

Beyond X™

Renewable Energy Solution

vector Energy

LS ELECTRIC

FUTURING SMART ENERGY

We open up a brighter future through
efficient and convenient energy solutions.



LS a leader of the electric power and automation industry, offers smart convergence solutions by combining ICT and DC technology.
Smart Power Transmission Solutions/Smart Power Distribution Solutions Smart Automation Solutions

Renewable Energy is key factor to reducing greenhouse gas emissions for the nextgeneration





CONTENTS

Summary 04

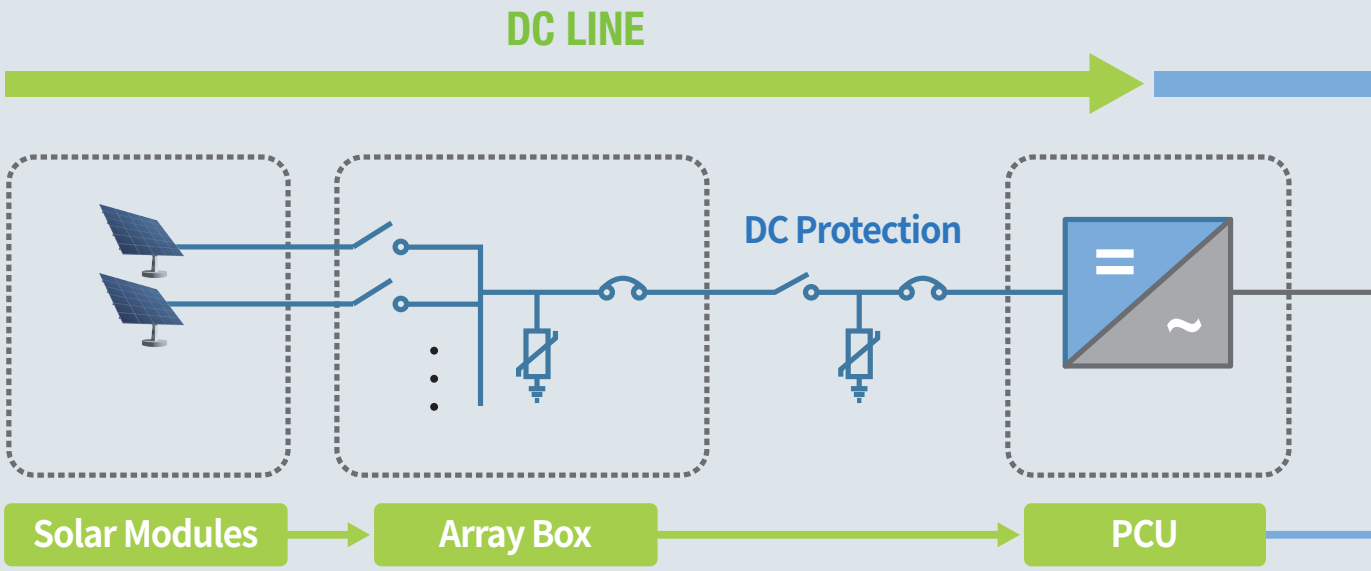
DC Components

DC MCCB 12
DC Switch-Disconnector 22
DC Compact Switch-Disconnector 26
DC Air Circuit Breakers 30
High Voltage DC Relay 32
DC MCB 38
DC FUSE 40
DC Contactor 42
SPD 44

AC Components

Susol MCCB 48
Susol MCCB up to 1000Vac 54
Susol ACB 56
Susol ACB up to 1150Vac 58
Susol Compact ACB 62
Susol VCB 68
Metasol Contactor 72
XGIPAM 82
Susol RMU 83
Transformer 89

Products for Photovoltaic Power Generation



P.12 **DC MCCB**



TD/TS/TSD/UTD Type
- 16 - 800 A
- Ue DC 1000 V/1500 V
- Icu 50 kA (Max)

P.18 **Switch Disconnector**



TS1600NA
- In 1000 - 1600 A
- Ue DC 1150 V
- Icw 25 kA 1s

P.22 **Switch Disconnector**



DDH/DDV/DDX
- In 800 - 4000 AF
- Ue DC 750 - 1800 V
- Icw 100 kA 1s

P.26 **Compact Switch Disconnector**



Compact DDH/DDV
- In 800 - 1600 AF
- Ue DC 750 - 1500 V
- Icw 50 kA 1 s

P.42 **DC Contactor**



MD-30a, 60a, 100a
- Ie 10 - 120 A
- Ue DC 125,250,500,1000 V
- DC-1, DC-3,5 ratings

P.32 **High Voltage DC Relay**



GPR010 - GPR-H600-A
- Ie 10 - 600 A
- Ue 450 - 1500 V

P.44 **DC SPD**

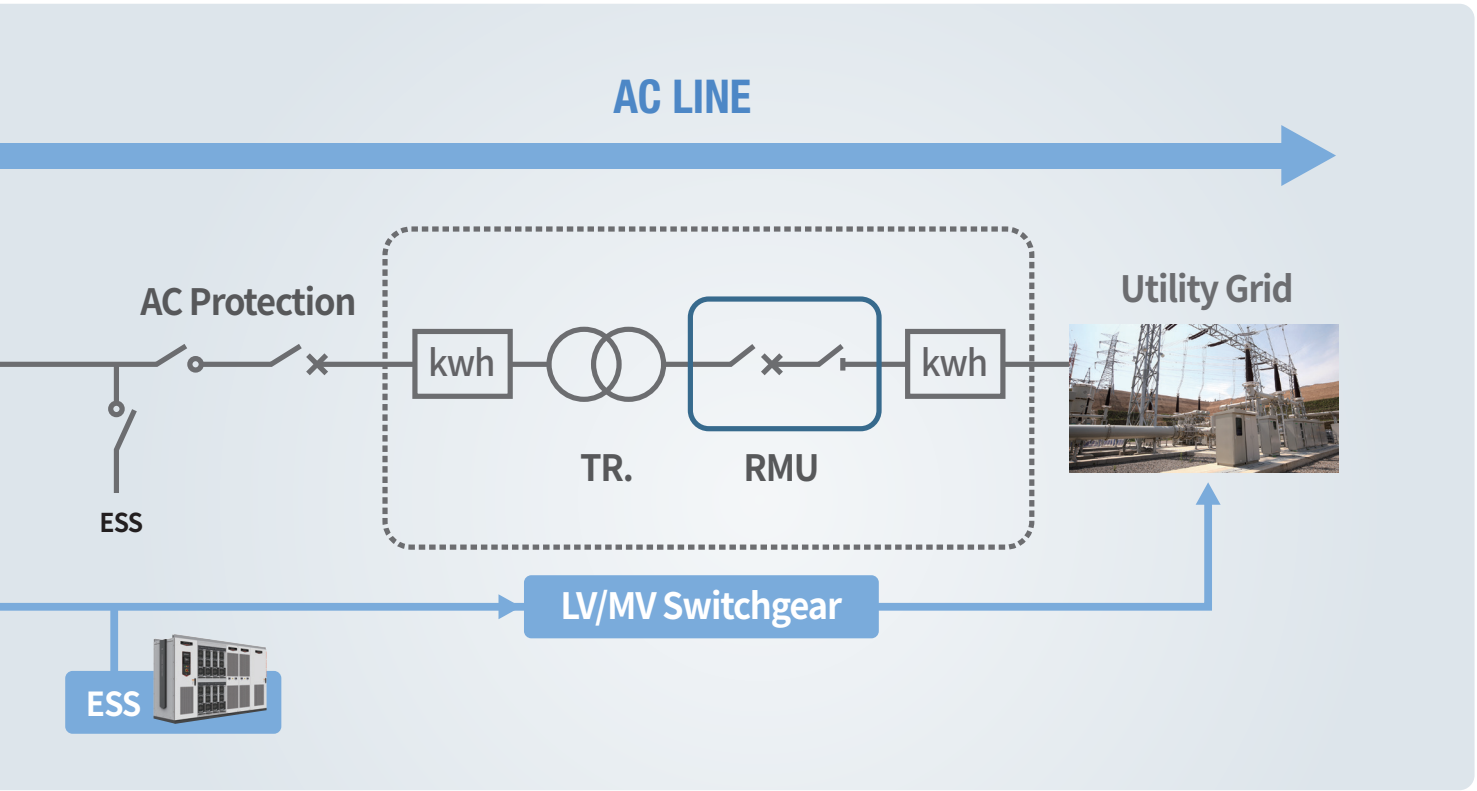


BK20S-DC1500
- Un DC 110 - 1500 V
- Up ≤ 1.0 - 4.5 kV
- Imax 40 kA
- t_A < 25 ns

P.38 **DC MCB**



BK63H-DC
- In 1 - 63 A
- Ue DC 250 - 1000 V
- Icu 10 kA



P.50 MCCB



TS1000 - 1600
- In 1000 - 1600 A
- Icu 50 - 150 kA
- AC 380/415 V

UTV250
- In 60 - 250 A
- Icu 100 kA (Max)
- AC 690/800/1000 Vac

P.75 Contactors



MC-1260a, 2650a
- Ie 1260 - 2650 A
- Ue AC 1000 V
- Coil: AC 100 - 240 V
  DC 100 - 220 V

P.89 Cast Resin TR



- Rated Power
  - Up to 25MVA
- Rated Vol tage
  - Primary: Up to 36 kV
  - Secondary: Up to 1200 V

P.83 RMU



- Rated Voltage: Up to 36 kV
- Ir: 630 A
- Isc 21 kA/3 s
- M1/E3
- IAC AFAL 21 kA/0.5 s

P.56 P.58 ACB(AH-Type) ACB(AV-Type)



AH
- In 630 - 6300 A
- Icu 65 - 150 kA
- Ue up to 690Vac

AV
- In 630 - 4000 A
- Icu 30 - 50 kA
- Ue up to 1150 Vac

P.82 XGIPAM



- XGIPAM Bay, F, M, T, DG
- PT: 110 V, CT: 5 A,
  ZCT: 1.5 mA
- AC 110 V, DC 110 - 125 V

P.91 Oil Immersed TR.



- Rated Power
  - Up to 80 MVA
- Rated Voltage
  - Up to 72 kV

P.83 Packaged Solution

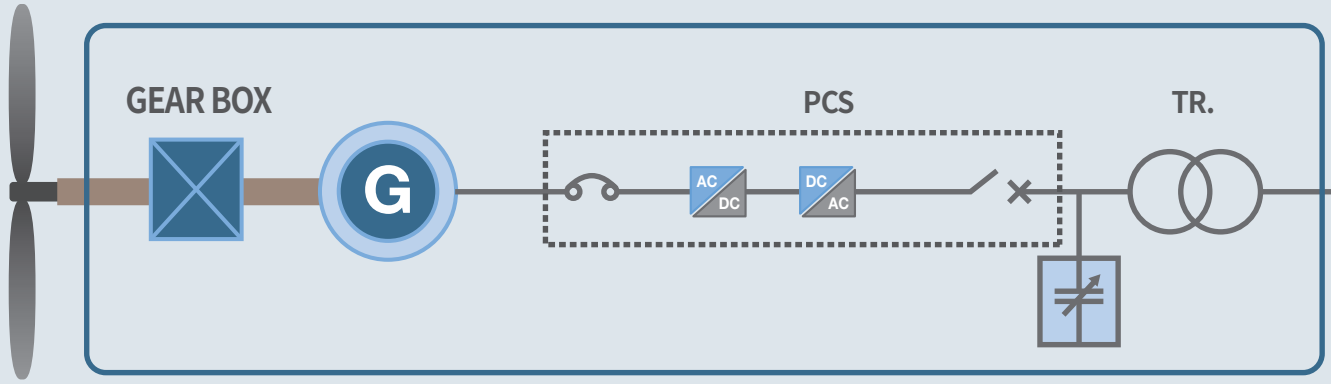


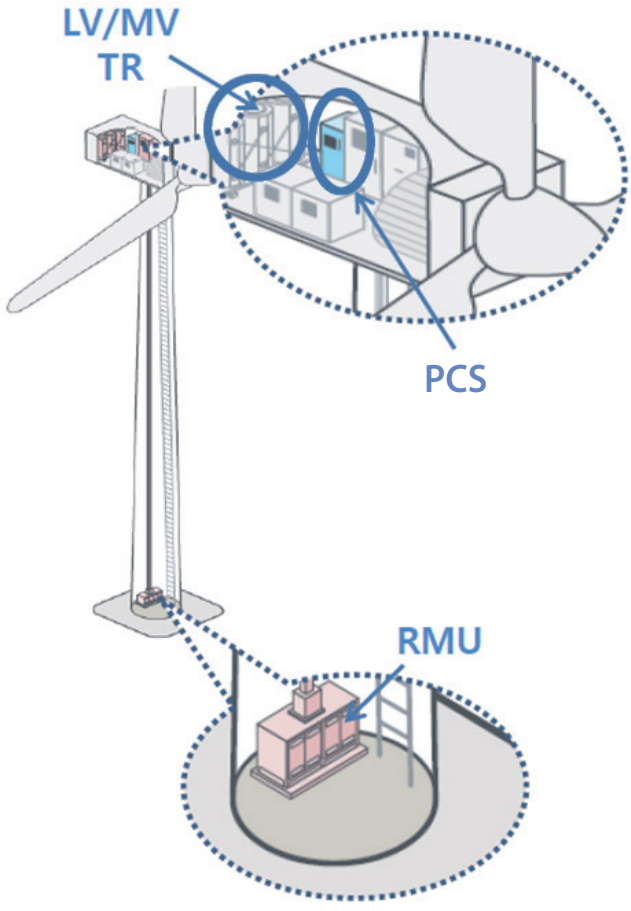
RMU+TR+LV



RMU+TR+PCU

Products for Grid Protection of Wind Power





P.50 MCCB



TS1000 - 1600
- In 1000 - 1600 A
- Icu 50 - 150 kA
- AC 380/415 V

UTV250
- In 60 - 250 A
- Icu 100 kA (Max)
- AC 690/800/1000 Vac

P.56 ACB



AH
- In 630 - 6300 A
- Icu 65 - 150 kA
- Ue up to 690 Vac

P.42 DC Contactor

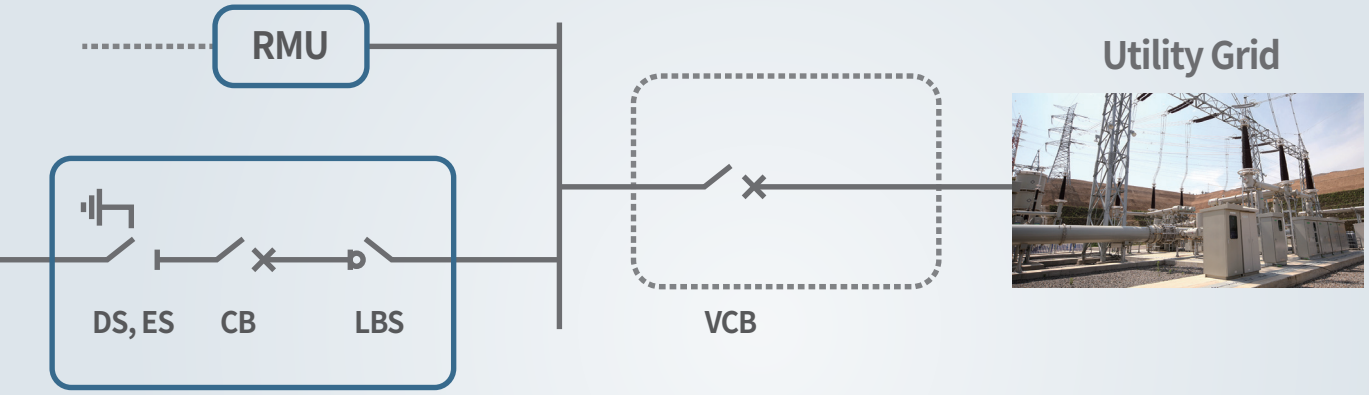


MD-30a, 60a, 100a
- Ie 10 - 120 A
- Ue DC 125,250,500,1000 V
- DC-1, DC-3,5 ratings

P.58 ACB



1150 Vac ACB
- In 630 - 4000 AF
- Ue - 1150 Vac
- Icu 30 - 50 kA



P.89 Cast Resin TR.



- Rated Power
  - Up to 25 MVA
- Rated Voltage
  - Primary: Up to 36 kV
  - Secondary: Up to 1200 V

P.83 RMU



- Rated Voltage: Up to 36 kV
- Ir: 630 A
- Isc 21 kA/3 s
- M1/E3
- IAC AFAL 21 kA/0.5s

P.68 VCB



VL - 25

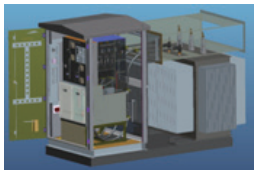
- Ir: 630 A/24 kV
- Breaking current: 25 kA
- M2/E2/C2

P.91 Oil Immersed TR.



- Rated Power
  - Up to 80 MVA
- Rated Voltage
  - Up to 72 kV

- CSS (RMU+TR+LV)



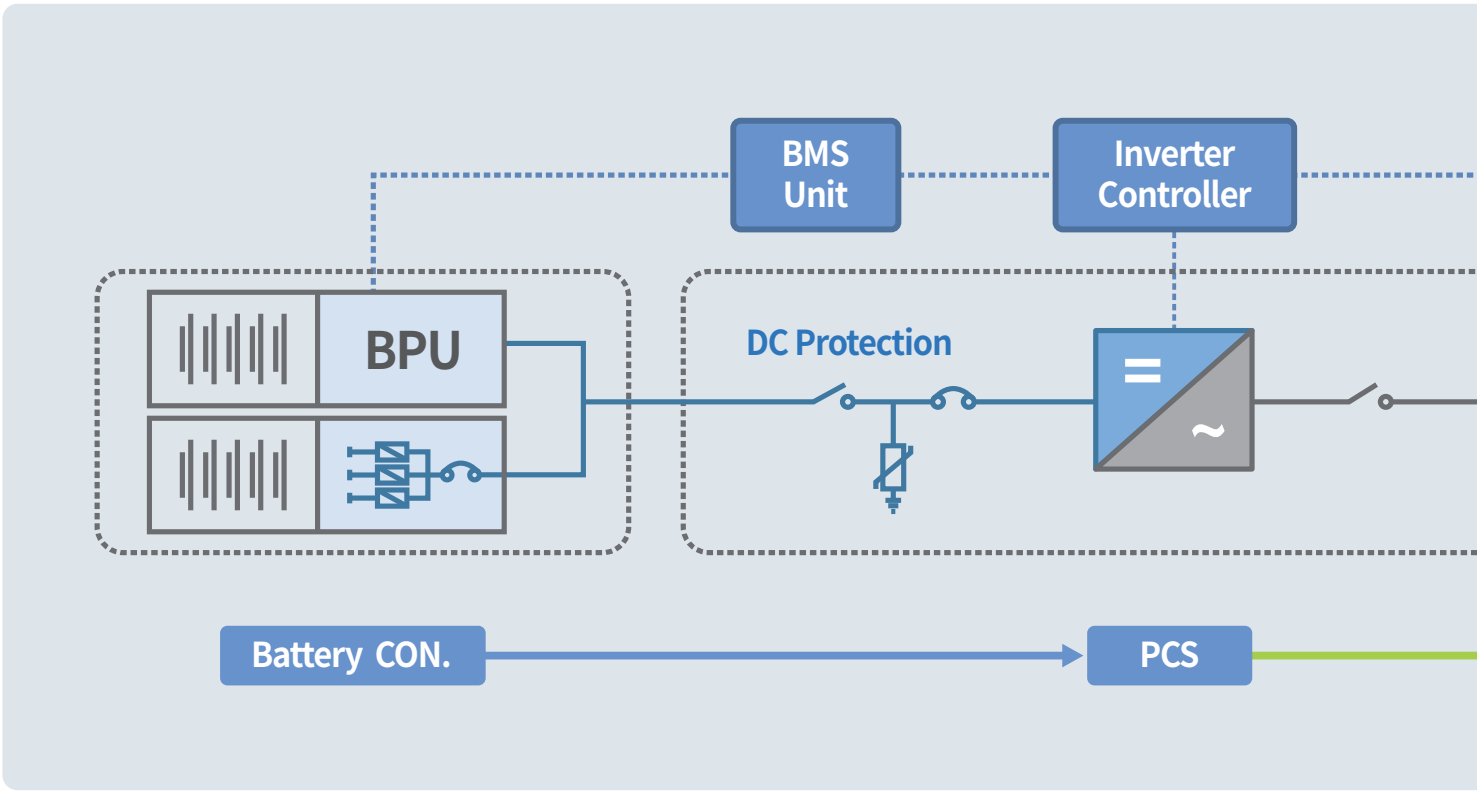


P.69 CB Compartment



- Ir: 630 A/24 kV
- Breaking current: 25 kA
- M2/E2/C2

Products for Energy Storage System



P.12 **DC MCCB**



TD/TSD/UTD Type
- In - 800 A - 250 A (320 A)/ - 550 A
- Ue DC1000 V/1500 V/1500 V
- Icu 100kA/50kA(20kA)/50kA

P.42 **DC Contactor**



MD-30a,60a,100a
- Ie 10 - 120 A
- Ue DC 125, 250, 500, 1000 V
- DC-1, DC-3,5 ratings

P.22 **Switch Disconnector**



DDH/DDV/DDX
- In 800 - 4000 AF
- Ue DC 750 - 1800 V
- Icw 100 kA 1 s

P.26 **Compact Switch Disconnector**



Compact DDH/DDV
- In 800 - 1600 AF
- Ue DC 750 - 1500 V
- Icw 50 kA 1 s

P.32 **High Voltage DC Relay**

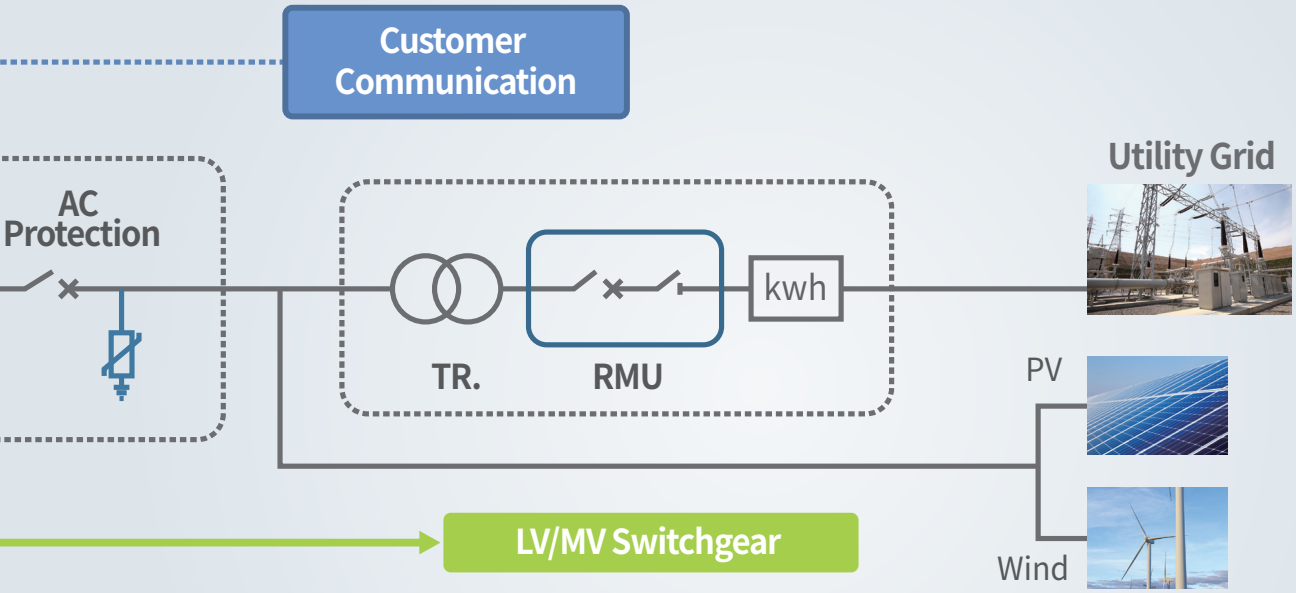


GPR010 - GPR-H600-A
- Ie 10 - 600 A
- Ue 450 - 1500 V

P.44 **DC SPD**



BK20S-DC1500
- Un DC 110 - 1500 V
- Up ≤ 1.0 - 4.5 kV
- Imax 40 kA
- t_A < 25 ns



P.50 MCCB



TS1000 - 1600
- In 1000 - 1600 A
- Icu 50 - 150 kA
- AC 380/415 V

UTV250
- In 60 - 250 A
- AC 690/800/1000 V

P.89 Cast Resin TR.



- Rated Power
  - Up to 25 MVA
- Rated Voltage
  - Primary: Up to 36 kV
  - Secondary: Up to 1200 V

P.83 RMU



- Rated Voltage: Up to 36 kV
- Ir: 630 A
- Isc 21 kA/3 s
- M1/E3
- IAC AFAL 21 kA/0.5 s

P.68 VCB



VL - 25
- Ir: 630 A/24 kV
- Breaking current: 25 kA
- M2/E2/C2

P.75 Contactor



MC-1260a, 2650a
- Ie 1260 - 2650 A
- Ue AC 1000 V
- Coil: AC 100 - 240 V
  DC 100 - 220 V

P.56 ACB



AH
- In 630 - 6300 A
- Icu 65 - 150 kA
- Ue up to 690 Vac

P.91 Oil Immersed TR.



- Rated Power
  - Up to 80 MVA
- Rated Voltage
  - Up to 72 kV

P.82 XGIPAM



- XGIPAM Bay, F, M, T, DG
- PT: 110 V, CT: 5 A,
  ZCT: 1.5 mA
- AC 110 V, DC 110 - 125 V

Susol

Super Solution

Metasol

Meta Solution



DC Components

You can count on us.

Global leader that puts customer values as the highest priority

We promise to return the best value for our customers. Committed to develop global leading products, we endeavor to expand overseas market as well as domestic market. Join us where you can share bright future.

