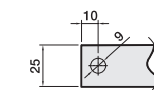
■ Dimensions for cutting the panel cover



■ Detail drawing of terminal part

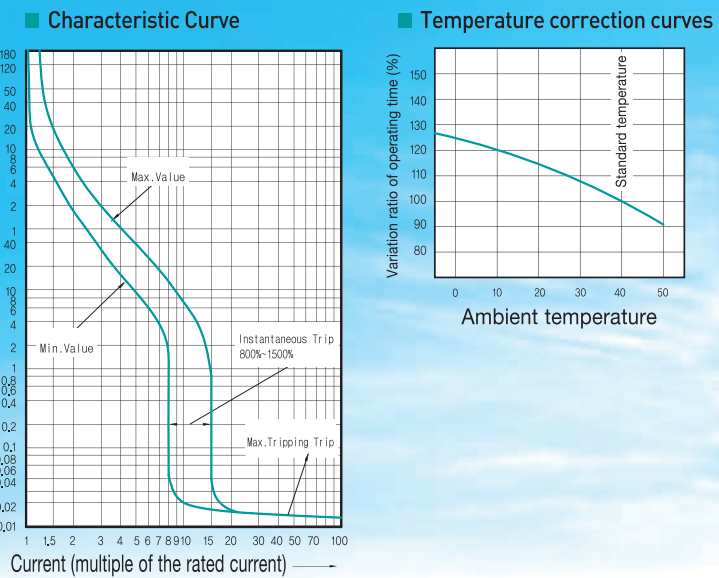
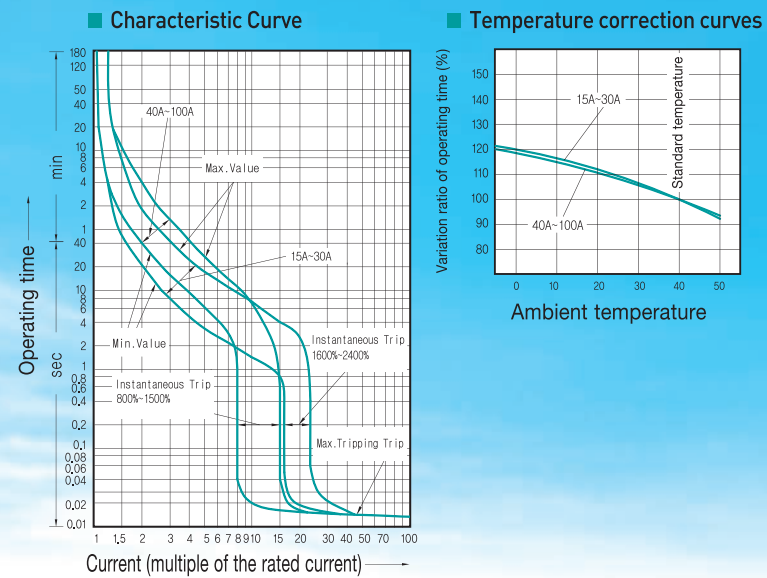


■ Processing drawing of connection conductor



Characteristic Curves and Exterior Dimensions (MCCB)

DBL 52S
DBL 53S
DBL 54S
DBL 102S
DBL 103S
DBL 104S

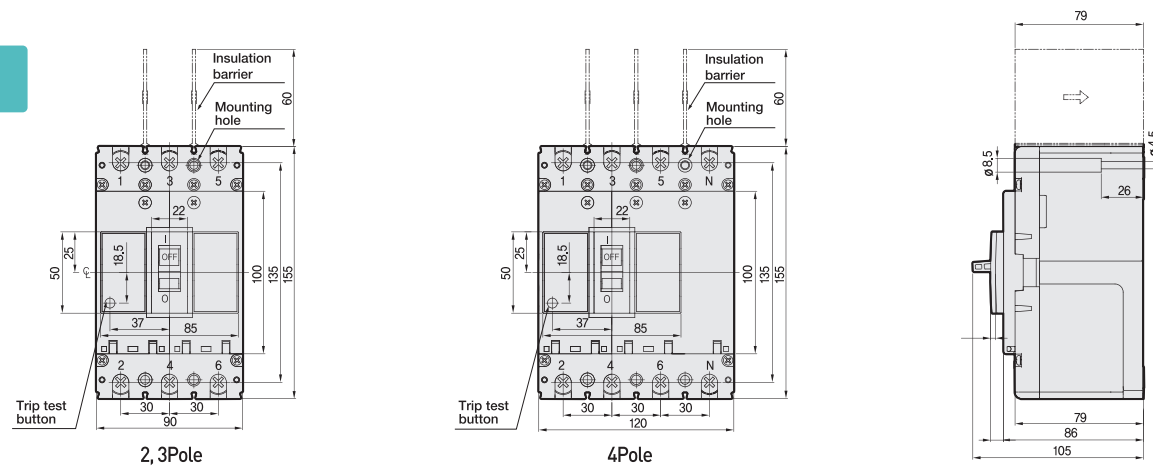


DBL 202S
DBL 203S
DBL 204S

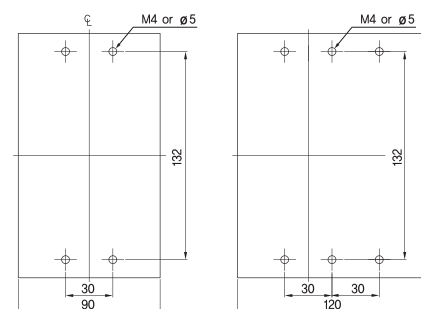


Dimensions

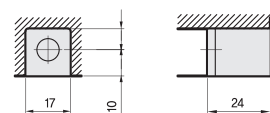
Unit:mm



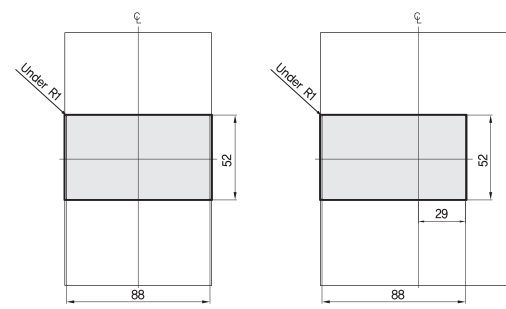
■ Dimensions for installation of the panel



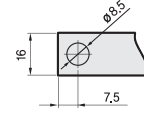
■ Detail drawing of terminal part



■ Dimensions for cutting the panel cover

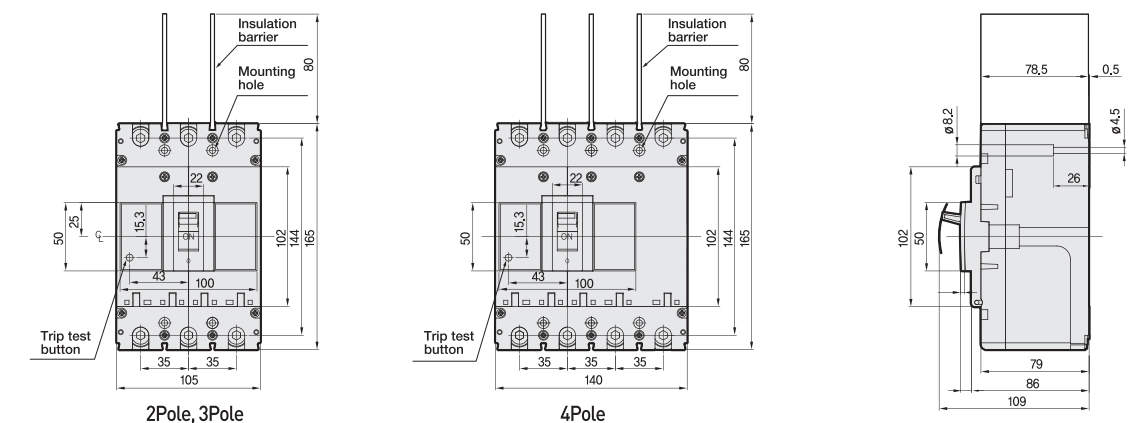


■ Processing drawing of connection conductor

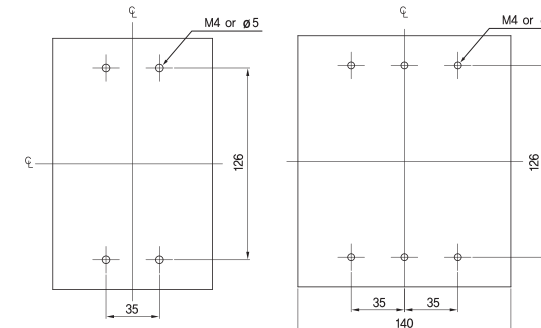


Dimensions

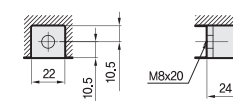
Unit:mm



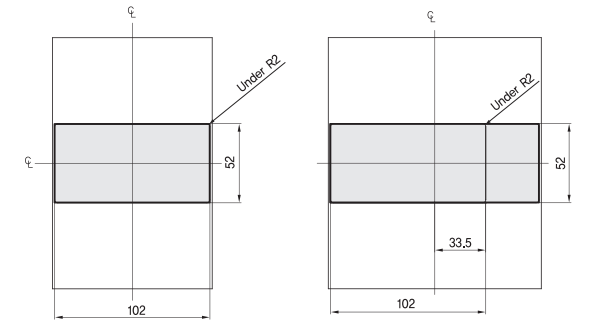
■ Dimensions for installation of the panel



