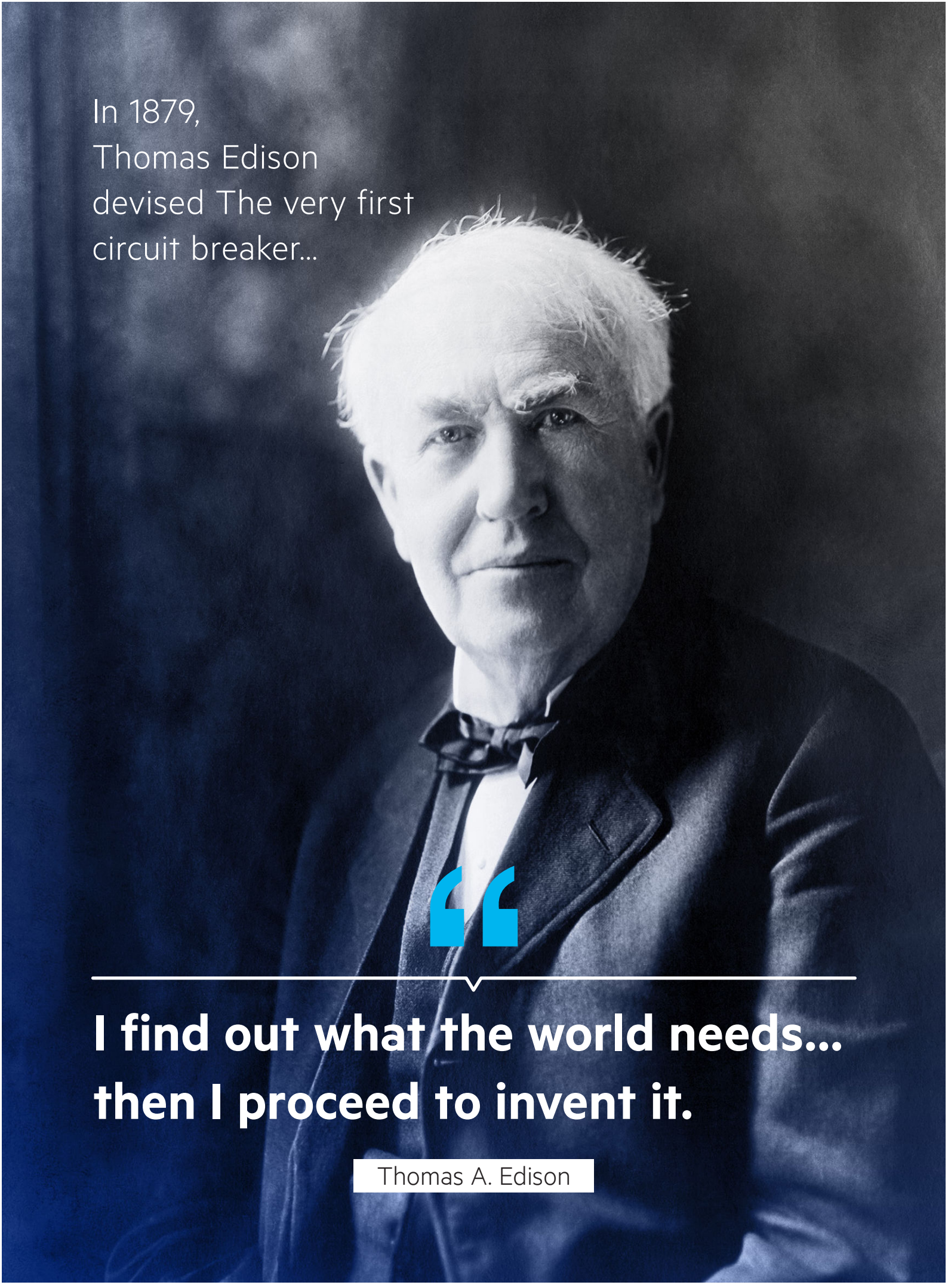
GEIS

ALPS

US3.0 SF6 Gas Insulated Switchgear

GEIS Electrical Protection

Safer Smarter Greener


In 1879,
Thomas Edison
devised The very first
circuit breaker...
I find out what the world needs...
then I proceed to invent it.
Thomas A. Edison

About GEIS

GEIS was formed as a spin-off from the original GE Industrial Solutions China operation in December 2019. The company operates under the AEG brand in China and the GEIS brand globally.

Reinventing a 130-year legacy with an entrepreneurial spirit, GEIS delivers products built on GE's original technologies, incorporating innovations for the latest electrification applications, and a steadfast commitment to the highest standards of quality.

The Evolution of Business and Brand

Note: GEIS brand is also used in China

Quality is Built-in

The Vertical Integrated Manufacturing Center

- Established in 2000, the 1st North Asia facility of GE Industrial Solutions
- Localize US and European products to serve the local market
- Evolving into a Global platform of Cast Coil Dry Type Transformer, Air Circuit Breaker, IEC and NEMA medium voltage VCB and switchgear for GE Industrial Solutions
- A GE Global Star Facility






GEIS deliver complete range of products for the evolving electrification needs:

SecoVac VCB

M-PACT Plus ACB

Elfa Series MCB/RCBO

EV Charger

SecoGear MV Switchgear

RMU Gas Insulated Switchgear

WaveCast Transformer

MLS LV Switchgear

US3.0 SF6 Gas Insulated Switchgear

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Product Overview

US3.0 SF6 Gas Insulated Switchgear

ALPS US3.0 SF6 gas insulated switchgear is applicable to 12~40.5kV power distribution systems, which provides a variety of systematic solutions for industrial and commercial areas with power supply , dual radiation power supply, and cable feeder networks, and the areas with large power supply loads and high density such as rural townships in a flexible and changeable combination of functions.

