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2020

Electric Products

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



LS ELECTRIC

Miniature Circuit Breakers

Page 4

- 1, 2, 3 and 4 pole series up to 125AF
- B, C and D Characteristics

Residual Current Circuit Breakers

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- 2 and 4 pole series up to 100AF
- Sensitivity up to 300mA
- Overcurrent protection type available

Surge Protective Device

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Contactors & Overload Relays

Page 16

Metasol series

- 3 and 4 pole series up to 2650AF Mini-contactors available
- AC/DC common use coil from 150AF
- Thermal (Bimetallic) and electronic type overload relays are available
- CE marked and UL approved

Mini Contactors

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Digital Motor Protection Relay

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Manual Motor Starters

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Molded Case Circuit Breakers

Page 30

Susol/Metasol series

- 2, 3 and 4 pole series up to 1600AF
- Rated ambient temperature at 40°C calibrated for 50°C available
- CE marked according to IEC standard and UL approved MCCBs are also available.

Earth Leakage Circuit Breakers

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Metasol series

- 2, 3 and 4 pole series up to 1200AF
- CE marked according to IEC standard



Air Circuit Breakers

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Susol/Metasol series

- 65, 85 and 150kA breaking capacity
- High functional digital trip relays
- CE marked and Marine classification

LS Final Distribution Boards

Page 52

LS SMDB Solution

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Vacuum Circuit Breakers

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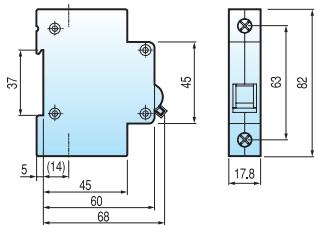
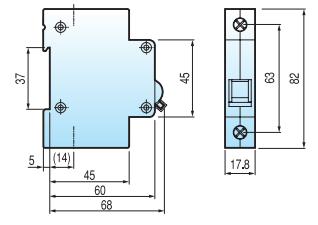
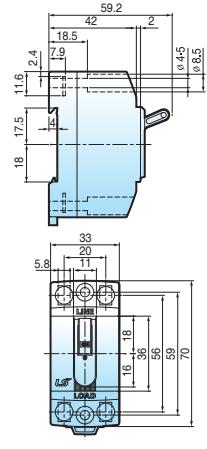
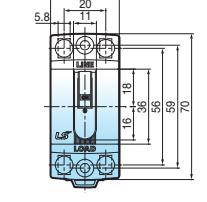
Susol series



Miniature Circuit Breakers

1, 2, 3 and 4pole series up to 125AF [IEC 60898-1, IEC 60947-2]



Type	MCB				
	BKN	BKN-c	BKN-b	BS32c	BS32d
Protection	Overload and short circuit		Overload and short circuit		Overload and short circuit
Rated current	1, 2, 3, 4, 6, 10, 13, 16, 20, 25, 32, 40, 50, 63A		1, 2, 3, 4, 6, 10, 16, 20, 25, 32, 40, 50, 63A	6, 10, 15, 20, 30A	10, 15, 20, 30A
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 1A ~ 63A 6kA at 230/400VAC	2~4pole 1A ~ 63A 6kA at 400VAC	1pole 1A ~ 63A 10kA at 240/415VAC	2~4pole 1A ~ 63A 10kA at 415VAC	2pole 1.5kA 2.5kA
Standard	IEC 60898-1		IEC 60898-1		IEC 60898-1, KS
Approval	CCC, SABS, SEMKO CB	SEMKO CB	KEMA CB, SABS, CE	CCC	-
Type of trip	Thermal magnetic release		Thermal magnetic release		-
Endurance	Electrical Mechanical	4,000 operations 10,000 operations	4,000 operations 10,000 operations	4,000 operations 10,000 operations	
Mount	On 35mm DIN rail		On 35mm DIN rail		DIN rail / Screw
Width	17.8mm per pole		17.8mm per pole		33mm per pole
Terminal	Lug type (Cable up to 25mm ²)	Dual type (Lug & Screw)	Lug type (Cable up to 25mm ²)		Screw clamp type (Cable up to 5.5mm ²)
Auxiliary switch, AX & AL 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 2.5mm ² 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 0.75~2.5mm ² 8.8mm wide		
Dimension	 		 		
Remarks	-				



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 230VAC	63A ~ 125A 10kA at 400VAC	3A ~ 32A 4.5kA at 230VAC	10A~100A 10kA at 240VAC 2.5kA at 415VAC	10A~100A 5kA at 240VAC 2.5kA at 415VAC	5A~50A 10kA at 230VAC	5A~50A 10kA at 400VAC				
IEC 60947-2		IEC 60898-1	IEC 60947-2		IEC 60947-2					
CCC, SEMKO CB, SABS, CE		CCC, SEMKO CB, 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	25mm per pole		25mm per pole					
Lug type (Cable up to 50mm ²)		Lug type (Cable up to 10mm ²)	Clamp type		Lug type (14-6 AWG.)					
<p>Technical drawing showing dimensions for the LS Electric BKH series circuit breaker. Top view: height 37mm, width 68mm, thickness 45mm. Side view: height 37mm, width 68mm, thickness 45mm. Bottom view: height 33mm, width 68mm, thickness 17.8mm.</p>										
<p>Technical drawing showing dimensions for the LS Electric BKP series circuit breaker. Top view: height 37mm, width 68mm, thickness 45mm. Side view: height 37mm, width 68mm, thickness 45mm. Bottom view: height 33mm, width 68mm, thickness 17.8mm.</p>										
<p>Technical drawing showing dimensions for the LS Electric BF-a series circuit breaker. Top view: height 37mm, width 68mm, thickness 45mm. Side view: height 37mm, width 68mm, thickness 45mm. Bottom view: height 33mm, width 68mm, thickness 17.8mm.</p>										
<p>Technical drawing showing dimensions for the LS Electric BFN series circuit breaker. Top view: height 37mm, width 68mm, thickness 45mm. Side view: height 37mm, width 68mm, thickness 45mm. Bottom view: height 33mm, width 68mm, thickness 17.8mm.</p>										
IEC 60947-2 (SABS)		-	-		-					

Residual Current Circuit Breakers

2 and 4 pole series up to 63AF



Type	RCBO					
	RKP	RKS	RKS-b	RKC	32KGRc	32KGRd
Protection	Ground fault and overcurrent		Ground fault and overcurrent		Ground fault and overcurrent	
Rated current	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)	
Rated residual current	-		-		-	
Operating, $I_{\Delta}n$	30, 100, 300mA (Non-adjustable)	30, 100mA (Non-adjustable)		10, 30mA (Non-adjustable)	15, 30mA (Non-adjustable)	
Non-operating, $I_{\Delta}no$	0.5 $I_{\Delta}n$	0.5 $I_{\Delta}n$		0.5 $I_{\Delta}n$	0.5 $I_{\Delta}n$	
Poles	1P+N	1P+N		1P+N	2pole	
Rated voltage	230VAC	230VAC	240VAC	240VAC	110/240VAC	
Residual current off-time	≤ 0.1 sec.	≤ 0.3 sec.		≤ 0.01 sec	≤ 0.03 sec	
Standard	IEC 61009	IEC 61009		IEC 61009	IEC 61009, KS	
Approval	CCC, SEMKO CB, CE, SABS	SEMKO CB, CE, SABS	SEMKO CB, CE	SEMKO CB, CE	CCC	
Type of trip	-	-		-	-	
Ground fault	Electronic	Electronic		Electronic	Electronic	
Overcurrent	Thermal-magnetic	Thermal-magnetic		Thermal-magnetic	Bimetallic	
Breaking capacity	4.5kA	10kA		6kA (32A 4.5kA)	1.5kA	2.5kA
Conditional short circuit capacity	-	-		-	-	
Endurance	Electrical Mechanical	4,000 operations 10,000 operations	4,000 operations 10,000 operations	4,000 operations 10,000 operations	4,000 operations 10,000 operations	
Mount	On 35mm DIN rail	On 35mm DIN rail		On 35mm DIN rail	On 35mm DIN rail / Screw	
Width	35.6mm	18mm		18mm	35mm	
Terminal	Lug type (Cable up to 10mm ²)	Lug type (Cable up to 10mm ²)		Lug type (Cable up to 10mm ²)	Screw clamp type (Cable up to 5.5mm ²)	
Type of operation	AC	AC		A/AC	-	
Dimension						

* 40, 50A are available only for RKS-b



RCCB				Isolator	
32GRhc	32GRhd	RKN	RKN-b	BKD	
Ground fault and overcurrent		Ground fault		-	
15, 20, 30A		25, 32, 40, 63A	63AF 25, 40, 63A	100AF 80, 100A	40, 50, 63, 80, 100, 125A
-		-	-	-	-
15, 30mA (Non-adjustable)		30, 100, 300mA (Non-adjustable)		-	
0.5I Δ n		0.5I Δ n		-	
2pole		1P+N, 3P+N		1p, 2p, 3p, 4p	
110/220VAC		240VAC (1P+N), 240/415V (3P+N)		230/400VAC	
≤ 0.03 sec		≤ 0.1 sec		-	
KS		IEC 61008		IEC 60947-3	
-		SEMKO CB, CE, SABS, CCC	SEMKO CB, CE, SABS	SABS, SEMKO CB	
-		-	-	-	
Electronic		Electro-magnetic		-	
Bimetallic		N.A		-	
1.5kA	2.5kA	6kA	10kA	-	
-		-	-	-	
4,000 operations		4,000 operations		1,500 operations (125A 1,000 operations)	
10,000 operations		10,000 operations		10,000 operations	
On 35mm DIN rail / Screw		On 35mm DIN rail		On 35mm DIN rail	
33mm		-		17.8mm per pole	
Screw clamp type (Cable up to 5.5mm ²)		Lug type (Cable up to 35mm ²)		Lug type (Cable up to 50mm ²)	
-		A/AC	A/AC	AC	
				-	

Surge Protective Device

BK Series

Din-rail type

Product description

The BK Series AC/DIN type surge protect protects a 50/60Hz electric system from surge voltages. Also, the system allows replacement of the protective element (MOV), ensuring convenience and economy. However, as only the protective module is provided, other components should be added when the system is installed in accordance with the site condition. When the protective device is activated (in an anomaly or an accident), the red lever in the status indicator protrudes.



Product rating <Uc: 385V

Item		AC Type						
		BK05S-T3	BK10S-T2	BK20S-T2	BK30S-T2	BK40S-T2	BK12S-T1 <small>Note4)</small>	
No. of poles	[Pole]	2, 4P	1, 1+N, 2, 3, 3+N, 4P					
Rated voltages	Un [V]	230/440V						
Max. continued-operation voltage	Uc [V]	-	385	385	385	385	385	
		N-PE		255	255	255	255	
Voltage protection level	Up [kV]	-	≤0.8	≤1.5	≤1.8	≤2.0	≤2.5	
		N-PE	-	≤1.0	≤1.2	≤1.5	≤2.0	
	Up [kV] <small>⑧</small>	-	≤2.0	≤1.5	≤1.8	-	≤2.5	
		N-PE	-	≤2.5	≤2.5	≤3.5	-	
Nominal discharge current	In [kA]		10	20	30	40	-	
Max. discharge current	I _{max} [kA]	-	20	40	60	80	-	
Impulse current	I _{imp} [kA]	-	-	-	-	-	12.5 (10/350)	
Open circuit voltage	U _{oc} [kV]	10	-	-	-	-	-	
Grades	Test class	Class III	Class II				Class I (Built-in type)	
Reaction time			< 25ns					
Status indication <small>Note2)</small>			Have Status indication					
Operating temperature range			-40°C~80°C					
Cross-sectional area of the connecting wires	6~16mm ²		6~32mm ²			16~32mm ²		
Accessories			AL <small>Note3)</small>				-	
Standard			IEC 61643-11 / KS C IEC 61643-11 / UL1449					
Certification	CE, UL, KS, S	CE, UL, KS, S	CE, UL, KS, S	CE, UL	CE, UL, KS, S	CE		

Note)

1. When the protective device is activated (in an anomaly or an accident) in products with Class II and III indication features, the red lever in the status indicator protrudes.
2. With a product with Class I indication feature, a green light will turn on when the protective device is in a normal condition. The green light will go off when the protective device is activated (for an anomaly or an accident.)
3. The AL contact accessories are not sole separately. You need to choose these accessories when you place your order for the product. Please be mindful of this fact when you place your order.
4. The Class I products are integrated with the MOVs, which cannot be detached.

