

SF₆ Gas Insulated Ring Main Unit *Susol* RMU



Susol
Super Solution

Ring Main Unit


شرکت فن آوران
صانع شرق®
Sane Shargh

LSIS

Ring Main Unit

The best solution for Power Distribution Systems



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Susol RMU

A Compact Switchgear Solution for Secondary Distribution (Ring Main Unit Up to 24kV, SF₆-Insulated)

Susol RMU is enable to install on medium voltage distribution network and mainly used for protection of transformers in compact substations. It is used for medium voltage distribution in compact substations, small buildings, residential housing complex, large shopping malls, airports, wind power, etc. comprising medium voltage networks.

The concept of Susol RMU is offering a choice of other switch-fuse combination or Circuit Breaker with relay for protection of the transformer.

Non-Extensible CB Feeder (LCL) & Fuse Feeder(LFL)RMU

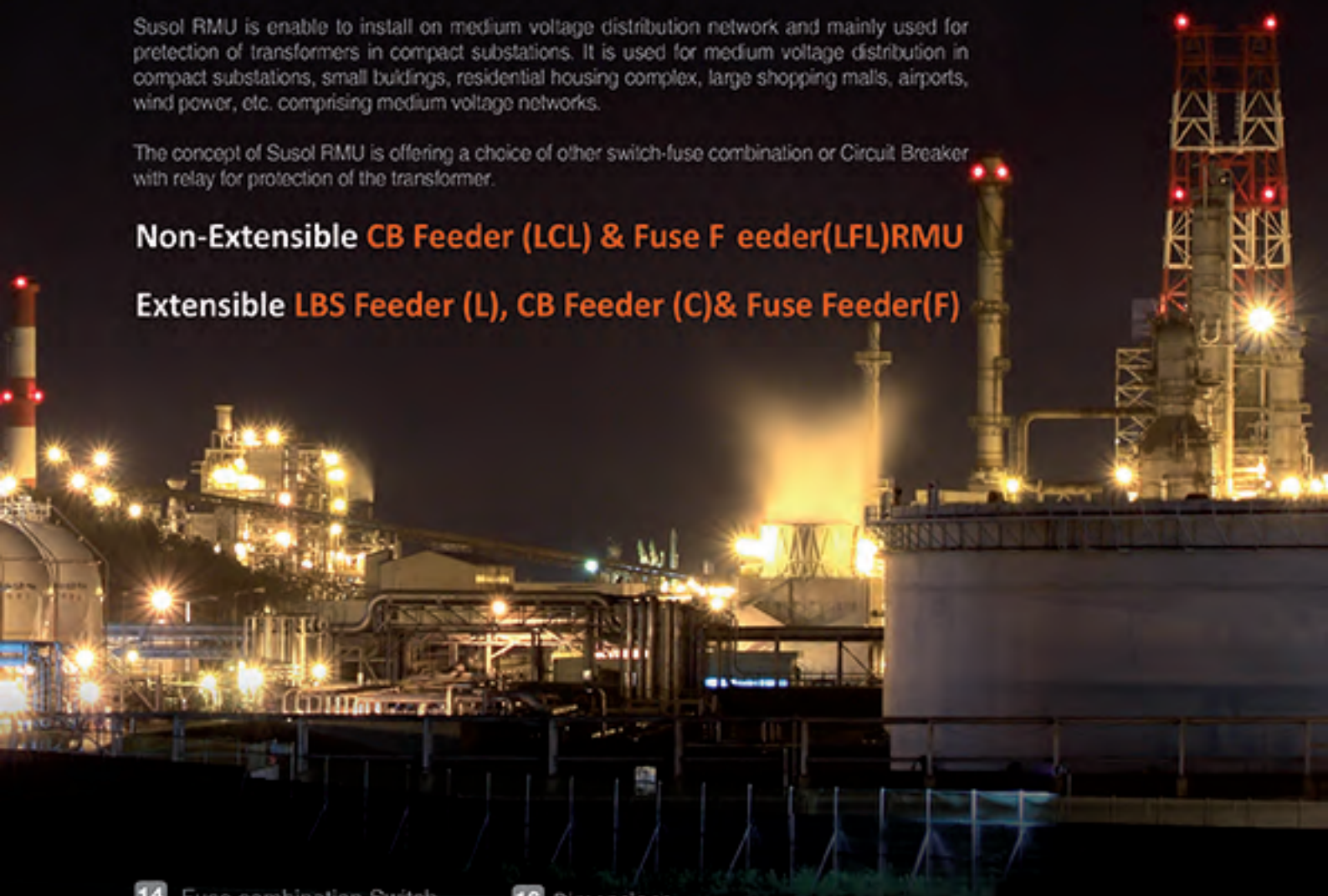
Extensible LBS Feeder (L), CB Feeder (C)& Fuse Feeder(F)

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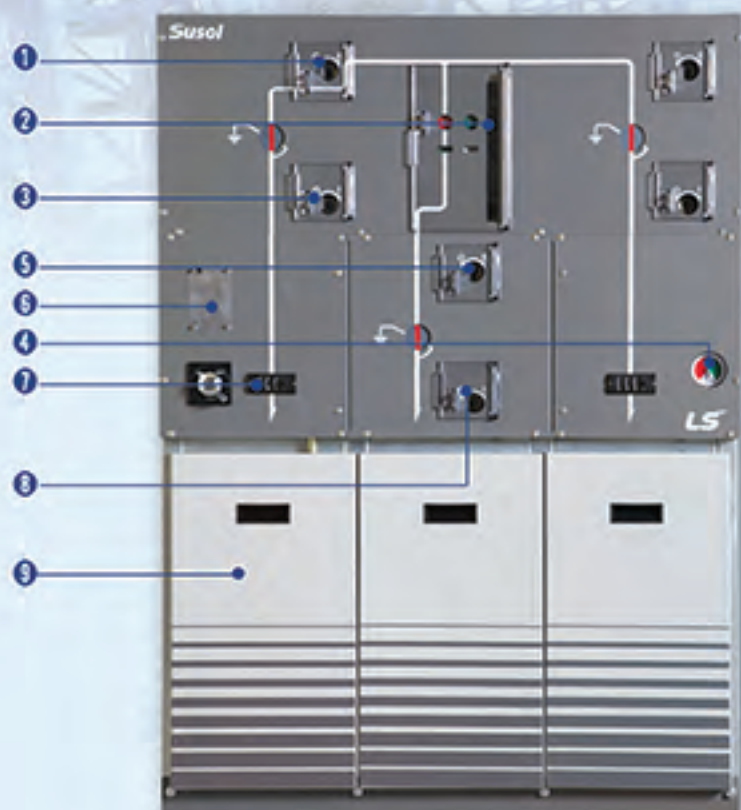