ALPS US3.0 SF6 gas insulated switchgear is based on SF6 gas insulation. All HV live parts of the switchgear are enclosed in the SF6 gas tank, so that they are not affected by the environment and maintenance-free with high safety. The unit is in a compact modular structure, with load switch, load switch-fuse combination switch, isolating switch-breaker and other main switches to form separate functional units in a form of sealed gas tank. The bus bar can be extended arbitrarily in the left and right directions through bus connectors. It can be arranged arbitrarily according to different design schemes for different power distribution tasks.

Executive Standard of the Product

- IEC 60694-2002 Common specifications for high-voltage switchgear and controlgear standards
- IEC 62271-200 High-voltage switchgear and controlgear - Part200:AC metal-enclosed switchgear and controlgear for ratedvoltages above 1 kV and up to and including 52 kV
- 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

Model Selection

Model Selection

US3.0	-12	C	/630	-20	L
Product series	**Rated voltage**	**Type of switchgear**	**Rated current**	**Rated breaking current**	**Type of extension**
	12-12kV	C: Load switch	630-630A	20-20kA	L: Left-extensible
	17-17.5kV	F: Combined fuse-switch	1250-1250A	25-25kA	R: Right-extensible
	24-24kV	CB: Vacuum circuit breaker			LR: Extensible on both side
	40.5-40.5kV	AM: Metering			Blank: Non-extensible
		D: Cable connection			
		CPT: Voltage transformer			
		ATS: Auto transfer switch			
		CI: Load switch busbar			
		CBI: Vacuum circuit breaker busbar			

Usage Environment

Temperature

- -40°C ~+55°C

Anti-seismic Grade

- Not more than grade 8

Humidity

- Maximum daily relative humidity ≤ 95%
- Maximum monthly relative humidity ≤ 90%

Altitude

- ≤ 1000m
- Above 1000m, please contact us

Product Features

- **Reliability**
  - The mechanical lives of the circuit breaker, load switch and grounding switch can reach 10000, 6000 and 3500 times, respectively.
  - The 3mm stainless steel gas tank, based on automatic laser welding, can meet the requirements of safe use for more than 40 years, truly free of maintenance.
- **Safety**
  - The bursting point of the explosion-proof membrane is accurately designed to be 2.5 times the standard atmospheric pressure, effectively ensuring the personal and equipment safety in case of arcing.
  - The full series is designed for flood control, so that the safety of maintenance personnel can be ensured even in case of flooding, and the power supply can be quickly restored after flooding.
  - The protection levels of standard equipped gas tanks and cabinets are IP67 (up to IP68), and IP42, respectively, which can help to effectively prevent the equipment from being damaged by pollution, condensation, chemicals and small animals.
- **Environmental protection**
  - Based on the special seal design, the gas leakage can be reduced to 0.01%/year, which is far lower than the national standard, minimizing the impact on the environment.
  - Designed with recovery of SF6 ensuring the safe and thorough recovery of SF6 at the end of the life cycle.

Technical Data

Overall Parameters

Item			Unit	Value			
Rated voltage			kV	12	17.5	24	40.5
Rated frequency			HZ	50 or 60	50 or 60	50 or 60	50 or 60
Rated insulation level	Power frequency withstand voltage (1min)	Between phase, to earth	kV	28	38	65	95
		Across contact		32	45	79	118
	Lightning impulse withstand voltage (peak)	Between phase, to earth		75	95	125	185
		Across contact		85	110	145	215
Dielectric of the auxiliary and control circuits			kV	2	2	2	2
IP degree	Gas compartment			IP67	IP67	IP67	IP67
	Enclosure			IP4X	IP4X	IP4X	IP4X
Rated flling level of SF6 (20 °C, gauge pressure)	Rated gas filled pressure		Mpa	0.03	0.045	0.045	0.045
	Minimum gas filled pressure			0.02	0.025	0.025	0.025
Annual leakage rate			% / year	≤ 0.01	≤ 0.01	≤ 0.01	≤ 0.01

Load Switch

Item		Unit	Value		
Rated voltage		kV	12 or 17.5	24	40.5
Rated current		A	630	630	630
Rated short time withstand current	Main circuit / Earting switch	kA/s	20/4, 25/4	20/4	20/4, 25/4
	Earth circuit connector		17.4/4, 21.7/4	17.4/4	17.4/4, 21.7/4
Rated peak withstand current	Main circuit / Earting switch	kA	50, 63	50	50, 63
	Earth circuit connector		43.5, 54.2	43.5	43.5, 54.2
Rated short-circuit making current		kA	50, 63	50	50, 63
Rated active load breaking current		A	630	630	630
Rated closed loop breaking current		A	630	630	630
Rated active load breaking current (5%)		A	31.5	31.5	31.5
Rated active load breaking times		Time	300	100	100
Mechanical life	Load switch		6000	5000	5000
	Earthing switch		3500	3000	3000