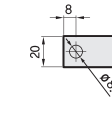
■ Detail drawing of terminal part



■ Dimensions for cutting the panel cover

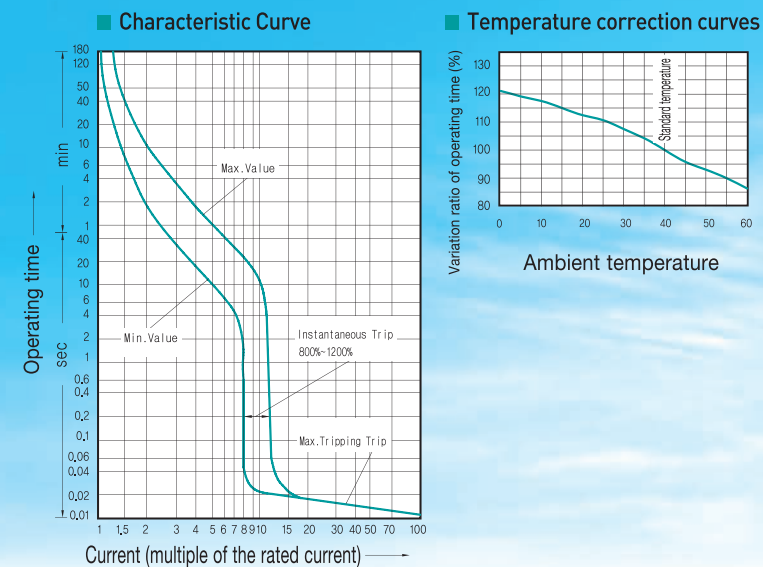
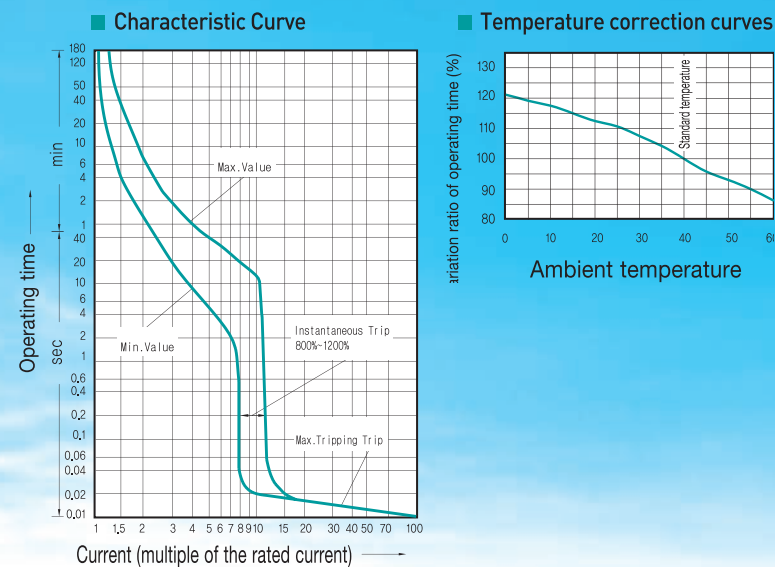


■ Processing drawing of connection conductor



Characteristic Curves and Exterior Dimensions (MCCB)

DBN 402N
DBN 403N
DBN 404N
DBN 402S
DBN 403S
DBN 404S
DBS 402S
DBS 403S
DBS 404S
DBH 402S
DBH 403S
DBH 404S
DBL 402S
DBL 403S
DBL 404S

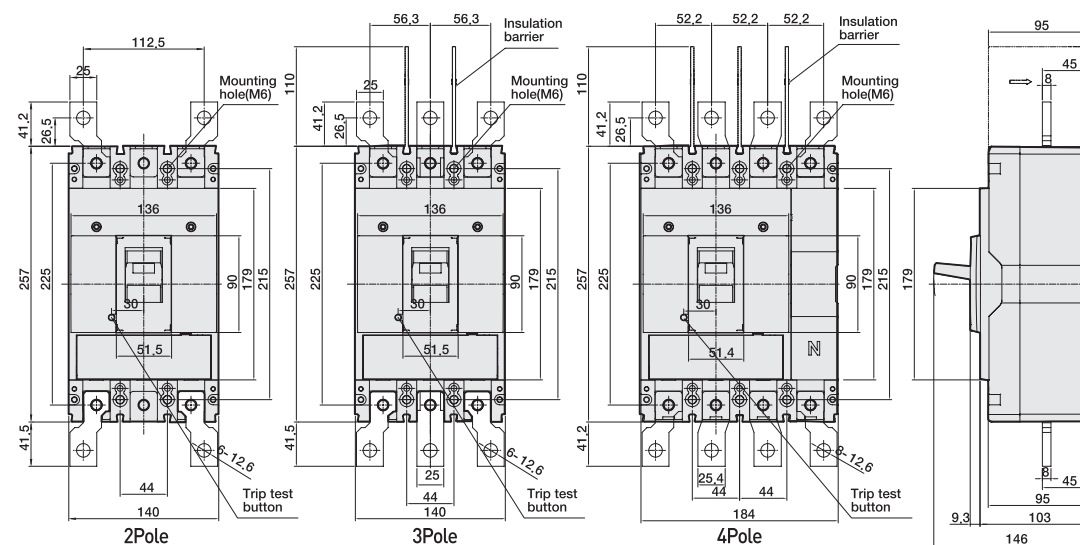


DBN 602Se
DBN 603Se
DBN 604Se
DBS 602S
DBS 603S
DBS 604S
DBL 602S
DBL 603S
DBL 604S



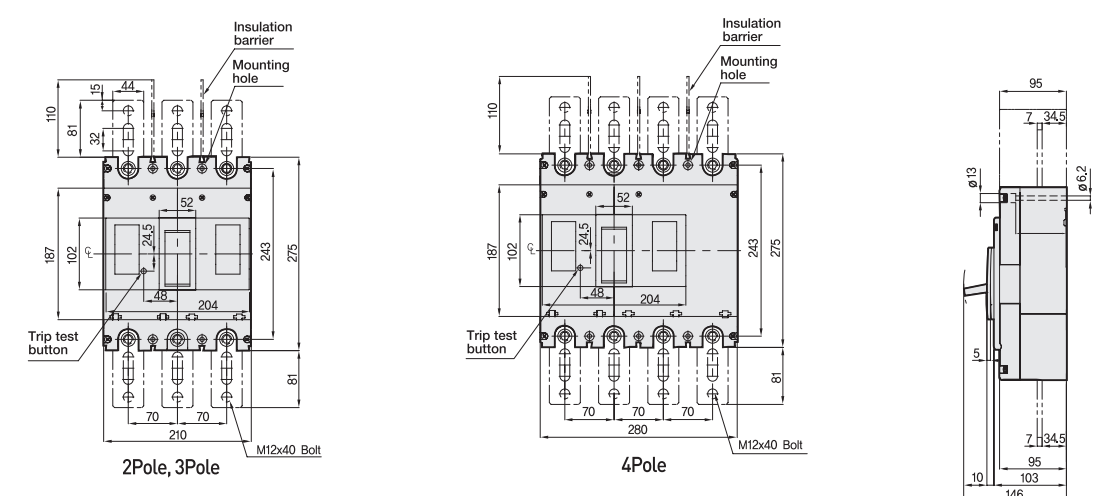
Dimensions

Unit:mm

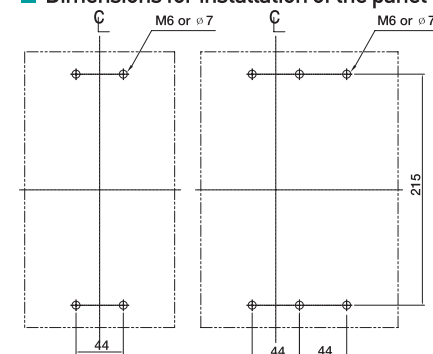


Dimensions

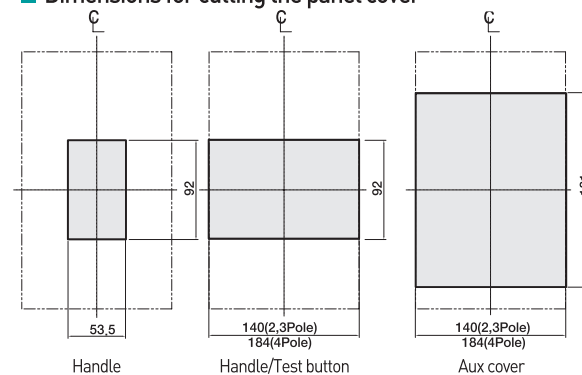
Unit:mm



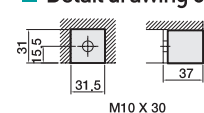
Dimensions for installation of the panel



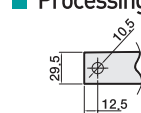
Dimensions for cutting the panel cover



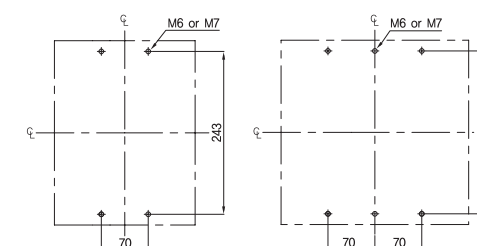
Detail drawing of terminal part



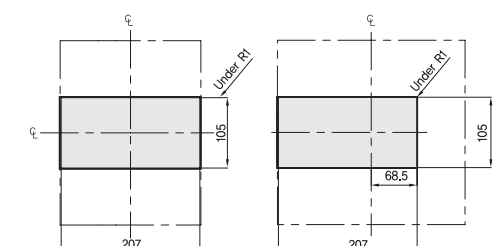
Processing drawing of connection conductor



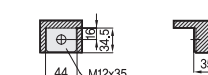
Dimensions for installation of the panel



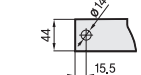
Dimensions for cutting the panel cover



Detail drawing of terminal part

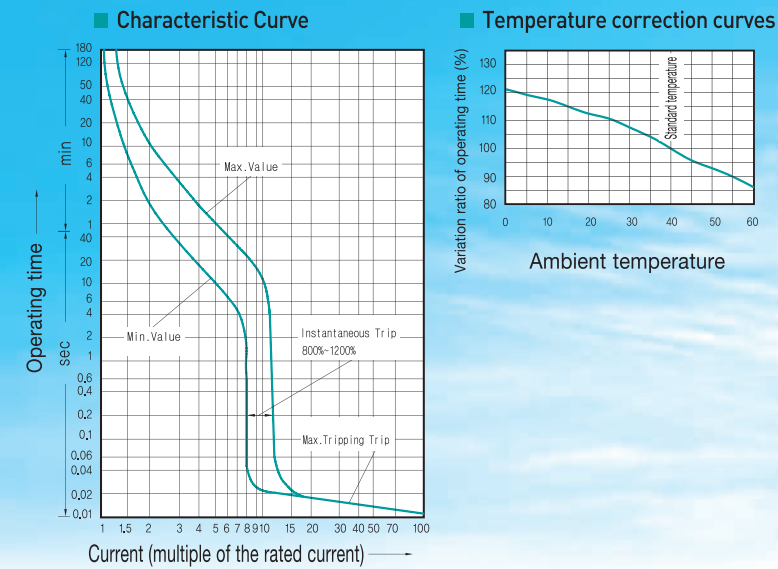
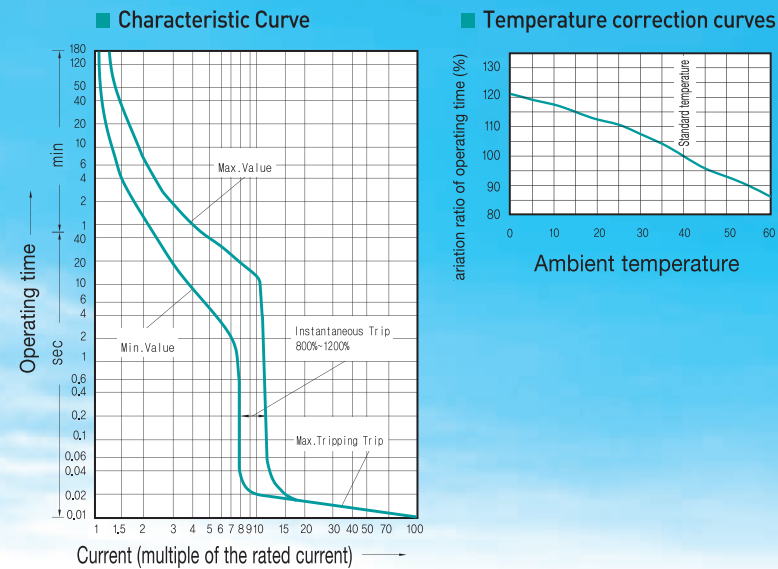