Non-Extensible CB Feeder RMU (LCL)

2 LBS & 1 CB-DS in single chamber.

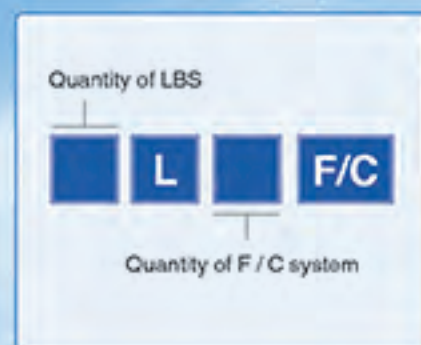
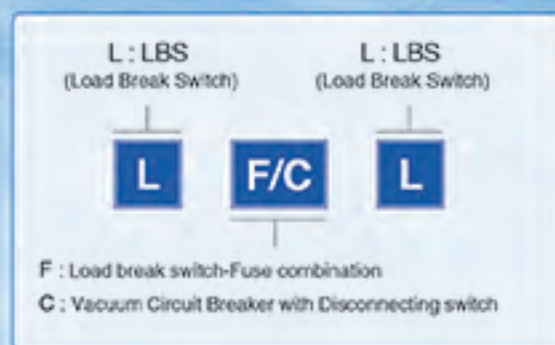
- **L : LBS (Load Break Switch)**
3-position Load Break Switch rated 630A and less for load breaking and earthing
- **C : VCB (Vacuum Circuit Breaker)**
Circuit Breaker with 21kA interrupting capacity for the transformer and line protection
- **Horizontal cable bushing in front**

- ❶ Ring S / W Earth operation
- ❷ Circuit Breaker operation
- ❸ Ring S / W operation
- ❹ Pressure gauge
- ❺ Earth S / W operation
- ❻ Name plate
- ❼ Voltage Indicator
- ❽ Disconnect S / W operation
- ❾ Cable compartment

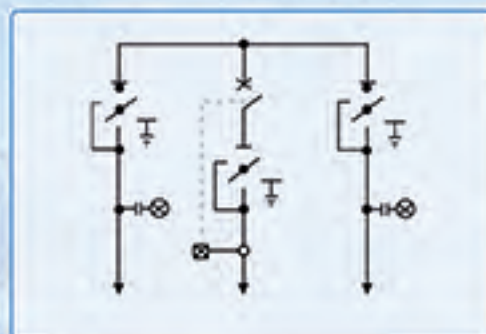


Configurations (Non-Extensible RMU)

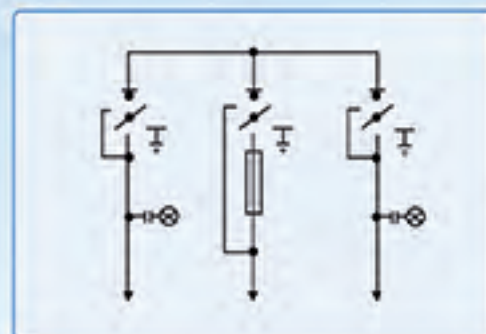
• Information of model name



• Diagram, standard types



LCL (2L1C)



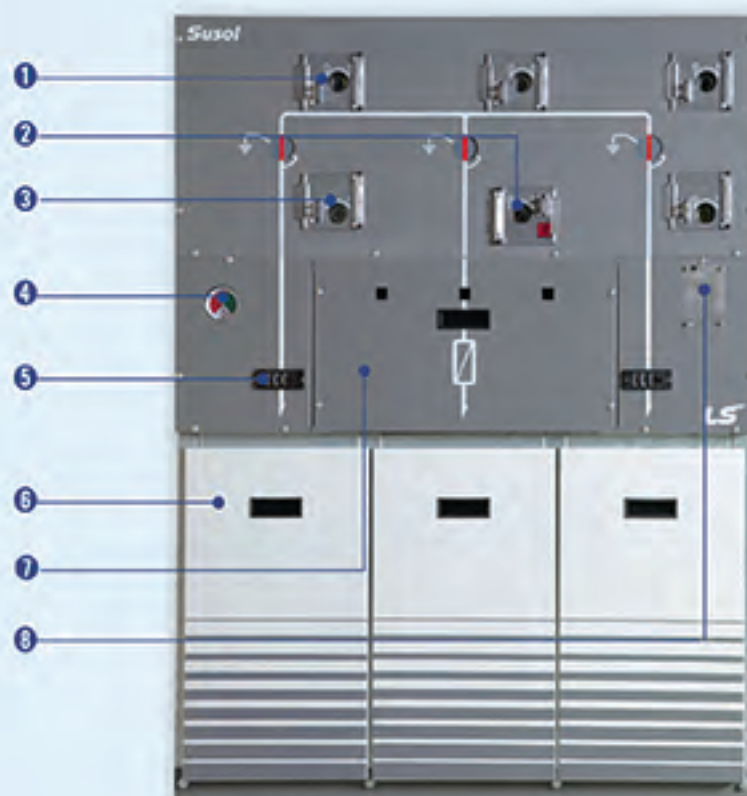
LFL (2L1F)

Non-Extensible Switch-Fuse Feeder RMU (LFL)

2 LBS & 1 Switch-Fuse in single chamber.

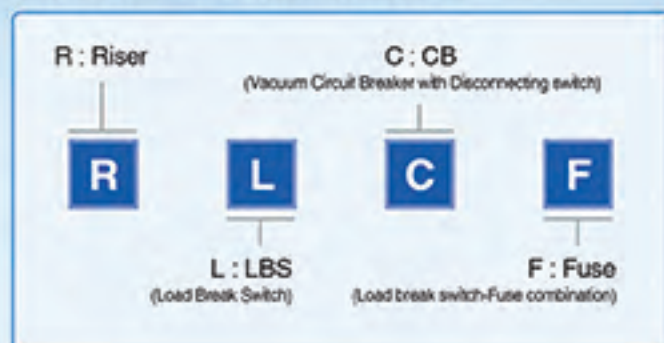
- **L : LBS (Load Break Switch)**
3-position Load Break Switch rated 630A and less for load breaking and earthing
- **F : Switch Fuse**
(Load Break Switch-Fuse combination)
200A switch-fuse combination for transformer protection
- **Horizontal cable bushing in front**

- 1 Ring S / W Earth operation
- 2 T-off operation
- 3 Ring S / W operation
- 4 Pressure gauge
- 5 Voltage Indicator
- 6 Cable compartment
- 7 Fuse compartment
- 8 Name plate