Combined fuse-switch

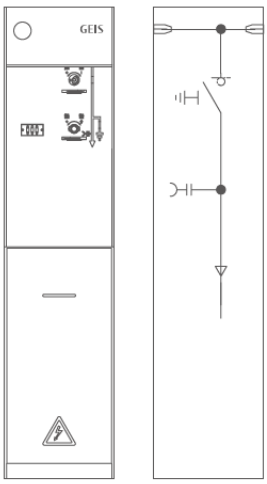
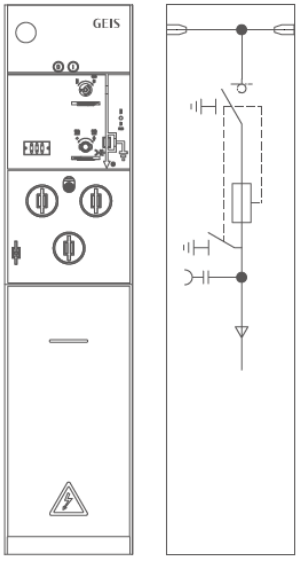
Item		Unit	Value		
Rated voltage		kV	12 or 17.5	24	40.5
Rated current		A	Depends on the fuse		
Rated short-circuit breaking current		kA	31.5	31.5	31.5
Rated short-circuit making current		kA	80	80	80
Rated transfer current		A	1600	1400	1400
Mechanical life	Combined switch	Time	5000	5000	5000
	Earthing switch		3000	3000	3000

Circuit Breaker

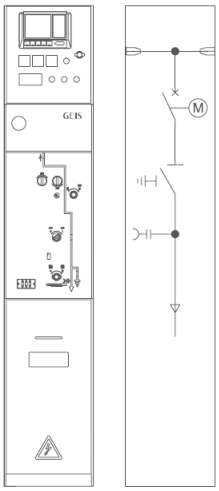
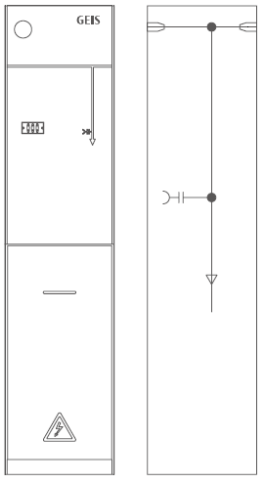
Item		Unit	Value		
Rated voltage		kV	12 or 17.5	24	40.5
Rated current		A	630/1250	630	630
Rated short time withstand current	Main circuit / Earting switch	kA/s	20/4, 25/4	20/4	20/4, 25/4
	Earth circuit connector		17.4/2, 21.7/2	17.4/2	17.4/2, 21.7/2
Rated peak withstand current	Main circuit / Earting switch	kA	50, 63	50	50, 63
	Earth circuit connector		43.5, 54.2	43.5	43.5, 54.2
Rated short-circuit breaking current and times		kA/Time	20/50, 25/30	20/30	20/50, 25/30
Rated short-circuit making current		kA	50, 63	50	50, 63
Rated operating sequence			O-0.3s-CO-180s-CO		
Mechanical life	Vacuum circuit breaker	Time	10000		10000
	solation switch		5000		3000
	Earthing switch		3000		3000

Functions and Configurations

Functions and Configurations

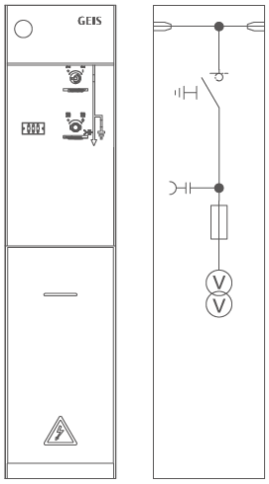
Solution	Description of function	Primary standard configuration	Secondary accessory configuration
 C Load switch cabinet	Equipped with three-position loadswitch, connecting and disconnecting the incoming and outgoing cables from the busbar, enabling the incoming and outgoing cables to be grounded in three phases at the same time , and with shortcircuit making capability. Used for the control of inlet and outlet cables	1. Three-position load switch 2. Voltage indicator 3. SF6 pressure indicator 4. Load switch spring-operated 5. Five defenses 6. 630A Busbar, grounding 7. Operating handle	1. Load switch motorised mechanism 2. Short and Grounded Fault Indicator 3. Lightning arrester or double cable head 4. Cable Tee Connector busbar 5. Expandable left and right 6. Terminal cover (for end cabinet) 7. Current transformer 8. key lock 9. Load switch auxiliary contact 10. Ground switch auxiliary contact
 F Combined fuse-switch cabinet	Equipped with the same load switch as the load switchgear and with high breaking capacity connecting and disconnecting capacity of the fuse in series to form a combination of electrical appliances. Used for transformer control and protection.	1. Three-position load switch 2. Voltage indicator 3. SF6 pressure indicator 4. Load switch spring operating mechanism 5. Five defenses 6. 630A Busbar, grounding busbar 7. Operating handle	1. Load switch moto rised mechanism 2. Short and Grounded Fault Indicator 3. Lightningarrester or double cable head 4. Cable Tee Connector busbar 5. Expandable left and right 6. Terminal cover (for end cabinet) 7. Current transformer 8. key lock 9. Load switch auxiliary contact 10. Ground switch auxiliary contact

