Electric Products

MCB / MC&TOR / MMS / MCCB /
ACB / FDB / SMDB / VCB

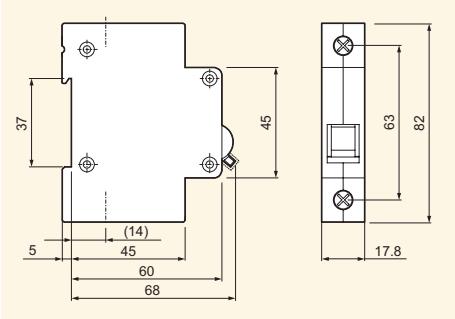
LSIS

Miniature circuit breakers

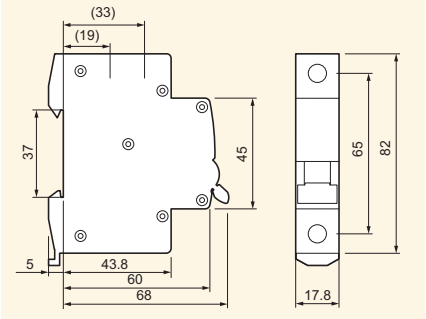
1, 2, 3 and 4 pole series up to 125AF

Type		MCB			
		BKN	BKN-c	BKN-b	
Protection		Overload and short circuit		Overload and short circuit	
Rated current		1, 2, 3, 4, 6, 10, 16, 20, 25, 32, 40, 50, 63A		1, 2, 3, 4, 6, 10, 16, 20, 25, 32, 40, 50, 63A	
Characteristic		B, C, D curve	B, C curve	B, C, D curve	
Poles		1p, 1p+N, 2p, 3p, 3p+N, 4p	1P, 2P, 3P, 4P	1p, 1p+N, 2p, 3p, 3p+N, 4p	
Breaking capacity		1pole	2~4pole	1pole	2~4pole
		1A~63A 6kA at 230/400VAC (NF: 4.5kA)	1A~63A 6kA at 400VAC	1A~63A 10kA at 240/415VAC	1A~63A 10kA at 415VAC
Standard		IEC 60898		IEC 60898	
Approval		CCC, SABS, SEMKO CB, NF	SEMKO CB	KEMA CB, SABS, UL 1077 †, CE	
Type of trip		Thermal magnetic release		Thermal magnetic release	
Endurance	**Electrical**	4,000 operations		4,000 operations	
	Mechanical	10,000 operations		10,000 operations	
Mount		On 35mm DIN rail		On 35mm DIN rail	
Width		17.8mm per pole		17.8mm per pole	
Terminal		Lug type(cable up to 25mm²)	Dual type(Lug & Screw)	Lug type(cable up to 25mm²)	
Auxiliary switch, AX **Optional**		 **1 changeover contact** 6A at 240VAC, 3A at 415VAC(AX) 6A at 230VAC, 3A at 415VAC(AL) 2A at 48VDC, 1A at 125VDC **Lug terminal** Cable capacity 2.5mm² **9mm wide** *Only for BKN		 **1 changeover contact** 6A at 240VAC, 3A at 415VAC(AX/AL) 6A at 24VDC, 2A at 48VDC, 1A at 130VDC **Lug terminal** Cable capacity 0.75~2.5mm² **8.8mm wide**	
Dimension		See drawing 1		See drawing 2	
Characteristic curve		See curve 1		See curve 1	

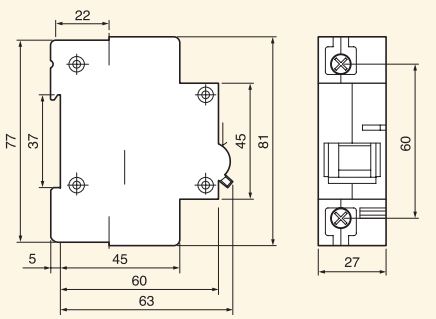
Drawing 1 : Type BKN & BKN-c

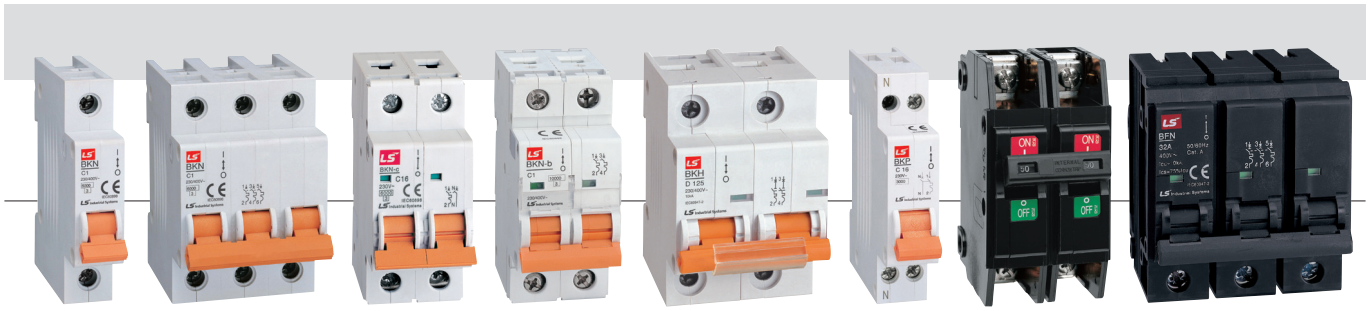


Drawing 2 : Type BKN-b



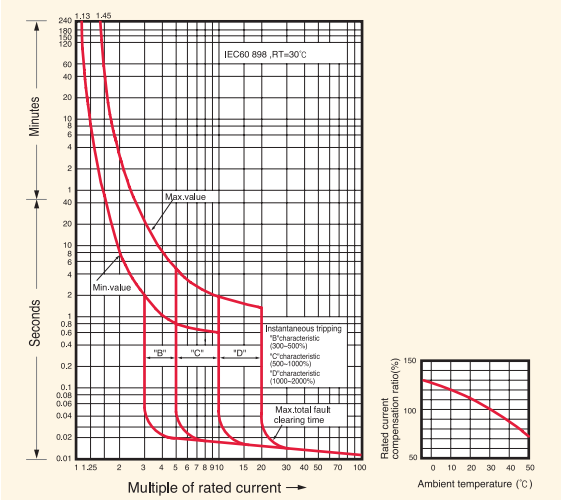
Drawing 3 : Type BKH



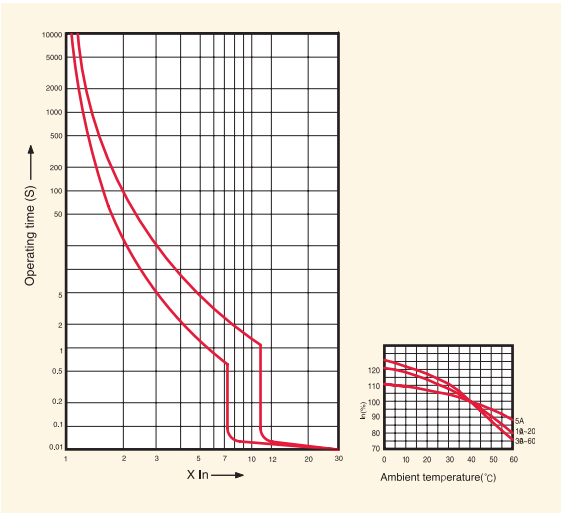


MCB						
BKH		BKP	BF-a	BF-c	BFN	
Overload and short circuit		Overload and short circuit	Overload and short circuit		Overload and short circuit	
63, 80, 100, 125A		3, 6, 10, 16, 20, 25, 32A	10~100A		5, 10, 15, 20, 30, 40, 50A	
C, D curve		B, C, D curve				
1p, 2p, 3p, 3p+N, 4p		1p+N	1P, 2P, 3P		1P, 2P, 3P	
1pole	2~4pole				1pole	2~3pole
63A~125A 10kA at 230/400 VAC	63A~125A 10kA at 400VAC	3A~32A 4.5kA at 230VAC (NF: 3kA)	10A~100A 10kA at 240VAC 2.5kA a 415VAC	10A~100A 5kA at 240VAC 2.5kA at 415VAC	5A~50A 10kA at 230VAC	5A~50A 10kA at 400VAC
IEC 60947-2		IEC 60898	IEC 60947-2		IEC 60947-2	
CCC, SEMKO CB, SABS, CE		CCC, SEMKO CB, NF,SABS, CE			SEMKO CB, CE	
Thermal magnetic release		Thermal magnetic release	Thermal magnetic release		Thermal magnetic release	
1,500 operations		4,000 operations	1,500 operations		1,500 operations	
10,000 operations		10,000 operations	10,000 operations		10,000 operations	
On 35mm DIN rail		On 35mm DIN rail	Holder mounting (Bolt on with fixing brackets)		Plug-in	
27mm per pole		17.8mm per pole	25mm per pole		25mm per pole	
Lug type(cable up to 50mm²)		Lug type(cable up to 10mm²)	Clamp type		Lug type (14-6 AWG.)	
See drawing 3		See drawing 4	See drawing 5		See drawing 6	
See curve 1		See curve 1	-		See curve 2	

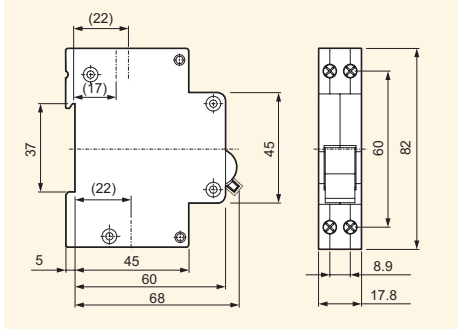
Curve 1 : Type BKN, BKN-b, BKN-c, BKH, BKP, RKP, RKS



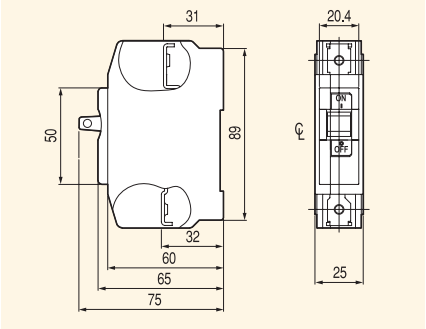
Curve 2 : Type BFN



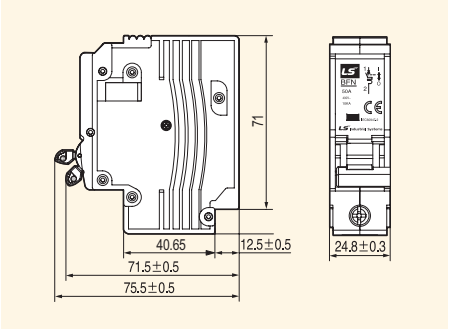
Drawing 4 : Type BKP



Drawing 5 : Type BF-a, BF-c



Drawing 6 : Type BFN

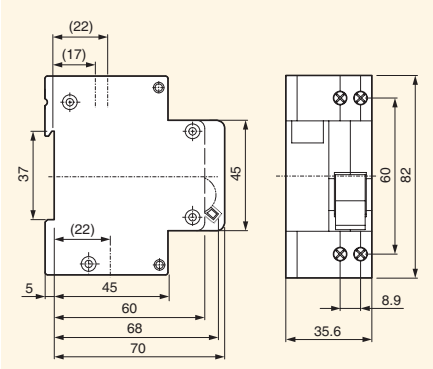


Residual current circuit breakers

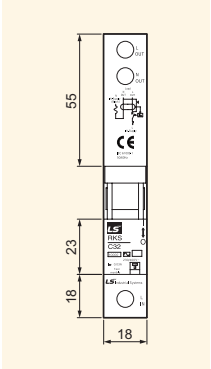
2 and 4 pole series up to 63AF

Tipo		RCBO							
		RKP	RKS	RKS-b	RKC	32KGRc	32KGRd	32GRhc	32GRhd
Protection		Ground fault and overcurrent	Ground fault and overcurrent		Ground fault and overcurrent	Ground fault and overcurrent		Ground fault and overcurrent	
Rated current, In		3 (C, D curve), 6, 10, 16, 20, 25, 32A (B, C, D curve)	6, 10, 16, 20, 25, 32A (40, 50A) (B, C curve)		6, 10, 16, 20, 25, 32A (B, C curve)	15, 20, 30A		15, 20, 30A	
Rated residual current									
	Operating, I△n	30, 100, 300mA (non-adjustable)	30, 100mA (non-adjustable)		10, 30mA (non-adjustable)	15, 30mA (non-adjustable)		15, 30mA (non-adjustable)	
	Non-operating, I△no	0.5I△n	0.5I△n		0.5I△n	0.5I△n		0.5I△n	
Number of poles		1P+N	1P+N		1P+N	2 polo		2 polo	
Rated voltage		230 VAC	230 VAC	240 VAC	240 VAC	110/220 VAC		110/220 VAC	
Residual current off-time		≤0.1 sec.	≤0.3 sec.		≤0.01 sec.	≤0.03 sec.		≤0.03 sec.	
Standard		IEC 61009	IEC 61009		IEC 61009	IEC 61009, KS		KS	
Approval		CCC, CQC CB, SABS, CE	SEMKO CB, SABS, CE	SEMKO CB, CE	BV CB	CCC		-	
Type of trip									
	Ground fault	Electronic	Electronic		Electronic	Electronic		Electronic	
	Overcurrent	Thermal-magnetic	Thermal-magnetic		Thermal-magnetic	Bimetallic		Bimetallic	
Breaking capacity		4.5kA	10kA		6kA (32A 4.5kA)	1.5kA	2.5kA	1.5kA	2.5kA
Conditional short circuit capacity		-	-		-	-		-	
Endurance	Electrical	4,000 operations	4,000 operations		4,000 operations	4,000 operations		4,000 operations	
	Mechanical	10,000 operations	10,000 operations		10,000 operations	10,000 operations		10,000 operations	
Mount		On 35mm DIN rail	On 35mm DIN rail		On 35mm DIN rail	On 35mm DIN rail / Screw		On 35mm DIN rail / Screw	
Width		35.6mm	18mm		18mm	35mm		33mm	
Terminal		Lug type (cable up to 10mm²)	Lug type (cable up to 10mm²)		Lug type (cable up to 10mm²)	Screw clamp type (cable up to 5.5mm²)		Screw clamp type (cable up to 5.5mm²)	
Type of operation		-	-		A/AC	-		-	
Dimension		See drawing 1	See drawing 2	See drawing 3	See drawing 4	See drawing 5		See drawing 6	
Characteristic curve		See page 7 (curve 1)	See page 7 (curve 1)		-	See page 3		See page 4	

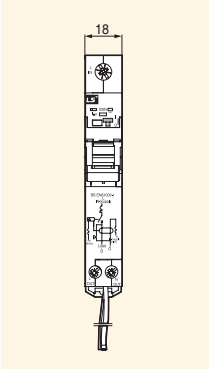
Drawing 1: Type RKP



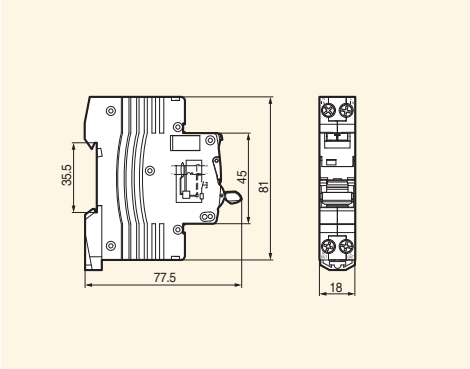
Drawing 2: Type RKS



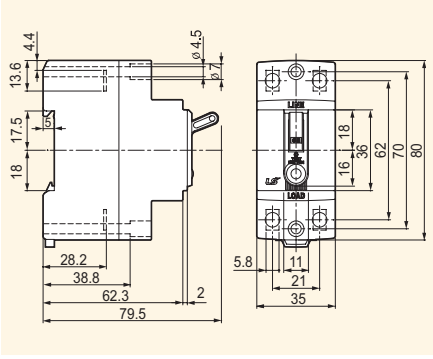
Drawing 3: Type RKS-b



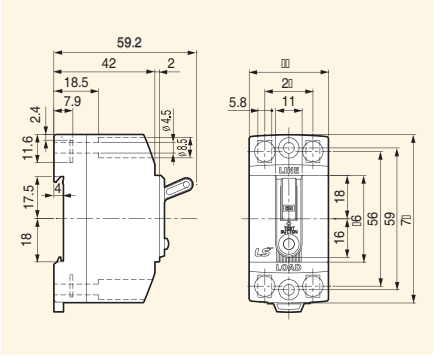
Drawing 4: Type 32KGRc & 32KGRd



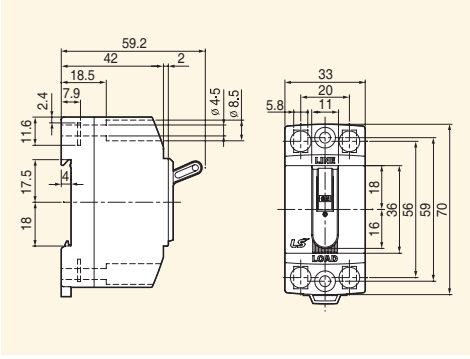
Drawing 5: Type 32GRhc & 32GRhd



Drawing 6: Type BS



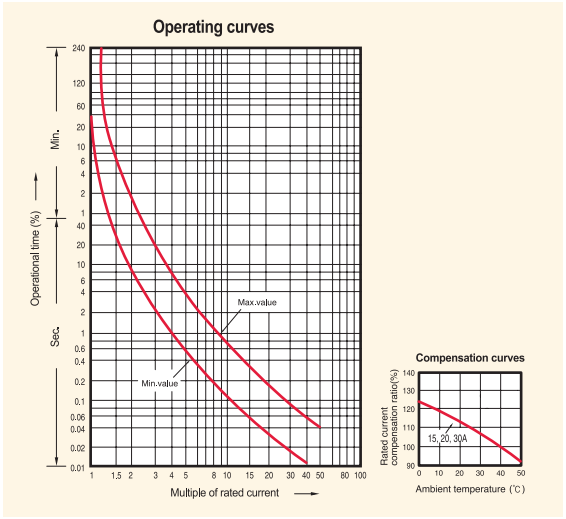
Drawing 7: Type RKN



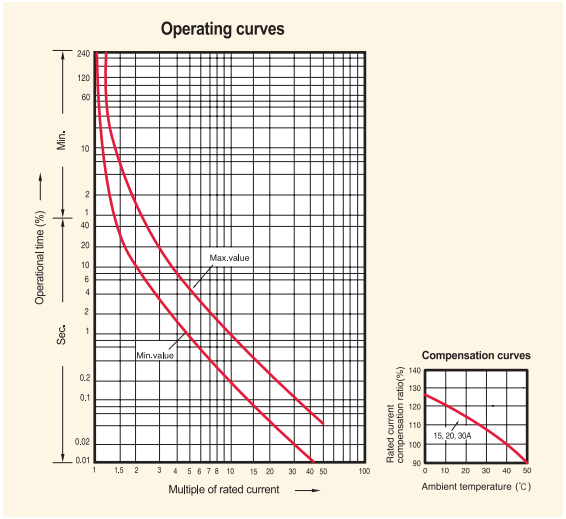
RCCB				
BS32c	BS32d	RKN	RKN-b	
Ground fault and overcurrent		Ground fault and overcurrent		
6, 10, 15, 20, 30A	10, 15, 20, 30A	25, 32, 40, 63A	63AF	100AF
			25, 40, 63A	80, 100A
15, 30mA (non-adjustable)		30, 100, 300mA (non-adjustable)		
0.5I△n		0.5I△n		
2 polo		1P+N, 3P+N		
110/220VAC		230VAC(1P+N), 230/415VAC(3P+N)		
≤0.03 sec.		≤0.1 sec.		
IEC 60898, KS		IEC 61008		
CCC		SEMKO CB, CE, NF, SABS, CCC	SEMKO CB, CE, SABS	
Electronic		Electro-magnetic		
Bimetallic		N.A		
1.5kA	2.5kA	-		
-		6kA	10kA	
4,000 operations		4,000 operations		
10,000 operations		10,000 operations		
On 35mm DIN rail / Screw		On 35mm DIN rail		
33mm		-		
Screw clamp type (cable up to 5.5mm²)		Lug type (cable up to 35mm²)		
-		A/CA		
See drawing 7		See drawing 8	See drawing 9	
-		-		

