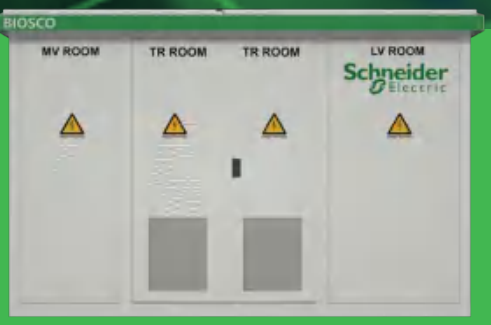
BIOSCO
HV/LV Prefabricated Substation



https://www.se.com/cn

Life Is On

Schneider Electric
施耐德电气



About Schneider Electric

The purpose of Schneider Electric is to **empower all to make the most of our energy and resources, bridging progress and sustainability for all.** We call this Life Is On.

Our mission is **to be your digital partner for sustainability and efficiency.**

We **drive digital transformation** to serve the home, building, data center, infrastructure and industrial markets. We integrate world-leading processes and energy management technologies and provide end-point to cloud integration connecting products, controls, software and services to run through the full business life cycle for integrated company management.

We are **the most local of global companies**. We are committed to advancing an open technology and partnership ecosystems, and we also actively promote **shared meaningful purpose, inclusive and empowered values**.

Schneider Electric in China

Schneider Electric has taken root in China for more than 30 years and expanded its footprint to more than 300 cities across the country, which has become the second largest market for Schneider Electric globally.

Schneider Electric China has:

- More than 18,000 employees, including over 2,000 R&D engineers and over 300 technical service engineers
- One China headquarters in Beijing, 12 branches and 33 offices
- 5 R&D centers and one Schneider Electric Training Institute
- 29 factories and logistics centers
- More than 1,100 distributors and 1,600 local suppliers

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Overview



Prefabricated substation is defined as an equipment that has been type-tested and used to transmit power from high-voltage system to low-voltage system or from low-voltage system to high-voltage system. It usually comprises of the transformer installed in the enclosure, LV and HV switchgear, connecting wire and auxiliary equipment. Such substation is installed in places easily accessible to the public and conforms to the specified service conditions, to ensure personal safety.

This means that, apart from the specified properties, rated value and relevant test procedures, special attention should be paid to the provisions on personal safety, including the operator and general public. Such protection is guaranteed by the adoption of type-tested components, rational design and enclosure structure.

The correct design and performance of prefabricated substation are verified by relevant type tests specified in GB/T17467-2020 or IEC62271-202:2014, including internal arc fault test.

Schneider Electric applies its mature power distribution technology in BIOSCO prefabricated substation and has supplied nearly 200,000 sets to various regions worldwide relying on nearly 60 years of design, installation and operation experiences. The product is widely used in industrial park, residence community, commercial real estate, public place, airport, wharf, school, hospital as well as construction site, mine, oilfield and other sites. Meanwhile, targeted at the special schemes and purposes of some segments, Schneider Electric has launched other solutions such as dual-transformer prefabricated substation and container prefabricated substation.

Overview

High reliability & safety

- Through verification by internal arcing fault (IAC-AB) resistance test, it can protect the personal safety of on-site operation and maintenance personnel to the largest extent.
- Professional modeling and simulation analysis, and verification by professional special environmental test.
- With C4H/C5M anti-corrosion design employed, it can adapt to the application requirements of various extreme environment such as desert, water surface and mountain.

Verification by whole set of type tests

- Meeting IEC62271-202/GB17467-2020

Fast track, professional execution

- Prefabrication, pre-test and pre-configuration, with no internal wiring or communication configuration required on site
- With intelligent design, it can be managed locally and controlled remotely, with site check reduced by more than 50%.
- Turnkey mode, greatly shortening the project delivery period, realizing rapid grid connection and improving the income of power plant.

Convenient transportation

- 20'HC/40'HC ISO standard container design, facilitating transportation
- The container body has maritime certification.
- Stackable, saving transportation cost.

Global service

- Professional global service, providing one-stop uninterrupted support, guaranteeing stable operation of equipment.

Low operation cost in the life cycle

- Complete set of MV and LV Schneider products, with excellent performance
- Verification by type test, and enclosure of box transformer as high as grade 10K, efficient and energy-saving
- The overall service life up to 25 years

Service conditions

- **Altitude:** ≤ 2,000 m;
- **Ambient temperature:** 40°C (highest), -25°C (lowest), with the highest daily average temperature not exceeding 35°C;
- **Relative humidity:** The daily average relative humidity shall not exceed 95%, and the monthly average relative humidity shall not exceed 90%;
- **Outdoor wind velocity:** not exceeding 34 m/s;
- **Ground inclination:** not greater than 3°;
- **Solar radiation:** not greater than 1200 W/m2;
- **Installation site:** no obvious pollution in the ambient air, such as corrosive or combustible gas, or water vapor; no explosion hazard, chemical corrosion or violent vibration;

Note: It should be used in the normal outdoor service conditions conforming to the requirements of GB/T 11022-2020 (IEC 62271-1:2017). If the condition is beyond the standard requirement, please contact with Schneider Electric for confirmation.

Model description



Note: The transformer capacity must be smaller than or equal to the capacity corresponding to the enclosure form.

Technical parameters

	Item		Unit	Parameter			
HV unit	Rated frequency		Hz	50			
	Rated voltage		kV	7.2	12	24	40.5
	Rated current		A	630, 1250			
	Rated short-time withstand current		kA	~20			
	Rated peak withstand current		kA	~50			
	Power frequency withstand voltage	To ground and interphase	kV	32	42	55	95
		Isolating fracture		36	48	60	118
	Lightning impulse withstand voltage	To ground and interphase	kV	60	75	95	185
		Isolating fracture		70	85	110	215
Transformer unit	Rated voltage		kV	6	10	20	35
	Rated capacity		kVA	~ 8000			
	Tapping range		%	±2X2.5%, ±5%			
	Bonding group			Dyn11, Dy11			
	Impedance voltage		%	4, 4.5, 6, 8			
LV unit	Rated voltage		V	220, 380, 690, 800			
	Rated current of main circuit		A	~4000			
	Branch current		A	~800			
	Rated short-time withstand current of main circuit		kA	~65			
	Rated peak withstand current of main circuit		kA	~110			
Box	IP rating			HV compartment: ~IP54 LV compartment: ~IP54 Transformer compartment: ~IP23			
	Noise level		dB	≤50			
	Temperature rise level			~10K			

Typical equipment configuration and intelligent functions

Ring main unit can realize:

- Temperature rise monitoring
- Partial discharge monitoring
- Monitoring of circuit breaker characteristics
- Gas pressure monitoring
- Health diagnosis
- Abnormal warning



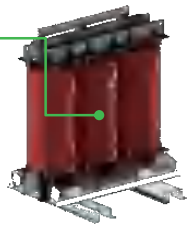
RMX

MV ring main unit

- Green and environment-friendly
- Intelligent and efficient
- Safe and reliable

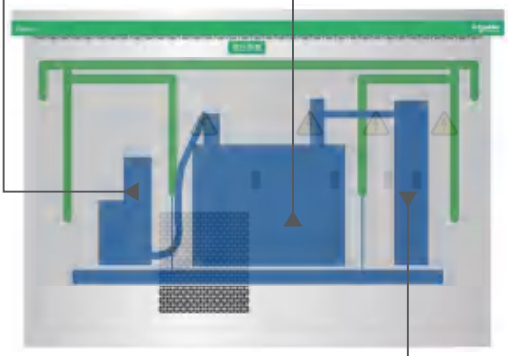
Transformer can realize:

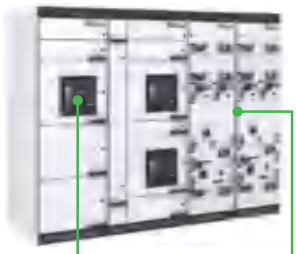
- Asset management
- Local temperature display
- Life analysis
- Abnormal alarm



Energy efficiency of Trihal NX

Cast-resin dry type transformer can meet the latest standards in GB 2005 2-2020, extremely energy-efficient.