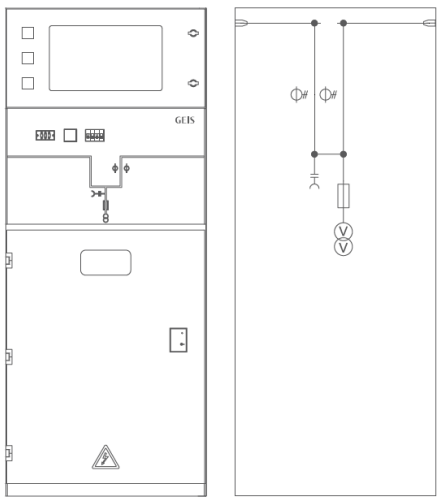
Functions and Configurations

Solution	Description of function	Primary standard configuration	Secondary accessory configuration
 CB Circuit breaker cabinet	Equipped with a vacuum circuit breaker and a three-position disconnecting switch in series, the circuit breaker is placed on the busbar side of the inlet and outle tlines, and the disconnecting switch is on the cable side, and it can be assembled with multi-curve over current relay protection device and conventional relay protection device. Used for line and trans former controland protection.	1. Circuit breaker 2. Three-position disconnect switches 3. 3SF6 pressure indicator Mechanical 4. Interlocking and position indicationof circuit breakers and disconnecting switches 5. Voltage indicator 6. 630A Busbar, grounding 7. Operating handle	1. Fault indicator 2. Arrester 3. CableTee Connector 4. Expandable left and right 5. Terminal cover (for end cabinet) 6. Current transformer 7. Key lock 8. Circuit breaker status contact 9. Disconnecting switch closing and grounding auxiliary contacts 10. Protective relay
 D Cable connection cabinet	The inlet and outlet cable is directly connected with the bus bar, and has a metal stainless steel protective housing and a voltage display. It is used to connect incoming and outgoing cables.	1. 630A Busbar 2. Voltage indicator	1. Arrester 2. CableTee Connector 3. 3Expandable left and right 4. Terminal cover (for end cabinet)

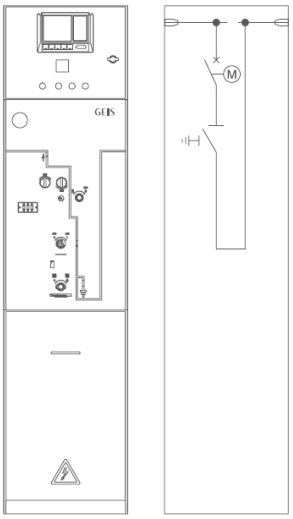
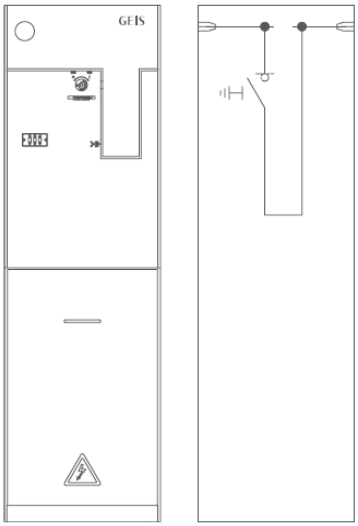
Functions and Configurations

Functions and Configurations

Solution	Description of function	Primary standard configuration	Secondary accessory configuration
 Cpt Voltage transformer cabinet	Equipped with three-position load switch, which can connect or disconnect the voltage transformer and grounding with load. Used to monitor system voltage and provide operating power	1. 630A Busbar grounding busbar 2. Three-position load switch 3. Load switch spring-operated mechanism 4. SF6 pressure indicator 5. Voltage transformer Operating handle	1. Load switch motorised mechanism 2. Key lock 3. Cable Tee Connector 4. Expandable left and right 5. Terminal cover (for end cabinet) 6. Arrester 7. Load switch auxiliary contact

Solution	Description of function	Primary standard configuration	Secondary accessory configuration
 AM Metering cabinet	Equipped with conventional current transformer and voltage transformer to facilitate calibration by the power aepartment, it can be conveniently combined with any other kind of cabinet. Used for electrical energy calculation (this cabinet is air insulated)	1. Current transformer 2. Voltage transformer 3. PT fuse	1. Meter 2. Arrester

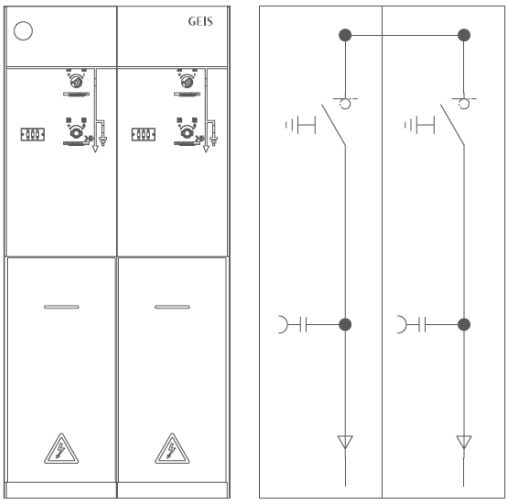
Functions and Configurations

Solution	Description of function	Primary standard configuration	Secondary accessory configuration
 CBI Vacuum circuit breaker busbar cabinet	Equipped with vacuum circuit breakers with busbar contact	1. Circuit breaker 2. SF6 pressure indicator 3. 630A Busbar, grounding 4. Operating handle	1. Key lock 2. Current transformer 3. Protective relay
 CI Load switch busbar cabinet	Equipped with a threeposition load switch, it can connect or disconnect the main busbar with load. Used for busbar contact.	1. Three-position load switch 2. Load switch spring-operated 3. SF6 pressure indicator 4. 630A Busbar, grounding 5. Operating handle	1. Load switch motorised mechanism 2. Key lock 3. Load switch auxiliary contact