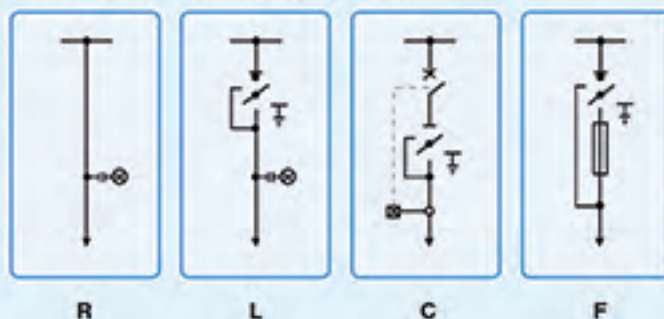


Configurations (Extensible RMU)

• Information of model name



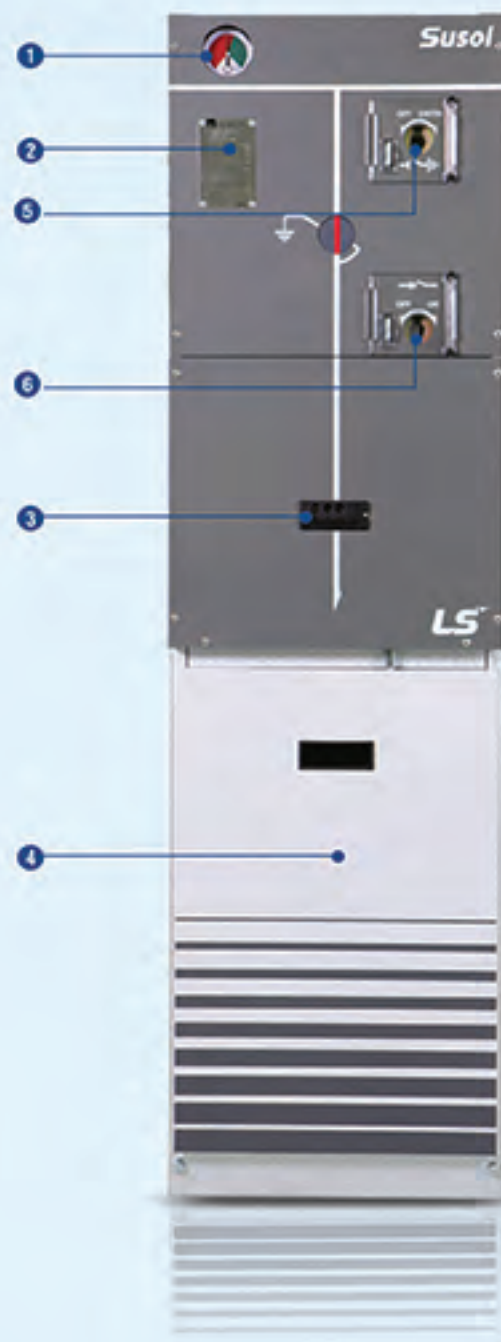
• Diagram, standard types



- ① Pressure gauge
- ② Name plate
- ③ Voltage detector
- ④ Cable compartment
- ⑤ Ring S / W Earth operation
- ⑥ Ring S / W operation
- ⑦ Circuit Breaker operation
- ⑧ Disconnecter S / W Earth operation
- ⑨ Disconnecter S / W operation
- ⑩ T-OFF operation
- ⑪ Fuse compartment

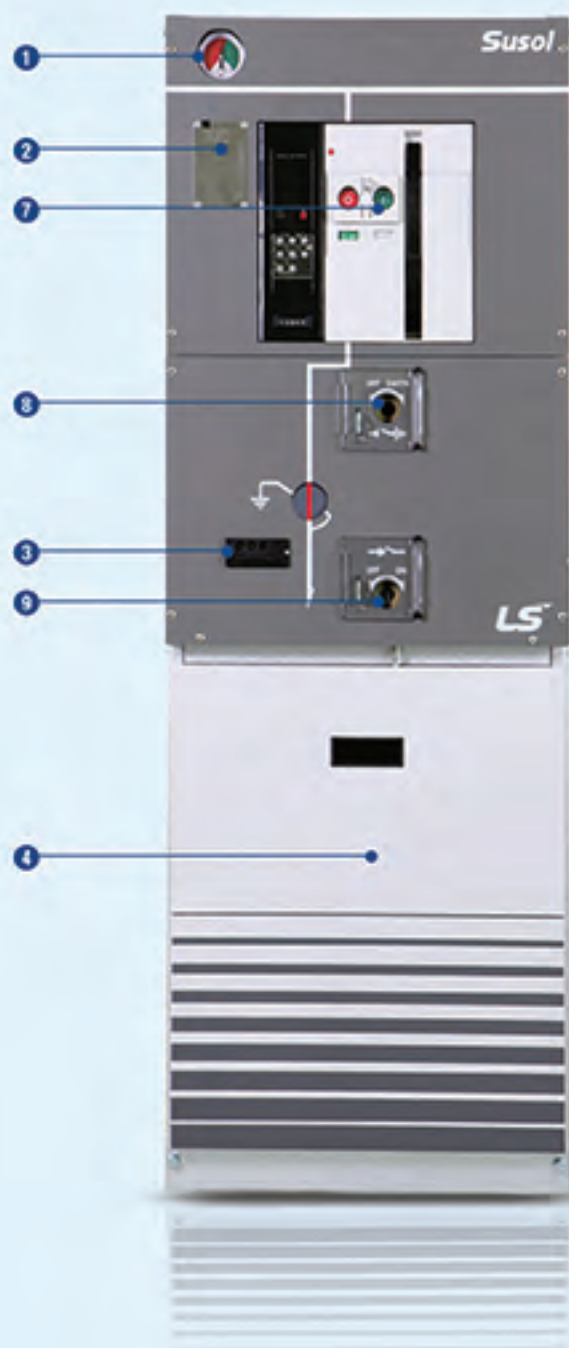
Extensible LBS Feeder RMU (L)

- **L : LBS (Load Break Switch)**
3-position Load Break Switch rated 630A and less for load breaking and earthing