Isolator			
Type			BKD
Rated current, In			63, 80, 100, 125A
Number of poles			1p, 2p, 3p, 4p
Rated voltage			230 / 400 VAC
Standard			IEC 60947-3
Certificado			SABS, SEMKO CB
Endurance	Electrical	40, 50, 63, 80, 100A	1,500 operations
		125A	1,000 operations
	Mechanical		10,000 operations
Mount			On 35mm DIN rail
Width			17.8mm per pole
Terminal			Lug type(cable up to 50mm²)
Dimension			See drawing 10

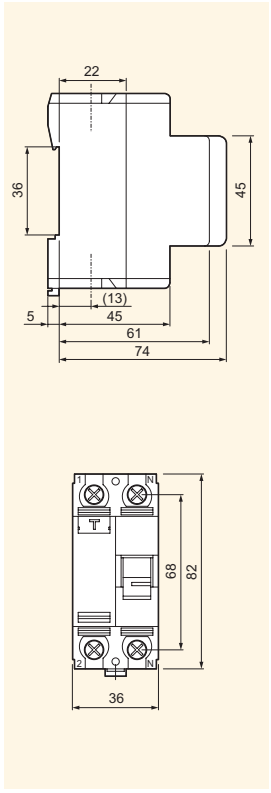
Curve 3 : Type 32KGRc, 32KGRd



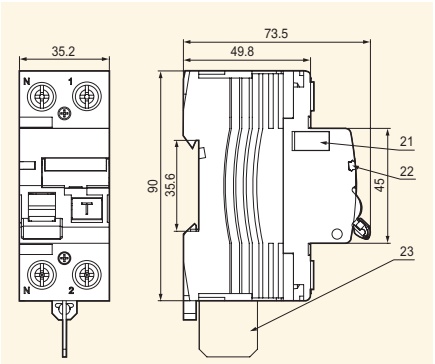
Curve 4 : Type 32GRhc, 32GRhd



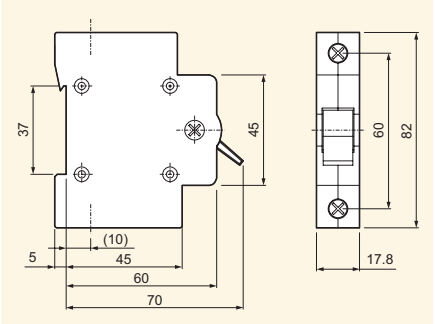
Drawing 8: Type RKN



Drawing 9: Type RKN-b



Drawing 10: Type BKD



BKS Series (Din-rail type)

BKS Series

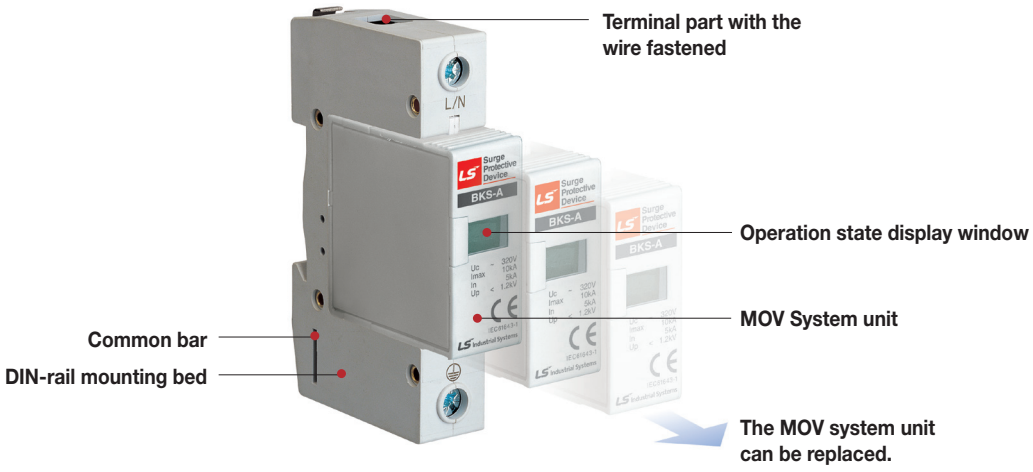
Din-rail type

Descrizione prodotto

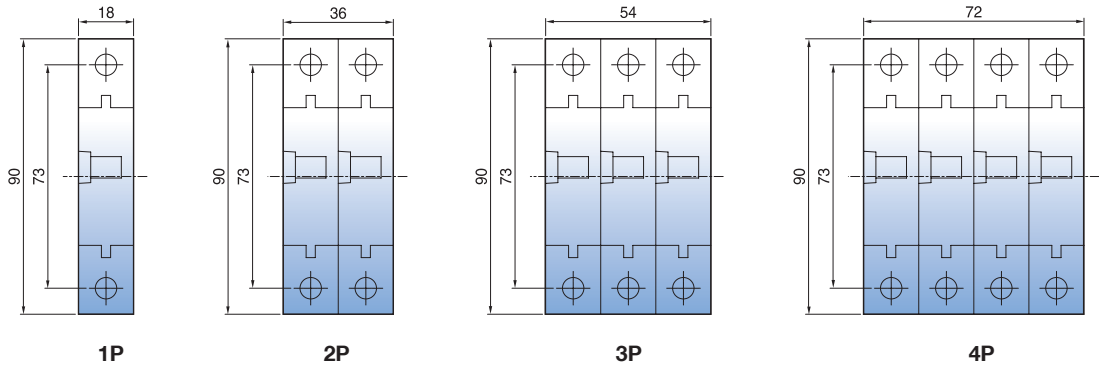
The BKS surge protective device is applied to the alternating current 50/60Hz power system and provides the protection from the surge overvoltage of an electric system.
Moreover, it is the protection element (MOV) replacement type and is the product with convenience and economic efficiency.
If the protective device is normal, the display becomes green.
The display becomes red after operation (abnormal or after an accident).

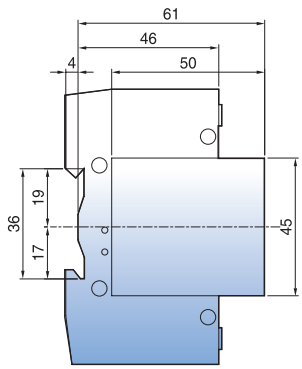
Product rating

	BKS-A	BKS-B	BKS-C	BKS-D	BKS-E
SPD according to IEC	Classe Ⅲ	Classe Ⅲ	Classe Ⅱ	Classe Ⅱ	Classe Ⅱ
Number of positions [Pole]	1, 2, 3, 4				
Nominal voltage, Un AC [V]	3P4W 380 / 220, 3P4W 380 / 440				
Max. continuous operating voltage, Uc AC [V]	320	320	320	420	460
Voltage protection level, Up [kV]	≤ 1.2	≤ 1.2	≤ 1.5	≤ 2.0	≤ 2.5
Nominal discharge current, .In 8/20㎲ [kA, per mode]	5	10	20	30	35
Maximum discharge current, Imax 8/20㎲ [kA, per mode]	10	20	40	60	70
Response time, tA [ns]	< 25ns				
Operating temperature range [℃]	-40 ~ +80 ℃				
Operating frequency [Hz]	50 / 60 Hz				
Mounting on	Din-rail 35mm				
Conductor cross section [mm²]	Line and neutral : 2.5mm², ground : 4mm²				
Degree of protection	IP20				
Modes of protection	L-G, N-G				
Operation status indication	Normal operation : Green, Abnormal/After an accident : Red				

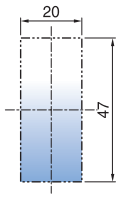


External dimension

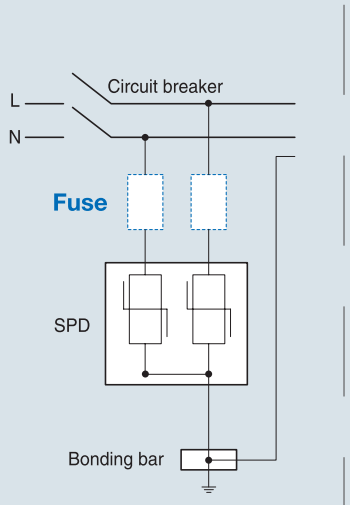




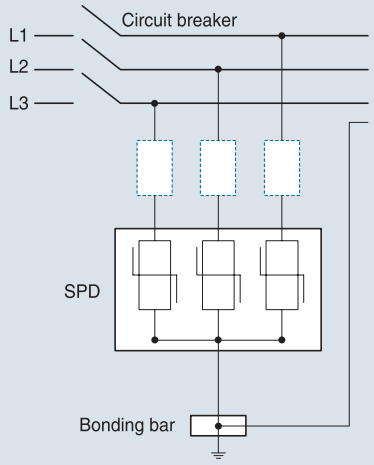
Panel cutting size



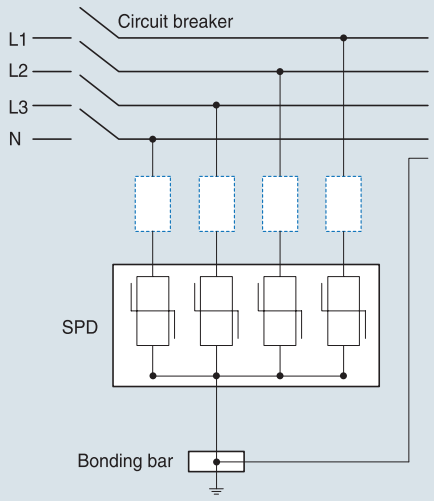
Installation wiring method



Single phase diagram



3 Phase 3 Line diagram



3 Phase 4 Line diagram

* A separate fuse can be installed depending on the side conditions. (The fuse should be purchased separately is not supplied by LS.)

SP Series (Box type)

SP Series

Box type

Product description

The SP series surge protective device is applied to the alternating current 50/60Hz, 220V/380V power system and provides the protection from the surge overvoltage of an electric system.
Moreover, the protection module, disconnectable device (fuse), and fastened power and ground wires are organized into the all-in-one steel cabinet with convenient installation and stability.
If the protective device is normal, the display becomes green.
The display becomes red after operation (abnormal or after an accident).

Product rating

- Single phase 2W+G (SPL) AC110/220V

			SPL-110S
SPD according to IEC			Class Ⅲ
Number of positions		[Pole]	2W+G
Nominal voltage, Un	AC	[V]	110/220
Max. continuous operating voltage, Uc	AC	[V]	320
Voltage protection level, Up		[kV]	≤ 1.5
Nominal discharge current, .In	8/20㎲	[kA, per mode]	10
Maximum discharge current, Imax	8/20㎲	[kA, per mode]	20
Response time, t_A		[ns]	< 5ns
Operating temperature range		[℃]	-40 ~ +70℃
Operating frequency		[Hz]	50 / 60 Hz
Mounting on			Screw
Operation status indication			Normal operation : Green, Abnormal/After an accident : Red
Degree of protection			IP20
Modes of protection			L-N, L-G, N-G

Product rating

-Three phase 2W+G (SPL) AC 220V

			SPL-220S	
SPD according to IEC			Class Ⅱ / Class Ⅲ	
Number of positions		[Pole]	2W+G	
Nominal voltage, Un	AC	[V]	220	
Max. continuous operating voltage, Uc	AC	[V]	320	
Voltage protection level, Up		[kV]	≤ 1.5	
Nominal discharge current, .In	8/20㎲	[kA, per mode]	20	40
Maximum discharge current, Imax	8/20㎲	[kA, per mode]	40	80
Response time, t_A		[ns]	< 5ns	
Operating temperature range		[℃]	-40 ~ +70℃	
Operating frequency		[Hz]	50 / 60 Hz	
Mounting on			Screw	
Operation status indication			Normal operation : Green, Abnormal/After an accident : Red	
Degree of protection			IP20	
Modes of protection			L-N, L-G, N-G	

Product rating

-Three phase 3W+G (SPT) AC 220V

	SPT-220S			
SPD according to IEC	Class Ⅱ / Ⅲ		Class Ⅰ	
Number of positions [Pole]	3W+G			
Nominal voltage, Un AC [V]	3P3W 220			
Max. continuous operating voltage, Uc AC [V]	320			
Voltage protection level, Up [kV]	≤ 2.0			
Lightning impulse current, .Iimp 10/350㎲[kA, per mode]	-	-	20	40
Nominal discharge current, .In 8/20㎲ [kA, per mode]	20	40	60	80
Maximum discharge current, Imax 8/20㎲ [kA, per mode]	40	80	120	160
Response time, t_A [ns]	< 5ns			
Operating temperature range [℃]	-40 ~ +70 ℃			
Operating frequency [Hz]	50 / 60 Hz			
Mounting on	Screw			
Operation status indication	Normal operation : Green, Abnormal/After an accident : Red			
Degree of protection	IP20			
Modes of protection	L-G			

Product rating

-Three phase 3W+G (SPT) AC 380V

	SPT-380S			
SPD according to IEC	Class Ⅱ / Ⅲ		Class Ⅰ	
Number of positions [Pole]	3W+G			
Nominal voltage, Un AC [V]	3P3W 380			
Max. continuous operating voltage, Uc AC [V]	320			
Voltage protection level, Up [kV]	≤ 2.0			
Lightning impulse current, .Iimp 10/350㎲[kA, per mode]	-	-	20	40
Nominal discharge current, .In 8/20㎲ [kA, per mode]	20	40	60	80
Maximum discharge current, Imax 8/20㎲ [kA, per mode]	40	80	120	160
Response time, t_A [ns]	< 5ns			
Operating temperature range [℃]	-40 ~ +70 ℃			
Operating frequency [Hz]	50 / 60 Hz			
Mounting on	Screw			
Operation status indication	Normal operation : Green, Abnormal/After an accident : Red			
Degree of protection	IP20			
Modes of protection	L-G			

SP Series (Box type)

SP Series

Box type

Product rating

-Three phase 3W+G (SPT) AC 440V

			SPT-440S			
SPD according to IEC			Class Ⅱ / Ⅲ		Class Ⅰ	
Number of positions		[Pole]	3W+G			
Nominal voltage, Un	AC	[V]	3P3W 440			
Max. continuous operating voltage, Uc	AC	[V]	320			
Voltage protection level, Up		[kV]	≤ 2.0			
Lightning impulse current, .Iimp	10/350μs	[kA, per mode]	-	-	20	40
Nominal discharge current, .In	8/20μs	[kA, per mode]	20	40	60	80
Maximum discharge current, Imax	8/20μs	[kA, per mode]	40	80	120	160
Response time, t_A		[ns]	< 5ns			
Operating temperature range		[℃]	-40 ~ +70 ℃			
Operating frequency		[Hz]	50 / 60 Hz			
Mounting on			Screw			
Operation status indication			Normal operation : Green, Abnormal/After an accident : Red			
Degree of protection			IP20			
Modes of protection			L-G			

Product rating

-Three phase 4W+G (SPY) AC127/220V

			SPY-127S			
SPD according to IEC			Class Ⅱ / Ⅲ		Class Ⅰ	
Number of positions		[Pole]	4W+G			
Nominal voltage, Un	AC	[V]	3P4W 127/220			
Max. continuous operating voltage, Uc	AC	[V]	320			
Voltage protection level, Up		[kV]	≤ 2.0			
Lightning impulse current, .Iimp	10/350μs	[kA, per mode]	-	-	20	40, 50, 60
Nominal discharge current, .In	8/20μs	[kA, per mode]	20	40	60	80, 100, 120
Maximum discharge current, Imax	8/20μs	[kA, per mode]	40	80	120	160, 200, 240
Response time, t_A		[ns]	< 5ns			
Operating temperature range		[℃]	-40 ~ +70 ℃			
Operating frequency		[Hz]	50 / 60 Hz			
Mounting on			Screw			
Operation status indication			Normal operation : Green, Abnormal/After an accident : Red			
Degree of protection			IP20			
Modes of protection			L-N, N-G			

Product rating

-Three phase 4W+G (SPY) AC 220/380V

	SPY-220S			
SPD according to IEC	Class Ⅱ / Ⅲ		Class Ⅰ	
Number of positions [Pole]	4W+G			
Nominal voltage, Un AC [V]	3P4W 220/380			
Max. continuous operating voltage, Uc AC [V]	320			
Voltage protection level, Up [kV]	≤ 2.0			
Lightning impulse current, .Iimp 10/350μs [kA, per mode]	-	-	20	40, 50, 60
Nominal discharge current, .In 8/20μs [kA, per mode]	20	40	60	80, 100, 120
Maximum discharge current, Imax 8/20μs [kA, per mode]	40	80	120	160, 200, 240
Response time, t_A [ns]	< 5ns			
Operating temperature range [℃]	-40 ~ +70 ℃			
Operating frequency [Hz]	50 / 60 Hz			
Mounting on	Screw			
Operation status indication	Normal operation : Green, Abnormal/After an accident : Red			
Degree of protection	IP20			
Modes of protection	L-N, N-G			

Contactors & Overload relays

Metasol MC 3P 18 to 150A

MC type
Magnetic Contactors

Frame size				18AF				22AF			
Type				MC-6a	MC-9a	MC-12a	MC-18a	MC-9b	MC-12b	MC-18b	MC-22b
	Screws clamp terminals			●	●	●	●	●	●	●	●
Number of poles				3pole				3pole			
Rated operational voltage, Ue				690V				690V			
Rated insulation voltage, Ui				690V				690V			
Rated frequency				50/60Hz				50/60Hz			
Rated impulse withstand voltage, Uimp				6kV				6kV			
Maximum operating rate in operating cycles per hour(AC3)				1800 operations per hour				1800 operations per hour			
Durability	Mechanical			15 mil. operations				15 mil. operations			
	Electrical			2.5 mil. operations				2.5 mil. operations			
Current and power	AC-1, Thermal current		A	25	25	25	32	25	25	40	40
	AC-3	200/240V	kW	2.2	2.5	3.5	4.5	2.5	3.5	4.5	5.5
			A	9	11	13	18	11	13	18	22
		380/440V	kW	3	4	5.5	7.5	4	5.5	7.5	11
			A	7	9	12	18	9	12	18	22
		500/550V	kW	3	4	7.5	7.5	4	7.5	7.5	15
			A	6	7	12	13	7	12	13	20
		690V	kW	3	4	7.5	7.5	4	7.5	7.5	15
			A	4	5	9	9	6	9	9	18
		1000V	kW	-	-	-	-	-	-	-	-
			A	-	-	-	-	-	-	-	-
Rated Short-time withstand current (IEC 60947)		1s	A	210	250	280	300	250	280	300	400
		10s	A	105	110	120	130	110	120	154	186
		30s	A	70	70	80	85	70	80	100	130
		1min	A	61	61	61	70	61	61	84	90
		3min	A	40	45	47	50	45	50	60	60
		10min	A	30	30	30	40	30	30	40	50
		≥15min	A	25	26	28	40	26	28	40	45
UL rating (50/60Hz)	Continuous current		A	25	25	25	32	25	25	40	40
	Single phase	110~120V	HP	0.5	0.5	0.75	1	0.5	0.75	1	2
		220~240V	HP	1.5	1.5	2	3	1.5	2	3	3
		200~208V	HP	2	2	3	5	2	3	5	7.5
	Three phase	220~240V	HP	3	3	5	7.5	3	5	7.5	10
		440~480V	HP	5	5	7.5	10	5	7.5	10	15
		550~600V	HP	7.5	7.5	10	15	7.5	10	15	20
	NEMA size			00	00	0	1	00	0	1	
Size and weight 	AC control	Weight	kg	0.33				0.34			
		Size(W×H×D)	mm	45×73.5×80.4				45×73.5×87.4			
	DC control	Weight	kg	0.4				0.41			
		Size(W×H×D)	mm	45×73.5×96.6				45×73.5×103.6			
Auxiliary(standard)				1NO or 1NC				1NO1NC			
Auxiliary	Side mount			UA-1				UA-1			
	Front mount			UA-2, UA-4				UA-2, UA-4			

Note) Minimum conduct current of Auxiliary contactor is DC 17V 5mA.

MT type
Thermal Overload Relays

Type			MT-12/□	MT-32/□
	Screws c terminals		●	●
Rated operational voltage, Ue			690V	690V
Rated insulation voltage, Ui			690V	690V
Rated impulse withstand voltage, Uimp			6kV	6kV
Trip class			10A, 20	10A, 20
Setting range			0.1~18A	0.1~40A
Size and weight 	Weight	kg	0.1	0.17
	Size(W×H×D)	mm	45×73.2×63.7	45×75×90

* The safety cover of magnetic contactor and thermal overload relay is optional.