Combination Block Type

Typical Diagram

CC



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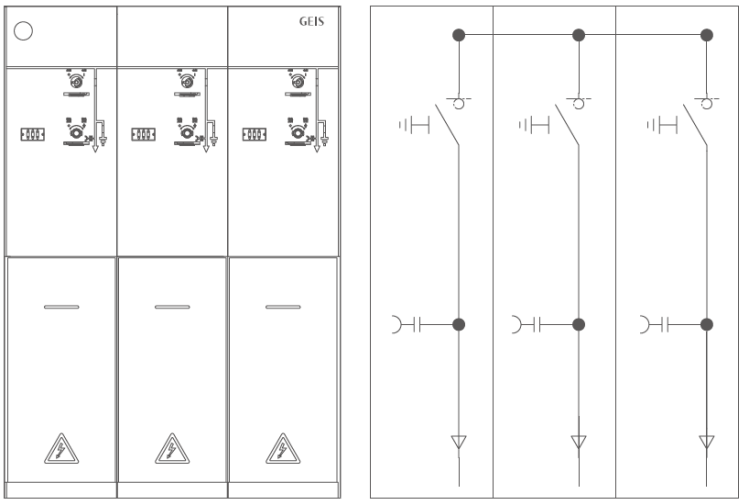
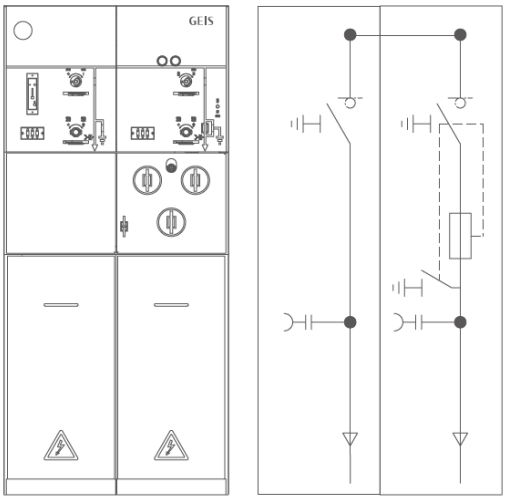
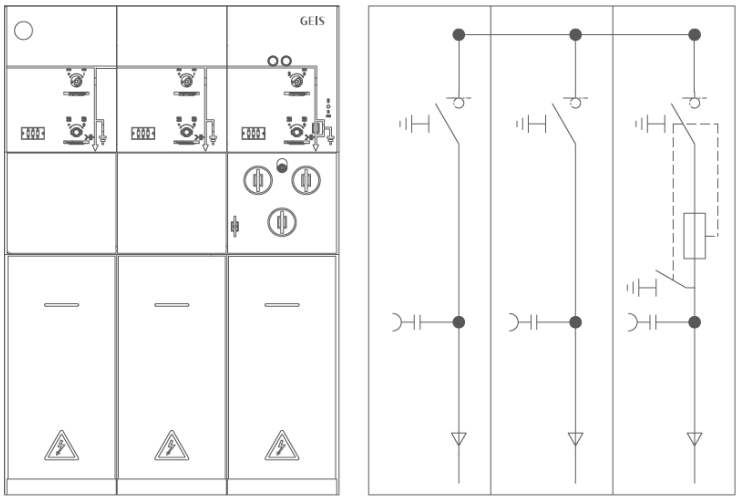


CF



CCF



Typical Diagram

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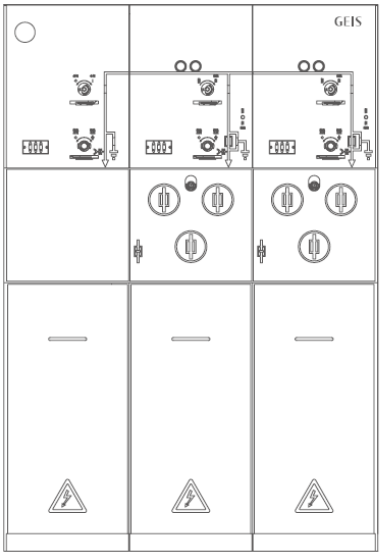