Processing drawing of connection conductor



Characteristic Curves and Exterior Dimensions (MCCB)

DBN 632S
DBN 633S
DBN 634S
DBS 632S
DBS 633S
DBS 634S
DBL 632S
DBL 633S
DBL 634S

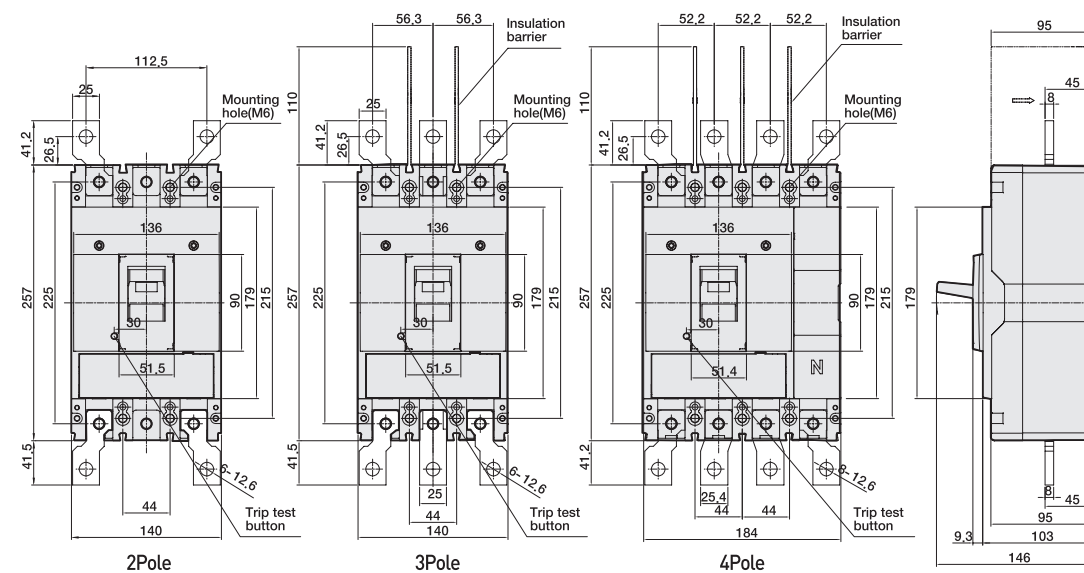


DBN 802Se
DBN 803Se
DBN 804Se
DBS 802S
DBS 803S
DBS 804S
DBL 802S
DBL 803S
DBL 804S

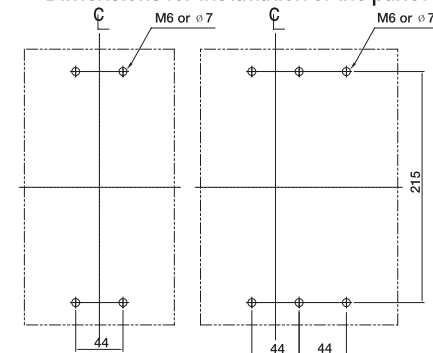


Dimensions

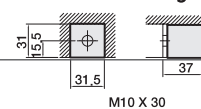
Unit:mm



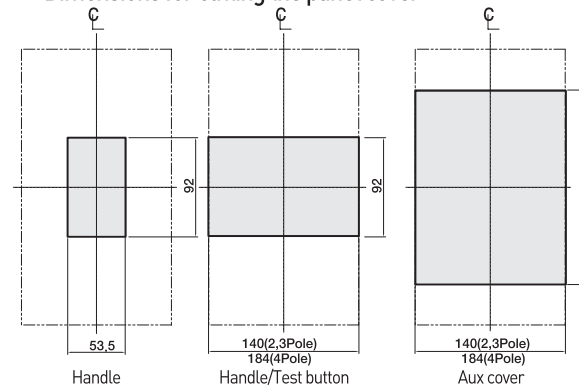
Dimensions for installation of the panel



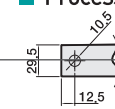
Detail drawing of terminal part



Dimensions for cutting the panel cover

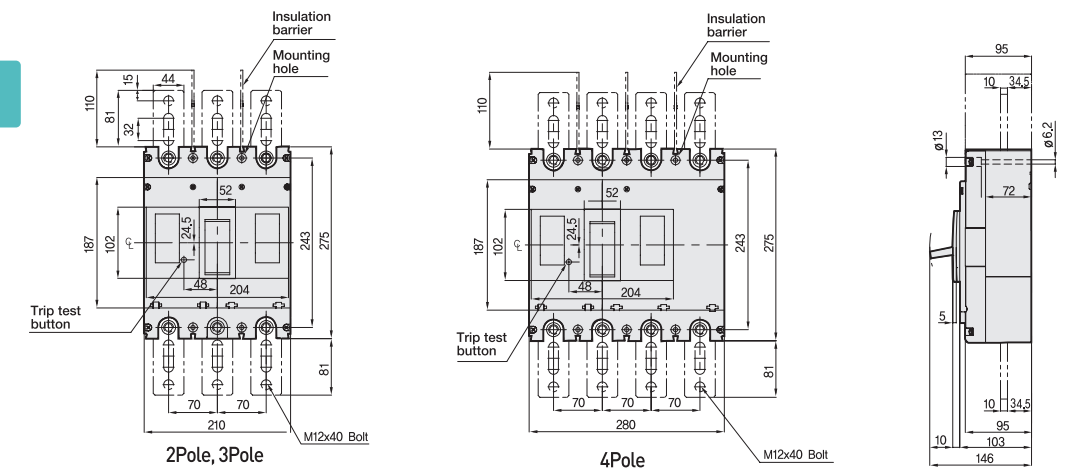


Processing drawing of connection conductor

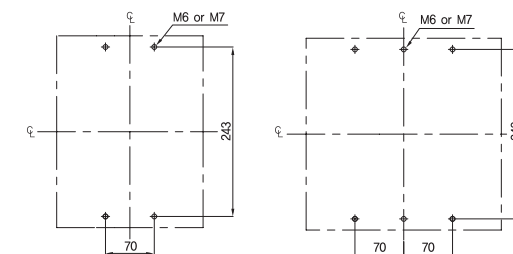


Dimensions

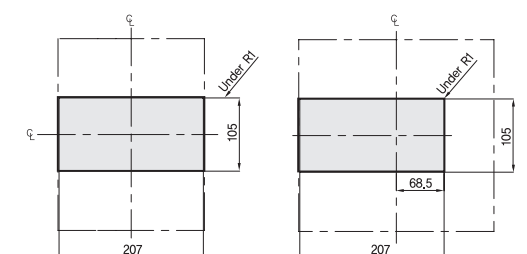
Unit:mm



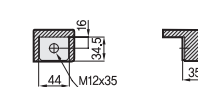
Dimensions for installation of the panel



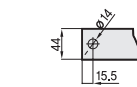
Dimensions for cutting the panel cover



Detail drawing of terminal part



Processing drawing of connection conductor

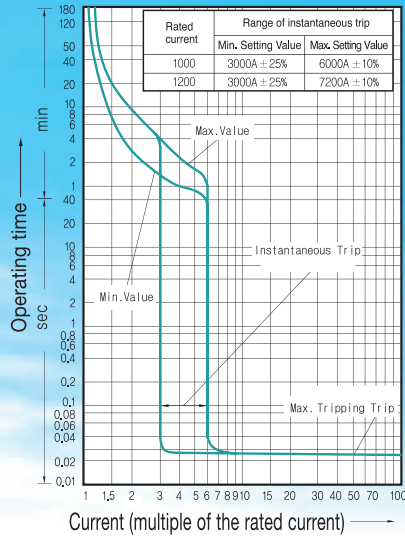


Characteristic Curves and Exterior Dimensions (MCCB)

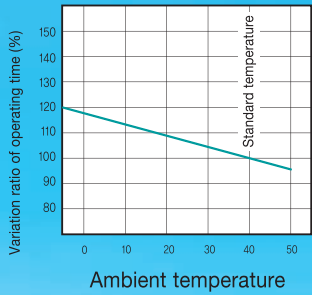
DBS 1003S
DBS 1004S
DBS 1203S
DBS 1204S



Characteristic Curve

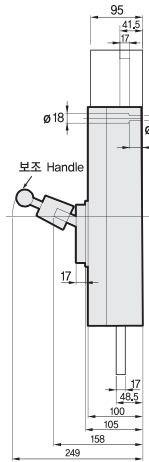
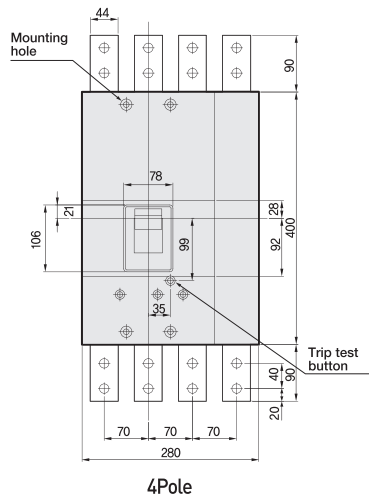
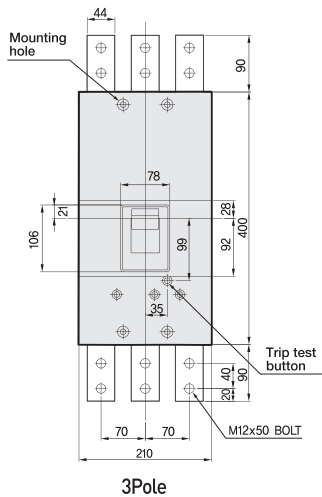


