

Top 100
Global
Innovator
for 10 years

Susol *Super Solution*

UL LOW VOLTAGE SWITCHBOARD



LS *ELECTRIC*



Susol *Super Solution*

UL LOW VOLTAGE SWITCHBOARD

Susol UL low voltage switchboard is designed to provide superior electrical distribution and protection for the facility. It is designed, built and tested to meet UL standards. As a service entrance equipment or a distribution center, it can be applied to a variety range of markets requiring high reliability and safety. With metal-enclosed and free-standing structure, Susol UL low voltage switchboard is a convenient and economical means of power distribution.



Contents

Product description	04
Technical data	07
Components	09
Layout instructions	22
Layouts and dimensions	24

Product description

General information

Ratings

- Voltage to 480 VAC
- 50/60 Hz
- Main bus rated to 6,000 A
- Vertical bus rated to 6,000 A
- Circuit breaker available up to 6,000 A

Design

- Front and rear accessible
- NEMA Type 1 enclosure
- Height: 90”(2281.2 mm) with base channels
- Section widths: 32”(812.8 mm), 36”(914.4mm), 44”(1117.6mm) or 46”(1,168.4 mm)
- Frame depths: 60”(1,500 mm) or 72”(1,800 mm)

Standards

Susol UL low voltage switchboard

- UL 891

Susol low voltage power circuit breakers (Susol ACB)

- ANSI C37.13, ANSI C37.16, ANSI C37.17, ANSI C37.50
- UL 1066 (cULus Listed)
- CSA C22.2 No.31-10

Susol molded case circuit breakers (Susol MCCB)

- UL 489

Applications



Building

- Data center
- Hospital
- Large office building
- Large warehouse
- University



Industry

- Chemical
- Mining and material
- Iron and steel
- Food and beverage
- Pharmaceutical
- Automobile
- Battery



Utility/Public

- Waste water
- Airport

Structure features

Frame

The frames of Susol UL LV switchboard are designed as a solid structure. Individual switchboard sections are built from formed steel channels, then secured together with thread-rolling screws. The frames are firmly fixed to base channel. When base channel is applied, the warp of the frame can be minimized and the internal parts can be supported stably.

Door and cover

For stronger structure, all covers and doors are made of formed steel. Also, the removable plates with formed edges cover the back and all covers are fixed with slot/hex head thread rolling screws.

Enclosure

Susol UL LV switchboards are available in NEMA Type 1 indoor enclosures.

Cable compartment

Cable compartments are designed with enough wire-bending space to facilitate cable termination and installation. For cable operations, a workspace considering the radius of curvature of the cable is required.

- Designs for cable, bus duct riser, cable bus, cable duct, and transformer connections
- Secure front access with completely isolated control and communication wiring sections
- Booth structure enabling future installation and expansion of additional equipment

Finish

ANSI #61 medium light gray is applied on all switchboards as a standard color.

Section

Each section has lifting angles so that it is easy to move and install. The sections are shipped separately to give a flexibility to the installer when moving them to desired place. Once the sections are located in place, they are connected to each frame and secured together.

An auxiliary (or extendable) section can be provided to enable the use of additional space for cable or bus transition or for connecting the service conductors to the main line. The auxiliary section has the same height as the existing section for appearance unity with the adjacent section, and only the depth is added. Also, it can be used as an installation space for customer metering (for ct, pt, or etc.), or as a space for the main bus and incoming lug pads.



Product description

Bus system

The bus is installed in the rear section of the switchboard. All of 1000A sq in bolted copper bus is provided as UL891 standard. The busbar is silver-plated electrolytic copper.

Main and vertical bus

Main bus is very important factor for a switchboard. The ratings of main bus are 2000, 2500, 3200, 4000, 5000, and 6000A with short circuit current rated up to 100kA in all types.

Vertical bus ratings are also 2000, 2500, 3200, 4000, 5000, and 6000A with short circuit current rated up to 100kA.

Neutral and branch bus

Neutral bus is rated 100% of main bus rating. The sectional area for all types of ground busbar is 1/4" X 4".

Branch bus ratings depend on circuit breaker ratings.

Short circuit current

Rated short circuit current is up to 85kA at D-frame ACB(800-1600A), 85/100kA at E-frame ACB (800-3200A) and 100kA at G-frame ACB(3200-6000A). UL Susol MCCB of LS Electric is applied to the interior and the maximum short circuit current rating of the interior is 100kA at 480Vac (depends on MCCB type).



USB	A		G		48		100		60		60	
	Section		CB frame		Voltage		Short circuit current rating		Main bus rating		Vertical bus rating	
Susol UL LV Switchboard	A	ACB	C	Combined D/E type	24	240V	85	85kA	20	2000A	20	2000A
			D	ACB D Frame	48	480V	100	100kA	25	2500A	25	2500A
			E	ACB E Frame					32	3200A	32	3200A
			G	ACB G Frame					40	4000A	40	4000A
	M	MCCB	I	6000-66X					50	5000A	50	5000A
			M	6000-46X					60	6000A	60	6000A
			N	6000-36X								
			O	4000-66X								
			P	4000-46X								
			Q	4000-36X								
			R	4000H-66X								
			S	4000H-46X								
			T	4000H-36X								
			U	2400-66X								
			V	2400-46X								
			W	2400-36X								
			X	2000-66X								
			Y	2000-46X								
			Z	2000-36X								

Technical data

Ratings

Description			USB-□□D (D-type)	USB-□□E (E-type)	USB-□□G (G-type)	USB-□□(I~Z) (MCCB panel)
Rated voltage		V, rms	Up to 480 V			
Rated current	Main bus	A, rms	2000 ~ 6000			
	Vertical bus		2000 ~ 6000			
	Branch bus		800 ~ 1600	800 ~ 3200	3200 ~ 6000	2000 ~ 6000
Short circuit current rating		kA, rms	85 at 480V	85 / 100 at 480V	100 at 480V	100 at 480V
Frequency		Hz	50/60			
Enclosure type			NEMA 1			
Stacks			4	2 / 3 / 4	1	-
Standard size ²⁾	W	Inch (mm)	32 (812.8)	32 (812.8)	44 (1117.6)	36 / 46 (914.4 / 1168.4)
	H	Inch (mm)	90 (2281.2)	90 (2281.2)	90 (2281.2)	90 (2281.2)
	D	Inch (mm)	60 / 72 ¹⁾ (1500 / 1800)	60 / 72 ¹⁾ (1500 / 1800)	72 ¹⁾ (1800)	60 / 72 ¹⁾ (1500 / 1800)
Standards			UL891			

Note) 1. The size of cable compartment can be extended. (Option)

2. For special size, please contact your local LS Electric representative.

Susol UL ACB

Overview

Susol UL ACB is UL listed/ANSI certified low-voltage power circuit breaker.

Premium Susol ACB meets your demands for high breaking capacity with full line-up up to 6000A, all in optimized frame sizes for panel design. Various accessories and connection methods realize user-friendly handling. Susol ACB provides the 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.

- Susol ACB low voltage power circuit breakers are designed and built to the following standards.
 - ANSI C37.13, ANSI C37.16, ANSI C37.17, ANSI C37.50, UL 1066 (cULus Listed), CSA C22.2 No.31-10
- Modular design
- 3 compact frame sizes that enables users to design panels of optimal volume
- High (130kA) breaking capacity full line-up to 6000A at 508Vac
- Satisfy the needs for compact sized panels
- N-Phase conducting capacity 100%
- Monitor temperatures for safety (Optional)
- Easy installation of accessories
- Interchangeable trip unit and rating plug
- Intelligent trip relay with various advanced functions for protection, measurement, diagnosis, analysis, communication



Component

Susol UL ACB



Ratings

Type					UAS-□□D		
AF					08	16	
Rated current (In max)	(A)	at 40°C			800	1600	
Rated current	(A)	at 40°C				800	
					400	1000	
					600	1200	
					630	1250	
					800	1600	
Rated maximum voltage	(V)	254V / 508V / 635V					
Frequency	(Hz)	50 / 60					
Number of poles	(P)	3P / 4P					
Type of trip relay (Electronic trip device)					N, A, P, S (4 type)		
Rated short circuit current (kA) (Sym.) UL 1066 ANSI C37.13	With instantaneous	AC	635V		65		
			508V		85		
			254V		85		
	With instantaneous	AC	635V		65		
			508V		65		
			254V		65		
Rated short time current	(kA)	65					
Operating time	(t)	(ms)	Maximum total breaking time		50ms		
			Maximum closing time		80ms		
Life cycle	ACB	(time)	Mechanical	Without maintenance	12,500		
				With maintenance	-		
			Electrical	Without maintenance	2,800		
				With maintenance	-		
Weight	lb (kg)	Drawout type	Main Body with Cradle	3P	154 (70)		
				4P	187 (85)		
			Only Cradle	3P	71 (32)		
				4P	84 (38)		
		Fixed type	Motor charging 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	16.93×16.5×16.02 (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)		