DC MCCB 12

DC Switch-Disconnector 22

DC Compact Switch-Disconnector 26

DC Air Circuit Breakers 30

High Voltage DC Relay 32

DC MCB 38

DC FUSE 40

DC Contactor 42

SPD 44

DC MCCB (100 - 800AF)

- Susol MCCB is sutable for DC application such as Photovoltaic Circuit Breaker, UPS and datacenter
- DC short circuit test tested by VDE
- Higher nominal voltage range up to 1000 VDC
- Rated Current: 16A - 800 A
- No of Pole: 2/3/4 Pole

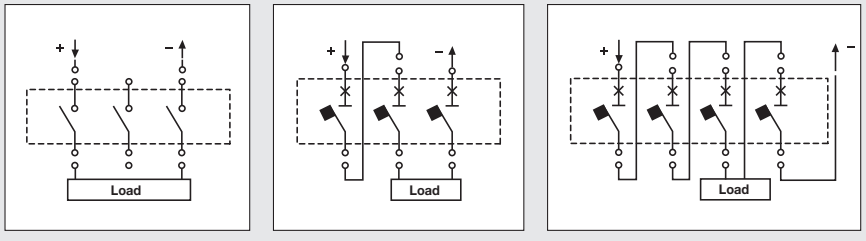


Rating

Model		TD100	TD160	TS100	TS160	TS250	TS400	TS630	TS800
Frame size	(AF)	100	160	100	160	250	400	630	800
Rated current, In	(A)	16, 20, 25, 32, 40, 50, 63, 80, 100	100, 125, 160	40, 50, 63, 80, 100	100, 125, 160	125, 160 200, 250	300, 400	500, 550	700 Note 5), 800
No. of poles	(Pole)	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4
Rated operational voltage, Ue (Vdc)	2 Pole	500	500	500	500	500	500	500	500
	3 Pole	750	750	750	750	750	750	750	750
	4 Pole	1000	1000	1000	1000	1000	1000	1000	1000
Rated insulation voltage, Ui (V)	2 Pole	800	800	800	800	800	800	800	800
	3 Pole	800	800	800	800	800	800	800	800
	4 Pole	1000	1000	1000	1000	1000	1000	1000	1000
Rated impulse withstand voltage Uimp (kV)		8	8	8	8	8	8	8	8
Rated ultimate short-circuit breaking capacity, Icu (kA)	Type	H	H	H	H	H	H	H	H
	500 VDC (2P)	40	40	40	40	40	40	40	40
	750 VDC (3P)	40	40	40	40	40	40	40	40
	1000 VDC (4P)	40	40	40	40	40	40	40	40
Rated service breaking capacity, Ics [%xIcu]		100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Trip Unit Function Note 4)	FTU	●	●	●	●	●	●	●	●
	FMU	●	●	●	●	●	●	●	●
	ATU	-	-	-	●	●	●	●	●

Note)
1. TD100/TD160 is the same Construction Frame.
2. TS100/TS160/TS250 is the same Construction Frame.
3. TS400/TS630 is the same Construction Frame.
4. Trip Unit Function have 3 Types (FTU/FMU/ATU)
   - FTU : Fixed thermal, fixed magnetic unit
   - FMU : Adjustable thermal, fixed magnetic unit
   - ATU : Adjustable thermal, adjustable magnetic unit
     (Not applicable to TS160 100 A ATU)
5. 700 A is only available for TS800FTU
6. 4 Pole type MCCB is 4P4T.

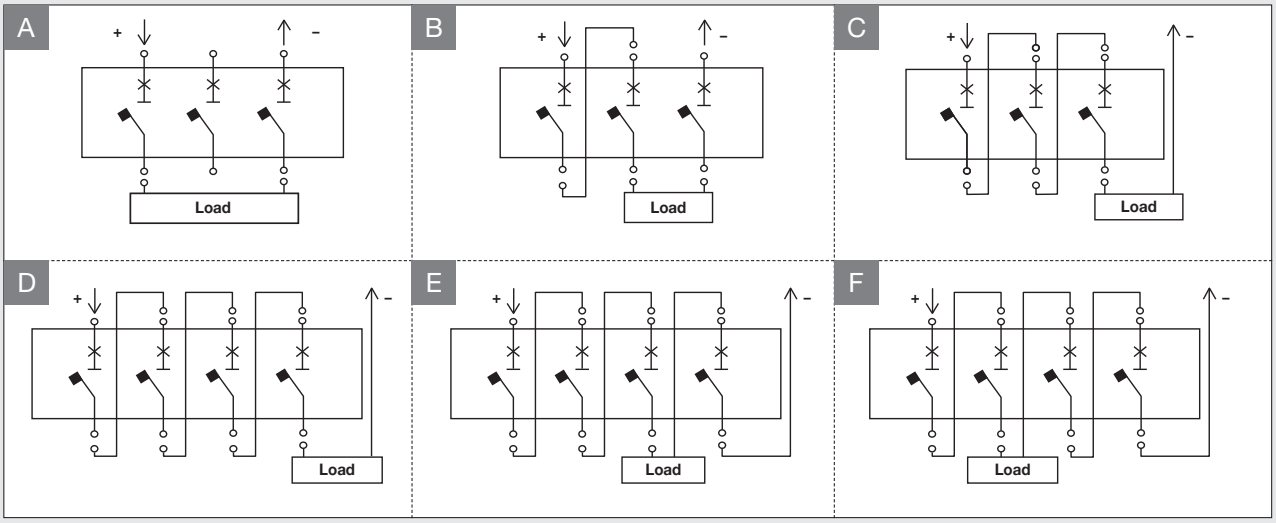
DC Exemplary circuit diagrams



DC500 V (2P) DC750 V (3P) DC1000 V (4P)

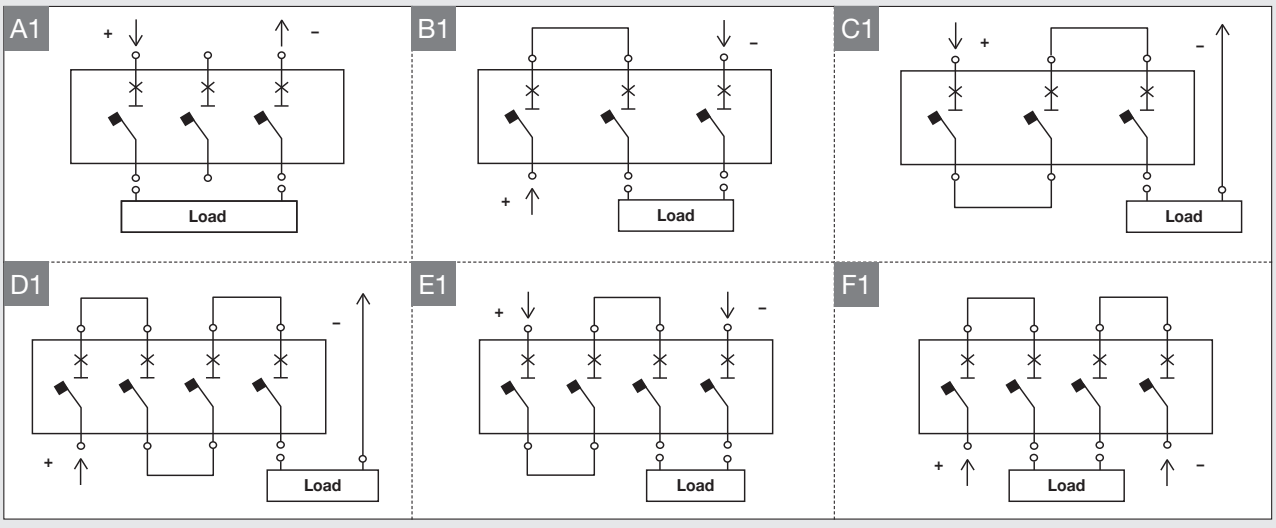
Connection method by DC voltage

Operating voltage (DC)	Center point Connected to earth (A)	One pole connected to earth (B)	Insulated from Earth (C)
- 250 V	A	A	A
- 500 V	A	B, C	A
- 750 V	F	C, E	B
- 1000 V	F	D	E, F



※ Application of 4P4D product when applying 4-pole product

Operating voltage (DC)	Center point Connected to earth (A)	One pole connected to earth (B)	Insulated from Earth (C)
- 250 V	A1	A1	A1
- 500 V	A1	B1, C1	A1
- 750 V	F1	C1, E1	B1
- 1000 V	F1	D1	E1, F1



※ Application of 4P4D product when applying 4-pole product

DC MCCB (DC 1000/1500 V)

Characteristics

- Applications such as photovoltaic (PV) power generation, UPS and data center.
- Compact size implemented
- Maximum breaking capacity
- Nominal voltage ranges up to 1000/1500 Vdc
- Rated current: 63 - 250 A
- No. of poles: 2/4 pole



Rating

AF		250 AF			
Type		N-Type	N-Type	H-Type	NA-Type
Model		TSD250N	TSD250N	TSD250H	TSD250NA
Pole		2P	4P		
Rated current, In		63**, 80, 100, 125, 160, 200, 250 A			200, 250 A
Rated operational voltage, Ue		DC 1000 V	DC 1500 V		
Rated insulation voltage, Ui		DC 1000 V	DC 1500 V		
Rated impulse withstand voltage, Uimp		8 kV			
Rated short-circuit breaking capacity, Icu		20 kA	20 kA	50 kA	Icw* 3 kA, Icm* 3 kA
Ics = % Icu		100			-
Category		A			
Type of trip unit		Thermal-Magnetic			-
Current range	Fixed (Ir)	1 × In			-
Magnetic trip range	Fixed (Ii)	6 × In			-
Life cycle (time)	Mechanical	10000			
	Electrical	2000			1000
Dimension (W×H×D, mm)		76 × 170 × 92	140 × 170 × 92		
Standards		IEC/EN60947-2, GB14048.2			IEC60947-3 and Annex D (For PV) GB/T14048.3
Certification		CCC, CB			

* Icw: Rated short-circuit withstand current (kA), 1 s
Icm: Rated short-circuit making capacity (kA)
** 63 A Magnetic trip range: 8×In

Temperature derating

Type	Rated Current (A)	Derating Current (A)		Compensated rated current in accordance with ambient temperature (A)										Terminal Connection
				40 °C		45 °C		50 °C		60 °C		70 °C		
TSD250	63	63	100 %	63	100 %	62	98 %	60	95 %	56	89 %	52	83 %	TS250 BUSBAR 5T
	80	80	100 %	80	100 %	78	98 %	76	95 %	71	89 %	66	83 %	
	100	100	100 %	100	100 %	98	98 %	95	95 %	89	89 %	83	83 %	
	125	125	100 %	125	100 %	122	98 %	119	95 %	111	89 %	104	83 %	
	160	160	100 %	160	100 %	155	97 %	150	94 %	141	88 %	131	82 %	
	200	200	100 %	200	100 %	196	98 %	190	95 %	178	89 %	166	83 %	
	250	250	100 %	250	100 %	243	97 %	235	94 %	220	88 %	205	82 %	

* Load-side terminal cover using derating current applied to 90 %

Altitude derating

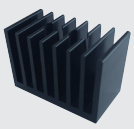
Altitude (m)	Ue (Vdc)			250 AF
	2P	4P	Compensation constant	
2000	1000 V	1500 V	1.00	100 %
3000	870 V	1300 V	0.87	98 %
4000	770 V	1150 V	0.77	93 %
5000	670 V	1000 V	0.67	90 %

* Exclusive codes required for MOP order

Exclusive external accessories



1) Busbar, DC Connector 5T



2) Heat Sink



3) Insulation Barriers



4) Terminal Cover



5) Back Barriers

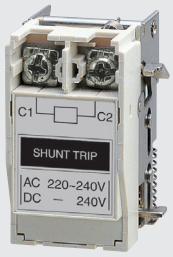


6) Motor Operator

Possible configuration of electrical auxiliaries



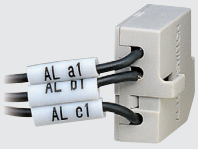
UVT



SHT



AX

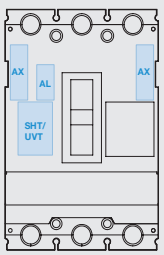


AL

Maximum possibilities

Phase	Accessory	TSD250
R (Left)	AX	1
	AL	1
	SHT, UVT	1
T (Right)	AX	1
	AL	-

TSD250



Note) 1. The internal accessories are assembled together with the product, so be careful when ordering.
2. SHT/UVT can not be used simultaneously

UL DC MCCB (DC 1500 V)

Characteristics

- Applications such as photovoltaic (PV) power generation, UPS and data center.
- Compact size implemented
- Maximum breaking capacity
- Nominal voltage ranges up to DC 1500 V
- Rated current: UL489-60 - 550 A
  UL489B - 40 - 450 A
- Applicable standard: Acquired IEC/UL
  Dual standard





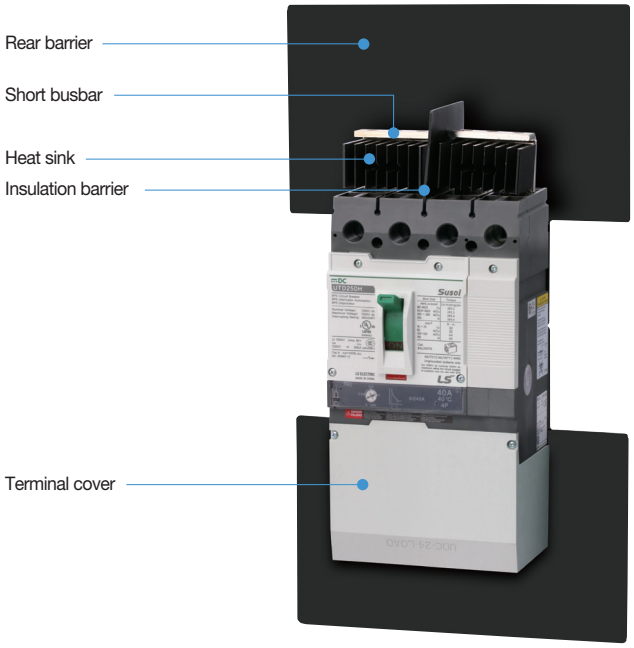


Rating

FRAME		UTD250			UTD400			UTD600		
Rated voltage		1500 Vdc			1500 Vdc			1500 Vdc		
Rated current	UL489 for BPS (40 °C)	60, 80, 100, 150, 200, 250 A			275, 300, 400 A			450, 500, 550 A		
	UL489B for PV (50 °C)	40, 60, 80, 100, 150, 200 A			250, 275 A			300, 400, 450 A		
Number of poles		4			4			4		
Breaker type		E	N	H	E	N	H	E	N	H
UL489 BPS/UL489B PV		**UTD250**			**UTD400**			**UTD600**		
Interrupting capacity (kA) UL, CSA		20	50	65	20	50	65	20	50	65
IEC60947-2		**UTD250**			**UTD400**			**UTD600**		
Ultimate breaking capacity (kA) DC, Icu		20	40	50	20	40	50	20	40	50
Service cut-off current (kA) DC, Ics	τ= 1ms(Annex P)	20	40	50	20	40	50	20	40	50
	τ= 10ms	20	20	20	20	20	20	20	20	20
Insulation voltage, Ui		1500 Vdc			1500 Vdc			1500 Vdc		
Impulse withstand voltage, Uimp		8 kV			8 kV			8 kV		
Utilization Ccategory		A			A			A		
IEC60947-3		**UTD250**			**UTD400**			**UTD600**		
Insulation voltage, Ui		1500 Vdc			1500 Vdc			1500 Vdc		
Impulse withstand voltage, Uimp		8 kV			8 kV			8 kV		
Rated short-time withstand current (Icw)		3 kA			4 kA			5 kA		
Utilization category		DC 23 A, DC-PV2			DC 23 A, DC-PV2			DC 23 A, DC-PV2		
Trip Units		**UL489**	**UL489B**		**UL489**	**UL489B**		**UL489**	**UL489B**	
	FTU*	60 - 250 A	40 - 200 A		275 - 400 A	250, 275 A		450 - 550 A	300 - 450 A	
	FMU*	60 - 250 A	60 - 200 A		275 - 400 A	275 A		450 - 550 A	300 - 450 A	
	MCS**	250 A	200 A		400 A	275 A		550 A	450 A	
	DSU***	250 A			400 A			600 A		
Unit mounted		●			●			●		
Mechanical lugs		●			●			●		
Control wire terminal kit		●			●			●		
Motor operator (MOP)		●			●			●		
Terminal cover		●			●			●		
Insulation barriers		●			●			●		
Shunt trip (SHT)		●			●			●		
Undervoltage trip (UVT)		●			●			●		
Auxiliary switch (AX)		●			●			●		
Alarm switch (AL)		●			●			●		
External handle/Direct connection type		●			●			●		
External handle/Extended type		●			●			●		
Padlock attachment		●			●			●		
Weight(approximate), lbs.(kg)		6.08 (2.76)			15.41 (6.99)			15.43 (7)		
Dimensions Inches(mm)		**W**	**H**	**D**	**W**	**H**	**D**	**W**	**H**	**D**
		5.51 (140)	7.87 (200)	3.62 (92)	7.34 (186.5)	11.42 (290)	4.33 (110)	7.34 (186.5)	13.39 (340)	4.33 (110)

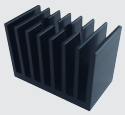
* FTU, FMU : UL489, UL489B, IEC 60947-2
** UL 489, UL 489B Only
*** IEC 60947-3 Only

External configuration



Exclusive external accessories


1) Short busbar


2) Heat sink


3) Insulation barriers


4) Terminal cover

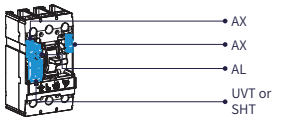
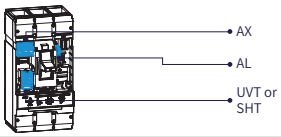

5) Back barriers

Accessories Assembly Quantity

Accessorys	Grounded system		Ungrounded system		Item code	Remarks
	Qty	Unit	Qty	Unit		
Short busbar	3	Set	2	Set	83261172113	UTD250, 40 - 200 A, 1 set
					83261172112	UTD250, 250 A, 1 set
					83261173650	UTD400/600, 250 - 500 A, 1 set
					83261173651	UTD400/600, 550 A - 600 A, 1 set
Insulation barriers	3	ea	4	ea	-	Included in spare part of MCCB or MCS
Terminal cover (Line)	1	ea	1	ea	83261172111 83261173557	UTD250 UTD400/600
Terminal cover (Load)	1	ea	1	ea		
Insulation barrier (1 ea)	2	ea	2	ea		

Note) For 400A ungrounded system, order MCCB or MCS, 83261173650 x2 and 83261173557 x1

Possible conifiguration of electrical auxiliaries

Frame	Internal accessories	Kinds	Left	Right
UTD250		AX	1	1
		AL	1	-
		SHT	1*	-
		UVT	1*	-
UTD400 UTD600		AX	3	-
		AL	-	1
		SHT	1*	-
		UVT	1*	-

* Only one type can be installed in a designated place

DC MCCB (1600 AF)

Characteristics

- DC 750 V (DC MCCB)
- 1000/1250/1600A DC
- Uimp = 8 kV
- 3Pole
- IEC60947-2

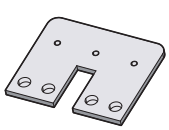


Rating

Model			TS1000N TM	TS1250N TM	TS1600N TM
Frame size			1000	1250	1600
Pole			3	3	3
Rated current, In (A)		-5 - 45τ	1000	1250	1600
		50τ	970	1210	1550
		65τ	880	1100	1410
Rated insulation voltage, (V)	Ui		1000	1000	1000
Rated impulse withstand voltage, (kV)	Uimp		8	8	8
Rated operational voltage, (V)	Ue	DC	750	750	750
Rated short-circuit	Icu	750 Vdc	40	40	40
breaking capacity, (kA)		600 Vdc	40	40	40
IEC60947-2		500 Vdc	60	60	60
Rated service breaking capacity, (kA)	Ics	% Icu	100	100	100
Isolation behavior			●	●	●
Category			A	A	A
Trip characteristic			6In, 10In		
Life cycle (time)	Mechanical		2500	2500	2500
	Electrical		500	500	500
Pollution degree			3	3	3
Dimension (mm)		W×H×D	327×210×152.5		
Weight (kg)			12.5		
Reference standard			IEC60947-2		

Accessories

1) TS1000/1250N TM DC
Order number: 70223472601(1set)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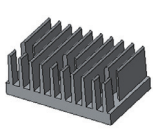
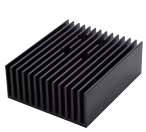

<Heat sink>

2) TS1600N TM DC
Order number: 70223472602 (1 set)


<Busbar>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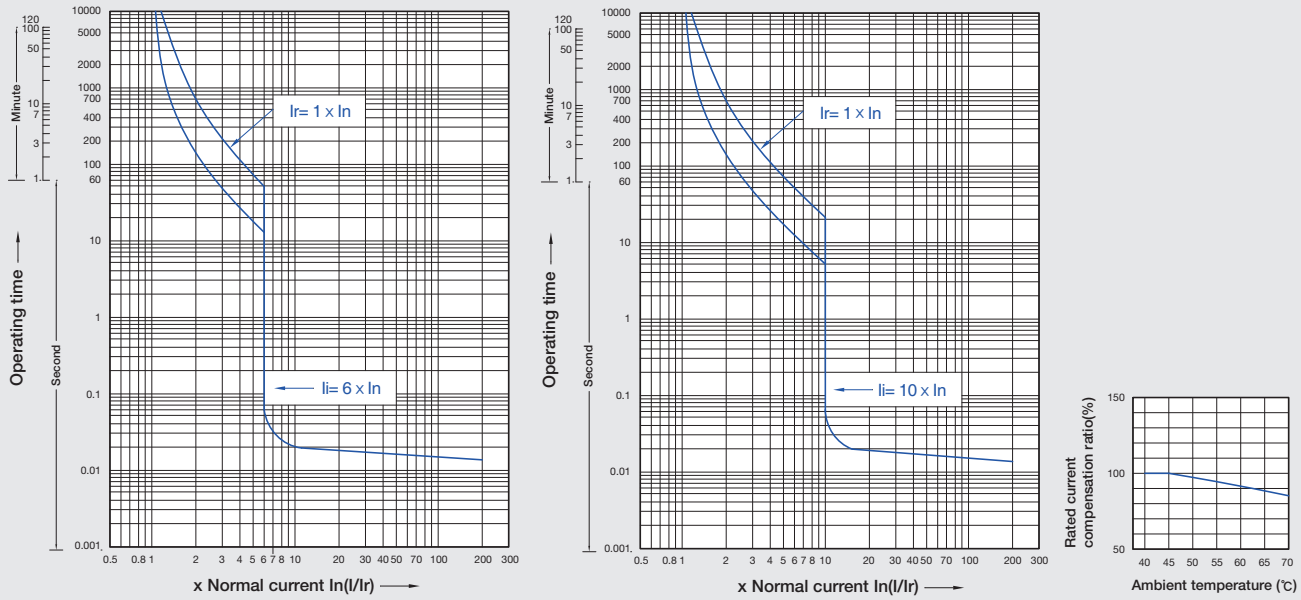
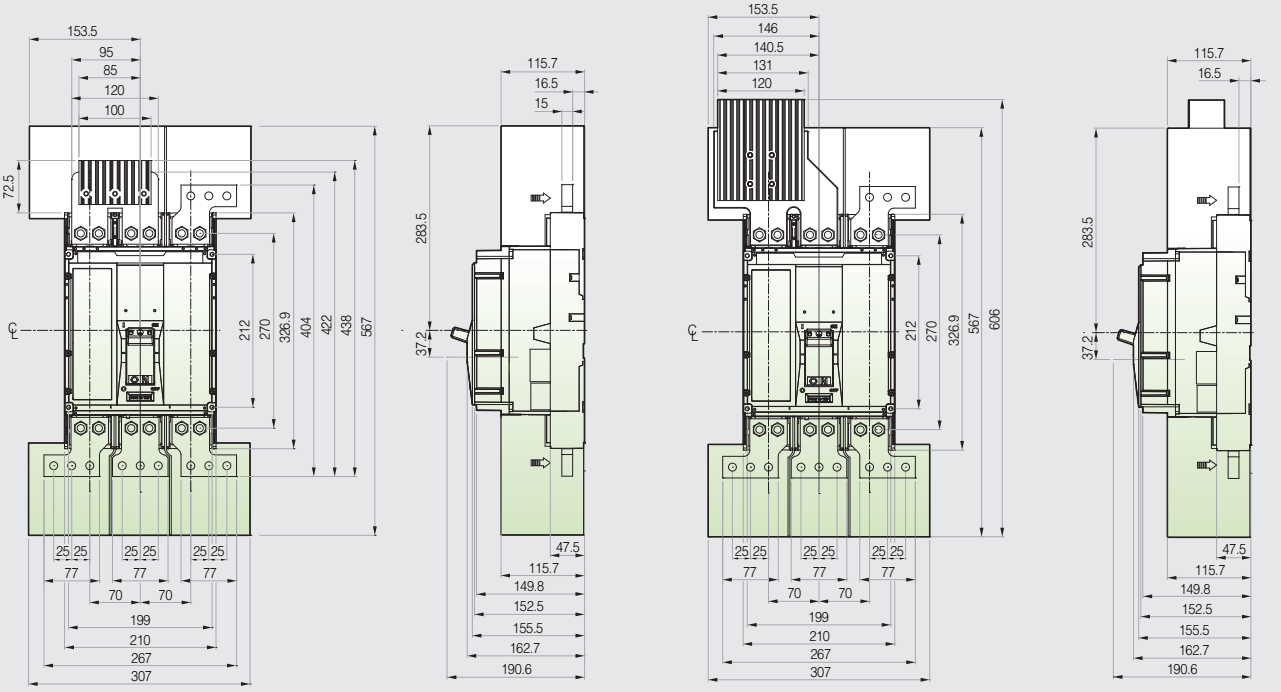
Characteristic curve



Dimensions

(unit: mm)



TS1000/1250N TM DC 3P

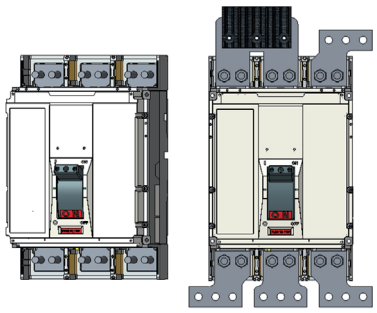
TS1600N TM DC 3P

DC Switch-Disconnector (1600 AF)