Temperature correction curves

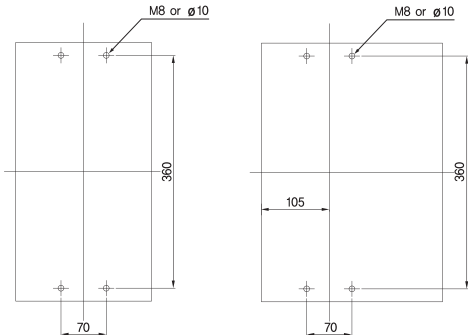


Dimensions

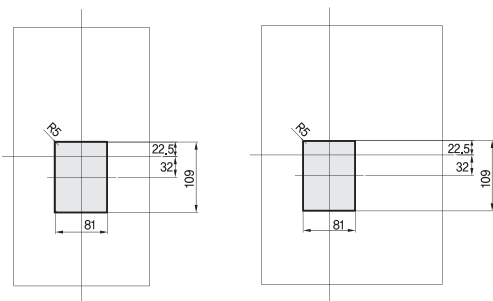
Unit:mm



Dimensions for installation of the panel



Dimensions for cutting the panel cover



Molded Case Circuit Breakers



Improve customers convenience by modular dimension



MCCB for Distribution Panel

MCCB



- DBS Series
- Suitable for branch circuits for housing and standard distribution panels
 - Small size, economical type



- DBE/DBS Series
- Optimal for the designing of standard distribution panels
 - Installation for combined use of DIN Rail and Screw (30~100AF)
 - Higher breaking capacity (5kA ? 10kA, AC220V standard)

Ordering Code

MCCB for Distribution Panel

30AF~100AF

D	SB	3	2	S	-	30A
Type	Ampere Frame	NO. of poles	Type	AF	Rated current	
SB Standard safety	3 30AF	2 2poles	S Standard	30AF	15A, 20A, 30A	

D	SB	3	2	F	-	100A	EC
Type	Ampere Frame	NO. of poles	F.Type	CT,ZCT내장형	AF	Rated current	Accessories
BE Economic	3 30AF	2 2poles	BA	- 일반	30AF	5A, 10A, 15A, 20A, 30A	B Insulation barrier
BS Standard	5 50AF	3 3poles	BE	CZ CT, ZCT General	50AF	15A, 20A, 30A, 40A, 50A	EC Easy Con
SB Safety	6 60AF		S		60AF	60A	EL EasyLock
SE Slim economy	10 100AF		CN		100AF	60A, 75A, 100A	SL Safety Lock
SS Slim standard			F				

Standard Table of Models

MCCB for Distribution Panel

Model	Voltage	Rated Breaking Capacity(kA)			Certificate status
		220V	380V	460V	
DSB 32S		2.5	-	-	☒
DSE 32F		2.5	-	-	☒
DSS 32F		5	-	-	☒
DSB 32, 52CN		5	-	-	☒
DBE 32BE, 33BE		5	2.5	2.5	☒
DBS 32BE, 33BE		10	5	5	☒
DBE 52BE, 53BE Note1		5	2.5	2.5	☒, ☒
DBS 52BE, 53BE		10	5	5	☒
DBE 52BA, 52BAcz		5	-	2.5	☒
DBE 62BE, 63BE		5	2.5	2.5	☒
DBS 62BE, 63BE		10	5	5	☒
DBE 62BA, 62BAcz		5	-	2.5	☒
DBE 102BE, 103BE Note1		5	2.5	2.5	☒, ☒
DBS 102BE, 103BE		10	5	5	☒

Note1 1. PES certificate : DBE 52BE 20A,30A,40A,50A
DBE 53BE 15A,20A,30A,40A,50A
DBE 103BE 60A,75A,100A

Molded Case Circuit Breakers

Improve customers convenience by modular dimension

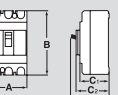


	DBS Series		DBE Series		DBS Series		DBE Series					
	30AF		50AF		50AF		50AF		60AF			
	DBS 32BE	DBS 33BE	DBE 52BE	DBE 53BE	DBS 52BE	DBS 53BE	DBE 52BA	DBE 52BAcz	DBE 62BA	DBE 62BAcz	DBE 62BE	DBE 63BE
	2	3	2	3	2	3	2		2		2	3
	5, 10, 15, 20, 30		15, 20, 30, 40, 50				30, 40, 50		60		60	
	220, 460		220, 460				220, 460		220, 460		220, 460	
	-		-				-		-		-	
	600		600				-		-		600	
	6		6				-		-		6	
	-		-				-		-		-	
	-		-				-		-		-	
	5		2.5		5		2.5		2.5		2.5	
	-		-				-		-		-	
	5		2.5		5		-		-		2.5	
	10		5		10		5		5		5	
	-		-				-		-		-	
	-		-				-		-		-	
	50		50				50		50		50	
	(8~16)×In		(8~16)×In				(8~16)×In		(8~16)×In		(8~16)×In	
	8500		8500				8500		8500		8500	
	1500		1500				1500		1500		1500	
	50	75	50	75	50	75	50		50		50	75
	98.5		98.5				130		130		98.5	
	60		60				50		50		60	
	65		65				55		55		65	
	79		79				71		71		79	
	0.3	0.4	0.3	0.4	0.3	0.4	0.3		0.3		0.4	0.5
	Hydraulic Magnetic (ODP)		Hydraulic Magnetic (ODP)				Hydraulic Magnetic (ODP)		Hydraulic Magnetic (ODP)		Hydraulic Magnetic (ODP)	
	0		0				0		0		0	
	0		0				0		0		0	
	-		-				-		-		-	
	DIN Rail, Screw		DIN Rail, Screw				Screw		Screw		DIN Rail, Screw	
	-		-				-		-		-	
	-		-				-		-		-	
	-		-				-		-		-	
	-		-				-		-		-	
	-		-				-		-		-	
	-		-				-		-		-	
	0		0				-		-		0	
	-		-				-		-		-	
	-		-				-		-		-	
	0		0				-		-		0	
	0		0				0		0		0	
	-		0	0	-		-		-		-	

Standard Table of Models_MCCB

MCCB for distribution panel

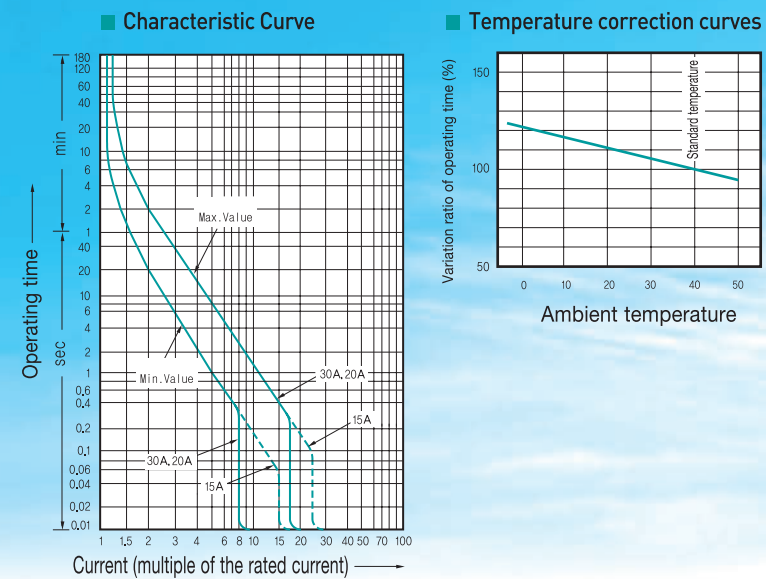
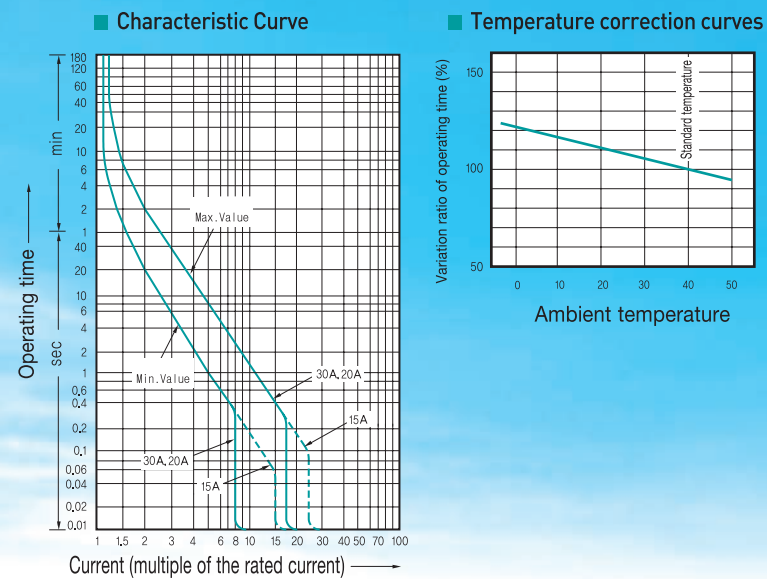