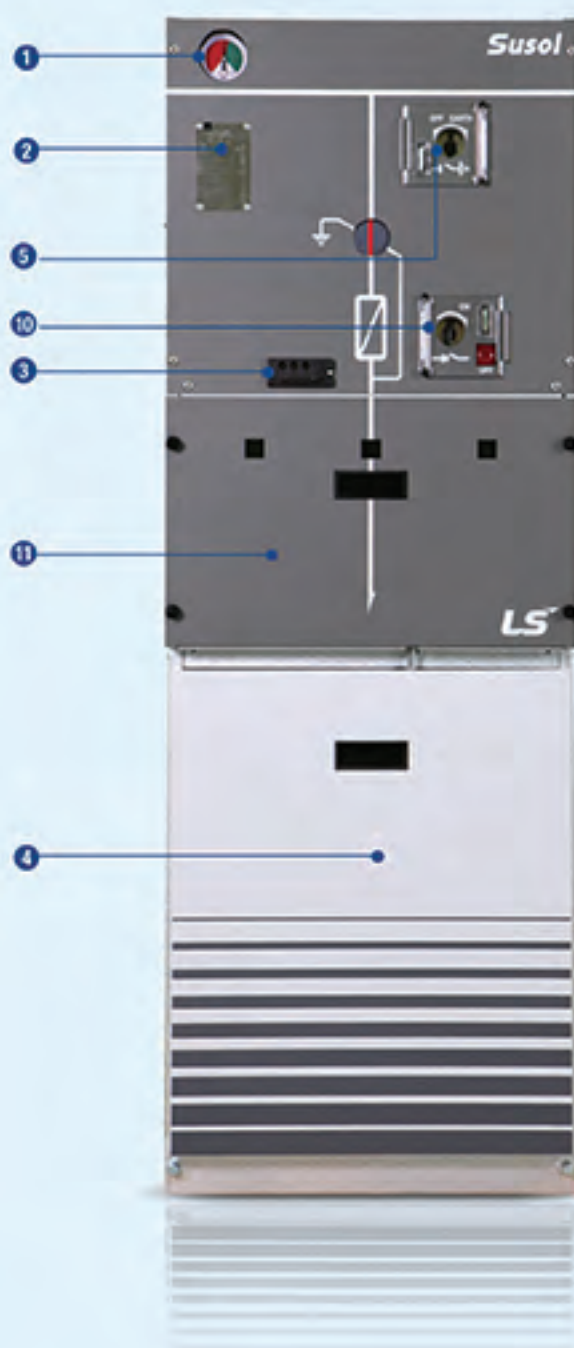
Extensible CB Feeder RMU (C)

- **C : VCB (Vacuum Circuit Breaker)**
Circuit Breaker with 21kA interrupting capacity for the transformer and line protection



Extensible Switch-Fuse Feeder RMU (F)

- **F : Switch-Fuse Feeder**
(Load Break Switch-Fuse combination)
200A switch-fuse combination for transformer protection





Intelligent application

Equipped with RTU (Remote Terminal Unit), the Susol RMU switchgear can implement intelligent application. Connecting all Susol RMU with communication network, it enables to monitor and control the switchgear remotely.



• RTU (Remote Terminal Unit)



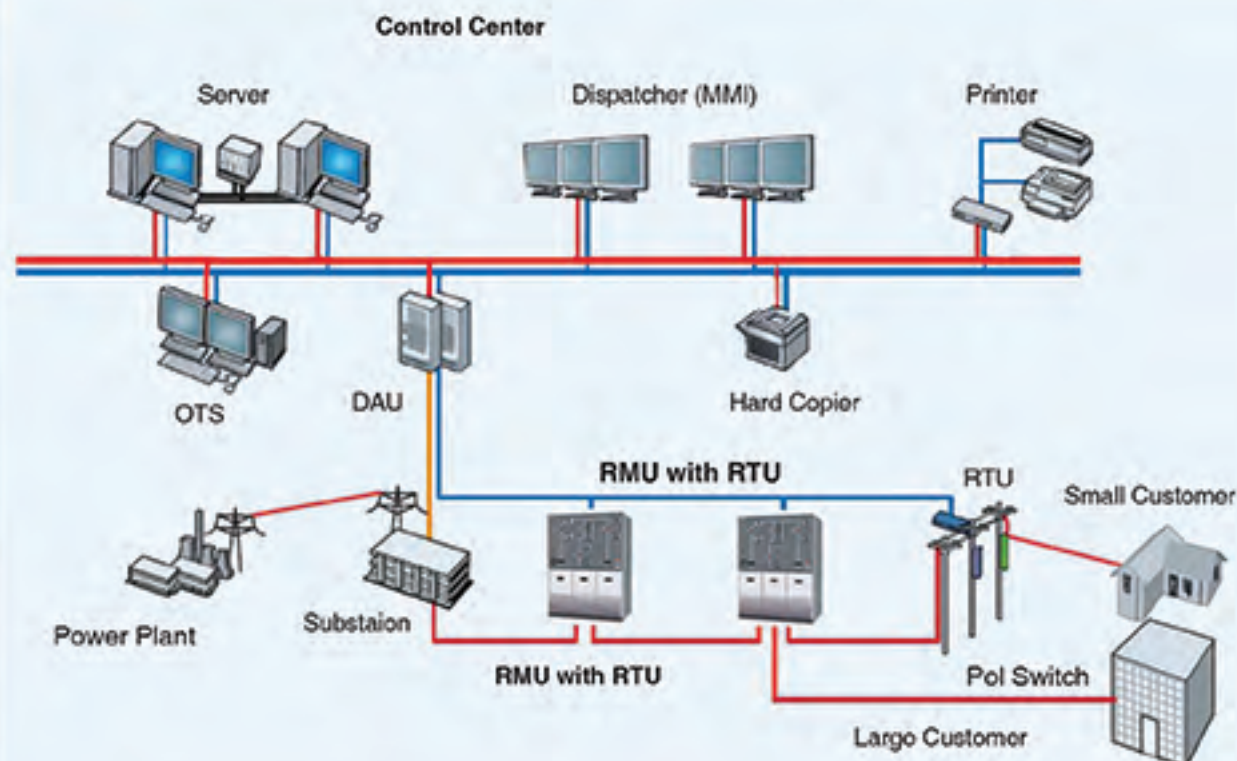
The Remote Terminal Unit (RTU) collects data from field instruments & sensors and transmits the information to the Supervisory Control and Data Acquisition System (SCADA) installed in a central control room through communication systems and lines, and receives control commands from the telemeter telecontrol system to conduct online controls in real time.

Network remote control for DAS / SCADA

Equipped with RTU (remote termination unit), the Susol RMU switchgear can implement intelligent application. Connecting all the IRMUs by a communication network, it enable to monitor and control the switchgear remotely, locate and isolate fault automatically as well as the system recovery. This will dramatically reduce the affected area and duration of blackout, and realize the high reliability and excellent power quality.