1600AF Switch-Disconnectors

Characteristics

- 4 Pole: DC 1150 V/AC 690 V Switch disconnectors
- 3 Pole: DC 900 V/AC 690 V Switch disconnectors
- 1000/1250/1600 A DC
- Uimp = 8 kV
- IEC60947-3



(TS1250NA 3P)



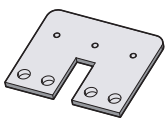
(TS1600NA 4P)

Rating

Type				TS1000NA	TS1250NA	TS1600NA
Frame size			[AF]	1000	1250	1600
Conventional thermal current, Ith			[A]	1000	1250	1600
Rated operational current, Ie			[A]	1000	1250	1600
No. of poles			[Pole]	3/4	3/4	3/4
Rated operational voltage, Ue		DC/AC 3 pole	[V]	900/690	900/690	900/690
		DC/AC 4 pole	[V]	1150/690	1150/690	1150/690
Rated insulation voltage, Ui		DC	[V]	1150	1150	1150
		AC	[V]	1000	1000	1000
Rated impulse withstand voltage, Uimp			[kV]	8	8	8
Rated short-circuit making capacity, Icm		DC	[kA peak]	25	25	25
		AC	[kA peak]	52.5	52.5	52.5
Rated short-circuit making capacity, Icw		1sec	[kA rms]	25	25	25
Utilization category				DC22B/AC23B	DC22B/AC23B	DC22B/AC23B
Isolation behavior				●	●	●
Trip unit (Release)	Disconnector unit		DSU	●	●	●
Connection	Fixed	Front-connection		●	●	●
		Rear-connection		●	●	●
Mechanical life			[Operations]	10000	10000	10000
Electrical life	@ V DC		[Operations]	500	500	500
	@ 690 V AC		[Operations]	2000	2000	2000
Dimensions without accessorys, W×H×D (Front connection)		3 pole	[mm]	210×327×152.5	210×327×152.5	210×327×152.5
		4 pole	[mm]	280×327×152.5	280×327×152.5	280×327×152.5
Weight without accessorys (Front connection)		3 pole	[kg]	12	12	12
		4 pole	[kg]	17.8	17.8	17.8
Reference standard				IEC60947-3	IEC60947-3	IEC60947-3

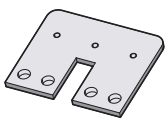
Accessorys

1) For TS1000NA DC



<Busbar>

2) For TS1250NA DC



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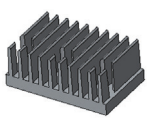

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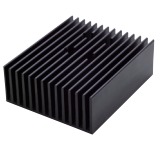
3) For TS1600NA DC



<Busbar>

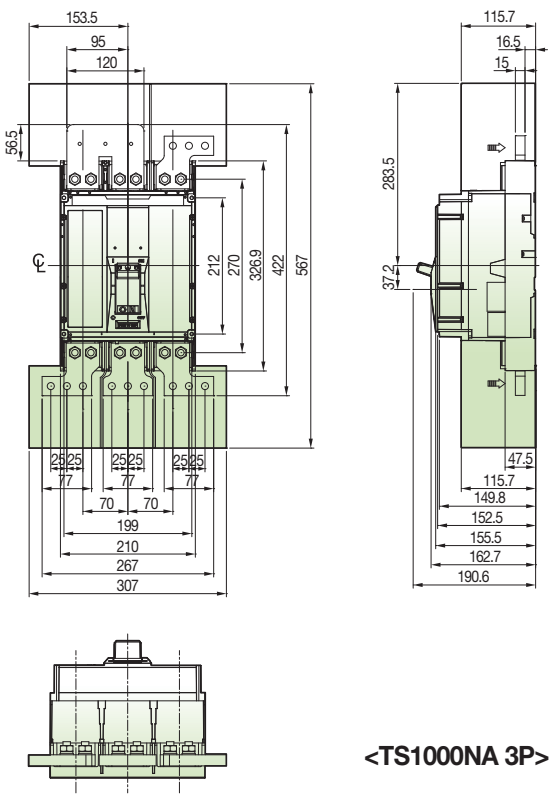


<Heatsink>

Dimensions

TS1600NA

Dimension of MCCB with DC BUSBAR



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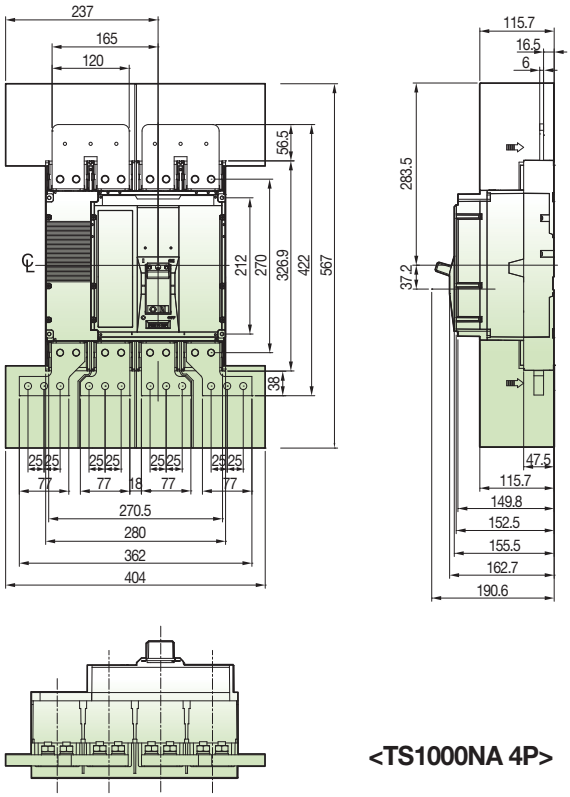

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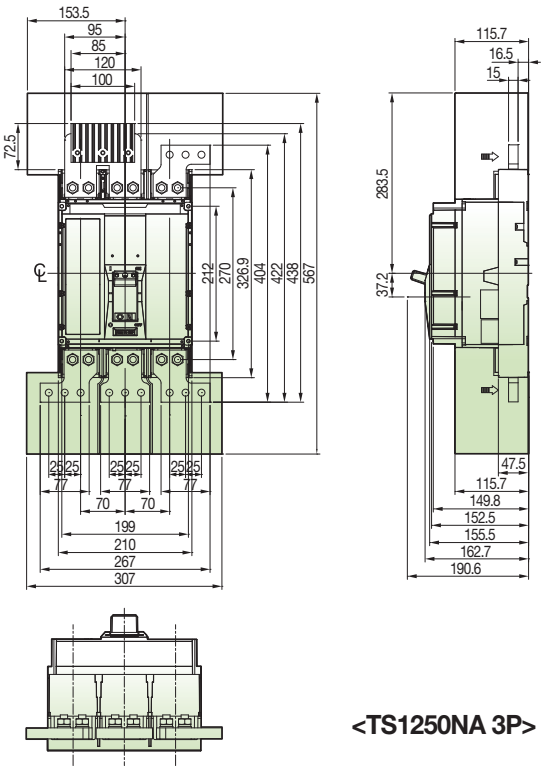

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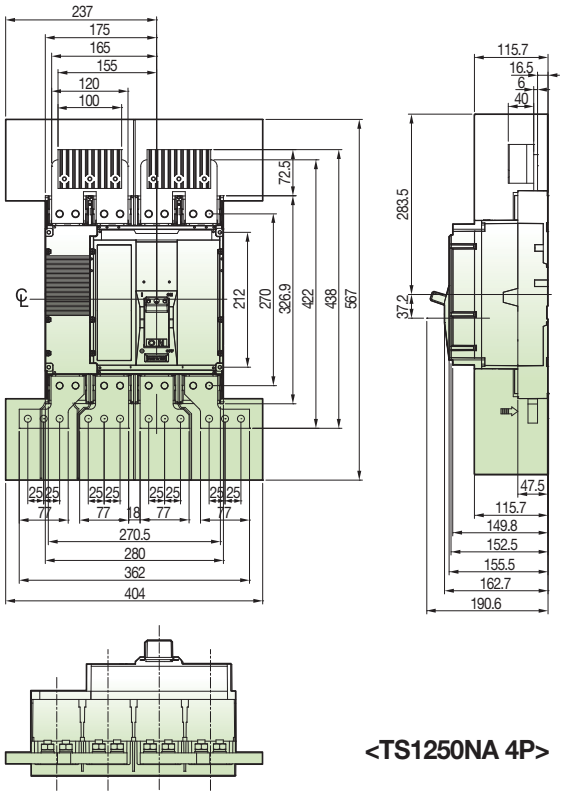


<TS1250NA 4P>

DC Switch-Disconnector

- Basic rating
  - Rated voltage: 1500 Vdc (DDV type), 1200 Vdc (DDH type), 1800 Vdc (DDX type)
  - Rated current: 800 - 4000 A - Icw = 100 kA/1 s
  - Utilization Category: DC-23 A
- Electrical endurance:
  - 10000 operations (1600 A @ 1500 Vdc)
  - 2000 operations (4000 A @ 1500 Vdc)
- Optional Short-Busbar considering temperature performance
- Compatible with existing Susol ACB
  - Accessories including closing and trip coils
  - Physical sizes for installation
- Applicable standards and tests: IEC 60947-3, DEKRA CB, UL listed certification

Note 2)



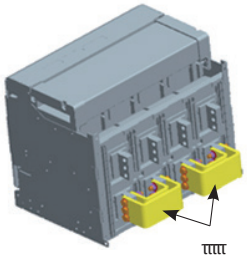
Type and ratings

Specification				Electrical characteristics		
				DDH/DDV-20D	DDH/DDV-40E	DDX-40E
Rated insulation voltage (Ui)			(Vdc)	1500		1800
Rated impulse withstand voltage (Uimp)			(kV)	12		12
Rated short-time withstand current (Icw)			(kA/1s)	100 [1]	100	100
Rated making capacity (Icm)			(kA, peak)	100		100
Operation time (ms)		Openning		Less than 25 ms under Icw/Less than 75ms over Icw		Max. 40
		Closing		80 ms under		Max. 80
Version		Draw-out type		●		●
		Fixed type		●		●
Standard certification				DEKRA CB certification according to IEC 60947-3		PT&T Test Report according to IEC 60947-3
DC 1200 V				**DDH**		
Type				DDH-08D	DDH-10D	DDH-13D	DDH-16D	DDH-20D	DDH-08E	DDH-10E	DDH-13E	DDH-16E	DDH-20E	DDH-25E	DDH-32E	DDH-40E
Frame size			(AF)	800	1000	1250	1600	2000	800	1000	1250	1600	2000	2500	3200	4000
Rated operational voltage (Ue)			(Vdc)	3 Pole	750				750							
				4 Pole	1200				1200							
Utilization category (according to IEC 60947-3)				DC-22 A					DC-22 A							
Endurance (times) (Without maintenance)	Mechanical			20000					15000							
	Electrical	Time const	2 ms	6000	5000	2500	1500	1000	3000				2000		1000	
DC 1500 V				**DDV**												
Type				DDV-08D	DDV-10D	DDV-13D	DDV-16D	DDV-20D	DDV-25D	DDV-08E	DDV-10E	DDV-13E	DDV-16E	DDV-20E	DDV-25E	DDV-32E	DDV-40E
Frame size			(AF)	800	1000	1250	1600	2000	2500	800	1000	1250	1600	2000	2500	3200	4000
Rated operational voltage (Ue)			(Vdc)	3 Pole	1000 (1200 V) [2]					1000 (1200 V) [2]							
				4 Pole	1500					1500							
Utilization category (according to IEC 60947-3)				DC-23 A						DC-23 A							
Endurance (times) (Without maintenance)	Mechanical			20000						15000							
	Electrical [2]	Time const	7.5 ms	-	-	-	-	-	-	5000			4000	2500	1500	1000
		Time const	2 ms	9000	6000	4000	2000	1500	1000	10000			8000	5000	3000	2000
DC 1800 V										**DDX**							
Type										DDX-08E	DDX-10E	DDX-13E	DDX-16E	DDX-20E	DDX-25E	DDX-32E	DDX-40E
Frame size			(AF)							800	1000	1250	1600	2000	2500	3200	4000
Rated operational voltage (Ue)			(Vdc)	3 Pole						1000 (1200V) [1]							
				4 Pole						1800							
Utilization category (according to IEC 60947-3)										DC-22 A							
Endurance (times) (Without maintenance)	Mechanical									15000							
	Electrical [2]	Time const	2 ms							10000	8000	5000	3000	2000	1000	800	500
Demension and weight				**DDH/DDV-20D**						**DDH/DDV/DDX-40E**							
Weight (3P/4P) (kg)	Without cradle	Draw-out type		34/42					37/45	43/53							
	With cradle			63/74					70/85	87/103							
		Fixed type		34/44					38/47	44/55							
External dimensions (H×W×D) (mm)		Draw-out type		430×334(419)×375						430×412(527)×375							
		Fixed type		300×300(385)×295						300×378(493)×295							

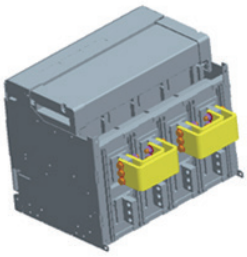
1) DDV 3 Pole models can be used up to DC 1200 V, but if the voltage exceeds DC 1000 V, please contact us.
2) Since Utilization category DC-22 A is applied, it can not be used for DC circuit with time constant exceeding 2 ms.

Connection diagram of DC ACB

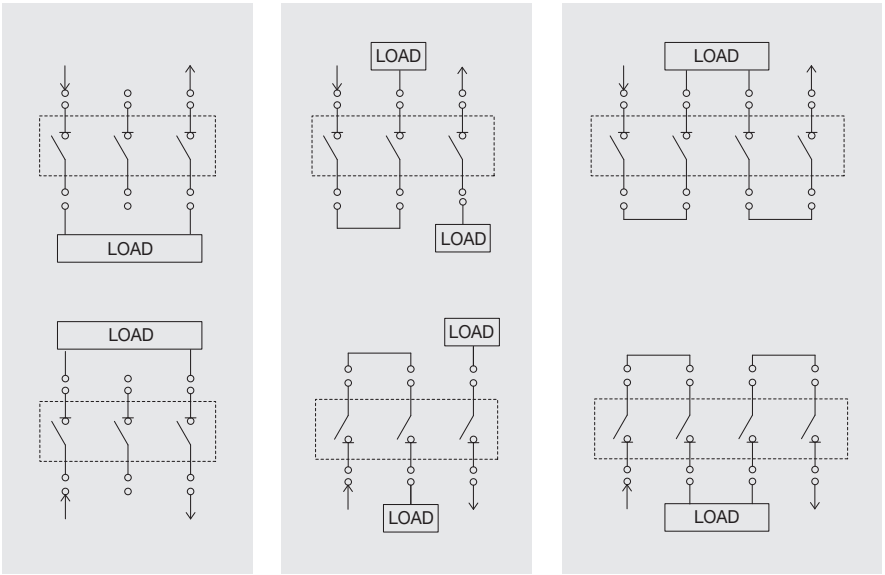
DDH	500 V	750 V	1200 V
DDV	500 V	1000 V	1500 V



ㅠㅠㅠ
(Short Busbar)



Upper supply

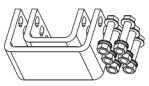
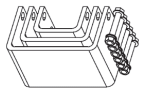
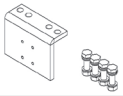
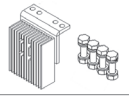
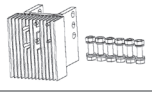


Lower supply

※ Refer to the following page for product dimensions with short busbar.

Composition of short busbar

1. Short busbars can be ordered as shown in the table below, or customer have to make short busbars in accordance with the specified short busbars according to AF.
2. The tightening torque for assembling short busbars is 40 - 50 N.m

Type	AF	Qty. of code	Aspects	Parts (3P)
DDH DDV	E: - 3200 AF	70223464603 3P: 1 ea 4P: 2 ea		Short busbars: 75 mm×10 T×2 ea Bolt: M12×60, 6 ea Nut: M12, 6 ea Spring washer, Plain washer
DDH DDV	E: 4000 AF	70223464604 3P: 1 ea 4P: 2 ea		Short busbars: 125 mm×10T×3 ea Bolt: M12×80, 6 ea Nut: M12, 6 ea Spring washer, Plain washer
DDH DDV	D: 1600 AF	70223461600 3P: 1 ea 4P: 2 ea		Short busbars: 135 mm×100 mm×10 T×1 ea (L type) Bolt: M12×45, 4 ea Nut: M12, 4 ea Spring washer, Plain washer
DDH DDV	D: 2000 AF	70223461601 3P: 1 ea 4P: 2 ea		Short busbars: 135 mm×100 mm×10 T×1 ea (L type) Bolt: M12×45, 4 ea Nut: M12, 4 ea Spring washer, Plain washer, Heat sink
DDV	D: 2500 AF	70223461602 3P: 1 ea 4P: 2 ea		Short busbars: 125 mm×10T×1ea Bolt: M12×45, 6ea Nut: M12, 6ea Spring washer, Plain washer, Heat sink

UL DC Switch-Disconnector



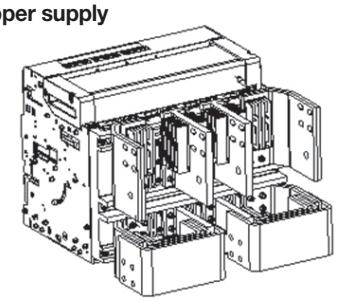


Brand				Susol										
Rated nominal voltage			Vdc	DC 1250 V (4P)/DC 800 V (3P)										
Rated maximum voltage			Vdc	DC 1500 V (4P)/DC 1000 V (3P)										
Poles			(P)	4P/3P										
Version				Fixed/Draw-out										
Standard				UL 489B, UL 489F										
Type				**UDA-08D**	**UDA-10D**	**UDA-13D**	**UDA-16D**	**UDA-20D**	**UDA-25D**	**UDA-08E**	**UDA-16E**	**UDA-20E**	**UDA-25E**	**UDA-32E**	**UDA-40E**
Ampere frame			(AF)	800	1000	1250	1600	2000	2500	800	1600	2000	2500	3200	4000
Short circuit withstand current			(kA)	85						100					
Operating time (ms)		Max. openning time		40 ms											
		Max. closing time		80 ms under											
Lift cycle (times)		Mechanical		12500											
		Electrical		3500	2500	1500	1000	600	400	10000	8000	5000	3000	2000
Weight lb (kg)	Draw-out type	Main body with cradle	3P	154 (70)					165 (75)	214 (97)			245 (111)	326 (148)
			4P	187 (85)					201 (91)	269(122)			309 (140)	414 (188)
		Only cradle	3P	71 (32)					82 (37)	99(45)			123 (56)	205 (93)
			4P	84 (38)					97 (44)	121(55)			152 (69)	256 (116)
	Fixed type	Motor charging type	3P	77 (35)					90 (41)	101 (46)			110 (50)	196 (89)
			4P	99 (45)					112 (51)	126 (57)			137 (62)	249 (113)
External dimensions Inches (mm)	Draw-out type	H×W×D	3P	16.93×13.15×16.02 (430×334×407)						16.93×16.22×16.02 (430×412×407)				
			4P	16.93×16.5×16.02 (430×419×407)						16.93×20.75×16.02 (430×527×407)				
	Fixed type	H×W×D	3P	11.81×11.81×11.61 (300×300×295)						11.81×14.88×11.61 (300×378×295)				
			4P	11.81×15.16×11.61 (300×385×295)						11.81×19.41×11.61 (300×493×295)				
Enclosure dimensions Inches (mm)		H×W×D	3P	19.69×15.75×13.39 (500×400×340)						19.69×19.69×13.39 (500×500×340)				
			4P	19.69×19.69×13.39 (500×500×340)						19.69×24.21×13.39 (500×615×340)				

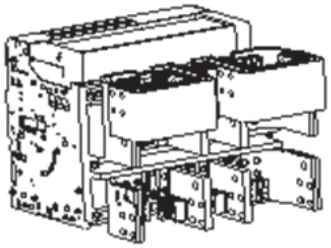
Note 1) External dimensions are excluded external terminal.
Note 2) UL certificate (UL489B/F) is listed on UL site.

Connection type

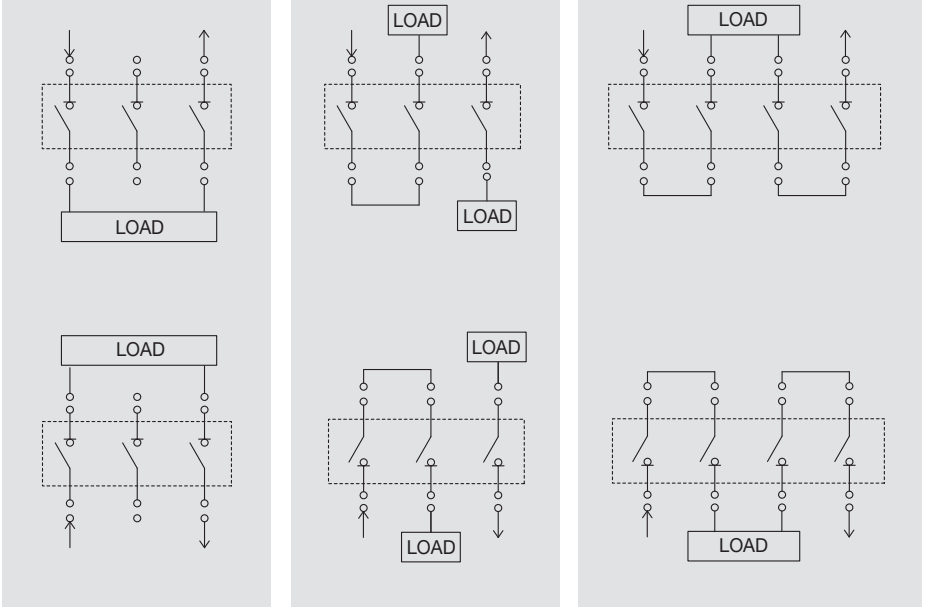
Upper supply



Lower supply

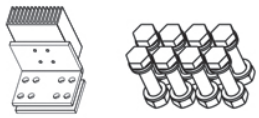
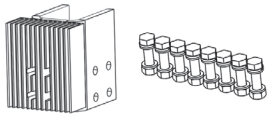
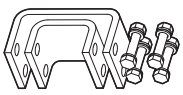
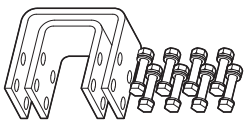
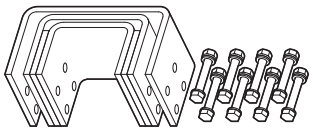


500 Vdc	1000 Vdc	1500 Vdc



Note) If you set up connections not involved in the instruction above, ask the LS technical team.