Type			DSB Series		DBE Series		DBS Series	
Frame size			60AF		100AF		100AF	
Type			DBS 62BE	DBE 63BE	DBE 102BE	DBE 103BE	DBS102BA	DBS 103BE
Ratings	No. of Pole		2	3	2	3	2	3
	No. of Pole		A		15, 20, 30, 40, 50		220, 460	
	Rated Voltage(Ue)	AC(V)	220, 460					
		DC(V)	-					
	Rated Insulation Voltage(Ui)		V	600		600		
Impulse Withstand Voltage(Uimp)		kV	6		6			
Rated Breaking Capacity (Icu)kA (Sym)	AC	600V	-		-		-	
		480/500V	-		-		-	
		460V	5		2.5		5	
		415V	-		-		-	
		380V	5		2.5		5	
		220V	10		5		10	
	DC	250V	-		-		-	
		125V	-		-		-	
Ics=%×Icu			50		50		50	
Instantaneous trip			(8~16)×In		(8~16)×In		(8~16)×In	
Endurance (No. of times)		Mechanical	8500		8500		8500	
		Electrical	1500		1500		1500	
Note1) Dimension (mm) 	A		50	75	75	50	50	75
	B		98.5		98.5		98.5	
	C1		60		60		60	
	C2		65		65		65	
	D		79		79		79	
Weight (kg)			0.4	0.5	0.4	0.5	0.4	0.5
Over current trip type			Hydraulic Magnetic (ODP)		Hydraulic Magnetic (ODP)		Hydraulic Magnetic (ODP)	
Trip test button			0		0		0	
Connection	Standard type		0		0		0	
	Rear Connection		-		-		-	
Mounting type			DIN Rail, Screw		DIN Rail, Screw		DIN Rail, Screw	
Accessories	Aux. Switch (AX)		-		-		-	
	Alarm Switch (AL)		-		-		-	
	Shunt trip SHT		-		-		-	
	Rotary Handle	Direct	-		-		-	
		Extended	-		-		-	
	Terminal Cover	Long Type	-		-		-	
		Short Type	0		0		0	
	Insulation Barrier B		-		-		-	
	Easy Lock EL		-		-		-	
	S Lock SL		0		0		0	
Easy Con EC		0		0		0		
Standard	KS C 8321/IEC 60947-2		0		0		0	
	PSE ◇ (Japan)		-		-	0	-	-

Note1) CT, ZCT-embedded MCCB

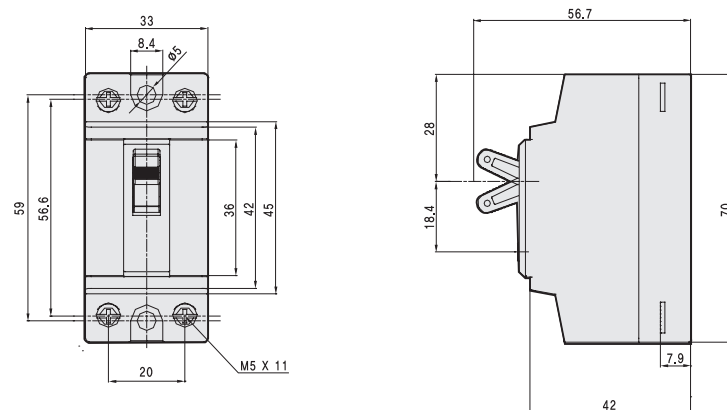
Characteristic Curves and Exterior Dimensions_MCCB

DSB 32S

DSE 32F
DSS 32F

Dimensions

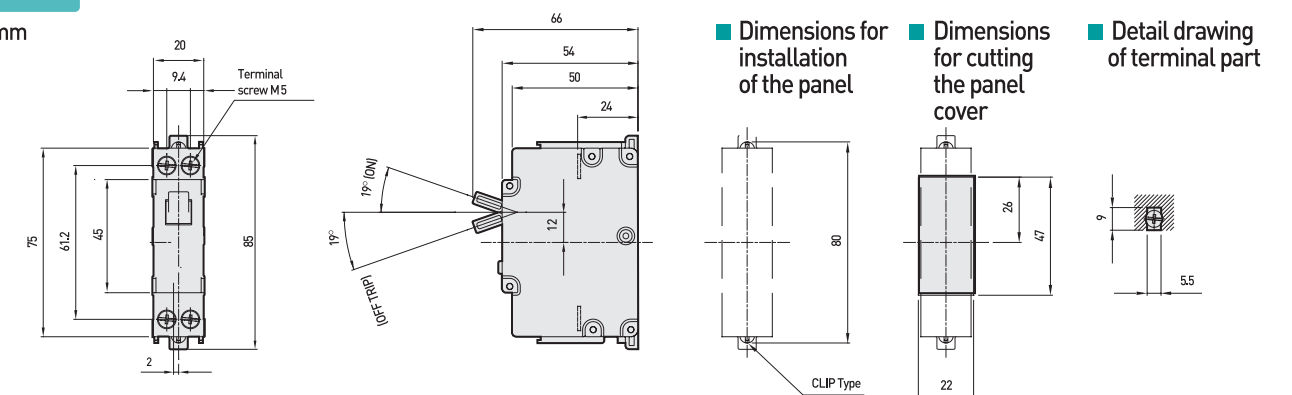
Unit:mm



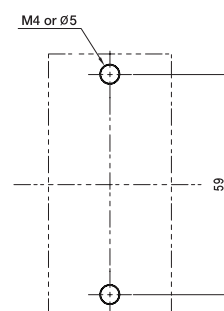
Dimensions

■ DSE 32F / DSS 32F

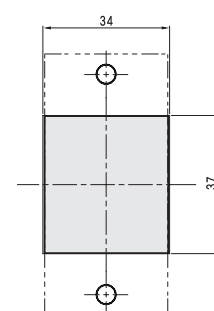
Unit:mm



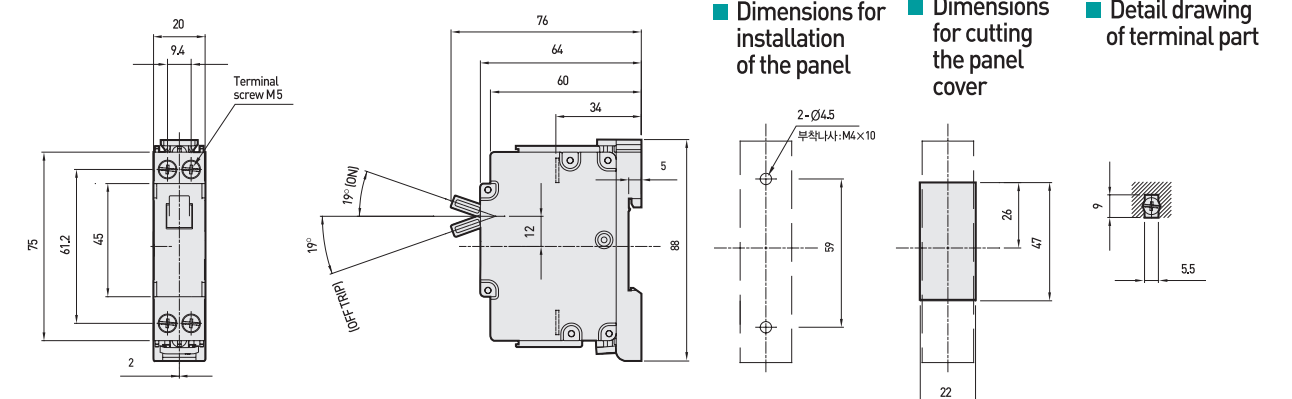
■ Dimensions for installation of the panel



■ Dimensions for cutting the panel cover

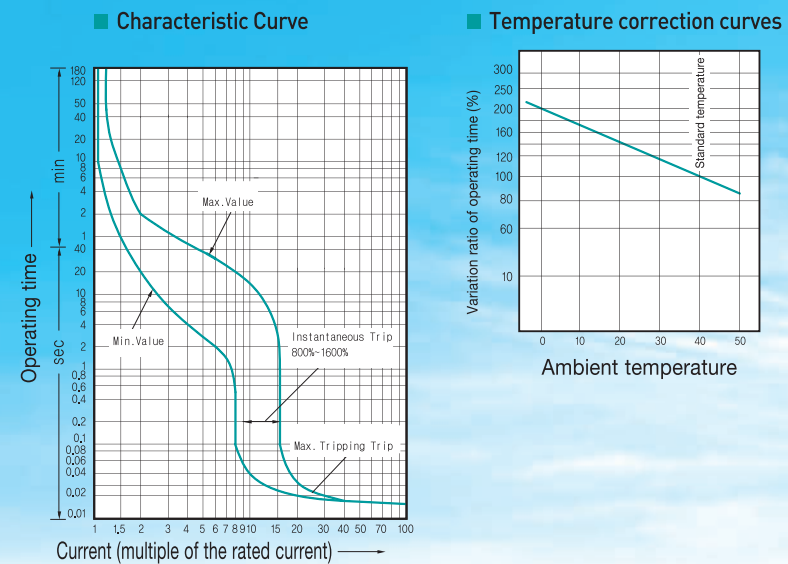
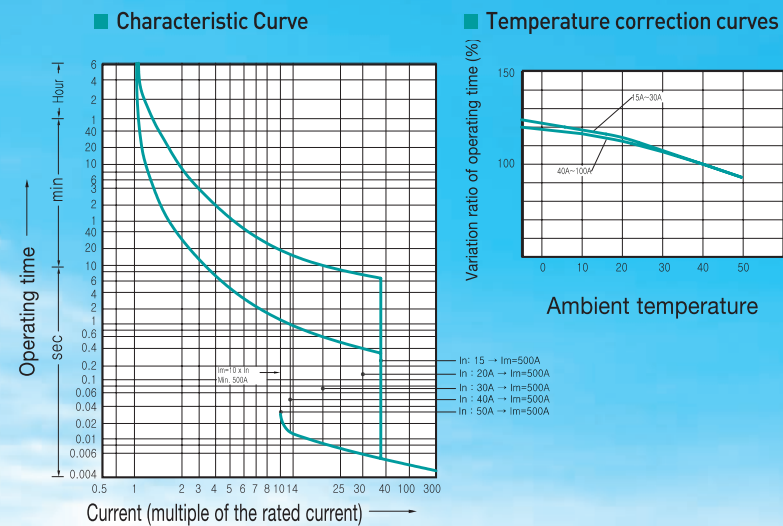


■ Separate mounting (Easy Lock)

