

LSIS showing the new, innovative products every customer desires to present standards for the future electric power solution as leading industrial electrical / electronic sectors with developing high-tech.

## ◆ Reliability

- Type testing is complete for all models according to latest standard, IEC62271-200
- Internal arc proofed 16 kA – 1 Sec
- Earthing of both the whole switchboard structure and the metal division between the compartments
- Mechanical interlocks which assure the exact operation sequence
- Protection Classes: PI (insulating partition)
- Loss of service continuity classes: LSC2A (LSC1 for metering functions)
- IP3X protection degree on the external housing
- High voltage indication system in each cubicle

## ◆ Optimize

- Reduced dimensions and weights
- Less space requirement for switchboard installation
- Easy integration in factory-built outdoor substations
- A solution adapted to cable connection
- Modular units containing fixed and withdrawable metal-enclosed switchgear, using vacuum

## ◆ Simplicity

- Simplified switchboard busbar design
- Mimic diagram front of the switchboard by means of simple and functional devices

## ◆ Applications

- Secondary electricity distribution networks
- MV/LV Distribution Transformer Substations
- Manufacturing industry
- Shopping malls
- Airports, hospitals, holiday village
- Small size power plants
- Wind Power plants

## ◆ Conception

LS C-AIS is an air insulated switchgear for applications in medium voltage distribution networks. LS C-AIS can be supplied as various configurations with additional equipment according to customer specification. The transformer is protected either by a switch fuse combination or a vacuum circuit-breaker.

## ◆ Type

- LU (Load break switch)
- Switch unit
- FU (Fuse-switch load break switch)
- Fuse-switch combination unit
- PU (Voltage transformer)
- Voltage transformers for measuring with earthed neutral system
- GAU (Riser)
- Incoming cable-connection unit with earthing
- CU-A (Fixed vacuum circuit breaker)
- Single-isolation, disconnectable circuit breaker unit
- CU-W (Withdrawable vacuum circuit breaker)
- Withdrawable single-isolation circuit breaker unit
- SU (Section)
- Double-isolation, disconnectable circuit breaker unit right or left outgoing line

## ◆ Characteristics

- C-AIS can be operated into three position (Close Open Earth) and has the interlock function between close and earth.
- C-AIS can be operated by manual or motor and can be controlled from remote with optional items.
- C-AIS protects transformer from the fault at load side when accidents happen.
- It is possible to protect transformer safely and operate power system efficiently.
- The Fuse combination switch will be mechanically tripped by operating of fuse striker pin, and then the fault area can be isolated.



## Electrical characteristics

Rated voltage	Ur	12	17.5	24
Rated frequency	fr Hz	50/60		
<b>Insulation level</b>				
Insulation	Ud 1 min (kV r ms)	28	38	50
Isolation	Ud 1 min (kV r ms)	32	45	60
Insulation	Ud 1.2/50 $\mu$ s (kV peak)	75	95	125
Isolation	Ud 1.2/50 $\mu$ s (kV peak)	85	110	145
<b>Breaking capacity</b>				
Transformer off load	A	16		
Cables off load	A	31.5		
Rated current	Ir A	630		
Short-time withstand current	Ik/tk 25kA/1 s	630		
	21kA/3 s	630		
	16kA/3 s	630		
Making capacity (50 Hz)	I <sub>ma</sub> 54.6 kA	630	N/A	
	50 kA	630		
	40 kA	630		
Internal arc classification	IAC kA/1 s	16 (AFL)		