Product description

The BK Series AC/DIN type surge protect protects a 50/60Hz electric system from surge voltages. Also, the system allows replacement of the protective element (MOV), ensuring convenience and economy. However, as only the protective module is provided, other components should be added when the system is installed in accordance with the site condition. When the protective device is activated (in an anomaly or an accident), the red lever in the status indicator protrudes.



Product rating <Uc: 460V>

Item		AC Type				
		BK10S-T2	BK20S-T2	BK30S-T2	BK40S-T2	
No. of poles		[Pole]			1, 1+N, 2, 3, 3+N, 4P	
Rated voltages		Un [V]			254/440V	
Max. continued-operation voltage	Uc [V]	-	460	460	460	
		N-PE	255	255	255	
Voltage protection level	Up [kV]	-	≤1.5	≤2.0	≤2.2	
		N-PE	≤1.0	≤1.2	≤1.5	
	Up [kV] ^③	-	-	-	-	
		N-PE	-	-	-	
Nominal discharge current		In [kA]	10	20	30	
Max. discharge current		I _{max} [kA]	20	40	60	
Impulse current		I _{imp} [kA]	-	-	-	
Open circuit voltage		U _{oc} [kV]	-	-	-	
Grades		Test class	Class II			
Reaction time			< 25ns			
Status indication ^{Note2)}			Have Status indication			
Operating temperature range			-40°C~80°C			
Cross-sectional area of the connecting wires			6~32mm ²			
Accessories			AL ^{Note3)}			
Standard			IEC 61643-11, UL1449			
Certification		CE, S	CE, S, UL	CE, S, UL	CE, S, UL	

Note)

- When the protective device is activated (in an anomaly or an accident) in products with Class II and III indication features, the red lever in the status indicator protrudes.
- With a product with Class I indication feature, a green light will turn on when the protective device is in a normal condition. The green light will go off when the protective device is activated (for an anomaly or an accident.)
- The AL contact accessories are not sole separately. You need to choose these accessories when you place your order for the product. Please be mindful of this fact when you place your order.



Surge Protective Device

BK Series

DC Din-rail type

Product description

The BK Series DC/DIN type surge protect protects a DC electric system from surge voltages. Also, the system allows replacement of the protective element (MOV), ensuring convenience and economy. However, as only the protective module is provided, other components should be added when the system is installed in accordance with the site condition. When the protective device is in a normal condition, the indication display will be green. The display will turn black when the protective device is activated (for an anomaly or an accident).



Product rating

Item	DC Type			
	BK20S-DC110	BK20S-DC600	BK20S-DC1000	BK20S-DC1500
No. of poles [Pole]	2P		3P	
Rated voltages Un [V]	DC110	DC600	DC1000	DC1500
Max. continued-operation voltage Uc [V]	DC220	DC700	DC1200	DC1500
Voltage protection level Up [kV]	≤1.0	≤2.5	≤3.9	≤4.5
Nominal discharge current In [kA]	20	20	20	20
Max. discharge current Imax [kA]	40	40	40	40
Impulse current Iimp [kA]	-	-	-	-
Grades	Test Class			
Reaction time	< 25ns			
Status indication	Have Status indication			
Operating temperature range	-40°C~80°C			
Cross-sectional area of the connecting wires	6mm ² or more			
Accessories	AL <small>Note1)</small>			
Standard	IEC 61643-11 / UL1449			
Certification	CE	CE, UL	CE, UL	CE
SPD Disconnector	MCCB	TD100 2P 32A	TD100 3P 32A	TD100 4P 32A TSD250N/H 4P 63A (Under development)
	MCB	BK63H-DC 2P 40A	BK63H-DC 3P 40A	BK63H-DC 4P 40A -

Note) 1. The AL contact accessories are not sole separately.

You need to choose these accessories when you place your order for the product.

Please be mindful of this fact when you place your order.



SD Series

SPD Disconnector

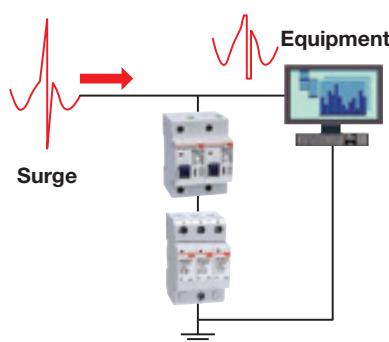
Product description

SPD Disconnector is a device that separates the SPD from the system during SPD failure and maintenance work. It has a trip function that can detect and cut off leakage current caused by SPD deterioration (varistor burnout, etc.) and has a high surge resistance to prevent the unintended trip operation of the Disconnector.



Product rating

Item	SD10-T2	SD20-T2	SD30-T2	SD40-T2	SD13-T1			
No. of poles	1, 2, 3, 4P							
Rated voltages Ue [V]	230/400V							
Rated insulation voltage Ui [V]	500V							
Voltage protection level Up [kV]	0.25kV	0.4kV	0.5kV	0.7kV	0.3kV			
Nominal discharge current In [kA]	10kA	20kA	30kA	40kA	-			
Max. discharge current Imax [kA]	20kA	40kA	60kA	80kA	-			
Impulse current limp [kA]	-	-	-	-	12.5kA			
Grades	Test Class	Class II, III	Class II					
Short circuit current Isc [kA]	25kA							
Frequency	50/60Hz							
Min. delay current It	3A (<10s)							
Min. instantaneous current li	5A (>0.1s), 10A(<0.1s)							
Protection degree	IP20							
Max. connection wire range	25mm ²							
AL connection wire range	1.5mm ²							
Operating temperature range	-25°C~60°C							
Ambient humidity	20%~90%							
Din-Rail	EN60715 (35mm)							



- Convenient SPD replacement
- High surge resistance
- Leakage current detection
- Prevent malfunctions in case of short circuit
- Easy installation using DIN rail

* AL available for SD20-T2 and SD-40T2

Surge Protective Device

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)

SPD Type	SPL (AC 110/220V)		SPL (AC 220V)	
	SPL3-20S	SPL2-40S	SPL2-80S	
Class	Class III		Class II	
Rated system	[Pole]	2W+G	2W+G	
Rated voltage, Un	AC [V]	110, 220	220	
Max. continuous operating voltage, Uc	AC [V]	275	385	
Voltage protection level, Up	[kV]	1.5	2.5	3.0
Operation voltage, Uoc	[kV/kA]	20/10	20	40
Nominal discharge current, In (8/20μs)	[kA, per mode]	-	40	80
Maximum discharge current, Imax (8/20μs)	[kA, per mode]	-	-	-
Response time, tA	[ns]	< 5 ns		< 5 ns
Operating temperature range	[°C]	-40 ~ +70°C		-40 ~ +70°C
Operating frequency	[Hz]	50/60 Hz		50/60 Hz
Mounting on		Screw		Screw
Operation status indication		Normal operation: Green, Abnormal/After an accident: Red		
Protection degree		IP20		IP20
Protection mode		L-N, N-PE (G), L-PE (G)		L-N, N-PE (G)
Ground		TN		TN
Certification		CE		KS, CE



Product rating

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

SPD Type	SPT (AC 220V)			
	SPT2-40S	SPT2-80S	SPT1-120S	SPT1-160S
Class	Class II		Class I, Class II	
Rated system	[Pole]	3W+G		
Rated voltage, Un	AC [V]	220		
Max. continuous operating voltage, Uc	AC [V]	385		
Voltage protection level, Up	[kV]	2.5	3.0	2.0
Nominal discharge current, In (8/20μs)	[kA, per mode]	20	40	-
Maximum discharge current, Imax (8/20μs)	[kA, per mode]	40	80	120
Lightning impulse current, limp (10/350μs)	[kA, per mode]	-	-	6.5
Response time, tA	[ns]		< 5 ns	
Operating temperature range	[°C]		-40 ~ +70°C	
Operating frequency	[Hz]		50/60 Hz	
Mounting on			Screw	
Operation status indication		Normal operation: Green, Abnormal/After an accident: Red		
Protection degree		IP20		
Protection mode		L-PE (G)		
Ground		TN		
Certification		KS, CE		

* SPT can not be used in Delta wiring grounding system



Product rating

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

SPD Type	SPT (AC 380V)						
	SPT2-40S	SPT2-80S	SPT1-120S	SPT1-160S			
Class	Class II		Class I, Class II				
Rated system	[Pole]		3W+G				
Rated voltage, Un	AC [V]	380					
Max. continuous operating voltage, Uc	AC [V]	385					
Voltage protection level, Up	[kV]	2.5	3.0	2.0			
Nominal discharge current, In (8/20μs)	[kA, per mode]	20	40	-			
Maximum discharge current, Imax (8/20μs)	[kA, per mode]	40	80	120			
Lightning impulse current, limp (10/350μs)	[kA, per mode]	-	-	6.5			
Response time, tA	[ns]	< 5 ns					
Operating temperature range	[°C]	-40 ~ +70°C					
Operating frequency	[Hz]	50/60 Hz					
Mounting on	Screw						
Operation status indication	Normal operation: Green, Abnormal/After an accident: Red						
Protection degree	IP20						
Protection mode	L-PE (G)						
Ground	TN						
Certification	KS, CE						

* SPT can not be used in Delta wiring grounding system



Product rating

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

SPD Type	SPT (AC 440V)						
	SPT2-40S	SPT2-80S	SPT1-120S	SPT1-160S			
Class	Class II		Class I, Class II				
Rated system	[Pole]		3W+G				
Rated voltage, Un	AC [V]	440					
Max. continuous operating voltage, Uc	AC [V]	385					
Voltage protection level, Up	[kV]	2.5	3.0	2.0			
Nominal discharge current, In (8/20μs)	[kA, per mode]	20	40	-			
Maximum discharge current, Imax (8/20μs)	[kA, per mode]	40	80	120			
Lightning impulse current, limp (10/350μs)	[kA, per mode]	-	-	6.5			
Response time, tA	[ns]	< 5 ns					
Operating temperature range	[°C]	-40 ~ +70°C					
Operating frequency	[Hz]	50/60 Hz					
Mounting on	Screw						
Operation status indication	Normal operation: Green, Abnormal/After an accident: Red						
Protection degree	IP20						
Protection mode	L-PE (G)						
Ground	TN						
Certification	KS, CE						

* SPT can not be used in Delta wiring grounding system

Surge Protective Device

SP Series Box type



Product rating

- Three phase 4W +G (SPY 127S)

SPD Type	SPY (AC 127/220V)								
	SPY2-40S	SPY2-80S	SPY1-120S	SPY1-160S	SPY1-200S *				
Class	Class II			Class I, Class II					
Rated system	[Pole]			4W+G					
Rated voltage, Un	AC [V]			127/220					
Max. continuous operating voltage, Uc	AC [V]			385					
Voltage protection level, Up	[kV]	2.5	3.0	2.0	2.0				
Nominal discharge current, In (8/20μs)	[kA, per mode]	20	40	-	-				
Maximum discharge current, Imax (8/20μs)	[kA, per mode]	40	80	120	160				
Lightning impulse current, limp (10/350μs)	[kA, per mode]	-	-	6.5	6.5				
Response time, tA	[ns]	< 5 ns							
Operating temperature range	[°C]	-40 ~ +70°C							
Operating frequency	[Hz]	50/60 Hz							
Mounting on	Screw								
Operation status indication	Normal operation: Green, Abnormal/After an accident: Red								
Protection degree	IP20								
Protection mode	L-N, N-PE (G)								
Ground	TN								
Certification	KS, CE								

* The wiring direction of SPY1-200S is located on the side. (Refer to external dimension)



Product rating

- Three phase 4W+G (SPY 220S)

SPD Type	SPY (AC 220/380V)								
	SPY2-40S	SPY2-80S	SPY1-120S	SPY1-160S	SPY1-200S *				
Class	Class II			Class I, Class II					
Rated system	[Pole]			4W+G					
Rated voltage, Un	AC [V]			220/380					
Max. continuous operating voltage, Uc	AC [V]			385					
Voltage protection level, Up	[kV]	2.5	3.0	2.0	2.0				
Nominal discharge current, In (8/20μs)	[kA, per mode]	20	40	-	-				
Maximum discharge current, Imax (8/20μs)	[kA, per mode]	40	80	120	160				
Lightning impulse current, limp (10/350μs)	[kA, per mode]	-	-	6.5	6.5				
Response time, tA	[ns]	< 5 ns							
Operating temperature range	[°C]	-40 ~ +70°C							
Operating frequency	[Hz]	50/60 Hz							
Mounting on	Screw								
Operation status indication	Normal operation: Green, Abnormal/After an accident: Red								
Protection degree	IP20								
Protection mode	L-N, N-PE (G)								
Ground	TN								
Certification	KS, CE								