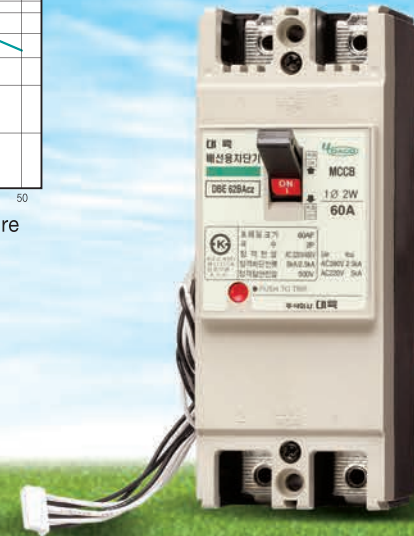


Characteristic Curves and Exterior Dimensions_MCCB

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DSB 52CN

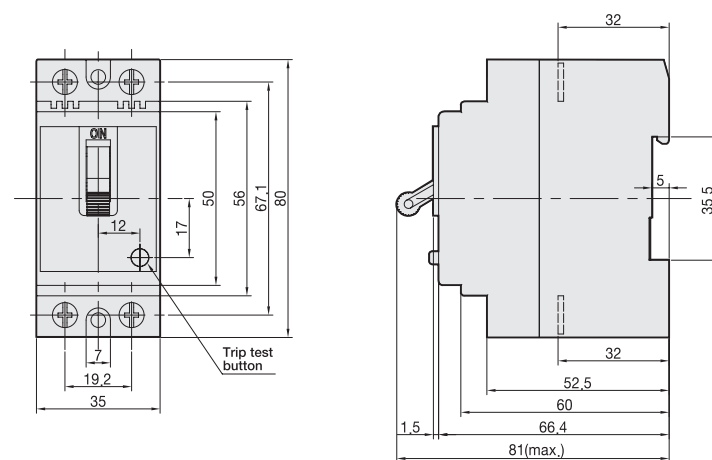


DBE 52BA
DBE 62BA
DBE 52BAcz
DBE 62BAcz



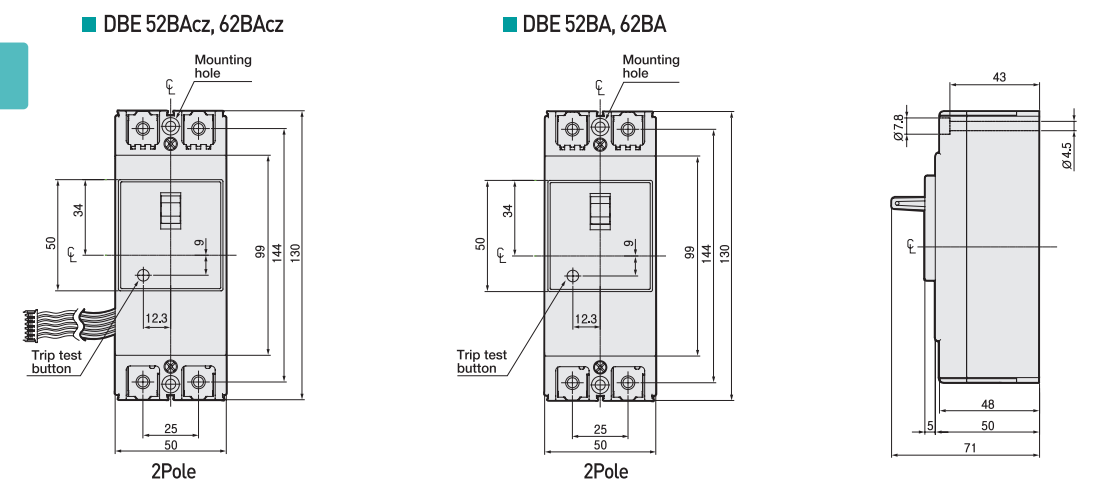
Dimensions

Unit:mm

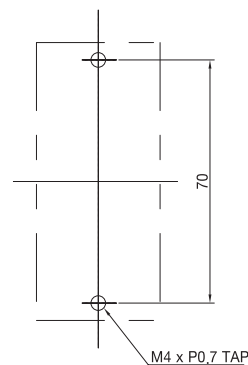


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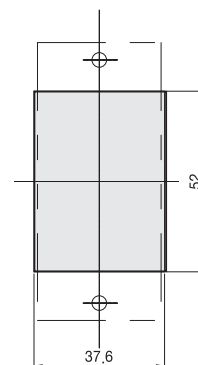
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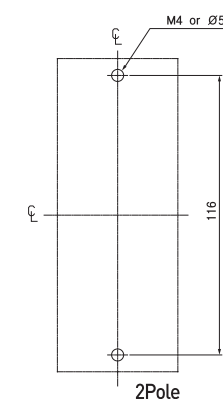
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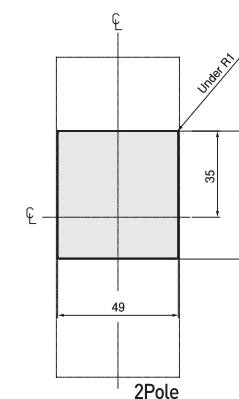
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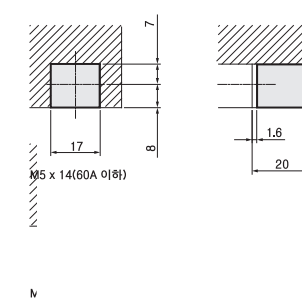
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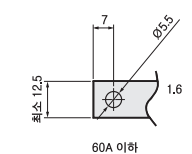
Dimensions for cutting the panel cover



Detail drawing of terminal part



Dimensions for cutting the panel cover

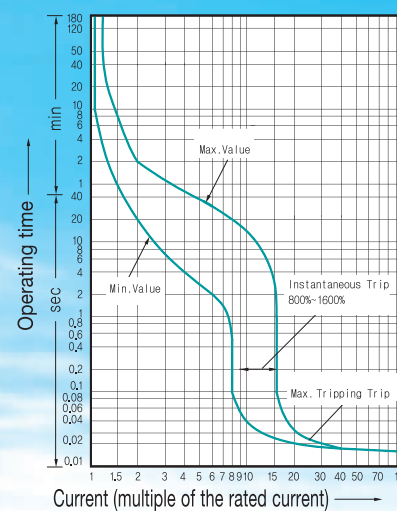


Characteristic Curves and Exterior Dimensions_MCCB

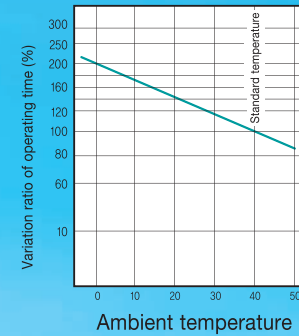
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DBS 103BE



Characteristic Curve

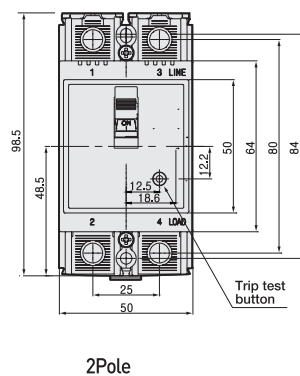


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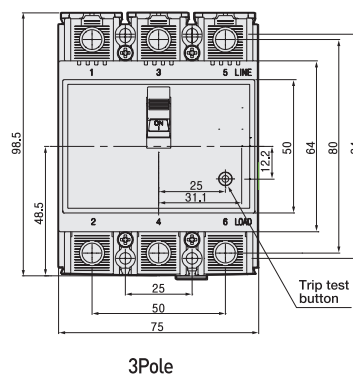


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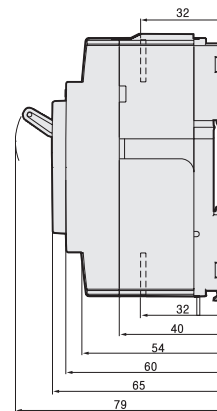
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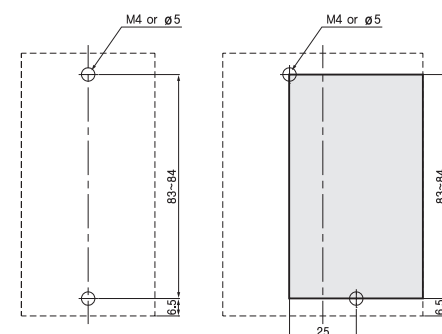
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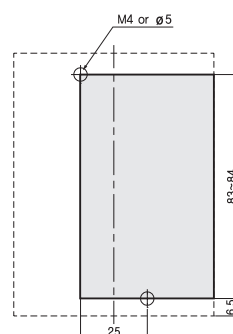
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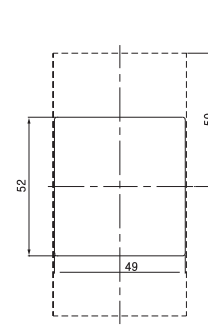
Dimensions for installation of the panel



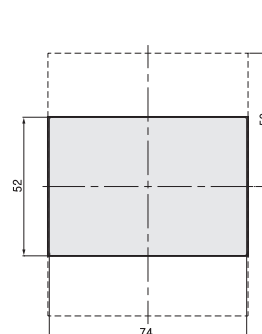
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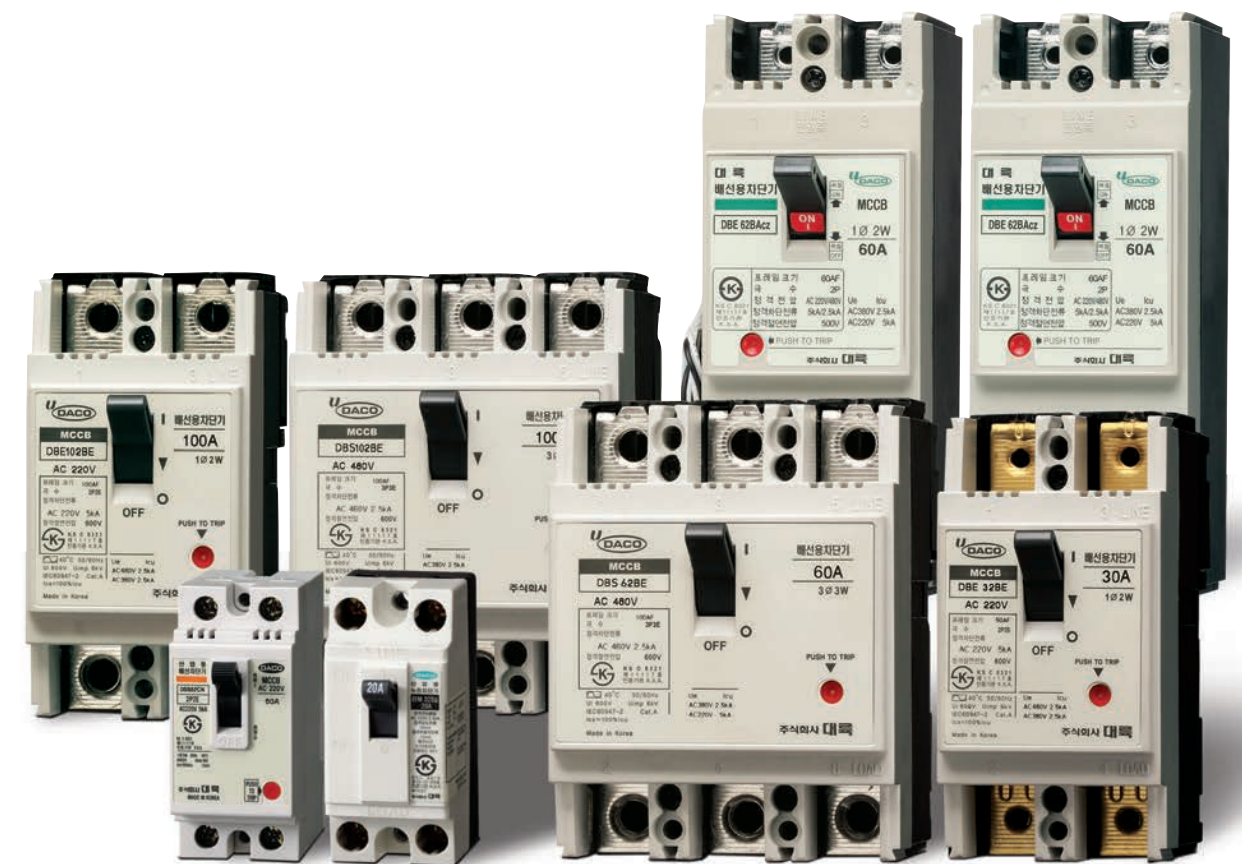
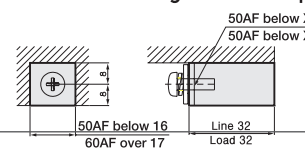
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Dimensions for cutting the panel cover