UAH-□□E					UAH-□□G				
08	16	20	25	32	32	40	50	60	
800	1600	2000	2500	3200	3200	4000	5000	6000	
400	800	1000	1200	1600	1600	2000	2500	3000	
600	1000	1200	1250	2000	2000	2500	3000	3200	
630	1200	1250	1600	2500	2500	3000	3200	3600	
800	1250	1600	2000	3000	3000	3200	3600	4000	
	1600	2000	2500	3200	3200	3600	4000	5000	
						4000	5000	6000	
254V / 508V / 635V					254V / 508V / 635V				
50 / 60					50 / 60				
3P / 4P					3P / 4P				
N, A, P, S (4 type)					N, A, P, S (4 type)				
85					100				
100					130				
100					130				
85					100				
85					100				
85					100				
85					100				
50ms					50ms				
80ms					90ms				
12,500				12,500	10,000				
-				-	-				
2,800				1,000	1,000				
-				-	-				
214 (97)			245 (111)	326 (148)	489 (222)			709(321)	
269 (122)			309 (140)	414 (188)	626 (284)			919 (417)	
99 (45)			123 (56)	205 (93)	276 (125)			482 (218)	
121 (55)			152 (69)	256 (116)	355 (161)			630 (286)	
101 (46)			110 (50)	196 (89)	227 (103)			433 (196)	
126 (57)			137 (62)	249 (113)	287 (130)			561 (255)	
16.93×16.22×16.02 (430×412×407)					18.11×30.91×16.02 (460×785×407)				
16.93×20.75×16.02 (430×527×407)					18.11×39.96×16.02 (460×1015×407)				
11.81×14.88×11.61 (300×378×295)					11.81×29.57×11.61 (300×751×295)				
11.81×19.41×11.61 (300×493×295)					11.81×38.62×11.61 (300×981×295)				
19.69×19.69×13.39 (500×500×340)					31.5×32.48×13.39 (800×825×340)				
19.69×24.21×13.39 (500×615×340)					31.5×41.54×13.39 (800×1055×340)				

Component

Susol UL ACB

Trip relay (OCR)





The trip relay of Susol ACB provides the additional protection functions for voltage, frequency, unbalance, and others in addition to main protection functions for over current, short-circuit, ground fault. It supports the advanced measurement functions for voltage, current, power, electric energy, harmonics, communication function, and others. Analog trip function interlocked with mechanism enhances the durability as well as the breaking capacity of the ACB. Zone selective interlocking function makes the protective coordination more simple and thermal memory can be applied to various loads.

Trip relays are classified according to their uses and functions to maximize customers' satisfaction. They are also easy to installation for customers' convenience.

- Protection : overload, short current, ground fault, earth leakage, under voltage, over voltage, under frequency, over frequency, reverse power, unbalance, etc
- Measurement: voltage, ampere, power, energy, frequency, power factor, harmonics, etc.
- Event & fault recording: Max. 256 events & faults
- Communication: Modbus/RS-485, Profibus-DP



Trip relay types

Classification	N type	A type	P type	S type
Externals				
Current protection	• L / S / I / G	• L / S / I / G(or Earth leakage) • Thermal • ZSI(Protective coordination) • ERMS	• L / S / I / G(or Earth leakage) • Thermal(Continuous) • ZSI(Protective coordination) • ERMS	• L / S / I / G(or Earth leakage) • Thermal(Continuous) • ZSI(Protective coordination) • ERMS
Other protection	-	• Earth leakage (Option)	• Earth leakage(Optional) • Over/Under voltage • Over/Under frequency • Unbalance(Voltage/Current) • Reverse power	• Earth leakage(Optional) • Over/Under voltage • Over/Under frequency • Unbalance(Voltage/Current) • Reverse power
Measurement function	-	• Current (R / S / T / N)	• 3 Phase Voltage/Current RMS/Vector • Power(P, Q, S), PF(3-Phase) • Energy(Positive/Negative) • Frequency, Demand	• 3 Phase Voltage/Current RMS/Vector • Power(P, Q, S), PF(3-Phase) • Energy(Positive/Negative) • Frequency, Demand • Voltage/Current harmonics (1st-63th) • 3 Phase Waveforms • THD, TDD, K-Factor
Fine adjustment	-	-	• Fine adjustment for long /short time delay / instantaneous / ground	• Fine adjustment for long /short time delay / instantaneous / ground
Pre Trip Alarm	-	-	• Overload protection relays : DO (Alarm) (Ground fault is not available when using Pre trip alarm)	• Overload protection relays : DO (Alarm) (Ground fault is not available when using Pre trip alarm)
Digital Output	-	• 3DO (Fixed) • L, S/I, G Alarm	• 3DO (Programmable) • Trip, Alarm, General	• 3DO (Programmable) • Trip, Alarm, General
IDMTL setting	-	-	• Compliance with IEC60255-3 • SIT, VIT, EIT, DT	• Compliance with IEC60255-3 • SIT, VIT, EIT, DT
Communication	-	• Modbus / RS-485 • Profibus-DP	• Modbus / RS-485 • Profibus-DP	• Modbus / RS-485 • Profibus-DP
Power supply	• Self Power - Power source works over 20% of load current.	• Self Power - Power source works over 20% of load current. - External power source are required for comm. • AC/DC 100~250V • DC 15~60V	• AC/DC 100~250V • DC 15~60V	• AC/DC 100~250V • DC 15~60V
RTC timer	-	• Available	• Available	• Available
LED for trip info.	• Long time delay • Short time delay/Instantaneous • Ground fault	• Long time delay • Short time delay/Instantaneous • Ground fault	• Long time delay • Short time delay/Instantaneous • Ground fault	• Long time delay • Short time delay/Instantaneous • Ground fault
Fault recording	-	• 10 records (Fault/Current/Date and Time)	• 256 records (Fault/Current/Date and Time)	• 256 records • Last fault wave recording (voltage, current are recorded in 3-phase, and can be read only by communication)
Event recording	-	-	• 256 records (Content, Status, Date)	• 256 records (Content, Status, Date)
Operating button	• Reset button	• Reset, Menu Up/Down, Tap, Enter	• Reset, Menu Up/Down, Tap, Enter	• Reset, Menu Up/Down, Tap, Enter

Each OCR type has Battery in itself.

1. Battery lifespan

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

2. The display minimum range of OCR current

- 1) A type: When more 15% than rated current (In)
- 2) P/S type: When more 12% than rated current (In)

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

Susol UL ACB

Ordering

UAS

Frame type

Breaker and accessories

16

Frame size

08	800AF
16	1600AF

D

Phasing

D	3/4P standard RST(N)
W	4P reversed NRST

3

Poles

3	3P
4	4P

16

Sensor rating

04~08	400A~800A
08~16	800A~1600A

A

Mounting and terminal

Mounting	
A	Drawout
Fixed	
H	Horizontal terminals
V	Vertical terminals
M	Horizontal for line
	Vertical for load
N	Vertical for line
	Horizontal for load
P	Front terminal
G	Horizontal-con type
W	Vertical-con type

* Terminals for P type must be ordered separately
* G and W types can be applicable to D-Frame only
* Front terminal is only available for 800~2000A
* 3200AF(E,X), 6000AF(G,Z) offers only vertical type terminals (Busbar).