• System configuration

Susol RMU equipped with RTU provides all the functions needed to operate the MV network in real time



Main characteristics

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LCL type



LFL type



Extendable type

Rating

Rated voltage	kV	12	17.5	24
Rated frequency	Hz	50/60	50/60	50/60
Rated power frequency withstand voltage	kV	28	38	50
Rated lightning impulse withstand voltage	kV	75	95	125
Rated current main busbars	A	630	630	630
Rated short-time withstand current (3s)	kA	21	21	21
Rated short-circuit making current	kA	54.6	54.6	54.6
Rated withstand arc current (1s, AFAL)	kA	21	21	21
Rated SF ₆ gas pressure	psi/G	5	5	5

Standards

Susol RMU meets international standards such as following

Standard	Description
IEC 62271-1	High-voltage switchgear and controlgear Part 1 : Common specifications
IEC 62271-100	High-voltage switchgear and controlgear Part 100 : Alternating-current circuit-breakers
IEC 62271-102	High-voltage switchgear and controlgear Part 102 : Alternating current disconnectors and earthing switch
IEC 62271-103	High-voltage switchgear and controlgear Part 103 : Switches for rated voltages above 1 kV up to and including 52 kV
IEC 62271-105	High-voltage switchgear and controlgear Part 105 : Alternating current switch-fuse combinations
IEC 62271-200	High-voltage switchgear and controlgear Part 200 : AC metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV

Environment conditions

Conditions	Description
Temperatures	- Products should be stored and installed under the following conditions. - For stocking : from -40 °C to +60 °C - For working : from -25 °C to +40 °C - Other temperature, consult us.
Altitude	Altitude for installation above sea level : under 1,000 m
Humidity	Relative humidity : max. 95 %

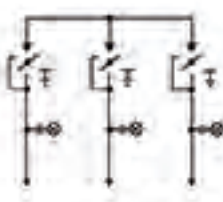
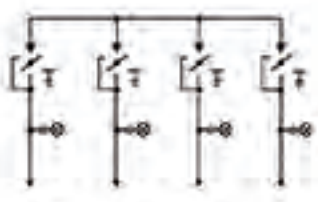
Additional information

Conditions	Description
Global options	- Manometer - VIS (Voltage Indication Systems) - All cable covers with interlock system - Fuse cover with interlock system
User options	- Internal arc exhausting box for 21kA / 1s - Remote operating system for Load break switch - Remote operating system for fuse combination switch - Remote operating system for Circuit Breaker - OCR (Over Current Relay) operating Circuit Breaker - Padlock system (key locking devices)
Protection index	IP3X on front face, IP67 for SF ₆ tank

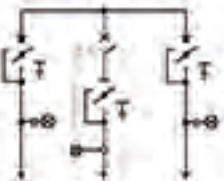
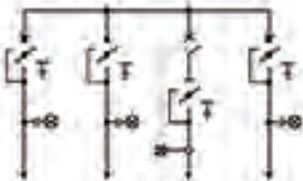
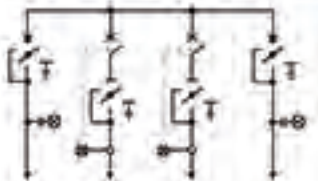
Types and diagrams

Dimension (W × H × D), mm

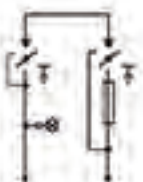
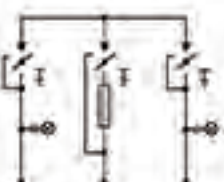
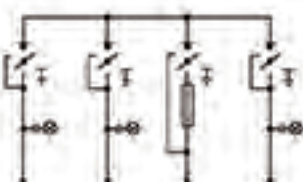
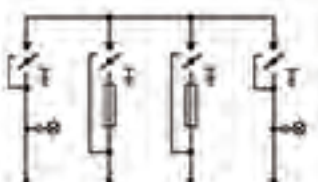
1. Non-Extensible LBS Feeder single RMU

LR (1L1R)	LLL (3L)	LLLL (4L)
		
718 × 1186 × 752	1030 × 1186 × 752	1362 × 1186 × 752

2. Non-Extensible CB Feeder RMU

RC (1R1C)	LC (1L1C)	LCL (2L1C)	LLCL (3L1C)	LOCL (2L2C)
				
718 × 1400 × 752	718 × 1400 × 752	1030 × 1400 × 752	1362 × 1400 × 752	1362 × 1400 × 752

3. Non-Extensible Switch-Fuse Feeder RMU

RF (1R1F)	LF (1L1F)	LFL (2L1F)	LLFL (3L1F)	LFFL (2L2F)
				
718 × 1400 × 752	718 × 1400 × 752	1030 × 1400 × 752	1362 × 1400 × 752	1362 × 1400 × 752

4. Extensible RMU

R	L	C	F
			
411 × 1437 × 752	411 × 1437 × 752	521 × 1437 × 752	521 × 1437 × 752

Load Break Switch

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Rating

Rated voltage	kV	12	17.5	24
Rated frequency	Hz	50 / 60	50 / 60	50 / 60
Rated power frequency withstand voltage	kV	28	38	50
Rated lightning impulse withstand voltage	kV	75	95	125
Rated current	A	630	630	630
Rated short-time withstand current (3s)	kA	21	21	21
Rated short-circuit making current	kA	54.6	54.6	54.6
Electrical endurance class		E3	E3	E3
Mechanical endurance class		M1	M1	M1
Earthing switch				
Rated short-time withstand current (3s)	kA	21	21	21
Rated short-circuit making current	kA	54.6	54.6	54.6
Electrical endurance class		E1	E1	E1
Mechanical endurance class		M1	M1	M1

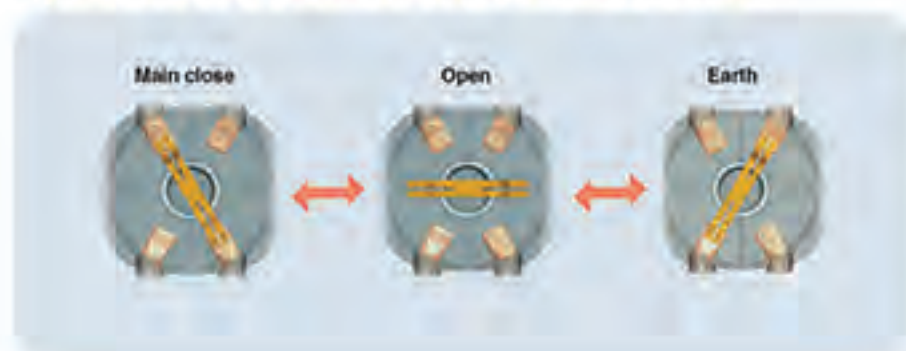
Standard features

- 3-position Load Break Switch rated 630A and less for load breaking and earthing
- Operating mechanism with two separate shaft for load and earthing function
- Switch position indication for LBS and ES
- Cable bushing horizontal in front with integrated capacitor for voltage indication

Optional features

- Motor operation for load break switch
- Auxiliary switches
 - Load break switch position
 - Earthing switch position
- Voltage indicating system
- Short circuit and earth fault indicator