* The wiring direction of SPY1-200S is located on the side. (Refer to external dimension)

Product rating

- limp 12.5kA Class I SPD



SPD Type	SPL1-13/50S	SPT1-13S	SPY1-13/50S
Class	Class I		
Rated system [Pole]	2W+G	3W+G	4W+G
Rated voltage, Un [V]	220	380	380/220
Max. continuous operating voltage, Uc [V]		320	
Voltage protection level, Up [kV]	L-N : 1.2, N-PE : 1.8	L-N : 1.2, N-PE : 1.8	L-N : 1.2, N-PE : 1.8
Nominal discharge current, In (8/20μs) [kA, per mode]	-	-	-
Maximum discharge current, Imax (8/20μs) [kA, per mode]	-	-	-
Lightning impulse current, limp (10/350μs) [kA, per mode]	12.5/50	12.5	12.5/50
Response time, tA [ns]		< 5 ns	
Operating temperature range [°C]		-40 ~ +70°C	
Operating frequency [Hz]		50/60 Hz	
Mounting on		Screw	
Operation status indication	Normal operation: Green, Abnormal/After an accident: Red		
Protection degree	IP20		
Protection mode	L-N, N-PE (G)	L-PE (G)	L-N, N-PE (G)
Ground		TN/TT/IT	
Certification		KS, CE	

* SPT can not be used in Delta wiring grounding system

Product rating

- limp 25kA Class I SPD



SPD Type	SPL1-25/50S	SPT1-25S	SPY1-25/100S
Class	Class I		
Rated system [Pole]	2W+G	3W+G	4W+G
Rated voltage, Un [V]	220	380	380/220
Max. continuous operating voltage, Uc [V]		320	
Voltage protection level, Up [kV]	L-N : 1.3, N-PE : 2.0	L-N : 1.3, N-PE : 2.0	L-N : 1.3, N-PE : 2.0
Nominal discharge current, In (8/20μs) [kA, per mode]	-	-	-
Maximum discharge current, Imax (8/20μs) [kA, per mode]	-	-	-
Lightning impulse current, limp (10/350μs) [kA, per mode]	25/50	25	25/100
Response time, tA [ns]		< 5 ns	
Operating temperature range [°C]		-40 ~ +70°C	
Operating frequency [Hz]		50/60 Hz	
Mounting on		Screw	
Operation status indication	Normal operation: Green, Abnormal/After an accident: Red		
Protection degree	IP20		
Protection mode	N-PE (G)	L-PE (G)	L-N, N-PE (G)
Ground		TN/TT/IT	
Certification		KS, CE	

* SPT can not be used in Delta wiring grounding system

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		●	●	●	●	●	●	●	●
Lug 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 AC-3 200/240V	A kW	25 2.2	25 2.5	25 3.5	32 4.5	25 2.5	27 3.5	32 4.5
		A	9	11	13	18	11	13	18
	380/440V	kW A	3 7	4 9	5.5 12	7.5 18	4 9	5.5 12	7.5 18
	500/550V	kW A	3 6	4 7	7.5 12	7.5 13	7 12	7.5 13	11 20
	690V	kW A	3 4	4 5	7.5 9	7.5 9	4 6	7.5 9	7.5 9
	1000V	kW A	-	-	-	-	-	-	-
Rated Short-time withstand current (IEC 60947)	1s	A	210	250	280	300	250	280	300
	10s	A	105	110	120	130	110	120	154
	30s	A	70	70	80	85	70	80	100
	1min	A	61	61	61	70	61	61	90
	3min	A	40	45	47	50	45	50	60
	10min	A	30	30	30	40	30	30	50
	≥15min	A	25	26	28	30	26	28	30
UL rating (50/60Hz)	Continuous current	A	25	25	25	32	25	25	40
	Single phase	110~120V HP	0.5	0.5	0.75	1	0.5	0.75	1
		220~240V HP	1.5	1.5	2	3	1.5	2	3
		200~208V HP	2	2	3	7.5	2	3	7.5
	Three phase	220~240V HP	3	3	5	7.5	3	5	7.5
		440~480V HP	5	5	7.5	10	5	7.5	10
		550~600V HP	7.5	7.5	10	15	7.5	10	15
	NEMA size		00	00	0	1	00	0	1
Size and weight	AC control	Weight kg			0.33				0.34
	H	Size(W×H×D) mm			45×73.5×80.4				45×73.5×87.4
	DC control	Weight kg			0.4				0.41
	I-w-D	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

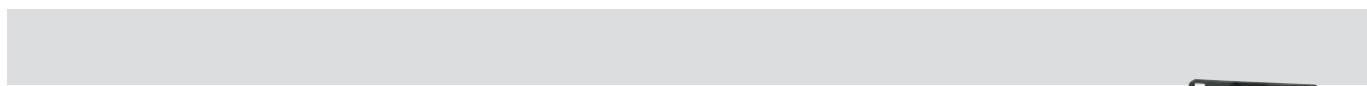
Note) Minimum conduct current of Auxiliary contactor is DC 17V 5mA.



MT type Thermal Overload Relays

Type		MT-12/□	MT-32/□
Screws clamp terminals		●	●
Lug 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		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	3pole	
1000V		1000V		1000V		1000V	1000V	
1000V		1000V		1000V		1000V	1000V	
50/60Hz		50/60Hz		50/60Hz		50/60Hz	50/60Hz	
8kV		8kV		8kV		8kV	8kV	
1800 operations per hour		1800 operations per hour		1800 operations per hour		1800 operations per hour	1200 operations per hour	
12 mil. operations		12 mil. operations		12 mil. operations		12 mil. operations	5 mil. operations	
2 mil. operations		2 mil. operations		2 mil. operations		1 mil. operations	4 mil. operations	
55	60	100	115	125	135	160	200	250
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	50	50
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	96	114	150	160	175	280
50	60	70	100	110	135	160	200	250
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				
69×83×90		79×106×119		94×140×135.8			2.4	
0.77		1.3		2.8			119×158×130.3	
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	●	●	●	●	●	●		
Lug clamp terminals	-	-	-	-	-	-		
Number of poles		3pole		3pole				
Rated operational voltage, Ue		1000V		1000V				
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 and power	AC-1, Thermal current	A	300	350	400	500	520	
	AC-3 200/240V	kW	55	75	80	90	125	
		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 withstand current (IEC 60947)	1s	A	2000	2500	3500	4000	4600	
	10s	A	1500	1700	2400	3000	4400	
	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 (50/60Hz)	Continuous current	A	300	350	400	500	520	
	Single phase	110~120V	HP	15	15	-	-	
		220~240V	HP	30	40	-	-	
		200~208V	HP	60	60	75	100	125
	Three phase	220~240V	HP	60	75	100	100	150
		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		
	H	Size(W×H×D) mm	138×203×185.1			163×243×204.4		
	DC control	Weight kg						
	I-w	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	Screws clamp terminals	MT-225/□	MT-400/□
Lug 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	2650AF			
MC-500a	MC-630a	MC-800a	MC-1260a	MC-1400a	MC-1700a	MC-2100a	MC-2650a
●	●	●	●	●	●	●	●
-	-	-	-	-	-	-	-
3pole			3pole			3pole	
1000V			1000V			1000V	
1000V			1000V			1000V	
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		0.3 mil. operations
0.5 mil. operations			0.05 mil. operations		0.05 mil. operations		0.02 mil. operations
700	900	1050	1260	1400	1700	2100	2650
147	190	220	-	290	310	-	-
500	630	800	-	860	1050	-	-
265	330	440	-	550	700	900	-
500	630	800	-	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	10000
4400	4500	4900	5200	-	-	-	-
3400	3500	3800	4000	4500	5500	5500	5500
2000	2200	2500	2300	-	-	-	-
1400	1550	1550	3000	2600	3000	3000	3000
1100	1300	1300	1500	-	-	-	-
700	900	1050	1260	1400	1700	2100	2650
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
150	200	200					
200	250	300					
400	500	600					
400	500	600					
6		7					
22.2			24	33.8		47	
285×310×246			285×352×246	431×380×246		431×392×246	

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

Metasol MC 4P 18 to 85A

MC type Magnetic Contactors



Frame size		18AF						
Type	Screw clamp terminal	MC-6a/4	MC-9a/4	MC-12a/4	MC-18a/4			
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 Power	AC-1 200/240V kW	9	9	9	15			
	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			
	Three 200~208V HP	2	2	3	7.5			
	Phase 220~240V HP	3	3	5	7.5			
	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					
	DC Control	Size(W×H×D) mm	45×73.5×80.4					
	AC Control	Weight kg	0.4					
	DC Control	Size(W×H×D) mm	45×73.5×96.6					
Auxiliary(standard)		-						
Auxiliary	Side Mount	UA-1						
	Front Mount	UA-2, UA-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		
UA-2, UA-4	UA-2, UA-4			UA-2, UA-4		

Contactors

Metasol MC 4P 225 to 800A

MC type Magnetic Contactors



Frame size		225AF					
Type	Screw clamp terminal	MC-100a/4	MC-130a/4	MC-150a/4	MC-185a/4	MC-225a/4	
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 and Power	Thermal current AC-1	A	200	250	275	300	350
	200/240V	kW	57	60	76	87	100
	A		200	250	275	300	350
	380/400V	kW	106	110	142	165	185
	A		200	250	275	300	350
	500/550V	kW	132	137	180	205	230
	A		200	250	275	300	350
	690V	kW	165	170	225	255	290
	A		200	250	275	300	350
UL rating (50/60Hz)	Continuous current Single	A	200	250	275	300	350
	Phase	HP	7.5	10	15	15	15
	Three	HP	15	20	25	30	40
	Phase	HP	30	40	40	60	60
	440~480V	HP	30	40	50	60	75
	550~600V	HP	60	75	100	125	150
			60	75	100	125	150
Size and weight	AC Control	Weight Size(W×H×D)	kg mm				
	DC Control	Weight Size(W×H×D)	kg 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			800AF		
MC-265a/4	MC-330a/4	MC-400a/4	MC-500a/4	MC-630a/4	MC-800a/4
•	•	•	•	•	•
4pole				4pole	
690V				690V	
1000V				1000V	
50/60Hz				50/60Hz	
8kV				8kV	
1200 operations per hour				1200 operations per hour	
2.5 mil. operations				2.5 mil. operations	
0.5 mil. operations				0.5 mil. operations	
400	500	520	700	900	1050
115	135	160	245	255	310
400	500	520	700	900	1050
215	250	300	450	470	570
400	500	520	700	900	1050
265	315	375	560	590	710
400	500	520	700	900	1050
335	390	470	710	740	900
400	500	520	700	900	1050
400	500	520	700	900	1050
-	-	-	-	-	-
-	-	-	-	-	-
75	100	125	150	200	200
100	125	150	200	250	300
200	200	300	400	500	600 *
200	200	300	400	500	600 **
9.9			26.3		
206×243×205			346×310 ×244		

2NO2NC	2NO2NC
AU-100	AU-100
-	-

Contactors

Metasol MC 3P 1260 to 2650A



Renewable Magnetic Contactor

- Eco-friendly contact material applied (Cd free)
- Type 2 coordination data with MCCB or ACB

Frame size		1260AF		
Type		MCi-900	MCi-1050	MCi-1260
Screw clamp terminals			●	
Number of poles	pole		3	
Rated operational voltage (Ue)	Vac		1000	
Rated insulation voltage (Ui)	Vac		1000	
Rated frequency	Hz		50/60	
Rated impulse withstand voltage (Uimp)	kV		8	
Mechanical operating cycle	cycles/hour	600	600	300
Electrical operating cycle	cycles/hour	600	600	300
Durability	Mechanical	million	100	50
	Electrical (AC-1@690V)	million	26	15
	Electrical (AC-1@400V)	million	50	20
Current and Power	AC-1 1000V 55/60/70°C	A	900/850/700	1050/875/720
(IEC)	Thermal current	A	900	1050
	Heat dissipation	W	100	170
Rated Short-time withstand current((Icw)	1s	A	7000	7500
(IEC 60947)	10s	A	6400	7000
	1min	A	3500	3800
	10min	A	1550	1550
max. breaking capacity	400V	A	6000	7500
(Icd)	690V	A	5000	7000
	1000V	A	2000	2500
Type-2 Coordination (with MCCB or ACB)	kA	42kA (Break time: less than 20ms)		
Current and HP	Thermal current		900	1050
(UL)	Single phase 110~120V	HP	-	-
	220~240V	HP	-	-
	Three phase 200~208V	HP	200	200
	220~240V	HP	250	300
	440~480V	HP	500	600
	550~600V	HP	500	600
Weight (kg)		22.2	22.2	25
Size (W×H×D)	mm	285×310×246	285×310×246	285×352×246
Auxiliary(standard)		2NO2NC		
Auxiliary	Side Mount	AU-100, AU-100E (max.4NO4NC)		
	Front Mount	-		