UAH

Frame type

32

Frame size

08	800AF
16	1600AF
20	2000AF
25	2500AF
32	3200AF
32	3200AF
40	4000AF
50	5000AF
60	6000AF

E

Phasing

E	3/4P standard RST(N)
X	4P reversed NRST
G	3/4P standard RST(N)
Z	4P reversed NRST

3

Poles

3	3P
4	4P

32

Sensor rating

04~08	400A~800A
08~16	800A~1600A
10~20	1000A~2000A
12~25	1200A~2500A
16~32	1600A~3200A
16~32	1600A~3200A
20~40	2000A~4000A
25~50	2500A~5000A
30~60	3000A~6000A

UAA

Frame type

16

Frame size

08	800AF
16	1600AF
08	800AF
16	1600AF
20	2000AF
25	2500AF
32	3200AF
32	3200AF
40	4000AF
50	5000AF
60	6000AF

D

Phasing

D	3/4P standard RST(N)
W	4P reversed NRST
E	3/4P standard RST(N)
X	4P reversed NRST
G	3/4P standard RST(N)
Z	4P reversed NRST

3

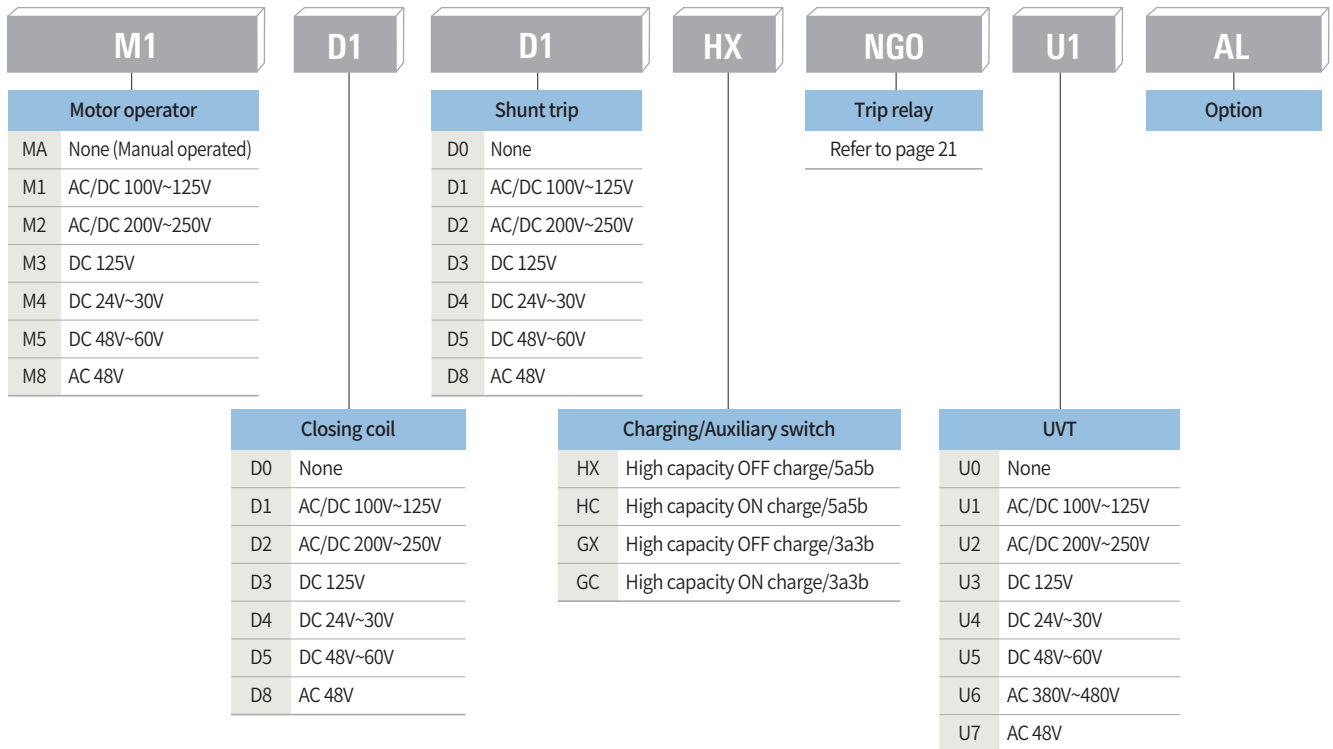
Poles

3	3P
4	4P

00

Sensor rating

Not applied	
-------------	--



Code	Description	Code	Description
AL	AL1 + MRB	K	K1 Key lock
A1	AL1 + MRB + RES (AC110 ~ 130V) *AC only	K2	K2 Key Interlock set
A2	AL1 + AL2 + MRB	K3	K3 Key Interlock double
A3	AL1 + MRB + RES (DC110 ~ 125V) *DC only	K5	K5 Profalux lock (CAMLOCK Type)
A4	AL1 + MRB + RES (AC200 ~ 250V) *AC only	K6	K6 Kirkkey lock (CAMLOCK Type)
A5	AL1 + MRB + Auto Reset	K7	K7 Kirkkey lock (CN22 Type)
A6	AL1 + AL2 + MRB + Auto Reset	R	RCS Ready to close switch
A7	AL1 + MRB + RES (DC110 ~ 125V) + Auto Reset *DC only	T	TM Temperature monitoring
A8	AL1 + MRB + RES (AC200 ~ 250V) + Auto Reset *AC only	H1	AC/DC 100V ~ 125V, Double shunt coil
A9	AL1 + MRB + RES (AC110 ~ 130V) + Auto Reset *AC only	H2	AC/DC 200V ~ 250V, Double shunt coil
S	CS2 Charge switch communication	H3	DC 125V, Double shunt coil
B	B Lockable On/Off button cover	H4	DC 24V ~ 30V, Double shunt coil
M	MI Mechanical interlock	H5	DC 48V ~ 60V, Double shunt coil
D	DI or MOC Door interlock or MOC (Mechanism operated cell switch)	H7	AC 48V, Double shunt coil

N01	A4 (AL1+MRB+RES(AC200~250V)) + B(ON/OFF button lock) + K(Key lock)+R(Ready to close switch)+M(Mechanic interlock)+E(Spring auto release)
N02	AL (AL1+MRB)+K(Key lock(OFF lock))+R(Ready to close switch) + D(Door interlock or MOC)+H1(AC/DC 100V ~ 130V, Double shunt coil)+E(Spring auto release)
N03	B(ON/OFF button lock) + K2(Key interlock set) + R(Ready to close switch)+T(Temperature monitoring)
N04	A4(AL1+MRB+RES(AC200~250V)) + B(ON/OFF button lock) + K(Key lock(OFF lock))+M(Mechanic interlock) + T(Temperature monitoring)
N05	A1(AL1+MRB+RES110~130V)+B(ON/OFF button lock)+K(Key lock(OFF lock))+R(Ready to close switch) + M(Mechanic interlock) + T(Temperature monitoring)
N06	A2(AL1+AL2+MRB)+K(Key lock(OFF lock))+R(Ready to close switch) + T(Temperature monitoring)

Note) 1. * Codes for over 5 optional accessories are composed separately.

2. UVT and SHT2 can not be selected together. Select one of two.

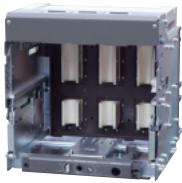
3. C(counter) is provided as standard.

Component

Susol UL ACB

Ordering

UAL
For UL ACB
cradle type



Adapter (Cradle)

S16D

Frame size	
S16D	1600AF
S20E	2000AF
S25E	2500AF
S32E	3200AF
S50G	5000AF
S60G	6000AF

Note) The corresponding
Breaker Adapter

3

Number of poles	
3	3P
4	4P

Secondary connector type	
A	Connector type
B	Screw joint type

A

H

Terminal configuration	
H	Horizontal type
V	Vertical type
M	Line: Horizontal Load: Vertical
N	Line: Vertical Load: Horizontal
P	Front type
G	Horizontal-con type
W	Vertical-con type

* Terminals for P type must be ordered separately

* G and W types can be applicable to S16D (1600AF) only.