Intelligence LV distribution cabinet

- Interconnectivity: standard TCP/IP Ethernet communication architecture
- Reliable protection: line short circuit protection, arc light protection
- Intelligent control: motor protection, automatic control, logic controller;
- Warning and diagnostic analysis: short-circuit tester, industrial machine for warning and diagnosis, wireless contact temperature rise and environment test
- Remote O&M management: scan the QR code for access and query, private identity, label



MTZ new digital frame circuit breaker

- Aging analysis
- Upgrading of digital module at any time
- Supporting mobile phone Bluetooth and NFC communication
- Digital module
- Ultra-accurate measurement of power (to 1%)



NSX moulded case circuit breaker

- Double rotating contacts structure and reflex tripping function
- Intelligent module expandable
- Integrated electronic residual current circuit breaker with overcurrent protection
- Heavy-current thermal magnetic breaker
- Aging analysis
- Indication contact wear

Ring main unit

	 RM6-S	 RM6	 Premset	 RM AirSeT	 Flusarc
Insulation and arc mode	SF6 insulation Vacuum arc	SF6 insulation SF6 arc	Solid insulation Vacuum arc	Dry air insulation SVI vacuum arc technology	SF6 insulation Vacuum arc
Rated current	~630A	~630A	~1250A	~630A	~630A
Rated voltage	12kV/24kV	12kV/24kV	12kV	12kV/24kV	36kV/40.5kV
Short-time withstand level	~20kA/1s	~20kA/4s	~31.5kA/4s	~20kA/4s	~25kA/4s
Dimensions / mm	Width: 360~1,996 Depth: 720/752 Height: 1,380	Width: 572~2,000 Depth: 670 Height: 1,142	Width: 375/750 Depth: 910 Height: 1,350	Width: 420 Depth: 850 Height: 1,650	Width: 450 Depth: 550 Height: 2,200
Features	It can realize 6 function units in one box at most - diversified solutions	It is capable of free combination, more flexible solution use - grounding visualization	It adopts shielded solid insulation, more environment-friendly, more tolerant in harsh environment - modular architecture, flexible solution configuration - no need for derating at 5,000 m high altitude	It satisfies the standardized design requirements - 3 station load switches, operation habit keeping - combination appliances & circuit breaker function optional - it can realize 6 function units in one box at most - diversified solutions	New upgrade of products. It owns the characteristic appearance design of Schneider and supreme environmental adaptability, fully adapts to high-altitude service environment, has more diversified configuration schemes and supports 3 units in one box.



Product features

- Low loss, energy-saving type conforms to the energy efficiency standard in the latest GB20052-2020.
- Low noise, meeting GB and IEC standards
- C4-E4 environment/climate test
- Excellent fire resistance
- High reliability of global operation qualification
- High lightning impulse resistance level (95 kV for 10 kV products)



Intelligent dry type transformer

- Take preventive measures and improve the operation and maintenance initiative
  - Warning: overload, overtemperature
  - Prediction: load energy consumption, equipment aging, and power quality problem
  - Prevention: abnormal power failure, accident spreading, and accurate fault location

- Refined management, improving the high efficiency of operation system
  - Asset: asset filing, quick asset check, and asset assessment
  - O&M: standardizing workflow, tracking the O&M process and filing the handling scheme
  - Intelligence: network equipment integration, automatic system combination
  - Analysis: big data collection, intelligent application combined with expert advisor service

Technical Parameters of New NX1 Series 10 kV Distribution Transformer

Technical parameters										
Rated capacity (KVA)	315	400	500	630	800	1000	1250	1600	2000	2500
Rated primary voltage	6, 6.3, 6.6, 10, 10.5, 11 kV									
Rated insulation level	7.2 kV at 6 kV - 12 kV at 10 kV									
Frequency	50HZ									
Maximum ambient temperature	40°C									
Secondary no-load voltage	400V / 415V / 433V									
HV tap	± 2 * 2.5 %									
Bonding group	Dyn11 or others									
No-load loss (W)	510	570	670	750	875	1020	1205	1415	1760	2080
Load loss st 75°C (W)	2729	3135	3834	4686	5472	6389	7616	9218	11358	13489
Load loss st 120°C (W)	3125	3590	4390	5365	6265	7315	8720	10555	13005	15445
Rated impedance voltage Uk (%)	4	4	4	6	6	6	6	6	6	6
No-load current I0 (%)	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4
Noise level DB (A)	35	35	38	38	39	39	43	43	45	48
Weight (kg)	1730	2090	2450	2600	3030	3640	4280	5350	5240	7300

Switch components



Switchgear components

Masterpact MT air circuit breaker

Masterpact MT circuit breaker of Schneider Electric provides protection and control functions for 800-6,300 A LV circuits. It falls into fixed type and withdrawable type. Masterpact MT circuit breaker is equipped with a control unit used to protect LV circuit and provide indication and measurement functions.
For more information, please refer to the Product Catalog of Masterpact MT.



Masterpact MTZ frame circuit breaker

Masterpact MTZ frame circuit breaker can satisfy your future power distribution requirements relying on the legendary performance, reliability and safety of Masterpact series products unprecedentedly, and is capable of intelligent wireless connection and remote monitoring, and can realize customization via digital module in an easy and fast manner.
For more information, please refer to the Product Catalog of Masterpact MTZ frame circuit breaker.
Masterpact MT frame circuit breaker provides protection and control functions for 630 A-6,300 A circuits and is equipped with intelligent control unit with indication, measurement and communication functions.



PowerTag NSX wireless power measurement module

PowerTag NSX wireless power measurement module is dedicated for Compact NSX moulded case circuit breaker. PowerTag NSX can be used to collect the electrical parameters of single Compact NSX circuit breaker during operation, and transmit to PowerTag Link SI B of gateway via Zigbee communication protocol in a wireless manner.
PowerTag Link SI B gateway can collect the data uploaded by at most 12 sets of PowerTag NSX, and the OF/SDE state parameters of circuit breaker can be accessed to the interface of PowerTag Link SI B (7 sets) via hardwiring; and 1 set of PowerTag Link Modbus can be expanded to read the OF/SDE state of circuit breakers via hardwiring (5 sets).



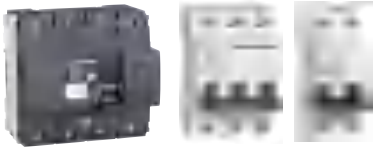
FDM128 cabinet door display screen

FDM128 cabinet door display screen of Schneider Electric can realize the control and monitoring of frame circuit breaker, moulded case circuit breaker and miniature circuit breaker, as well as the digital and graphical display of electrical parameters and circuit breaker interface.



Compact moulded case circuit breaker

Compact circuit breaker of Schneider Electric covers all the rated value from 15 to 3,200 A.
For more information, please refer to the Product Catalog of Compact.



ACTI 9 miniature circuit breaker

ACTI 9 circuit breaker of Schneider Electric covers all the rated value from 1 to 125 A.
For more information, please refer to the Product Catalog of ACTI 9.

Switch components



Acti 9 surge protector

Acti 9 surge protector covers Type I and Type II surge protectors.
Iimp of Type I surge protector is 12.5 kA/20 kA, and Imax of Type II surge protector is 10 kA-120 kA.
Comply with GB 18802.1-2011 standard.
For more information, please refer to the comprehensive product catalog of surge protector.



Tesys motor circuit breaker

Motor circuit breaker products fall into 4 series:
GV2 total current 0.1-32 A, GV3 total current 9-80 A, GV4 total current 0.1-115 A, Tesys U “Integrated” motor protector, which integrates protection and communication functions. For more information, please refer to the Product Catalog.



Tesys contactor

The two series of contactor are used for motor control:
D series for 09 to 620 A (AC-3), F series for 115 to 1,000 A (AC-3)
For more information, please refer to the Product Catalog.



Tesys thermal protection relay

Three series of thermal protection relay:
LRD series for 0.1-630 A (bimetal elements), LR9D series for 0.1-150 A (ELE), LR9F series for 30-630 A (ELE).
For more information, please refer to the Product Catalog.



Varplus CAN reactive power compensation system

Varplus CAN LV reactive power compensation system comprises of Varplus CAN LV capacitor, reactor and Varlogic power factor controller.
Varplus CAN capacitor has a complete range of specifications and can satisfy pure capacitance compensation applications and distribution reactor compensation applications; with high self-healing properties, it can meet relevant IEC and GB standards; compact in dimensions, small in size and simple in installation, it owns unique anti-shock terminal and is easy for maintenance.



VCK-M LV reactive power compensation module

VCK LV reactive power compensation module is composed of LV capacitor, tuned reactor, contactor, combined fuse disconnecting switch, bus system and corresponding mounting structures by integration.
All core components are from Schneider, which guarantees overall high performance of products; they are assembled at Schneider factory, strictly observe Schneider industrialization system and quality assurance system, pass CCC (China Compulsory Certification) and adapt to various cabinet width requirements.