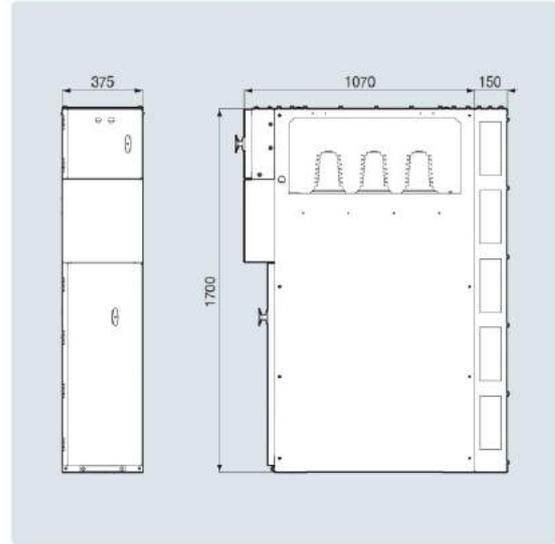
## IEC standards

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 switches
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

## Normal operating conditions

Ambient air pollution	no significant pollution by dust, smoke, corrosive and/or flammable gases, vapours or salt.
Ambient air temperature	less than or equal to 40°C less than or equal to 35°C on average over 24 hours greater or equal to -5°C
Altitude	less than or equal to 1000 m
Humidity	average relative humidity over a 24 hour period, less than or equal to 95% (average relative humidity over a 1 month period, less than or equal to 90%)

## LU – Load Break Switch



- W×H×D(mm) : 375×1700×1070
- Load Break Switch

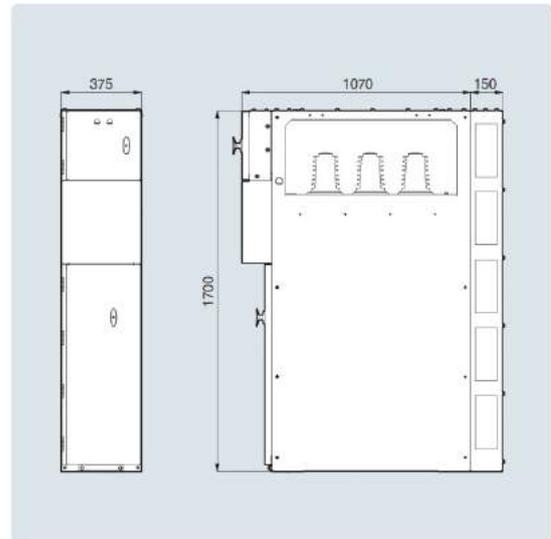
### BASE UNIT

- 3-position Load Break Switch rated 630A and less for load breaking and earthing
- Key Interlock

### OPTIONAL COMPONENTS

- Motor operation for load break switch
- Voltage Detector
- Gas gauge

## FU – Switch fuse combination



- W×H×D(mm) : 375×1700×1070
- Switch Fuse Combination
- Power Fuse
- External E/S

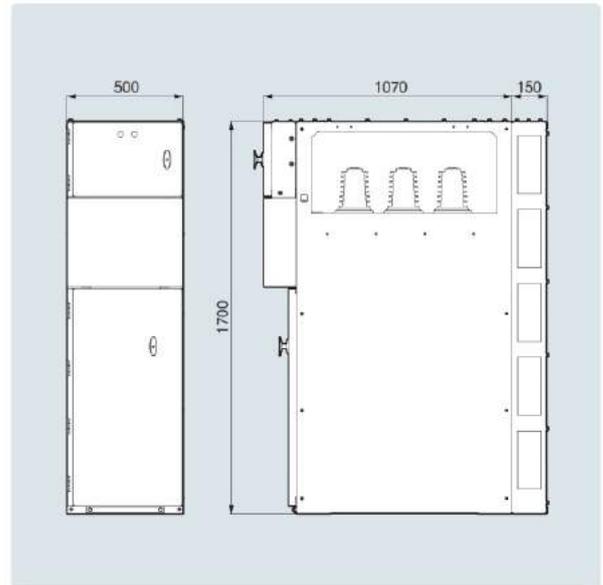
### BASE UNIT

- 3-position switch-fuse combination with earthing switch
- Key Interlock key lock
- Key Interlock key lock
- Power Fuse : 63A (SIBA)