Specification

Type	AF	Ordering number	3D configuration	Configuration
UDA series	D: 2000 AF	70223466502 3P: 1 ea 4P: 2 ea		Short busbar: 140 mm×10 T×2 ea Bolt: M12×55, 8 ea Nut: M12, 8 ea Spring washer, Plain washer, Heat sink
	D: 2500 AF	70223466500 3P: 1 ea 4P: 2 ea		Short busbar: 125 mm×12 T×1 ea Bolt: M12×45, 8 ea Nut: M12, 8 ea Spring washer, Plain washer, Heat sink
	E: 2500 AF	70223467601 3P: 1 ea 4P: 2 ea		Short busbar: 75 mm×10 T×2 ea Bolt: M12×50×4 ea Nut: M12, 4 ea Spring washer, Plain washer
	E: 3200 AF	70223467602 3P: 1 ea 4P: 2 ea		Short busbar: 75 mm×10 T×2 ea Bolt: M12×50×4 ea Nut: M12, 4 ea Spring washer, Plain washer
	E: 4000 AF	70223467603 3P: 1 ea 4P: 2 ea		Short busbar: 125 mm×10 T×3 ea Spacer busbar: 125 mm×10 T×2 ea Bolt: M12×50×8 ea Nut: M12, 4 ea Spring washer, Plain washer

DC Compact Switch-Disconnector

- Rated current 800 - 1600 A
- Rated operational voltage:
  - DDH type (3P: 750 Vdc, 4P: 1200 Vdc)
  - DDV type (3P: 1000 Vdc, 4P: 1500 Vdc)
- Rated short-time current (Icw): 50 kA/ 1s
- Operation durability without maintenance: 12500 times
- Various control power sources
- Various accessories
- Application Standards and Certification:
  IEC 60947-3 (DEKRA CB certification),
  GB 14048.3 (CCC certification)



Fixed type

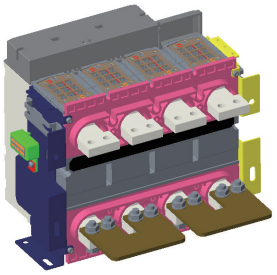


Drawable type

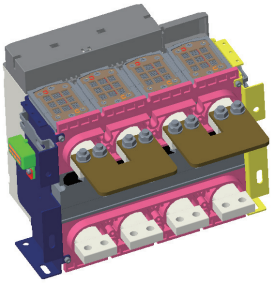
Type and ratings

Commonness													
Rated insulation voltage (Ui)	(V)					1500							
Rated impulse withstand voltage (Uimp)	(kV)					12							
Rated operational voltage (Ue)	(V)					750 V DC (3P), 1200 V DC (4P)				750 V DC (2P)			1000 V DC (3P), 1500 V DC (4P)			
Number of poles	(P)					3, 4				2			3, 4			
Installation type						Fixed/Draw-out				Fixed			Fixed/Draw-out			
Related standards						IEC 60947-3 (DEKRA CB certification), GB 14048.3 (CCC certification)				IEC 60947–3			IEC 60947-3 (DEKRA CB certification), GB 14048.3 (CCC certification)			
Type						DDH				DDV			DDV			
						DDH-08C	**DDH-10C**	**DDH-13C**	**DDH-16C**	**DDV-08C**	**DDV-10C**	**DDV-13C**	**DDV-16C**	**DDV-08C**	**DDV-10C**	**DDV-13C**	**DDV-16C**
Ampere frame	(AF)					800 AF	1000 AF	1250 AF	1600 AF	800 AF	1000 AF	1250 AF	1600 AF	800 AF	1000 AF	1250 AF	1600 AF
Utilization category (According to IEC 60947-3)						DC-22 A				DC-22 A				DC-23 A			
Rated making capacity (Icm)	(kA peak)	DC				50				50				50			
Rated short-time withstand current (Icw)	(kA/1s)	DC				50				50				50			
Operation time	(ms)	Openning time				Less than 25 ms under Icw/Less than 75 ms over Icw											
		Closing time				80 ms under											
Connection		Horizontal type				○				○				○			
		Vertical type				● (Default)				● (Default)				● (Default)			
Mechanical and electrical life cycle																	
Endurance (times) (Without maintenance)		Mechanical (120 times/hr)				12500											
		Electrical (L/R 2 ms) (30 times/hr)				2000	1000	500	500	2000	1000	500	500	4000	2000	1000	1000
Demension and weight																	
Weight (3P/4P)	(kg)	Draw -out	Without cradle			15.5 (3P)/19 (4P)				-				15.5 (3P)/19 (4P)			
			With cradle			22 (3P)/26 (4P)				-				22 (3P)/26 (4P)			
		Fixed				15.5 (3P)/19 (4P)				14 (2P)				15.5 (3P)/19 (4P)			
External dimensions (W×H×D)	(mm)	Draw-out				361.3×267×255.4 (3P), 361.3×267×326 (4P)				-				361.3×267×255.4 (3P), 361.3×267×326 (4P)			
		Fixed				283×219.5×272.4 (3P), 283×219.5×342.4 (4P)				283×219.5×272.4 (2P)				283×219.5×272.4 (3P), 283×219.5×342.4 (4P)			

Product connection

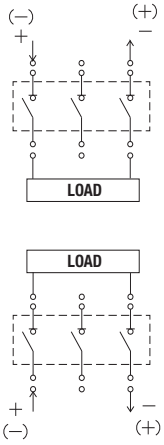
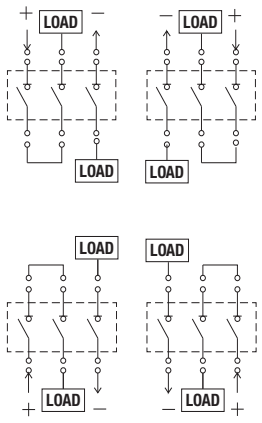
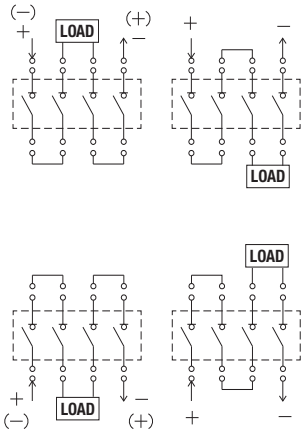


Upper Supply

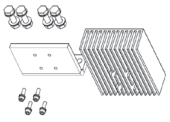
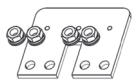
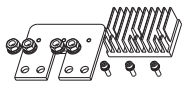
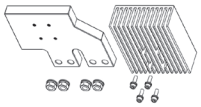


Lower Supply

Operation voltage and connection diagram of DC ACB series

Poles	3P	3P	4P
DDH type	500 Vdc	750 Vdc	1200 Vdc
DDV type	500 Vdc	1000 Vdc	1500 Vdc
Connection diagram			

Note) If different circuit configurations are needed, please contact LS.

Type	Rated current	Busbar connection	Order code	Edifice	Order quantity	Weight (kg/set)
Fixed/ Draw-out type	800 - 1600 A	Vertical/ Horizontal	70223472600	Short busbar: 1 ea/unit, Heatsink: 1 ea/unit M10 Bolt Set: 4 ea/unit, M6 Bolt: 4 ea/unit M4 Screw: 1 ea/unit 	3P: 1 unit 4P: 2 unit	2 kg/unit
Fixed type	800 - 1000 A	Front	70223472603	Short busbar: 1 ea/unit M10 Nut Set: 4 ea/unit 	3P: 1 unit 4P: 2 unit	0.6 kg/unit
	1250 A		70223472601	Short busbar: 1 ea/unit, Heatsink: 1 ea/unit M10 Nut Set: 4 ea/unit, M6 Bolt: 2 ea/unit 	3P: 1 unit 4P: 2 unit	0.7 kg/unit
	1600 A		70223472602	Short busbar: 1 ea/unit Heatsink: 1 ea/unit, Barrier Pad: 1 ea/unit M10 Nut Set: 4 ea/unit, M6 Bolt: 4 ea/unit 	3P: 1 unit 4P: 2 unit	5 kg/unit

UL DC Compact Switch Disconnector



Fixed type

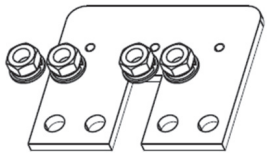
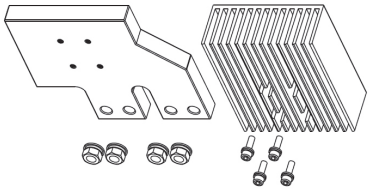
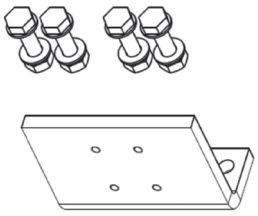


Drawable type

Commonness				Characteristics			
Rated operational voltage (Ue)			(V)	DC 1000 V (3P), DC 1500 V (4P)			
Rated insulation voltage (Ui)			(V)	1500			
Rated impulse withstand voltage (Uimp)			(kV)	12			
Poles			(P)	3, 4			
Installation type				Fixed type/Draw-out type			
Related standards				UL 489B (PV system), UL 489F (ESS system)			
Type				UDA			
				UDA-08C	UDA-10C	UDA-12C	UDA-16C Note)
Ampere frame	(AF)			800 AF	1000 AF	1200 AF	1600 AF
Rated making capacity	(kA peak)		DC	50			
Rated short-time withstand current (Icw)	(kA/1 s)		DC	50			
Interrupting rating	(kA)	DC 1500 V (4P) DC 1000 V (3P) (L/R=8 ms)		8	10	12	12
Operation time	(ms)	Openning time		max.40			
		Closing time		max.80			
Busbar connection method	Fixed type, Draw-out type	Horizontal		○			
		Vertical		● (Default)			
		Mixed		○			
	Flat	Flat		○			
Durability							
Opening and closing duratoin (times) (Unpaid)		Mechanical		12500			
		Electrical (L/R=3 ms)		800	500	400	400
Common Demension and weight							
Weight (3P/4P)	(kg)	Draw-out	Without cradle	19.5 (3P)/24.5 (4P)			
			With cradle	35.5 (3P)/43 (4P)			
		Fixed		16 (3P)/19.5 (4P)			
Dimensions (W×H×D)	(mm)	Draw-out		361.3×267×255.4 (3P), 361.3×267×326 (4P)			
		Fixed		283×219.5×272.4 (3P), 283×219.5×342.4 (4P)			

Note) UDA-16C certified UL 489B only.

DC Short Busbar

Type	Busbar connection	Rated current	Order code	Edifice	Order quantity	Weight (kg/set)
Fixed type	Flat	800 A	70223472603	Short busbar: 1 ea/unit M10 Nut Set: 4 ea/unit 	3P: 1 unit 4P: 2 unit	0.7 kg/unit
		1000-1200 A	70223472605	Short busbar: 1 ea/unit, Heatsink: 1 ea/unit M10 Nut Set: 4 ea/unit, M6 Bolt: 4 ea/unit Barrier Pad: 1 ea/unit 	3P: 1 unit 4P: 2 unit	5 kg/unit
Fixed/ Draw-out type	Vertical/ Horizontal	800-1200 A	70223472604	Short busbar: 1 ea/unit M10 Nut Set: 1 ea/unit 	3P: 1 unit 4P: 2 unit	1.5 kg/unit

DC ACB

- Basic rating
  - Rated voltage: 1500 Vdc (4p)/1000 Vdc (3p) - Rated current: 800 - 4000 A
  - Short-time capacity: 65 kA/1 sec - Breaking capacity: 70 kA @ 750 Vdc (3P), 60 kA @ 1500 Vdc (4P)
- Multi-function relays dedicated to DC protect and enhancing user convenience
  - Precise measurement of current, voltage, power and various protection relay functions
  - Self diagnosis function, event and fault waveform recording
- Electrical endurance:
  10000 operations (1600 A @ 1000 Vdc), 3000 operations (3200 A @ 1000 Vdc)
- Isolation function convenient for withstand voltage test of switchgears
- Optional Short-Busbar considering temperature performance
- Compatible with existing Susol ACB
  - Accessories including closing and trip coils
  - Physical sizes for installation
- Applicable standards and tests: IEC 60947-2, DEKRA CB certification



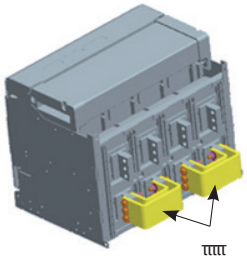
Type and ratings

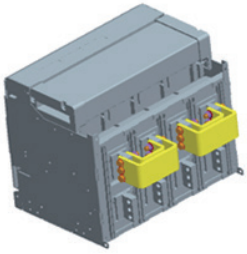
Characteristics				DC 1200 V					DC 1500 V				
Number of poles			(P)	3/4					3/4				
Rated operational voltage (Ue)			(V DC)	750 (3P)/1200 (4P)					1000 (3P)/1500 (4P)				
Rated insulation voltage (Ui)			(V)	1500					1500				
Rated impulse withstand voltage (Uimp)			(kV)	12 kV					12 kV				
Version				Fixed / Withdrawable					Fixed / Withdrawable				
Suitability for isolation				⊣/ ⊢					⊣/ ⊢				
Degree of pollution	IEC60661-1			3					3				
Certification				CB certification according to IEC 60947-2					CB certification according to IEC 60947-2				
Brand name				**Susol**					**Susol**				
Ampere Frame				**ADH-16E**	**ADH-20E**	**ADH-25E**	**ADH-32E**	**ADH-40E**	**ADV-16E**	**ADV-20E**	**ADV-25E**	**ADV-32E**	**ADV-40E**
				1600 AF	2000 AF	2500 AF	3200 AF	4000 AF	1600 AF	2000 AF	2500 AF	3200 AF	4000 AF
Rated current (In) at 40°C			(A)	800, 1000, 1250, 1600	2000	2000, 2500	2000, 2500, 3200	2000, 2500, 3200, 4000	800, 1000, 1250, 1600	2000	2000, 2500	2000, 2500, 3200	2000, 2500, 3200, 4000
Rated ultimate breaking capacity (Icu)	(3P)	500 V DC	(kA)	60	85				-				
		750 V DC	(kA)	40					60	70			
		1000 V DC	(kA)	-					50	60			
	(4P)	750 V DC	(kA)	50					-				
		1000 V DC	(kA)	-					60	70			
		1250 V DC	(kA)	35	40				-				
		1500 V DC	(kA)	-					50	60			
Rated serivce breaking capacity (Ics)			(%)	100 %					100 %				
Rated short-time withstand current (Icw)	(3P)	500 V DC	(kA/1s)	60 Note1)	65				-				
		750 V DC	(kA/1s)	40	40				50 Note1)	60			
		1000 V DC	(kA/1s)	-					50 Note1)	50			
	(4P)	750 V DC	(kA/1s)	50 Note1)	50				-				
		1000 V DC	(kA/1s)	-					50 Note1)	65			
		1250 V DC	(kA/1s)	35	40				--				
		1500 V DC	(kA/1s)	-					50 Note1)	50			
Rated making capacity (Icm)			(kA peak)	100					100				
Utilization category (according to IEC 60947-2)				B					B				
Overcurrent protection	Electronic trip units for DC applications			●					●				
Operation time	Total Breaking time	< Icw	(ms)	Less than 75 ms under Icw					Less than 75 ms under Icw				
		> Icw	(ms)	Less than 25 ms over Icw					Less than 25 ms over Icw				
	Closing time		(ms)	Less than 80 ms					Less than 80 ms				
Mechanical and Electrical Life cycle													
Endurance (times) (Without maintenance)	Mechanical		(times)	15000					15000				
	Electrical (at 1000 V DC)	lesssw than 1600 A	(times)	10000					10000				
		2000 A	(times)	8000					8000				
		2500 A	(times)	-	5000	3000	500		-	5000	3000	500	
Demension and Weight													
Weight (3P/4P)	Drawout	Without cradle	(kg)	43/53					43/53				
		With cradle	(kg)	87/103					87/103				
	Fixed		(kg)	44/55					44/55				
External dimensions (H×W×D)	Drawout	3P (4P)	(mm)	430×412(527)×375					430×412(527)×375				
	Fixed	3P (4P)	(mm)	300×378(493)×295					300×378(493)×295				

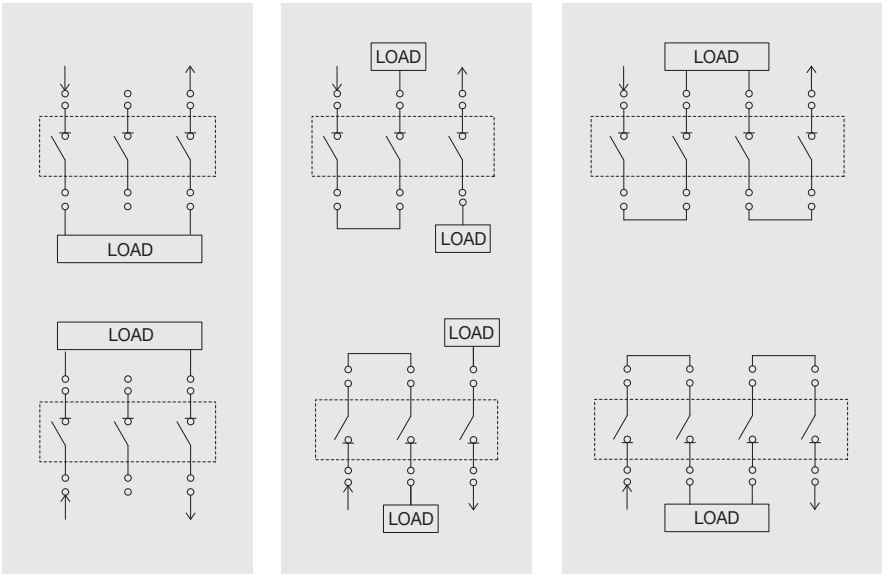
Note 1) Duration of rated short-time withstand current (Icw) is 0.5 s

Connection diagram of DC ACB

ADV	750 V	1000 V	1500 V
ADH	500 V	750 V	1200 V



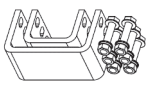
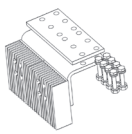




※ Refer to the following page for product dimensions with short busbar.

Composition of short busbar

1. Short busbars can be ordered as shown in the table below, or customer have to make short busbars in accordance with the specified short busbars according to AF.
2. The tightening torque for assembling short busbars is 40 - 50 N.m

Type	AF	Qty. of code	Aspects	Parts (3P)
ADH ADV	E: - 2500 AF	70223464603 3P: 1 ea 4P: 2 ea		Short busbars: 75 mm×10 T×2 ea Bolt: M12×60, 6 ea Nut: M12, 6 ea Spring washer, Plain washer
ADH ADV	E: 3200 AF	70223464620 3P: 1 ea 4P: 2 ea		Short busbars: 100 mm×10 T×1 ea 120 mm×105 mm×10 T×1 ea (L type) Bolt: M12×60, 8 ea Nut: M12, 8 ea Spring washer, Plain washer, Heat sink

High Voltage DC Relay

What is LS High Voltage DC Relay?

The LS High Voltage DC Relay serves to supply and disconnect DC power, and contains hydrogen and nitrogen gas, which is optimized to withstand making and breaking. Therefore, it has excellent electrical durability, compact size, and low noise.







GPR Specifications

Rating

Model		GPR010	GPR040	
Number of poles		1 Pole	1 Pole	
Operating voltage, Ue		DC 450 V	DC 450 V	
Rated impulse withstand voltage, Uimp		4 kV	4 kV	
Conventional thermal current, Ith		10 A	40 A	
Short time withstand current	120 s	15 A	100 A	
	15 Min	-	60 A	
Durability	Mechanical (*) (3600 operations per hour)	200000 cycles	200000 cycles	
	Electrical	10 A, 450 VDC, 150000 cycles (at 36 0cycles/Hr) (only Making)	40 A, 450 VDC, 1000 cycles (at 1200 cycles/Hr)	
Voltage drop (Initial)		0.5 V @ 10 A	0.2 V @ 20 A	
Operating time		Max. 50 ms	Max. 50 ms	
Release time		Max. 30 ms	Max. 30 ms	
Insulation strength (Initial)		Min. 100 MΩ (@ 500 VDC)	Min. 100 MΩ(@ 500 VDC)	
Size, W × H × D(mm)		56×28×45	67×35×47	
Temperature range		-40 - 85 ℃	-40 - 85 ℃	
Humidity		5-95 % R.H.	5-95 % R.H.	
Weight		85 g	145 g	
Certification		CE cULus	CE cULus	

* The number of Mechanical times is the number that meets the basic performance after durability.

Features

Compact Design
Achieved compact size by filling with hyrodgen and nitrogen gas to improve the breaking performance.

Proven Safety
High value of short circuit current withstanding.

Superior Reliability
Excellent performance with electrical and mechanical endurances.






	GPR100	GPR150	GPR250	GPR400
	1 Pole	1 Pole	1 Pole	1 Pole
	DC 450 V	DC 450 V	DC 450 V	DC 450 V
	4 kV	4 kV	4 kV	4 kV
	100 A	150 A	250 A	400 A
	225 A	320 A	500 A	900 A
	150 A	225 A	350 A	600 A
	200000 cycles	200000 cycles	200000 cycles	200000 cycles
	100 A, 450 VDC, 1000 cycles (at 1200 cycles/Hr)	150 A, 450 VDC, 1000 cycles (at 1200 cycles/Hr)	250 A, 450 VDC, 1000 cycles (at 360 cycles/Hr)	400 A, 450 VDC, 1000 cycles (at 360 cycles/Hr)
	0.04 V @ 20 A	0.04 V @ 20 A	0.02 V @ 20 A	0.02 V @ 20 A
	Max. 50 ms	Max. 50 ms	Max. 30 ms	Max. 30 ms
	Max. 30 ms	Max. 30 ms	Max. 10 ms	Max. 10 ms
	Min. 100 MΩ (@ 500 VDC)	Min. 100 MΩ (@ 500 VDC)	Min. 100 MΩ (@ 500 VDC)	Min. 100 MΩ (@ 500 VDC)
	81×39×70	81×39×70	92×45×87	100×58×91
	-40 - 85 ℃	-40 - 85 ℃	-40 - 85 ℃	-40 - 85 ℃
	5-95 % R.H.	5-95 % R.H.	5-95 % R.H.	5-95 % R.H.
	330 g	330 g	500 g	630 g
	CE	CE cULus	CE	CE

High Voltage DC Relay

GPR-M Specifications (Operating voltage DC1000 V)





Model		GPR-M010	GPR-M040	GPR-M100	
Number of poles		1 Pole	1 Pole	1 Pole	
Operating voltage, Ue		DC 600 V	DC 1000 V	DC 1000 V	
Rated impulse withstand voltage, Uimp		4 kV	4 kV	6 kV	
Conventional thermal current, Ith		10 A	40 A	100 A	
Short time withstand current	2 Min	-	100 A	225 A	
	15 Min	15 A	60 A	150 A	
Durability	Mechanical (*) (3600 operations per hour)	200000 cycles	200000 cycles	200000 cycles	
	Electrical	5 A, 600 VDC, 10000 cycles (at 360 cycles/Hr) (only Making)	20 A, 1000 VDC, 1000 cycles (at 360 cycles/Hr)	50 A, 1000 VDC, 1000 cycles (at 360 cycles/Hr)	
Voltage drop(Initial)		0.5 V @ 10 A	0.2 V @ 20 A	0.04 V @ 20 A	
Operating time		Max. 50 ms	Max. 50 ms	Max. 50 ms	
Release time		Max. 30 ms	Max. 30 ms	Max. 30 ms	
Insulation strength(Initial)		Min. 100 MΩ (@ 1000 VDC)	Min. 100 MΩ (@ 1000 VDC)	Min. 100 MΩ (@ 1000 VDC)	
Size, W × H × D (mm)		56 × 28 × 45	67 × 35 × 47	81 × 39 × 70	
Temperature range		-40 - 85 ℃	-40 - 85 ℃	-40 - 85 ℃	
Humidity		5-95 % R.H.	5-95 % R.H.	5-95 % R.H.	
Weight		80 g	145 g	330 g	
Certification		CE cULus	CE cULus	CE cULus	

* The number of Mechanical times is the number that meets the basic performance after durability.







*Bi-directional

	GPR-M150	GPR-M250	GPR-M400	GPR-M400-A	GPR-M400-A BI
	1 Pole	1 Pole	1 Pole	1 Pole	1 Pole
	DC 1000 V	DC 1000 V	DC 1000 V	DC 1000 V	DC 1000 V
	6 kV	6 kV	6 kV	6 kV	4 kV
	150 A	250 A	400 A	400 A	400 A
	320 A	500 A	750 A	750 A	750 A
	225 A	350 A	500 A	500 A	500 A
	200000 cycles	200000 cycles	200000 cycles	200000 cycles	200000 cycles
	75 A, 1000 VDC, 1000 cycles (at 360 cycles/Hr)	125 A, 1000 VDC, 1000 cycles (at 360 cycles/Hr)	200 A, 1000 VDC, 1000 cycles (at 360 cycles/Hr)	200 A, 1000 VDC, 3000 cycles (at 360 cycles/Hr)	100 A, 1000 VDC, 6000 cycles 220 A, 800 VDC, 1500 cycles (at 360 cycles/Hr)
	0.04 V @ 20 A	0.02 V @ 20 A	0.02 V @ 20 A	0.02 V @ 20 A	0.04 V @ 20 A
	Max. 50 ms	Max. 30 ms	Max. 30 ms	Max. 30 ms	Max. 30 ms
	Max. 30 ms	Max. 10 ms	Max. 10 ms	Max. 10 ms	Max. 10 ms
	Min. 100MΩ (@ 1000 VDC)	Min. 100 MΩ (@ 1000 VDC)	Min. 100 MΩ (@ 1000 VDC)	Min. 100 MΩ (@ 1000 VDC)	Min. 100 MΩ (@ 1000 VDC)
	81 × 39 × 70	92 × 45 × 87	100 × 58 × 91	100 × 58 × 99	100 × 58 × 99
	-40 - 85 ℃	-40 - 85 ℃	-40 - 85 ℃	-40 - 85 ℃	-40 - 85 ℃
	5-95 % R.H.	5-95 % R.H.	5-95 % R.H.	5-95 % R.H.	5-95 % R.H.
	330 g	500 g	630 g	750 g	800 g
	CE cULus	CE cULus	CE cULus	CE cULus	CE cULus

High Voltage DC Relay

GPR-H Specifications (Operating voltage DC1500 V)



* Bi-directional



* Bi-directional

Model		GPR-H500-A	GPR-H600-A
Number of poles		1 Pole	1 Pole
Operating voltage, Ue		DC 1500 V	DC 1500 V
Rated impulse withstand voltage, Uimp		8 kV	8 kV
Conventional thermal current, Ith		500 A	600 A
Short time withstand current	2 Min	900 A	1000 A
	6 Min	770 A	800 A
	15 Min	750 A	800 A
Durability	Mechanical (*) (3600 operations per hour)	200000 cycles	200000 cycles
	Electrical	200 A, 1500 VDC, 1000 cycles (at 360 cycles/Hr)	200 A, 1500 VDC, 1500 cycles 150 A, 1500 VDC, 6000 cycles (at 360 cycles/Hr)
Voltage drop (Initial)		0.04 V @ 20 A	0.04 V @ 20 A
Operating time		Max. 35 ms	Max. 35 ms
Release time		Max. 15 ms	Max. 15 ms
Insulation strength (Initial)		Min. 100 MΩ (@ 1000 VDC)	Min. 100 MΩ (at DC 1000 V)
Size, W × H × D (mm)		118 × 70 × 108	118 × 70 × 110.5
Temperature range		-40 - 85	-40 to 85
Humidity		5-95 % R.H.	5 to 95 % R.H.
Weight		1.3 kg	1.3 kg
Certification		CE cULus CCC	CE cULus CCC

* The number of Mechanical times is the number that meets the basic performance after durability.

Ordering Information

GPR-M 400 -A DC12V SM BI □
❶ ❷ ❸ ❹ ❺ ❻ ❼

❶ Operating Voltage

R	450 V
R-M	1000 V
R-H	1500 V -

❷ Conventional thermal Current

010	10 A	250	250 A
040	40 A	400	400 A
100	100 A	500	500 A
150	150 A		

❸ Aux Type

-A	Aux.
blank	No Aux.