2650AF

MCI-1700	MCI-2100	MCI-2650
•	•	
3		
1000		
1000		
50/60		
8		
300		
300	300	120
50	50	30
5	5	2
5	5	5
1700/1450/1300	2100/1750/1500	2650/2350/2150
1700	2100	2650
220	350	350
	12000	
	10000	
	5500	
	3000	
9000	12000	1200
8000	8500	8500
3000	3150	3150
42kA (Break time: less than 50ms)		
1700	2100	2650
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
34.6	34.6	47
431×380×246	431×380×246	431×392×246

2NO2NC

AU-100, AU-100E (max.4NO4NC)

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
AC1		20		20	
AC3	200/240V	1.5	7	2.2	9
	380/440V	2.2	6	4	9
	500/550V	3	5	3.7	6
	690V	3	4	4	5
Ratings / UL508		hp	A	hp	A
continuous current		I _{th} = 20A (maximum for cage clamp type is 10A)			
single phase	120V	1/2		1 *	-
	230V/240V	1		2 **	-
three phase	240V	1.5		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



DMPi

Rated specifications

Connection method		Penetrated / Terminal type
Protection functions		Overcurrent, phase fail, phase unbalance, stall, locked rotor, reverse phase, ground fault (Type option) Instance (Type option)
Connection method		Penetrated / Terminal type
Operating time characteristics		Thermal heat build-up inverse time / Non-thermal heat build-up inverse time / Definite time
Rated current		0.5~6A/5~65A(Rating option upon placing an order)
Display		4 digit, 7-Segment
Operating power		AC/DC 85~260V(50Hz/60Hz)
Reset method	Automatic	1~20min (only for overcurrent)
	Manual	(Electrical reset)
Installation / Mounting method		Display can be installed separately, 35mm DIN rail / Screw installation
Tolerance	Current	±3%
	Time	±5%
	4~20mA output	±5%
Time setting	Startup delay	1~200sec
	Operation delay	1~60sec
Aux. contact	Composition	3-SPST(Power supply 1a1b, instantaneous operation 1a) <small>Note1)</small>
	Capacity	3A/250VAC Resistive Load
	Contact minimum load	100mA / 6VDC : (95-996, 97-98) 10mA / 5VDC (07-08)
ZCT Input	External	200mA/100mV(Exclusive ZCT) <small>Note2)</small>
	Built-in	Support (Separate connection unnecessary) <small>Note2)</small>
Service environment	Service temperature	-20°C ~ 60°C
	Storage temperature	-30°C ~ 70°C
	Relative humidity	Below 50% RH (Without condensation)
Insulation resistance		100MΩ/500VDC
Lightning impulse voltage		1.2X50us 5kV Prototype waveform supply
Fast transient		2kV/1Min
Power consumption		Below 2W

Note) 1. See No. 21 to 23 of A-Group in Setting menu If single phase is set, the device measures R/S/T phase. In HMI, the maximum phase of three phases is displayed without any indication of phase.

2. It is used when zero current detection type is selected.

3. This product is used to protect a low-voltage motor with 1000V or less

Manual Motor Starters

Quick selection table ... IEC rating





Molded Case Circuit Breakers

Susol MCCB 100AF to 800AF Series

Frame Size (AF)			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, 60, 63, 80, 100		100, 125, 160, 1P: 16~160				
No. of poles		3,4	3,4	2*, 3, 4		1, 2*, 3, 4				
Rated operational voltage, Ue	AC [V] DC [V]	690 500	690 500	690 500		690, 1P; 240 500, 1P:250				
Rated impulse withstand voltage, Uimp	[kV]	8	8	8		8				
Rated insulation voltage,Ui	[V]	750	750	1000		1000				
Rated ultimate short-circuit breaking capacity, Icu		S 50 37 25 18 -	N 85 50 37 25 18 -	S 50 37 25 18 -	N 85 50 37 25 18 -	H 100 85 70 50 35 22	L 200 150 130 65 50 35	N 85 50 37 25 18 -	H 100 42 100 42 100 42	L 200 85 70 50 35 50
AC 50/60Hz	220/240V 380/415V 440/460V 480/500V 525V 660/690V	[kA]								
DC	250V 500V (2poles in series)	[kA]								
Rated service breaking capacity, Ics		100% - 100%	100% - 100%	100% - 100%	100% 5 100%	100% 5 100%	100% 5 100%	100% 5 100%	100% 5 100%	
AC 50/60Hz	220~525V 660/690V	[%Icu] [kA]	[%Icu] [kA]	[%Icu] [kA]	[%Icu] 5 100%	[%Icu] 5 100%	[%Icu] 5 100%	[%Icu] 5 100%	[%Icu] 5 100%	
DC		[%Icu]								
Rated short-circuit making capacity Icm		A 105 77.7 52.5 36 -	A 187 105 77.7 52.5 36 -	A 105 105 105 63 46 17	A 187 330 154 105 74 17	A 440 286 143 63 105 17	A 187 105 105 63 46 17	A 220 154 105 105 74 17	A 440 286 143 105 74 17	
Category of utilization		A	A	A	A	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 plug-in	front-connection rear-connection front-connection rear-connection								
Mechanical life		[operations]	25000	25000	25000	25000	25000	25000	25000	
Electrical life @ 415 V AC		[operations]	10000	10000	10000	10000	10000	10000	10000	
Basic dimensions, WxHxD (front connection)	1-pole 3-pole 4-pole	[mm] [mm] [mm]	- 76x130x82 101x130x82	- 76x130x82 101x130x82	- 90x140x86 120x140x86	- 90x140x86 120x140x86	- 90x140x86 120x140x86	- 35x140x86	- 35x140x86	
Weight (front connection)	1-pole 3-pole 4-pole	[kg] [kg] [kg]	- 1.05 1.35	- 1.05 1.35	- 1.5 1.8	- 1.5 1.8	- 1.5 1.8	- 0.57	- 0.57	
Reference standard			IEC60947-2							

Note) ● applicable or available

* Applicable to MCCBs equipped with FTU, FMU, ATU ** Not applicable to 1pole
* 2 pole MCCB in 3pole frame size

※ The trip unit ATU is available from 125A



	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



Frame Size (AF)		TS1000		TS1250		TS1600	
Type		TS1000		TS1250		TS1600	
Ampere frame		1000		1250		1600	
Pole		3, 4		3, 4		3, 4	
Rated current, In(A)	-5~40°C	800, 1000		1250		1600	
	50°C	800, 1000		1250		1560	
	65°C	800, 1000		1240		1420	
Rated insulation voltage, Ui (V)		1000		1000		1000	
Rated impulse withstand voltage, Uimp (kV)		8		8		8	
Rated operational voltage, Ue (V)	AC50/60Hz	690		690		690	
	DC	-		-		-	
Rated short-circuit breaking capacity IEC60947-2 AC50/60Hz (sym)		N	H	L	N	H	N
Rated ultimate short-circuit breaking capacity, (kA) (Icu)	220/240V	55	75	200	55	75	55
	380/415V	50	70	150	50	70	50
	440/460V	50	65	130	50	65	50
	480/500V	40	50	100	40	50	40
	660/690V	35	45	-	35	45	35
	DC	250V 2P	-	-	-	-	-
		500V 2P	-	-	-	-	-
		750V 3P	-	-	-	-	-
Rated service breaking capacity (Ics)	%Icu	100%	75%	100%	100%	75%	100%
Rated short-circuit making capacity (Icw)	AC50/60Hz 1s	25		12	25		25
	3s	-		-	-		-
Overriding instantaneous protection	kA peak	50		30	50		50
Isolation		O			O		O
Category		B	A		B		B
Mechanical life (operations)				10000	4000	10000	10000
(Life cycle)	Electrical life (operations)	440V	In/2	6000	4000	5000	5000
			In	5000	3000	4000	2000
		690V	In/2	4000	3000	3000	2000
			In	2000	2000	2000	1000
Pollution degree		3		3	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	<ul style="list-style-type: none"> • L / S / I / G / Thermal 	<ul style="list-style-type: none"> • L / S / I / G / Thermal • ZSI(Protective coordination) 	<ul style="list-style-type: none"> • L / S / I / G / Thermal(Continuous) • ZSI(Protective coordination) 	• P type
Other protection	-	<ul style="list-style-type: none"> • Earth leakage (Option) 	<ul style="list-style-type: none"> • Earth leakage(Option) • Over/Under current • Over/Under frequency • Unbalance(Voltage/Current) • Reverse power 	• P type
Measurement function	-	<ul style="list-style-type: none"> • Current (R / S / T / N) 	<ul style="list-style-type: none"> • 3 Phase Voltage/Current RMS/Vector • Power(P, Q, S), PF(3-Phase) • Energy(Positive/Negative) • Frequency, Demand 	<ul style="list-style-type: none"> • 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	-	-	<ul style="list-style-type: none"> • Fine adjustment for long/short time delay/Instantaneous/ ground 	• P type
Pre Trip Alarm	-	-	<ul style="list-style-type: none"> • Overload protection relays : DO (Alarm) (Ground fault is not available when using Pre trip alarm) 	• P type
Digital Output	-	<ul style="list-style-type: none"> • 3DO (Fixed) • L, S/I, G Alarm 	<ul style="list-style-type: none"> • 3DO (Programmable) • Trip, Alarm, General 	• P type
IDMTL setting	-	-	<ul style="list-style-type: none"> • Compliance with IEC60255-3 SIT, VIT, EIT, DT 	• P type
Communication	-	<ul style="list-style-type: none"> • Modbus/RS-485 • Profibus-DP 	<ul style="list-style-type: none"> • Modbus / RS-485 • Profibus-DP 	<ul style="list-style-type: none"> • Modbus / RS-485 • Profibus-DP
Power supply	<ul style="list-style-type: none"> • Self Power - Power source works over 25% of current of In (one pole) 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • AC/DC 100~250V • DC 24~60V * Basic protection function (L / S / I / G) is still under normal operation without control power. 	<ul style="list-style-type: none"> • AC/DC 100~250V • DC 24~60V * Basic protection function (L / S / I / G) is still under normal operation without control power.
RTC timer	<ul style="list-style-type: none"> • Available 	<ul style="list-style-type: none"> • Available 	<ul style="list-style-type: none"> • Available 	<ul style="list-style-type: none"> • Available
LED for trip info.	<ul style="list-style-type: none"> • Long time delay • Short time delay/Instantaneous • Ground fault 	<ul style="list-style-type: none"> • N type 	<ul style="list-style-type: none"> • N type 	<ul style="list-style-type: none"> • N type
Fault recording	-	<ul style="list-style-type: none"> • 10 records (Fault/Current/Date and Time) 	<ul style="list-style-type: none"> • 256 records (Fault/Current/Date and Time) 	<ul style="list-style-type: none"> • 256 records • Last fault wave recording (3 Phase)
Event recording	-	-	<ul style="list-style-type: none"> • 256 records(Content, Status, Date) 	<ul style="list-style-type: none"> • P type
Operating button	<ul style="list-style-type: none"> • Reset button 	<ul style="list-style-type: none"> • Reset, Menu Up/Down, Left/Right, Enter 	<ul style="list-style-type: none"> • A type 	<ul style="list-style-type: none"> • 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)	1000	1000	1000	1000	1000	1000
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 (Number of operations)	Mechanical	25,000	25,000	25,000	25,000	25,000	25,000
	Electrical	10,000	10,000	10,000	10,000	10,000	10,000
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