ON7550/7650 series power quality monitoring device

At important power transmission point and sensitive load point, ION7550 and ION7650 devices provide unparalleled powerful functions, including advanced power quality analysis, high-precision measurement, multi-communication options, and webpage compatibility and control functions. With multi-communication ports and multi-communication protocols, it can access to Struxure Ware energy management system software or share the operation data with the existing SCADA system.



PM800 series power meter

PM800 series power meter is a high-performance monitoring instrument that can provide various measuring functions required by the electrical equipment monitored. It is equipped with readable large LCD display and can monitor three-phase and neutral wires. The display features light rejection and anti-scraping, with menu of homing function on the intuitive interface.



PM5000 series power meter

PM5000 series power meter is a brand new series of meters. Its rich electrical measurement functions, comprehensive power and power quality monitoring, vivid graphics and diagrams, multiple digital I/O ports and communication protocols, and bright and antireflective display make the power meter the ideal choice for power monitoring and management.



iEM3000/PM3000 series DIN-mounted power meter

Cost-effective schemes covering high-precision power measurement, multiple electrical parameter measurement, and submetering; perfect coordination between standard DIN mounting method and 4-pole miniature circuit breakers; small and compact, and can be easily mounted in distribution boxes to easily fulfill power monitoring reform; RS485 communication interface and pulse output port for selection to easily form the power management network.



DM6000/PM1000 series power meter

DM6000/PM1000 series products are the full-functional power meter of PowerLogic power monitoring system, with advanced measurement function. They can be used for monitoring the main feeder circuit and branch circuit as well as the combined generator set supporting communication function. DM6000/PM1000 series is cost-effective. The meter is easy for mounting and can provide visual display, so it is the ideal choice for monitoring control cabinets, motor control center and generator sets.

Switch components



ATMT automatic power transfer system

Designed specially for the power incoming line side, support automatic transfer of 400A-6300A power with the rated voltage below AC415V, and provide excellent transfer control function and stable protection function.

Meet the requirement of most incoming line schemes, support both the traditional dual-power transfer (2A/2B controller) and the incoming line power transfer system (3A/3B controller) of “two incoming lines and one bus coupling” for single busbar segmented connection and can provide the unique three-power automatic power transfer system (TA/TB controller);

Besides the conventional transfer function, it supports parallel switching function (2B/3B/TB controller) required in power plants and industrial fields to comprehensively ensure uninterruptible power supply for special occasion.

For more information, please refer to sample SCDOC1432 of ATMT products.



WOTPC automatic transfer switches

WOTPC automatic transfer switches are the new generation of special PC-level transfer switches, with current ratings of 32-4000A. Comparing with the global similar product, it is of high performance and small volume and is mountable in standard cabinets; it supports neutral line overlapping switching to ensure continuous and stable power supply for distribution system and load jointly with UPS. Its industrial controller can guarantee reliable operation of products in multiple distribution environment; its three kinds of switching modes can meet different needs on power switching in different industries and of different loads.

For more information, please refer to sample SCDOC1858 of WOTPC products.



ATNSX automatic transfer switches

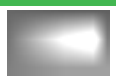
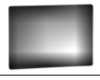
ATNSX automatic transfer switches are CB-level products, with Compact NSX MCCB used, and covering the current ratings of 16-630A. Its integrated design greatly improves the product reliability. Its diversified types of trips can meet different needs on distribution application and generator protection.

ATNSX provides three working modes of auto transfer–auto return, auto transfer–no return and mutual standby, and four switching modes of auto switching, manual switching, keying switching and remote control switching.

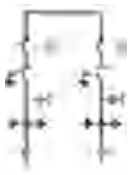
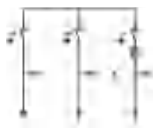
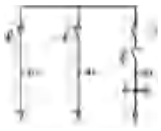
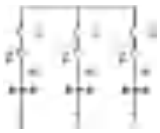
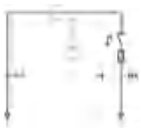
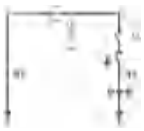
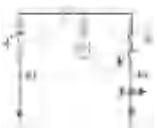
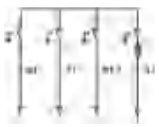
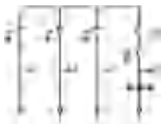
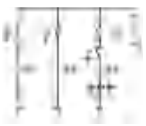
The power isolation protection module of ATNSX provides isolation and protection function for primary and secondary power supply, which significantly improves the EMC and is applicable to be used in complex industrial environment.

For more information, please refer to Product Catalog of ATNSX.

Intelligent components

Picture	Product model	Name and function overview
	POI station control expert	Software and hardware integrated intelligent distribution terminal; fulfill active operation and maintenance on distribution station site.
	Digital panel	Intelligent panel kit; used for loss-of-voltage detection, temperature rise alarm, and cloud data pushing.
	EcoStruxure Panel Server Box	Full-function cloud gateway; provide interface and protocols for device access, transmit data to cloud via 4G, WIFI and wired network, provide device access and data cloud solutions in universal MV and LV distribution room.
	EcoStruxure Panel Server Hub	Locally accessed border gateway; provide multiple interface and protocols for device connection to fulfill device concentration in areas and finally transmit data to cloud gateway or local application.
	EcoStruxure Panel Server Cloud	Lightweight cloud gateways; provide cloud solutions at low costs for Sensor, PowerTag and other Zigbee devices.
	Thermal Tag series wireless temperature measuring sensor	A customized temperature measuring sensor based on all-wireless architecture
	IFE1	Circuit breaker Ethernet interface module; can be connected to a single MT/MTZ frame circuit breaker or a NSX moulded case circuit breaker.
	IFE	Ethernet interface intelligent gateway; can be simultaneously connected with a MT/MTZ frame circuit breaker or multiple NSX moulded case circuit breakers as well as iEM33**, PM3** and other meters.
	EIFE	Built-in Ethernet interface of MTZ circuit breakers.
	I/O	I/O intelligent application module; acquire and upload the ON/OFF state of circuit breakers.
	IFM	Modbus communication modules of circuit breakers; it is applicable for a single NSX moulded case circuit breaker to transfer ULP into Modbus protocol.
	PowerTag Link D type	Ethernet intelligent terminal, Zigbee wireless communication; can simultaneously support 20 PowerTag devices under wireless communication. Din mounted.
	PowerTag Link B type	Ethernet intelligent terminal, Zigbee wireless communication; can simultaneously support 20 PowerTag devices under wireless communication, provide 7 digital interfaces and can monitor the ON/OFF state of circuit breakers or used for terminal distribution remote control.
	PowerTag NSX	Wireless energy measurement modules for NSX moulded case circuit breakers; can support the maximum current of 630A.
	PowerTag FD	Wireless energy measurement modules for A9 miniature circuit breakers.
	FDM 12D	Exclusive for PowerTag for NSX scheme, and provided with a color touch screen cabinet door display unit; can simultaneously acquire the electrical parameters of a maximum of 14 devices. It is a prefabricated program and is debugging-free.
	FDM 128	Color touch screen cabinet door display unit; can simultaneously acquire the electrical parameters of a maximum of 8 devices and can fulfill the authorized monitoring function and remote web access or access on mobile APP. It is a prefabricated program and is debugging-free.
	Masterpact MTZ	The new generation of digital air circuit breaker; its linkage performance is superior and can comprehensively meet the requirement for future distribution.
	Compact NSX	Moulded case circuit breakers
	Electric instrument	It is the choice for multiple power meters, and includes PM8000, PM5000, IEM DIN mounted series; it is accurate for measurement and easy for mounting.