### OPTIONAL COMPONENTS

- Motor operation for switch-fuse combination
- Voltage Detector
- Gas gauge

## PU - Power Transformer



- WxHxD(mm)  
500x1700x1070
- Switch Fuse Combination
- Power Fuse
- Power Transformer

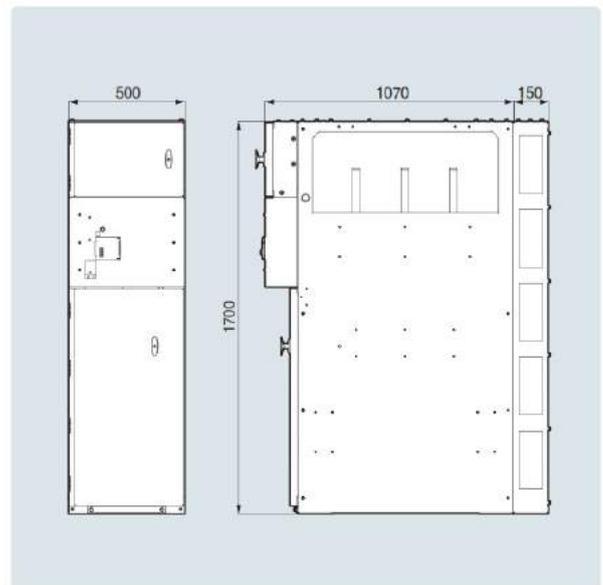
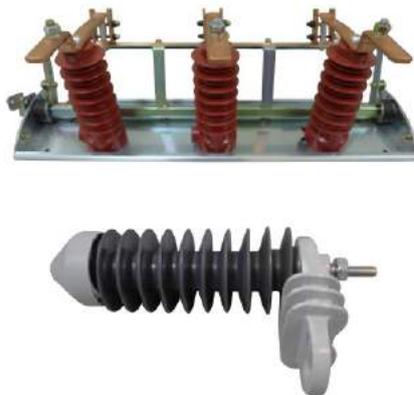
### BASE UNIT

- 3-Position Load Break Switch rated 630A and less for load breaking and earthing
- Key Interlock
- Power Fuse : 1A (SIBA)

### OPTIONAL COMPONENTS

- Motor operation for load break switch
- Voltage Detector
- Gas gauge
- Power Transformer

## GAU—Riser

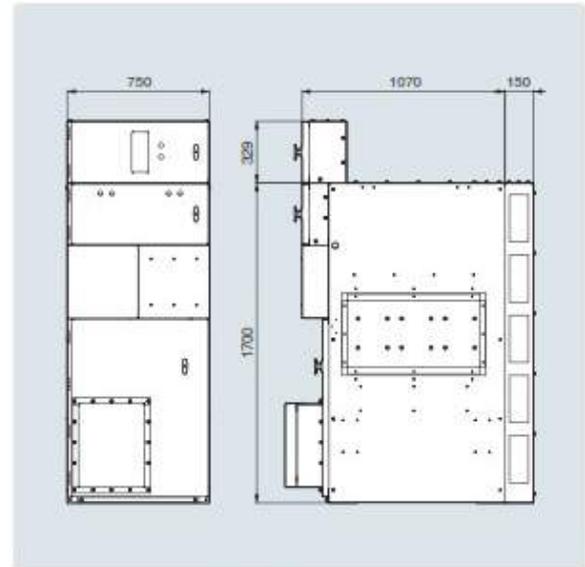


- WxHxD(mm)  
500x1700x1070
- External E/S
- Lightning Arrester

### OPTIONAL COMPONENTS

- Voltage Detector

## CU-A/CU-W – Vacuum Circuit Breaker



- W×H×D(mm) : 750×1700×1070
- Load Break Switch
- Vacuum Circuit Breaker
- Current Transformer
- External E/S