E

Shutter	
E	Without safety shutter
F	With safety shutter

S

Other options	
S	Arc cover

Breaker		Adapter
UAS-08D	UAS-08W	S16D
UAS-16D	UAS-16W	
UAH-08E	UAH-08E	S20E
UAH-16E	UAH-16X	
UAH-20E	UAH-20X	S25E
UAH-25E	UAH-25X	
UAH-32E	UAH-32X	S32E
UAH-32G	UAH-32Z	S50G
UAH-40G	UAH-40Z	
UAH-50G	UAH-50Z	S60G
UAH-60G	UAH-60Z	

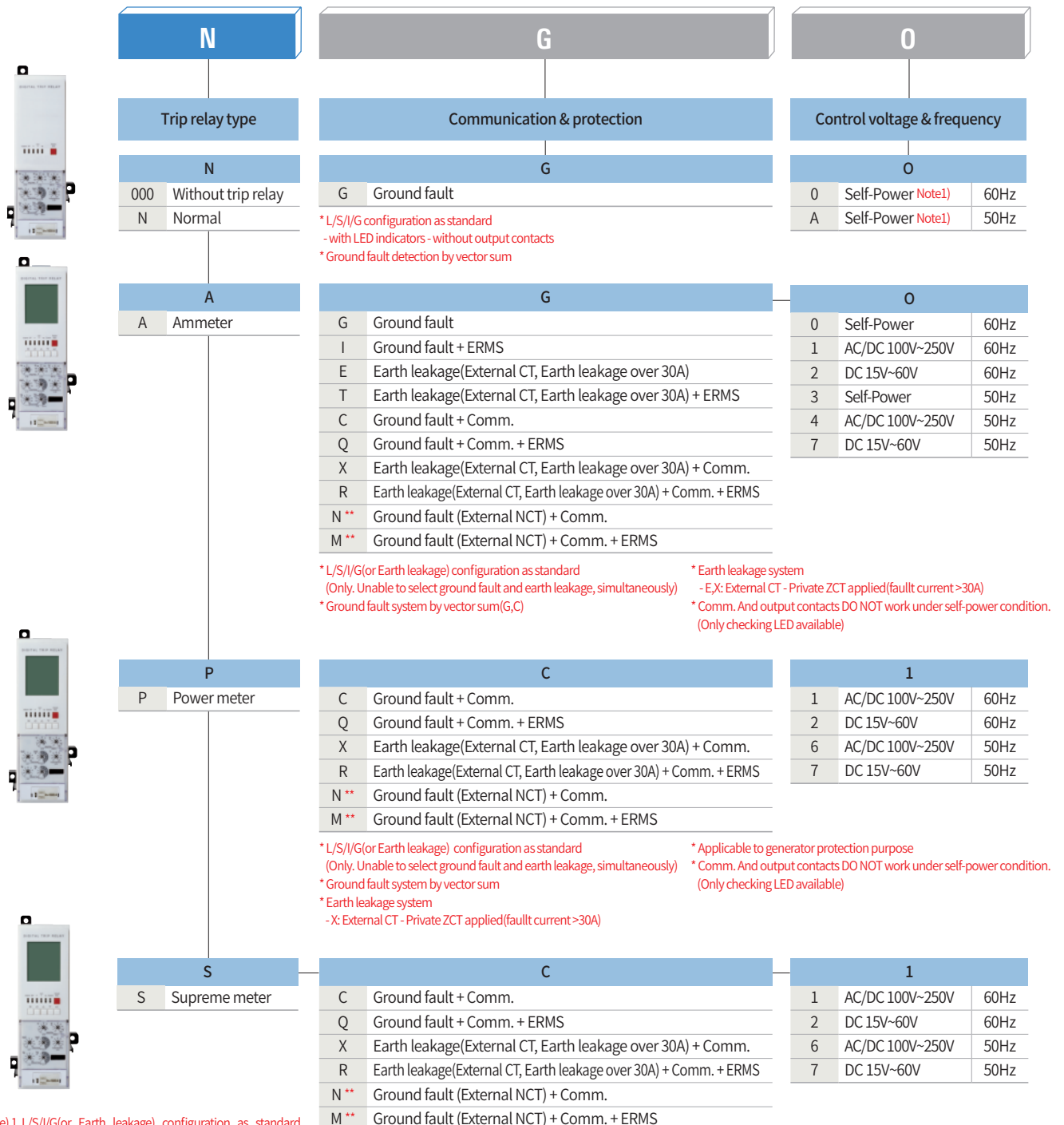
Rating plug

Rating plug classification				ACB ampere frame							
Rating plug code	For none NCT type	For NCT type	Rating	800A	1600A	2000A	2500A	3200A	4000A	5000A	6000A
	73263466352	73263466372	400A	400A~ 800A							
	73263466353	73263466373	600A								
	73263466354	73263466374	630A								
	73263466355	73263466375	800A		800A~ 1600A						
	73263466356	73263466376	1000A								
	73263466357	73263466377	1200A			1000A~ 2000A					
	73263466358	73263466378	1250A								
	73263466359	73263466379	1600A				1200A~ 2500A				
	73263466360	73263466380	2000A								
	73263466361	73263466381	2500A				1600A~ 3200A				
	73263466362	73263466382	3000A								
	73263466363	73263466383	3200A					2000A~ 4000A			
	73263466364	73263466384	3600A								
	73263466365	73263466385	4000A								
	73263466366	73263466386	5000A							2500A~ 5000A	
	73263466367	73263466387	6000A								3000A~ 6000A

* A rating plug ranging from 50 to 100% of the ACB ampere frame should be used.

* The minimum value of the OCR self-power supply is based on the CT rating, not the rating plug rating.

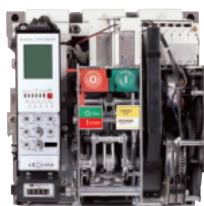
Trip relay



Component

Susol UL ACB

Accessories

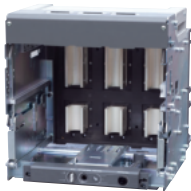


Mounting	Accessories		AH		Page
			Standard	Option	
Internal	SHT1	Shunt Coil		○	52
	SHT2	Double Shunt Coil		○	53
	CC	Closing Coil		○	54
	M	Motor		○	55
	CS1	Charge Switch		○	55
	CS2	Charge Switch Communication **		○	55
	UVT	Under Voltage Trip Device		○	56
	AL	Trip Alarm Contact **		○	57
	MRB	Manual Reset Button **		○	57
	RES	Remote Reset Switch		○	58
	RCS	Ready to Close Switch		○	58
	C	Counter	●		65
	AX	Auxiliary Switch		○	59
	TM	Temperature Alarm **		○	74
External	K1	Key Lock		○	60
	K2	Key Interlock Set		○	60
	K3	Double Key Lock		○	61
	K5	Profalux Lock (CAMLOCK Type)		○	60
	K6	Kirkkey Lock (CAMLOCK Type)		○	60
	K7	Kirkkey Lock (CN22 Type)		○	60
	B	On/Off Button lock		○	61
	LH	Lifting Hook		○	62
	CTD	Condenser Trip Device *		○	62
	ATS	Automatic Transfer Switch Controller *		○	63
	DC	Dust Cover		○	65
	DF	Door Frame		○	68
	OT	OCR Tester *		○	64

* Non UL Listed.

** Separate purchasing is not allowed. Each item should be purchased with the main body.

*** Refer to Susol UL ACB catalog for detail information.



Mounting	Accessories		AH		Page
			Standard	Option	
Trip relay	N	N type		○	26
	A	A type		○	28
	P	P type		○	30
	S	S type		○	32
	VM	Voltage Module		○	36
Cradle	SBC	Shorting "b" Contact *		○	
	MI	Mechanical Interlock **		○	67
	ST	Safety Shutter		○	68
	MIP	Miss Insertion Prevent Device		○	72
	MOC	Mechanical Operated Cell Switch		○	66
	CEL	Cell Switch		○	69
	DI	Door Interlock		○	67
	BSP	Body Supporter		○	70
	RI	Racking Interlock		○	70
	PL	Pad Lock/ Position Lock	●		71
	UDC	UVT Time Delay Controller		○	73
	RCO	Remote I/O		○	75
Other	PC	Profibus-DP comm. module		○	

* Non UL Listed.

** Separate purchasing is not allowed. Each item should be purchased with the main body.

*** Voltage module should be purchased with P/S type trip relay.

**** It is available only when the control block is in the mode of auto-connection.

***** Trip unit P type & S type are under development, coming soon.

***** Refer to Susol UL ACB catalog for detail information.

Component

Susol UL MCCB



Overview

Susol UL 489 MCCBs are designed to protect low voltage electrical systems from damage caused by overloads and short circuits.