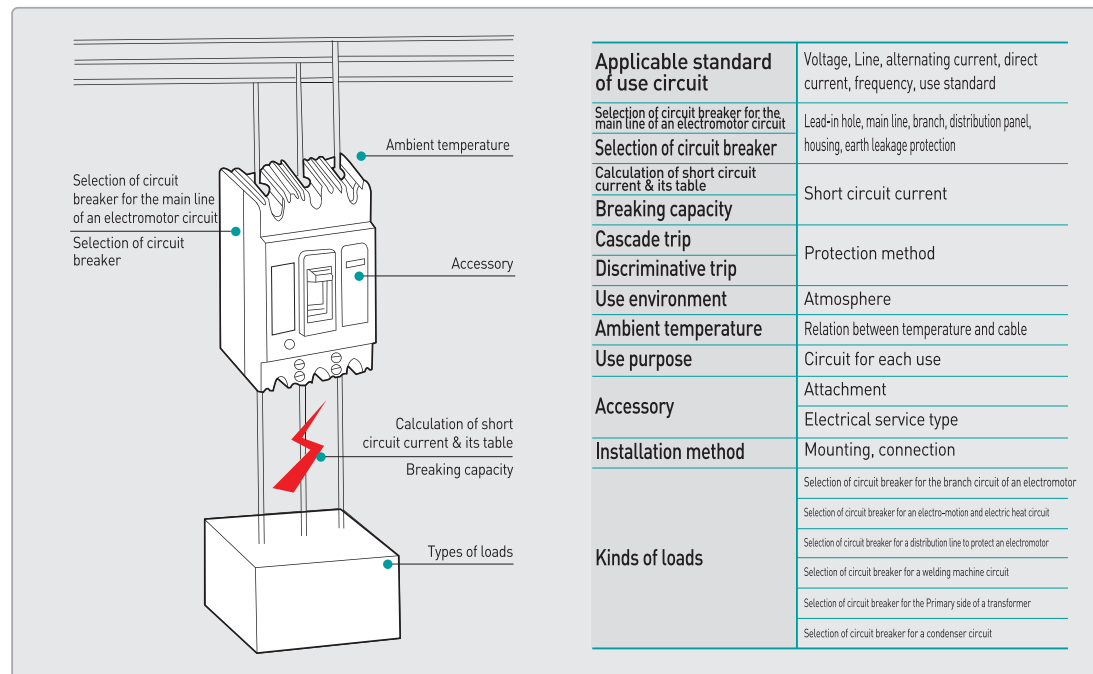


Detail drawing of terminal part



Technical Data

Points to be considered when choosing a circuit breaker



Principle of Selection

1. Should be able to break the fault current.
2. Should be able to safely apply a load current.
3. Should not operate unnecessarily, except for accidents such as load start-up, etc.
4. The rated current of the circuit breaker should exceed the load current.
5. The protection you are aiming at should be guaranteed.
6. The rated current of the earth leakage circuit breaker for combined use for protection of both overload and short circuit should be less than the allowable current value of the cable used in the branch circuit.
7. Select the circuit breaker with the rated device suitable for the circuit voltage.
8. The earth leakage circuit breaker for combined use for protection of both overload and short circuit should be able to break the short circuit that passes through its installation places and should have a rated breaking capacity greater than the value of the short circuit current.

Sequence of Selection

MCCB

Item to be checked	Points for consideration
Use circuit	Phase-line, rated voltage, rated current, size
Rated current decision	Kinds of cables, size, kinds of loads
Breaking capacity decision	Transformer capacity, size and length of cable
Operating characteristic decision	Kinds of loads
Type name decision	Use
Mounting method	Attachment
Attachment	Interior accessories, exterior accessories
Use environment	Use environment

Relation between temperature and cable

Relation between use current and ambient temperature

The rated current of the circuit breaker has been adjusted to 40°C as the basis ambient temperature. This is because we assumed that the circuit breaker would be installed inside a panel such as a distribution panel, control panel, etc. If the temperature of the place where the circuit breaker is installed is greatly over or below 40°C, the rated current, which has been corrected according to the Temperature compensation curve, should be used. However, in consideration of variation, etc. of power and voltage, it should have some allowance against the rated current of which the maximum use current has been compensated.

0.6/1kV XLPE Insulation cable

• Applicable products : CV, F-CV, CE, F-FR-8, F-FR-3, HFCO, NFR-8 • Application method of KS C IEC 60364-5-52 [Unit : A]

Nominal cross section(mm ²)	Placement condition	Placement by closed conduit in the air			Placement by direct laying	
		Single core	2Core	3 • 4Core	2Core	3 • 4Core
		3Line S=d	1Line Placement	1Line Placement	1Line	1Line
1.5		22	26	23	26	22
2.5		30	36	32	34	29
4		42	49	42	44	37
6		55	63	54	56	46
10		77	86	75	73	61
16		105	115	100	95	79
25		141	149	127	121	101
35		176	185	158	146	122
50		216	225	192	173	144
70		279	289	246	213	178
95		342	352	298	252	211
120		400	410	346	287	240
150		464	473	399	324	271
185		533	542	456	363	304
240		634	641	538	419	351
300		736	741	621	474	396
400		868	892	745	—	—
500		998	—	—	—	—
630		1151	—	—	—	—

0.6/1kV PVC Insulation cable

• applicable products : VV • Application method of KS C IEC 60364-5-52 [Unit : A]

Nominal cross section(mm ²)	Placement condition	Placement by closed conduit in the air			Placement by direct laying	
		Single core	2Core	3 • 4Core	2Core	3 • 4Core
		3Line S=d	1Line Placement	1Line Placement	1Line	1Line
1.5		19	22	18,5	22	18
2.5		28	30	25	29	24
4		36	40	34	38	31
6		47	51	43	47	39
10		64	70	60	63	52
16		85	94	80	81	67
25		114	119	101	104	86
35		143	148	126	125	103
50		174	180	153	148	122
70		225	232	196	183	151
95		275	282	238	216	179
120		321	328	276	246	203
150		372	379	319	278	230
185		427	434	364	312	258
240		507	514	430	361	297
300		587	593	497	408	336
400		689	—	—	—	—
500		789	—	—	—	—
630		905	—	—	—	—

Technical Data

Application in special environments

Though we have many various peripheral environments where the MCCB & ELCB are used, they are manufactured based on the standard use condition as shown below.



- When the standard circuit breaker is used in the condition of high temperatures exceeding 40°C, the reduction ratio is as shown below.
50°C.....90% 60°C.....80%
In case of a circuit breaker with a temperature compensation device, no compensation is required for up to 50°C.
- When used in highly humid conditions, the dielectric strength or electrical performance may drop.



- When you need to put it in a dustproof structure, please contact us.

Standard use condition specified in KS Standard

- 1) Use temperature : -5°C~40°C
- 2) Relative humidity : less than 85%
- 3) Altitude: less than 2000m
- 4) Environment: There should be no excessive vapor, oil, smoke, dust, corrosive gas, combustible gas, etc.



- Even in -20°C, there is no difficulty with electric application switching, trip and short circuit breaking.
- No difficulty either in passing through a cold place of -40°C or with.
- As the basis ambient temperature has been adjusted as 40°C, the operating characteristics may vary.

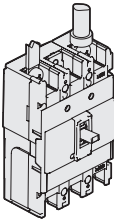
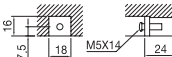
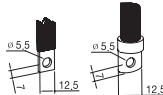
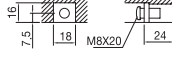
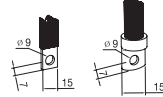
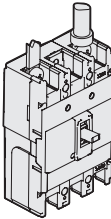
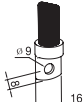
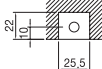
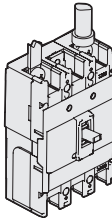
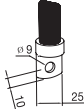
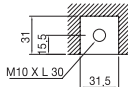
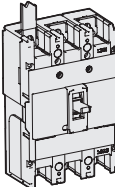
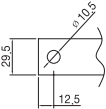


- In case of leaving it being switched to ON or OFF for a long time, it is advisable to check it by periodically switching the load current.
- In case there is a lot of corrosive gas, you need to put it inside an airtight protection structure.