Operation of 3-Position Load Break Switch



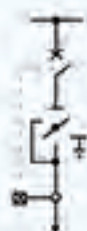
Circuit Breaker

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Rating

Rated voltage	kV	12	17.5	24
Rated frequency	Hz	50 / 60	50 / 60	50 / 60
Rated power frequency withstand voltage	kV	28	38	50
Rated lightning impulse withstand voltage	kV	75	95	125
Rated current	A	200 / 630	200 / 630	200 / 630
Rated short-time withstand current (3s)	kA	21	21	21
Rated short-circuit making current	kA	54.6	54.6	54.6
Electrical endurance class		E2	E2	E2
Mechanical endurance class		M1	M1	M1
Disconnecter and Earthing switch				
Rated current	A	630	630	630
Rated short-time withstand current (3s)	kA	21	21	21
Rated short-circuit making current	kA	54.6	54.6	54.6
Electrical endurance class		E1	E1	E1
Mechanical endurance class		M1	M1	M1

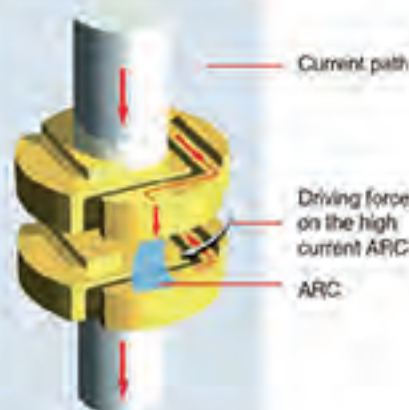


Standard features

- Circuit Breaker with 21kA interrupting capacity for the transformer and line protection
- 3-position DS disconnecting and earthing switch
- Switch position indication for CB and DS / ES
- Cable bushing horizontal in front
- Interlocking between CB and DS / ES

Optional features

- Motor operation for Circuit Breaker
- Auxiliary switches
 - CB position
 - Disconnecter position
 - Earthing switch position
- Voltage indicating system
- Trip coil and close coil



Vacuum interrupter

In the closed position, normal current flows through the interrupter. When a fault occurs and interruption is required, the contacts are quickly separated. The arc drawn between the surfaces of contact is rapidly moved around the slotted contact surface by self induced magnetic effects, preventing gross contact erosion and the formation of hot spot on the surface. The arc burns in an ionized metal vapor, which condenses on the surrounding metal shield. At current zero the arc extinguishes and vapor production ceases. The metal vapor plasma is very rapidly dispersed, cooled, recombined, and deionized, and the metal vapor products are quickly condensed so that the contacts withstand the transient recovery voltage.

Switch-fuse combination

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Rating

Rated voltage	kV	12	17.5	24
Rated frequency	Hz	50 / 60	50 / 60	50 / 60
Rated power frequency withstand voltage	kV	28	38	50
Rated lightning impulse withstand voltage	kV	75	95	125
Rated current	A	200	200	200
Electrical endurance class		E1	E1	E1
Mechanical endurance class		M1	M1	M1
Earthing switch				
Rated short-time withstand current (1s)	kA	5	5	5
Rated short-circuit making current	kA	13	13	13
Electrical endurance class		E1	E1	E1
Mechanical endurance class		M1	M1	M1



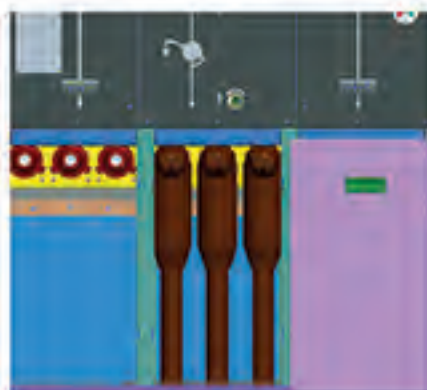
Standard features

- 3-position switch-fuse combination with earthing switch
- Switch position indication for switch-fuse combination and earth switch
- Cable bushing horizontal in front
- Fuse holder for DIN type fuse-links
- Fuse-link rating
 - 12 / 17.5kV : max. 100 A, LSIS DIN type fuse-link
 - 24kV : max. 75 A, LSIS DIN type fuse-link
- Automatically tripped to protect from fault current when a fuse is blown.

Optional features

- Motor operation for switch-fuse combination
- Auxiliary switches
 - LBS position
 - Earthing switch position
 - Fuse blown status
- Voltage indicating system
- Trip coil

Cable compartment

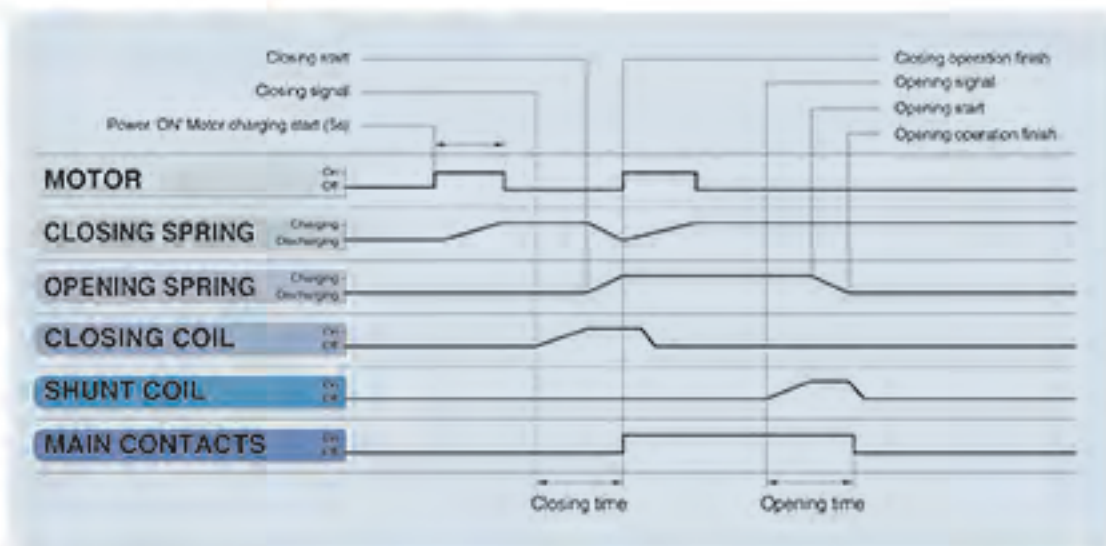


1. Screened body
2. Inner screen
3. Compressing lug
4. Stress cone adapter
5. Earthing eye and lead
6. Threaded pin
7. Rear plug with test point
8. Test point
9. Conductive end cap