Breaker type	Ampere frame	Ampere rating	Performance			Pole	Trip units							
			80% Rating	100% Rating ¹⁾	kA @480 Vac		FTU	FMU	ATU	ETS	ETM	OCR	MCP	MCS
UTS150	150	40/50/60/70/80/90/100/125/150A	N	NT	35	2, 3	●	●	●	●	-	-	●	●
			H	HT	65									
			L	LT	100									
UTS250	250	150/160/170/200/225/250A	N	NT	35	2, 3	●	●	●	●	-	-	●	●
			H	HT	65									
			L	LT	100									
UTS400	400	250/300/350/400A	N	NT	35	2, 3	●	●	●	●	●	-	●	●
			H	HT	65									
			L	LT	100									
UTS600	600	500/600A	N	-	35	2, 3	●	●	●	●	●	-	●	●
			H	-	65									
			L	-	100									
UTS800	800	400/600/630/800A	N	NT	35	3	-	-	-	-	-	●	●	●
			H	HT	65									
			L	LT	100									
UTS1200	1200	800/1000/1200A	N	-	35	3	-	-	-	-	-	●	●	●
			H	-	65									
			P	-	50									
			L	-	100									

Note 1) The 100% rating circuit should use 90°C wire for 1200A paniboard.

Circuit breaker terminals



UTS150 + bamier



Bamier for UTS150

UTS150 to UTS1200 frame circuit breakers can be ordered with line side and load side lugs.

The standard lugs can be removed for the installation of bus connections. All lugs are UL/cUL Listed Certified for their proper application and marked for use with aluminum and copper (Al/Cu) or copper only (Cu) conductors. Lugs suitable for copper and aluminum conductors are made of tin-plated aluminum. Mechanical lugs are sold either factory installed or as field installable kits.

Breaker type	Lug type	Ampere rating	Applicable wire (Copper)	TORQUEN N*m (lb-in)
UTS150	AL150TS	1.6 ~ 15A	14 AWG	4.1 (36.2)
		20 ~ 30A	12-10 AWG	5.4 (47.8)
		40 ~ 175A	8-2/0 AWG	15.1 (133.6)
UTS250	AL250TS	150 ~ 175A	1/0 ~ 2/0 AWG	32 (283.2)
		200 ~ 225A	3/0 ~ 4/0 AWG	
		250A	250 ~ 350 kcmil	44 (389.4)
UTS400	AL400TS	250, 300A	1/0 AWG ~ 300 kcmil	40.5 (358.5)
		350, 400A	350 ~ 600 kcmil	54 (478)
UTS600	AL600TS	500, 600A	2/0 AWG ~ 350 kcmil	40.5 (358.3)
UTS800	AL800TS	400, 600, 630, 800A	3/0 AWG ~ 300 kcmil	45 (398.3)
UTS1200	AL1200TS	800, 1000, 1200A	3/0 AWG ~ 350 kcmil	45 (398.3)

Note 1) For the UTS150, bamiers are required when connecting the breaker to the bus.

Layout and dimension

Layout instruction

Layout can be selected according to the following method. The layout below is the UL-approved minimum size, and the depth of the cable space can be increased at the request of the user.

1. Select the capacity of the main bus and short circuit current rating.

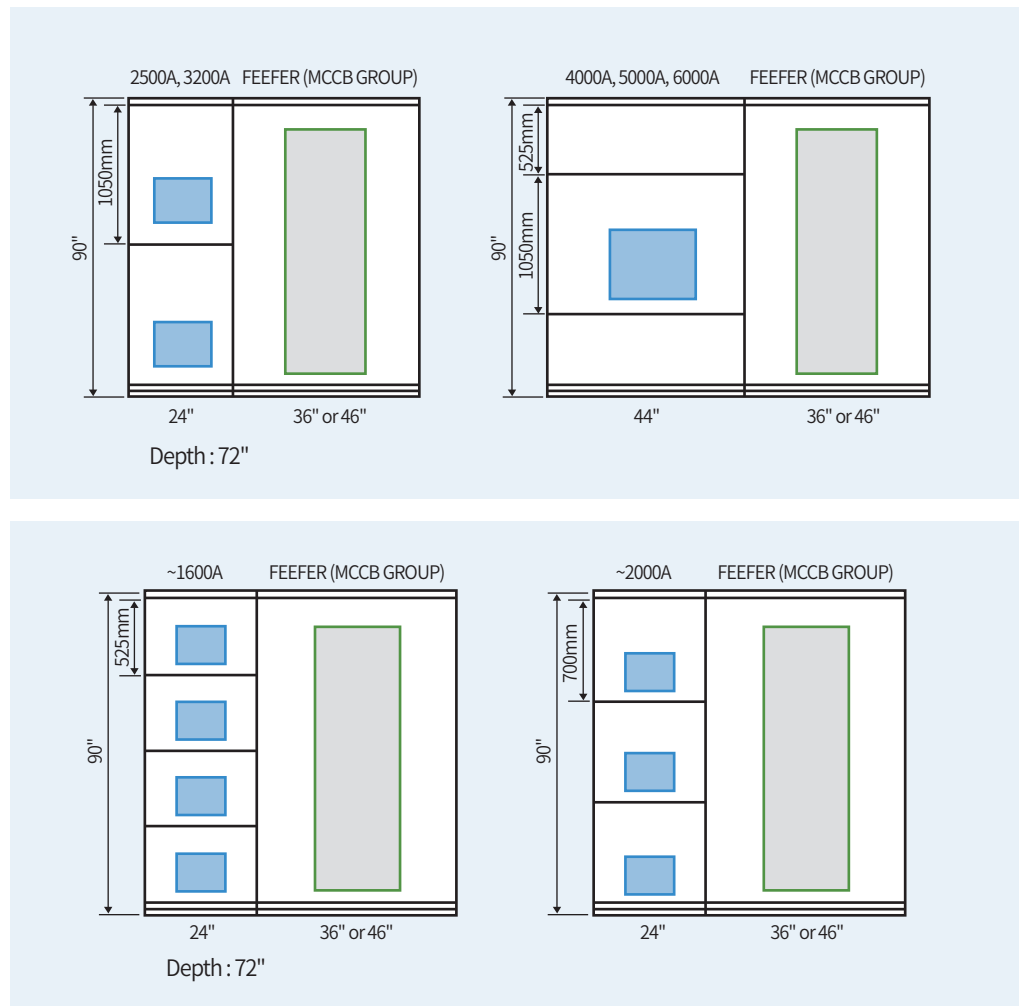
Main bus	Short circuit current
2000, 2500, 3200, 4000, 5000, 6000A	85 or 100 kA

2. Decide the quantity of incoming section, the presence or absence of a tie section, and the application of service equipment.
3. Decide the method of the incoming source (Busway, cable or etc.).
Decide if the source comes in the top or bottom entry.
4. Decide the required outgoing ACB and MCCB capacity and quantity.
5. In the ACB section and MCCB section, the frame size of each device is determined according to the capacity and required short-circuit current rating.

ACB				MCCB			
Frame	Frame	Stacks (Max.)	Nos	Frame	Ampere	Height	Nos
D	1600 A	4		UTS150	40~150 A	4X	
	1250 A			UTS250	150~250 A		
	1000 A			UTS400	250~400 A	6X	
	800 A			UTS600	500~600 A		
E	3200 A	2		UTS800	400~800 A	9X	
	2500 A	3		UTS1200	800~1200 A		
	2000 A						
	1600 A	4					
	1250 A						
	1000 A						
	800 A						
G	6000 A	1					
	5000 A						
	4000 A						
	3200 A						

6. Decide the panel composition of ACB section. [Refer to page 24~27](#)
7. Decide the panel composition of MCCB section. [Refer to page 28~29](#)
8. Decide the method of the outgoing. (cable lug or busway or etc.)
Decide if the outgoing goes in the top or bottom feed.

9. Select the required LV component and check the required space.
10. Select the location of the LV component. In case of lack of space, the panel can be increased in the panel configuration of item 6.
11. With the above configuration, create SLD and outline drawing.