40AF		65AF		100AF			150AF	
MC-32a	MC-40a	MC-50a	MC-65a	MC-75a	MC-85a	MC-100a	MC-130a	MC-150a
●	●	●	●	●	●	●	●	●
3pole		3pole		3pole			3pole	
690V		690V		690V			690V	
1000V		1000V		1000V			1000V	
50/60Hz		50/60Hz		50/60Hz			50/60Hz	
8kV		8kV		8kV			8kV	
1800 operations per hour		1200 operations per hour		1200 operations per hour			1200 operations per hour	
12 mil. operations		12 mil. operations		12 mil. operations			5 mil. operations	
2 mil. operations		2 mil. operations		2 mil. operations			1 mil. operations	
50	60	70	100	110	135	160	160	210
7.5	11	15	18.5	22	25	30	37	45
32	40	55	65	75	85	105	130	150
15	18.5	22	30	37	45	55	60	75
32	40	50	65	75	85	105	130	150
18.5	22	30	33	37	45	55	60	70
28	32	43	60	64	75	85	90	100
18.5	22	30	33	37	45	55	55	55
20	23	28	35	42	45	65	60	60
22	22	30	30	37	37	37	75	75
17	17	23	23	28	28	28	53	53
600	700	1000	1050	1100	1200	1320	1350	1800
260	300	550	700	750	800	900	950	1200
160	190	330	380	400	450	500	700	800
100	120	250	270	300	350	400	550	600
70	80	150	200	220	270	270	350	450
55	65	90	120	140	170	180	200	300
50	60	87	100	114	150	160	175	280
50	60	70	100	110	135	160	160	210
2	3	3	5	5	7.5	10	10	15
5	7.5	10	15	15	15	20	20	25
7.5	15	20	25	25	30	30	40	40
10	15	25	30	30	40	40	40	50
20	30	40	50	50	60	75	75	100
25	30	50	60	60	75	75	75	75
1P	2				3			4
0.55		1.05		1.93			2.4	
69×83×90		79×106×119		94×140×135.8			119×158×130.3	
0.77		1.3		2.8				
69×83×117.1		79×106×146.4		94×140×172.3				
2NO2NC		2NO2NC		2NO2NC			2NO2NC	
UA-1		UA-1		UA-1			UA-1	
UA-2, UA-4		UA-2, UA-4		UA-2, UA-4			UA-2, UA-4	

MT-32/□	MT-63/□	MT-95/□	MT-150/□
●	●	●	●
690V	690V	690V	690V
690V	690V	690V	690V
6kV	6kV	6kV	6kV
10A, 20	10A, 20	10A, 20	10A, 20
0.1~40A	4~65A	7~100A	34~150A
0.17	0.31/0.33	0.48/0.5	0.67
45×75×90	55×81×100	70×97×110	95×109×113

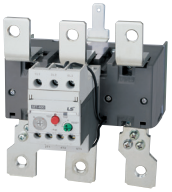
Contactors & Overload relays

Metasol MC 3P 225 to 2100A

MC type
Magnetic Contactors

Frame size				225AF		400AF		
Type				MC-185a	MC-225a	MC-265a	MC-330a	MC-400a
	Screws clamp terminals			●	●	●	●	●
Number of poles				3pole		3pole		
Rated operational voltage, Ue				690V		690V		
Rated insulation voltage, Ui				1000V		1000V		
Rated frequency				50/60Hz		50/60Hz		
Rated impulse withstand voltage, Uimp				8kV		8kV		
Maximum operating rate in operating cycles per hour(AC3)				1200 operations per hour		1200 operations per hour		
Durability	Mechanical			5 mil. operations		5 mil. operations		2.5 mil. operations
	Electrical			1 mil. operations		1 mil. operations		0.5 mil. operations
Current	AC-1, Thermal current		A	230	275	300	350	450
and	AC-3	200/240V	kW	55	75	80	90	125
power			A	185	225	265	330	400
		380/440V	kW	90	132	147	160	200
			A	185	225	265	330	400
		500/550V	kW	110	132	147	160	225
			A	180	200	225	250	350
		690V	kW	110	140	160	200	250
			A	120	150	185	220	300
		1000V	kW	132	132	147	147	147
			A	90	90	105	105	105
Rated Short-time		1s	A	2000	2500	3500	4000	4600
withstand current		10s	A	1500	1700	2400	3000	4400
(IEC 60947)		30s	A	1000	1200	1500	2500	2974
		1min	A	800	1000	1100	1700	1846
		3min	A	520	700	800	1000	1313
		10min	A	350	500	600	620	760
		≥15min	A	320	400	500	553	699
UL rating	Continuous current		A	230	275	300	350	450
(50/60Hz)	Single	110~120V	HP	15	15	-	-	-
	phase	220~240V	HP	30	40	-	-	-
		200~208V	HP	60	60	75	100	125
	Three	220~240V	HP	60	75	100	100	150
	phase	440~480V	HP	125	150	200	200	300
		550~600V	HP	125	150	200	200	300
	NEMA size					5		
Size and weight	AC control	Weight	kg	5.4		9.2		
		Size(W×H×D)	mm	138×203×185.1		163×243×204.4		
	DC control	Weight	kg					
		Size(W×H×D)	mm					
Auxiliary(standard)				2NO2NC		2NO2NC		
Auxiliary	Side mount			AU-100, AU-100E (Max.4NO4NC)		AU-100, AU-100E (Max.4NO4NC)		
	Front mount			-		-		

MT type
Thermal Overload Relays



Type			MT-225/□	MT-400/□
	Screws clamp terminals		●	●
Rated operational voltage, Ue			690V	690V
Rated insulation voltage, Ui			690V	690V
Rated impulse withstand voltage, Uimp			6kV	6kV
Trip class			10A, 20	10A, 20
Setting range			65~240A	85~400A
Size and weight	Weight	kg	2.5	2.6
	Size(W×H×D)	mm	147×141×184	151×171×198

* The safety cover of magnetic contactor and thermal overload relay is optional.

800AF			1260AF	2100AF		
MC-500a	MC-630a	MC-800a	MC-1260a	MC-1400a	MC-1700a	MC-2100a
●	●	●	●	●	●	●
3pole			3pole	3pole		
1000V			1000V	1000V		
1000V			1000V	1040V		
50/60Hz			50/60Hz	50/60Hz		
8kV			8kV	8kV		
1200 operations per hour			300 operations per hour	300 operations per hour		
2.5 mil. operations			0.5 mil. operations	0.5 mil. operations		
0.5 mil. operations			0.5 mil. operations	0.05 mil. operations		
580	660	900	1260	1400	1700	2100
147	190	220	-	290	310	-
500	630	800	-	860	1050	-
265	330	440	900	550	700	900
500	630	800	1450	860	1050	1450
265	330	500	-	-	-	-
400	500	720	-	-	-	-
300	400	500	-	800	1000	-
380	420	630	-	800	950	-
280	280	280	-	-	-	-
220	220	220	-	-	-	-
6000	7000	7500	8000	-	-	-
5050	6400	7000	7200	8000	10000	10000
4400	4500	4900	5200	-	-	-
3400	3500	3800	4000	4500	5500	5500
2000	2200	2500	2300	-	-	-
1400	1550	1550	3000	2600	3000	3000
1100	1300	1300	1500	-	-	-
580	660	900	-	1400	1700	2100
-	-	-	-	-	-	-
-	-	-	-	-	-	-
150	200	200				
200	250	300				
400	500	600				
400	500	600				
6		7				
22.4 285×312×245.3			23.5 285×352×246	33.8 431×380×246		
2NO+2NC			2NO+2NC	2NO+2NC		
AU-100, AU-100E (Max.4NO4NC)			AU-100, AU-100E (Max.4NO4NC)	AU-100, AU-100E (Max.4NO4NC)		
-			-	-		

MT-800/□
●
690V
690V
6kV
10A, 20
200~800A
11.5
360×530×212

Contactors & Overload relays

Metasol MC 4P 18 to 85A

MC type
Magnetic Contactors

Frame size				18AF			
Type				MC-6a/4	MC-9a/4	MC-12a/4	MC-18a/4
	Screw clamp terminal					●	
Number of poles						4pole	
Rated operational voltage (Ue)						690V	
Rated insulation voltage (Ui)						690V	
Rated frequency						50/60Hz	
Rated impulse withstand voltage, Uimp						6kV	
Maximum operating rate in operating cycles per hour(AC1)						1800 operations per hour	
Durability	Mechanical					15 mil. Operations	
	Electrical			0.5 mil. Operations		0.8 mil. Operations	
Current	Thermal current		A	25	25	25	40
and	AC-1	200/240V	kW	9	9	9	15
Power			A	25	25	25	40
		380/400V	kW	17	17	17	27
			A	25	25	25	40
		500/550V	kW	21	21	21	35
			A	25	25	25	40
		690V	kW	27	27	27	44
			A	25	25	25	40
UL rating	Continuous current		A	25	25	25	32
(50/60Hz)	Single	110~120V	HP	0.5	0.5	0.75	1
	Phase	220~240V	HP	1.5	1.5	2	3
		200~208V	HP	2	2	3	5
	Three	220~240V	HP	3	3	5	7.5
	Phase	440~480V	HP	5	5	7.5	10
		550~600V	HP	7.5	7.5	10	15
Size and weight 	AC Control	Weight	kg	0.33			
		Size(W×H×D)	mm	45×73.5× 79			
	DC Control	Weight	kg	0.5			
		Size(W×H×D)	mm	45×73.5×110.7			
Auxiliary(standard)				-			
Auxiliary	Side Mount			UA-1			
	Front Mount			AU-2, AU-4			

22AF	40AF		85AF			
MC-22a/4	MC-32a/4	MC-40a/4	MC-50a/4	MC-65a/4	MC-75a/4	MC-85a/4
●	●		●			
4pole	4pole		4pole			
690V	690V		690V			
690V	690V		1000V			
50/60Hz	50/60Hz		50/60Hz			
6kV	6kV		8kV			
1800 operations per hour	1800 operations per hour		1800 operations per hour			
15 mil. Operations	15 mil. Operations		12 mil. Operations			
1 mil. Operations	1 mil. Operations		1 mil. Operations			
40	50	60	80	100	110	135
15	18	22	30	37	41	51
40	50	60	80	100	110	135
27	35	42	56	70	76	95
40	50	60	80	100	110	135
35	43	52	70	88	97	120
40	50	60	80	100	110	135
44	55	66	88	110	120	150
40	50	60	80	100	110	135
32	45	50	70	80	90	100
2	2	3	3	5	5	7.5
3	5	5	7.5	10	15	15
7.5	7.5	10	10	15	20	25
7.5	10	10	15	20	25	30
10	20	25	30	40	50	50
15	20	25	30	40	50	50
0.4	0.59		1.2			
47.2×80×86.8	59×83.5×94.5		91×123.5×117.8			
0.5	0.7		1.29			
47.2×80×113.2	59×83.5×121		91×123.5×117.8			
-	-		-			
AU-1	AU-1		AU-1			
AU-2, AU-4	AU-2, AU-4		AU-2, AU-4			

Metasol MC 4P 225 to 800A

MC type
Magnetic Contactors

Frame size				225AF				
Type				MC-100a/4	MC-130a/4	MC-150a/4	MC-185a/4	MC-225a/4
	Screw clamp terminal					●		
Number of poles						4pole		
Rated operational voltage (Ue)						690V		
Rated insulation voltage (Ui)						1000V		
Rated frequency						50/60Hz		
Rated impulse withstand voltage, Uimp						8kV		
Maximum operating rate in operating cycles per hour(AC1)						1200 operations per hour		
Durability	Mechanical					5 mil. Operations		
	Electrical					0.8 mil. Operations		
Current	Thermal current		A	160	165	250	300	330
and	AC-1	200/240V	kW	57	60	76	87	100
Power			A	150	155	200	230	260
		380/400V	kW	106	110	142	165	185
			A	150	155	200	230	260
		500/550V	kW	132	137	180	205	230
			A	150	155	200	230	260
		690V	kW	165	170	225	255	290
			A	150	155	200	230	260
UL rating	Continuous current		A	160	160	210	230	275
(50/60Hz)	Single	110~120V	HP	7.5	10	15	15	15
	Phase	220~240V	HP	15	20	25	30	40
		200~208V	HP	30	40	40	60	60
	Three	220~240V	HP	30	40	50	60	75
	Phase	440~480V	HP	60	75	100	125	150
		550~600V	HP	60	75	100	125	150
Size and weight 	AC	Weight	kg			5.6		
	Control	Size(W×H×D)	mm			175×203×185		
	DC	Weight	kg					
	Control	Size(W×H×D)	mm					
Auxiliary(standard)				2NO2NC				
Auxiliary	Side Mount					AU-100 / AU-100E		
	Front Mount					-		

* - FLA = 722 A, LRA = 5618 A
** - FLA = 566 A, LRA = 4495 A

400AF		
MC-265a/4	MC-330a/4	MC-400a/4
	●	
	4pole	
	690V	
	1000V	
	50/60Hz	
	8kV	
	1200 operations per hour	
	2.5 mil. Operations	
	0.5 mil. Operations	
360	420	500
115	135	160
300	350	420
215	250	300
300	350	420
265	315	375
300	350	420
335	390	470
300	350	420
300	350	450
-	-	-
-	-	-
75	100	125
100	125	150
200	250	300
200	250	300
9.9		
206×243×205		
2NO2NC		
AU-100		
-		

800AF		
MC-500a/4	MC-630a/4	MC-800a/4
	●	
	4pole	
	690V	
	1000V	
	50/60Hz	
	8kV	
	1200 operations per hour	
	2.5 mil. Operations	
	0.5 mil. Operations	
630	750	900
245	255	310
630	660	800
450	470	570
630	660	800
560	590	710
630	660	800
710	740	900
630	660	800
580	660	900
-	-	-
-	-	-
150	200	200
200	250	300
400	500	600 *
400	500	600 **
26.3		
346×310 ×244		
2NO2NC		
AU-100		
-		

Mini contactors

6 to 16A

Mini contactors

3NO main contacts
1 auxiliary contacts

Screw clamp type

Fast-on type

Cage clamp type

Solder pin type

Frame size		6A		9A		12A		16A	
Screw clamp type	AC coil	GMC-6M		GMC-9M		GMC-12M		GMC-16M	
	DC coil	GMD-6M		GMD-9M		GMD-12M		GMD-16M	
Fast-on type	AC coil	GMC-6MF		GMC-9MF		GMC-12MF		GMC-16MF	
	DC coil	GMD-6MF		GMD-9MF		GMD-12MF		GMD-16MF	
Cage clamp type	AC coil	GMC-6MC		GMC-9MC		GMC-12MC		GMC-16MC	
	DC coil	GMD-6MC		GMD-9MC		GMD-12MC		GMD-16MC	
Solder pin type	AC coil	GMC-6MP		GMC-9MP		GMC-12MP		GMC-16MP	
	DC coil	GMD-6MP		GMD-9MP		GMD-12MP		GMD-16MP	
Ratings / IEC60947-4		kW	A	kW	A	kW	A	kW	A
AC1			20		20		20		20
AC3	200/240V	1.5	7	2.2	9	3	12	4	16
	380/440V	2.2	6	4	9	5.5	12	7.5	16
	500/550V	3	5	3.7	6	4	7	5.5	9
	690V	3	4	4	5	4	5	4	5
Ratings / UL508		hp	A	hp	A	hp	A	hp	A
continuous current		Ith = 20A (maximum for cage clamp type is 10A)							
single phase	120V	1/2		1/2		1 *		-	
	230V/240V	1		1.5		2 **		-	
three phase	240V	1.5		3		3		-	
	480V	3		5		7.5 ***		-	
	600V	3		5		7.5		-	
	Wire Range : Copper, 75°C, Stranded, 18-12AWG								
NEMA size		00		00		00		0	

Additional auxiliary contacts

	Screw clamp type	Fast-on type	Cage clamp type	Solder pin type
2-pole, Front mount	AU-2M	AU-2MF	AU-2MC	
4-pole, Front mount	AU-4M	AU-4MF	AU-4MC	AU-1MP
2-pole, Side mount	AU-1M	AU-1MF	AU-1MC	

Note) * = 1/2 for cage clamp type, ** = 1.5hp for cage clamp type, *** = 5hp for cage clamp type
16AF : not approved from UL

Overload Relays

Bimetallic style

Type GT

GT-12M

Setting ranges (A)

0.1 - 0.16	4 - 6
0.16 - 0.25	5 - 8
0.25 - 0.4	6 - 9
0.4 - 0.63	7 - 10
0.63 - 1	9 - 13
1 - 1.6	12 - 16
1.6 - 2.5	
2.5 - 4	

Base for separate mount

Differential	GTK-12M
Non-differential (3-heater)	GTH-12M/3
Non-differential (2-heater)	GTH-12M

Digital motor protection relay

DMP -S/Sa

DMP -T/Ta

Model No.			DMP06-S/Sa	DMP60-S/Sa	DMP06-T/Ta	DMP06-T/Ta
Wiring			Screw type		Tunnel type	
Panel mount			Unit or Extension Note1)			
Operation time			Select either reverse time characteristics or definite time characteristics			
Protection		Over current	According to the setting time			
		Phase failure	3 sec.			
		Reverse phase	Within 0.1 sec.			
		Asymmetry	5 sec.			
		Stall	5 sec.			
		Lock	Within 0.5 sec.			
		Under current	3 sec.			
		Ground fault	Within 0.05~1 sec. Selectable (0.05~1.0sec)			
		Short circuit Note2)	Within 50ms			
Alarm			Variable (60~110% of the setting current)			
Current setting range (A)			0.5~6	5~60	0.5~6	5~60
Motor capacity		220~240V	0.09~0.75	1.1~11	0.09~0.75	1.1~11
(kW)		380~440V	0.12~1.5	2.2~22	0.09~1.5	2.2~22
Time setting range (sec)	Definite time	Delay in starting	0~60sec			
		Delay in operating	0~30sec			
	Inverse time		0~60sec			
	Reset		Manual reset			
Tolerance		Current	±5%			
		Time	±5% (or±0.5sec)			
Operating power Note3)		Voltage	AC 190~250V			
		Frequency	60Hz (50Hz)			
Aux. contact	OL	1a1b	3A/250Vac Resistive load			
	AL	1a	3A/250Vac Resistive load			
Insulation resistance			Over DC500V 100㏁			
Surge impulse voltage(IEC1000-4-5)			1.2×50㎲ 6kV (Apply standard wave form)			
Fast transient burst(IEC1000-4-4)			2.5kV/5min			
Environment	Temperature	Operation	-25~70℃			
		Storage	-30~80℃			
	Humidity		30~90% RH (No freezing)			
Display		7-Segment	3 phase current, cause of a fault			
		Bar-Graph	60~110% of real load current			
Mounting type			35mm Din-rail/Panel			

Note1) In extension type, the digital EMPR is calibrated with combining the display past and main body so, please cautious not to combine the display part and main body with different part No.
Note2) Instantaneous short circuit protection is optional
Note3) Operational voltage of AC 110V and 50Hz is optional