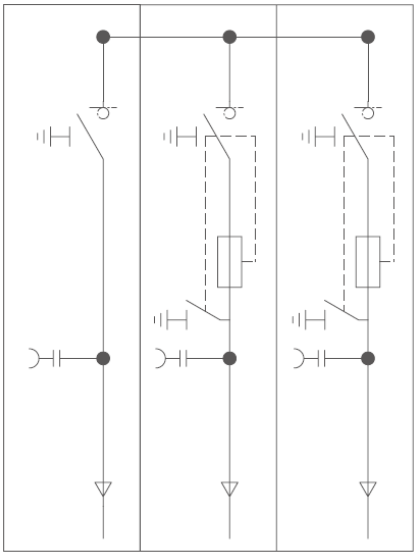

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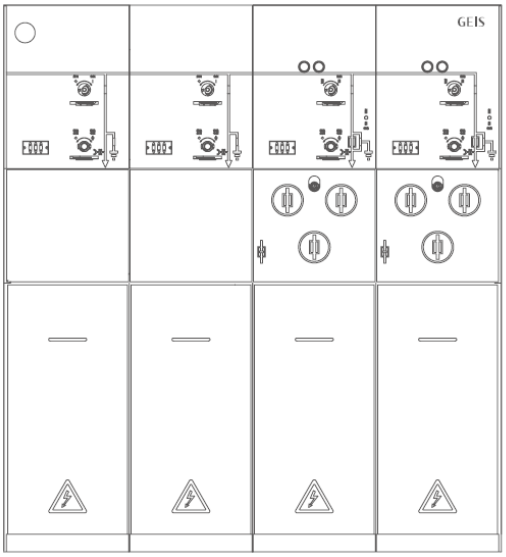
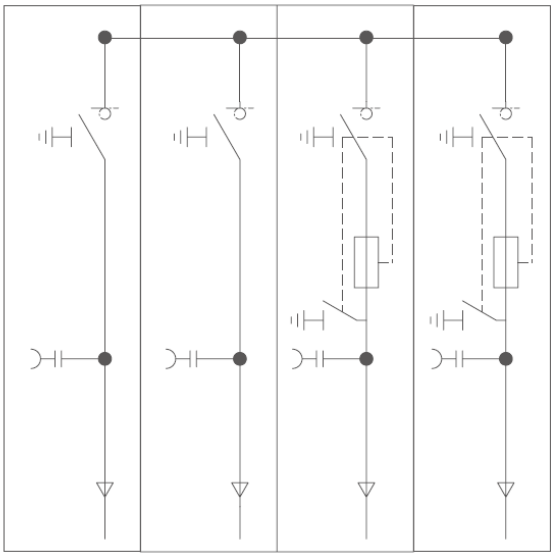
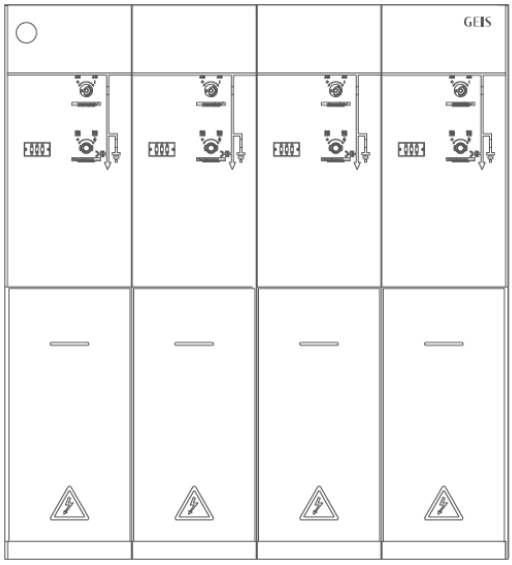