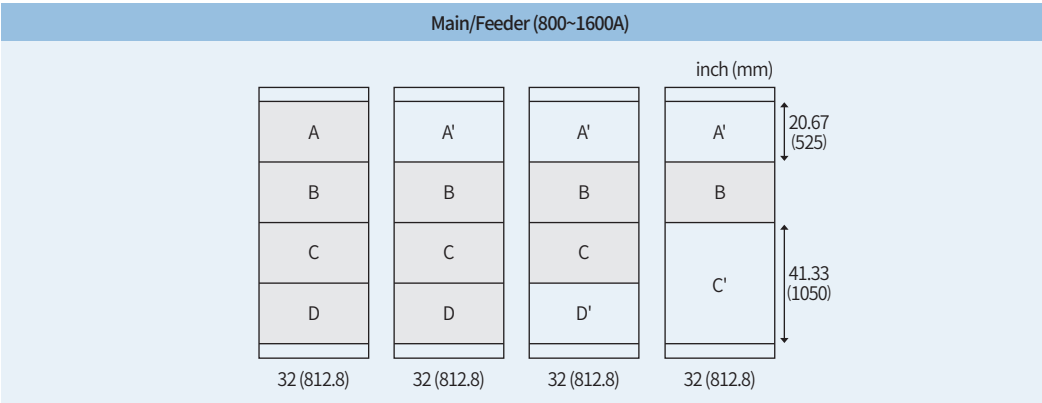
Layout and dimension

D-type (800~1600A)

Application rules

- 1) Main / feeder circuit breaker: up to 1600A
- 2) Enclosure size(WxHxD): 32"x90"x60"/72" (812.8x2281.2x1500/1800mm)
- 3) Bus rating: Main bus and vertical bus up to 100kA
- 4) Available top or bottom feed

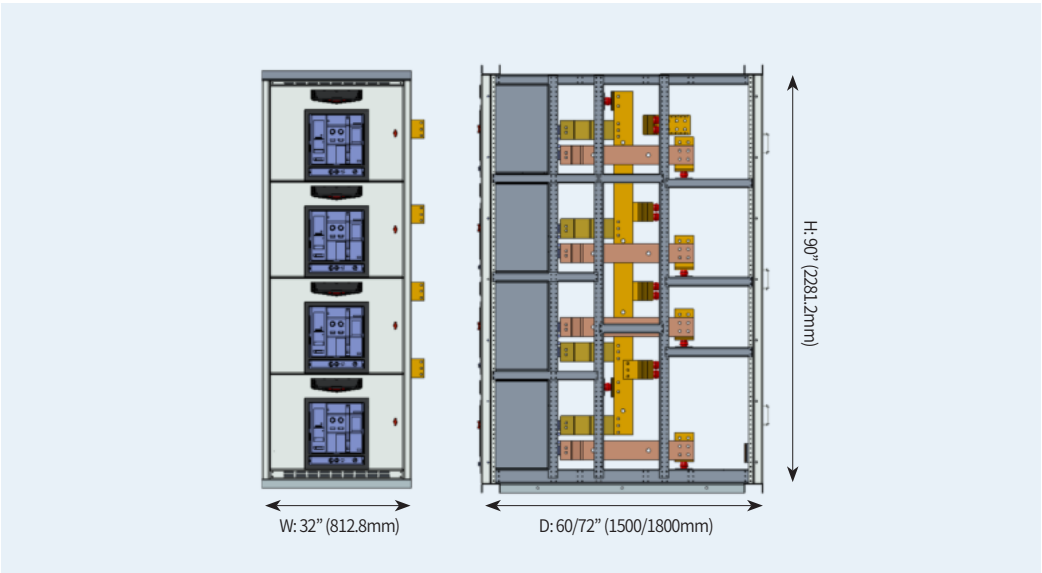
Layout



Available ampacity

Comp.	Available ampacity
A	800, 1000, 1200, 1600A
B	800, 1000, 1200, 1600A
C	800, 1000, 1200, 1600A
D	800, 1000, 1200, 1600A
A', C', D'	Blank, Instrument, LV compartment

Dimensions

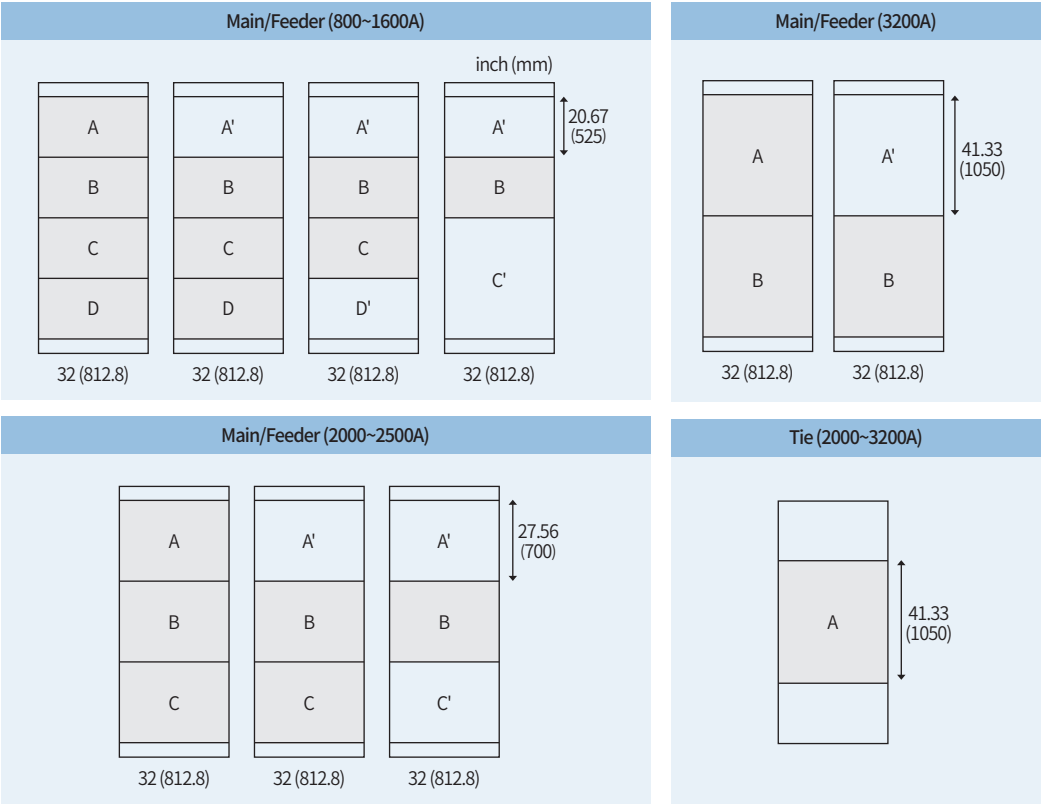


E-type (800~3200A)

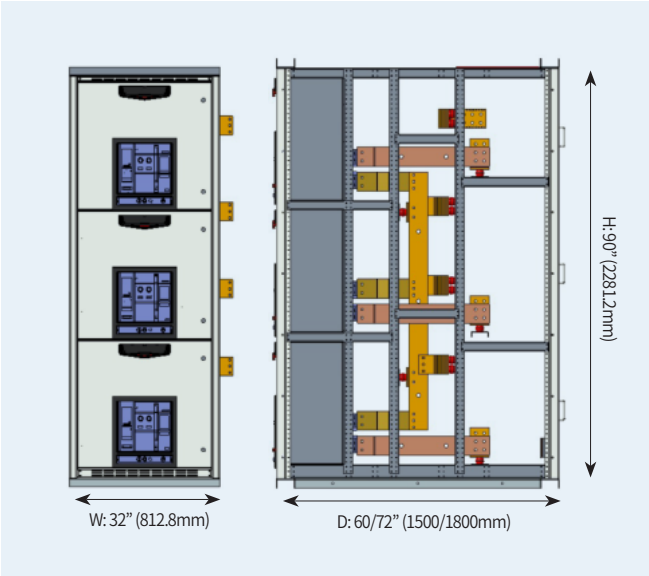
Application rules

- 1) Main / feeder circuit breaker: up to 3200A
- 2) Tie circuit breaker: 2000 ~ 3200A
- 3) Enclosure size(WxHxD): 32"x90"x60/72" (812.8x2281.2x1500/1800mm)
- 4) Bus rating: Main bus and vertical bus up to 100kA
- 5) Available top or bottom feed
- 6) 800~1600A circuit breaker comp. shall be applied to 4-stack structure
- 7) 2000/2500A circuit breaker comp. shall be applied to 3-stack structure
- 8) 3200A circuit breaker comp. shall be applied to 2-stack structure

Layout



Dimensions



Available ampacity

Comp.	Available ampacity
A	800, 1000, 1200, 1600, 2000, 2500, 3200A
B	800, 1000, 1200, 1600, 2000, 2500, 3200A
C	800, 1000, 1200, 1600, 2000, 2500, 3200A
D	800, 1000, 1200, 1600, 2000, 2500, 3200A
A', C', D'	Blank, Instrument, LV compartment