Manual motor starters

Quick selection table ... IEC rating

Frame			32AF																			
Type	Current adjustable type		MMS-32S										MMS-32H									
	Instantaneous type		-										MMS-32HI									
Breaking capacity			Standard										High breaking									
Handle Type			Toggle										Rotary									
Number of poles			3										3									
Rated operational voltage (Ue)			Up to 690V										Up to 690V									
Rated frequency			50/60 Hz										50/60 Hz									
Rated insulation voltage (Ui)			690V										690V									
Rated impulse voltage (Uimp)			6kV										6kV									
Utilization category	IEC 60 947-2 (Breaker)		Cat. A										Cat. A									
	IEC 60 947-4 (Motor starter)		AC 3										AC 3									
Mechanical endurance (Operating)			100,000										100,000									
Electrical endurance (Cycles)			100,000										100,000									
Max operating frequency per hour (Ope./h)			25										25									
Temperature compensation (Operation)			-20 ~ +60℃										-20 ~ +60℃									
Instantaneous short circuit release			13 × Ie max.										13 × Ie max.									
Overload protection			○										○									
Phase failure function			○										○									
Trip indicating function			×										×									
Test function			○										○									
Dimension(W × H × D)			45×105×54.4										45×105×60.3									
Weight (g)			320										360									
Rated breaking capacity (kA)	Rated operational current (Ie)	Thermal release Adjustment range (A)	220V 240V 230V		415V 400V		460V 440V		525V 500V		690V 600V		220V 240V 230V		415V 400V		460V 440V		525V 500V		690V 600V	
			Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics
	0.16	0.1~0.16	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	0.25	0.16~0.25	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	0.4	0.25~0.4	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	0.63	0.4~0.63	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	1	0.63~1	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	1.6	1~1.6	100	100	100	100	100	100	100	100	3	3	100	100	100	100	100	100	100	100	100	100
	2.5	1.6~2.5	100	100	100	100	100	100	50	38	3	3	100	100	100	100	100	100	100	100	8	8
	4	2.5~4	100	100	100	100	50	38	15	11	3	3	100	100	100	100	100	100	100	100	8	8
	6	4~6	100	100	100	100	15	11	10	8	3	3	100	100	100	100	100	100	100	100	6	6
	8	5~8	100	100	100	100	15	11	10	8	3	3	100	100	100	100	50	38	50	38	6	6
	10	6~10	100	100	50	38	15	11	6	5	3	3	100	100	100	100	50	38	50	38	6	6
	13	9~13	100	100	50	38	10	8	6	5	3	3	100	100	100	100	50	38	42	32	6	6
	17	11~17	50	38	20	15	10	8	6	5	3	3	100	100	50	38	20	15	10	8	4	4
	22	14~22	40	30	15	11	8	6	6	5	3	3	100	100	50	38	20	15	10	8	4	4
	26	18~26	40	30	15	11	8	6	6	5	3	3	100	100	50	38	20	15	10	8	4	4
	32	22~32	30	22	15	11	6	4	5	4	3	3	100	100	50	38	20	15	10	8	4	4
	40	28~40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	50	34~50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	63	45~63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	75	55~75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	90	70~90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	100	80~100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

63AF		100AF	
MMS-63S	MMS-63H	MMS-100S	MMS-100H
-	MMS-63HI	-	MMS-100HI
Standard	High breaking	Standard	High breaking
Rotary	Rotary	Rotary	Rotary
3	3	3	3
Up to 690V	Up to 690V	Up to 690V	Up to 690V
50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
1,000V	1,000V	1,000V	1,000V
8kV	8kV	8kV	8kV
Cat. A	Cat. A	Cat. A	Cat. A
AC 3	AC 3	AC 3	AC 3
50,000	50,000	50,000	50,000
25,000	25,000	25,000	25,000
25	25	25	25
-20 ~ +60℃	-20 ~ +60℃	-20 ~ +60℃	-20 ~ +60℃
13 × Ie max.	13 × Ie max.	13 × Ie max.	13 × Ie max.
○	○	○	○
○	○	○	○
×	×	○	○
○	○	○	○
55×125×112.3	55×125×112.3	70×165×138	70×165×138
1,000	1,000	2,200	2,200

63AF

MMS-63S										MMS-63H / MMS-63HI									
220V 240V 230V		415V 400V		460V 440V		525V 500V		690V 600V		220V 240V 230V		415V 400V		460V 440V		525V 500V		690V 600V	
Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	100	100	100	15	12	10	8	4	3	100	100	100	100	50	38	50	38	6	5
100	100	50	38	10	8	6	5	4	3	100	100	100	100	50	38	42	32	6	5
100	100	25	19	10	8	6	5	4	3	100	100	50	50	50	38	12	9	5	5
50	38	25	19	10	8	6	5	4	3	100	100	50	50	50	38	12	9	5	5
50	38	25	19	10	8	6	5	4	3	100	100	50	50	35	27	12	9	5	5
50	38	25	19	10	8	6	5	4	3	100	100	50	50	35	27	10	8	5	5
50	38	25	19	10	8	6	5	4	3	100	100	50	50	35	27	10	8	5	5
50	38	25	19	10	8	6	5	4	3	100	100	50	50	35	27	10	8	5	5
50	38	25	19	10	8	6	5	4	3	100	100	50	50	35	27	10	8	5	5
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

100AF

MMS-100S										MMS-100H / MMS-100HI									
220V 240V 230V		415V 400V		460V 440V		525V 500V		690V 600V		220V 240V 230V		415V 400V		460V 440V		525V 500V		690V 600V	
Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics	Icu	Ics
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	100	50	38	40	30	25	19	10	8	100	100	100	100	50	38	35	27	12	9
100	100	50	38	40	30	25	19	10	8	100	100	100	50	50	38	35	27	12	9
100	100	50	38	40	30	25	19	10	8	100	100	100	50	50	38	35	27	12	9
100	100	50	38	40	30	15	11	10	8	100	100	100	50	50	38	25	19	12	9
100	100	50	38	40	30	15	11	6	5	100	100	100	50	50	38	20	15	12	9
100	100	50	38	40	30	12	9	6	5	100	100	100	50	50	38	15	11	10	8
100	100	50	38	40	30	12	9	6	5	100	100	100	50	50	38	15	11	8	6
100	100	50	38	40	30	8	6	5	4	100	100	75	50	50	38	12	9	6	6
100	100	50	38	40	30	8	6	5	4	100	100	75	50	50	38	12	9	6	6
100	100	50	38	40	30	8	6	5	4	100	100	75	50	50	38	12	9	6	6

Molded case circuit breakers

Susol MCCB 100AF to 800AF Series

			TE100		TE160		TD100			TD160		
Frame size		[AF]	100		160		100			160		
Rated current, In *		[A]	16~100		100,125,160		16, 20, 25, 32, 40, 50, 63, 80, 100			1P: 16, 20, 25, 32, 40, 50, 63, 80,100,125, 160 2, 3P: 100, 125, 160		
No. of poles			3,4		3,4		2*, 3, 4			1, 2*, 3, 4		
Rated operational voltage, Ue	AC	[V]	690		690		690			240(1P), 690		
	DC	[V]	500		500		500			250(1P), 500		
Rated impulse withstand voltage, Uimp		[kV]	8		8		8			8		
Rated insulation voltage, Ui [V]			750		750		750			750		
Rated ultimate short-circuit breaking capacity, Icu			S	N	S	N	N	H	L	N	H	L
AC 50/60Hz	220/240V	[kA]	50	85	50	85	85	100	200	30(1P) 85	50(1P) 100	200
	380/415V	[kA]	37	50	37	50	50	85	150	50	85	150
	440/460V	[kA]	25	37	25	37	50	70	130	50	70	130
	480/500V	[kA]	18	25	18	25	30	50	65	30	50	65
	660/690V	[kA]	6	8	6	8	5	8	10	5	8	10
DC	250V	[kA]	37	50	37	50	42	65	100	16(1P) 42	25(1P) 65	100
	500V(2poles in series)	[kA]	37	50	37	50	42	65	100	42	65	100
Rated service breaking capacity, Ics		[%Icu]	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Rated short-circuit making capacity Icm												
AC 50/60Hz	220/240V	[kA]	105	187	105	187	187	220	440	105(1P) 187	105(1P) 220	440
	380/415V	[kA]	77.7	105	77.7	105	105	187	330	105	187	330
	440/460V	[kA]	52.5	77.7	52.5	77.7	105	154	286	105	154	286
	480/500V	[kA]	36	52.5	36	52.5	63	105	143	63	105	143
	660/690V	[kA]	9.2	13.6	9.2	13.6	8	14	17	8	14	17
Category of utilization			A		A		A			A		
Isolation behavior			●		●		●			●		
Trip unit (release)												
Thermal-Magnetic												
● fixed-thermal, fixed-magnetic		FTU	●		●		●			●		
● adjustable-thermal, fixed-magnetic		FMU					●			● **		
● adjustable-thermal, adjustable-magnetic		ATU	●		●		-			-		
● magnetic only		MTU	-		-		-			-		
Electronic			-		-							
● LSI		ETS	-		-		-			-		
● LSI		ETM	-		-		-			-		
Option	Earth-fault protection, Ig		-		-		-			-		
	Zone selective interlocking, ZSI		-		-		-			-		
	Ammeter		-		-		-			-		
	Communication		-		-		-			-		
	Earth-leakage protection module		-		-		-			-		
Connection	fixed	front-connection	●		●		●			●		
		rear-connection	●		●		●			● **		
	plug-in	front-connection	-		-		●			● **		
		rear-connection	-		-		●			● **		
Mechanical life		[operations]	25000		25000		25000			25000		
Electrical life @ 415 V AC		[operations]	10000		10000		10000			10000		
Basic dimensions, W×H×D (front connection)	1-pole	[mm]	-		-		-			35×140×86		
	3-pole	[mm]	76×130×82		76×130×82		90×140×86			90×140×86		
	4-pole	[mm]	101×130×82		101×130×82		120×140×86			120×140×86		
Weight (front connection)	1-pole	[kg]	-		-		-			0.57		
	3-pole	[kg]	1.05		1.05		1.5			1.5		
	4-pole	[kg]	1.35		1.35		1.8			1.8		
Reference standard			IEC60947-2		IEC60947-2		IEC60947-2			IEC60947-2		

Note) ● applicable or available

* Applicable to MCCBs equipped with FTU, FMU, ATU
* 2 pole MCCB in 3pole frame size

** Not applicable to 1pole

※ The trip unit ATU is available from 125A

	TS100			TS160			TS250			TS400			TS630			TS800		
	100			160			250			400			630			800		
	40, 50, 63, 80, 100			(100)※, 125, 160			125, 160, 200, 250			300, 400			500, 630			800		
	2*, 3, 4			2*, 3, 4			2*, 3, 4			2*, 3, 4			2*, 3, 4			2*, 3, 4		
	690			690			690			690			690			690		
	500			500			500			500			500			500		
	8			8			8			8			8			8		
	750			750			750			750			750			750		
	N	H	L	N	H	L	N	H	L	N	H	L	N	H	L	N	H	L
	100	120	200	100	120	200	100	120	200	100	120	200	100	120	200	100	120	200
	50	85	150	50	85	150	50	85	150	65	85	150	65	85	150	65	100	150
	50	70	130	50	70	130	50	70	130	65	85	130	65	85	130	65	100	130
	42	65	85	42	65	85	42	65	85	42	65	85	42	65	85	42	85	100
	10	15	20	10	15	20	10	15	20	10	20	35	10	20	35	10	20	35
	50	85	100	50	85	100	50	85	100	50	85	100	50	85	100	50	85	100
	50	85	100	50	85	100	50	85	100	50	85	100	50	85	100	50	85	100
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	220	264	440	220	264	440	220	264	440	220	264	440	220	264	440	220	264	440
	105	187	330	105	187	330	105	187	330	143	187	330	143	187	330	143	220	330
	105	154	286	105	154	286	105	154	286	143	187	286	143	187	286	143	220	286
	88	143	187	88	143	187	88	143	187	88	143	187	88	143	187	88	187	220
	17	30	40	17	30	40	17	30	40	17	40	74	17	40	74	17	40	74
	A			A			A			A			A			A		
	●			●			●			●			●			●		
	●			●			●			●			●			●		
	●			●			●			●			●			●		
	-			●			●			●			●			●		
	●			●			●			●			●			●		
	●			●			●			●			●			●		
	-			-			-			●			●			●		
	-			-			-			●			●			●		
	-			-			-			●			●			●		
	-			-			-			●			●			●		
	-			-			-			●			●			●		
	-			-			-			●			●			●		
	●			●			●			●			●			●		
	●			●			●			●			●			●		
	●			●			●			●			●			●		
	●			●			●			●			●			●		
	25000			25000			25000			20000			20000			10000		
	10000			10000			10000			6000			6000			3000		
	-			-			-			-			-			-		
	105×160×86			105×160×86			105×160×86			140×260×110			140×260×110			210×320×135		
	140×160×86			140×160×86			140×160×86			186.5×260×110			186.5×260×110			280×320×135		
	-			-			-			-			-			-		
	2			2			2			5.4			5.4			15.1		
	2.6			2.6			2.6			7.2			7.2			19.6		
	IEC60947-2			IEC60947-2			IEC60947-2			IEC60947-2			IEC60947-2			IEC60947-2		

	Amb. Temp.	-5°C	0°C	10°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C
Calibrated for 40°C	TD160	122.5%	120.0%	115.0%	110.0%	107.5%	105.0%	102.5%	100.0%	97.5%	95.0%
	TS250	122.5%	120.0%	115.0%	110.0%	107.5%	105.0%	102.5%	100.0%	97.5%	95.0%
	TS630	110.0%	109.0%	107.0%	105.0%	104.0%	103.0%	101.5%	100.0%	98.5%	97.0%
	TS800	110.0%	109.0%	107.0%	105.0%	104.0%	103.0%	101.5%	100.0%	98.5%	97.0%
Calibrated for 50°C	TD160	122.0%	120.0%	116.0%	112.0%	110.0%	108.0%	106.0%	104.0%	102.0%	100.0%
	TS250	122.0%	120.0%	116.0%	112.0%	110.0%	108.0%	106.0%	104.0%	102.0%	100.0%
	TS630	122.2%	112.0%	110.0%	108.0%	107.0%	106.0%	104.5%	103.0%	101.5%	100.0%
	TS800	112.2%	112.0%	110.0%	108.0%	107.0%	106.0%	104.5%	103.0%	101.5%	100.0%

Molded case circuit breakers

Susol MCCB 1600AF Series

Electrical characteristics

				TS1000			TS1250		TS1600	
Type				TS1000			TS1250		TS1600	
Ampere frame				1000			1250		1600	
Pole				3, 4			3, 4		3, 4	
Rated current,(A)		In	-5~40°C	800, 1000			1250		1600	
			50°C	800, 1000			1250		1560	
			65°C	800, 1000			1240		1420	
Rated insulation voltage, (V)		Ui		1000			1000		1000	
Rated impulse withstand voltage, (kV)		Uimp		8			8		8	
Rated operational voltage, (V)		Ue	AC50/60Hz	690			690		690	
			DC	-			-		-	
Rated short-circuit breaking capacity				N	H	L	N	H	N	H
IEC60947-2	Rated ultimate short-circuit		220/240V	55	75	200	55	75	55	75
AC50/60Hz	breaking capacity, (kA) (Icu)		380/415V	50	70	150	50	70	50	70
(sym)			440/460V	50	65	130	50	65	50	65
			480/500V	40	50	100	40	50	40	50
			660/690V	35	45	-	35	45	35	45
		DC	250V 2P	-	-	-	-	-	-	-
			500V 2P	-	-	-	-	-	-	-
			750V 3P	-	-	-	-	-	-	-
	Rated service breaking capacity (Ics)	%Icu		100%	75%	100%	100%	75%	100%	75%
	Rated short-circuit making capacity (kA) (Icw)	AC50/60Hz	1s	25		12	25		25	
			3s	-			-		-	
Overriding instantaneous protection			kA peak	50		30	50		50	
Isolation				○			○		○	
Category				B		A	B		B	
(Life cycle)	Mechanical life (operations)			10000		4000	10000		10000	
	Electrical life	440V	In/2	6000		4000	5000		5000	
	(operations)		In	5000		3000	4000		2000	
		690V	In/2	4000		3000	3000		2000	
			In	2000		2000	2000		1000	
Pollution degree				3			3		3	
Dimension (mm)			3-pole	210×327×152.5						
(H×W×D)			4-pole	280×327×152.5						
Weight (kg)			3-pole	13						
			4-pole	16.8						

Overview

Classification	N type	A type	P type	S type
Externals				
Current protection	• L / S / I / G / Thermal	• L / S / I / G / Thermal • ZSI(Protective coordination)	• L / S / I / G / Thermal(Continuous) • ZSI(Protective coordination)	• P type
Other protection	-	• Earth leakage (Option)	• Earth leakage(Option) • Over/Under current • Over/Under frequency • Unbalance(Voltage/Current) • Reverse power	• P type
Measurement function	-	• Current (R / S / T / N)	• 3 Phase Voltage/Current RMS/Vector • Power(P, Q, S), PF(3-Phase) • Energy(Positive/Negative) • Frequency, Demand	• 3 Phase Voltage/Current RMS/Vector • Power(P, Q, S), PF(3-Phase) • Energy(Positive/Negative) • Frequency, Demand • Voltage/Current harmonics (1st~63th) • 3 Phase Waveforms • THD, TDD, K-Factor
Fine adjustment	-	-	• Fine adjustment for long/short time delay/instantaneous/ ground	• P type
Pre Trip Alarm	-	-	• Overload protection relays : DO (Alarm) (Ground fault is not available when using Pre trip alarm)	• P type
Digital Output	-	• 3DO (Fixed) • L, S/I, G Alarm	• 3DO (Programmable) • Trip, Alarm, General	• P type
IDMTL setting	-	-	• Compliance with IEC60255-3 SIT, VIT, EIT, DT	• P type
Communication	-	• Modbus/RS–485 • Profibus–DP	• Modbus / RS-485 • Profibus-DP	• Modbus / RS-485 • Profibus-DP
Power supply	• Self Power -Power source works over 25% of current of In (one pole)	• Self Power - Power source works over 25% of current of In (one pole) - External power source are required for comm. • AC/DC 100~250V • DC 24~60V	• AC/DC 100~250V • DC 24~60V Basic protection function(L / S / I / G) is still under normal operation without control power.	• AC/DC 100~250V • DC 24~60V
RTC timer	• Available	• Available	• Available	• Available
LED for trip info.	• Long time delay • Short time delay/Instantaneous • Ground fault	• N type	• N type	• N type
Fault recording	-	• 10 records (Fault/Current/Date and Time)	• 256 records (Fault/Current/Date and Time)	• 256 records • Last fault wave recording (3 Phase)
Event recording	-	-	• 256 records(Content, Status, Date)	• P type
Operating button	• Reset button	• Reset, Menu Up/Down, Left/Right, Enter	• A type	• A type

Molded case circuit breakers

Metasol 30AF to 250AF Series

Frame Size(AF)		30	50			60	
Type		S-Type	N-Type	S-Type	H-Type	N-Type	S-Type
Type and Pole	2 pole	ABS32c	ABN52c	ABS52c	ABH52c	ABN62c	ABS62c
	3 pole	ABS33c	ABN53c	ABS53c	ABH53c	ABN63c	ABS63c
	4 pole	ABS34c	ABN54c	ABS54c	ABH54c	ABN64c	ABS64c
Rated current, In	A	(3, 5, 10) 15, 20, 30	15, 20, 30, 40, 50		15, 20, 30, 40, 50	15, 20, 30, 40, 50, 60	
Rated operational voltage, Ue	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
Rated impulse withstand voltage, Uimp	kV	8	8	8	8	8	8
Rated short-circuit breaking capacity(Icu) kA (Sym), KSC8321, IEC 60947-2							
AC	690V	2.5	2.5	5	10	2.5	5
	480/500V	7.5	7.5	10	35	7.5	10
	415/460V	14 (10)	14	18	50	14	18
	380V	18 (14)	18	22	50	18	22
	220/250V	30 (25)	30	35	100	30	35
DC	500V(3P)	5	5	10	30	5	10
	250V(2P)	5	5	10	30	5	10
Service breaking capacity(%Icu), Ics		100	100	100	100	100	100
Category of use		A	A	A	A	A	A
Endurance	Mechanical	8500	25000	25000	25000	25000	25000
(Number of operations)	Electrical	1500	10000	10000	10000	10000	10000
Type of trip unit							
Thermal-magnetic release		fixed	fixed	fixed	fixed	fixed	fixed
Hydraulic-magnetic release		-	-	-	-	-	-
Magnetic release only without thermal trip							
Earth leakage protection	for 3 pole	▲	▲	▲	▲	▲	▲
Accessories							
Electrical auxiliaries	Auxiliary switch	●	●	●	●	●	●
	Alarm switch	●	●	●	●	●	●
	Shunt trip	●	●	●	●	●	●
	Undervoltage trip	●	●	●	●	●	●
External accessories	Direct rotary handle	●	●	●	●	●	●
	Extended rotary handle	●	●	●	●	●	●
	Terminal shield	●	●	●	●	●	●
	Insulation barrier	●	●	●	●	●	●
	Rear connection	●	●	●	●	●	●
	Pad handle lock	●	●	●	●	●	●
	Plug-in device	●	●	●	●	●	●
Dimensions (mm)	W×H×D (3P)	75×130×60	75×130×60		90×155×60	75×130×60	
Weight(kg)	2 pole	0.5	0.5	0.5	0.7	0.5	0.5
	3 pole	0.7	0.7	0.7	1	0.7	0.7
	4 pole	0.9	0.9	0.9	1.2	0.9	0.9