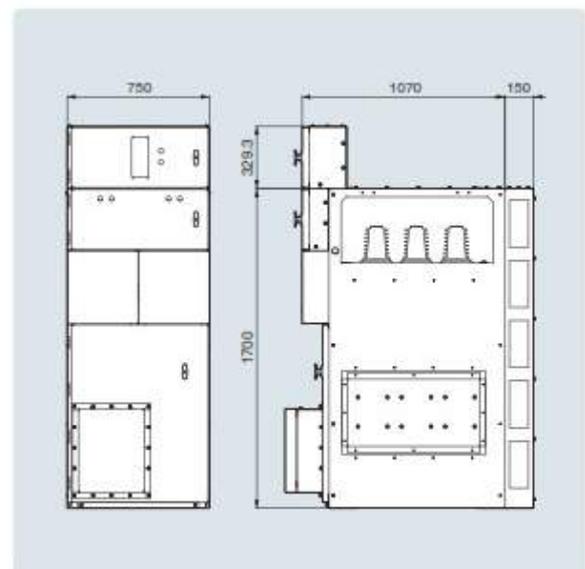
### BASE UNIT

- 3cycle Circuit Breaker
- SM-VCB Auxiliary contacts : 4a4b
- 3-position Load Break Switch rated 630A and less for load breaking and earthing
- Key Interlock

### OPTIONAL COMPONENTS

- Motor operation for load break switch
- Voltage Detector
- Gas gauge
- Current Transformer

## SU—Section



- W×H×D(mm) : 750×1700×1070
- Load Break Switch
- Vacuum Circuit Breaker
- Current Transformer
- External E/S

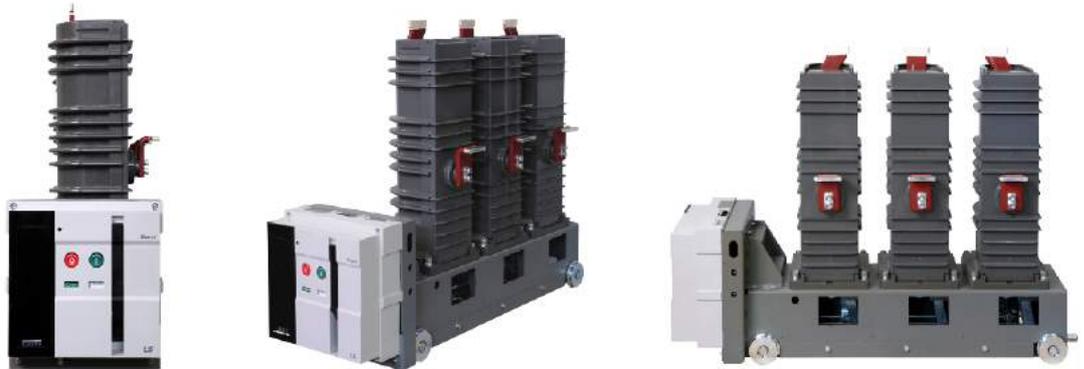
### BASE UNIT

- 3cycle Circuit Breaker
- SM-VCB Auxiliary contacts : 4a4b
- 3-position Load Break Switch rated 630A
- Key Interlock