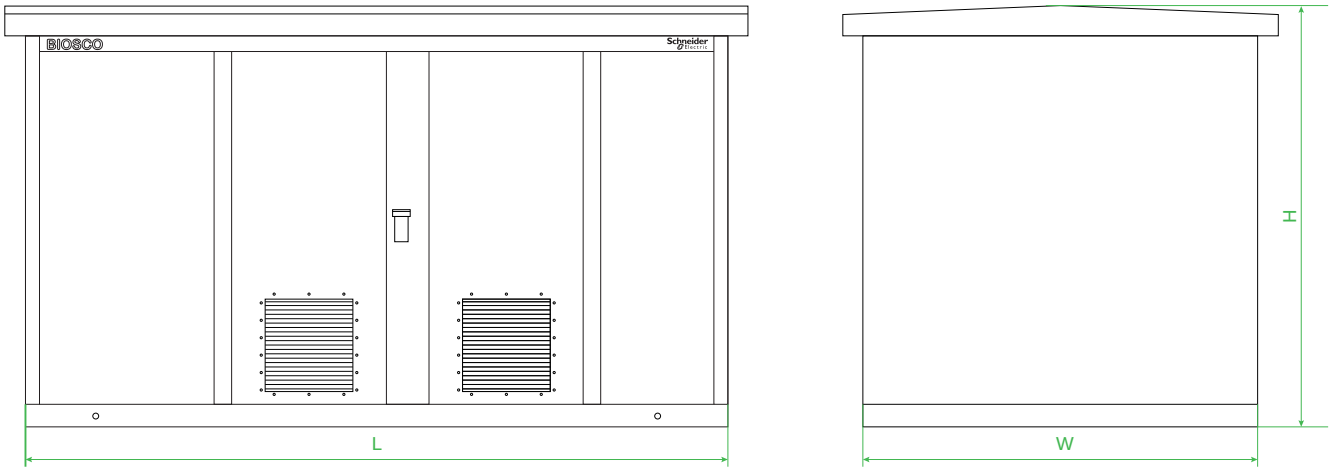
1. HV main circuit standard scheme (RM6-S)

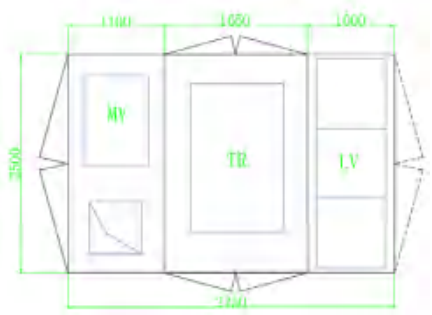
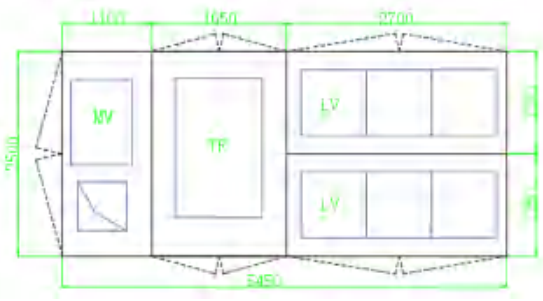
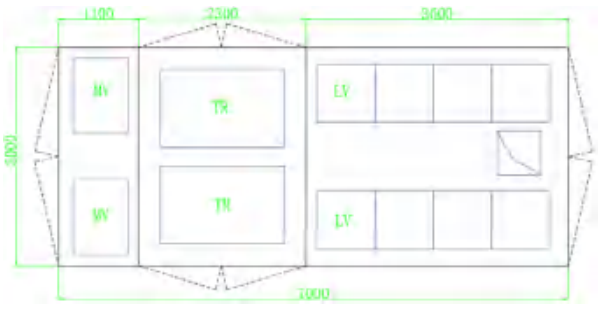
Diagram of Typical HV Main Circuit Scheme							
HV main circuit scheme No.	OQ	IQ	OB	IB	BB		
Diagram of Typical HV Main Circuit Scheme							
HV main circuit scheme No.	IIQ	IIB	BBB	OMQ	OMB	IMQ	IMB
Diagram of Typical HV Main Circuit Scheme							
HV main circuit scheme No.	IIMQ	IIMB	IIIQ	IIIB	IIQPT	IIBPT	

Note 1:
The HV scheme above is a standard scheme, and for other non-standard schemes, consult Schneider Electric (Xiamen) Switchgear Equipment Co., Ltd.;

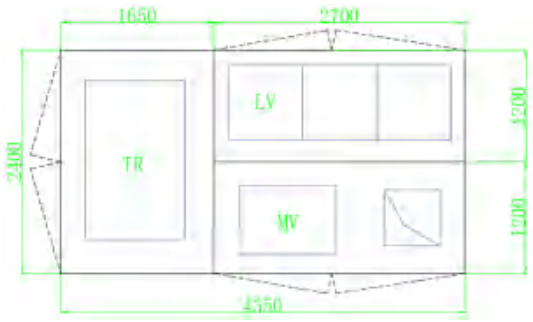
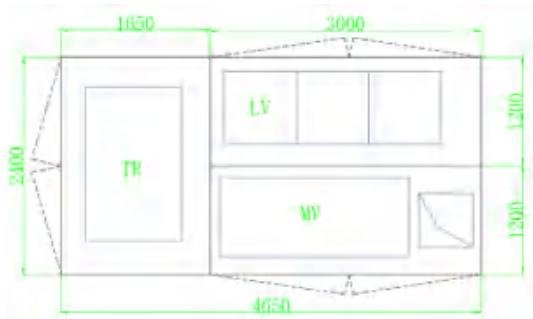
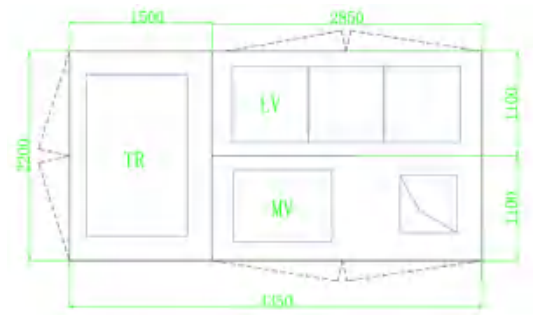
Note 2:
O - direct cable connection scheme;
Q - load switch and fuse-combination unit scheme;
I - load switch scheme;
B - circuit breaker scheme;
M - metering scheme.

2. Layout of BIOSCO prefabricated substations



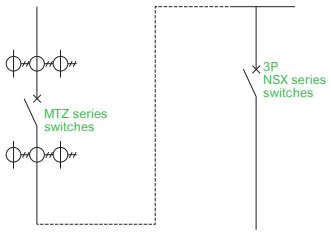
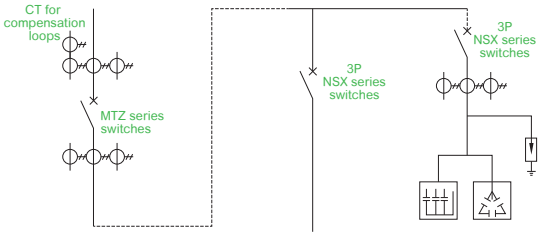
Substation layout scheme No.	Interior dimensions	Overall dimensions (mm) (L*W*H)	Appliance selection
Biosco-12-M1		3750*2500*2800	Transformer type: oil transformer/dry transformer Transformer capacity: Dry transformer ≤1250 KVA Oil transformer ≤1000 KVA HV scheme: OQ, IQ, OB, IB, BB, IIQ, IIB, BBB, OMQ, OMB, IMQ, IMB, IIIQ, IIIB LV scheme: B1250FA1, B1250FA2 Weight of box transformer: ~9t
Biosco-12-M2		5450*2500*2800	Transformer type: oil transformer/dry transformer Transformer capacity: Dry transformer ≤1250 KVA Oil transformer ≤1000 KVA HV scheme: OQ, IQ, OB, IB, BB, IIQ, IIB, BBB, OMQ, OMB, IMQ, IMB, IIIQ, IIIB LV scheme: according to the specific solution Weight of box transformer: ~11t
Biosco-12-M3		7000*3000*2800	Transformer type: oil transformer/dry transformer Maximum capacity of transformers: Dry transformer ≤1250 KVA Oil transformer ≤1000 KVA HV scheme: OQ, IQ, OB, IB, BB, IIQ, IIB, BBB LV scheme: according to the specific solution Weight of box transformer: ~19t

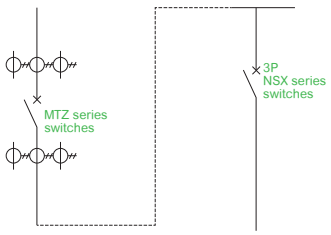
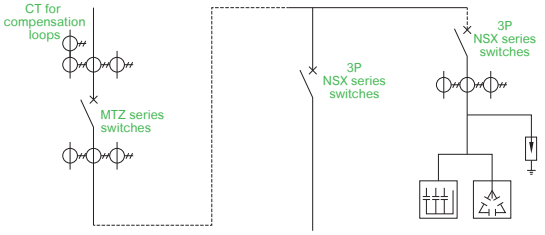
BIOSCO-12kV prefabricated substation standard scheme