Note) 1. ● applicable or available
2. ▲ available as a separate breaker

100	125		250		
N-Type	S-Type	H-Type	N-Type	S-Type	H-Type
ABN102c	ABS102c	ABH102c	ABN202c	ABS202c	ABH202c
ABN103c	ABS103c	ABH103c	ABN203c	ABS203c	ABH203c
ABN104c	ABS104c	ABH104c	ABN204c	ABS204c	ABH204c
15, 20, 30, 40, 50, 60, 75, 100	15, 20, 30, 40, 50, 60, 75, 100, 125		100, 125, 150, 175, 200, 225, 250		
690	690	690	690	690	690
500	500	500	500	500	500
750	750	750	750	750	750
8	8	8	8	8	8
5	8	10	8	8	10
10	25	30	18	26	30
18	37	50	26	37	50
22	42	50	30	42	50
35	85	100	65	85	100
10	20	30	10	20	30
10	20	30	10	20	30
100	100	100	100	100	100
A	A	A	A	A	A
25000	25000	25000	25000	25000	25000
10000	10000	10000	5000	5000	5000
fixed	fixed	fixed	fixed	fixed	fixed
-	-	-	-	-	-
▲	▲	▲	▲	▲	▲
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
75×130×60	90×155×60		105×165×60		
0.5	0.7	0.7	1.1	1.1	1.1
0.7	1	1	1.2	1.2	1.2
0.9	1.2	1.2	1.6	1.6	1.6

	Amb. Temp.	-5°C	0°C	10°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C
Calibrated for 40°C	In=15 to 30	111.9%	111.3%	110.0%	108.0%	106.6%	104.9%	102.7%	100.0%	96.8%	93.3%
	In=40 to 100	110.2%	109.8%	108.7%	107.0%	105.8%	104.3%	102.4%	100.0%	97.2%	94.0%
	In=100 to 225	114.3%	113.2%	110.6%	107.5%	105.8%	104.0%	102.0%	100.0%	97.9%	95.6%
	In=250 to 800	110.0%	109.0%	107.0%	105.0%	104.0%	103.0%	101.5%	100.0%	98.5%	97.0%

Molded case circuit breakers

Metasol 400AF to 1200AF Series

Frame Size(AF)		400			
Type		N-Type	S-Type	H-Type	L-Type
Type and Pole	2 pole	ABN402c	ABS402c	ABH402c	ABL402c
	3 pole	ABN403c	ABS403c	ABH403c	ABL403c
	4 pole	ABN404c	ABS404c	ABH404c	ABL404c
Rated current, In	A	250, 300, 350, 400			
Rated operational voltage, Ue	AC(V)	690	690	690	690
	DC(V)	500	500	500	500
Rated insulation voltage, Ui	V	750	750	750	750
Rated impulse withstand voltage, Uimp	kV	8	8	8	8
Rated short-circuit breaking capacity(Icu) kA (Sym), KSC8321, IEC 60947-2					
AC	690V	5	8	10	14
	480/500V	18	35	50	65
	415/460V	37	50	65	85
	380V	42	65	70	100
	220/250V	50	75	85	125
DC	500V(3P)	10	20	40	40
	250V(2P)	10	20	40	40
Service breaking capacity(%Icu), Ics		100	100	100	75
Category of use		A	A	A	A
Endurance (Number of operations)	Mechanical	4000	4000	4000	4000
	Electrical	1000	1000	1000	1000
Type of trip unit					
Thermal-magnetic release		fixed	fixed	fixed	fixed
Hydraulic-magnetic release		-	-	-	-
Magnetic release only without thermal trip		-	-	-	-
Earth leakage protection	for 3 pole	▲	▲	▲	▲
Accessories					
Electrical auxiliaries	Auxiliary switch	●	●	●	●
	Alarm switch	●	●	●	●
	Shunt trip	●	●	●	●
	Undervoltage trip	●	●	●	●
External accessories	Direct rotary handle	●	●	●	●
	Extended rotary handle	●	●	●	●
	Terminal shield	●	●	●	●
	Insulation barrier	●	●	●	●
	Rear connection	●	●	●	●
	Mechanical interlock	●	●	●	●
	Plug-in device	●	●	●	●
Dimensions (mm)	W×H×D (3P)	140×257×109			
Weight(kg)	2 pole	5.2	5.2	5.2	5.2
	3 pole	6.2	6.2	6.2	6.2
	4 pole	7.8	7.8	7.8	7.8

Note) 1. ● applicable or available
2. ▲ available as a separate breaker

800			1000		1200		
N-Type	S-Type	L-Type	S-Type	L-Type	S-Type		L-Type
ABN802c	ABS802c	ABL802c	-	-	-	-	-
ABN803c	ABS803c	ABL803c	ABS1003b	ABL1003b	ABS1203b	ABS1203bE	ABL1203b
ABN804c	ABS804c	ABL804c	ABS1004b	ABL1004b	ABS1204b	-	ABL1204b
500, 630, 700, 800			1000		1200		
690	690	690	600	600	600	600	600
500	500	500	-	-	-	-	-
750	750	750	690	690	690	690	690
8	8	8	6	6	6	6	6
8	10	14	-	-	-	-	-
25	45	65	50	75	50	50	75
37	65	85	65	85	65	65	85
45	75	100	65	85	65	65	85
50	85	125	100	125	100	100	125
10	20	40	-	-	-	-	-
10	20	40	-	-	-	-	-
100	100	75	50	50	50	50	50
A	A	A	A	A	A	A	A
2500	2500	2500	2500	2500	2500	2500	2500
500	500	500	500	500	500	500	500
fixed	fixed	fixed	fixed	fixed			
-	-	-	-	-	fixed	-	fixed
-	-	-	-	-	-	Adjustable	-
▲	▲	▲	-	-	-	-	-
					-	●	-
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	-	-	-	-	-
●	●	●	-	-	-	-	-
●	●	●	-	-	-	-	-
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
●	●	●	-	-	-	-	-
●	●	●	-	-	-	-	-
210×280×109			220×400×105		220×400×105		
11	11	11	-	-	-	-	-
11.5	11.5	11.5	19.6	19.6	-	-	-
18.2	18.2	18.2	-	-	25.7	25.7	25.7

	Amb. Temp.	-5°C	0°C	10°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C
Calibrated for 40°C	In=15 to 30	111.9%	111.3%	110.0%	108.0%	106.6%	104.9%	102.7%	100.0%	96.8%	93.3%
	In=40 to 100	110.2%	109.8%	108.7%	107.0%	105.8%	104.3%	102.4%	100.0%	97.2%	94.0%
	In=100 to 225	114.3%	113.2%	110.6%	107.5%	105.8%	104.0%	102.0%	100.0%	97.9%	95.6%
	In=250 to 800	110.0%	109.0%	107.0%	105.0%	104.0%	103.0%	101.5%	100.0%	98.5%	97.0%

Earth Leakage Circuit Breakers

Metasol 30AF to 250AF Series

Frame Size(AF)		30	50			60	
Type		S-Type	N-Type	S-Type	H-Type	N-Type	S-Type
Type and Pole	2-pole	-	EBN52c	-	-	-	-
	3-pole	EBS33c	EBN53c	EBS53c	EBH53c	EBN63c	EBS63c
	4-pole	EBS34c	-	EBS54c	EBH54c	-	EBS64c
Protective function		Overload, Short-circuit and Ground fault	Overload, Short-circuit and Ground fault		Overload, Short-circuit and Ground fault	Overload, Short-circuit and Ground fault	
Rated current, In A		15, 20, 30	15, 20, 30, 40, 50		15, 20, 30, 40, 50	60	
Rated residual current, I△n	mA	30, 100/200/500	30, 100/200/500		30, 100/200/500	30,100/200/500	
Rated operational voltage, Ue	AC(V)	220/460	220/460		220/460	220/460	
Rated impulse withstand voltage, Uimp	kV	6	6		6	6	
Residual current off-time at I△n	sec	≤0.1 sec	≤0.1 sec		≤0.1 sec	≤0.1 sec	
Rated short-circuit breaking capacity (Icu) kA (Sym), KSC8321, IEC 60947-2							
AC	460V	14	14	18	50	14	18
	415V	14	14	18	50	14	18
	220/250V	30	30	35	100	30	35
Service breaking capacity(%Icu), Ics		100	100	100	100	100	100
Category of use		A	A	A	A	A	A
Endurance	Mechanical	25000	25000	25000	25000	25000	25000
(Number of operations)	Electrical	10000	10000	10000	10000	10000	10000
Type of trip unit							
Overcurrent pick-up		Thermal-magnetic	Thermal-magnetic			Thermal-magnetic	
Earth leakage pick-up		Electronic	Electronic			Electronic	
Accessories					●		
Electrical auxiliaries	Auxiliary switch	●	●	●	●	●	●
	Alarm switch	●	●	●		●	●
	Shunt trip						
	Undervoltage trip						
External accessories	Insulation barrier	●	●	●	●	●	●
	Terminal cover (Long)	●	●	●	●	●	●
	Terminal cover (Short)	●	●	●	●	●	●
	Rotary handle (Direct)	●	●	●	●	●	●
	Rotary handle (Direct, Key lock)	●	●	●	●	●	●
	Rotary handle (Extended)	●	●	●	●	●	●
	Rear terminal (Bar)				●	●	●
	Rear terminal (Round)	●	●	●	●	●	●
	Plug-in kit	●	●	●	●	●	●
	Pad handle lock	●	●	●	●	●	●
Dimensions (mm)	W×H×D (3P)	75×130×60	75×130×60		90×155×60	75×130×60	
Weight(kg)	2 pole	-	0.5	-	-	-	-
	3 pole	0.7	0.7	0.7	1	0.7	0.7
	4 pole	0.9	-	0.9	1.2	-	0.9

Note) 1. ● applicable or available
2. ▲ available as a separate breaker

100	125		250		
N-Type	S-Type	H-Type	N-Type	S-Type	H-Type
EBN102c	-	-	EBN202c	-	-
EBN103c	EBS103c	EBH103c	EBN203c	EBS203c	EBH203c
EBN104c	EBS104c	EBH104c	-	EBS204c	EBH204c
Overload, Short-circuit and Ground fault	Overload, Short-circuit and Ground fault		Overload, Short-circuit and Ground fault		
60, 75, 100	15, 20, 30, 40, 50, 60, 75, 100, 125		100, 125, 150, 175, 200, 225, 250		
30, 100/200/500	30,100/200/500		30,100/200/500		
220/460	220/460		220/460		
6	6		6		
≤0.1 sec	≤0.1 sec		≤0.1 sec		
18	37	50	26	37	50
18	37	50	26	37	50
35	85	100	65	85	100
100	100	100	100	100	
A	A	A	A	A	A
25000	25000	25000	20000	20000	20000
10000	10000	10000	5000	5000	5000
Thermal-magnetic	Thermal-magnetic		Thermal-magnetic		
Electronic	Electronic		Electronic		
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
75×130×60	90×155×60		105×165×60		
0.5	-	-	1.1	-	-
0.7	1	1	1.2	1.2	1.2
0.9	1.2	1.2	-	1.5	1.5

Earth Leakage Circuit Breakers

Metasol 400AF to 1200AF Series

Frame Size(AF)		400			
Type		N-Type	S-Type	H-Type	L-Type
Type and Pole	3-pole	EBN403c	EBS403c	EBH403c	EBL403c
	4-pole	EBN404c	EBS404c	EBH404c	EBL404c
Protective function		Overload, Short-circuit and Ground fault			
Rated current, In A		250, 300, 350, 400			
Rated residual current, I△n	mA	30, 100/200/500mA			
Rated operational voltage, Ue	AC(V)	220/460	220/460	220/460	220/460
Rated impulse withstand voltage, Uimp	kV	6	6	6	6
Residual current off-time at I△n	sec	0.1 sec	0.1 sec	0.1 sec	0.1 sec
Rated short-circuit breaking capacity (Icu) kA (Sym), KSC8321, IEC 60947-2					
AC	415/460V	37	50	65	85
	220/250V	50	75	85	125
Service breaking capacity(%Icu), Ics		100	100	100	75
Category of use		A	A	A	A
Endurance	Mechanical	40000	40000	40000	40000
(Number of operations)	Electrical	10000	10000	10000	10000
Type of trip unit					
Overcurrent pick-up		Thermal-magnetic			
Earth leakage pick-up		Electronic			
Accessories					
Electrical auxiliaries	Auxiliary switch	●	●	●	●
	Alarm switch	●	●	●	●
	Shunt trip	●	●	●	●
	Undervoltage trip	●	●	●	●
External accessories	Insulation barrier	●	●	●	●
	Terminal cover (Long) - 2, 3pole	●	●	●	●
	Terminal cover (Long) - 4pole	●	●	●	●
	Rotary handle (Direct)	●	●	●	●
	Rotary handle (Extended)	●	●	●	●
	Mechanical interlock - 2, 3pole	●	●	●	●
	Mechanical interlock - 4pole	●	●	●	●
	Rear terminal - 2pole	●	●	●	●
	Rear terminal - 3pole	●	●	●	●
	Rear terminal - 4pole	●	●	●	●
	Plug-in kit	●	●	●	●
Dimensions (mm)	W×H×D (3P)	140×257×109			
Weight(kg)	2 pole	-	-	-	-
	3 pole	7	7	7	7
	4 pole	8.4	8.4	7	7

Note) 1. ● applicable or available
2. ▲ available as a separate breaker

800			1000	1200
N-Type	S-Type	L-Type	S-Type	S-Type
EBN803c	EBS803c	EBL803c	EBS1003b	EBS1203b
-	-	-	-	-
Overload, Short-circuit and Ground fault			Overload, Short-circuit and Ground fault	
500, 630, 700, 800			1000	1200
30, 100/200/500mA			100/200/500mA	100/200/500mA
220/460	220/460	220/460	220/460	220/460
6	6	6	-	-
0.1 sec	0.1 sec	0.1 sec	0.1 sec	0.1 sec
37	65	85	85	85
50	85	125	125	125
100	100	75	-	-
A	A	A	-	-
2500	2500	2500	2500	2500
500	500	500	500	500
Thermal-magnetic			Thermal-magnetic	Thermal-magnetic
Electronic			Electronic	Electronic
●	●	●	●	●
●	●	●	●	●
●	●	●	-	-
●	●	●	-	-
●	●	●	-	-
●	●	●	-	-
●	●	●	-	-
●	●	●	-	-
●	●	●	-	-
●	●	●	-	-
●	●	●	-	-
●	●	●	-	-
●	●	●	-	-
●	●	●	-	-
●	●	●	-	-
210×280×109			220×565×105	
-	-	-	-	-
11.5	11.5	11.5	27.1	27.1
-	-	-	-	-

Air circuit breakers

Susol ACB Series

Circuit Breaker

				Susol					
Type				AH-06D	AH-08D	AH-10D	AH-13D	AH-16D	AH-20D
Ampere frame	(AF)			630	800	1000	1250	1600	2000
Rated current(A)	(In max)		at 40℃	200 400 630	400 630 800	1000	1250	1600	2000
Setting current (A) *	Control trip relay (... × In max)			(0.4 ~ 1.0) × In max					
Rated current of neutral pole (A)				400 630	400 630 800	1000	1250	1600	2000
Rated insulation voltage(V)	(Ui)			1,000					
Rated operational voltage(V)	(Ue)			690					
Rated impulse withstand voltage (kV)	(Uimp)			12					
Frequency(Hz)				50/60					
Number of poles (P)				3/4					
Rated breaking capacity (kA sym) AC 50/60Hz	(Icu)	IEC 60947-2 KS C 4620	220V/230V/380V/415V	85					
			460V/480V/500V	85					
			550V/600V/690V	65					
Rated service breaking capacity (kA)	(Ics)		... %×Icu	100%					
Rated making capacity (kA peak) AC 50/60Hz	(Icm)	IEC 60947-2 KS C 4620	220V/230V/380V/415V	187					
			460V/480V/500V	187					
			550V/600V/690V	143					
Rated short-time withstand current (kA)	(Icw)	2 sec	1 sec	65					
				60					
			3 sec	50					
Operating time (ms)			Maximum total breaking time	40					
			Maximum closing time	80					
Life cycle (time)		Mechanical		20,000					
		Electrical		5,000					
Connections **	Draw-out / Fixed		Horizontal connection	●					-
			Vertical connection	○					●
			Front connection	○					-
			Mixed connection	○					-
Weight (kg) (3P/4P)	Draw-out type	Main body (With cradle)	Motor charging type	63/74					70/85
			Manual charging type	61/72					68/83
		Cradle only		29/32					33/40
	Fixed type		Motor charging type	34/44					38/47
			Manual charging type	32/42					36/45
External dimensions (mm) (H×W×D) 		Draw-out type	3P	430×334×375					
			4P	430×419×375					
		Fixed type	3P	300×300×295					
			4P	300×385×295					
Trip relay				N, A, P, S type					
Certificate & Approval				KS / KEMA / KERI / GOST / CCC					
Marine clasiflcation				LR, ABS, DNV, KR, BV, GL, RINA, NK					

* Refer to trip relay specification. ** ●: Standard, ○: Option

Note) 1. Life time means not guarantee, but limitation.
Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee
2. In case of Marine ACB, please contact us.
3. The use of AN-D, AS-D, AH-D and AS-F in IT systems is limited to 500 V network voltage.
4. AH-20D, AH-40E types are equipped with vertical-only terminals.

Susol								
AH-06E	AH-08E	AH-10E	AH-13E	AH-16E	AH-20E	AH-25E	AH-32E	AH-40E
630	800	1000	1250	1600	2000	2500	3200	4000
630	800	1000	1250	1600	2000	2500	3200	4000
(0.4 ~ 1.0) × In max								
630	800	1000	1250	1600	2000	2500	3200	4000
1,000								
690								
12								
50/60								
3, 4								
100								
100								
85								
100%								
220								
220								
187								
85								
75								
65								
40								
80								
15,000								
5,000								
●								-
○								●
○								-
○								-
87/103								104/147
85/101								102/145
44/55								58/70
44/55								63/100
42/53								61/98
430×412×375								
430×527×375								
300×378×295								
300×493×295								
Tip N, A, P, S								
KS / KEMA / KERI / GOST / CCC								
LR, ABS, DNV, KR, BV, GL, RINA, NK								

Susol		
AH-40G	AH-50G	AH-63G
4000	5000	6300
4000	5000	6300
(0.4 ~ 1.0) × In max		
4000	5000	6300
1,000		
690		
12		
50/60		
3, 4		
150		
150		
100		
100%		
330		
330		
220		
100		
85		
75		
40		
80		
10,000		
2,000		
○		
●		
-		
-		
181/223		186/230
179/221		184/228
97/117		102/124
98/123		103/130
96/121		101/128
460×785×375		
460×1015×375		
300×751×295		
300×981×295		
Tip N, A, P, S		
KS / KEMA / KERI / GOST / CCC		
LR, ABS, DNV, KR, BV, GL, RINA, NK		

Derating of the rated current is required according to the ambient temperature around the breaker in a panel if it is higher than the reference value.