### OPTIONAL COMPONENTS

- Motor operation for load break switch
- Voltage Detector
- Gas gauge
- Relay

## SM VCB



Insulation level		SVL-06□20,25□06,13	SVL-12□16,20,25□06,13	SVL-17□16,20,25□06,13	SVL-20□16,20,25□06,13	SVL-25□16,20,25□06,13						
Rated voltage	Ur (kV)	7.2		12		17.5		24		25.8		
Rated normal current	Ir (A)	630	1250	630	1250	630	1250	630	1250	630	1250	
Phase distance	(mm)	210(Fixed Type Only), 230										
Weight (Fixed type)	(kg)	80										
Weight (Withdrawable type)	(kg)	85										
Rated frequency	fr (Hz)	50/60										
Rated short-circuit current	Isc (kA)	20, 25		16, 20, 25								
Rated short-circuit breaking capacity	(MVA)	249, 312		333, 415, 520		485, 606, 758		665, 831, 1039		715, 894, 1117		
Rated short-time withstand current	Ik/tk(kA)	16/3(4*), 20/3(4*), 25/3(4*)										
Rated short-circuit making current	Ip (kA)	2.5 Isc(50Hz)/2.6 Isc(60Hz)										
Rated breaking time	(cycle)	3										
Rated withstand voltage	Power frequency	Ud (kV)	20		28		38		50		60	
	Impulse	-	60		75		95		125		125	
Rated operating sequence		O-0.3s-CO-15s-CO										
Control voltage	Closing coil	(V)	DC 24~30V, DC 48~60V, DC110V, DC125V, DC220V,				AC 48V, AC100~130V, AC220~250V					
	Trip coil	(V)	DC 24~30V, DC 48~60V, DC110V, DC125V, DC220V,				AC 48V, AC100~130V, AC220~250V					
Auxiliary contacts		4a4b										
Rated opening time	(s)	≤ 0.04										
No-load closing time	(s)	≤ 0.07										
Type test class	Mechanical	M2										
	Electrical	E2 (List3)										
	Capacitive current switching	C2										
Type	Fixed type	R/L type										
	Withdrawable type	S/T type										
Standards		IEC 62271-100										

Note ) \* Please contact us

## SM VCB

### Breaker

<b>SVL</b>	<b>06</b>	<b>R</b>	<b>20</b>	<b>H</b>	<b>06</b>
<b>Basic model name</b>	<b>Rated voltage (kV)</b>	<b>Version</b>	<b>Interrupting current (kA)</b>	<b>Phase distance/Compatibility</b>	<b>Rated current (A)</b>
SVL SM VCB	06 7.2 12 12 17 17.5 20 24 25 25.8	R Fixed type Right L Fixed type Left S Withdrawable type Right T Withdrawable type Left	16 16 20 20 25 25 <small>* 7.2kV Model 20, 25kA Only</small>	B 210mm H 230mm <small>* 210mm Fixed Type Only</small>	06 630A 13 1250A

<b>SVL-06R20H06</b>	<b>M1</b>	<b>C1</b>	<b>T1</b>	<b>SB2</b>	<b>U1</b>	<b>A</b>	<b>1 2 3...</b>
	<b>Motor control voltage</b>		<b>Trip coil voltage</b>		<b>UVT</b>		
	M0 - M1 DC 110V M2 DC 220V M3 DC 125V M4 DC 24V-30V M5 DC 48V-60V M6 AC 48V M7 AC 100V-130V M8 AC 200V-250V		T0 - T1 DC 110V T2 DC 220V T3 DC 125V T4 DC 24V-30V T5 DC 48V-60V T6 AC 48V T7 AC 100V-130V T8 AC 200V-250V		U0 - U1 DC 110V U2 DC 220V U3 DC 125V U4 DC 24V-30V U5 DC 48V-60V U6 AC 48V U7 AC 100V-130V U8 AC 200V-250V		
		<b>Closing coil voltage</b>		<b>Connector and wire</b>		<b>Other accessories</b>	
		C0 - C1 DC 110V C2 DC 220V C3 DC 125V C4 DC 24V-30V C5 DC 48V-60V C6 AC 48V C7 AC 100V-130V C8 AC 200V-250V		SA2 Standard A type connector, 4a4b SB6 Flame retardant A type connector, 4a4b		A1 Secondary Trip coil A2 Secondary Trip Coil with TCS Contact A3 A4 A5 A6 A7 Keylock A8 Button Padlock A9 Button Cover AA Lead Wire AB User Plug(Part)	