3. The Ics(service breaking capacity) of ABN100e, ABL125/250AF are in ()



100		125			250				
N-Type		S-Type	H-Type	L-Type	N-Type	S-Type	H-Type	L-Type	
ABN102c	ABN102e	ABS102c	ABH102c	ABL102c	ABN202c	ABS202c	ABH202c	ABL202c	
ABN103c	ABN103e	ABS103c	ABH103c	ABL103c	ABN203c	ABS203c	ABH203c	ABL203c	
ABN104c	ABN104e	ABS104c	ABH104c	ABL104c	ABN204c	ABS204c	ABH204c	ABL204c	
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	690	690	690
500		500	500	500	500	500	500	500	500
1000		1000	1000	1000	1000	1000	1000	1000	1000
8		8	8	8	8	8	8	8	8
5	7.5 (5)	8	10	10 (10)	8	8	10	10 (10)	
10	14 (10)	25	35	35 (35)	18	26	35	35 (35)	
18	31 (18)	37	50	60 (50)	26	37	50	60 (50)	
22	31 (22)	42	50	60 (50)	30	42	50	60 (50)	
35	50 (35)	85	100	100 (100)	65	85	100	100 (100)	
10	15 (10)	20	30	30 (30)	10	20	30	30 (30)	
10	15 (10)	20	30	30 (30)	10	20	30	30 (30)	
100	()	100	100	()	100	100	100	()	
A	A	A	A	A	A	A	A	A	
25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	
10,000	10,000	10,000	10,000	10,000	5,000	5,000	5,000	5,000	
fixed	fixed	fixed	fixed	fixed	fixed	fixed	fixed	fixed	
-	-	-	-	-	-	-	-	-	
▲	▲	▲	▲	▲	▲	▲	▲	▲	
●	●	●	●	●	●	●	●	●	
●	●	●	●	●	●	●	●	●	
●	●	●	●	●	●	●	●	●	
●	●	●	●	●	●	●	●	●	
●	●	●	●	●	●	●	●	●	
●	●	●	●	●	●	●	●	●	
●	●	●	●	●	●	●	●	●	
●	●	●	●	●	●	●	●	●	
●	●	●	●	●	●	●	●	●	
●	●	●	●	●	●	●	●	●	
●	●	●	●	●	●	●	●	●	
75×130×60		90×155×60			105×165×60				
0.5	0.5	0.7	0.7	0.7	1.1	1.1	1.1	1.1	
0.7	0.7	1	1	1	1.2	1.2	1.2	1.2	
0.9	0.9	1.2	1.2	1.2	1.6	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) DC(V)	690 500	690 500	690 500	690 500
Rated insulation voltage, Ui	(V)	1000	1000	1000	1000
Rated impulse withstand voltage, Uimp	(kV)	8	8	8	8
Rated short-circuit breaking capacity(lcu) 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(%lcu), lcs		100	100	100	75
Category of use		A	A	A	A
Endurance (Number of operations)	Mechanical Electrical	4,000 1,000	4,000 1,000	4,000 1,000	4,000 1,000
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	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	-	-	-	-	-	
1000	1000	1000	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	
2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	
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%

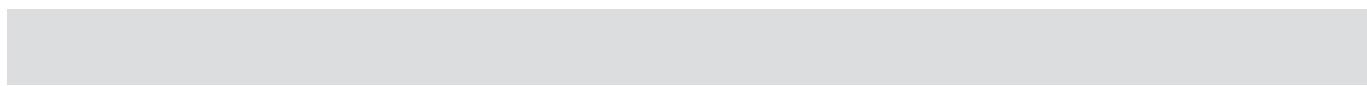
Earth Leakage Circuit Breakers

Metasol 30AF to 250AF Series

Frame Size (AF)		30	50		
Type		S-Type	N-Type	S-Type	H-Type
Type and pole	2-pole	EBS32c	EBN52c	-	-
	3-pole	EBS33c	EBN53c	EBS53c	EBH53c
	4-pole	EBS34c	-	EBS54c	EBH54c
Protective function		Overload, Short-circuit and ground fault	Overload, Short-circuit and ground fault		Overload, Short-circuit and ground fault
Rated current, In	(A)	(5, 10) ^{Note 2)} , 15, 20, 30	15, 20, 30, 40, 50		15, 20, 30, 40, 50
Rated impulse withstand voltage, Uimp	(kV)	6	6		6
Instantaneous type	Rated residual current, IΔn	(mA)	30, 100, 100/200/500 100/300/500	30, 100, 100/200/500, 100/300/500 (Adjustable)	30, 100, 100/200/500 100/300/500
	Residual current off-time at IΔn	sec	≤ 0.1	≤ 0.1	≤ 0.1
	Rated operational voltage, Ue	AC (V)	220/460	220/460	220/460
Time delay type	Rated residual current	1A	0.1/0.2/0.5/1	0.1/0.2/0.5/1	0.1/0.2/0.5/1
	Intentional time delay	1s	0/0.2/0.5/1	0/0.2/0.5/1	0/0.2/0.5/1
	Rated residual current	2A	0.1/0.4/1/2	0.1/0.4/1/2	0.1/0.4/1/2
	Intentional time delay	2s	0.5/1/1.5/2	0.5/1/1.5/2	0.5/1/1.5/2
Rated short-circuit breaking capacity (Icu) kA (Sym), KSC8321, IEC 60947-2					
AC	460V	14 (10)	14	18	50
	415V	14 (10)	14	18	50
	220/250V	30 (25)	30	35	100
Service breaking capacity(%Icu), Ics		100	100	100	100
Category of use		A	A	A	A
Endurance	Mechanical	25,000	25,000	25,000	25,000
(Number of operations)	Electrical	10,000	10,000	10,000	10,000
Type of trip unit					
Overcurrent pick-up		Thermal-magnetic	Thermal-magnetic		
Earth leakage pick-up		Electronic	Electronic		
Accessories					
Electrical auxiliaries	Auxiliary switch	●	●	●	●
	Alarm switch	●	●	●	●
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)	●	●	●	●
	Pad handle lock	●	●	●	●
Dimensions (mm)	WxHxD (3P)	75×130×60	75×130×60		90×155×60
Weight(kg)	2 pole	-	0.5	-	-
	3 pole	0.7	0.7	0.7	1
	4 pole	0.9	-	0.9	1.2

Note) 1. ● applicable or available

2. The short-circuit breaking capacities in () are applied to the rated current in (5, 10A)



60		100	125		250		
N-Type	S-Type	N-Type	S-Type	H-Type	N-Type	S-Type	H-Type
-	-	EBN102c	-	-	EBN202c	-	-
EBN63c	EBS63c	EBN103c	EBS103c	EBH103c	EBN203c	EBS203c	EBH203c
-	EBS64c	EBN104c	EBS104c	EBH104c	-	EBS204c	EBH204c
Overload, Short-circuit and ground fault		Overload, Short-circuit and ground fault	Overload, Short-circuit and ground fault		Overload, Short-circuit and ground fault		
60		60, 75, 100	15, 20, 30, 40, 50, 60, 75, 100, 125		100, 125, 150, 175, 200, 225, 250		
6		6	6		6		
30, 100, 100/200/500, 100/300/500		30, 100, 100/200/500, 100/300/500	30, 100, 100/200/500, 100/300/500		30, 100, 100/200/500, 100/300/500		
≤ 0.1		≤ 0.1	≤ 0.1		≤ 0.1		
220/460		220/460	220/460		220/460		
0.1/0.2/0.5/1		0.1/0.2/0.5/1	0.1/0.2/0.5/1		0.1/0.2/0.5/1		
0/0.2/0.5/1		0/0.2/0.5/1	0/0.2/0.5/1		0/0.2/0.5/1		
0.1/0.4/1/2		0.1/0.4/1/2	0.1/0.4/1/2		0.1/0.4/1/2		
0.5/1/1.5/2		0.5/1/1.5/2	0.5/1/1.5/2		0.5/1/1.5/2		

14	18	18	37	50	26	37	50
14	18	18	37	50	26	37	50
30	35	35	85	100	65	85	100
100	100	100	100	100	100	100	100
A	A	A	A	A	A	A	A
25,000	25,000	25,000	25,000	25,000	20,000	20,000	20,000
10,000	10,000	10,000	10,000	10,000	5,000	5,000	5,000

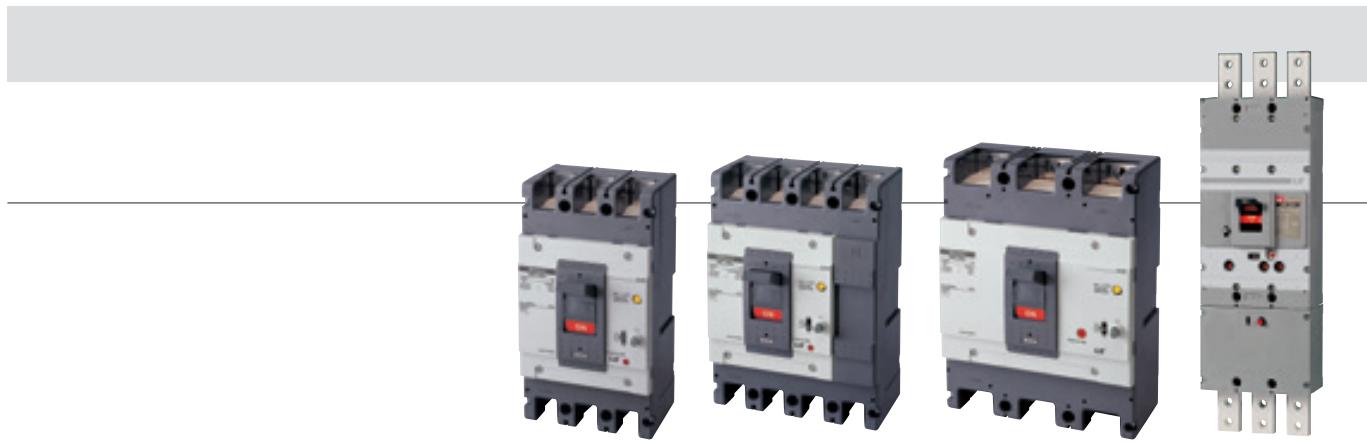
Thermal-magnetic		Thermal-magnetic		Thermal-magnetic		Thermal-magnetic	
Electronic		Electronic		Electronic		Electronic	
•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•
75×130×60		75×130×60		90×155×60		105×165×60	
-	-	0.5	-	-	1.1	-	-
0.7	0.7	0.7	1	1	1.2	1.2	1.2
-	0.9	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 impulse withstand voltage, Uimp (kV)		6			
Rated operational voltage, Ue	AC (V)	220/460			
Instantaneous type	Rated residual current, IΔn (mA)	30, 100/200/500			
	Residual current off-time at IΔn sec	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1
Time delay type	Rated residual current A	0.1/0.4/1/2	0.1/0.4/1/2	0.1/0.4/1/2	0.1/0.4/1/2
	Intentional time delay s	0.5/1/1.5/2	0.5/1/1.5/2	0.5/1/1.5/2	0.5/1/1.5/2
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	100
Category of use		A	A	A	A
Endurance (Number of operations)	Mechanical	4,000	4,000	4,000	4,000
	Electrical	1,000	1,000	1,000	1,000
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, 3 pole	●	●	●	●
	Terminal cover (Long) - 4 pole	●	●	●	●
	Rotary handle (Direct)	●	●	●	●
	Rotary handle (Extended)	●	●	●	●
	Mechanical interlock - 2, 3 pole	●	●	●	●
	Mechanical interlock - 4 pole	●	●	●	●
	Rear terminal - 2 pole	●	●	●	●
	Rear terminal - 3 pole	●	●	●	●
	Rear terminal - 4 pole	●	●	●	●
Dimensions (mm)	WxHxD (3P)		140×257×109		
Weight(kg)	3 pole	7	7	7	7
	4 pole	8.4	8.4	7	7

Note) 1. ● applicable or available



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
6			-	-
220/460			220/460	220/460
30, 100/200/500			100/200/500	100/200/500
≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1
0.1/0.4/1/2	0.1/0.4/1/2	0.1/0.4/1/2	-	-
0.5/1/1.5/2	0.5/1/1.5/2	0.5/1/1.5/2	-	-
37	65	85	85	85
50	85	125	125	125
100	100	75	-	-
A	A	A	-	-
2,500	2,500	2,500	2,500	2,500
500	500	500	500	500
Thermal-magnetic			Thermal-magnetic	
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



Frame		AH-D					
Type	(AF)	AH-06D	AH-08D	AH-10D	AH-13D	AH-16D	AH-20D
Ampere frame		630	800	1000	1250	1600	2000
Rated current (A)	(In max)						
		at 40°C					
Setting current (A)	Control trip relay (... × In max)						
Rated current of neutral pole (A)							
Rated insulation voltage (V)	(Ui)						1,000
Rated operational voltage (V)	(Ue)						690
Rated impulse withstand voltage (kV)	(Uiimp)						12
Frequency (Hz)							50/60
Number of poles (P)							3/4
Rated breaking capacity (kA sym)		220V/230V/380V/415V					
AC 50/60Hz	(Icu) IEC 60947-2 KS C 4620	460V/480V/500V					
		550V/600V/690V					
Rated service breaking capacity (kA)	(Ics)	... % × Icu					100%
Rated making capacity (kA peak)		220V/230V/380V/415V					
AC 50/60Hz	(Icm) IEC 60947-2 KS C 4620	460V/480V/500V					
		550V/600V/690V					
Rated short-time withstand current (kA)	(Icw)	1 sec					65
		2 sec					60
		3 sec					50
Operating time (ms)		Maximum total breaking time					
		Maximum closing time					
Life cycle (time)	Mechanical						20,000
	Electrical						5,000
Connections	Draw-out / Fixed	Horizontal connection					-
		Vertical connection					●
		Front connection					○
		Mixed connection					○
Weight (kg)	Draw-out type	Main body	Motor charging type				70/85
(3P/4P)		(With cradle)	Manual charging type				68/83
		Cradle only					33/40
	Fixed type		Motor charging type				38/47
			Manual charging type				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 classification							LR, ABS, DNV, KR, BV, GL, RINA, NK

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 AH-D in IT systems is limited to 500 V network voltage.