Air circuit breakers

Susol ACB Series

Switch-Disconnector

				Susol					
Type				DH-06D	DH-08D	DH-10D	DH-13D	DH-16D	DH-20D
Ampere frame		(AF)		630	800	1000	1250	1600	2000
Rated current(A)		(In max)	at 40℃	200 400 630	400 630 800	1000	1250	1600	2000
Setting current (A) *		Control trip relay (... × In max)		(0.4 ~ 1.0) × In max					
Rated current of neutral pole (A)				400 630	400 630 800	1000	1250	1600	2000
Rated insulation voltage(V)		(Ui)		1,000					
Rated operational voltage(V)		(Ue)		690					
Rated impulse withstand voltage (kV)		(Uimp)		12					
Frequency(Hz)				50/60					
Number of poles (P)				3/4					
Rated service breaking capacity (kA)		(Ics)	... %×Icu	100%					
Rated making capacity (kA peak)		(Icm) IEC 60947-3 AC	~ 690 V	143					
Rated short-time withstand current (kA)	(Icw)	2 sec	1 sec	65					
				60					
			3 sec	50					
Operating time (ms)			Maximum total breaking time	40					
			Maximum closing time	80					
Life cycle (time)		Mechanical		20,000					
		Electrical		5,000					
Connections **	Draw-out / Fixed		Horizontal connection	●					-
			Vertical connection	○					●
			Front connection	○					-
			Mixed connection	○					-
Weight (kg) (3P/4P)	Draw-out type	Main body (With cradle)	Motor charging type	63/74					70/85
			Manual charging type	61/72					68/83
		Cradle only		29/32					33/40
	Fixed type		Motor charging type	34/44					38/47
			Manual charging type	32/42					36/45
External dimensions (mm) (H×W×D) 		Draw-out type	3P	430×334×375					
			4P	430×419×375					
		Fixed type	3P	300×300×295					
			4P	300×385×295					
Trip relay				N, A, P, S type					

* Refer to trip relay specification. ** ●: Standard, ○: Option

Note) 1. Life time means not guarantee, but limitation.
Quality guarantee: On/Off frequency on the basis of IEC60947-3 within the term of guarantee
2. In case of Marine ACB, please contact us.
3. DH-20D, DH-40E types are equipped with vertical-only terminals.

Susol								
DH-06E	DH-08E	DH-10E	DH-13E	DH-16E	DH-20E	DH-25E	DH-32E	DH-40E
630	800	1000	1250	1600	2000	2500	3200	4000
630	800	1000	1250	1600	2000	2500	3200	4000
(0.4 ~ 1.0) × In max								
630	800	1000	1250	1600	2000	2500	3200	4000
1,000								
690								
12								
50/60								
3/4								
100%								
187								
85								
78								
65								
40								
80								
15,000								
5,000								
●								-
○								●
○								-
○								-
87/103								107/139
85/101								102/145
44/55								65/85
44/55								61/81
42/53								60/80
430×412×375								
430×527×375								
300×378×295								
300×493×295								
N, A, P, S type								

Derating of the rated current is required according to the ambient temperature around the breaker in a panel if it is higher than the reference value.

Air circuit breakers

Metasol ACB Series

Circuit Breaker

				Metasol					
Type				AN-06D	AN-08D	AN-10D	AN-13D	AN-16D	AS-20D
Ampere frame	(AF)			630	800	1000	1250	1600	2000
Rated current(A)	(In max)		at 40℃	200 400 630	400 630 800	1000	1250	1600	2000
Setting current (A) *	Control trip relay (... × In max)			(0.4 ~ 1.0) × In max					
Rated current of neutral pole (A)				400 630	400 630 800	1000	1250	1600	2000
Rated insulation voltage(V)	(Ui)			1,000					
Rated operational voltage(V)	(Ue)			690					
Rated impulse withstand voltage (kV)	(Uimp)			12					
Frequency (Hz)				50/60					
Number of poles (P)				3/4					
Rated breaking capacity (kA sym) AC 50/60Hz	(Icu)	IEC 60947-2 KS C 4620	220V/230V/380V/415V	65					70
			460V/480V/500V	65					70
			550V/600V/690V	50					65
Rated service breaking capacity (kA)	(Ics)		... %×Icu	100%					100%
Rated making capacity (kA peak) AC 50/60Hz	(Icm)	IEC 60947-2 KS C 4620	220V/230V/380V/415V	143					154
			460V/480V/500V	143					154
			550V/600V/690V	105					143
Rated short-time withstand current (kA) (Icw)		2 sec	1 sec	50					65
				42					50
			3 sec	36					42
Operating time (ms)			Maximum total breaking time	40					
			Maximum closing time	80					
Life cycle (time)		Mechanical		20,000					
		Electrical		5,000					
Connections **	Draw-out / Fixed		Horizontal connection	●					-
			Vertical connection	○					●
			Front connection	○					-
			Mixed connection	○					-
Weight (kg) (3P/4P)	Draw-out type	Main body (With cradle)	Motor charging type	63/74					70/85
			Manual charging type	61/72					68/83
		Cradle only		29/32					33/40
	Fixed type		Motor charging type	34/44					38/47
			Manual charging type	32/42					36/45
External dimensions (mm) (H×W×D) 		Draw-out type	3P	430×334×375					
			4P	430×419×375					
		Fixed type	3P	300×300×295					
			4P	300×385×295					
Trip relay				N, A, P type					
Certificate & Approval				KS / KEMA / KERI / GOST					
Marine clasiflcation				-					

*** Refer to trip relay specification.** **** ●: Standard, ○: Option**

Note) 1. Life time means not guarantee, but limitation.
Quality guarantee: On/Off frequency on the basis of IEC60947-2 within the term of guarantee
2. The use of AN-D, AS-D and AS-F in IT systems is limited to 500 V network voltage.
3. AS-20D, AS-40E types are equipped with vertical-only terminals.

Metasol			
AS-20E	AS-25E	AS-32E	AS-40E
2000	2500	3200	4000
630, 800 1000, 1250 1600, 2000	2500	3200	4000
(0.4 ~ 1.0) × In max			
630, 800 1000, 1250 1600, 2000	2500	3200	4000
1,000			
690			
12			
50/60			
3/4			
85			
85			
85			
100%			
187			
187			
187			
85			
75			
65			
40			
80			
15,000			
5,000			
●			-
○			●
○			-
○			-
87/103			104/147
85/101			102/145
44/50			58/70
44/55			63/100
42/53			61/98
430×412×375			
430×527×375			
300×378×295			
300×493×295			
N, A, P type			
KS / KEMA / KERI / GOST			
LR, ABS, DNV, KR, BV, GL, RINA, NK			

Metasol	
AS-40F	AS-50F
4000	5000
4000	5000
(0.4 ~ 1.0) × In max	
4000	5000
1,000	
690	
12	
50/60	
3/4	
100	
100	
85	
100%	
220	
220	
187	
85	
75	
65	
40	
80	
10,000	
2,000	
○	
●	
-	
-	
107/139	
102/145	
65/85	
61/81	
60/80	
460×629×375	
460×799×375	
300×597×295	
300×767×295	
N, A, P type	
KS / KEMA / KERI / GOST	
LR, ABS, DNV, KR, BV, GL, RINA, NK	

Metasol		
AS-40G	AS-50G	AS-63G
4000	5000	6300
4000	5000	6300
(0.4 ~ 1.0) × In max		
4000	5000	6300
1,000		
690		
12		
50/60		
3/4		
120		
120		
100		
100%		
264		
264		
220		
100		
85		
75		
40		
80		
10,000		
2,000		
○		
●		
-		
-		
181/223		186/230
179/221		184/228
97/117		102/124
98/123		103/130
96/121		101/128
460×785×375		
460×1015×375		
300×751×295		
300×981×295		
N, A, P type		
KS / KEMA / KERI / GOST		
LR, ABS, DNV, KR, BV, GL, RINA, NK		

Derating of the rated current is required according to the ambient temperature around the breaker in a panel if it is higher than the reference value.

Switch-Disconnector

				Metasol		
Type				DN-06D	DN-08D	DN-10D
Ampere frame	(AF)			630	800	1000
Rated current(A)	(In max)		at 40℃	200 400 630	400 630 800	1000
Setting current (A) *	Control trip relay (... × In max)			(0.4 ~ 1.0) × In max		
Rated current of neutral pole (A)				400 630	400 630 800	1000
Rated insulation voltage(V)	(Ui)			1,000		
Rated operational voltage(V)	(Ue)			690		
Rated impulse withstand voltage (kV)	(Uimp)			12		
Frequency(Hz)				50/60		
Number of poles (P)				3/4		
Rated service breaking capacity (kA)	(Ics)		... %×Icu	100%		
Rated making capacity (kA peak)	(Icm)	IEC 60947-3 AC	~ 690V	105		
Rated short-time withstand current (kA)	(Icw)		1 sec	50		
			2 sec	42		
			3 sec	36		
Operating time (ms)			Maximum total breaking time	40		
			Maximum closing time	80		
Life cycle (time)		Mechanical		20,000		
		Electrical		5,000		
Connections **	Draw-out / Fixed		Horizontal connection	●		
			Vertical connection	○		
			Front connection	○		
			Mixed connection	○		
Weight (kg) (3P/4P)	Draw-out type	Main body (With cradle)	Motor charging type	63/74		
			Manual charging type	61/72		
		Cradle only		29/32		
	Fixed type		Motor charging type	34/44		
			Manual charging type	32/42		
External dimensions (mm) (H×W×D)		Draw-out type	3P	430×334×375		
			4P	430×419×375		
		Fixed type	3P	300×300×295		
			4P	300×385×295		
Trip relay				N, A, P type		

* Refer to trip relay specification. ** ●: Standard, ○: Option

Note) 1. Life time means not guarantee, but limitation.
Quality guarantee: On/Off frequency on the basis of IEC60947-3 within the term of guarantee
2. DS-20D, DS-40E types are equipped with vertical-only terminals.

Metasol		
DN-13D	DN-16D	DS-20D
1250	1600	2000
1250	1600	2000
(0.4 ~ 1.0) × In max		
1250	1600	2000
1,000		
690		
12		
50/60		
3/4		
100%		
105		143
50		65
42		50
36		42
40		
80		
20,000		
5,000		
●		-
○		●
○		-
○		-
63/74		70/85
61/72		68/83
29/32		33/40
34/44		38/47
32/42		36/45
430×334×375		
430×419×375		
300×300×295		
300×385×295		
N, A, P type		

Metasol			
DS-20E	DS-25E	DS-32E	DS-40E
2000	2500	3200	4000
630, 800 1000, 1250 1600, 2000	2500	3200	4000
(0.4 ~ 1.0) × In max			
630, 800 1000, 1250 1600, 2000	2500	3200	4000
1,000			
690			
12			
50/60			
3/4			
100%			
187			
85			
75			
65			
40			
80			
15,000			
5,000			
●			-
○			●
○			-
○			-
87/103			104/147
85/101			102/145
44/50			58/70
44/55			63/100
42/53			61/98
430×412×375			
430×527×375			
300×378×295			
300×493×295			
N, A, P type			

Derating of the rated current is required according to the ambient temperature around the breaker in a panel if it is higher than the reference value.

Trip relay(OCR)

The trip relay of Susol ACB provides the additional protection functions for voltage, frequency, unbalance, and others in addition to main protection functions for over current, short-circuit, ground fault. It supports the advanced measurement functions for voltage, current, power, electric energy, harmonics, communication function, and others.

Analog trip function interlocked with mechanism enhanced a durability of devices as well as the breaking capacity of ACB.

Zone selective interlocking function makes the protective coordination more simple and thermal memory can be applied to various loads.

Trip relay types

Classification	N type	A type	P type	S type
Externals				
Current protection	• L / S / I / G / Thermal	• L / S / I / G(or EL) • Thermal • ZSI (Protective coordination)	• L / S / I / G(or EL) • Thermal (linear hot start) • ZSI (Protective coordination)	• L / S / I / G(or EL) • Thermal (linear hot start) • ZSI (Protective coordination)
Other protection	-	-	• Over/Under voltage • Over/Under frequency • Unbalance(Voltage/Current) • Reverse power	• Over/Under voltage • Over/Under frequency • Unbalance(Voltage/Current) • Reverse power
Measurement function	-	• Current (R / S / T / N)	• 3 Phase Voltage/Current RMS/Vector • Power(P, Q, S), PF(3-Phase) • Energy(Positive/Negative) • Frequency, Demand	• 3 Phase Voltage/Current RMS/Vector • Power(P, Q, S), PF(3-Phase) • Energy(Positive/Negative) • Frequency, Demand • Voltage/Current harmonics (1st~63th) • 3 Phase Waveforms • THD, TDD, K-Factor
Fine adjustment	-	-	• Fine adjustment for long/short time delay/instantaneous/ ground	• Fine adjustment for long/short time delay/instantaneous/ ground
Pre Trip Alarm	-	-	• Overload protection relays : DO (Alarm) (Ground fault is not available when using Pre trip alarm)	• Overload protection relays : DO (Alarm) (Ground fault is not available when using Pre trip alarm)
Digital Output	-	• 3DO (Fixed) • L, S/I, G Alarm	• 3DO (Programmable) • Trip, Alarm, General	• 3DO (Programmable) • Trip, Alarm, General
IDMTL setting	-	-	• Compliance with IEC60255-3 SIT, VIT, EIT, DT	• Compliance with IEC60255-3 SIT, VIT, EIT, DT
Communication	-	• Modbus/RS–485 • Profibus–DP	• Modbus / RS-485 • Profibus-DP	• Modbus / RS-485 • Profibus-DP
Power supply	• Self Power - Power source works over 20% of load current.	• Self Power - Power source works over 20% of load current. - External power source are required for comm. • AC/DC 100~250V • DC 24~60V	• AC/DC 100~250V • DC 24~60V Basic protection function(L / S / I / G) is still under normal operation without control power.	• AC/DC 100~250V • DC 24~60V
RTC timer	-	• Available	• Available	• Available
LED for trip info.	• Long time delay • Short time delay/Instantaneous • Ground fault	• Long time delay • Short time delay/Instantaneous • Ground fault	• Long time delay • Short time delay/Instantaneous • Ground fault	• Long time delay • Short time delay/Instantaneous • Ground fault
Fault recording	-	• 10 records (Fault/Current/Date and Time)	• 256 records (Fault/Current/Date and Time)	• 256 records • Last fault wave form recording (3 Phase)
Event recording	-	-	• 256 records(Content, Status, Date)	• 256 records(Content, Status, Date)
Operating button	• Reset button	• Reset, Menu Up/Down, Left/Right, Enter	• Reset, Menu Up/Down, Left/Right, Enter	• Reset, Menu Up/Down, Left/Right, Enter

Each OCR type has Battery in itself.

1. Battery lifespan
   1) When turned off : 14~28years
   2) When using 1 LED consecutively or turned off : 7~14days

2. The recognizable range of OCR current
   1) 1ø : When more 20% than rated current(In) (ratio to In regardless of Iu and Ir)
   2) 3ø : When more 12% than rated current(In)

* L/S/I/G(or EL)configuration as standard
(Only. Unable to select ground fault and earth leakage, simultaneously)

LS Final Distribution Boards

LS Final Distribution Boards is fully type-tested by ASTA and specially designed for residential and commercial area for the protection of people and equipment.

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Full range of Residential & Commercial Distribution System

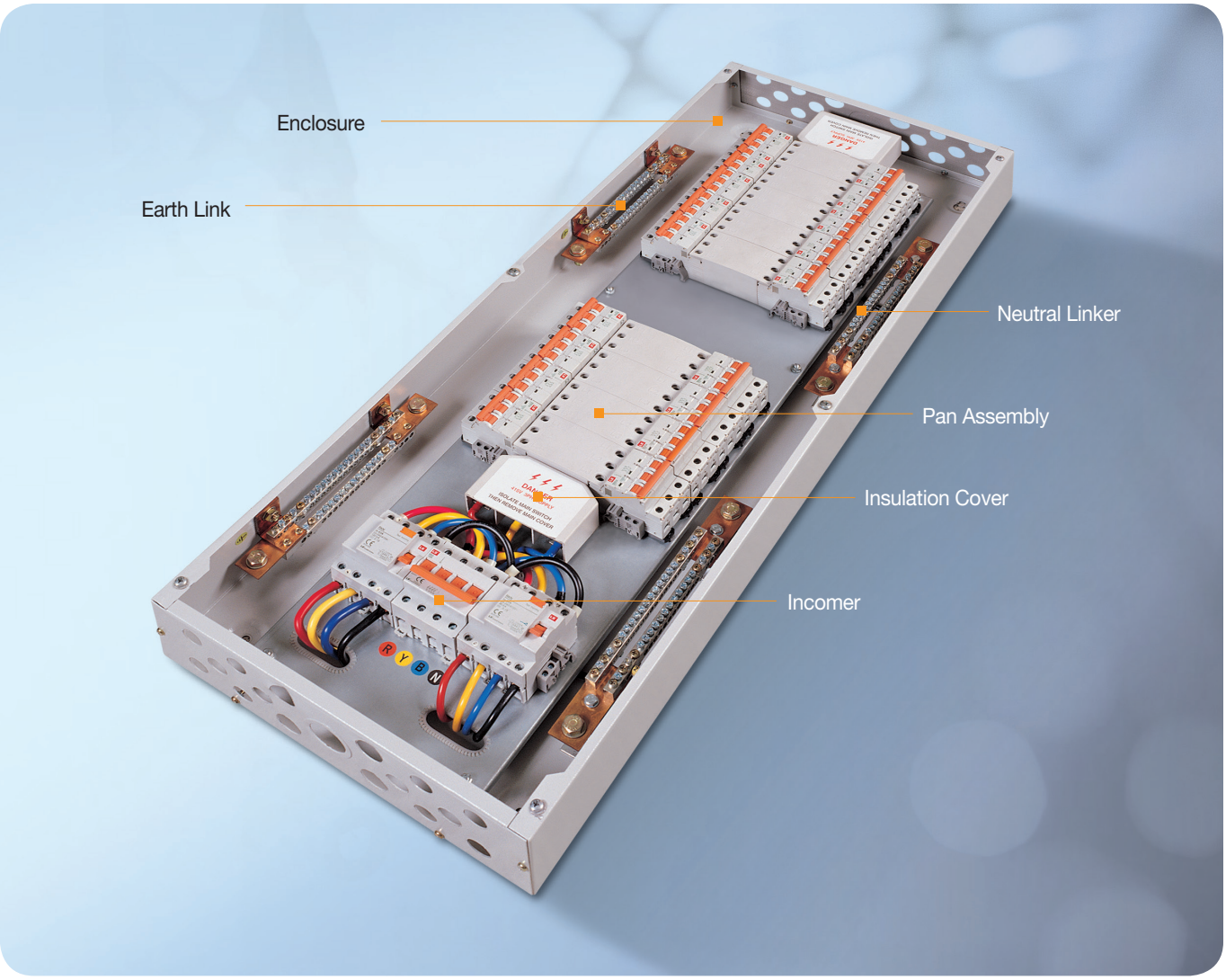
Features:

- Designed to provide higher level of safety for final distribution board
- Pan assembly type busbar systems to provide easier cabling
- Split neutral bars provide easy connection and maximum cable space
- Easy and safe mounting of LS Miniature Circuit Breaker
- Flush and surface mounted
-Tin plate and cooper busbar
- Galvanized 1.2mm steel sheet

Technical Description

- In compliance with standards : IEC 60439-3
- Short-circuit withstand: 17kA/0.2s
- Peak short time withstand: 35kA
- Index of degree: IP 4X
- Rated operational Voltage(Ue): 415V
- Rated insulation Voltage(Ui): 460V
- Rated Frequence: 50/60Hz
- Rated impuls withstand Voltage(Uimp): 4kV
- Rated Current (In): Upto 125A

Internal view



Pan Assembly System

- Rigid and removable pan assembly to provide easier cabling
- Modular panel system
- Flexible connect with CB, RCCB and Disconnect switch

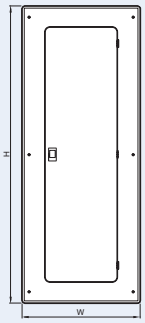
LS Final Distribution Boards

Specific of FDB

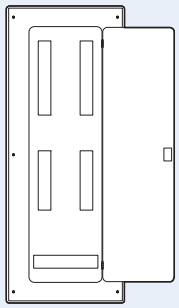
Split busbar type

with incoming Isolator feeding two ELCBs

Side view



Front view


Door opened view

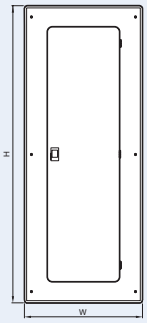
Selection of Enclosure

Code Description	Type	Dimension
02+02 Way Split DB	Flush	530H×430W×110D mm
04+02 Way Split DB		580H×430W×110D mm
04+04 Way Split DB		680H×430W×110D mm
06+04 Way Split DB		780H×430W×110D mm
06+06 Way Split DB		780H×430W ×110D mm
08+06 Way Split DB		830H×430W×110D mm
08+08 Way Split DB		980H×430W×110D mm
10+08 Way Split DB		980H×430W×110D mm
12+06 Way Split DB		980H×430W×110D mm
02+02 Way Split DB	Surface	510H×410W×110D mm
04+02 Way Split DB		560H×410W×110D mm
04+04 Way Split DB		660H×410W×110D mm
06+04 Way Split DB		760H×410W×110D mm
06+06 Way Split DB		760H×410W×110D mm
08+06 Way Split DB		810H×410W×110D mm
08+08 Way Split DB		960H×410W×110D mm
10+08 Way Split DB		960H×410W×110D mm
12+06 Way Split DB		960H×410W×110D mm