❹ Control Voltage

DC 12 V
DC 24 V

❺ Mounting Type

blank | Bottom Mounting

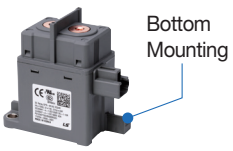
❻ Breaking Direction

blank	Uni-directional
BI	Bi-directional

❼ Special feature

blank | General
Special feature

Option detail

No	Item		Shape	Type	Remarks
❸	Auxiliary contact			GPR-M400-A GPR-H500-A	ON/OFF detection of main contact
❹	Control voltage		-	See coil rating on page 10	Coil voltage 12/24 V
❺	Mounting type	Bottom mounting		ALL	Vertical mounting

DC MCB

Characteristics

- Solar power, renewable suitable for DC power source
- SEMKO CB
- Maximum working voltage: DC 1000 V
- Rating and number of poles: 1 - 63 A, 1/2/3/4 pole
- Rated voltage: DC 250/500/750/1000 V
- Rated breaking capacity: 10 kA
- Trip characteristic: B, C
- Accessorys: AX, AL, SHT



Rating



ON / OFF Display Indicator



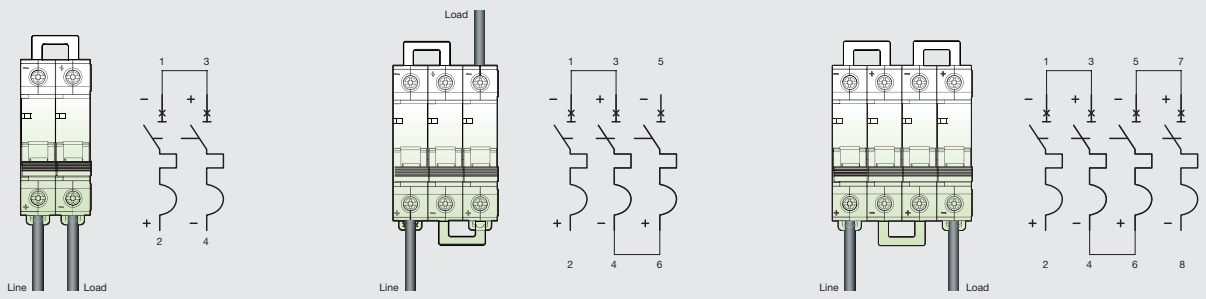
AX, AL



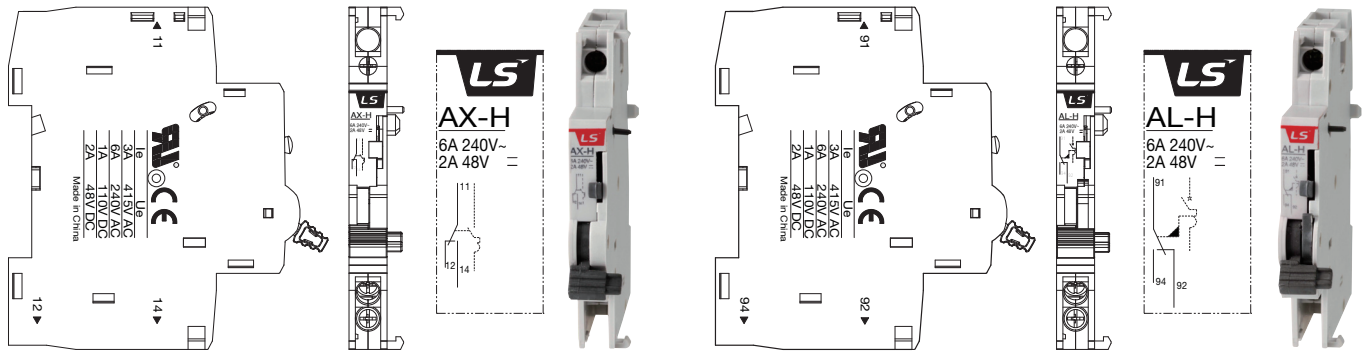
SHT, UVT

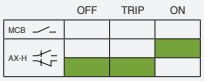
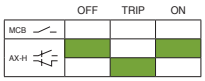
Type			BK63H-DC
Frame size			63 AF
No. of poles			1P, 2P, 3P, 4P
Rated current, In			1, 2, 3, 4, 6, 10, 16, 20, 25, 32, 40, 50, 63 A
Rated operational voltage, Ue DC	Reference standard	Poles	
	IEC 60947-2, Icu	Rated voltage	250 V / 500 V / 750 V / 1000 V
		Breaking current	10 kA / 10 kA / 10 kA / 10 kA
		Interrupting capacity service	7.5 kA / 7.5 kA / 7.5 kA / 7.5 kA
Rated insulation voltage, Ui AC			DC 1000 V
Rated impulse withstand voltage, Uimp			6 kV
Trip characteristic			B (5In), C (8In)
Protection			Overload and short circuit
Endurance life (times)	Electrical		1500
	Mechanical		20000
Degree of protection			IP20
Tightening torque			18-4 AWG (0.75 … 25 mm²)/20 kgf·cm
Installation			Mounting on 35 mm DIN rail
Type of Terminal			Lug Type/Screw Type
Type of trip			Thermal-Magnetic
Ambient temperature			40 °C (Standard), -35 - + 70 °C (Use)
Approval			CE, SEMCO, CB

DC Type connection wiring diagram



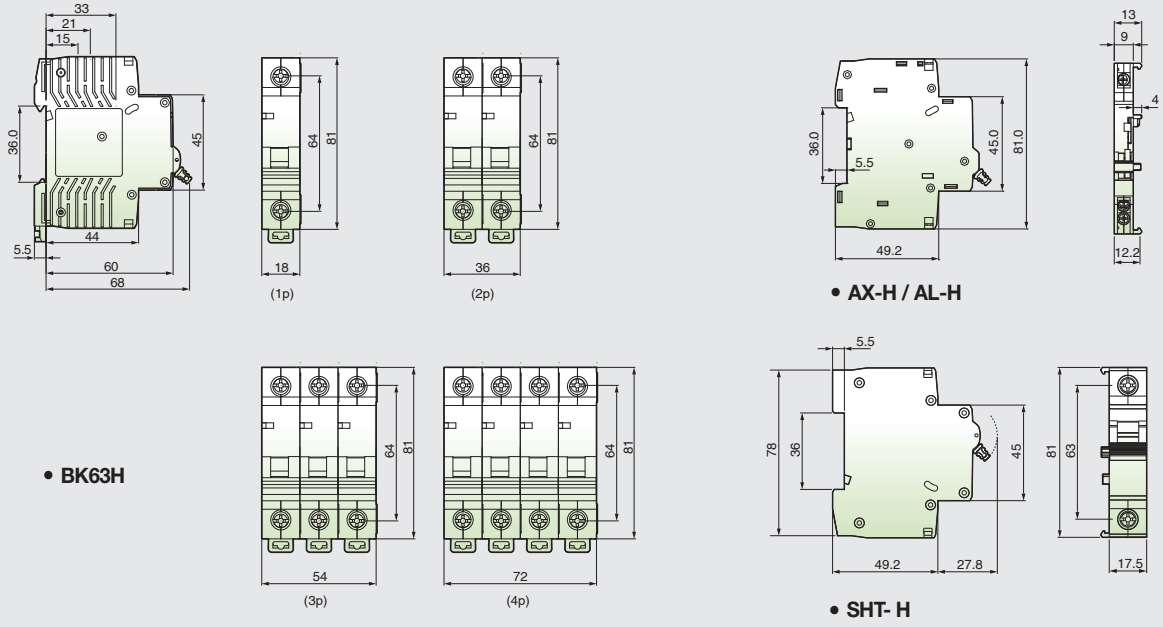
Accessory



Type		AX-H	AL-H	SHT-H
Appearance				
Rated Operational Current (A)	Rated voltage (Ue)	AC 6A @ 240 V/3 A @ 415 V 1 A @ 110 V/2 A @ 48 V		DC 60 - 220 V AC 110 - 380 V DC 24 - 220 V *
	Working voltage	-		85 % - 110 % Ue
Mechanical Endurance		10000		-
Cable capacity		0.75 - 2.5 mm²		≤ 2.5 mm²
Contact				-
Weight (g)		48	48	100

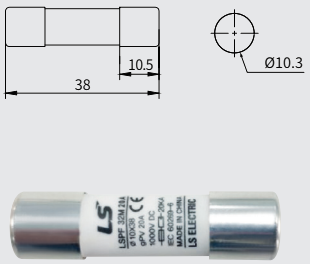
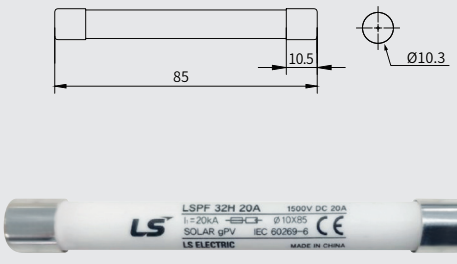
* 24 V only SHT product. Please note when ordering.

Dimensions



DC FUSE

Fuse rating

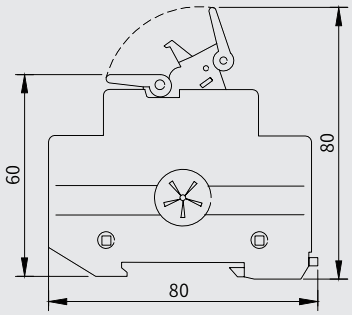
LSPF 32M	LSPF 32H
	

Type	FUSE	
Model	LSPF 32M	LSPF 32H
Rated voltage	DC 1000 V	DC 1500 V
Rated current	2A - 32 A	2A - 32 A
Class of operation	gPV	gPV
Breaking capacity	20 kA	20 kA
Time constant	1 - 3 ms	1 - 3 ms
Size (mm)	10×38 mm	10×85 mm
Standard	IEC 60269-6	IEC 60269-6
Certificate	CE	CE

Fuse holder rating

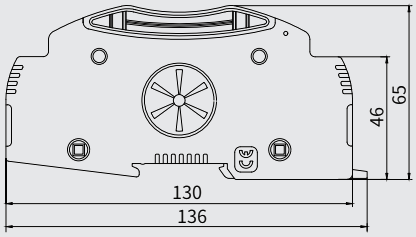
LSPF 32M B





LSPF 32M B





Type	FUSE HOLD	
Model	LSPF 32M B	LSPF 32H BL
Rated voltage	DC 1000 V	DC 1500 V
Rated current	32 A	50 A
Class of operation	gPV	gPV
Signal indicator	LED	LED
Wire range	1 - 10 mm^2	1 - 16 mm^2
Torque	2 - 2.5 N.m	2.5 N.m
Size (W×H×D, mm)	18×80×60 mm	24×136×65 mm
Standard	IEC 60269-6	IEC 60269-6
Certificate	CE	CE

DC Contactors

Characteristics

Products application and Function

- Two normally open main contacts for DC circuit
- Positive and negative pol es indicated on the front plate
- Eternal magnet installed for the effective arc extinguishing
- DIN rail or screw mountable
- 2NO+2NC Auxiliary contacts built-in as standard
- AC/DC control voltage
- CE, UL Certified

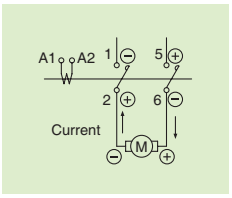


Selection

Contactor types	DC-2 - 5 ratings			DC-1 rating	Continuous current, Ith	Auxiliary contacts
	125 V	250 V	500 V	1000 V		
MD-30a	40 A	30 A	20 A	10 A	60 A	2a(NO)+2b(NC)
MD-60a	80 A	60 A	40 A	25 A	100 A	2a(NO)+2b(NC)
MD-100a	120 A	100 A	60 A	35 A	135 A	2a(NO)+2b(NC)

Ratings of auxiliary contacts

UA-1	AC15 duty						DC13 duty				
	120 V	240 V	380 V	480 V	500 V	600 V	125 V	250 V	400 V	500 V	600 V
Rated currents	6 A	3 A	1.9 A	1.5 A	1.4 A	1.2 A	1.1 A	0.55 A	0.31 A	0.27 A	0.2 A
Continuous current, Ith	16 A										





Coil voltage

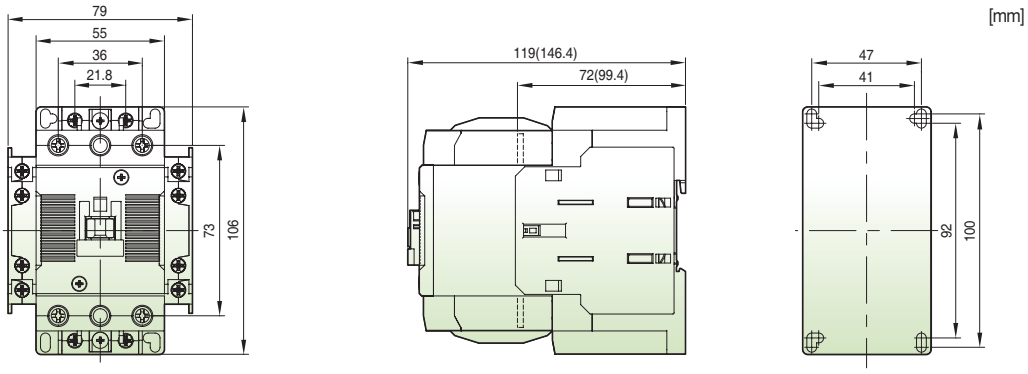
AC	50/60 Hz	24, 48, 100, 110, 120, 200, 220, 230, 240, 380, 400, 415, 440, 500, 550 V
DC	DC	12, 20, 24, 48, 60, 80, 100, 110, 125, 200, 220, 250 V

Dimensions

MD-30a AC(DC)

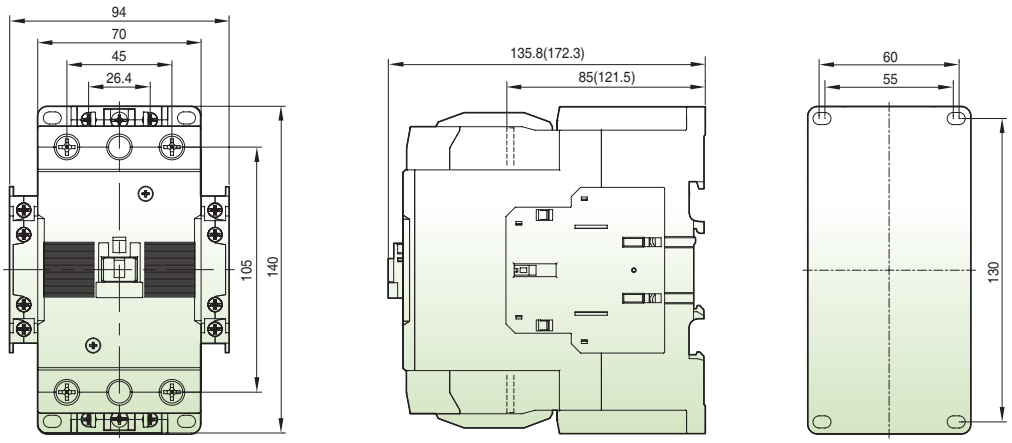
2NO2NC

[mm]



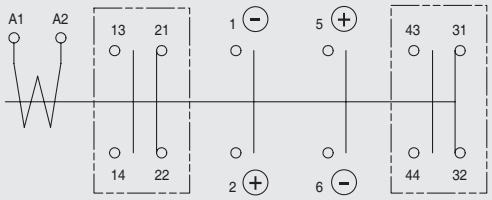
MD-60a,100a AC(DC)

2NO2NC

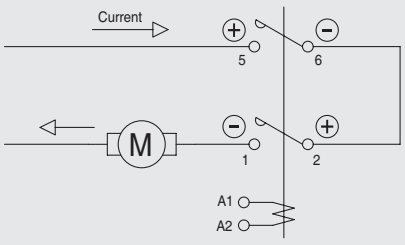


Composition

MD-30a, 60a, 100a



Contact arrangement



SPD BK Series (DC/DIN type)

Characteristics

- DC system surge voltage protection
- Rating: - DC 1500 V
- Pole: 2P, 3P
- Grades: Class Ⅱ
- Status indication
  - Steady state: Green
  - After the accident: colorless (black)






Rating

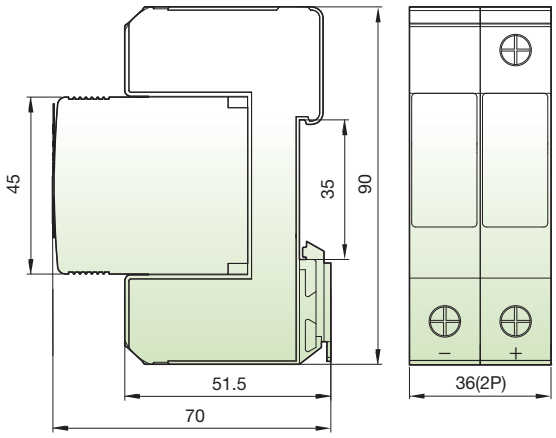
Type		DC Type			
		BK20S-DC110	BK20S-DC600	BK20S-DC1000	BK20S-DC1500
No. of poles	[Pole]	2P	3P		
Rated voltages	Un [V]	DC110	DC600	DC1000	DC1500
Max. continued-operation voltage	Uc [V]	DC220	DC700	DC1200	DC1500
Voltage protection level	Up [kV]	≤1.0	≤2.5	≤3.9	≤4.5
Nominal discharge current	In [kA]	20	20	20	20
Max. discharge current	Imax [kA]	40	40	40	40
Impulse current	Iimp [kA]	-	-	-	-
Grades	Test Class	Class Ⅱ			
Reaction time		< 25 ns			
Status indication		Have Status indication			
Operating temperature range		-40 ℃ - 80 ℃			
Cross-sectional area of the connecting		6 mm² or more			
Accessories		AL Note1)			
Standard		EN50539-11 IEC 61643-11 / UL1449			
Certification		CE	CE, UL	CE, UL	CE
SPD Disconnector	MCCB	TD100 2P 32 A	TD100 3P 32 A	TD100 4P 32 A	TSD250N/H 4P 63 A
	MCB	BK63H-DC 2P 40 A	BK63H-DC 3P 40 A	BK63H-DC 4P 40 A	-

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

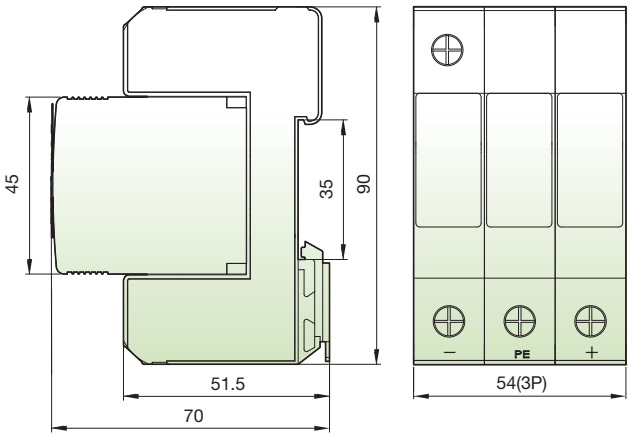
Dimensions

BK20S-DC

[Unit: mm]

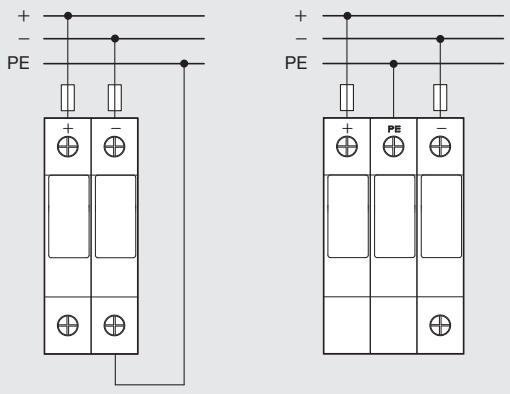


2P



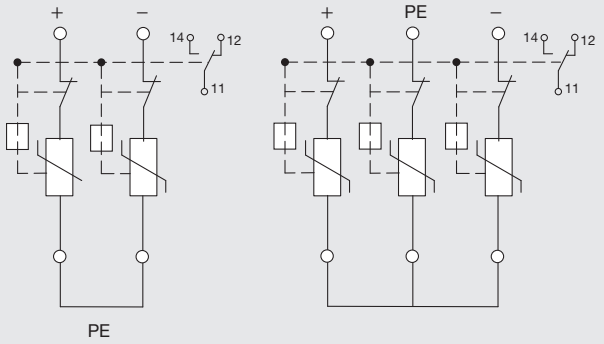
3P

Installation wiring method



2P 3P

Wiring Diagram



2P 3P

Susol
Super Solution

Metasol
Meta Solution



AC Components

You can count on us.

Customer satisfaction with world-class products and services LS is committed to excellence.

LS is implementing the 6-Sigma program with the goal of 'zero-defect' to make only the highest quality products. And to secure product reliability, we embody a high quality guarantee system by carrying out product test evaluations that are internationally recognized for their use of the most current technology.

Susol MCCB 48

Susol MCCB up to 1000Vac 54

Susol ACB 56

Susol ACB up to 1150Vac 58

Susol Compact ACB 62

Susol VCB 68

Metasol Contactors 72

XGIPAM 82

Susol RMU 83

Transformer 89

Susol MCCB (100 - 800 AF)





Rating

				TD100			TD160			TS100		
Frame size			[AF]	100			160			100		
Rated current, In			[A]	16, 20, 25, 32, 40, 50, 63, 80, 100			100, 125, 160			40, 50, 63, 80, 100		
No. of poles				2, 3, 4			2, 3, 4			2, 3, 4		
Rated operational voltage, Ue		AC	[V]	690			690			690		
		DC	[V]	500			500			500		
Rated impulse withstand voltage, Uimp			[kV]	8			8			8		
Rated insulation voltage, Ui			[V]	1000			1000			1000		
Rated ultimate short-circuit breaking capacity, Icu				N	H	L	N	H	L	N	H	L
	AC 50/60Hz	220/240 V	[kA]	85	100	200	85	100	200	100	120	200
		380/415 V	[kA]	50	85	150	50	85	150	50	85	150
		440/460 V	[kA]	50	70	130	50	70	130	50	70	130
		480/500 V	[kA]	30	50	65	30	50	65	42	65	85
		525 V	[kA]	22	35	50	22	35	50	22	35	50
		660/690 V	[kA]	10	10	10	10	10	10	10	10	10
	DC	250 V	[kA]	42	65	100	42	65	100	50	85	100
		500 V	[kA]	42	65	100	42	65	100	50	85	100
Rated service breaking capacity, Ics	AC 50/60Hz	220 - 525 V	[% Icu]	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
		660/690 V	[kA]	5	5	5	5	5	5	5	5	5
	DC		[% Icu]	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Rated short-circuit making capacity, Icm	AC 50/60Hz	220/240 V	[kA]	187	220	440	187	220	440	220	264	440
		380/415 V	[kA]	105	187	330	105	187	330	105	187	330
		440/460 V	[kA]	105	154	286	105	154	286	105	154	286
		480/500 V	[kA]	63	105	143	63	105	143	88	143	187
		525 V	[kA]	46	74	105	46	74	105	46	74	105
		660/690 V	[kA]	17	17	17	17	17	17	17	17	17
Category of utilization					A			A			A	
Isolation behavior					●			●			●	
Thermal-Magnetic	• fixed-thermal, fixed-magnetic		FTU		●			●			●	
	• adjustable-thermal, fixed-magnetic		FMU		●			●			●	
	• adjustable-thermal, adjustable-magnetic		ATU		-			-			-	
Electronic	• LSI		ETS		-			-			●	
	• LSI		ETM		-			-			-	
	Option	Earth-fault protection, Ig			-			-			-	
		Zone selective interlocking, ZSI			-			-			-	
		Ammeter			-			-			-	
		Communication			-			-			-	
Connection	fixed	front-connection			●			●			●	
		rear-connection			●			●			●	
	plug-in	front-connection			●			●			●	
		rear-connection			●			●			●	
Mechanical life			[operations]	25000			25000			25000		
Electrical life			[operations]	10000			10000			10000		
Basic dimensions, W×H×D (front connection)		3-pole	[mm]	90×140×86			90×140×86			105×160×86		
		4-pole	[mm]	120×140×86			120×140×86			140×160×86		
Weight (front connection)		3-pole	[kg]	1.5			1.5			2		
		4-pole	[kg]	1.8			1.8			2.6		
Reference standard				IEC60947-2			IEC60947-2			IEC60947-2		

※ The trip unit ATU is available from 125 A







	TS160			TS250			TS400			TS630			TS800		
	160			250			400			630			800		
	(100) ※, 125, 160			125, 160, 200, 250			300, 400			500, 630			700, 800		
	2, 3, 4			2, 3, 4			2, 3, 4			2, 3, 4			2, 3, 4		
	690			690			690			690			690		
	500			500			500			500			500		
	8			8			8			8			8		
	1000			1000			1000			1000			1000		
	N	H	L	N	H	L	N	H	L	N	H	L	N	H	L
	100	120	200	100	120	200	100	120	200	100	120	200	100	120	200
	50	85	150	50	85	150	65	85	150	65	85	150	65	100	150
	50	70	130	50	70	130	65	85	130	65	85	130	65	100	130
	42	65	85	42	65	85	42	65	85	42	65	85	42	85	100
	22	35	50	22	35	50	22	35	50	22	35	50	22	35	50
	10	10	10	10	10	10	10	20	35	10	20	35	10	20	35
	50	85	100	50	85	100	50	85	100	50	85	100	50	85	100
	50	85	100	50	85	100	50	85	100	50	85	100	50	85	100
	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
	5	5	5	5	5	5	10	12	12	10	12	12	10	20	20
	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
	220	264	440	220	264	440	220	264	440	220	264	440	220	264	440
	105	187	330	105	187	330	143	187	330	143	187	330	143	220	330
	105	154	286	105	154	286	143	187	286	143	187	286	143	220	286
	88	143	187	88	143	187	88	143	187	88	143	187	88	187	220
	46	74	105	46	74	105	46	74	105	46	74	105	46	74	105
	17	17	17	17	17	17	17	40	74	17	40	74	17	40	74
	A			A			A			A			A		
	●			●			●			●			●		
	●			●			●			●			●		
	●			●			●			●			●		
	●			●			●			●			●		
	●			●			●			●			●		
	-			-			●			●			●		
	-			-			●			●			●		
	-			-			●			●			●		
	-			-			●			●			●		
	-			-			●			●			●		
	●			●			●			●			●		
	●			●			●			●			●		
	●			●			●			●			●		
	●			●			●			●			●		
	25000			25000			20000			20000			10000		
	10000			10000			6000			6000			3000		
	105×160×86			105×160×86			140×260×110			140×260×110			210×320×135		
	140×160×86			140×160×86			186.5×260×110			186.5×260×110			280×320×135		
	2			2			5.4			5.4			15.1		
	2.6			2.6			7.2			7.2			19.6		
	IEC60947-2			IEC60947-2			IEC60947-2			IEC60947-2			IEC60947-2		

Susol MCCB (1600 AF)





Rating

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

* Power. Reverse connection of the load side is possible, but use it for normal connection for maintenance, inspection and safety in use.
* 4-pole neutral electrode (N phase) is a method that is blocked after line input.