4. AH-20D, AH-40E types are equipped with vertical-only terminals.





AH-E									AH-G		
AH-06E	AH-08E	AH-10E	AH-13E	AH-16E	AH-20E	AH-25E	AH-32E	AH-40E	AH-40G	AH-50G	AH-63G
630	800	1000	1250	1600	2000	2500	3200	4000	4000	5000	6300
630	800	1000	1250	1600	2000	2500	3200	4000	4000	5000	6300
(0.4 ~ 1.0) × In max									(0.4 ~ 1.0) × In max		
630	800	1000	1250	1600	2000	2500	3200	4000	4000	5000	6300
1,000									1,000		
690									690		
12									12		
50/60									50/60		
3/4									3/4		
100									150		
100									150		
85									100		
100%									100%		
220									330		
220									330		
187									220		
85									100		
75									85		
65									75		
40									40		
80									80		
15,000									10,000		
5,000									2,000		
●									○		
○									●		
○									-		
○									-		
87/103									181/223		
85/101									179/221		
44/55									97/117		
44/55									98/123		
42/53									96/121		
430×412×375									460×785×375		
430×527×375									460×1015×375		
300×378×295									300×751×295		
300×493×295									300×981×295		
N, A, P, S type									N, A, P, S type		
KS / KEMA / KERI / GOST / CCC									KS / KEMA / KERI / GOST / CCC		
LR, ABS, DNV, KR, BV, GL, RINA, NK									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



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

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.





DH-E								
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				
			●				-	
		O					●	
		O					-	
		O					-	
		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



Frame			AN-D				
Type			AN-06D	AN-08D	AN-10D	AN-13D	AN-16D
Ampere frame	(AF)		630	800	1000	1250	1600
Rated current (A)	(In max)	at 40°C	200	400			
Setting current (A)	Control trip relay (... × In max)		400	630	1000	1250	1600
Rated current of neutral pole (A)			630	800			
Rated insulation voltage (V)	(Ui)				0.4 ~ 1.0		
Rated operational voltage (V)	(Ue)						
Rated impulse withstand voltage (kV) (Uimp)							
Frequency (Hz)							
Number of poles (P)							
Rated breaking capacity (kA sym)			220V/230V/380V/415V				
AC 50/60Hz	(lcu)	IEC 60947-2 KS C 4620	460V/480V/500V				
			550V/600V/690V				
Rated service breaking capacity (kA)	(lcs)		... %×lcu				
Rated making capacity (kA peak)			220V/230V/380V/415V				
AC 50/60Hz	(lcm)	IEC 60947-2 KS C 4620	460V/480V/500V				
			550V/600V/690V				
Rated short-time withstand current (kA)	(lcw)		1 sec				
			2 sec				
			3 sec				
Operating time (ms)			Maximum total breaking time				
			Maximum closing time				
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	
		Cradle only	Manual charging type			61/72	
	Fixed type		Motor charging type			29/32	
			Manual charging type			34/44	
						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	
Certificate & Approval						KS / KEMA / KERI / GOST	
Marine classification						-	

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.





AS-D						AS-E				AS-F		AS-G		
AS-06D	AS-08D	AS-10D	AS-13D	AS-16D	AS-20D	AS-20E	AS-25E	AS-32E	AS-40E	AS-40F	AS-50F	AS-40G	AS-50G	AS-63G
630	800	1000	1250	1600	2000	2000	2500	3200	4000	4000	5000	4000	5000	6300
200	400					630, 800								
400	630	1000	1250	1600	2000	1000, 1250	2500	3200	4000	4000	5000	4000	5000	6300
630	800					1600, 2000								
0.4 ~ 1.0						0.4 ~ 1.0				0.4 ~ 1.0		0.4 ~ 1.0		
630	800	1000	1250	1600	2000	630, 800 1000, 1250 1600, 2000	2500	3200	4000	4000	5000	4000	5000	6300
1,000						1,000				1,000		1,000		
690						690				690		690		
12						12				12		12		
50/60						50/60				50/60		50/60		
3/4						3/4				3/4		3/4		
70						85				100		120		
70						85				100		120		
65						85				85		100		
100%						100%				100%		100%		
154						187				220		264		
154						187				220		264		
143						187				187		220		
65						85				85		100		
50						75				75		85		
42						65				65		75		
40						40				40		40		
80						80				80		80		
20,000						15,000				10,000		10,000		
5,000						5,000				2,000		2,000		
●						●				○		○		
○						○				●		●		
○						○				-		-		
○						○				-		-		
63/74						70/85				87/103		104/147		
61/72						63/83				85/101		102/145		
29/32						33/40				44/50		58/70		
34/44						38/47				44/55		63/100		
32/42						36/45				42/53		61/98		
430×334×375						430×412×375				460×629×375		460×785×375		
430×419×375						430×527×375				460×799×375		460×1015×375		
300×300×295						300×378×295				300×597×295		300×751×295		
300×385×295						300×493×295				300×767×295		300×981×295		
N, A, P type						N, A, P type				N, A, P type		N, A, P type		
KS / KEMA / KERI / GOST						KS / KEMA / KERI / GOST				KS / KEMA / KERI / GOST		KS / KEMA / KERI / GOST		
LR, ABS, DNV, KR, BV, GL, RINA, NK						LR, ABS, DNV, KR, BV, GL, RINA, NK				LR, ABS, DNV, KR, BV, GL, RINA, NK		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

Metasol ACB Series

Switch-Disconnectors



Frame		DN-D						
Type		DN-06D	DN-08D	DN-10D	DN-13D	DN-16D		
Ampere frame	(AF)	630	800	1000	1250	1600		
Rated current (A)	(In max)	200	400					
		400	630	1000	1250	1600		
		630	800					
Setting current	(A)	Control trip relay (... × In max)						
Rated current of neutral pole	(A)							
Rated insulation voltage (V)	(Ui)	1000						
Rated operational voltage (V)	(Ue)	690						
Rated impulse withstand voltage (kV) (Uiimp)		12						
Frequency (Hz)		50/60						
Number of poles (P)		3/4						
Rated service breaking capacity (kA) (Ics)		100%						
Rated making capacity (kA peak)	(Icm) IEC 60947-3 AC	690V / 600V / 550V						
Rated short-time withstand current (kA)	(Icw)	1 sec	105					
		2 sec	50					
		3 sec	42					
Operating time (ms)		Total breaking time	36					
		Closing time	40					
Life cycle (time)		Mechanical	80					
		Electrical	20000					
			5000					
Connections	Draw-out type/ Fixed type	Horizontal connection	●	●	●	●	●	
		Vertical connection	○	○	○	○	○	
		Front connection	○	○	○	○	○	
		Mixed connection	○	○	○	○	○	
Weight (kg) (3P/4P)	Draw-out type	Main body (With cradle)	Motor charging type					
		Cradle only	Manual charging type					
	Fixed type		63/74					
		Motor charging type	61/72					
		Manual charging type	29/32					
External dimensions (mm) (H×W×D)		Draw-out type	3P	34/44				
		4P	32/42					
		3P	430×334×375					
		4P	430×419×375					
		3P	300×300×295					
		4P	300×385×295					

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.



DS-D						DS-E			
DS-06D	DS-08D	DS-10D	DS-13D	DS-16D	DS-20D	DS-20E	DS-25E	DS-32E	DS-40E
630	800	1000	1250	1600	2000	2000	2500	3200	4000
200	400					630, 800, 1000, 1250, 1600, 2000			
400	630	1000	1250	1600	2000	2500	1000	1250	
630	800								
0.4~1.0						0.4~1.0			
630	800	1000	1250	1600	2000	630, 800, 1000, 1250, 1600, 2000	2500	3200	4000
1000						1000			
690						690			
12						12			
50/60						50/60			
3/4						3/4			
100%						100%			
143						187			
65						85			
50						75			
42						65			
40						40			
80						80			
20000						15000			
5000						5000			
●	●	●	●	●	-	●	●	●	-
○	○	○	○	○	●	○	○	○	●
○	○	○	○	○	-	○	○	○	-
○	○	○	○	○	-	○	○	○	-
63/74						70/85			
61/72						68/83			
29/32						33/40			
34/44						38/47			
32/42						36/45			
430×334×375						430×412×375			
430×419×375						430×527×375			
300×300×295						300×378×295			
300×385×295						300×493×295			

※ 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	<ul style="list-style-type: none"> • L / S / I / G / Thermal 	<ul style="list-style-type: none"> • L / S / I / G(or EL) • Thermal • ZSI (Protective coordination) 	<ul style="list-style-type: none"> • L / S / I / G(or EL) • Thermal (linear hot start) • ZSI (Protective coordination) 	<ul style="list-style-type: none"> • L / S / I / G(or EL) • Thermal (linear hot start) • ZSI (Protective coordination)
Other protection	-	-	<ul style="list-style-type: none"> • Over/Under voltage • Over/Under frequency • Unbalance(Voltage/Current) • Reverse power • Reverse power 	<ul style="list-style-type: none"> • Over/Under voltage • Over/Under frequency • Unbalance(Voltage/Current)
Measurement function	-	<ul style="list-style-type: none"> • Current (R / S / T / N) 	<ul style="list-style-type: none"> • 3 Phase Voltage/Current RMS/Vector • Power(P, Q, S), PF(3-Phase) • Energy(Positive/Negative) • Frequency, Demand 	<ul style="list-style-type: none"> • 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	-	-	<ul style="list-style-type: none"> • Fine adjustment for long/short time delay/instantaneous/ground 	<ul style="list-style-type: none"> • Fine adjustment for long/short time delay/instantaneous/ground
Pre Trip Alarm	-	-	<ul style="list-style-type: none"> • Overload protection relays : DO (Alarm) (Ground fault is not available when using Pre trip alarm) 	<ul style="list-style-type: none"> • Overload protection relays : DO (Alarm) (Ground fault is not available when using Pre trip alarm)
Digital Output	-	<ul style="list-style-type: none"> • 3DO (Fixed) • L, S/I, G Alarm 	<ul style="list-style-type: none"> • 3DO (Programmable) • Trip, Alarm, General 	<ul style="list-style-type: none"> • 3DO (Programmable) • Trip, Alarm, General
IDMTL setting	-	-	<ul style="list-style-type: none"> • Compliance with IEC60255-3 SIT, VIT, EIT, DT 	<ul style="list-style-type: none"> • Compliance with IEC60255-3 SIT, VIT, EIT, DT
Communication	-	<ul style="list-style-type: none"> • Modbus/RS-485 • Profibus-DP 	<ul style="list-style-type: none"> • Modbus / RS-485 • Profibus-DP 	<ul style="list-style-type: none"> • Modbus / RS-485 • Profibus-DP
Power supply	<ul style="list-style-type: none"> • Self Power - Power source works over 20% of load current. 	<ul style="list-style-type: none"> • Self Power - Power source works over 20% of load current. - External power source are required for comm. • AC/DC 100~250V • DC 15~60V 	<ul style="list-style-type: none"> • AC/DC 100~250V • DC 15~60V * Basic protection function (L / S / I / G) is still under normal operation without control power. 	<ul style="list-style-type: none"> • AC/DC 100~250V • DC 15~60V * Basic protection function (L / S / I / G) is still under normal operation without control power.
RTC timer	-	<ul style="list-style-type: none"> • Available 	<ul style="list-style-type: none"> • Available 	<ul style="list-style-type: none"> • Available
LED for trip info.	<ul style="list-style-type: none"> • Long time delay • Short time delay/Instantaneous • Ground fault 	<ul style="list-style-type: none"> • Long time delay • Short time delay/Instantaneous • Ground fault 	<ul style="list-style-type: none"> • Long time delay • Short time delay/Instantaneous • Ground fault 	<ul style="list-style-type: none"> • Long time delay • Short time delay/Instantaneous • Ground fault
Fault recording	-	<ul style="list-style-type: none"> • 10 records (Fault/Current/Date and Time) 	<ul style="list-style-type: none"> • 256 records (Fault/Current/Date and Time) 	<ul style="list-style-type: none"> • 256 records • Last fault wave form recording (voltage, current are recorded in 3-phase, and can be read only by communication)
Event recording	-	-	<ul style="list-style-type: none"> • 256 records(Content, Status, Date) 	<ul style="list-style-type: none"> • 256 records(Content, Status, Date)
Operating button	<ul style="list-style-type: none"> • Reset button 	<ul style="list-style-type: none"> • Reset, Menu Up/Down, Tap, Enter 	<ul style="list-style-type: none"> • Reset, Menu Up/Down, Tap, Enter 	<ul style="list-style-type: none"> • Reset, Menu Up/Down, Tap, 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) A-Type: When more 15% than rated current(I_n)

2) P/S-Type: When more 12% than rated current(I_n)

* 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.