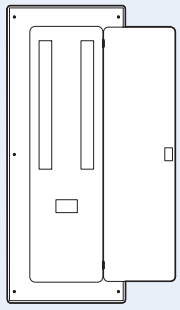
Single busbar & Single Incomer type

With Incoming 4P ELCB/MCB/Isolator

Side view



Front view


Door opened view

Selection of Enclosure

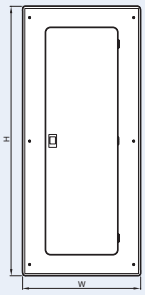
Code Description	Type	Dimension
4 Way DB 1 INC	Flush	530H×430W×110D mm
6 Way DB 1 INC		580H×430W×110D mm
8 Way DB 1 INC		680H×430W×110D mm
12 Way DB 1 INC		780H×430W×110D mm
14 Way DB 1 INC		830H×430W×110D mm
18 Way DB 1 INC		980H×430W×110D mm
20 Way DB 1 INC		Customized available
24 Way DB 1 INC		Customized available
4 Way DB 1 INC	Surface	510H×410W×110 D mm
6 Way DB 1 INC		560H×410W×110 D mm
8 Way DB 1 INC		660H×410W×110 D mm
12 Way DB 1 INC		760H×410W×110 D mm
14 Way DB 1 INC		810H×410W×110 D mm
18 Way DB 1 INC		960H×410W×110 D mm
20 Way DB 1 INC		Customized available
24 Way DB 1 INC		Customized available

Specific of FDB

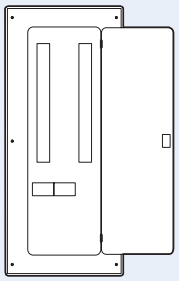
Single busbar & Dual Incomer type

With Incoming Isolator & ELCB

Side view



Front view



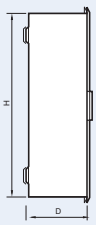
Door opened view

Selection of Enclosure

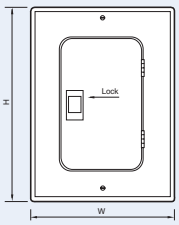
Code Description	Type	Dimension
4 Way DB 2 INC	Flush	530H×430W×110D mm
6 Way DB 2 INC		580H×430W×110D mm
8 Way DB 2 INC		680H×430W×110D mm
12 Way DB 2 INC		780H×430W×110D mm
14 Way DB 2 INC		830H×430W×110D mm
18 Way DB 2 INC		980H×430W×110D mm
20 Way DB 2 INC		Customized available
24 Way DB 2 INC		Customized available
4 Way DB 2 INC	Surface	510H×410W×110D mm
6 Way DB 2 INC		560H×410W×110D mm
8 Way DB 2 INC		660H×410W×110D mm
12 Way DB 2 INC		760H×410W×110D mm
14 Way DB 2 INC		810H×410W×110D mm
18 Way DB 2 INC		960H×410W×110D mm
20 Way DB 2 INC		Customized available
24 Way DB 2 INC		Customized available

SP&N Consumer Unit

Incoming 2P ELCB / MCB / Isolator



Side view



Front view

Selection of Enclosure

Code Description	Type	Dimension
6 Way 1P C.Unit		320H×240W×100D mm
9 Way 1P C.Unit		370H×240W×100D mm
12 Way 1P C.Unit		420H×250W×100D mm
15 Way 1P C.Unit		490H×250W×100D mm
18 Way 1P C.Unit		550H×250W×100D mm
22 Way 1P C.Unit		Customized available

LS SMDB Solution

- LS SMDB Solutions are arranged for 3 Phase and neutral incoming supply and specially designed easy to install MCCBs.
- These are fitted with Form 3b and 2 busbar assemblies, tested and ASTA Certified.

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Rating

- A wide choice of incoming MCCBs make LS SMDB panesboards flexible to suit most of the requirements and represent excellent value and will apeal to consultants, contractors. end users and OEMs. These are offered in ratings of 125A, 250A, 400A, 630A.
- All incoming and outgoing MCCBs have Thermal/Magnetic fixed and adjustable tripping mechanisms incorporated with a trip-to-test button. These are available in ratings as follows : 16, 20, 25, 32, 40, 50, 63, 80, 100, 125, 160, 250, 400, 630A.

Technical Specifications

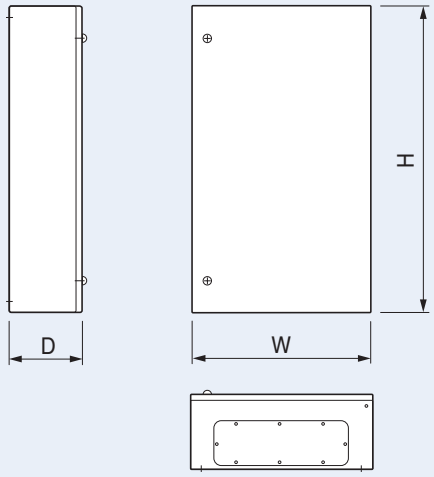
Constructional Characteristics

- Complied with IEC 60947-1
- Fully Type Tested, ASTA Certified
- Degree of protection : IP41 as per IEC 60529
- Form of separation: Form 3b
- Enclosure constructed from rigid folded zinc phosphate and protected both internally and externally with polyester powder coating

Electrical Characteristics

- Rated Operational Voltage Ue: upto 690V
- Rated Insulation voltage Ui: upto 750V
- Rated Frequency: 50/60Hz
- Rated Impulse withstand voltage Uimp: 8kV
- Rated Short time Icw & peak withstand Ipk Current: 36kA/1S

Incoming Devices
MCCB Panelboards



Metasol Series

Incoming Breaker 250 Amps Outgoing Breaker 100 Amps				Incoming Breaker 400 Amps Outgoing Breaker 100 Amps				Incoming Breaker 630 Amps Outgoing Breaker 100 Amps			
No of Ways	Width	Height	Depth	No of Ways	Width	Height	Depth	No of Ways	Width	Height	Depth
2	700	800	180	4	700	1000	250				
4	700	800	180	6	700	1000	250	6	800	1000	250
6	700	800	180	8	700	1200	250	8	800	1200	250
8	700	1000	180	10	700	1400	250	10	800	1400	250
10	700	1200	180	12	700	1400	250	12	800	1400	250
12	700	1200	180	14	700	1600	250	14	800	1600	250

Susol TD/TS Series

Incoming Breaker 250 Amps Outgoing Breaker 100 Amps				Incoming Breaker 400 Amps Outgoing Breaker 100 Amps				Incoming Breaker 630 Amps Outgoing Breaker 100 Amps			
No of Ways	Width	Height	Depth	No of Ways	Width	Height	Depth	No of Ways	Width	Height	Depth
2	700	800	180	4	700	1000	250				
4	700	800	180	6	700	1000	250	6	800	1000	250
6	700	800	180	8	700	1200	250	8	800	1200	250
8	700	1000	180	10	700	1400	250	10	800	1400	250
10	700	1200	180	12	700	1400	250	12	800	1400	250
12	700	1200	180	14	700	1600	250	14	800	1600	250

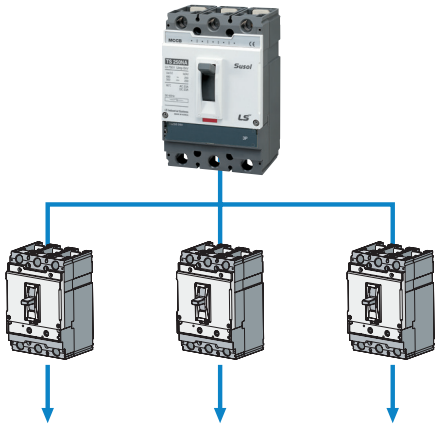
LS SMDB Solution

Incoming Devices

LSIS “Susol series” range of MCCBs

Rated current, In	250A 630A								
Rated operational voltage, Ue	750V								
MCCB breaker type	TS250			TS400			TS630		
Ultimate breaking capacity, Icu (kA rms) at 415V	N	H	L	N	H	L	N	H	L
	50	85	150	50	85	150	50	85	150
Service breaking capacity, Ics.....% Icu	100% Icu			100% Icu			100% Icu		
Protection trip unit	Thermal magnetic / Electronic								
Switch disconnector type TS	TS250NA			TS400NA			TS630NA		
Short-circuit making capacity Icm (kApeak) (with upstream circuit breaker)	4.9			7.1			8.5		

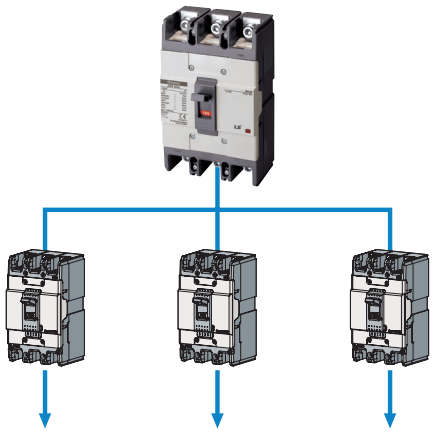
Incoming application



LSIS “Metasol series” range of MCCBs

Rated current, In	250A 630A		
Rated operational voltage, Ue	690V		
Breaker type	ABS203c	ABS403c	ABS803c
Ultimate breaking capacity, Icu (kA rms) at 415V	37	50	65
Service breaking capacity, Ics.....% Icu	100% Icu	100% Icu	100% Icu
Protection trip unit	Thermal magnetic		

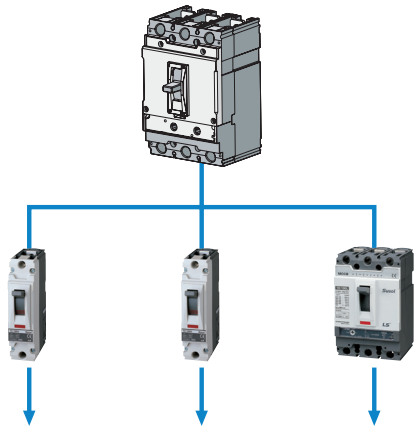
Incoming application



LSIS “Susol series” range of MCCBs

Rated current, In	16A 250A					
Rated operational voltage, Ue	upto 750V					
Breaker type	TD100, TD160, TS100, TS160, TS250					
	N		H		L	
No. of poles	1P	3P	1P	3P	1P	3P
Ultimate breaking capacity, Icu (kA rms) at 240V	30	100	50	120	-	200
Service breaking capacity, Ics.....% Icu	100% Icu					
Protection trip unit	Thermal magnetic / Electronic					

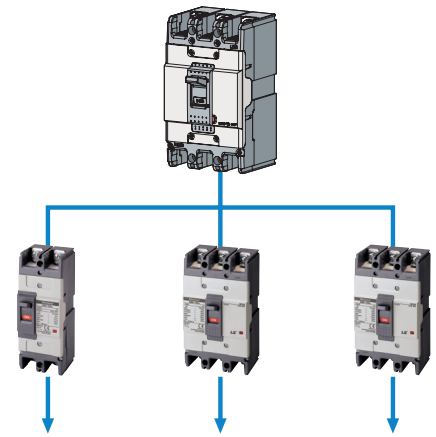
Incoming application



LSIS “Metasol series” range of MCCBs

Rated current, In	15A 100A					
Rated operational voltage, Ue	upto 415V - Single pole upto 690V - Three pole					
Breaker type	ABS103c					
	N		H		L	
No. of poles	2P	3P	2P	3P	2P	3P
Ultimate breaking capacity, Icu (kA rms) at 240V	35		85		100	
Ultimate breaking capacity, Icu (kA rms) at 415V	18		37		50	
Service breaking capacity, Ics.....% Icu	100% Icu					
Protection trip unit	Thermal magnetic					

Incoming application



Vacuum Circuit Breakers

Susol VCB Series

VL-06

Type			VL-06□08□04	VL-06□13□06
Rated voltage		Ur (kV)	7.2	
Rated normal current		Ir (A)	400	630
Rated frequency		fr (Hz)	50/60	
Rated short-circuit current		Isc (kA)	8	12.5
Rated short-time withstand current		Ik/tk (kA/s)	8/3	12.5/3
Rated short-circuit breaking capacity		(MVA)	100	160
Rated short-circuit making current		Ip (kA)	2.5×Isc (50Hz)/2.6×Isc (60Hz)	
Rated breaking time		(cycle)	3	
Rated withstand voltage	Power frequency (1 min)	Ud (kV)	20	
	Impulse (1.2×50㎲)	Up (kV)	60	
Rated operating sequence			O-0.3s-CO-15s-CO	
Control voltage	Closing coil	(V)	AC/DC 100~130V, AC/DC 200~250V, DC 125V, DC 24~30V, DC 48~60V, AC 48V	
	Trip coil	(V)	AC/DC 100~130V, AC/DC 200~250V, DC 125V, DC 24~30V, DC 48~60V, AC 48V	
Auxiliary contacts			2a2b, 4a4b, 6a6b	
Rated opening time		(sec)	≤ 0.04	
No-load closing time		(sec)	≤ 0.06	
Type test class	Mechanical		M2	
	Electrical		E2 (List1)	
	Capacitive current switching		C2	
Installation version	Fixed		P type	
	Drawout		E, F, G type (for MESG)	
Phase distance		(mm)	130	
Weight	Breaker (E, F, G type)	(kg)	37	37
	Cradle (E, F, G type)	(kg)	18, 25, 32	19, 26, 33
Standards			IEC 62271-100:2012, KS C 4611, JEC 2300/JIS C 4603, V-check (KESCO)	

VL-06/12/17

Type			VL-06□20/25□06/13/20			VL-12□20/25□06/13/20			VL-17□20/25□06/13/20		
Rated voltage		Ur (kV)	7.2			12			17.5		
Rated normal current		Ir (A)	630	1250	2000	630	1250	2000	630	1250	2000
Rated frequency		fr (Hz)	50/60								
Rated short-circuit current		Isc (kA)	20, 25								
Rated short-time withstand current		Ik/tk (kA/s)	20/3, 25/3								
Rated short-circuit breaking capacity		(MVA)	250/310			410/520			600/750		
Rated short-circuit making current		Ip (kA)	2.5×Isc (50Hz)/2.6×Isc (60Hz)								
Rated breaking time		(cycle)	3								
Rated withstand voltage	Power frequency (1 min)	Ud (kV)	20			28 (42)			38		
	Impulse (1.2×50㎲)	Up (kV)	60			75 (82)			95		
Rated operating sequence			O-0.3s-CO-15s-CO								
Control voltage	Closing coil	(V)	DC 24~30V, DC 48~60V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 100~130V, AC 220~250V								
	Trip coil	(V)	DC 24~30V, DC 48~60V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 100~130V, AC 220~250V								
Auxiliary contacts			4a4b, 10a10b								
Rated opening time		(sec)	≤ 0.04								
No-load closing time		(sec)	≤ 0.06								
Type test class	Mechanical		M2								
	Electrical		E2 (List3)								
	Capacitive current switching		C2								
Installation version *	Fixed		P type			P type					
	Drawout		E, F, G type (for MESG), H type (for MCSG)			E, F type (for MESG), H type (for MCSG)					
Phase distance **		(mm)	150			150 (210)			150 (210)		
Weight	Breaker (E, F, G type)	(kg)	100	100	130	115 (120)	115 (120)	130 (140)	115 (120)	115 (120)	130 (140)
	Cradle (E, F, G type)	(kg)	170	170	180	170 (200)	170 (200)	180 (200)	170 (200)	170 (200)	180 (200)
Standards			IEC 62271-100:2012, KERI/KEMA, V-check (KESCO)								

* H type is a box type cradle with CB compartment style structure.
** ( ) displays option of phase distance.

VL-06/12/17

Type			VL-06□32□06/13/20			VL-12□32□06/13/20/25				VL-17□32□06/13/20/25			
Rated voltage		Ur (kV)	7.2			12				17.5			
Rated normal current		Ir (A)	630	1250	2000	630	1250	2000	2500	630	1250	2000	2500
Rated frequency		fr (Hz)	50/60										
Rated short-circuit current		Isc (kA)	31.5										
Rated short-time withstand current		Ik/tk (kA/s)	31.5/3(4 Note 1))										
Rated short-circuit breaking capacity		(MVA)	393			655				955			
Rated short-circuit making current		Ip (kA)	2.5×Isc (50Hz)/2.6×Isc (60Hz)										
Rated breaking time		(cycle)	3										
Rated withstand voltage	Power frequency (1 min)	Ud (kV)	20			28 (42) Note 2)				38			
	Impulse(1.2×50㎲)	Up (kV)	60			75				95			
Rated operating sequence			O-0.3s-CO-3min-CO										
Control voltage	Closing coil	(V)	DC 24~30V, DC 48~60V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 100~130V, AC 220~250V										
	Trip coil	(V)	DC 24~30V, DC 48~60V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 100~130V, AC 220~250V										
Auxiliary contacts			4a4b, 10a10b										
Rated opening time		(sec)	≤ 0.04										
No-load closing time		(sec)	≤ 0.06										
Type test class	Mechanical		M2										
	Electrical		E2 (List 3)										
	Capacitive current switching		C2										
Installation version *	Fixed		Tip P										
	Drawout		H type (for MCSG)	E,F,G,K type (for MESG) H type (for. MCSG)		H type (for MCSG)	K type (for MESG) H type (for MCSG)		H type (for MCSG)	H type (for MCSG)			
Phase distance **		(mm)	150			150 (210)			210 (275)	150 (210)			210 (275)
Weight	Breaker (H type)	(kg)	100	100	130	115/120	115/120	130/140	160/175	115/120	115/120	130/140	160/175
	Cradle (H type)	(kg)	170	170	200	170/200	170/200	170/200	260/290	170/200	170/200	170/200	260/290
	Breaker (E, F, G, K type)	(kg)	85	85	100	85/100	85/100	100/115	120/135	85/100	85/100	100/115	120/135
Standards			IEC 62271-100:2012, KERI, V-check (KESCO)										

* H type is a box type cradle with CB compartment style structure. ** ( ) displays option of phase distance.
Nota 1) For Icw 4s, please contact us.
2) Contact us.

VL-20/25

Type			VL-20,25□13□06/13		VL-20,25□16□06/13		VL-20,25□25□06/13/20/25			
Rated voltage		Ur (kV)	24/25.8							
Rated normal current		Ir (A)	630	1250	630	1250	630	1250	2000	2500
Rated frequency		fr (Hz)	50/60 Note 1)							
Rated short-circuit current		Isc (kA)	12.5		16		25			
Rated short-time withstand current		Ik/tk (kA/s)	12.5/3 Note 2)		16/3 Note 2)		25/3 Note 2)			
Rated short-circuit breaking capacity		(MVA)	520/560		665/715		1040/1120			
Rated short-circuit making current		Ip (kA)	2.5×Isc (50Hz)/2.6×Isc (60Hz)							
Rated breaking time		(cycle)	3							
Rated withstand voltage	Power frequency (1 min)	Ud (kV)	50/60							
	Impulse(1.2×50㎲)	Up (kV)	125							
Rated operating sequence			O-0.3s-CO-3min-CO							
Control voltage	Closing coil	(V)	DC 24~30V, DC 48~60V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 100~130V, AC 220~250V							
	Trip coil	(V)	DC 24~30V, DC 48~60V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 100~130V, AC 220~250V							
Auxiliary contacts			4a4b, 10a10b							
Rated opening time		(sec)	≤ 0.04							
No-load closing time		(sec)	≤ 0.06							
Type test class	Mechanical		M2							
	Electrical		E2 (List 3)							
	Capacitive current switching		C2							
Installation version *	Fixed		P type							
	Drawout		E, F, G type (for MESG), K, H type (for MCSG)							H type (for MCSG)
Phase distance **		(mm)	210/265/275							275
Weight	Breaker (H type)	(kg)	120 (130)		130 (140)		150 (160)			
	Cradle (H type)	(kg)	200 (220)		200 (220)		200 (220)			
	Breaker (E, F, G, K type)	(kg)	110	115	120		135			-
Standards			IEC 62271-100 (2008), KERI, V-check (KESCO)							

* H type is a box type cradle with CB compartment style structure. ** ( ) displays option of phase distance.
Nota 1) 24/25.8kV 25kA 2000A(Phase distance 210mm): 60Hz available only 2) For Icw 4s, please contact us.