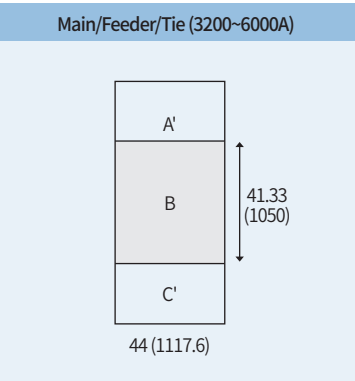
Layout and dimension

G-type (3200~6000A)

Application rules

- 1) Main / feeder / tie circuit breaker: up to 6000A
- 2) Enclosure size(WxHxD): 44"x90"x72" (1117.6x2281.2x1800mm)
- 3) Bus rating: Main bus and vertical bus up to 100kA
- 4) Available top or bottom feed

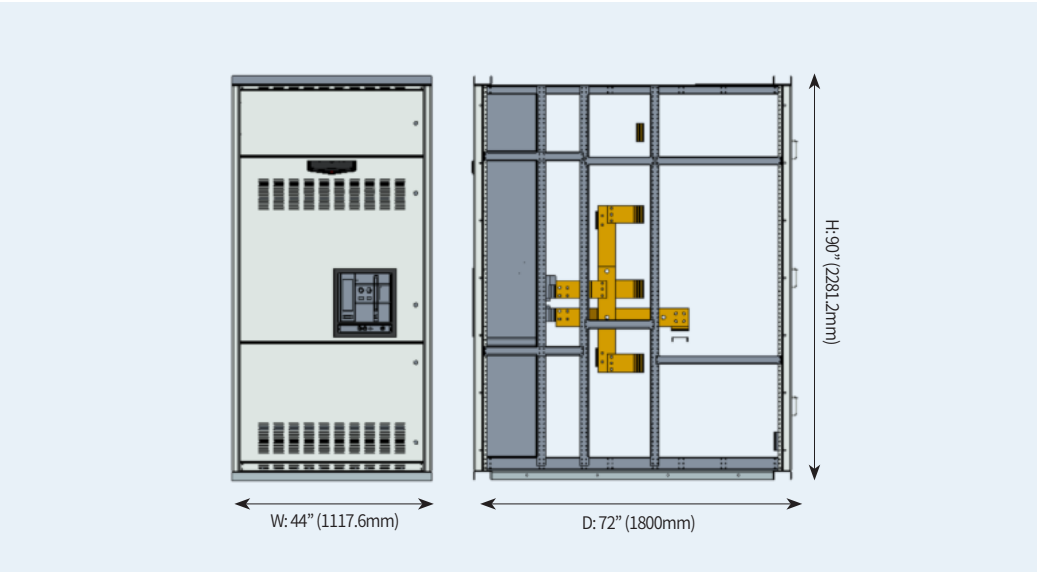
Layout



Available ampacity

Comp.	Available ampacity
A'	Blank, Instrument, LV compartment
B	3200, 4000, 5000, 6000A
C'	Blank, Instrument, LV compartment

Dimensions

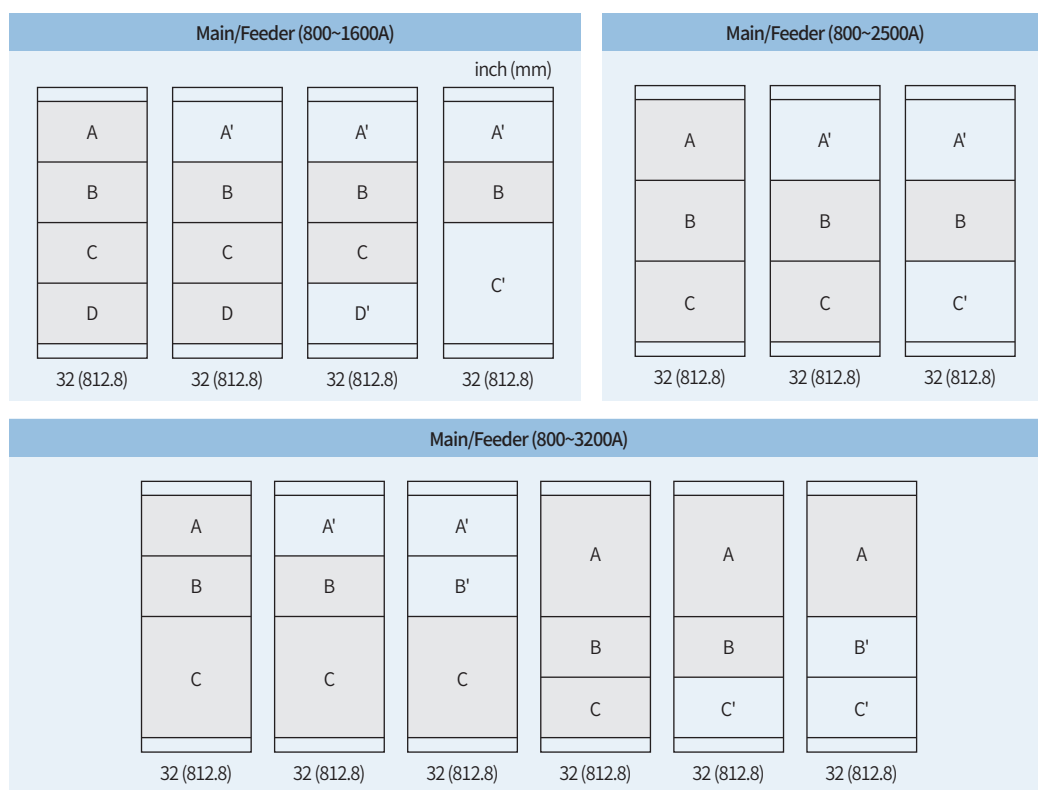


C-type (D/E-type combined)

Application rules

- 1) Main / feeder circuit breaker: up to 3200A
- 2) Enclosure size(WxHxD): 32"x90"x60/72" (812.8x2281.2x1500/1800mm)
- 3) Bus rating: Main bus and vertical bus up to 100kA
- 4) Available top or bottom feed
- 5) D-type and E-type can be combined together
- 6) 800~1600A circuit breaker comp. shall be applied to 4-stack structure
- 7) 2000/2500A circuit breaker comp. shall be applied to 3-stack structure
- 8) 3200A circuit breaker comp. shall be applied to 2-stack structure

Layout



Available ampacity

Comp.	Available ampacity
A	800, 1000, 1200, 1600A
B	800, 1000, 1200, 1600, 2000, 2500, 3200A
C	800, 1000, 1200, 1600, 2000, 2500, 3200A
D	800, 1000, 1200, 1600, 2000, 2500, 3200A
A', B', C', D'	Blank, Instrument, LV compartment

Dimensions

Dimensions are coincide with D, E type.

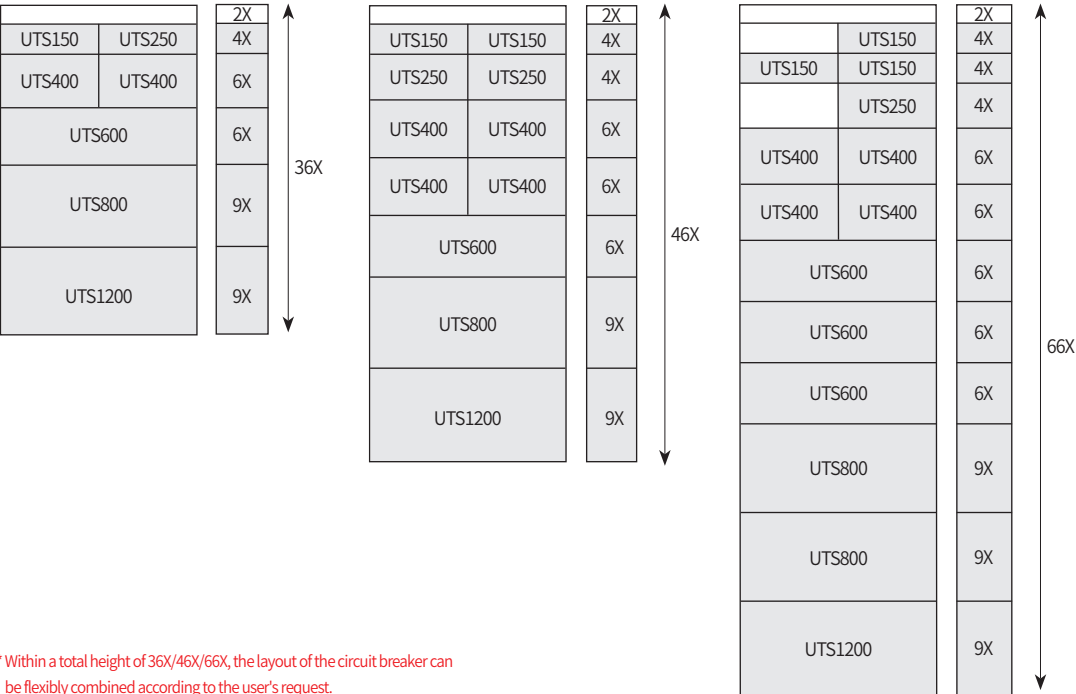
Layout and dimension

(I~Z)-type (MCCB Group Mounted Section: 2400/4000/6000A)