ASTA

CERTIFICATE OF TYPE TESTS



Full range of Residential & Commercial Distribution System



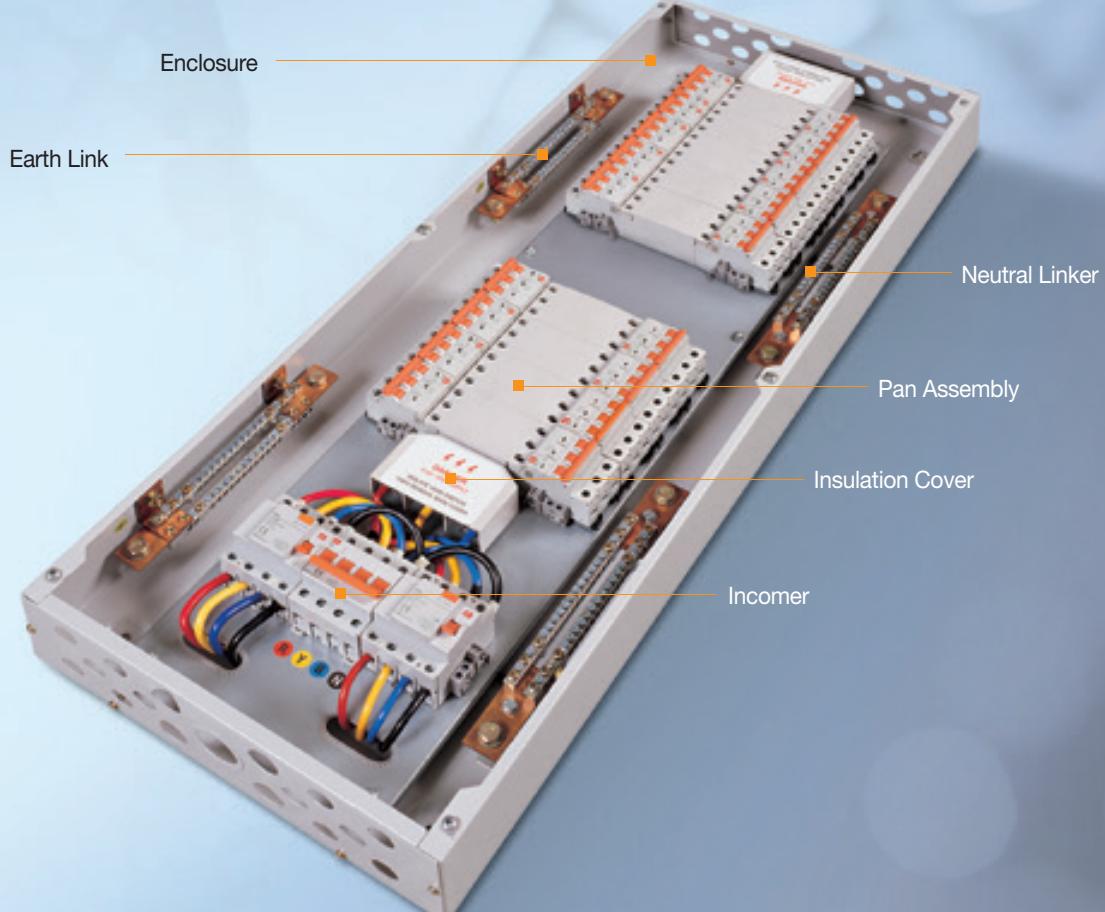
Features:

- 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 Frequency: 50/60Hz
- Rated impuls withstand Voltage(Uimp): 4kV
- Rated Current (In): Upto 125A

Internal view



Pan Assembly System

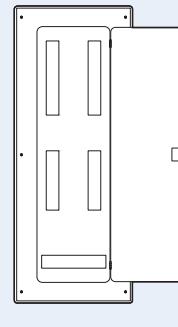
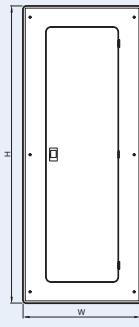


- Rigid and removable pan assembly to provide easier cabling
- Modular panel system
- Flexible connect with CB, RCCB and Disconnect switch

LS Final Distribution Boards

Specific of FDB Split busbar type

with incoming Isolator feeding two ELCBs

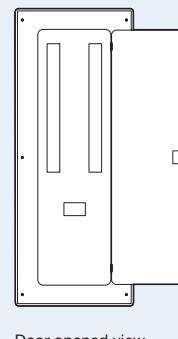
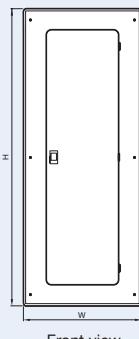


Selection of Enclosure

Code Description	Type	Dimension
02+02 Way Split DB		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	Flush	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



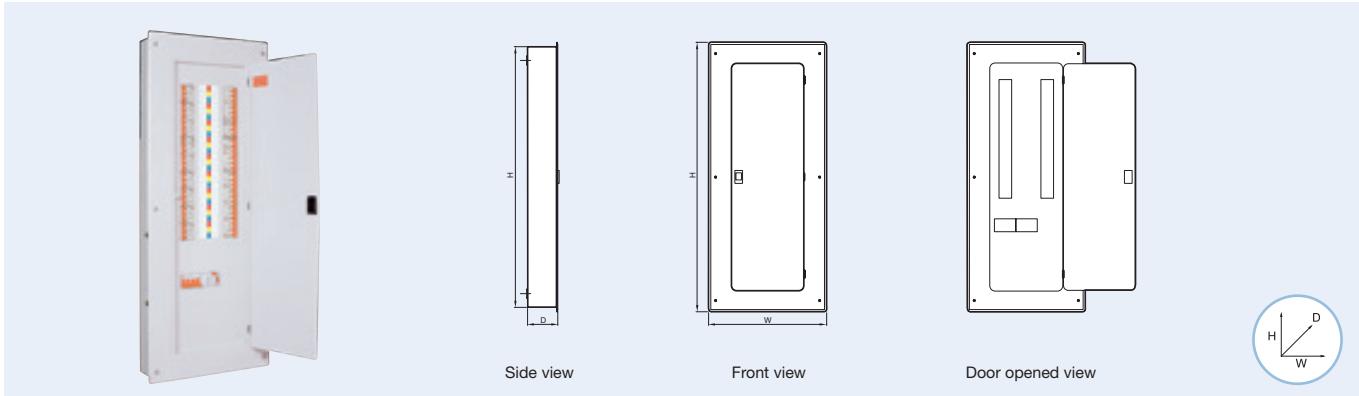
Selection of Enclosure

Code Description	Type	Dimension
4 Way DB 1 INC		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	Flush	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

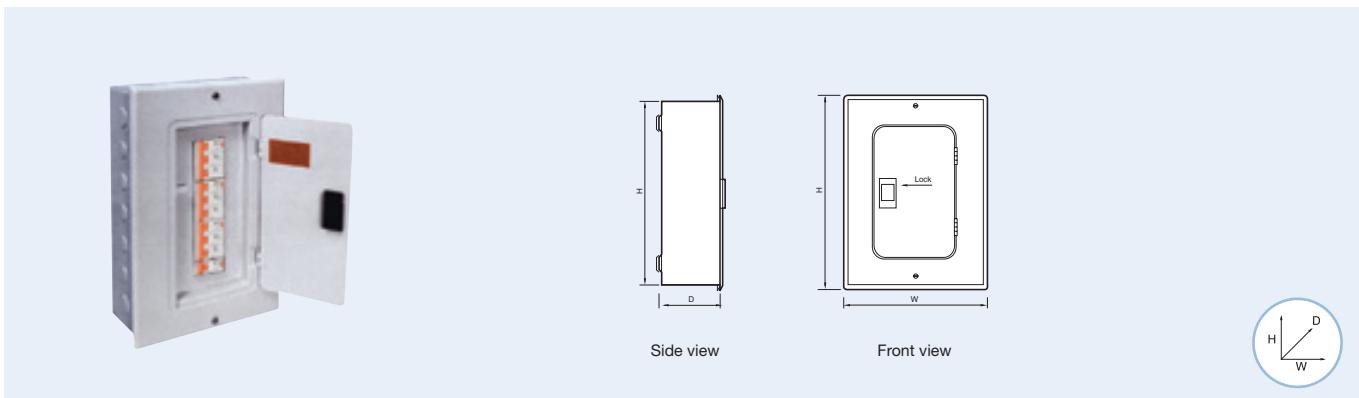


Selection of Enclosure

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		510H×410W×110D mm
6 Way DB 2 INC		560H×410W×110D mm
8 Way DB 2 INC	Surface	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



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.



شركة أبوظبي للتوزيع
Abu Dhabi Distribution Co.



Rating

- A wide choice of incoming MCCBs make LS SMDB panels flexible to suit most of the requirements and represent excellent value and will appeal 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

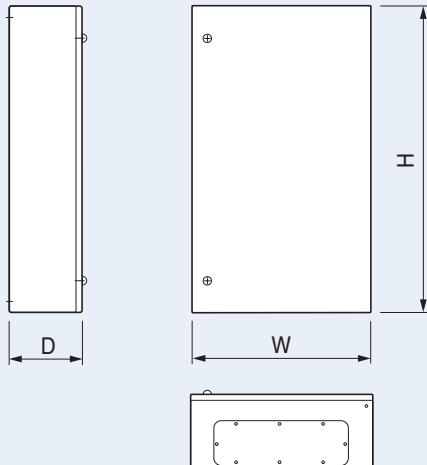
- Complied with IEC 60947-1
- Fully Type Tested, ASTA Certified
- Degree of protection : IP41 as per IEC 60529
- Form of separation: Form 3b
- Enclosure constructed from rigid folded zinc phosphate and protected both internally and externally with polyester powder coating