Substation layout scheme No.	Interior dimensions	Overall dimensions (mm) (L*W*H)	Appliance selection
Biosco-12-P1		4350*2400*2800	Transformer type: oil transformer/dry transformer Transformer capacity: Dry transformer ≤1250 KVA Oil transformer ≤1000 KVA HV scheme: OQ, IQ, OB, IB, BB, IIQ, IIB, BBB, OMQ, OMB, IMQ, IMB LV scheme: B1250FA1, B1250FA2 Weight of box transformer: ~9t
Biosco-12-P2		4650*2400*2800	Transformer type: oil transformer/dry transformer Transformer capacity: Dry transformer ≤1250 KVA Oil transformer ≤1000 KVA HV scheme: IIMQ, IIMB, IIQPT, IIBPT LV scheme: B1250FA1, B1250FA2 Weight of box transformer: ~9t
Biosco-12-P3		4350*2200*2800	Transformer type: oil transformer/dry transformer Transformer capacity: Dry transformer ≤1250 KVA Oil transformer ≤1000 KVA HV scheme: OQ, IQ, OB, IB, BB, IIQ, IIB, BBB, OMQ, OMB, IMQ, IMB LV scheme: B630FA1, B630FA2 Weight of box transformer: ~8t

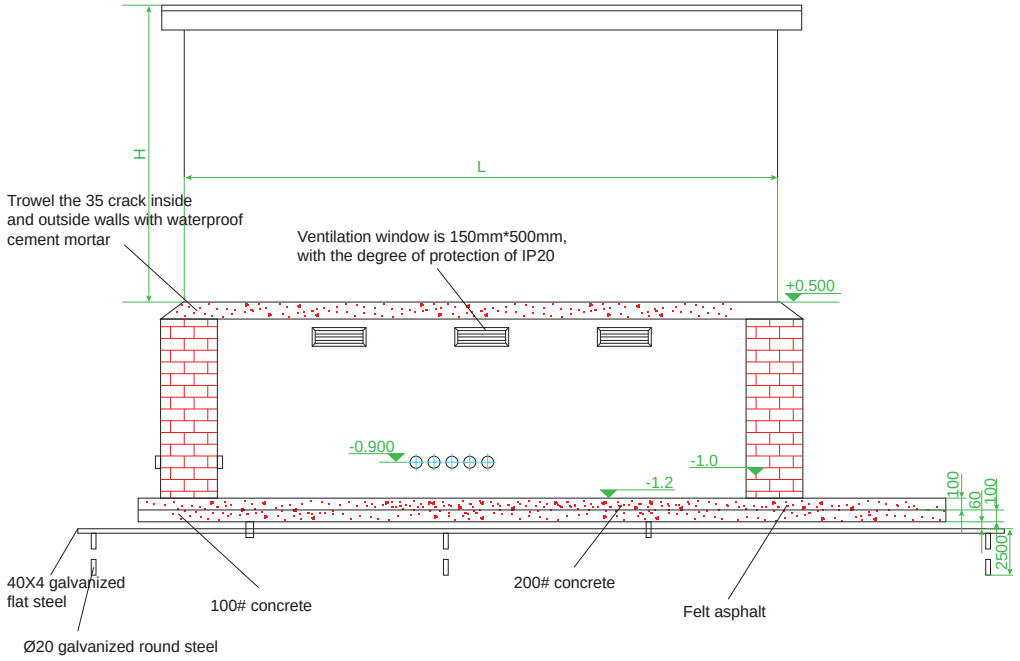
Note 1: MV - HV cabinet TR - transformer LV - LV cabinet
Note 2: For other non-typical schemes, please contact Schneider!

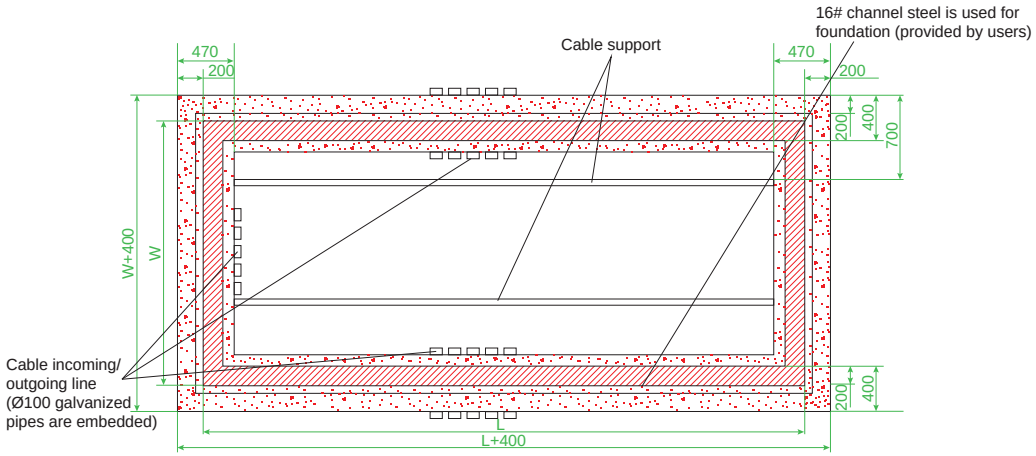
3. LV standard scheme No.

LV scheme No.		B1250FA1		B1250FA2		
Primary scheme						
Purpose		Main incoming line	Feeding power	Main incoming line	Feeding power	Reactive power compensation
Distribution output capacity (KVA)		1250		1250		
Main components	NSX-160		5		5	NSX100~630A
	NSX-250		5		5	15kVar x 2~24
	NSX-400		4		4	
	NSX-630		3		3	
	MTZ-1250	1		1		
Note						
Maximum overall dimensions of LV cabinets W×D×H (mm)		800*600*2000mm	800*600*2000mm	800*600*2000mm	800*600*2000mm	800*600*2000mm

LV scheme No.		B1250FA1		B1250FA2		
Primary scheme						
Purpose		Main incoming line	Feeding power	Main incoming line	Feeding power	Reactive power compensation
Distribution output capacity (KVA)		630		630		
Main components	NSX-160		3		3	NSX100~630A
	NSX-250		2		2	15Kvar x 2~10
	NSX-400		1		1	
	NSX-630		1		1	
	MTZ-630	1		1		
Note						
Maximum overall dimensions of LV cabinets W×D×H (mm)		800*600*2000mm	800*600*2000mm	800*600*2000mm	800*600*2000mm	800*600*2000mm

4. Diagram of Box Transformer Foundation

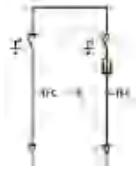
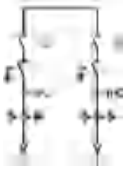
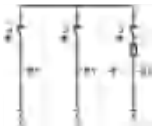
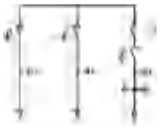
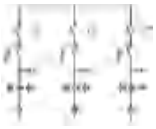




Note:

1. A guiding gutter is required in the foundation;
2. The slope extending to the soakaway pit in foundation is 3%;
3. The maintenance channel around the box transformer is no less than 1.5 m;
4. The surface of the base station contacting the bottom surface of box transformers shall be flat and smooth and shall be ±3 mm;
5. The grounding body includes horizontal grounding body (primary) and vertical grounding body (auxiliary), and the outer insulation closure buried depth is greater than 2.5 m.
6. The embedded parts for foundation of the box transformer shall be welded respectively with the grounding grid, with the welding points no less than 2;
7. The grounding resistance shall be no greater than 4 Ω and shall conform to Code for Design of AC Electrical Installations Earthing;
8. All devices to be grounded not indicated in the drawing must be constructed in strict accordance with relevant specifications;
9. The box transformer shall be laid in the center of the grounding network;
10. Ventilation holes shall be reserved on the foundation, or poor ventilation and other serious consequences will be made.