Application rules

- 1) Interior rated current: 2400/4000/6000A
- 2) Up to 1200A breaker mounted as a branch device
- 3) Double branched 150, 250 and 400AF breakers
- 4) The interior maximum short circuit current rating: 100kA at 480Vac
- 5) Individual breaker protection cover plates are provided
- 6) Bus strap kits are provided according to MCCB rating.
- 7) Blank filler plate heights are from 2X to 9X.
- 8) Frame size: 36/46"x90"x60/72" (914.4/1168.4x2281.2x1500/1800mm)

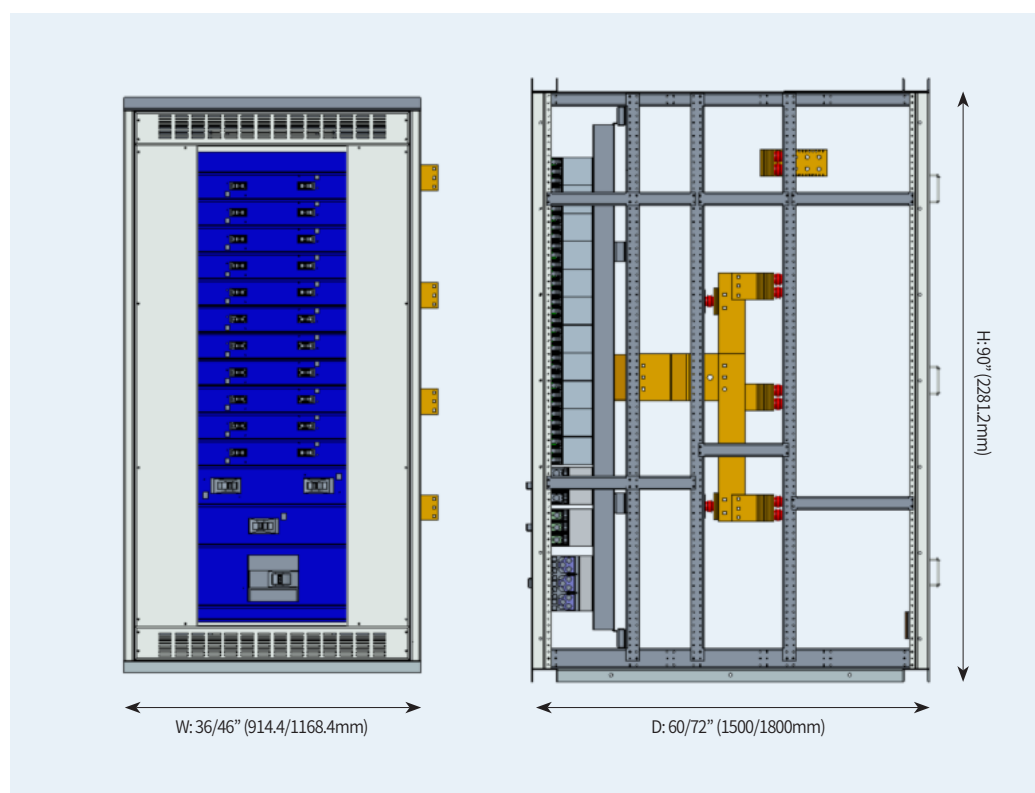
Layout (Interior)



Dimensions (Interior)

Description			Interior-2400			Interior-4000			Interior-6000		
Rated current			2400A			4000A			6000A		
Rated short-circuit breaking capacity			100kA @ 480Vac								
Applicable MCCB			UTS150, UTS250, UTS400, UTS600, UTS800, UTS1200								
Frame size			36X	46X	66X	36X	46X	66X	36X	46X	66X
	mm	W	542			542			562		
		H	1256.6	1520.6	1995.8	1256.6	1520.6	1995.8	1256.6	1520.6	1995.8
		D	92			92			127.3		
	inch	W	21.34			21.34			22.13		
		H	49.47	59.87	78.57	49.47	59.87	78.57	49.47	59.87	78.57
		D	3.62			3.62			5.01		
Standard			UL891								

Dimensions (Switchboard)





Safety Instructions

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



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



www.ls-electric.com

■ Headquarters

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

■ Overseas Subsidiaries

- **LS ELECTRIC Japan Co., Ltd. (Tokyo, Japan)**
Tel: 81-3-6268-8241 E-Mail: japan@ls-electric.com
- **LS ELECTRIC (Dalian) Co., Ltd. (Dalian, China)**
Tel: 86-411-8730-5872 E-Mail: china.dalian@lselectric.com.cn
- **LS ELECTRIC (Wuxi) Co., Ltd. (Wuxi, China)**
Tel: 86-510-6851-6666 E-Mail: china.wuxi@lselectric.com.cn
- **LS ELECTRIC Vietnam Co., Ltd.**
Tel: 84-93-631-4099 E-Mail: vietnam@ls-electric.com
Tel: 84-28-3823-7890 E-Mail: vietnam@ls-electric.com
- **LS ELECTRIC Middle East FZE (Dubai, U.A.E.)**
Tel: 971-4-886-5360 E-Mail: middleeast@ls-electric.com
- **LS ELECTRIC Europe B.V. (Hoofddorf, Netherlands)**
Tel: 31-20-654-1424 E-Mail: europartner@ls-electric.com
- **LS ELECTRIC America Inc. (Chicago, USA)**
Tel: 1-800-891-2941 E-Mail: sales.us@lselectricamerica.com
- **LS ENERGY SOLUTIONS LLC**
Tel: 1-704-587-4051 E-Mail: cmfeldman@ls-es.com
- **LS ELECTRIC Turkey Co., Ltd. (Istanbul, Turkey)**
Tel: 90-212-806-1252 E-Mail: turkey@ls-electric.com

■ Overseas Branches

- **LS ELECTRIC Tokyo Office (Japan)**
Tel: 81-3-6268-8241 E-Mail: tokyo@ls-electric.com
- **LS ELECTRIC Beijing Office (China)**
Tel: 86-10-5095-1631 E-Mail: china@lselectric.com.cn
- **LS ELECTRIC Shanghai Office (China)**
Tel: 86-21-5237-9977 E-Mail: china@lselectric.com.cn
- **LS ELECTRIC Guangzhou Office (China)**
Tel: 86-20-3818-2883 E-Mail: china@lselectric.com.cn
- **LS ELECTRIC Chengdu Office (China)**
Tel: 86-28-8670-3201 E-Mail: china@lselectric.com.cn
- **LS ELECTRIC Qingdao Office (China)**
Tel: 86-532-8501-2065 E-Mail: china@lselectric.com.cn
- **LS ELECTRIC Nanjing Office (China)**
Tel: 86-25-8467-0005 E-Mail: china@lselectric.com.cn
- **LS ELECTRIC Bangkok Office (Thailand)**
Tel: 66-90-950-9683 E-Mail: thailand@ls-electric.com
- **LS ELECTRIC Jakarta Office (Indonesia)**
Tel: 62-21-2933-7614 E-Mail: indonesia@ls-electric.com
- **LS ELECTRIC Moscow Office (Russia)**
Tel: 7-499-682-6130 E-Mail: info@lselectric-ru.com
- **LS ELECTRIC America Western Office (Irvine, USA)**
Tel: 1-949-333-3140 E-Mail: america@ls-electric.com
- **LS ELECTRIC India Office**
Tel: 91-80-6142-9108 E-Mail: Info_india@ls-electric.com
- **LS ELECTRIC Singapore Office (Singapore)**
Tel: 65-6958-8162 E-Mail: singapore@ls-electric.com



Technical Question or After-sales Service

Customer Center-Quick Responsive
Service, Excellent technical support

82-1644-5481