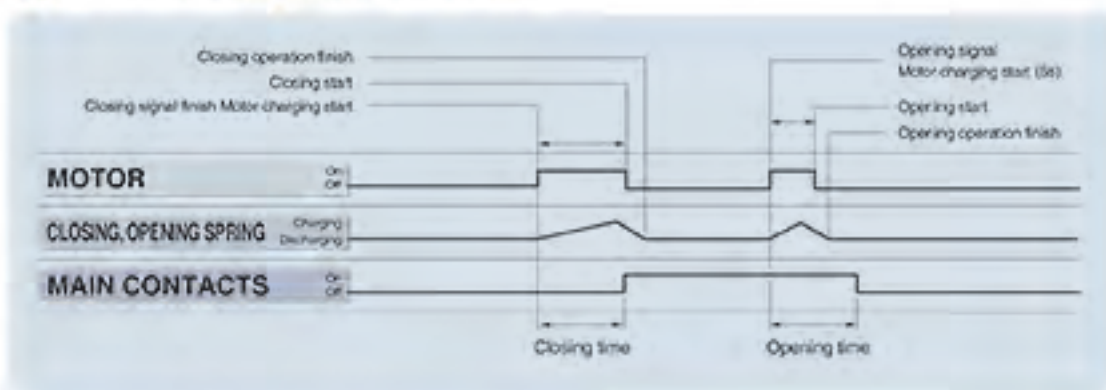
Operational sequence

Susol

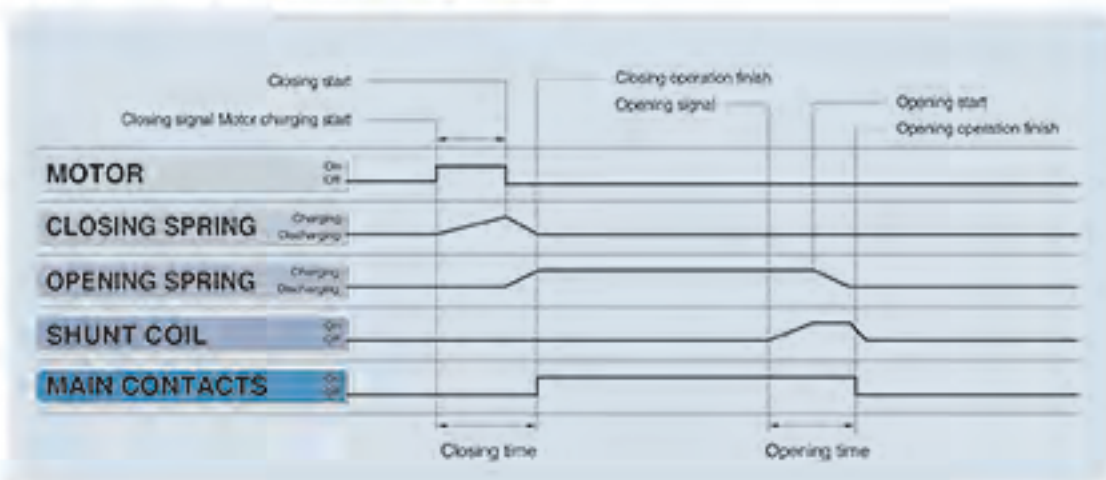
Operational sequence for CB



Operational sequence for LBS



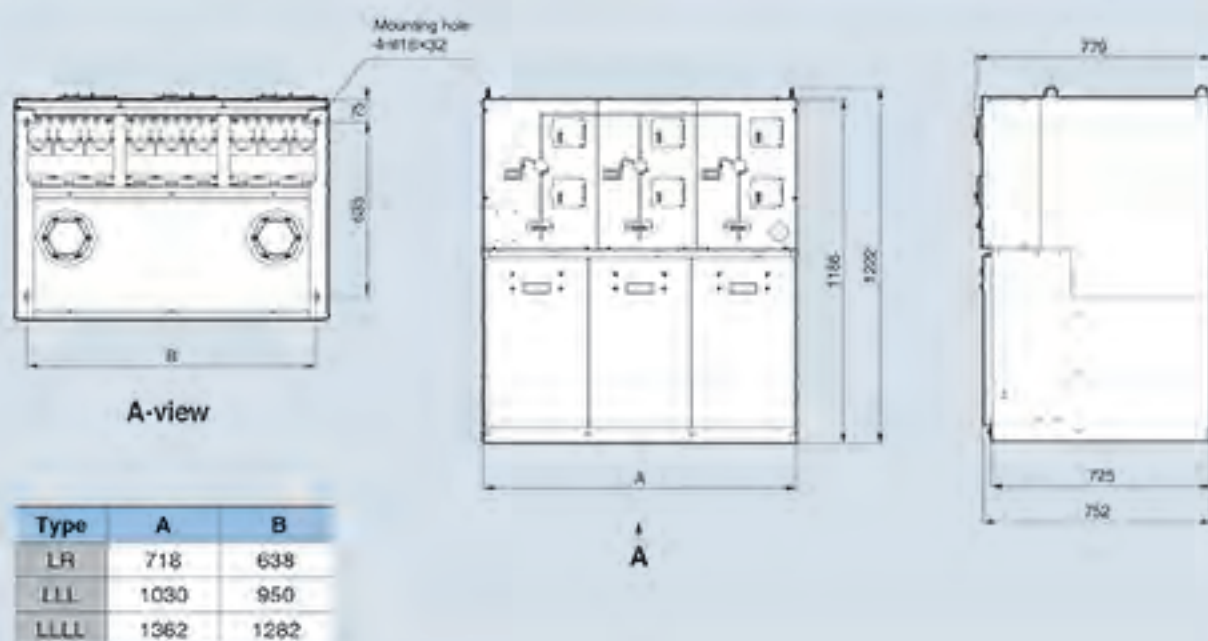
Operational sequence for F-LBS



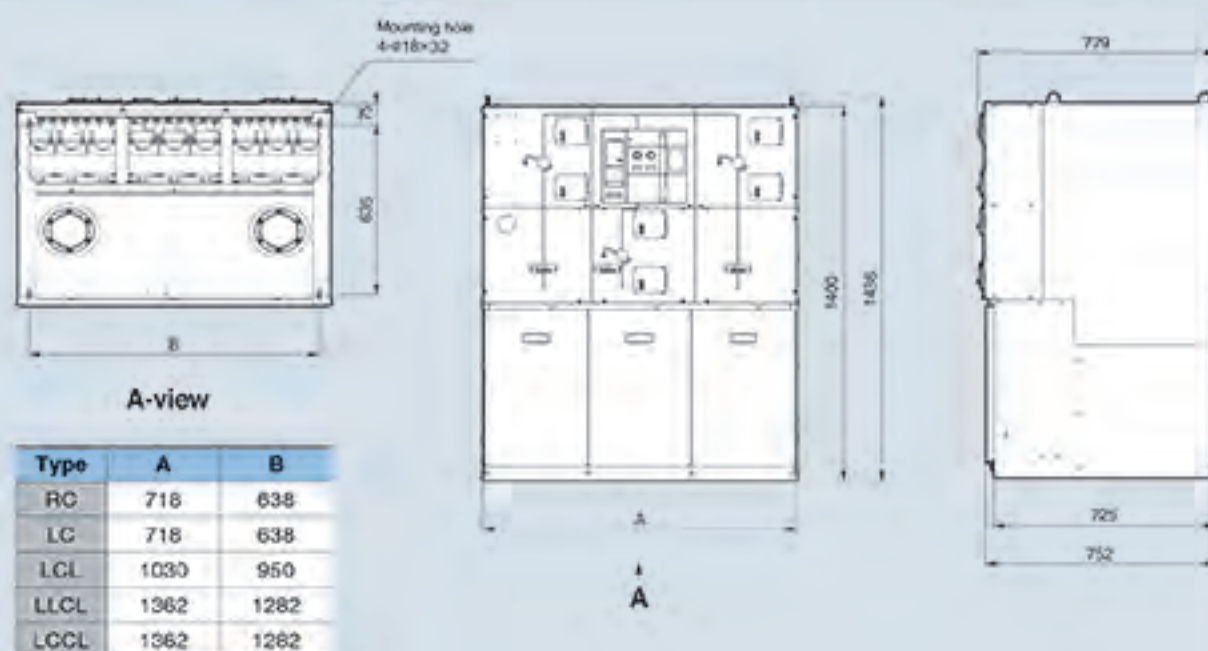
Dimensions

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1. Non-Extensible LBS Feeder single RMU



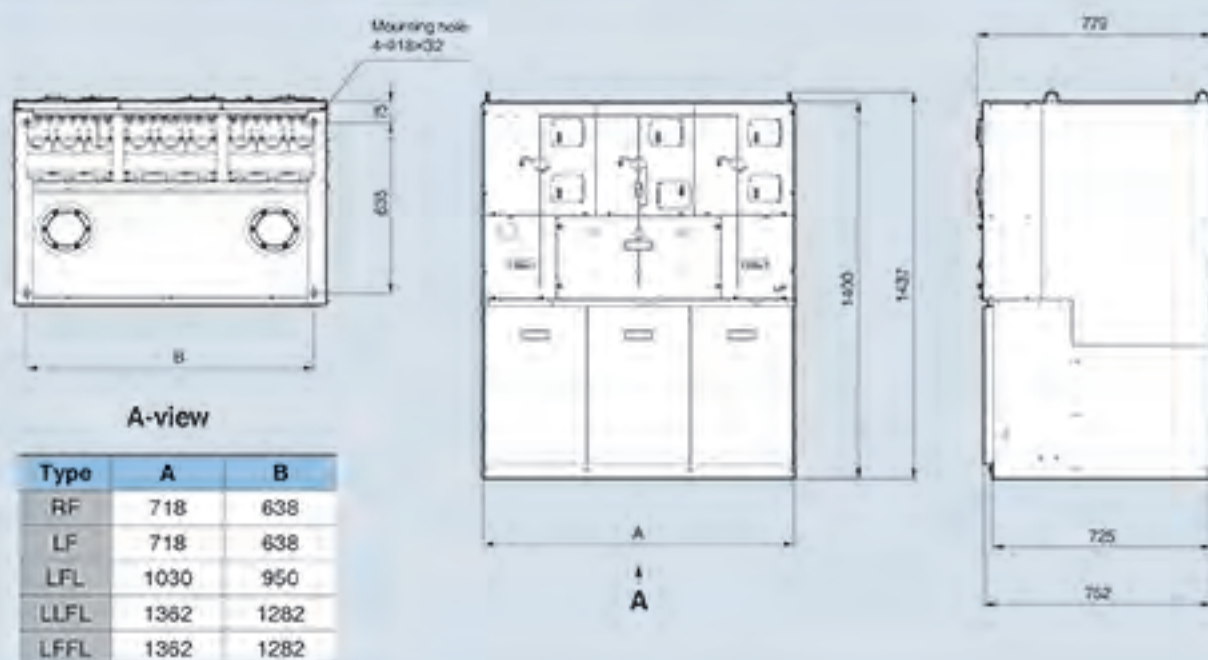
2. Non-Extensible CB Feeder RMU



Dimensions

Susol

3. Non-Extensible Switch-Fuse Feeder RMU



4. Extensible RMU



Ordering Information

Susol

1. Non-Extensible LBS Feeder single RMU

LR		B		24		6		0		0		0	
Type	Operation	Code	Rated Voltage	Code	Rated Current (Main)	Code	Rated Current (T-OFF)	Code	Rated Frequency	Code	Order Type	Code	
LR	Manual	B	24kV	24	630A	6	N / A	0	60 / 50Hz	0	SKD	S	
LLL	AC 110V	A1	17.5kV	17							CKD	C	
LLLL	AC 220V	A2	12kV	12							Complete Product	0	
	DC 110V	D1											
	DC 220V	D2											

2. Non-Extensible CB Feeder RMU

RC		B		24		6		6		6		0	
Type	Operation	Code	Rated Voltage	Code	Rated Current (Main)	Code	Rated Current (T-OFF)	Code	Rated Frequency	Code	Order Type	Code	
RC	Manual	B	24kV	24					60Hz	6	SKD	S	
LC	AC 110V	A1	17.5kV	17	600A	6	600A	6	50Hz	5	CKD	C	