Overview

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

Each type of OCR has a built-in battery.

1. Battery life
   1) LED is off: 14 - 28 years
   2) 1 LED is continuously on of flashing: 7 - 14 days

2. OCR current detectable range
   1) 1 Ø: 20 % or more of the rated current (In) ratio to the value of In regardless of the setting value of Iu and Ir)
   2) 3 Ø: 12 % or more of the rated current (In)

* RTC Timer : Real Time Clock Timer (required for time alarm and hot start function when event occur)

Susol Switch-Disconnectors (100 - 800 AF)

Electrical characteristics/Trip unit - DSU

Wiring breaker has the same appearance as circuit breakers but has switching function without protection function. Therefore, its basic accessories are the same accessories for circuit breakers.



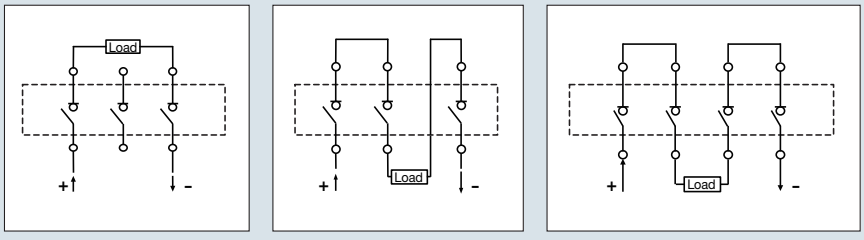


Rating

				TD100NA	TD160NA		TS100NA
Frame size			[AF]	100	160	160	100
Conventional thermal current, Ith			[A]	100	100	160	100
No. of poles				2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4
Rated operational voltage, Ue	AC		[V]	690	-	690	690
	DC		[V]	500	500, 750, 1100	500, 750, 1100	500
Rated operational current, Ie				100	-	160	100
Rated impulse withstand voltage, Uimp			[kV]	8	8	8	8
Rated insulation voltage, Ui	AC		[V]	750	-	750	750
	DC		[V]	-	1100	1100	-
Rated short-circuit making capacity, Icm	AC		[kA peak]	3.1	-	3.1	2.8
	DC		[kA peak]	-	1.92	1.92	-
Rated short-time withstand current, Icw	AC	1 s	[A rms]	2200	-	2200	2000
		3 s	[A rms]	2200	-	2200	2000
		20 s	[A rms]	960	-	960	690
	DC	1 s	[A rms]	-	1920	1920	-
Isolation behavior				●	●	●	●
Trip unit (Release)							
● Disconnector unit			DSU	●	●	●	●
Connection	Fixed	Front-connection		●	●	●	●
		Rear-connection		●	●	●	●
	Plug-in	Front-connection		●	●	●	●
		Rear-connection		●	●	●	●
Mechanical life			[Operations]	25000	-	25000	25000
Electrical life @415 V	AC		[Operations]	10000	-	10000	10000
	DC		[Operations]	-	1500	1000	-
Basic dimensions, W×H×D	3-pole		[mm]	90×140×86	90×140×86		105×160×86
(Front connection)	4-pole		[mm]	120×140×86	120×140×86		140×160×86
Weight	3-pole		[kg]	1.5	1.5		2
(Front connection)	4-pole		[kg]	1.8	1.8		2.6
Reference standard				IEC60947-3	IEC60947-3		IEC60947-3

Note)
1. Rating of TD160NA is 100,160 A
2. Rating of TS250NA is 200, 250 A
3. DC Rating of TS630NA is 500 A

DC Exemplary circuit diagrams



DC500 V (2P) DC750 V (3P) DC1100 V (4P)

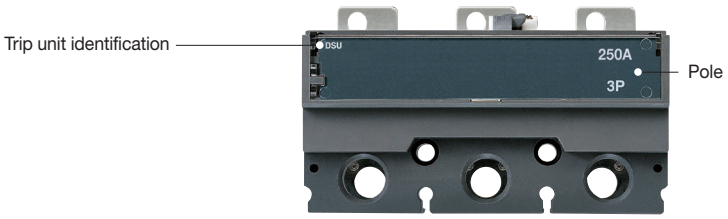






	TS160NA	TS250NA		TS400NA	TS630NA	TS800NA
	160	250	250	400	630	800
	160	200	250	400	630 (500) Note 3)	800
	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4
	690	-	690	690	690	690
	500	500, 750, 1100	500, 750, 1100	500	500, 750, 1100	500, 750, 1100
	160	-	250	400	630	800
	8	8	8	8	8	8
	750	-	750	750	750	750
	-	1100	1100	1100	1100	1100
	3.6	-	4.9	7.1	8.5	12
	-	3.0	3.0	6.0	6.0	9.6
	2500	-	3500	5000	6300	8000
	2500	-	3500	5000	6300	8000
	960	-	1350	1930	2320	2560
	-	3000	3000	6000	6000	9600
	●	●	●	●	●	●
	●	●	●	●	●	●
	●	●	●	●	●	●
	●	●	●	●	●	●
	●	●	●	●	●	●
	●	●	●	●	●	●
	25000	-	25000	20000	20000	10000
	10000	10000	10000	6000	6000	3000
	-	1000	1000	1000	1000	500
	105×160×86	105×160×86		140×260×110	140×260×110	210×320×135
	140×160×86	140×160×86		186.5×260×110	186.5×260×110	280×320×135
	2	2		5.4	5.4	15.1
	2.6	2.6		7.2	7.2	19.6
	IEC60947-3	IEC60947-3		IEC60947-3	IEC60947-3	IEC60947-3

Trip unit appearance



Susol MCCB (Up to 1000 Vac)

Characteristics

For renewable application and high altitude

- High breaking capacity (Up to 1000 Vac)
- Features compact size
- Various trip unit
- Standards: Acquisition of dual standards IEC/UL



Rating

FRAME		UTV250		
Rated voltage		690/800/1000 Vac		
Rated current		60, 80, 100, 150, 200, 250 A		
Number of poles		3/4		
Breaker type		E	N	H
UL489				
Interrupting capacity (kA) UL, CSA	AC 800 V	25	42	50
	AC 1000 V	14	20	30
IEC 60947-2				
Ultimate breaking capacity (kA), Icu	AC 690 V	65	85	100
	AC 800 V	25	40	50
	AC 1000 V	15	20	30
Service breaking capacity (kA), Ics	AC 690 V	65	85	100
	AC 800 V	18.5	30	37.5
	AC 1000 V	8	10	15
Insulation voltage, Ui		1000 Vac		
Impulse withstand voltage, Uimp		8 kV		
Utilization category		A		
IEC 60947-3				
Insulation voltage, Ui		1000 Vac		
Impulse withstand voltage, Uimp		8 kV		
Rated short-time withstand current, Icw		3 kA		
Utilization category		AC-23 A		
Trip Unit				
Trip unit	FTU*	60, 80, 100, 150, 200, 250 A		
	FMU*	60, 80, 100, 150, 200, 250 A		
	ATU*	100, 150, 200, 250 A		
	MCS**	60, 80, 100, 150, 200, 250 A		
	DSU***	250 A		
Accessories				
Unit mounted		○		
Mechanical lugs		○		
Busbar connectors		○		
Control wire terminal kit		○		
Motor operator		○		
Interphase barriers		○		
Shunt trip		○		
Undervoltage trip		○		
Auxiliary switch		○		
Alarm switch		○		
Directly-Mounted rotary operating handle		○		
IEC-Door-Mounted operating mechanisms		○		
Padlock attachment		○		
Weight(approximate), lbs.(kg)	3 Pole	4.85 (2.20)		
	4 Pole	6.35 (2.88)		
Dimensions, Inches(mm)		W	H	D
	3 Pole	4.13 (105)	8.07 (205)	3.62 (92)
	4 Pole	5.51 (140)	8.07 (205)	3.62 (92)

* FTU, FMU, ATU: UL489, IEC 60947-2 ** UL 489 Only *** IEC 60947-3 Only

ACB

Air Circuit Breakers

Premium Susol ACB meets your demands for high breaking capacity, full line-up, and optimized panel size. Various accessories and connection methods create a user-friendly handling. Susol ACB provides total solution with an advanced trip relay for measurement, diagnosis, analysis, and communication as well as protective functions for absolute protective coordination and electric power monitoring system.

- KS certified (KS C 4620)
- KEPIC(Nuclear rating) and quality (Q-class) certified.
- LR, ABS, DNV, KR, BV, GL, RINA, NK certified
- Maximum breaking capacity: 150 kA (6300 AF at 500 Vac)
- 2000/4000/6300AF, 3 Ampere Frame Sizes
- N phase current conducting capacity: 100 %
- Offers variety of accessories including digital trip relay with metering/ mearsuring/analysis/communication functions.
- Rated impulse voltage (Uimp): 12 kV

Ratings

- In: 630 - 6300 AF 3, 4 poles, fixed or draw-in/out type
- Ics: 85/100/150 kA, 500 Vac rating
- Icw: 65/85/100 kA

LS has passed and achieved Korea's highest and toughest KS rating (KS C 8325 KS C 4620) to prove its safety and function-ality in ACB market.



Susol ACB (- 6300 AF)



Rating

				AH-D					
Type				AH-06D	AH-08D	AH-10D	AH-13D	AH-16D	AH-20D
Ampere frame	(AF)			630	800	1000	1250	1600	2000
Rated current(A)	(In max)		at 40 ℃	200 400 630	400 630 800	1000	1250	1600	2000
Setting current (A) *	Control trip relay (... × In max)			(0.4 - 1.0) × In max					
Rated current of neutral pole (A)				400 630	400 630 800	1000	1250	1600	2000
Rated insulation voltage (V)	(Ui)			1000					
Rated operational voltage (V)	(Ue)			690					
Rated impulse withstand voltage (kV)	(Uimp)			12					
Frequenc y(Hz)				50/60					
Number of poles (P)				3/4					
Rated breaking capacity (kA sym) AC 50/60Hz	(Icu)	IEC 60947-2 KS C 4620	220 V/230 V/380 V/415 V	85					
			460 V/480 V/500 V	85					
			550 V/600 V/690 V	65					
Rated service breaking capacity (kA)	(Ics)		... %×Icu	100 %					
Rated making capacity (kA peak) AC 50/60Hz	(Icm)	IEC 60947-2 KS C 4620	220 V/230 V/380 V/415 V	187					
			460 V/480 V/500 V	187					
			550 V/600 V/690 V	143					
Rated short-time withstand current (kA)	(Icw)		1 sec	65					
			2 sec	60					
			3 sec	50					
Operating time (ms)			Maximum total breaking time	40					
			Maximum closing time	80					
Life cycle (time)		Mechanical		20000					
		Electrical		5000					
Connections **	Draw-out / Fixed		Horizontal connection	●					-
			Vertical connection	○					●
			Front connection	○					-
			Mixed connection	○					-
Weight (kg) (3P/4P)	Draw-out type	Main body (With cradle)	Motor charging type	63/74					70/85
			Manual charging type	61/72					68/83
		Cradle only		29/32					33/40
	Fixed type		Motor charging type	34/44					38/47
			Manual charging type	32/42					36/45
External dimensions (mm) (H×W×D) 		Draw-out type	3P	430×334×375					
			4P	430×419×375					
		Fixed type	3P	300×300×295					
			4P	300×385×295					
Trip relay				N, A, P, S type					
Certificate and Approval				KS / KEMA / KERI / GOST / CCC					
Marine clasiflcation				LR, ABS, DNV, KR, BV, GL, RINA, NK					

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

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





AH-E								
AH-06E	AH-08E	AH-10E	AH-13E	AH-16E	AH-20E	AH-25E	AH-32E	AH-40E
630	800	1000	1250	1600	2000	2500	3200	4000
630	800	1000	1250	1600	2000	2500	3200	4000
(0.4 - 1.0) × In max								
630	800	1000	1250	1600	2000	2500	3200	4000
1000								
690								
12								
50/60								
3/4								
100								
100								
85								
100 %								
220								
220								
187								
85								
75								
65								
40								
80								
15000								
5000								
●								-
○								●
○								-
○								-
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								
KS / KEMA / KERI / GOST / CCC								
LR, ABS, DNV, KR, BV, GL, RINA, NK								

AH-G		
AH-40G	AH-50G	AH-63G
4000	5000	6300
4000	5000	6300
(0.4 - 1.0) × In max		
4000	5000	6300
1000		
690		
12		
50/60		
3/4		
150		
150		
100		
100 %		
330		
330		
220		
100		
85		
75		
40		
80		
10000		
2000		
○		
●		
-		
-		
181/223		186/230
179/221		184/228
97/117		102/124
98/123		103/130
96/121		101/128
460×785×375		
460×1015×375		
300×751×295		
300×981×295		
N, A, P, S type		
KS / KEMA / KERI / GOST / CCC		
LR, ABS, DNV, KR, BV, GL, RINA, NK		

※ Derating of the rated current is required according to the ambient temperature around the breaker in a panel if it is higher than the reference value. (See pages 123 to 126)

Susol ACB (up to 1150 Vac)



Rating

Characteristics				Susol AV-D						
Number of poles			(P)	3/4						
Rated operational voltage (Ue)			(Vac)	- 1150						
Rated insulation voltage (Ui)			(V)	1250						
Rated impulse withstand voltage (Uimp)			(kV)	12 kV						
Version				Fixed / Withdrawable						
Suitability for isolation										
Degree of pollution	IEC60661-1			3						
Certification				CB certification according to IEC 60947-2						
Brand name										
Model				AV-06D	AV-08D	AV-10D	AV-13D	AV-16D	AV-20D	
Ampere Frame			(AF)	630	800	1000	1250	1600	2000	
Rated current (In max)			(A)	200 400 630	400 630 800	630 800 1000	630 800 1000 1250	800 1000 1250 1600	1000 1250 1600 2000	
Rated ultimate breaking capacity (Icu)	1150 V		(kA)	30						
	1000 V		(kA)	42						
	900 V		(kA)	50						
	800 V		(kA)	50						
Rated serivce breaking capacity (Ics)			(% Icu)	100						
Rated short-timewithstand current (Icw)	1150 V		(kA/1s)	30						
	1000 V		(kA/1s)	42						
	900 V		(kA/1s)	50						
	800 V		(kA/1s)	50						
Rated making capacity (Icm)			(kA)	63						
Selectivity category (according to IEC 60947-2)				B						
Operation time (ms)	Total Breaking time	< Icw		max. 75						
		≥ Icw		max. 25						
	Closing time			max. 80						
Mechanical and Electrical Life cycle										
Endurance (times) (Without maintenance)	Mechanical			20000						
	Electrical			1000						
Dimension and Weight										
Weight (3P/4P)	Draw-out	Without cradle	(kg)	37/45						
		With cradle	(kg)	70/85						
	Fixed		(kg)	34/44						
External Dimensions (H×W×D)	Draw-out	3P(4P)	(mm)	430×334(419)×375						
	Fixed	3P(4P)	(mm)	300×300(385)×295						

* AV type can be applied to IT system up to 1000 Vac.





	3/4											
	- 1150											
	1250											
	12 kV											
	Fixed / Withdrawable											
	3											
	CB certification according to IEC 60947-2											
	Susol AV-E									**Susol AV-G**		
	AV-06E	AV-08E	AV-10E	AV-13E	AV-16E	AV-20E	AV-25E	AV-32E	AV-40E	AV-40G	AV-50G	AV-63G
	630	800	1000	1250	1600	2000	2500	3200	4000	4000	5000	6300
	400 630	400 630 800	630 800 1000	630 800 1000 1250	800 1000 1250 1600	1000 1250 1600 2000	1250 1600 2000 2500	1600 2000 2500 3200	2000 2500 3200 4000	2000 2500 3200 4000	2500 3200 4000 5000	3200 4000 5000 6300
	50									65		
	65									85		
	75									85		
	75									85		
	100									100		
	50									65		
	65									85		
	75									85		
	75									85		
	105									14 3(1150 V)/187 (below 1000 V)		
	B									B		
	max. 75									max. 75		
	max. 25									max. 25		
	max. 80									max. 90		
	20000									10000		
	1,000									500		
	44/49									84/106		
	88/104									181/223		
	45/56									98/123		
	430×412(527)×375									430×785(1015)×375		
	300×378(493)×295									300×751(981)×295		

Susol ACB (up to 900 Vac)



Rating

Characteristics				
Number of poles			(P)	3/4
Rated operational voltage (Ue)			(Vac)	- 900
Rated insulation voltage (Ui)			(V)	1000
Rated impulse withstand voltage (Uimp)			(kV)	12 kV
Version				Fixed / Withdrawable
Suitability for isolation				
Degree of pollution	IEC60661-1			3
Certification				CB certification according to IEC 60947-2

Brand name				Susol AW-D					
Model				AW-06D	AW-08D	AW-10D	AW-13D	AW-16D	AW-20D
Ampere frame			(AF)	630	800	1000	1250	1600	2000
Rated current (In max)			(A)	200 400 630	400 630 800	630 800 1000	630 800 1000 1250	800 1000 1250 1600	1000 1250 1600 2000
Rated ultimate breaking capacity (Icu)	900 V		(kA)	42					
	800 V		(kA)	50					
Rated serivce breaking capacity (Ics)			(% Icu)	100					
Rated short-timewithstand current (Icw)	1 s		(kA)	42					
	3 s		(kA)	42					
Rated making capacity (Icm)			(kA)	88.2					
Selectivity category (according to IEC 60947-2)				B					
Operation time (ms)	Total Breaking time	< Icw		max. 75					
		≥ Icw		max. 25					
	Closing time			max. 80					
Mechanical and Electrical Life cycle									
Endurance (times) (Without maintenance)	Mechanical			20000					
	Electrical			1000					
Dimension and Weight									
Weight (3P/4P)	Draw-out	Without cradle	(kg)	37/45					
		With cradle	(kg)	70/85					
	Fixed		(kg)	34/44					
External Dimensions (H×W×D)	Draw-out	3P (4P)	(mm)	430×334 (419)×375					
	Fixed	3P (4P)	(mm)	300×300 (385)×295					





3/4											
- 900											
1000											
12 kV											
Fixed / Withdrawable											
											
3											
CB certification according to IEC 60947-2											
Susol AW-E									**Susol AW-G**		
AW-06E	**AW-08E**	**AW-10E**	**AW-13E**	**AW-16E**	**AW-20E**	**AW-25E**	**AW-32E**	**AW-40E**	**AW-40G**	**AW-50G**	**AW-63G**
630	800	1000	1250	1600	2000	2500	3200	4000	4000	5000	6300
400 630	400 630 800	630 800 1000	630 800 1000 1250	800 1000 1250 1600	1000 1250 1600 2000	1250 1600 2000 2500	1600 2000 2500 3200	2000 2500 3200 4000	2000 2500 3200 4000	2500 3200 4000 5000	3200 4000 5000 6300
50									85		
65									85		
100									100		
50									85		
50									85		
105									187		
B									B		
max. 75									max. 75		
max. 25									max. 25		
max. 80									max. 90		
10000									10000		
1000									1000		
44/49									84/106		
88/104									181/223		
45/56									98/123		
430×412 (527)×375									430×785 (1015)×375		
300×378 (493)×295									300×751 (981)×295		

Susol Compact ACB (up to 800 Vac)



Fixed type



Draw-out type

Rating

Characteristics				
Number of poles			(P)	3/4
Rated operational voltage (Ue)			(Vac)	- 800
Rated insulation voltage (Ui)			(V)	1000
Rated impulse withstand voltage (Uimp)			(kV)	12 kV
Version				Fixed / Withdrawable
Suitability for isolation				
Degree of pollution	IEC60661-1			3
Certification				CB certification according to IEC 60947-2
Brand name				**Susol AW**
Model				AW-08C / AW-16C
Ampere Frame			(AF)	800 / 1600
Rated current (In max)			(A)	400, 630, 800 / 800, 1000, 1250, 1600
Rated ultimate breaking capacity (Icu)	800 V		(kA)	40
Rated serivce breaking capacity (Ics)			(% Icu)	100
Rated short-timewithstand current (Icw)	1 s		(kA)	40
	3 s		(kA)	40
Rated making capacity (Icm)			(%)	84
Selectivity category (according to IEC 60947-2)				B
Operation time (ms)	Total Breaking time	< Icw		max. 75
		≥ Icw		max. 25
	Closing time			max. 80
Mechanical and Electrical Life cycle				
Endurance (times) (Without maintenance)	Mechanical			12500
	Electrical			500
Dimension and Weight				
Weight	Draw-out (3P/4P)		(kg)	22/26
	Fixed (3P/4P)		(kg)	16/19.5
External Dimensions (H×W×D)	Draw-out	3P	(mm)	W: 256 D: 274.5 [1] H: 364.3
		4P	(mm)	W: 326 D: 274.5 [1] H: 364.3
	Fixed	3P	(mm)	W: 272.4 D: 198.5 [1] H: 322
		4P	(mm)	W: 342.4 D: 198.5 [1] H: 322

1) Exclude terminal length
* AW-08/16C are applicable for IT system

Susol Compact ACB (1600 A)



Fixed type



Draw-out type

Rating

Common characteristics												
Number of poles	(P)			3P/4P								
Frequency	(Hz)			50/60 Hz								
Rated operational voltage	(V, Ue)			690 V								
Rated insulation voltage	(V, Ui)			1000 V								
Rated impulse withstand voltage	(kV, Uimp)			12 kV								
Circuit breaker as per IEC60947-2												
Type				AN/AH/AR-C								
Description				AN-08C	AN-16C	AH-08C	AH-16C	AR-08C	AR-10C			
Ampere Frame	(AF)			800	1600	800	1600	800	1000			
Rated current (In Max.) at 40℃	(A)			400	-	400	-	400	-			
	(A)			630	-	630	-	630	-			
	(A)			800	800	800	800	800	800			
	(A)			-	1000	-	1000	-	1000			
	(A)			-	1250	-	1250	-	-			
	(A)			-	1600	-	1600	-	-			
Rated current of neutral pole	(A)			100 %								
Rated breaking capacity (Icu)	(kA)	IEC60947-2	AC 690 V/600 V/550 V	42		50		-				
			AC 500 V/480 V/460 V	42		50		130 [1]				
			AC 415 V/380 V/220 V	50		60		150				
Rated service breaking capacity (Ics)	(kA, %×Icu)			100 %								
Rated making capacity (Icm)	(kA)			88.2		105		17 [2]				
Rated Short-time capacity (Icw)	(kA)		1 sec/3 sec	42/25		50/30		10 [3]				
Operating time (t)	(ms)		Total breaking time	40								
			Closing time	80								
Common mechanical and electrical life cycle												
Life cycle	(time)		Mechanical	12500				5000				
			Electrical	6000				3000				
Common dimension and weight												
Weight	(kg)	Draw-out type (3P/4P)		16/19.5								
		Fixed type (3P/4P)		16/19.5								
		Cradle (3P/4P)		22/26								
Dimension	(mm)	Draw-out type	3P	W: 256 D: 269.5 [4] H: 364.3								
			4P	W: 326 D: 269.5 [4] H: 364.3								
		Fixed type	3P	W: 272.4 D: 198.5 [4] H: 322								
			4P	W: 342.4 D: 198.5 [4] H: 322								

1) 130 kA/460 V, 100 kA/500 V 2) at 500 V 3) 0.5 sec 4) Exclude terminal length

Susol UL ACB



Type					Susol UAS-□□D	
AF					08	16
Rated current (CT Ration)	(A)			at 40 °C	800	1600
Rated current (Available Rating plug)	(V)			at 40 °C	400 600 630 800	800 1000 1200 1250 1600
Rated maximum voltage	(V)				254 V/508 V/635 V/730 V(UAW)	
Frequency	(Hz)				UAS/UAH: 50/60, UAW: 60	
Number of poles	(P)				3P/4P	
Type of trip relay (Electronic trip device)					N, A, P, S (4 type)	
Rated short circuit current (Sym.) (Duty: O-15s-CO)	(kA)	With instantaneous	AC	730 V (60 Hz)	-	
				635 V	65	
				508 V	85	
				254 V	85	
		Without instantaneous	AC	730 V (60 Hz)	-	
				635 V	65	
				508 V	65	
				254 V	65	
Rated making current (X/R=more than 6.6)	(kA peak)	With instantaneous	AC	730 V (60 Hz)	-	
				635 V	149.5	
				508 V	195.5	
				254 V	195.5	
		Without instantaneous	AC	730 V (60 Hz)	-	
				635 V	149.5	
				508 V	150.5	
				254 V	151.5	
Rated short time current	(kA)		AC		60	
Operating time (t)	(ms)	Breaking time			Less than 30 ms	
		Opening time			Less than 50 ms	
		Closing time			Less than 80 ms	
		Charging time			Less than 5 sec.	
Endurance Rating C/O Cycles) (with no maintenance)	(Cycles)	Mechanical			12500	
		Electrical			2800	
Weight (Include Charging motor)	lb (kg)	Drawout type	Main Body with Cradle	3P	154 (70)	
				4P	187 (85)	
			Only Cradle	3P	71 (32)	
				4P	84 (38)	
		Fixed type		3P	77 (35)	
				4P	99 (45)	
External dimension	Draw-out type	in (mm)	H×W×D	3P	16.93×13.15×16.02 (430×334×407)	
				4P	16.93×16.50×16.02 (430×419×407)	
	Fixed type	in (mm)	H×W×D	3P	11.81×11.81×11.61 (300×300×295)	
				4P	11.81×15.16×11.61 (300×385×295)	
Enclosure dimension		in (mm)	H×W×D	3P	19.69×15.75×13.39 (500×400×340)	
				4P	19.69×19.69×13.39 (500×500×340)	
Certified Standards					UL 1066/ANSI C37.13	