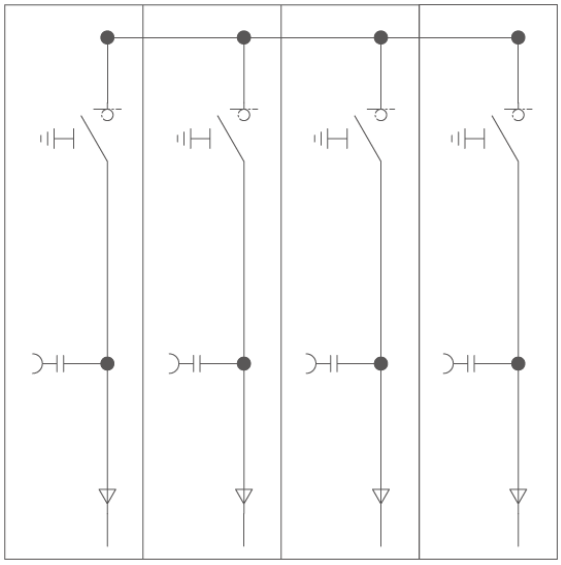


Combination Block Type

Typical Diagram

CCCC





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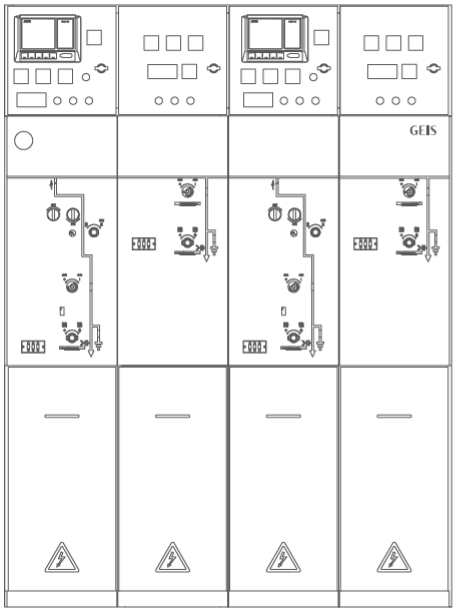
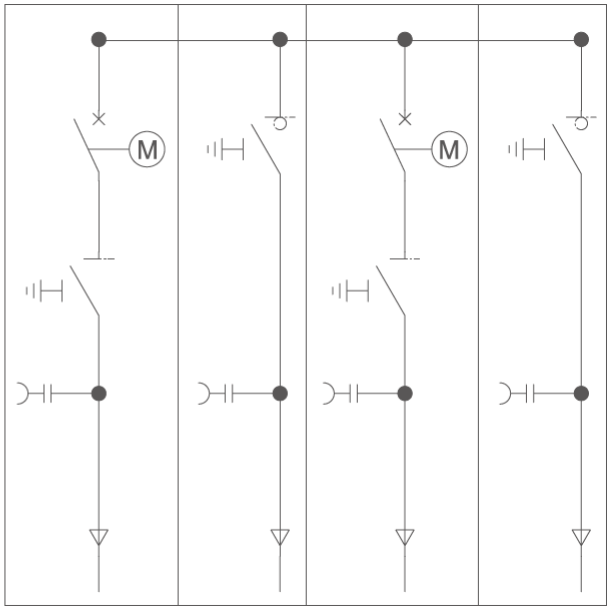




ATS Switch Cabinet (dual power supply)

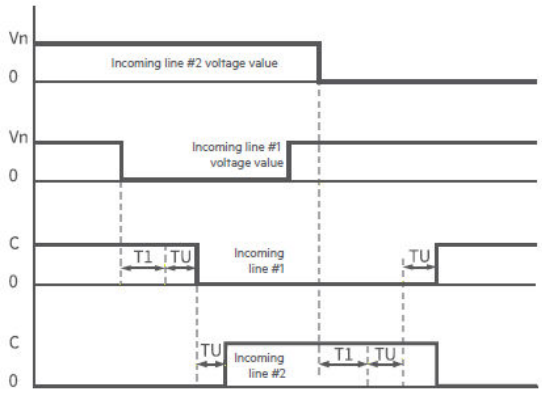
Description of Solution

- For various action logic modes of the ATS Switch Cabinet, the device automatically recognizes external access signals, and the device software automatically completes all action logic processes according to the status of the received signal, without operator intervention.
- If the action logic fails to operate normally during automatic charge and automatic recovery operation due to external reasons (e.g., jamming of the mechanism, poor contact of the switching auxiliary contact, etc.), the device will automatically report an automatic charge (or automatic recovery) failure signal after a delay of 10s.
- The operating power supply of the device isD C220V, which is provided by the power module.U nder normal conditions, the power supply is supplied to the power module by the external AC power, and when the AC power is cut off, the power supply is supplied to the power module by the battery as backup power.
- The two incoming lines are electrically blocked, and only one of the two incoming lines can be combined.
- When incoming line #1 fails, it will be automatically switched to incoming line #2 through the automatic switch device.

Operation modes for switching between the two medium voltage network power supplies:

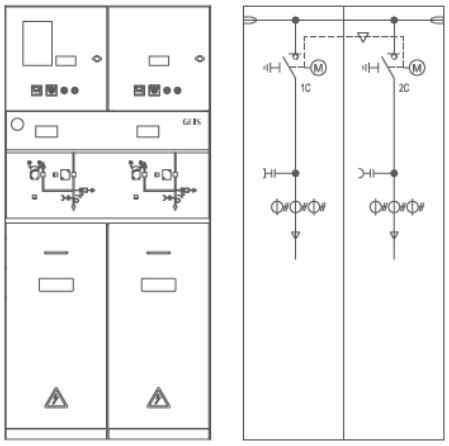
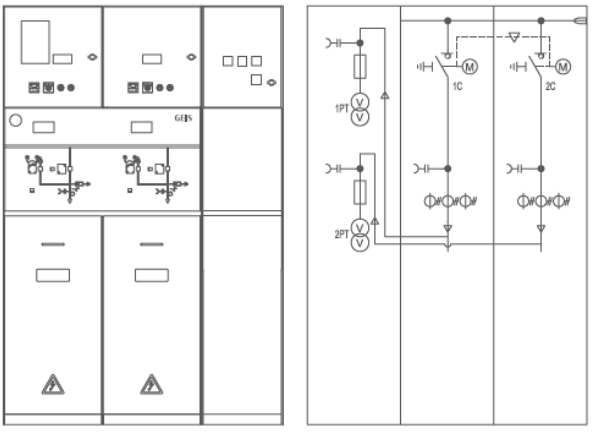
1. Automatic incoming line #1 or automatic incoming line #2 mode
   If there is a loss of voltage on the operating distribution line (incoming line #2), the ATS delays switching to the backup line
   (incoming line #1).
   [Open 2C, close 1C]
   The ATS returns to the mains (incoming line #2) as soon as voltage is restored to the mains.
   [No external spare power supply automatic charging blocking contact]
2. Semi-automatic incoming line #1 ← → incoming line #2
   If there is a loss of voltage on the line (incoming line #2), the ATS will delay switching to the backup line (incoming line #1).
   The ATS will not return to the mains unless there is a loss of voltage on the backup line.
   For all the above-mentioned action logic methods, the device automatically recognizes the external access signal, and the device software automatically completes all the action logic processes according to the state of the signal without the intervention of the operator.
   If the action logic fails to operate normally during automatic charge and automatic recovery operation due to external reasons (e.g., jamming of the mechanism, poor contact of the switching auxiliary contact, etc.), the device will automatically report an automatic charge (or automatic recovery) failure signal after a delay of 10s.