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

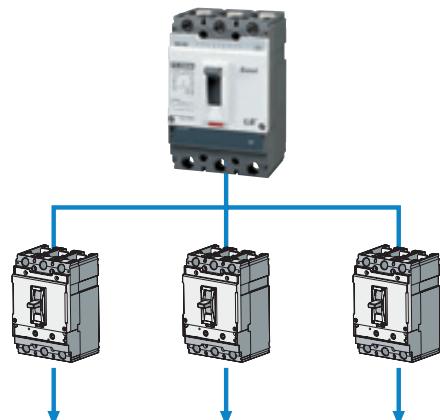
LS SMDB Solution

Incoming Devices

LS “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		

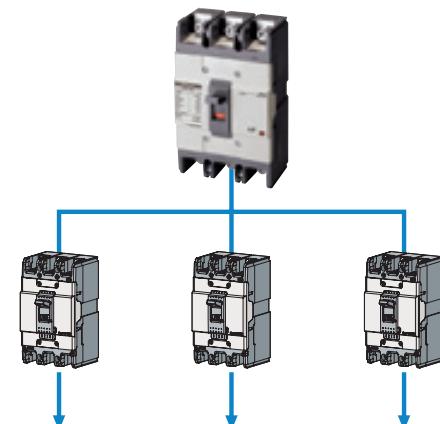
Incoming application



LS “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

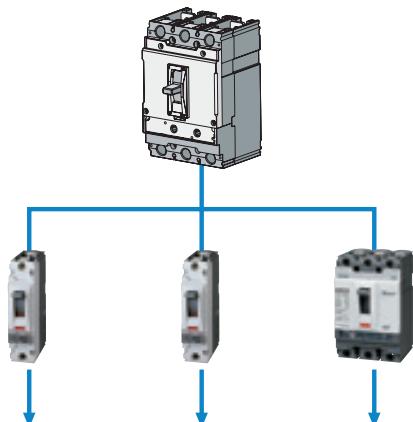


Outgoing devices

LS “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					

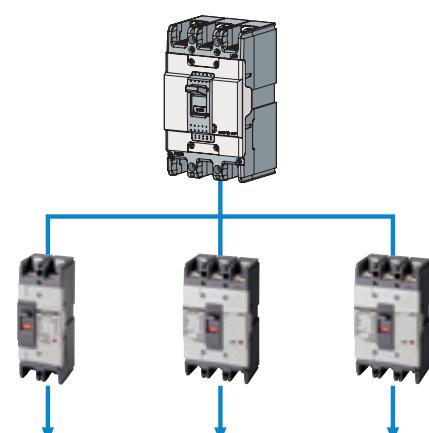
Incoming application



LS “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	
voltage Impulse ($1.2 \times 50\mu s$) Up (kV)	60	
Rated operating sequence	O-0.3s-CO-15s-CO	
Control voltage Closing coil (V)	AC/DC 100~130, AC/DC 200~250, DC 125, DC 24~30, DC 48~60, AC 48	
	AC/DC 100~130, AC/DC 200~250, DC 125, DC 24~30, DC 48~60, AC 48	
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, 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
voltage Impulse ($1.2 \times 50\mu s$) Up (kV)	60	75 (82)	95
Rated operating sequence	O-0.3s-CO-15s-CO		
Control voltage Closing coil (V)	DC 24~30, DC 48~60, DC 110, DC 125, DC 220~250, AC 48, AC 100~130, AC 220~250		
	DC 24~30, DC 48~60, DC 110, DC 125, DC 220~250, AC 48, AC 100~130, AC 220~250		
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 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, K type) (kg)	100 100 130	115 (120) 115 (120) 130 (140)	115 (120) 115 (120) 130 (140)
Cradle (E, F, G, K type) (kg)	170 170 180	170 (200) 180 (200) 170 (200)	170 (200) 180 (200)
Standards	IEC 62271-100, 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			31.5				31.5/3(4 Note 1)												
Rated short-circuit current	Isc (kA)	31.5			2.5×Isc (50Hz)/2.6×Isc (60Hz)				955												
Rated short-time withstand current	Ik/tk (kA/s)	393			655				28 (42) Note 2												
Rated short-circuit breaking capacity	(MVA)	2.5×Isc (50Hz)/2.6×Isc (60Hz)			3				38												
Rated short-circuit making current	Ip (kA)	2.5×Isc (50Hz)/2.6×Isc (60Hz)			75				95												
Rated breaking time	(cycle)	3			O-0.3s-CO-3min-CO				4a4b, 10a10b												
Rated withstand voltage	Power frequency (1 min)	Ud (kV)	20	28 (42) Note 2				38				38									
	Impulse($1.2 \times 50\mu s$)	Up (kV)	60	75				95				95									
Rated operating sequence	O-0.3s-CO-3min-CO																				
Control voltage	Closing coil	(V)	DC 24~30, DC 48~60, DC 110, DC 125, DC 220~250, AC 48, AC 100~130, AC 220~250																		
	Trip coil	(V)	DC 24~30, DC 48~60, DC 110, DC 125, DC 220~250, AC 48, AC 100~130, AC 220~250																		
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, F _s , G, G _s , K type (for MESG)	H type (for MCSG)	Gs, 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 (P, 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, 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				24/25.8				24/25.8							
Rated normal current	Ir (A)	630	1250	630	1250	630	1250	2000	2500	630	1250	2000	2500				
Rated frequency	fr (Hz)	50/60				50/60 Note 1)				25							
Rated short-circuit current	Isc (kA)	12.5				16				25/3 Note 2)							
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($1.2 \times 50\mu s$)	Up (kV)	125														
Rated operating sequence	O-0.3s-CO-3min-CO																
Control voltage	Closing coil	(V)	DC 24~30, DC 48~60, DC 110, DC 125, DC 220~250, AC 48, AC 100~130, AC 220~250														
	Trip coil	(V)	DC 24~30, DC 48~60, DC 110, DC 125, DC 220~250, AC 48, AC 100~130, AC 220~250														
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				275							
Weight	Breaker (H type)	(kg)	120 (130)			130 (140)				150 (160)							
	Cradle (H type)	(kg)	200 (220)			200 (220)				200 (220)							
	Breaker (P, E, F, G, K, H type)	(kg)	110	115		120				135							
Standards	IEC 62271-100, 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 Impulse ($1.2 \times 50\mu s$) Up (kV)		70	170	
Rated operating sequence	O-0.3s-CO-15s-CO			
Control voltage Closing coil (V)	DC 24~30, DC 48~60, DC 110, DC 125, DC 220, AC 48, AC 100~130, AC 220~250			
	Trip coil (V)	DC 24~30, DC 48~60, DC 110, DC 125, DC 220, AC 48, AC 100~130, AC 220~250		
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	P type			
	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
Standards	IEC 62271-100			

Note 1) For Icw 4s, please contact us.

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		
voltage Impulse ($1.2 \times 50\mu s$) Up (kV)		60				75		
Rated operating sequence	O-0.3s-CO-3min-CO							
Control voltage Closing coil (V)	DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220							
	Trip coil (V)	DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220						
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 (MESG, MCSG type) (kg)	210, 220	135, 160	135, 160	210, 220	220	164	165	220
	Cradle (MESG, MCSG type) (kg)	135, 155	55, 110	63, 117	135, 155	155	110	117
Standards	IEC 62271-100, KERI/KEMA, V-check(KESCO)							

* MCSG style drawble type provide a cradle for builting in the switchgear, not a box type for CB compartment. Ordering type is LVB.

Note 1) H type that is a box type cradle for enabling a CB compartment in MCSG is under development. Consult us for ordering.

2) Some LVB is the ordering name of the switchboard for export

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	
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 (1.2×50μs) 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 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220							
	Trip coil (V)	DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220							
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	Fs, Gs, K, H type				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			

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 (1.2×50μs) Up (kV)	60	75	95		
Rated operating sequence	O-0.3s-CO-15s-CO					
Control voltage	Closing coil (V)	DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220				
	Trip coil (V)	DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220				
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	Fs, Gs, K, H type	Gs, 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				

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) <small>Note</small>				38									
	Impulse ($1.2 \times 50\mu s$)	Up (kV)	60			75 (82) <small>Note</small>				95									
Rated operating sequence	O-0.3s-CO-3min-CO																		
Control voltage	Closing coil (V)	DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220																	
	Trip coil (V)	DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220																	
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		210	275							
Weight	Breaker (H type) (kg)	230	287	290	230	287	290	230	287	290	230	287	290						
	Cradle (H, type) (kg)	175	320	320	175	320	320	175	320	320	175	320	320						
Standards	IEC 62271-100, 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
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
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
	Impulse ($1.2 \times 50\mu s$)	Up (kV)	60	75	95	75
Rated operating sequence	O-0.3s-CO-15s-CO					
Control voltage	Closing coil (V)	DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220				
	Trip coil (V)	DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220				
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	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					

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 I _{sc} (kA)	40/50	
Rated short-time withstand current I _{k/tk} (kA/s)	50/4	
Rated short-circuit breaking capacity (MVA)	624	1040
Rated short-circuit making current I _p (kA)	2.5 × I _{sc} (50Hz)/2.6 × I _{sc} (60Hz)	
Rated breaking time (Cycle)	3	
Rated withstand voltage Power frequency (1 min) Ud (kV)	20	20
voltage Impulse (1.2 × 50μs) Up (kV)	60	75
Rated operating sequence	O-0.3s-CO-3min-CO	
Control voltage Closing coil (V)	DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220	
Trip coil (V)	DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220	
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)	320	
Weight Breaker (H type) (kg)	430	
Cradle (K type) (kg)	200	
Standards	IEC 62271-100	

VH-20/25

Type	VH-20,25□25□25	VH-20,25□32□13/20/32	VH-20,25□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)	50/60	60	50/60
Rated short-circuit current I _{sc} (kA)	25	31.5	40
Rated short-time withstand current I _{k/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 I _p (kA)		2.6 × I _{sc} (60Hz)	
Rated breaking time (cycle)		3	
Rated withstand voltage Power frequency (1 min) Ud (kV)		50 (65) Note	
voltage Impulse (1.2 × 50μs) Up (kV)		125	
Rated operating sequence ****	O-0.3s-CO-3min-CO		
Control voltage Closing coil (V)	DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220		
Trip coil (V)	DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220		
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)
Cradle (H type) (kg)	316	257 (284) 257 (284)	316 257 (284) 257 (284)
Standards	IEC 62271-100, KERI/KEMA, V-check (KESCO)		

* H type is a box type cradle with CB compartment style structure. ** () displays option of phase distance. *** Rated frequency(fr) 50Hz is certified only to 24kV.

**** Rated operating sequence O-0.3s-CO-15s-CO is certified only to 24kV 40kA.

Note) Contact us.

Vacuum Circuit Breakers

Susol VCB Series

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) Impulse (1.2 × 50μs)	Ud (kV)				70 (95) <small>Note</small>					
No-load closing time	(sec)				170						
Rated operating sequence											
Control voltage	Closing coil Trip coil	(V)	DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220			DC 48, DC 110, DC 125, DC 220~250, AC 48, AC 110, AC 220					
Auxiliary contacts											
Rated opening time	(sec)				≤ 0.04						
No-load closing time	(sec)				≤ 0.06						
Type test class	Mechanical Electrical Capacitive current switching				M2						
Installation version *	Fixed Drawout				E2 (List3)			C2			
Phase distance	(mm)				P type			H type (for MCSG)			
Weight	Breaker (H type) Cradle (H type)	(kg)	400	490	400	490	400	490	400	490	
Standards	IEC 62271-100, KERI/KEMA, V-check (KESCO)										

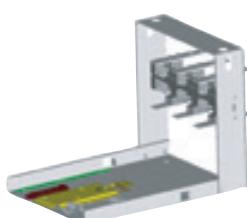
* H type is a box type cradle with CB compartment style structure.

Note) Contact us.

Accessories

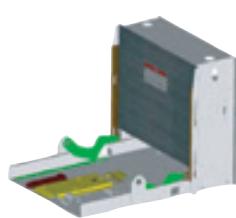
Breakers	Main	Cradle
	<ul style="list-style-type: none"> • Secondary trip coil • Under voltage trip release • Current trip coil • Position S/W • Keylock • Button padlock • Button cover • Mechanical position indicator 	<ul style="list-style-type: none"> • Mechanical position indicator
	<ul style="list-style-type: none"> • Secondary trip coil • Under voltage trip release • Current trip coil • Position S/W • Keylock • Button padlock • Button cover • Plug interlock • Mechanical position indicator 	<ul style="list-style-type: none"> • 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
	<ul style="list-style-type: none"> • Secondary trip coil • Under voltage trip release • Current trip coil • Position S/W • Keylock • Button padlock • Button cover • Plug interlock • Mechanical position indicator 	<ul style="list-style-type: none"> • 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



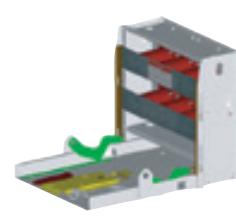
E type

- No Shutter
- For MESG



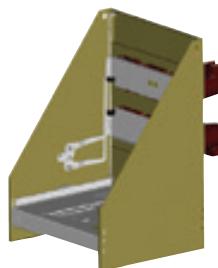
F type

- 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



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.



- According to The WEEE Directive, please do not discard the device with your household waste.



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Technical Question or After-sales Service

Customer Center-Quick Responsive
Service, Excellent technical support

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