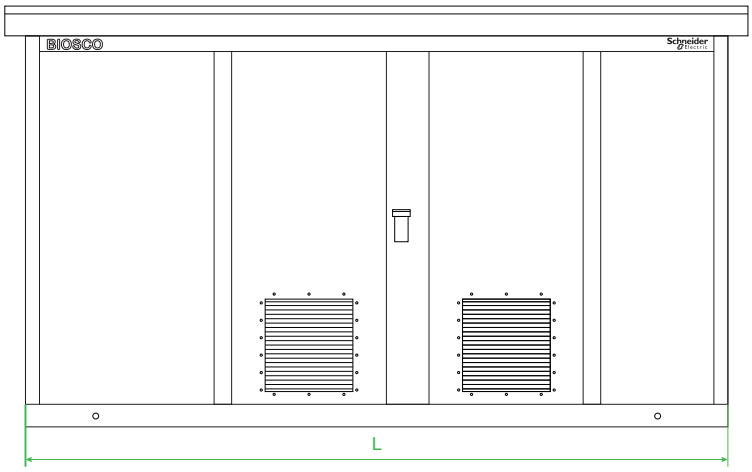
1. HV main circuit standard scheme (FBX)

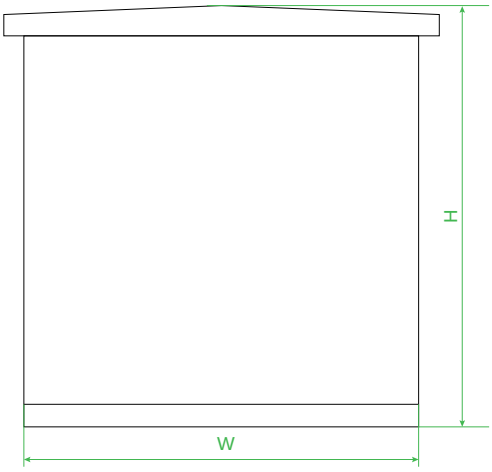
Diagram of Typical HV Main Circuit Scheme					
HV main circuit scheme No.	OQ	IQ	OB	IB	BB
Diagram of Typical HV Main Circuit Scheme					
HV main circuit scheme No.	IIQ	IIB	BBB		

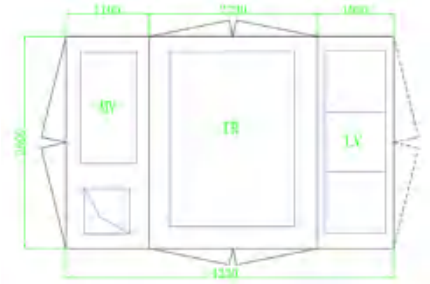
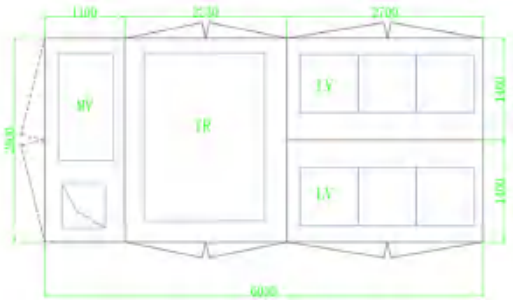
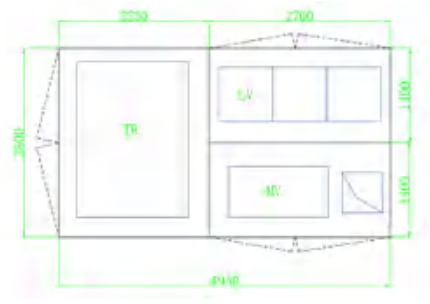
Note 1:
The HV scheme above is a standard scheme, and for other non-standard schemes, consult Schneider Electric (Xiamen) Switchgear Equipment Co., Ltd.;

Note 2:
O - direct cable connection scheme;
Q - load switch and fuse-combination unit scheme;
I - load switch scheme;
B - circuit breaker scheme.

2. Layout of BIOSCO prefabricated substations

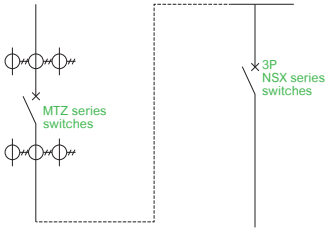
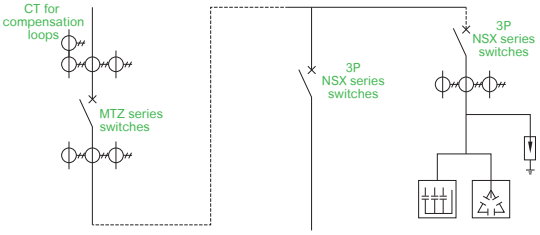


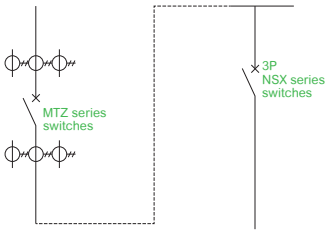
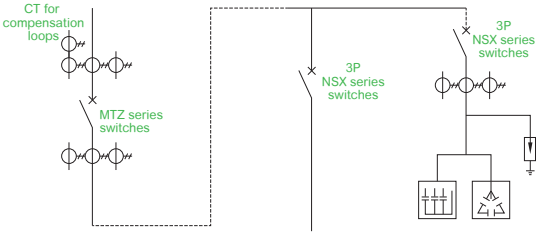


Substation layout scheme No.	Interior dimensions	Overall dimensions (mm) (L*W*H)	Appliance selection
Biosco-24-M1		4330*2800*2800	Transformer model: oil transformer Transformer capacity ≤2,000 KVA HV scheme: OQ, IQ, OB, IB, BB, IIQ, IIB, BBB LV scheme: B1250FA1, B1250FA2 Weight of box transformer: ~11t
Biosco-24-M2		6030*2800*2800	Transformer model: oil transformer Maximum capacity of transformers ≤2,000 KVA HV scheme: OQ, IQ, OB, IB, BB, IIQ, IIB, BBB LV scheme: B1250FA1, B1250FA2 Weight of box transformer: ~14t
Biosco-24-P1		4930*2800*2800	Transformer model: oil transformer Maximum capacity of transformers ≤2,000 KVA HV scheme: OQ, IQ, OB, IB, BB, IIQ, IIB, BBB LV scheme: B1250FA1, B1250FA2 Maximum weight of box transformers: ~12t

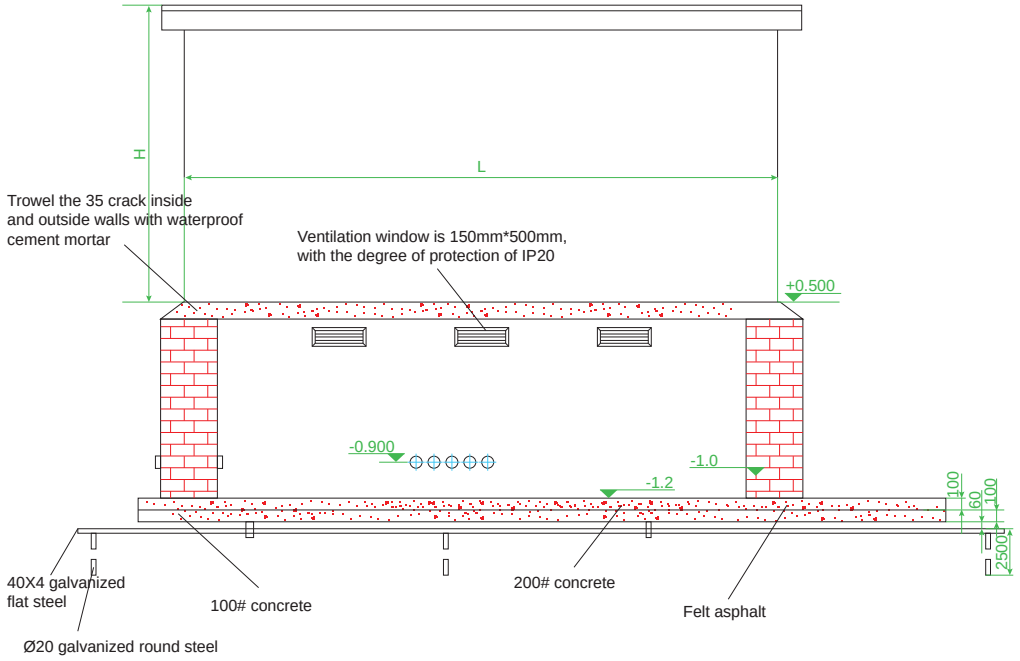
Note 1: MV - HV cabinet TR - transformer LV - LV cabinet
Note 2: For other schemes, please contact Schneider!