ATS Action Profile



ATS Switch Cabinet (dual power supply)

Functions and Configurations

Solution	Description of function	Primary standard configuration	Secondary accessory configuration
 ATS-V Automatic switching cabinet (dual power supply)	Two power supplies of one main and one standby. (no voltage transformer) The presence or absence of voltage is judged through the live indicator, and automatic transferring to standby power.	1. Current transformer 2. ATS device	1. Expandable left and right side 2. Terminal cover
 ATS-P Automatic switching cabinet (dual power supply)	Two power supplies of one main and one standby. (with voltage transformer) The presence or absence of voltage is judged through the live indicator, and automatic transferring to standby power.	1. Current transformer 2. Voltage transformer 3. ATS device	1. Expandable left and right side 2. Terminal cover

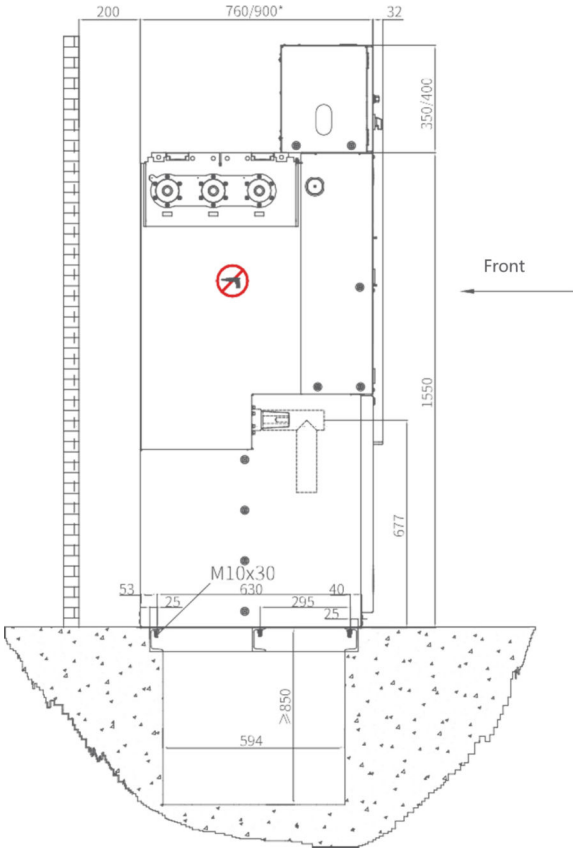
Basic Installation Diagram

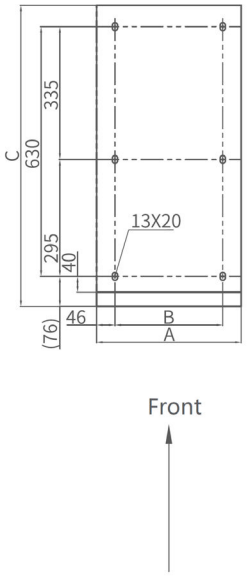
The ground foundation construction of the installation of the switch cabinet shall comply with the provisions of the connection betweenthe cabinet and the channel steel in the “Technical Specification for the Construction and Acceptance of Electric Power Construction” to ensure the installation quality.

The technical reauirements for the installation of the basic channel steel frame are that the alowable error is not more than imm/m, and thetotal length deviation is ± 3mm.

For the basic frame structure, see the against-wallinstallation foundation detailed drawing and off-wall installation plan diagramThe installation foundation of the switch cabinet is aenerally divided into secondary pouring concrete, The first is the installation base ofthe switch cabinet, and the second is the ground supplementary laver.The general thickness is 60mm, and the height of the supplementarylayer should be 1~3mm lower than the basic channel steel.

12kV 630-20





Dimension mm / Type	C	F	CB	CI	D	CPT	AM
A	362	362	362	462	362	400	800
B	270	270	270	370	270	308	708
C	760	760	760	760	760	760	900

3AE Protective Relay

GALAXY 3AE series protection and management device is the next generation of microcomputer measurement and control integrated protection device launched to meet the requirements of the development of substation automation technology. The device adopts dual CPU structure and are able to complete the operations of protection, measurement, control and remote communication of the circuit. The device is simple and practical in structure, safe and reliable in operation.

Product Features

- Adopting anti-vibration, wide-temperature, dust-proof sealing and “one-to-one” design principle, it can be installed in the switchgear unit in a decentralized manner or be configured through combined screen in a centralized manner
- Adaptable to harsh on-site operating environments, EMC up to level 4
- A wide range of power supply, 100-250VDC or 85-276VAC, 50Hz (DC48V optional)
- Equipped with large white screen and Chinese language interface, and intuitively presenting dynamic single line diagrams and histograms
- Multifunction buttons provided for convenient panel operations by the users
- Two sets of settings that can be switched manually or automatically
- Capable of measuring various parameters such as current, voltage, power, power factor and energy.
- One RS485 communication interface that can transmit information, and one RS232 communication interface on the front panel for testing, with communication protocol MODBUS-RTU
- Eight passive switch inputs, four electrical pulse inputs (can be defined as switch inputs), and six switch outputs. Most of which can be customized and programmed
- One analog output, applied to DCS system
- Capable of recording 100 power outagw events in 1ms resolution

GEIS

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