Vacuum Circuit Breakers

Susol VCB Series

VL-36

Type			VH-36□25□06	VH-36□25□13	VH-36□25□20	VH-36□25□25
Rated voltage		Ur (kV)	36			
Rated normal current		Ir (A)	630	1250	2000	2500
Rated frequency		fr (Hz)	50/60			
Rated short-circuit current		Isc (kA)	60			
Rated short-time withstand current		Ik/tk (kA/s)	25/3(4 Note 1)			
Rated short-circuit breaking capacity		(MVA)	1560			
Rated short-circuit making current		Ip (kA)	62.5/65			
Rated short-circuit making current		(Cycle)	3			
Rated withstand voltage	Power frequency (1 min)	Ud (kV)	70			
	Impulse (1.2×50㎲)	Up (kV)	170			
Rated operating sequence			O-0.3s-CO-15s-CO			
Control voltage	Closing coil	(V)	DC 24~30V, DC 48~60V, DC 110V, DC 125V, DC 220V, AC 48V, AC 100~130V, AC 220~250V			
	Trip coil	(V)	DC 24~30V, DC 48~60V, DC 110V, DC 125V, DC 220V, AC 48V, AC 100~130V, AC 220~250V			
Auxiliary contacts			4a4b, 10a10b			
Rated opening time		(sec)	≤ 0.04			
No-load closing time		(sec)	≤ 0.07			
Type test class	Mechanical		M2			
	Electrical		E2 (List3)			
	Capacitive current switching		C2			
Installation version *	Fixed		Type P			
	Drawout		H type (for MCSG)			
Phase distance		(mm)	275			
Weight	Breaker (H type)	(kg)	260	260	280	300
	Cradle (H, type)	(kg)	440	440	450	460
Standards			IEC 62271-100:2012			

Note 1) Pour Icw 4s, contactez-nous

LVB-06/12

Type			VH-06□32□32	VH-06□40□12, 20, 32			VH-12□32□32	VH-12□40□12, 20, 32		
Rated voltage		Ur (kV)	7.2	7.2			12	12		
Rated normal current		Ir (A)	3150 *	1250	2000	3150 *	3150 *	1250	2000	3150 *
Rated frequency		fr (Hz)	50/60							
Rated short-circuit current		Isc (kA)	31.5	40			31.5	40		
Rated short-time withstand current		Ik/tk (kA/s)	31.5/3	40/3			31.5/3	40/3		
Rated short-circuit breaking capacity		(MVA)	393	499			655	831		
Rated short-circuit making current		Ip (kA)	2.5×Isc (50Hz)/2.6×Isc (60Hz)							
Rated short-circuit making current		(Cycle)	3							
Rated withstand voltage	Power frequency (1 min)	Ud (kV)	20				28			
	Impulse (1.2×50㎲)	Up (kV)	60				75			
Rated operating sequence			O-0.3s-CO-3min-CO							
Control voltage	Closing coil	(V)	DC 48V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 110V, AC 220V							
	Trip coil	(V)	DC 48V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 110V, AC 220V							
Auxiliary contacts			4a4b, 10a10b							
Rated opening time		(sec)	≤ 0.04							
No-load closing time		(sec)	≤ 0.06							
Type test class	Mechanical		M2							
	Electrical		E2 (List1)							
	Capacitive current switching		C2							
Installation version *	Fixed		P type				-			
	Drawout		E,F,G type (for MESG), MCSG Cradle				MCSG Cradle			
Phase distance		(mm)	210	150		210	210	150		210
Weight	Breaker (H type)	(kg)	210, 220	135, 160	135, 160	210, 220	220	164	165	220
	Cradle (H, type)	(kg)	135, 155	55, 110	63, 117	135, 155	155	110	117	155
Standards			IEC 62271-100, KERI/KEMA, V-check(KESCO)							

* MCSG style drawable type provide a cradle for builting in the switchgear, not a box type for CB compartment. Ordering type is LVB.
Note) H type that is a box type cradle for enabling a CB compartment in MCSG is under development. Consult us for ordering.

VH-06/12/17

Type			VH-06/12□40□13/20				VH-06/12/17□40□13/20					
Rated voltage		Ur (kV)	7.2		12		7.2		12		17.5	
Rated normal current		Ir (A)	1250	2000	1250	2000	1250	2000	1250	2000	1250	2000
Rated frequency		fr (Hz)	50/60									
Rated short-circuit current		Isc (kA)	40									
Rated short-time withstand current		Ik/tk (kA/s)	40/4									
Rated short-circuit breaking capacity		(MVA)	499		831		499		831		1212	
Rated short-circuit making current		Ip (kA)	2.5×Isc (50Hz)/2.6×Isc (60Hz)									
Rated short-circuit making current		(Cycle)	3									
Rated withstand voltage	Power frequency (1 min)	Ud (kV)	20		28 (42)		20		28 (42)		38	
	Impulse (1.2×50㎲)	Up (kV)	60		75		60		75		95	
Rated operating sequence			O-0.3s-CO-3min-CO				O-0.3s-CO-15s-CO					
Control voltage	Closing coil	(V)	DC 48V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 110V, AC 220V									
	Trip coil	(V)	DC 48V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 110V, AC 220V									
Auxiliary contacts			4a4b, 10a10b									
Rated opening time		(sec)	≤ 0.04									
No-load closing time		(sec)	≤ 0.06									
Type test class	Mechanical		M2									
	Electrical		E2 (List3)									
	Capacitive current switching		C2									
Installation version	Drawout		K, H type									
Phase distance		(mm)	150				210					
Weight	Breaker (H type)	(kg)	165				215					
	Cradle (H, type)	(kg)	205				226					
Standards			IEC 62271-100:2012									

VH-06/12/17

Type			VH-06/12/17□32/40□32				
Rated voltage		Ur (kV)	7.2	12	17.5		
Rated normal current		Ir (A)	3150				
Rated frequency		fr (Hz)	50/60				
Rated short-circuit current		Isc (kA)	31.5/40				
Rated short-time withstand current		Ik/tk (kA/s)	40/4				
Rated short-circuit breaking capacity		(MVA)	393/499	655/831	955/1212		
Rated short-circuit making current		Ip (kA)	2.5×Isc (50Hz)/2.6×Isc (60Hz)				
Rated short-circuit making current		(Cycle)	3				
Rated withstand voltage	Power frequency (1 min)	Ud (kV)	20	28 (42)	38		
	Impulse (1.2×50㎲)	Up (kV)	60	75	95		
Rated operating sequence			O-0.3s-CO-15s-CO				
Control voltage	Closing coil	(V)	DC 48V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 110V, AC 220V				
	Trip coil	(V)	DC 48V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 110V, AC 220V				
Auxiliary contacts			4a4b, 10a10b				
Rated opening time		(sec)	≤ 0.04				
No-load closing time		(sec)	≤ 0.06				
Type test class	Mechanical		M2				
	Electrical		E2 (List3)				
	Capacitive current switching		C2				
Installation version	Drawout		K, H type	K, H type	K, H type	K type	H type
Phase distance		(mm)	210	210	210	254	275
Weight	Breaker (H type)	(kg)	240	240	240	280	280
	Cradle (H, type)	(kg)	235	235	235	250	250
Standards			IEC 62271-100:2012				

Vacuum Circuit Breakers

Susol VCB Series

VH-06/12/17

Type			VH-06□50□13/20/25/32				VH-12□50□13/20/25/32				VH-17□50□13/20/25/32			
Rated voltage		Ur (kV)	7.2				12				17.5			
Rated normal current		Ir (A)	1250	2000	2500	3150	1250	2000	2500	3150	1250	2000	2500	3150
Rated frequency		fr (Hz)	60											
Rated short-circuit current		Isc (kA)	50											
Rated short-time withstand current		Ik/tk (kA/s)	50/3											
Rated short-circuit breaking capacity		(MVA)	623				1039				1515			
Rated short-circuit making current		Ip (kA)	2.6×Isc (60Hz)											
Rated breaking time		(cycle)	3											
Rated withstand voltage	Power frequency (1 min)	Ud (kV)	20				28 (42) Note 1)				38			
	Impulse (1.2×50㎲)	Up (kV)	60				75 (82) Note 1)				95			
Rated operating sequence			O-0.3s-CO-3min-CO											
Control voltage	Closing coil	(V)	DC 48V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 110V, AC 220V											
	Trip coil	(V)	DC 48V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 110V, AC 220V											
Auxiliary contacts			4a4b, 10a10b											
Rated opening time		(sec)	≤ 0.04											
No-load closing time		(sec)	≤ 0.06											
Type test class	Mechanical		M2											
	Electrical		E2 (List3)											
	Capacitive current switching		C2											
Installation version	Fixed		P type											
	Drawout		H type (for MCSG)											
Phase distance		(mm)	210		275		210		275		210		275	
Weight	Breaker (H type)	(kg)	230		287	290	230		287	290	230		287	290
	Cradle (H, type)	(kg)	175		320	320	175		320	320	175		320	320
Standards			IEC 62271-100:2012, KERI/KEMA, V-check(KESCO)											

* H type is a box type cradle with CB compartment style structure.
Note) Contact us.

VH-06/12/17

Type			VH-06/12/17□40□40			VH-06/12/17□50□40		
Rated voltage		Ur (kV)	7.2	12	17.5	7.2	12	17.5
Rated normal current		Ir (A)	4000					
Rated frequency		fr (Hz)	50/60					
Rated short-circuit current		Isc (kA)	40			50		
Rated short-time withstand current		Ik/tk (kA/s)	40/4			50/4		
Rated short-circuit breaking capacity		(MVA)	499	831	1212	624	1040	1515
Rated short-circuit making current		Ip (kA)	104			130		
Rated short-circuit making current		(Cycle)	3					
Rated withstand voltage	Power frequency (1 min)	Ud (kV)	20	28 (42)	38	20	28 (42)	38
	Impulse (1.2×50㎲)	Up (kV)	60	75	95	60	75	95
Rated operating sequence			O-0.3s-CO-15s-CO					
Control voltage	Closing coil	(V)	DC 48V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 110V, AC 220V					
	Trip coil	(V)	DC 48V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 110V, AC 220V					
Auxiliary contacts			4a4b, 10a10b					
Rated opening time		(sec)	≤ 0.04					
No-load closing time		(sec)	≤ 0.06					
Type test class	Mechanical		M2					
	Electrical		E2 (List3)					
	Capacitive current switching		C2					
Installation version	Fixed		-	-	P type	-	-	P type
	Drawout		H type	H type	H type	H type	H type	H type
Phase distance		(mm)	275					
Weight	Breaker (H type)	(kg)	395					
	Cradle (H, type)	(kg)	200					
Standarde aplicate			IEC 62271-100:2012					

VH-06/12

Type			VH-06H40,50L50	VH-12H40,50L50
Rated voltage		Ur (kV)	7.2	12
Rated normal current		Ir (A)	5000	5000
Rated frequency		fr (Hz)	50/60	
Rated short-circuit current		Isc (kA)	40, 50	
Rated short-time withstand current		Ik/tk (kA/s)	50/4	
Rated short-circuit breaking capacity		(MVA)	624	1040
Rated short-circuit making current		Ip (kA)	2.5×Isc (50Hz)/2.6×Isc (60Hz)	
Rated breaking time		(Cycle)	3	
Rated withstand voltage	Power frequency (1 min)	Ud (kV)	20	20
	Impulse (1.2×50㎲)	Up (kV)	60	75
Rated operating sequence			O-0.3s-CO-3min-CO	
Control voltage	Closing coil	(V)	DC 48V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 110V, AC 220V	
	Trip coil	(V)	DC 48V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 110V, AC 220V	
Auxiliary contacts			4a4b, 10a10b	
Rated opening time		(sec)	≤ 0.04	
No-load closing time		(sec)	≤ 0.06	
Type test class	Mechanical		M2	
	Electrical		E2 (List3)	
	Capacitive current switching		C2	
Installation version	Fixed		P type	
	Drawout *		H type (for MESG)	
Phase distance		(mm)	320	
Weight	Breaker (P type, H type)	(kg)	430	
	Cradle (K type)	(kg)	200	
Standards			IEC 62271-100:2012	

VH-06/12

Type			VH-06□40, 50□04	VH-12□40, 50□04
Rated voltage		Ur (kV)	7.2	12
Rated normal current		Ir (A)	4000	4000
Rated frequency		fr (Hz)	50/60	
Rated short-circuit current		Isc (kA)	40, 50	
Rated short-time withstand current		Ik/tk (kA/s)	40/3, 50/3	
Rated short-circuit breaking capacity		(MVA)	499, 623	831, 1039
Rated short-circuit making current		Ip (kA)	2.5×Isc (50Hz)/2.6×Isc (60Hz)	
Rated breaking time		(Cycle)	3	
Rated withstand voltage	Power frequency (1 min)	Ud (kV)	20	28
	Impulse (1.2×50㎲)	Up (kV)	60	75
Rated operating sequence			O-0.3s-CO-3min-CO	
Control voltage	Closing coil	(V)	DC 48V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 110V, AC 220V	
	Trip coil	(V)	DC 48V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 110V, AC 220V	
Auxiliary contacts			4a4b, 10a10b	
Rated opening time		(sec)	≤ 0.04	
No-load closing time		(sec)	≤ 0.06	
Type test class	Mechanical		M2	
	Electrical		E2 (List1)	
	Capacitive current switching		C2	
Installation version	Fixed		P type	
	Drawout *		H type (for MESG), with K type Cradle	
Phase distance		(mm)	275	
Weight	Breaker (P type, H type)	(kg)	270, 318	
	Cradle (K type)	(kg)	315	
Standards			IEC 62271-100, KERI/KEMA, V-check(KESCO)	

* K type cradle drawable type provide a cradle for builting in the switchgear, not a box type for CB compartment. Ordering type is LVB.

Vacuum Circuit Breakers

Susol VCB Series

VH-20/25

Type			VH-20□25□25	VH-20□32□13/20/32			VH-20□40□13/20/32		
Rated voltage		Ur (kV)	24/25.8						
Rated normal current		Ir (A)	2500	1250	2000	3150	1250	2000	3150
Rated frequency		fr (Hz)	60						
Rated short-circuit current		Isc (kA)	25	31.5			40		
Rated short-time withstand current		Ik/tk (kA/s)	25/3	31.5/3			40/3		
Rated short-circuit breaking capacity		(MVA)	1039/1117	1309/1407			1662/1787		
Rated short-circuit making current		Ip (kA)	2.6 ×Isc (60Hz)						
Rated breaking time		(cycle)	3						
Rated withstand voltage	Power frequency (1 min)	Ud (kV)	50 (65) Note)						
	Impulse (1.2×50㎲)	Up (kV)	125						
Rated operating sequence			O-0.3s-CO-3min-CO						
Control voltage	Closing coil	(V)	DC 48V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 110V, AC 220V						
	Trip coil	(V)	DC 48V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 110V, AC 220V						
Auxiliary contacts			4a4b, 10a10b						
Rated opening time		(sec)	≤ 0.04						
No-load closing time		(sec)	≤ 0.06						
Type test class	Mechanical		M2						
	Electrical		E2 (List3)						
	Capacitive current switching		C2						
Installation version *	Fixed		P type						
	Drawout		H type (for MCSG)						
Phase distance **		(mm)	275	210 (275)	210 (275)	275	210 (275)	210 (275)	275
Weight	Breaker (H type)	(kg)	295	256 (273)	256 (273)	318	256 (273)	256 (273)	318
	Cradle (H type)	(kg)	316	257 (284)	257 (284)	316	257 (284)	257 (284)	316
Standards			IEC 62271-100 (2008), KERI/KEMA, V-check (KESCO)						

* H type is a box type cradle with CB compartment style structure. ** ( ) displays option of phase distance.
Note) Contact us.

VH-36

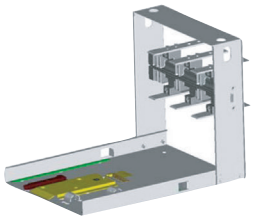
Type			VH-36□25□13/20/32			VH-36□32□13/20/32			VH-36□40□13/20/32		
Rated voltage		Ur (kV)	36								
Rated normal current		Ir (A)	1250	2000	3150	1250	2000	3150	1250	2000	3150
Rated frequency		fr (Hz)	50/60								
Rated short-circuit current		Isc (kA)	25			31.5			40		
Rated short-time withstand current		Ik/tk (kA/s)	25/3			31.5/3			40/3		
Rated short-circuit breaking capacity		(MVA)	1559			1964			2494		
Rated short-circuit making current		Ip (kA)	2.5 * Isc (50Hz)/2.6 * Isc (60Hz)								
Rated breaking time		(cycle)	3								
Rated withstand voltage	Power frequency (1 min)	Ud (kV)	70 (95) Note)								
	Impulse (1.2×50㎲)	Up (kV)	170								
Rated operating sequence			O-0.3s-CO-3min-CO								
Control voltage	Closing coil	(V)	DC 48V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 110V, AC 220V								
	Trip coil	(V)	DC 48V, DC 110V, DC 125V, DC 220~250V, AC 48V, AC 110V, AC 220V								
Auxiliary contacts			4a4b, 10a10b								
Rated opening time		(sec)	≤ 0.04								
No-load closing time		(sec)	≤ 0.06								
Type test class	Mechanical		M2								
	Electrical		E2 (List3)								
	Capacitive current switching		C2								
Installation version *	Fixed		P type								
	Drawout		H type (for MCSG)								
Phase distance		(mm)	300								
Weight	Breaker (H type)	(kg)	400	490		400	490		400	490	
	Cradle (H type)	(kg)	700	750		700	750		700	750	
Standards			IEC 62271-100 (2008), KERI/KEMA, V-check (KESCO)								

* H type is a box type cradle with CB compartment style structure.
Note) Contact us.

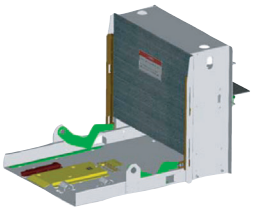
Accessories

Dimensions	Main	Cradle
	• Secondary trip coil • Under voltage trip release • Current trip coil • Position S/W • Keylock • Button padlock • Button cover • Mechanical position indicator	• Mechanical position indicator
	• Secondary trip coil • Under voltage trip release • Current trip coil • Position S/W • Keylock • Button padlock • Button cover • Plug interlock • Mechanical position indicator	• Earthing S/W • Earthing with electromechanical interlock • Earthing S/W with position S/W • Earthing S/W with keylock • Door interlock • MOC • TOC • Shutter padlock • Emergency mechanical trip device
	• Secondary trip coil • Under voltage trip release • Current trip coil • Position S/W • Keylock • Button padlock • Button cover • Plug interlock • Mechanical position indicator	• Earthing S/W • Earthing with electromechanical interlock • Earthing S/W with position S/W • Earthing S/W with keylock • Door interlock • MOC • TOC • Shutter padlock • Emergency mechanical trip device

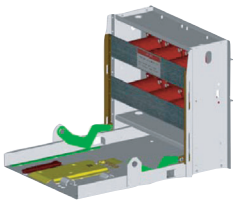
Various type of Cradle



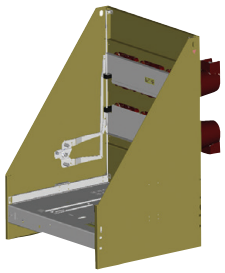
E type
- No Shutter
- For MESG



F type
- Insulation Shutter
- For MESG



G type
- Bushing
- Insulation Shutter
- For MESG



K type
- Bushing
- Closed Compartment structure
- For MCSG

H type
- Bushing
- Metal Insulation Shutter
- Closed Compartment structure
- Earthing Switch & Interlock
- For MCSG
- Door Interlock

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We open up a brighter future through
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Safety Instructions

- For your safety, please read user's manual thoroughly before operating.
- Contact the nearest authorized service facility for examination, repair, or adjustment.
- Please contact qualified service technician when you need maintenance.
  Do not disassemble or repair by yourself!
- Any maintenance and inspection shall be performed by the personnel having expertise concerned.

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Specifications in this catalog are subject to change without notice due to continuous product development and improvement.