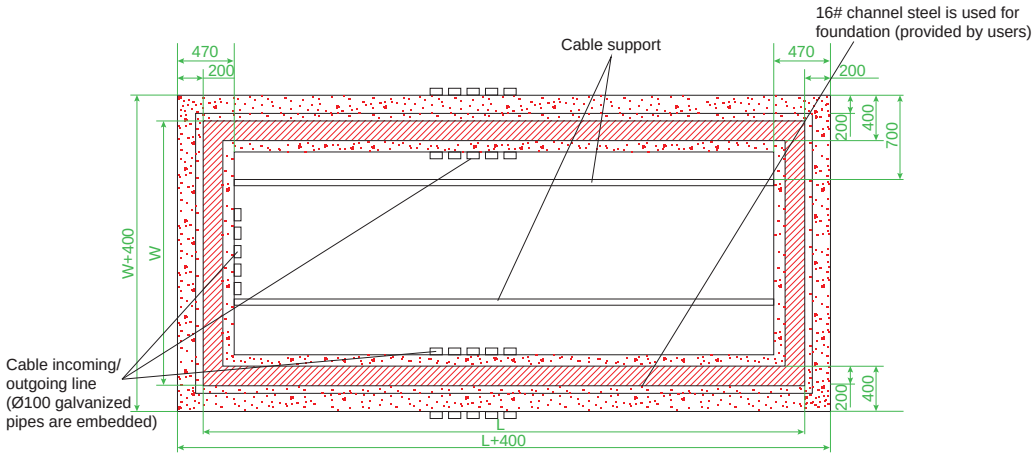
3. LV standard scheme No.

Scheme No.		B1250FA1		B1250FA2		
Primary scheme						
Purpose		Main incoming line	Feeding power	Main incoming line	Feeding power	Reactive power compensation
Distribution output capacity (KVA)		1250		1250		
Main components	NSX-160		5		5	NSX100~630A
	NSX-250		5		5	15kVar x 2~10
	NSX-400		4		4	
	NSX-630		3		3	
	MTZ-1250	1		1		
Note						
Maximum overall dimensions of LV cabinets W×D×H (mm)		800*600*2000mm	800*600*2000mm	800*600*2000mm	800*600*2000mm	800*600*2000mm

Scheme No.		B630FA1		B630FA2		
Primary scheme						
Purpose		Main incoming line	Feeding power	Main incoming line	Feeding power	Reactive power compensation
Distribution output capacity (KVA)		630		630		
Main components	NSX-160		3		3	NSX100~630A
	NSX-250		2		2	15kVar x 2~10
	NSX-400		1		1	
	NSX-630		1		1	
	MTZ-630	1		1		
Note						
Maximum overall dimensions of LV cabinets W×D×H (mm)		800*600*2000mm	800*600*2000mm	800*600*2000mm	800*600*2000mm	800*600*2000mm

4. Diagram of Box Transformer Foundation

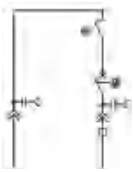
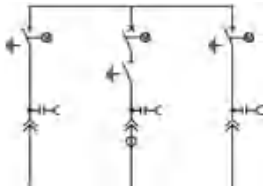
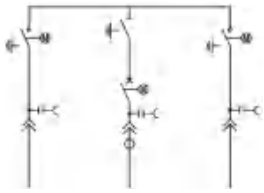
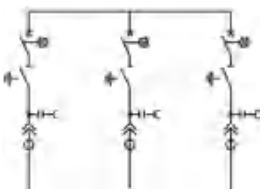
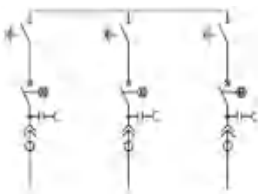




Note:

1. A guiding gutter is required in the foundation;
2. The slope extending to the soakaway pit in foundation is 3%;
3. The maintenance channel around the box transformer is no less than 1.5 m;
4. The surface of the base station contacting the bottom surface of box transformers shall be flat and smooth and shall be ±3 mm;
5. The grounding body includes horizontal grounding body (primary) and vertical grounding body (auxiliary), and the outer insulation closure buried depth is greater than 2.5 m.
6. The embedded parts for foundation of the box transformer shall be welded respectively with the grounding grid, with the welding points no less than 2;
7. The grounding resistance shall be no greater than 4 Ω and shall conform to Code for Design of AC Electrical Installations Earthing;
8. All devices to be grounded not indicated in the drawing must be constructed in strict accordance with relevant specifications;
9. The box transformer shall be laid in the center of the grounding network;
10. Ventilation holes shall be reserved on the foundation, or poor ventilation and other serious consequences will be made.

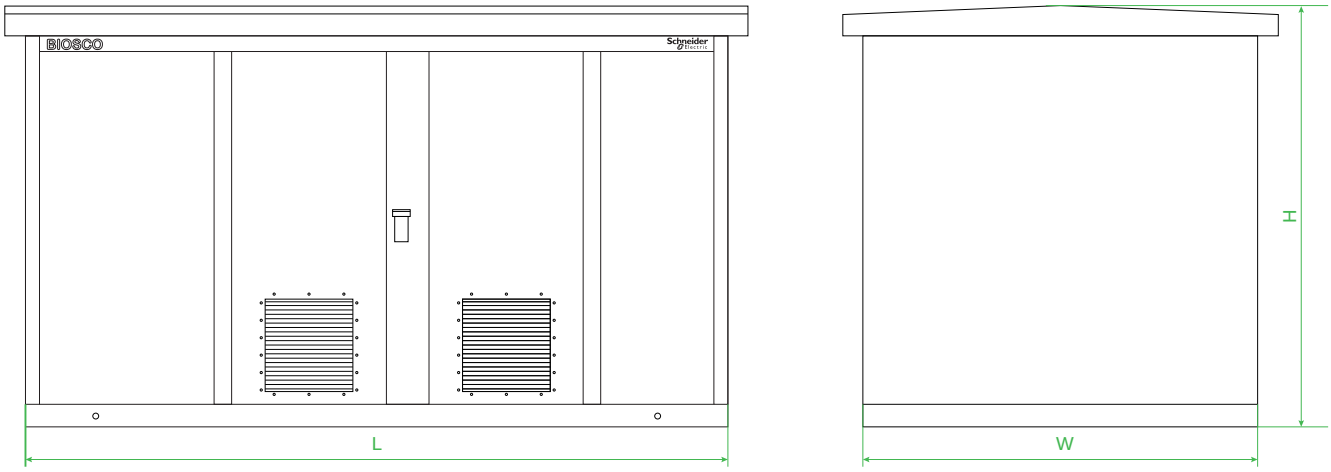
1. HV main circuit standard scheme (Flusarc)

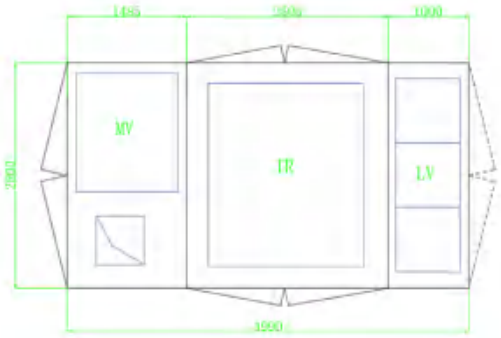
Diagram of Typical HV Main Circuit Scheme				
HV main circuit scheme No.	OB		IB	
Diagram of Typical HV Main Circuit Scheme				
HV main circuit scheme No.	IBI		BBB	

Note 1:
The HV scheme above is a standard scheme, and for other non-standard schemes, consult Schneider Electric (Xiamen) Switchgear Equipment Co., Ltd.;

Note 2:
O - direct cable connection scheme;
I - load switch scheme;
B - circuit breaker scheme.

2. Layout of BIOSCO prefabricated substations

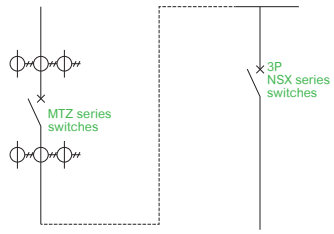
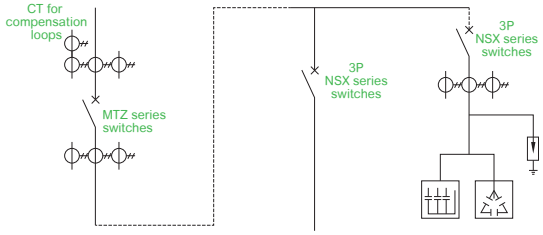
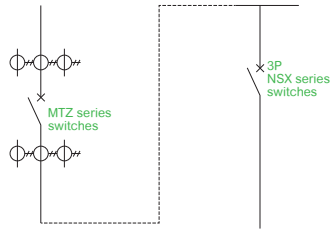
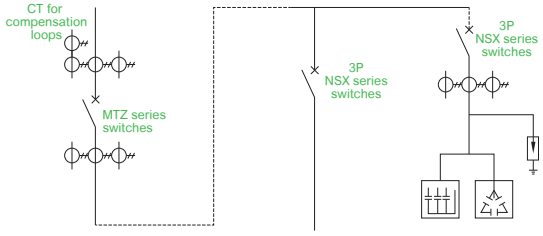