Influence in special environment

Special environment	Influence of MCCB & ELCB
low temperature	• Deformation due to ice formation or condensation • Lowering of mechanical strength
Higher temperature and humidity	• Corrosion • Lowering of insulation resistance • Operation fault
Corrosive gas, salinity	• Corrosion • Lowering of insulation resistance • Total fault of contact
Dust, vapor	• Total fault of contact • Operation fault with tool part • Lowering of insulation resistance

Connection Way

Smart MCCB Frame	Terminal(mm)		Torque(Kg.Cm)	Conductor(mm)
	NS Type	S Type		
100AF	15-50A	15-50A		15-50A
				
	60-100A	60-100A		60-100A
				
125AF	 			 
250AF	 			 
400AF/ 600AF	 			

Mounting and Connection

Influence by Mounting Angle

With the Hydraulic-Magnetic Type, the operating current varies according to the mounting angle due to the influence by gravity imposed on the Plunger inside the Oil Dash Pot. Please use it after compensating for the rated current on the basis of the table below

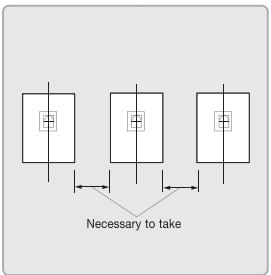
Compensation ratio of rated current

Mounting angle	Vertical	Horizontal	Reverse horizontal	Rear inclination 15°	Rear inclination 45°	Rear inclination 15°	Rear inclination 45°
AF							
	100%	120%	80%	105%	110%	95%	85%

[Note] In case of 100AF, only the economical type is applicable

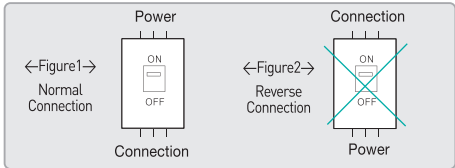
Influence by the mounting clearance

When several circuit breakers are arranged in a row as shown in the Figure right, though the characteristic of time delay Trip may vary due to the heat influence between circuit breakers, the operating characteristic hardly varies even when the close equipment is adhered to each other. Therefore, though it is not necessary to take into consideration the influence of the mounting space on the characteristics, please give plenty of consideration to the insulation clearance in consideration of the connection way, etc.



Connection of Power and Load

The connection of cable load to the terminal of the MCCB is made on the basis of the connection as shown in <Figure 1>. When the connection is made as shown in <Figure 2>, as the breaking performance may be lowered, please avoid this kind of connection.



Technical Data

Repair & Check

■ Check in earlier time

After installation of MCCB, please check for the following items before applying an electric current.

Equipment model	Items to check	Indication standard
Common	1. Remove all obstacles/blockages from around the device, such as screws, processed things, cuttings of cable, etc.	Remove completely
	2. There should be no cracks or damage to the cover and case.	There should be no cracks or damage
	3. There should be no condensation in the part of the cover and case.	There should be no condensation
	4. Measure the insulation resistance with an insulation ohmmeter of 500V.	More than 5MΩ.
	5. The connection part of the electric conduction should be fixed securely.	Specified fixing Torque

■ Notes

Test of withstanding voltage

- Based on the table on the right side, please perform the test to withstand voltage greater than the basis
- Do not perform the test to withstand voltage between the terminals for the circuit breaker for the protection of an electrometer. Note) The withstand voltage between housing contacts of leakage Relay is 1000V.

[Unit:V]

Main circuit		Aux circuit or control circuit	
Rated insulation voltage	Test voltage(virtual value of alternating current part)	Rated insulation voltage of operating circuit	Test voltage (virtual value of alternation current part)
Ui≤300	2000	Uis≤60	1000
300 < Ui ≤ 600	2500	60 < Ui ≤ 600	2Uis+100(min,1500)

Measurement of insulation resistance and Test to withstand voltage (In case of ELCB)

- Measurement of insulation resistance: The insulation resistance marked as Δ in the right side table will not be destroyed when measuring it with a 500V insulation ohmmeter, but it will be destroyed when authorizing 1000V. The order value of n insulation ohmmeter is almost "0". Measure it when the circuit breaker is switched to "OFF". Do not use it for the 1000V insulation resistance.
- Test to withstand voltage: Please do not authorize the voltage to the spot marked as X in the right side Table.

Test		Measurement of insulation resistance		Test to withstand voltage	
Number of measurement places					
Handle condition		ON	OFF	ON	OFF
Between charging part and ground		○	○	○	○
Between R phase-S phase, S phase-T phase		○	○	○	○
between R phase and T phase	Power side	Δ	○	×	—
	Load side	Δ	Δ	×	×
Between power and load terminal		—	○	—	○

■ Check time

Not only to prevent accidents in advance but to maintain the circuit breaker for a long time, please check it one time about one month later after starting to use it. Thereafter, you need to check it periodically.

[Check time]

1. Clean and dry environment	2. Environment with dust, corrosive gas, vapor, salinity	3. Environment worse than 1 & 2 as above
One time every 2 ~3 years	One time every year	One time every six months

■ Checking after Breaking

When the circuit breaker is tripped due to a fault in the current, there are two[2] cases, one is that you can reuse it and the other is that you have to replace it with a new one.

The size of breaking current	Damage degree of circuit breaker	Measures to take
Operating within the operation scope of the time delay trip (excess-current less than 10 times the size of the rated current)	No abnormality was found other than the exhaust hole	50 times in the overload current 6 times the size of the rated current (no more than 100A) Breaking is possible
Short-circuit current with comparatively small current value	Carbonization phenomenon was shown around the exhaust hole	Reusable
High short-circuit current close to the rated breaking capacity	Carbonization phenomenon around the handle Carbonization phenomenon around the exhaust hole Extraneous matter for metal is attached inside the circuit breaker	Replace with a new product

- When the insulation resistance value is under 5MΩ, please perform the dielectric strength test
- If it turned out to be a specified dielectric strength, you may temporarily use it. However, you have to replace it with a new product as soon as possible.
- If the insulation resistance and dielectric strength are sufficient, it seems possible to reuse it. However, please check carefully if the temperature does not rise abnormally for a certain period.

■ Replacement interval(Life span of product)

As for the repair and checking, you need to check it according to the installation environment of the circuit breaker.

Note) The life span of the circuit breaker is not decided by the use year. The diagnosis by specialist is necessary, and as a whole, about the cycle as shown below is required.

Degree	Environment	Concrete example	Replacement interval(year)
Standard use condition	Clean and dry place	Dustproof and ventilated electrical room	About 10~15
	A dusty place, but without corrosive gas	Distribution panel in a separate electrical room without dustproof and ventilation	About 7~10
Inferior environment	A place with little dust but with some gas like sulfurous acid, hydrogen sulfide and salinity & high humidity	Local power plant, sewage treatment plant, iron works, paper-mill, pulp factory, etc.	About 3~7
	A place with a particularly large amount of corrosive gas, dust, etc.	Chemicals factory, quarry, mine, etc.	About 1~3

Technical Data

Items to check

Check in earlier time

Check item	Check point	Measures to take
Loosening of terminal screw	- Check if the terminal screw, cable tightening screw, etc. has not been loosened. - Please use the standard tool.	Tighten it by specified torque in respect of the quality and size of screw
Dust	Check if there is dust, oil, etc piled up on the surface of the MCCB, especially on the surface of the power side.	- Remove the dust with cleaner or wipe it off with a piece of cloth - Please use a neutral detergent (use of corrosive detergent is prohibited)
Switch	As for the circuit breaker that is always closed, prevent the increase of friction resulting from the hardening of grease, etc. by switching it several times.	If the switching is not smooth in the circuit breaker, replace it or make repairs
Insulation item	- Measure the insulation resistance of inter phase and inter ground with the 500V insulation ohmmeter - As for the conductor, measure the exterior side.	If the resistance is below 5MΩ, replace the circuit breaker with a new one, and investigate the causes for the lowering of resistance.

Abnormal condition

Kind of abnormality	Abnormal condition	Cause	Emergency treatment
Abnormality of accessories	Abnormality of SHT	- Decrease in operating voltage - Wrong selection of voltage used	Improvement of power
		Coil damage	Service request
	Closing is impossible	Applied frequency / Abnormal Voltage	Improvement of power
	- Alarm Switch - Operating fault	Untightened Screw	Readjustment

Abnormal condition of ELCB and way to take measures

Kind of abnormality	Abnormal condition	Cause	Emergency treatment
Abnormal operation	The leakage display button is projected at the same time as the closing(in the case that leakage device part operates)	As the ground power failure capacity increases due to long wiring, the leakage current flows	- Change of rated sensitivity current - Install the ELCB at a place close to load
		- Connection of circuit breakers in a row - Faulty fastening of neutral line	Check the fastening of the cable
	Operating while it is being used	Intrusion of excessive surge	Install the Surge Absorber to a converter
		- Inducement from main cable of great current in the area - Intrusion of noise	Solution of the cause of noise

Kind of abnormality	Abnormal condition	Cause	Measures to take
Temperature rise	Overheating of terminal part	- Loosening of screw tightened onto the terminal part - Inferior assembly of bus-bar	- Tightening by specified torque - Re-assembly of bus-bar
	Overheating of Product (except for terminal part)	- Inferior contact at the interior wipers - Increase of current density resulting from downing of cable	Replacement with a new product
Temperature rise	Closing is impossible	- Inflow of foreign material into the switching device - In case reclosing without being Reset to the trip condition	- Removal of foreign material - Closing after performing Reset
	- Reoperation is impossible - Breaking is impossible - OFF is impossible	- Abrasion resulting from blocking resistance - Inferior operation of Reset device - It is not possible to do coil magnetizing of the trip device of short voltage - Burn and fatigue of switch spring - Corrosion and deformation of bimetal - Reach the marginal life span of switch - Overheating of element to detect the over-current - Contact adhesion resulting from the excessiveness of blocking current	- Exchange with new product - Request for service - Power authorization - Replacement and repair - Request for service - Exchange with new product - Operation after cooling - Exchange with new product
Inferior application of electric current	Inferior application of electric current	- Inflow of insulation material between the contacts - Fusing of electric conduction part - Burn (abrasion) of contact	- Removal of foreign material - Exchange with new product
Frequent tripping of MCCB	Breaking at the normal load	- Faulty selection of product rating (overheating) - No window inside a panel (overheating) - Interior heating of MCCB - Loosening of terminal connection part	- Exchange with new product (Re-selection of rating) - Ventilation - Exchange with new product - Tightening of terminal screw (Check)
	Faulty Operation at the time of motor start-up	- Heat generation due to starting current - Flow of load current greater than the rated current (When using motor in overload or overvoltage)	- Exchange with new product - Change of rating
	Instantaneous operating at the time of motor start-up	- Excessiveness of starting current - Over-current at the time of Y-Δ starting transfer - Over-current resulting from reversible operation - Inrush current of instantaneous reoperation - Charge current of capacitor, overflow of incandescent electric lamp - Layer short of electromotor - Flow of abnormal current at the same time of closing - Faulty connection of operation circuit	- Change of the setting of instantaneous blocking current or change of rating - Repair of electromotor - Check of circuit
Non-operating	Non-operating at the abnormality of specified operating current	- The rated current selected became enlarged - Current-limiting blocking of higher level fuse or aid of higher level circuit breaker has not been made.	- Selection of smaller rating - Re-examination of protection aid or change of rating
Short-circuit of power side		- Dust, etc. has piled up - Falling of obstacles/blockages onto the power side	Exchange with new product