Susol UAH-□□E / UAW-□□E				
08	16	20	25	32
800	1600	2000	2500	3200
400	800	1000	1200	1600
600	1000	1200	1250	2000
630	1200	1250	1600	2500
800	1250	1600	2000	3000
	1600	2000	2500	3200
254 V/508 V/635 V/730 V (UAW)				
UAS/UAH: 50/60, UAW: 60				
3P/4P				
N, A, P, S (4 type)				
85				
85				
100				
100				
85				
85				
85				
85				
195.5				
195.5				
230				
230				
195.5				
195.5				
195.5				
195.5				
85				
Less than 30 ms				
Less than 50 ms				
Less than 80 ms				
Less than 5 sec.				
12500				5000
2800				1000
214 (97) 269 (122)			245 (111) 309 (140)	326 (148) 414 (188)
99 (45) 121 (55)			123 (56) 152 (69)	205 (93) 256 (116)
101 (46) 126 (57)			110 (50) 137 (62)	196 (89) 249 (113)
16.93×16.22×16.02 (430×412×407)				
16.93×20.75×16.02 (430×527×407)				
11.81×14.88×11.61 (300×378×295)				
11.81×19.41×11.61 (300×493×295)				
19.69×19.69×13.39 (500×500×340)				
19.69×24.21×13.39 (500×615×340)				
UL 1066/ANSI C37.13				

Susol UAH-□□G			
32	40	50	60
3200	4000	5000	6000
1600	2000	2500	3000
2000	2500	3000	3200
2500	3000	3200	3600
3000	3200	3600	4000
3200	3600	4000	5000
	4000	5000	6000
254 V/508 V/635 V/730 V (UAW)			
UAS/UAH : 50/60, UAW : 60			
3P/4P			
N, A, P, S (4 type)			
-			
100			
130			
130			
-			
100			
100			
100			
-			
230			
299			
299			
-			
230			
230			
230			
100			
Less than 30 ms			
Less than 50 ms			
Less than 90 ms			
Less than 5 sec.			
5000			
1000			
489 (222) 626 (284)			
276 (125) 355 (161)			
227 (127) 287 (130)			
18.11×30.91×16.02 (460×785×407)			
18.11×39.96×16.02 (460×1015×407)			
11.81×29.57×11.61 (300×751×295)			
11.81×38.62×11.61 (300×981×295)			
31.50×32.48×13.39 (800×825×340)			
31.50×41.54×13.39 (800×1055×340)			
UL 1066/ANSI C37.13			

UL Compact ACB (1200 A)



Fixed type



Draw-out type

Rating

Common characteristics			
Rated operational voltage, Ue			(V)
Rated insulation voltage, Ui			(V)
Frequency			(Hz)
Rated impulse withstand voltage, Uimp			(kV)
Number of poles			(P)

Type							
Description				Circuit breaker			Switch
				UAN		UAS	UAA-08C / UAA-12C
Ampere Frame			(AF)	UAN-08C	UAN-12C	UAS-08C / UAS-12C	800 / 1200
Rated current (In Max.) at 40°C			(A)	800	1200	800 / 1200	800 / 1200
			(A)	400	-	400 / -	800 / 1200
			(A)	630	-	600 / -	- / -
			(A)	800	800	800 / 800	- / -
			(A)	-	1000	- / 1000	- / -
			(A)	-	1200	- / 1200	- / -
Rated current of neutral pole			(A)	100 %			
Interrupting Ratings	UL489	AC 800 V	(kA)	-		42	42
		AC 600 V	(kA)	42		50	
		AC 480 V	(kA)	50		50	
		AC 240 V	(kA)	50		65	
Rated short time current, Icw			(kA)	42			
Operating time	Closing Time		(ms)	≤ 80			≤ 80
	Total breaking time	(≥ Icw)	(ms)	≤ 25			≤ 40**
		(< Icw)	(ms)	≤ 75			

Common mechanical and electrical life cycle				
Endurance	Mechanical		(time)	12500
	Electrical (30 cycle/Hr)	- AC 600 V	(time)	6000
		AC 800 V	(time)	500

Demension and Weight					
Weight (3P/4P)	Drawout (3P/4P) (without cradle)		(kg)	21/25.5	19.5/24.5
	Fixed (3P/4P)		(kg)	16.0/19.5	15.5/19.0
Dimension	Draw-out type	3P	(mm)	W:256 D:274.5* H:364.3	
		4P	(mm)	W:326 D:274.5* H:364.3	
	Fixed type	3P	(mm)	W:272.4 D:198.5* H:322	
		4P	(mm)	W:342.4 D:198.5** H:322	

* exclude teminal length
** Operation time is by shunt coil not Trip unit

VCB

Vacuum Circuit Breakers

Vacuum Circuit Breaker, VCB is installed in the medium voltage distribution lines to protect life and load equipment. In case of accidents such as over current, short circuit and ground fault current, VCB works by interrupting the circuit through the inner Vacuum Interrupter which is acted by signal from the outside separate relay.

Suitable for use as the main circuit breaker to protect key installations in the places such as device industry, power plants, high-rise buildings, large ships.

- ▶ **Strengthening of the high interrupting capacity and large current models and full line-up new VCB models to high/middle/low.**
- ▶ **Main circuit structure with high reliability.**
  - ■ Maximizing the durability and reliability of the main circuit contactors (Stego Tulip contactor).
  - ■ Strong structure for the temperature rise (Natural cooling system).
- ▶ **Convenience of switchgear configuration and a variety of accessories.**
  - ■ CB compartment structure: Metal isolation structures to prevent the accident spread and ensure safety. And the convenience of switchgear building is extended by its module style.
  - ■ A variety of accessories: UVT, Locking Magnet, Plug Interlock, Key lock, Temperature Sensor, MOC, TOC, Earthing S/W.
  - ■ Maximizing compatibility with existing products through the dualistic deployment of phases and compact models.

※ Type testing is complete for all models according to latest standard, IEC62271-100 (2012) [M2, E2 (List1 or 3), C2].





Susol VCB Family

Susol VCB series are premium-type products featuring main structure with high reliability application and a variety of accessories and ability to maximize to be suitable for use as the main circuit breaker to protect key installations in the places such as device industry, power plants, high-rise buildings, large ships

7.2 kV (VL-06)

- Rated short-time (for withstand current): 3 sec.
- Rated operating sequence: O-0.3s-CO-15s-CO
- Type test level: M2, E2 (List1), C2
- 100 % Compatibility
  - with existing fixed type breakers
  - with existing drawout type breakers
- Various cradle: E, F and G type
- A variety of control power
  - DC 24 - 30 V, DC 48 - 60 V, DC 110 V, DC 125 V, DC 220 V
  - AC 48 V, AC 100 - 130 V, AC 220 - 250 V
- A variety of accessories
  - Charge switch, UVT, Secondary trip Coil, Current trip coil, Trip Latch Checking S/W, Position S/W
  - Key-lock, Button lock, Button cover, Padlock, UVT, Time Delay Controller, Lifting hook, CTD
- Anti Pumping Device
- TEST/SERVICE Automatic Position Indicator
- Standards and certification
  - IEC62271-100 (2012) [M2, C2, E2 (List1)]
  - Tested in enclosure
  - KERI type tested, V-check (KESCO) certification



Ur (kV)	Isc (kA)	Ir (A)
7.2	8	400
	12.5	630



Full line–up and Compact

Full line-up new VCB models to the high interrupting capacity and large current (- 50 kA, - 5000 A) featuring maximization of compatibility with existing products through the dualistic deployment of phases and compact models

7.2/12/17.5/24/25.8/36 kV (VL-06/12/17/20/25/36)

- Rated short-time (to withstand current): 3 sec. 4 sec*
- Rated operating sequence: O-0.3s-CO-15s-CO, (O-0.3s-CO-3min-CO**)
- Type test level: M2, E2 (List3), C2
- Compatibility with existing Pro-MEC breakers
- Various cradle: E, F, G and H type
- CB Compartment for MCSG available
- A variety of control power
  - DC 24 - 30 V, DC 48 - 60 V, DC 110 V, DC 125 V, DC 220 V
  - AC 48 V, AC 100 - 130 V, AC 220 - 250 V
- A variety of accessories
  - VCB part: Charge switch, UVT, Secondary trip coil, Latch checking switch, Position switch, Locking magnet, Plug interlock, Key lock, Button cover, Button padlock, Padlock (H type Door interlock), MOC
  - Cradle part: MOC (Mechanical Operated Cell switch), TOC (Truck Operated Cell switch), Temperature sensor, Earthing switch and accessaries, Door, Door interlock, Door emergency button
  - Others: Racking in/out handle, UVT Time delay controller, CTD (Condensor Trip Device), Temperature module
- Anti Pumping Device
- TEST/SERVICE Automatic Position Indicator
- Standards and certification
  - IEC62271-100 (2012) [M2, C2, E2 (List3)]
  - KEMA, KERI type tested, V-check (KESCO) certification

Note) * Please contact us
** Please refer to the ratings.

Ur (kV)	Isc (kA)	Ir (A)
7.2	20	630
		1250
		2000
	25	630
		1250
		2000
	31.5	630
		1250
		2000
12	20	630
		1000
		1250
		2000
	25	630
		1000
		1250
		2000
	31.5	630
		1250
		2000
		2500
17.5	20	630
		1250
		2000
	25	630
		1250
		2000
	31.5	630
		1250
		2000
		2500
24, 25.8	12.5	630
		1250
	16	630
		1250
	25	630
		1250
		2000
		2500
36	25	630
		1250
		2000
		2500



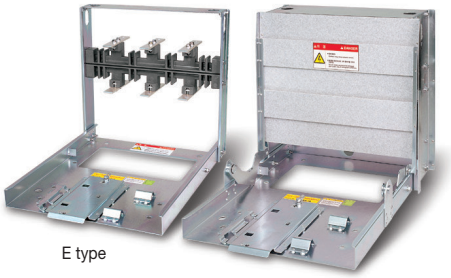
7.2/12/17.5/24/25.8/36 kV (VH-06/12/17/20/25/36)

- Rated short-time (to withstand current): 3 sec. 4 sec*
- Rated operating sequence: O-0.3s-CO-3min-CO
- Type test level: M2, E2 (List3), C2
- Electrical and mechanical life: 20000 operations
- Various cradle: K and H type
- CB Compartment for MCSG available
- A variety of control power
  - DC 48 V, DC 110 V, DC 125 V, DC 220 V
  - AC 48 V, AC 110 V, AC 220 V
- A variety of accessories
  - VCB part: UVT, Secondary trip coil, Latch checking switch, Position switch, Locking magnet, Plug interlock, Key lock, Button cover, Button padlock, Padlock (H type Door interlock), MOC
  - Cradle part: MOC (Mechanical Operated Cell switch), TOC (Truck Operated Cell switch), Temperature sensor, Earthing switch and accessaries, Door, Door interlock, Door emergency button
  - Others: Racking in/out handle, Lifting hook, UVT Time delay controller, CTD (Condensor Trip Device), Temperature module
- Anti Pumping Device
- Standards and certification
  - IEC62271-100 (2012) [M2, C2, E2 (List3)]
  - KEMA, KERI type tested, V-check (KESCO) certification

Note) * Please contact us

Ur (kV)	Isc (kA)	Ir (A)
7.2 12	31.5	1250
		2000
		3150
	40	1250
		2000
		3150
		4000
	50	1250
		2000
		2500
		3150
		4000
17.5	31.5	3150
		1250
	40	2000
		3150
	50	1250
		2000
		2500
		3150
24 25.8	25	2500
	31.5	1250
		2000
		3150
	40	1250
		2000
		3150
36	25	1250
		2000
		3150
	31.5	1250
		2000
		3150
	40	1250
		2000
		3150





E type

F type



H type

VCB Cradle type

Memo

MS

Contactors and Overload relays

Sealed structure has improved its safety features so that no arc flash is exposed. In order to emphasize its durability as an industrial device, Metasol series adopt simple design form and sophisticated shape applying diamond cut concepts on product surface.

- Advanced technology and Expert solution
- Offering economical solution with compact size and easy connection
- Ensure reliability in the system: Type II Coordination
- Perfect system with peripheral devices
- Complies with applicable requirements of the EU RoHS Directive
- 25 Models in 9 Frames

- Compact design for space saving
- DIN rail and screw mountable (upto 150 AF)
- Finger-proof design
- World class products conforming to IEC and UL standards



Metasol Contactors

MC type
Magnetic Contactors





Frame size				18 AF				22 AF			
Type				MC-6a	MC-9a	MC-12a	MC-18a	MC-9b	MC-12b	MC-18b	MC-22b
	Screw clamp terminals			●	●	●	●	●	●	●	●
	Lug clamp terminals			-	-	-	-	-	-	-	-
Number of poles				3 P				3 P			
Rated operational voltage, Ue				690 V				690 V			
Rated insulation voltage, Ui				690 V				690 V			
Rated frequency				50/60 Hz				50/60 Hz			
Rated impulse withstand voltage, Uimp				6 kV				6 kV			
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 (IEC)	AC-1, Thermal current		A	25	25	25	32	25	27	32	45
	AC-3	200/240 V	kW	2.2	2.5	3.5	4.5	2.5	3.5	4.5	5.5
			A	9	11	13	18	11	13	18	22
		380/440 V	kW	3	4	5.5	7.5	4	5.5	7.5	11
			A	7	9	12	18	9	12	18	22
		500/550 V	kW	3	4	7.5	7.5	4	7.5	7.5	15
			A	6	7	12	13	7	12	13	20
		690 V	kW	3	4	7.5	7.5	4	7.5	7.5	15
			A	4	5	9	9	6	9	9	18
		1000 V	kW	-	-	-	-	-	-	-	-
			A	-	-	-	-	-	-	-	-
Rated Short-time withstand current (IEC 60947)		1 s	A	210	250	280	300	250	280	300	400
		10 s	A	105	110	120	130	110	120	154	186
		30 s	A	70	70	80	85	70	80	100	130
		1 min	A	61	61	61	70	61	61	84	90
		3 min	A	40	45	47	50	45	50	60	60
		10 min	A	30	30	30	40	30	30	40	50
		≥15 min	A	25	26	28	30	26	28	30	45
Rating (UL)	Continuous current		A	25	25	25	32	25	25	40	40
	Single phase	110 - 120 V	HP	0.5	0.5	0.75	1	0.5	0.75	1	2
		220 - 240 V	HP	1.5	1.5	2	3	1.5	2	3	3
	Three phase	200 - 208 V	HP	2	2	3	7.5	2	3	7.5	7.5
		220 - 240 V	HP	3	3	5	7.5	3	5	7.5	10
		440 - 480 V	HP	5	5	7.5	10	5	7.5	10	15
		550 - 600 V	HP	7.5	7.5	10	15	7.5	10	15	20
	NEMA size			00	00	0	1	00	0	1	
Size and weight 	AC control	Weight	kg	0.33				0.34			
		Size(W×H×D)	mm	45×73.5×80.4				45×73.5×87.4			
	DC control	Weight	kg	0.4				0.41			
		Size(W×H×D)	mm	45×73.5×96.6				45×73.5×103.6			
Auxiliary(standard)				**1NO or NC**				**1NO1NC**			
Auxiliary	Side mount			UA-1				UA-1			
	Front mount			UA-2, UA-4				UA-2, UA-4			









40 AF		65 AF		100 AF			150 AF	
MC-32a	MC-40a	MC-50a	MC-65a	MC-75a	MC-85a	MC-100a	MC-130a	MC-150a
●	●	●	●	●	●	●	●	●
-	-	●	●	●	●	●	●	●
3 P		3 P		3 P			3 P	
1000 V		1000 V		1000 V			1000 V	
1000 V		1000 V		1000 V			1000 V	
50/60 Hz		50/60 Hz		50/60 Hz			50/60 Hz	
8 kV		8 kV		8 kV			8 kV	
1800 operations per hour		1200 operations per hour		1200 operations per hour			1200 operations per hour	
12 mil. operations		12 mil. operations		12 mil. operations			5 mil. operations	
2 mil. operations		2 mil. operations		2 mil. operations		1 mil. operations	1 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			2.4	
69×83×90		79×106×119		94×140×135.8			119×158×130.3	
0.77		1.3		2.8				
69×83×117.1		79×106×146.4		94×140×172.3				
2NO2NC		2NO2NC		2NO2NC			2NO2NC	
UA-1		UA-1		UA-1			UA-1	
UA-2, UA-4		UA-2, UA-4		UA-2, UA-4			UA-2, UA-4	

Metasol Contactors

MC type
Magnetic Contactors





Frame size				225 AF		400 AF		
Type				MC-185a	MC-225a	MC-265a	MC-330a	MC-400a
	Screw clamp terminals			●	●	●	●	●
	Lug clamp terminals			-	-	-	-	-
Number of poles				3 P		3 P		
Rated operational voltage, Ue				1000 V		1000 V		
Rated insulation voltage, Ui				1000 V		1000 V		
Rated frequency				50/60 Hz		50/60 Hz		
Rated impulse withstand voltage, Uimp				8 kV		8 kV		
Maximum operating rate in operating cycles per hour(AC3)				1200 operations per hour		1200 operations per hour		
Durability	Mechanical			5 mil. operations		5 mil. operations		2.5 mil. operations
	Electrical			1 mil. operations		1 mil. operations		0.5 mil. operations
Current	AC-1, Thermal current		A	300	350	400	500	520
and	AC-3	200/240 V	kW	55	75	80	90	125
power			A	185	225	265	330	400
(IEC)		380/440 V	kW	90	132	147	160	200
			A	185	225	265	330	400
		500/550 V	kW	110	132	147	160	225
			A	180	200	225	280	350
		690 V	kW	110	140	160	200	250
			A	120	150	185	220	300
		1000 V	kW	132	132	147	147	147
			A	90	90	105	105	105
Rated Short-time		1 s	A	2000	2500	3500	4000	4600
withstand current		10 s	A	1500	1700	2400	3000	4400
(IEC 60947)		30 s	A	1000	1200	1500	2500	2974
		1 min	A	800	1000	1100	1700	1846
		3 min	A	520	700	800	1000	1313
		10 min	A	350	500	600	620	760
		≥15 min	A	320	400	500	553	699
Rating	Continuous current		A	300	350	400	500	520
(UL)	Single	110 - 120 V	HP	15	15	-	-	-
	phase	220 - 240 V	HP	30	40	-	-	-
	Three	200 - 208 V	HP	60	60	75	100	125
	phase	220 - 240 V	HP	60	75	100	100	150
		440 - 480 V	HP	125	150	200	200	300
		550 - 600 V	HP	125	150	200	200	300
	NEMA	size				5		
Size and weight	AC control	Weight	kg	5.4		9.2		
		Size(W×H×D)	mm	138×203×185.1		163×243×204.4		
	DC control	Weight	kg					
		Size(W×H×D)	mm					
Auxiliary(standard)				**2NO2NC**		**2NO2NC**		
Auxiliary	Side mount			AU-100, AU-100E (Max.4NO4NC)		AU-100, AU-100E (Max.4NO4NC)		
	Front mount			-		-		







800 AF			1260 AF	2650 AF			
MC-500a	MC-630a	MC-800a	MC-1260a	MC-1400a	MC-1700a	MC-2100a	MC-2650a
●	●	●	●	●	●	●	●
-	-	-	-	-	-	-	-
3 P			3 P	3 P			
1000 V			1000 V	1000 V			
1000 V			1000 V	1000 V			
50/60 Hz			50/60 Hz	50/60 Hz			
8 kV			8 kV	8 kV			
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					
22.2 285×310×246			24 285×352×246	33.8 431×380×246			47 431×392×246
2NO2NC			2NO2NC	2NO2NC			
AU-100, AU-100E (Max.4NO4NC)			AU-100, AU-100E (Max.4NO4NC)	AU-100, AU-100E (Max.4NO4NC)			
-			-	-			

Metasol Contactors



MC type
Magnetic Contactors (4 pole)

Frame size				18 AF			
Type				MC-6a/4	MC-9a/4	MC-12a/4	MC-18a/4
	Screw clamp terminal			●			
Number of poles				4 P			
Rated operational voltage (Ue)				690 V			
Rated insulation voltage (Ui)				690 V			
Rated frequency				50/60 Hz			
Rated impulse withstand voltage, Uimp				6 kV			
Maximum operating rate in operating cycles per hour(AC3)				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	200/240 V	kW	9	9	9	15
(IEC)			A	25	25	25	40
		380/400 V	kW	17	17	17	27
			A	25	25	25	40
		500/550 V	kW	21	21	21	35
			A	25	25	25	40
		690 V	kW	27	27	27	44
			A	25	25	25	40
UL rating	Continuous current		A	25	25	25	32
(UL)	Single	110 - 120 V	HP	0.5	0.5	0.75	1
	Phase	220 - 240 V	HP	1.5	1.5	2	3
	Three	200 - 208 V	HP	2	2	3	7.5
	Phase	220 - 240 V	HP	3	3	5	7.5
		440 - 480 V	HP	5	5	7.5	10
		550 - 600 V	HP	7.5	7.5	10	15
Size and weight 	AC Control	Weight	kg	0.33			
		Size(W×H×D)	mm	45×73.5× 80.4			
	DC Control	Weight	kg	0.4			
		Size(W×H×D)	mm	45×73.5×96.6			
Auxiliary(standard)				-			
Auxiliary	Side Mount			UA-1			
	Front Mount			UA-2, UA-4			







22 AF	40 AF		85 AF			
MC-22a/4	MC-32a/4	MC-40a/4	MC-50a/4	MC-65a/4	MC-75a/4	MC-85a/4
●	●		●			
4 P	4 P		4 P			
690 V	690 V		690 V			
690 V	690 V		1000 V			
50/60 Hz	50/60 Hz		50/60 Hz			
6 kV	6 kV		8 kV			
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			

Metasol Contactors



MC type
Magnetic Contactors (4 pole)

Frame size				225 AF				
Type				MC-100a/4	MC-130a/4	MC-150a/4	MC-185a/4	MC-225a/4
	Screw clamp terminal					●		
Number of poles						4 P		
Rated operational voltage (Ue)						690 V		
Rated insulation voltage (Ui)						1000 V		
Rated frequency						50/60 Hz		
Rated impulse withstand voltage, Uimp						8 kV		
Maximum operating rate in operating cycles per hour (AC3)						1200 operations per hour		
Durability	Mechanical					5 mil. operations		
	Electrical					0.8 mil. operations		
Current	Thermal current		A	200	250	275	300	350
and Power	AC-1	200/240 V	kW	57	60	76	87	100
(IEC)			A	200	250	275	300	350
		380/400 V	kW	106	110	142	165	185
			A	200	250	275	300	350
		500/550 V	kW	132	137	180	205	230
			A	200	250	275	300	350
		690 V	kW	165	170	225	255	290
			A	200	250	275	300	350
UL rating	Continuous current		A	200	250	275	300	350
(UL)	Single	110 - 120 V	HP	7.5	10	15	15	15
	Phase	220 - 240 V	HP	15	20	25	30	40
	Three	200 - 208 V	HP	30	40	40	60	60
	Phase	220 - 240 V	HP	30	40	50	60	75
		440 - 480 V	HP	60	75	100	125	150
		550 - 600 V	HP	60	75	100	125	150
Size and weight 	AC	Weight	kg			5.6		
	Control	Size(W×H×D)	mm			175×203×185		
	DC	Weight	kg					
	Control	Size(W×H×D)	mm					
Auxiliary(standard)				**2NO2NC**				
Auxiliary	Side Mount					AU-100, AU-100E		
	Front Mount					-		

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

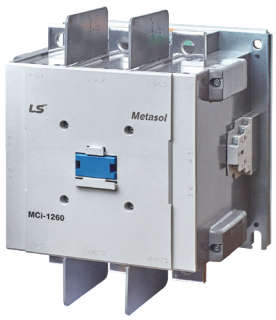




400 AF		
MC-265a/4	MC-330a/4	MC-400a/4
●		
4 P		
690 V		
1000 V		
50/60 Hz		
8 kV		
1200 operations per hour		
2.5 mil. operations		
0.5 mil. operations		
400	500	520
115	135	160
400	500	520
215	250	300
400	500	520
265	315	375
400	500	520
335	390	470
400	500	520
400	500	520
-	-	-
-	-	-
75	100	125
100	125	150
200	200	300
200	200	300
9.9		
206×243×205		
2NO2NC		
AU-100, AU-100E		
-		

800 AF		
MC-500a/4	MC-630a/4	MC-800a/4
●		
4 P		
690 V		
1000 V		
50/60 Hz		
8 kV		
1200 operations per hour		
2.5 mil. operations		
0.5 mil. operations		
700	900	1050
245	255	310
700	900	1050
450	470	570
700	900	1050
560	590	710
700	900	1050
710	740	900
700	900	1050
700	900	1050
-	-	-
-	-	-
150	200	200
200	250	300
400	500	600 *
400	500	600 **
26.3		
346×310 ×244		
2NO2NC		
AU-100, AU-100E		
-		

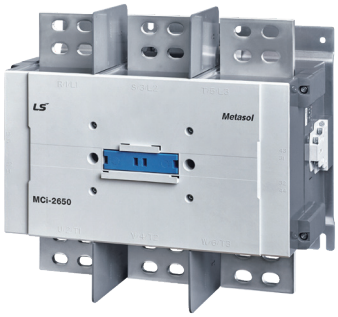
Metasol Contactors



Renewable Magnetic Contactor

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

Frame size				1260 AF		
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
Eelectrical operating cycle			cycles/hour	600	600	300
Durability	Mechanical		million	1	1	0.5
	Electrical (AC-1 @ 690 V)		million	0.26	0.26	0.15
	Electrical (AC-1 @ 400 V)		million	0.5	0.5	0.2
Current and Power	AC-1 1000 V 55/60/70 °C		A	900/850/700	1050/875/720	1260/1060/900
(IEC)	Thermal current		A	900	1050	1260
	Heat dissipation		W	100	170	170
Rated Short-time	1 s		A	7000	7500	8000
withstand current((Icw)	10 s		A	6400	7000	7200
(IEC 60947)	1 min		A	3500	3800	4000
	10 min		A	1550	1550	2300
max. breaking capacity	400 V		A	6000	7500	7500
(Icd)	690 V		A	5000	7000	7000
	1000 V		A	2000	2500	2500
Type-2 Coordination (with MCCB or ACB)			kA	42 kA (Break time: less than 20 ms)		
Current and HP	Thermal current			900	1050	1260
(UL)	Single phase	110 - 120 V	HP	-	-	-
		220 - 240 V	HP	-	-	-
	Three phase	200 - 208 V	HP	200	200	-
		220 - 240 V	HP	250	300	-
		440 - 480 V	HP	500	600	-
		550 - 600 V	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			-		



2650 AF		
MCi-1700	MCi-2100	MCi-2650
	●	
	3	
	1000	
	1000	
	50/60	
	8	
	300	
300	300	120
0.5	0.5	0.3
0.05	0.05	0.02
0.05	0.05	0.05
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
	42 kA (Break time: less than 50m s)	
1700	2100	2650
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
34.6	34.6	47
431×380×246	431×380×246	431×392×246
2NO2NC		
	AU-100, AU-100E (max.4NO4NC)	
	-	

XGIPAM

Characteristics

- Protective use model (F, B, M, T, DG)
- 8.4 inches of color Touch Screen
- Performing 0.2 % measurement accuracy for Current and Voltage
- Sag, Swell, Interruption and Harmonic analysis of 1 - 63rd orders
- Increasing reliability/Flexibility through Duplex communication



Type of Protection

Type	Vsage	Protection
XGIPAM - F	Feeder/Incomming	OCR(50/51), OCGR(50/51N), UVR(27), OVR(59), SGR(67G), DGR(67N) Note), OVGR(64I/D), NSOVR(47N), POR(47), SYNC Check(25), Reclosing(79), Temperature(38)
XGIPAM - B	Bay controller	OCR(50/51), OCGR(50/51N), UVR(27), OVR(59), SGR(67G), DGR(67N)Note), OVGR(64I/D), NSOVR(47N), POR(47), SYNC Check(25), Reclosing(79), Temperature(38), DOCR(67I/D), NSOCR(46I/D), UFR(81U), OFR(81O), DPR(32P), DQR(32Q)
XGIPAM - M	Motor	OCR(50/51), OCGR(50/51N), UVR(27), OVR(59), SGR(67G), DGR(67N)Note), OVGR(64I/D), NSOVR(47N), POR(47), Temperature(38), Stall/Locked Rotor(48/51LR), THR(49), DOCR(67I/D), UCR(37), NCH(66), NSOCR(46I/D)
XGIPAM - T	Transformer	OCR(50/51)×2, OCGR(50/51N), UVR(27), OVR(59), Temperature(38), DPR(32P), DFR(87T)
XGIPAM - DG	Distributed Generator	OCR(50/51), OCGR(50/51N), UVR(27), OVR(59), DPR(32P), UPR(37P), DQR(32Q), UFR(81U), OFR(81O), DGR(67N)Note), SYNC Check(25), DOCR(67I/D), NSOCR(46I/D), POR(47), NSOVR(47N), ROCOF(81R), SGR(67G), OVGR(64I/D)
XGIPAM - 3wT	Transformer (3 wires)	OCR(50/51)×3, OCGR(50N/51N), UVR(27), OVR(59), OVGR(64I/D), DFR(3W87T)

Note) DGR is the same as DOCGR.