LCL	AC 220V	A2	12kV	12			400A	4	60 / 50Hz	0	Complete Product	0	
LLCL	DC 110V	D1					200A	2					
LOCL	DC 220V	D2											

3. Non-Extensible Switch-Fuse Feeder RMU

RF		B		24		6		6		6		0	
Type	Operation	Code	Rated Voltage	Code	Rated Current (Main)	Code	Rated Current (T-OFF)	Code	Rated Frequency	Code	Order Type	Code	
RF	Manual	B	24kV	24	630A	6	200A	2	60 / 50Hz	0	SKD	S	
LF	AC 110V	A1	17.5kV	17							CKD	C	
LFL	AC 220V	A2	12kV	12							Complete Product	0	
LLFL	DC 110V	D1											
LFLL	DC 220V	D2											

4. Extensible RMU

R		B		24		6		6		6		0	
Type	Operation	Code	Rated Voltage	Code	Rated Current (Main)	Code	Rated Current (T-OFF)	Code	Rated Frequency	Code	Order Type	Code	
R	Manual	B	24kV	24	630A	6	630A	6	60Hz	6	SKD	S	
L	AC 110V	A1	17.5kV	17			630A	6	50Hz	5	CKD	C	
C	AC 220V	A2	12kV	12			400A	4	60 / 50Hz	0	Complete Product	0	
F	DC 110V	D1					200A	2					
	DC 220V	D2											



Sane Shargh

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Safety Instructions

- For your safety, please read user's manual thoroughly before operating.
- Contact the nearest authorized service facility for examination, repair, or adjustment.
- These certified 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 and trained.

LSIS Co., Ltd.

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