- Note)
- If A1(Secondary trip coil), A7(Keylock), A8(Button Padlock) are selected, A14B is the type name in the ordering.
  - A1(Secondary trip coil), U1-U8(UVT) can not be selected simultaneously.
  - A8 (Button Padlock) and A9 (Button Cover) can not be selected simultaneously.
  - If A1(Sencondary Trip Coil with TCS Contact) are selected, Auxiliary contacts is max 4a3b



Protection Relay can be provide as client request, as follow:

- Eaton
- Multilin,
- SEL
- PNC
- As request by client

## Current Transformer



Section		Contents			
Highest voltage for equipment	kV	7.2	12	17.5	24
Rated power frequency withstand voltage (1min)	kV	20	28	38	50
Rated lightning impulse withstand voltage	kV	60	75	95	125
Rated frequency	Hz	50 / 60			
Rated primary current	A	20 to 600			
Rated continuous thermal current	X In	1.2			
Rated secondary current	A	5 or 1			
Rated short-time thermal current Ith (1sec)	max.kA	50			
Rated dynamic current Idyn (2.5xIth)	max.kA	125			
Number of cores	max.	2			
Weight (approx.)	kg	20			
Applying Standards		IEC 61869-2, IEEE C57.13, KS C 1706, JEC 1201			
Model designation		DCI-209C			

## Power Transformer



Section		Contents	
Highest voltage for equipment	kV	24	
Rated power frequency withstand voltage	kV	50	
Rated lightning impulse withstand voltage	kV	125	
Rated frequency	Hz	50 / 60	
Rated primary voltage	kV	22000/√3	
Rated secondary voltage	V	100/√3	
Rated voltage factor/cont		1.9/8h	
Rated burden	VA	15	
Weight (approx.)	kg	25	
Applying Standards		IEC 61869-2, IEEE C57.13, KS C 1706, JEC 1201	
Model designation		DPI-209N	



## Indicator

## Power Fuse



Bemessungs-spannung Rated voltage	Artikel Article	Bemessungsstrom Rated current	Länge "e" Length "e"	Durchmesser D Diameter D
kV		A	mm	mm
10/24	30 006 13	6,3 - 40	442	53
	30 014 13	50 - 80		67
	30 022 13	100 - 160RC100		85
	30 022 14	200RC112		87

## Certificate



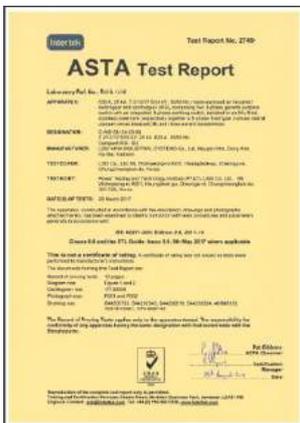
Type Test Certificate - CU-A by ASTA



Type Test Certificate - CU-W by ASTA



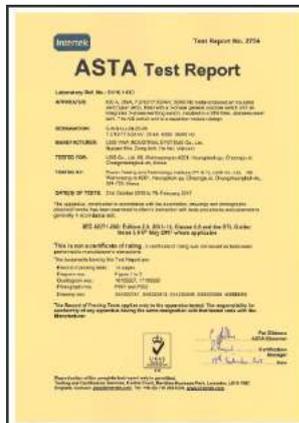
Type Test Certificate - PU by ASTA



Type Test Certificate - SU by ASTA



Type Test Certificate - GAU by ASTA



Type Test Certificate - LU by ASTA

## Success Story

NO	Project Name	Customer	Market Application
1	MALL TAMAN ANGGREK PROJECT	PT. MULIA INTI PELANGI	High risk building

## Address :

Assembly Factory:  
Kawasan Industri Greenland I  
Jl. Greenland IV Blok AC No. 07 kota Deltamas  
Cikarang Pusat, Bekasi-Indonesia 17530

Sheet Metal Factory:  
Kawasan Delta Silicon 3  
Jl. Rotan I Blok F27 NO. 20D Lippo Cikarang  
Cikarang Pusat - Bekasi 17530

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