Ratings

Type		Specification	
Wiring		3P3W, 3P4W	
Input	Frequency	60 Hz (50 Hz *)	
	Voltage	PT: 100/√3, 110/√3, 120/√3, 190/√3, 100, 110, 120 V GPT: 100 - 190 V	
	Current	CT: 5A , ZCT: 1.5 mA	
	Power consumption	Normal: Max. 30 W, Operating: Max. 70 W	
	Control voltage	AC 110 V, DC 110 - 125 V	
	Burden	PT: Max. 0.5 VA (Phase PT Standard), CT: Max. 1.0V A Input contact Digital Input, AC/DC 110 V	
Output contact	TRIP	Rated	AC 250 V 10 A/DC 30 V 10 A, Resistive Load
		Open	AC 2500 VA, DC 300 W
	ALARM	Close	AC 250 V 5 A/DC 30 V 5 A, Resistive Load
		Open	AC 1250 VA, DC 150 W
Insulation Resistance		Over DC 500 V 10 MΩ	
Dielectric Strength		Electric circuits to Earth : AC 2 kV (1 kV) / for 1 min Between electric circuits : AC 2 kV (1 kV) / for 1 min Between terminals of contact circuit: AC 1 kV (1 kV)/for 1 min	
Overload withstand	Current circuit	2 In for 3 hours, 20 In for 2 second	
	Voltage circuit	1.15Vn for 3 hours	
Fast Transient Disturbance		Power Input 4 kV, PT/CT/DI/DO/AI/AO input 4 kV, Communication 2 kV	
Electrostatic Discharge(ESD)		Air 8 kV, Contact 6 kV	
Operation temperature		-10 ℃ - 55 ℃	
Storage temperature		-25 ℃ - 70 ℃	
Humidity		30 % - 80 %	
Height above sea level		1500 m or less	
Others		Non-impact place, Non-air pollution place	
Weight		7kg (HMI: 2 kg)	

* Please contact the sales department for 50 Hz in parentheses.

Susol RMU

Characteristics

- Applicable to renewable electricity generation (wind, solar)
- Configurable TR Container Pack



Susol RMU

Ratings

Rated voltage	kV	12	17.5	24	36
Rated frequency	Hz	50/60	50/60	50/60	50/60
Rated power frequency withstand voltage	kV	28	38	50	70
Rated power frequency withstand voltage	kV	75	95	125	170
Rated current main busbars	A	630	630	630	630
Rated short-time withstand current (3s)	kA	21	21	21	20
Rated short-circuit making current	kA	54.6	54.6	54.6	52
Internal arc fault current (1 s, AFAL)	kA	21	21	21	20
Rated SF_6 gas pressure	Psi.G	5	5	5	5

Applicable type



24 kV LFL type



24 kV LCL type



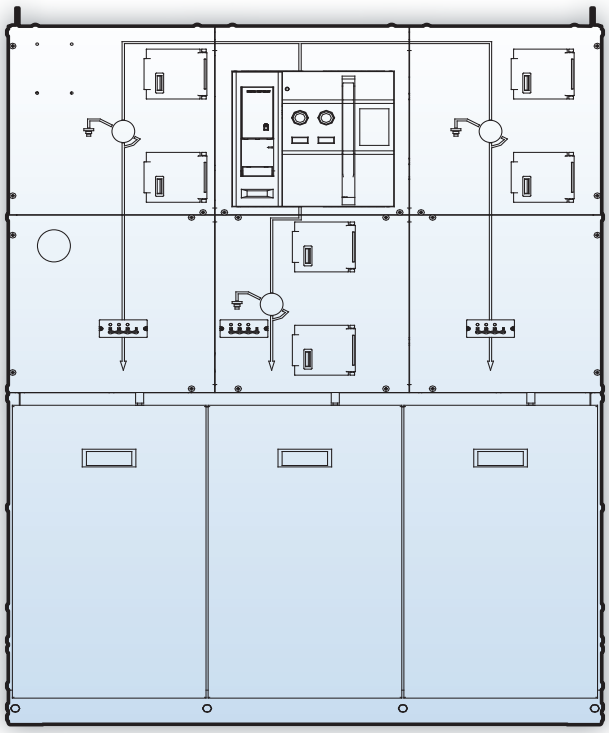
24 kV Extensible type



36 kV LCL type

Susol RMU

12/17.5/24 kV CB Feeder Non-Extensible RMU

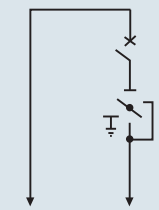


- Consists of two circuit LBS and one circuit CB-DS in a single chamber
- Protects equipment using Circuit Breaker
- Complete Sealing System
- Increases durability through S/S application
- L: Load break switch
- C: Vacuum circuit breaker

Applicable type

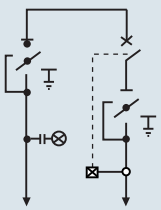
[W×H×D, mm]

RC (1R1C)



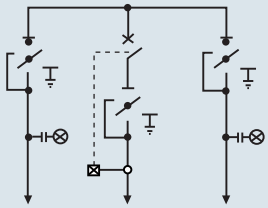
718×1437×779

LC (1L1C)



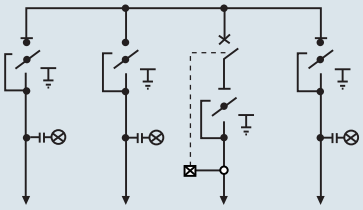
718×1437×779

LCL (2L1C)



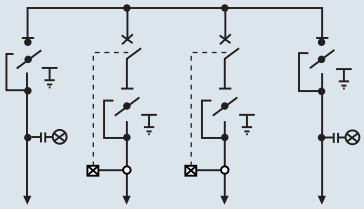
1030×1437×779

LLCL (3L1C)



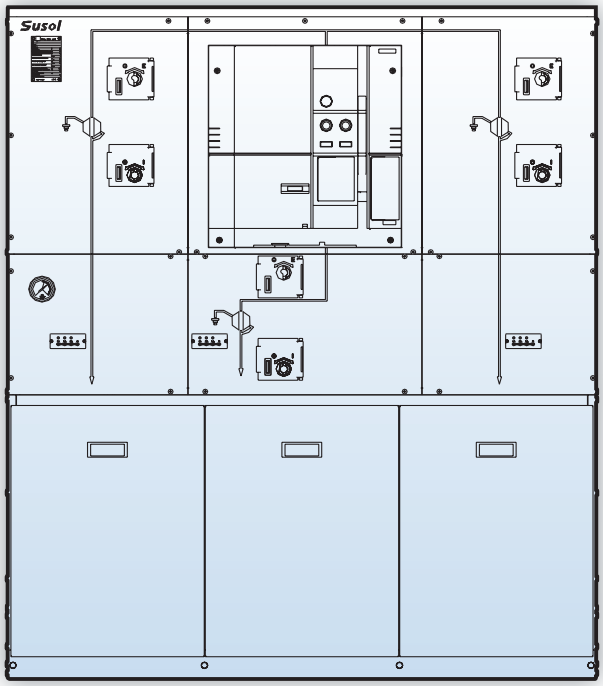
1362×1437×779

LCCL (2L2C)



1362×1437×779

36 kV CB Feeder Non-Extensible RMU

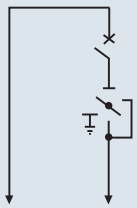


- Consists of two circuit LBS and one circuit Switch-Fuse in a single chamber
- Protects equipment using Switch Fuse
- Complete Sealing System
- Application of high grade OCR
- Increase durability through S/S application
- L: Load break switch
- C: Vacuum circuit breaker

Applicable type

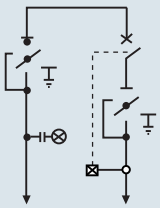
[W×H×D, mm]

RC (1R1C)



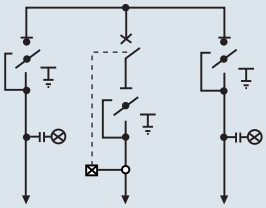
1015×1607×1108

LC (1L1C)



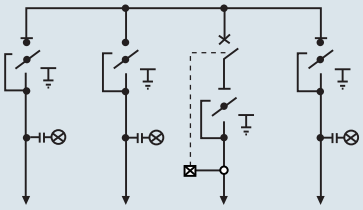
1015×1607×1108

LCL (2L1C)



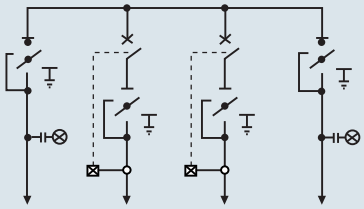
1375×1607×1108

LLCL (3L1C)



1950×1607×1108

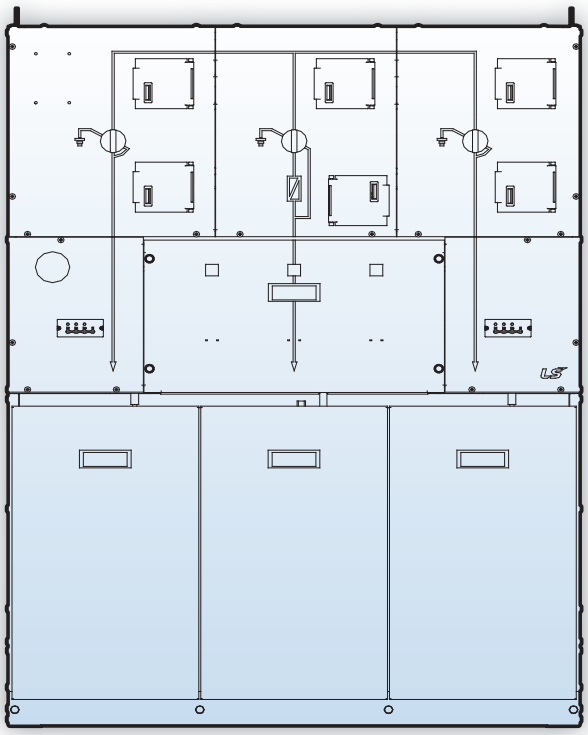
LCCL (2L2C)



2020×1607×1108

Susol RMU

12/17.5/24 kV Switch-Fuse Feeder Non-Extensible RMU

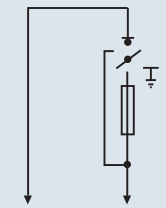


- Consists of two circuit LBS and one circuit Switch-Fuse in a single chamber
- Protects equipment using Switch Fuse
- Complete Sealing System
- Increase durability through S/S application
- L: Load break switch
- C: Vacuum circuit breaker

Applicable type

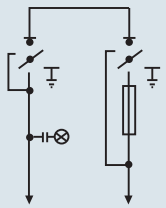
[W×H×D, mm]

RF (1R1F)



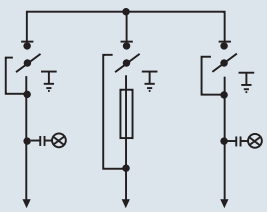
718×1437×779

LF (1L1F)



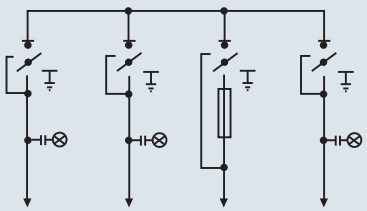
718×1437×779

LFL (2L1F)



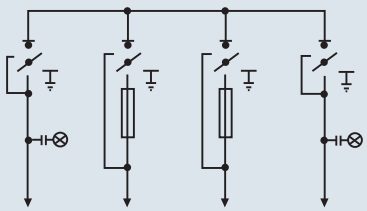
1030×1437×779

LLFL (3L1F)



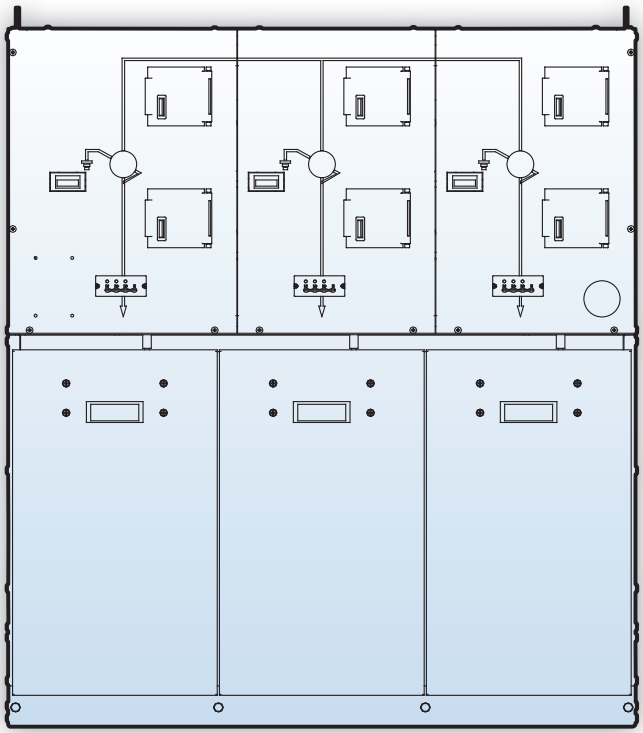
1362×1437×779

LFFL (2L2F)



1362×1437×779

12/17.5/24 kV LBS Feeder Non-Extensible RMU

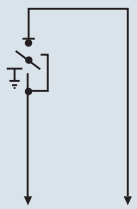


- Complete Sealing System
- Increase durability through S/S application
- L: Load break switch

Applicable type

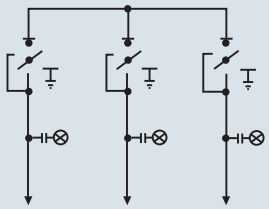
[W×H×D, mm]

LR (1L1R)



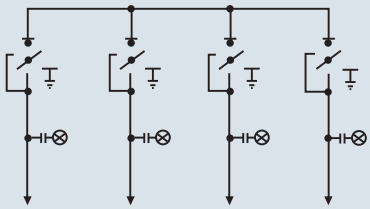
718×1222×779

LLL (3L)



1030×1222×779

LLLL (4L)



1362×1222×779

Susol RMU

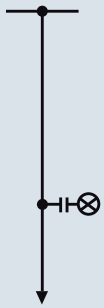
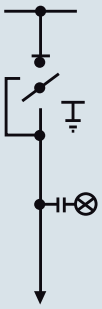
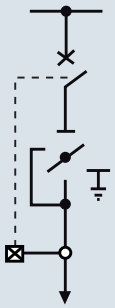
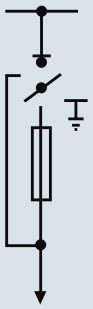
Extensible RMU

- Protects equipment using Switch Fuse
- Complete Sealing System
- Increase durability through S/S application
- L: Load break switch
- C: Vacuum circuit breaker



12/17.5/24kV Extensible RMU

[W×H×D, mm]

R	L	C	F
			
411×1456×779	411×1456×779	521×1456×779	521×1456×779

Cast Resin Transformer

Characteristics

- Applicable to wind power plant
- Superior shock voltage (125 kV BIL)
- Strengthening seismic performance (scale 8.0)
- Low noise and high efficiency
- Up to 36 kV voltage and 30 MVA capacity



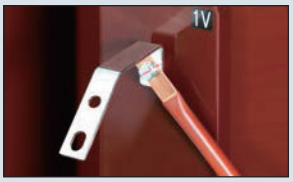
Ratings

Division			Standard specification				
Installation place			Indoor(Enclosure needed for outdoor)				
Applicable standard			KS C 4311				
Frequency			60				
Insulation kind			F type				
Coil temperature rise			100 K				
1st rated voltage		kA	22.9 kV			6.6 or 3.3 kV	
1st tap voltage		V	F23900-R22900-21900-20900-19900			F6900-R6600-6300-6000-5700 F3450-R3300-3150-3000-2850	
2nd rated voltage			6.6 or 3.3 kV	380-220 V	220-110 V	380-220 V	220-110 V
Phase			3P	3P	1P	3P	1P
Angular displacement			Dd0	Dyn11	-	Dyn11	-
Impulse withstand voltage	(1 st/2 nd)	kV	95/40 (20) 125/40 (20)	95/- 125/-	95/- 125/-	40 (20)/-	40 (20)/-
Normal frequency withstand voltage	(1 st/2 nd)	kV	50/20 (10)	50/3	50/3	20 (10)/3	20 (10)/3
Rated capacity		kVA		100	100	100	100
				200	200	200	200
				300	300	300	300
				400	400	400	400
			500	500	500	500	500
			600	600	600	600	600
			750	750	750	750	750
			1000	1000	1000	1000	1000
			1250	1250		1250	
			1500	1500		1500	
			2000	2000		2000	
			2500	2500		2500	
			3000	3000		3000	
			4000				
			5000				
			6000				
			7500				
			8500				
			10000				

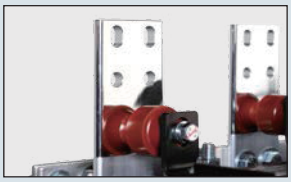
* The above descriptions are standard specifications, but other specifications are available according to orders. (- 36 kV, - 30 MVA)
* The ( ) in the impulse withstand voltage and the normal frequency withstand voltage is insulation classes for 3.6 kV.

Cast Resin Transformer

Standard components



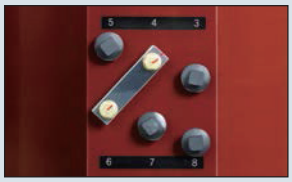
1st terminal
This is connected to the inlet cable, so check the bolt tightening condition before inputting power.



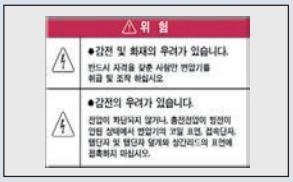
2nd terminal
This is connected to the flexible bus and cable in the 2nd load side, so check the bolt tightening condi-tion before inputting power.



Grounding terminal
This is attached on the bottom frame, so check the grounding condition before inputting power.



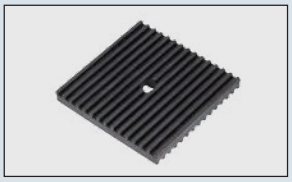
Tap change terminal
To change the 2nd voltage of the transformer, turn off the tap and adjust the tap terminal.



Danger mark
Touching the coil surface during operation of the transformer can cause danger, so never touch it during operation



Lifting eye
This is attached on the top of the top frame, so use it to lift the trans-former.

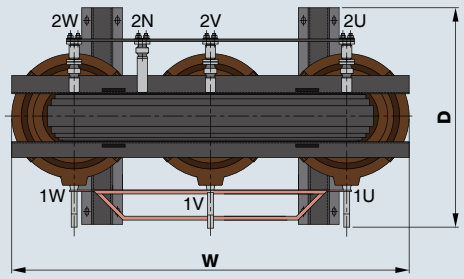


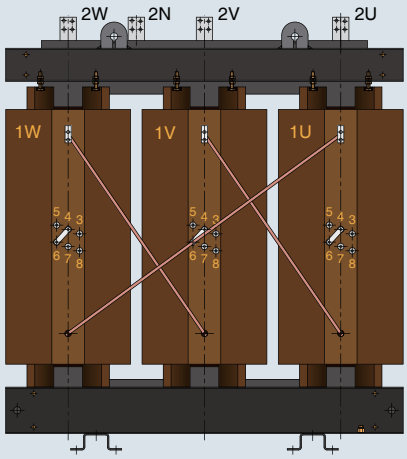
Cushion rubber
Insert cushion rubber between the transformer bed frame and the ground to prevent iron core vibrations from transferring to the floor during operation to reduce noises.

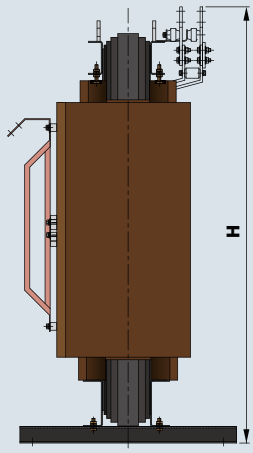


Tap change terminal cover Insulate
The conductor part of the tap terminals to secure an insul-ation distance and improve safety.

Dimensions







Oil-Immersed Transformer

Characteristics

- Applicable to solar/wind power plant
- Mobile transformer (Connection type)
- Quality control through multiple tests
- Various accessories available
- Up to 72 kV voltage and 80 MVA capacity



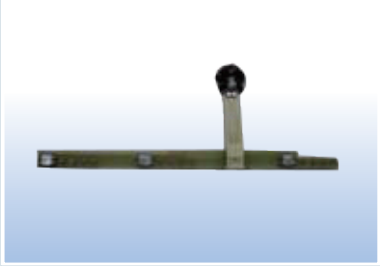
LS transformer adopts a structure that can reduce the loss, and it ensures the electrical sability of the transformer by selecting the high efficiency and the optimum insulation structure. Also, it realizes the optimum cooling system, seismic condition considering the short-circuit mechanical power and external shock occurred in the transformer in case of system failure. And strong design of structure that can endure the impact during transportation.

Ratings

Applicable specifications		
Applicable standard		IEC 60076/ANSI(IEEE) C57
Installation location		Outdoor/Indoor
Frequency		50/60 Hz
Thermal class		A type 105 ℃
Winding temp. rising		65 K
Oil Temp. rising		60 K
Cooling method	Internal	ON/OF/OD
	External	AN/AF/WF
Voltage		Up to 69 kV
Capacity (MVA)		Up to 80 MVA
Conductor		Al or Cu

Oil-Immersed Transformer

Standard components



Tap changer
The tap changer is a device for adjusting the voltage, No load tap changer and on-load tap-changer, etc. use.



Breather
Breather is used to prevent deterioration and aging of insulating oil. It consists of two containers filled with moisture absorbent and insulating oil.

* 3000 kVA or less is not required.



Winding temperature indicator
Winding temperature indicator do not directly measure the winding temperature but indirectly measure it using a current transformer (BCT) and a temperature detector It can be used by alarm or break contact.



Oil temperature indicator
Oil temperature indicator is located in the protective pipe attached to the transformer enclosure and indicates the temperature of oil level of the top of transformer during operation. It can be used by alarm or break contact.



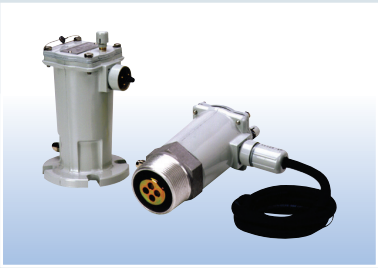
Oil level gauge
This displays the height of the oil level of the tank and the conservator.



Buchholz relay
Buchholz relay is installed between the pipes connecting the transformer and the controller. Alarm and trip signal is generated by detecting changes of gas and flow rate when any internal error occurs.



Pressure relief device
Pressure relief device releases the pressure generated by an accident of the transformer to the outside air, and is attached to the cover of the transformer enclosure. It has a alarm and a break contact.



Sudden pressure relay
Sudden pressure relay is operated at the time of accident such as short circuit and flash over of the transformer, and has alarm and trip contact.



Conservator
It is responsible for contraction and expansion of insulation oil due to changes in oil temperature.

* 3000 kVA or less is not required.

Memo

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Headquarter
127 LS-ro (Hogye-dong) Dongan-gu, Anyang-si, Gyeonggi-Do, 14119, Korea

Seoul Office
LS Yongsan Tower, 92, Hangang-daero, Yongsan-gu, Seoul, 04386, Korea
TEL: 82-2-2034-4916, 4684, 4429

C/Montcada 7, Pol. Ind. Les Pereres
08130 Santa Perpètua de Mogoda
Barcelona - Spain

Tel. +34 935 748 206
info@vectorenergy.com
www.vectorenergy.com

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

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