Substation layout scheme No.	Interior dimensions	Overall dimensions (mm) (L*W*H)	Appliance selection
Biosco-40.5-M1		4990*2800*3000	Transformer model: oil transformer Transformer capacity: ≤6,600 KVA HV scheme: OB, IB, IBI, BBB LV scheme: B1250FA1, 0B1250FA2 Weight of box transformer: ~22t

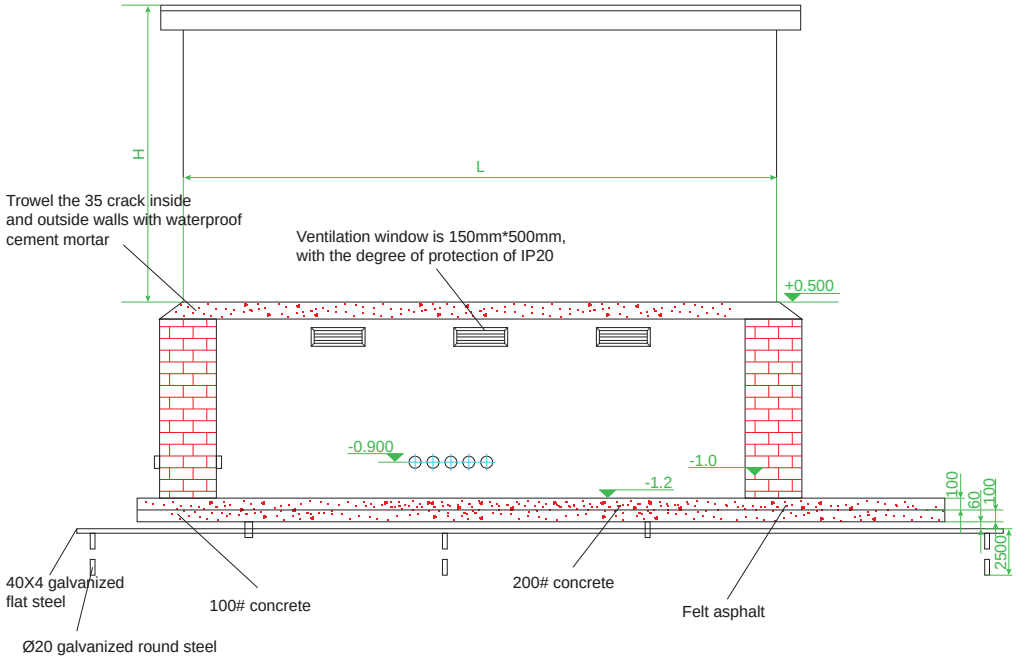
Note 1: MV - HV cabinet TR - transformer LV - LV cabinet

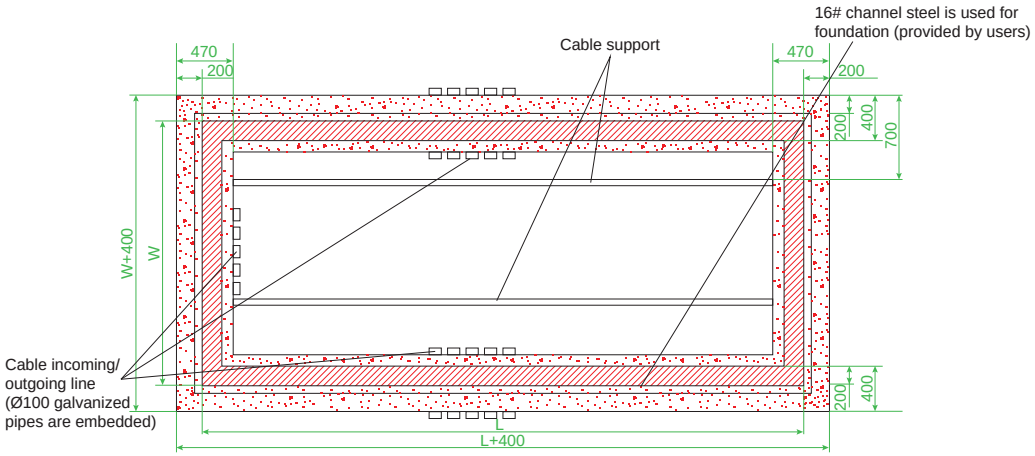
Note 2: For other schemes, please contact Schneider!

3. LV standard scheme No.

Scheme No.		B1250FA1		B1250FA2		
Primary scheme						
Purpose		Main incoming line	Feeding power	Main incoming line	Feeding power	Reactive power compensation
Distribution output capacity (KVA)		1250		1250		
Main components	NSX-160		5		5	NSX100~630A
	NSX-250		5		5	15kVar x 2~10
	NSX-400		4		4	
	NSX-630		3		3	
	MTZ-1250	1		1		
Note						
Maximum overall dimensions of LV cabinets W×D×H (mm)		800*600*2000mm	800*600*2000mm	800*600*2000mm	800*600*2000mm	800*600*2000mm
Scheme No.		B630FA1		B630FA2		
Primary scheme						
Purpose		Main incoming line	Feeding power	Main incoming line	Feeding power	Reactive power compensation
Distribution output capacity (KVA)		630		630		
Main components	NSX-160		3		3	NSX100~630A
	NSX-250		2		2	15kVar x 2~10
	NSX-400		1		1	
	NSX-630		1		1	
	MTZ-630	1		1		
Note						
Maximum overall dimensions of LV cabinets W×D×H (mm)		800*600*2000mm	800*600*2000mm	800*600*2000mm	800*600*2000mm	800*600*2000mm

4. Diagram of Box Transformer Foundation



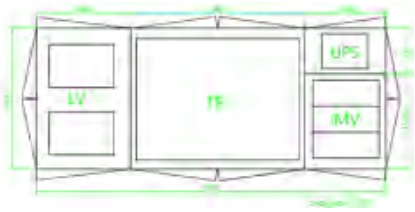
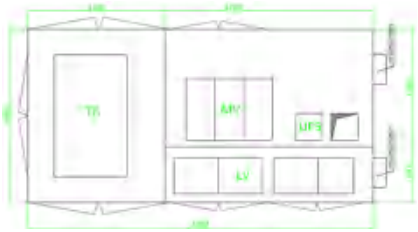


Note:

1. A guiding gutter is required in the foundation;
2. The slope extending to the soakaway pit in foundation is 3%;
3. The maintenance channel around the box transformer is no less than 1.5 m;
4. The surface of the base station contacting the bottom surface of box transformers shall be flat and smooth and shall be ±3 mm;
5. The grounding body includes horizontal grounding body (primary) and vertical grounding body (auxiliary), and the outer insulation closure buried depth is greater than 2.5 m.
6. The embedded parts for foundation of the box transformer shall be welded respectively with the grounding grid, with the welding points no less than 2;
7. The grounding resistance shall be no greater than 4 Ω and shall conform to Code for Design of AC Electrical Installations Earthing;
8. All devices to be grounded not indicated in the drawing must be constructed in strict accordance with relevant specifications;
9. The box transformer shall be laid in the center of the grounding network;
10. Ventilation holes shall be reserved on the foundation, or poor ventilation and other serious consequences will be made.

BIOSCO-40.5kV prefabricated substation standard scheme

BIOSCO prefabricated substation container scheme

Scheme No.	Layout Plan	Transformer	Overall dimensions (L*W*H)	HV unit	LV unit	Scope of application
PV-MOS-35/0.8-8000		Capacity of oil transformers ≤9,000 kVA Transformer ratio 35/0.8/0.8kV Uk=8%	20ft standard substation 6,058* 2,438* 2,896	The total width of a maximum of 3 switchgears of Flusarc shall be no more than 1,350.	A maximum of 2 T1100 cabinets for GGD, with 22 outline lines of 400A (MCCB is KFM5	PV/wind power/ degree of protection of enclosures >IP4X project/ambient temperature>40°C project
PV-PON-11/0.8-4125		Capacity of oil transformers ≤4,125 kVA Transformer ratio 11/0.8kV Uk=13.25%	7800* 3900* 3500	The total width of PIX 12 is no more than 2,100.	A maximum of 3 cabinets of GGD are 1000+ wide, and 1 is 800 wide, 16 outgoing lines of 250A	Ip of MV cabinets >20kA
AP-PGS-10/0.4-800		Dry transformer, capacity of air-cooled transformer≤800 kVA Transformer ratio 10/0.8kV Uk=6%	13300* 2600* 3000	Width of PIX 12 Is no more than 2*2100	A maximum of 12 LV cabinets for Blockset, with 34 outgoing lines of 160A	Airport and distribution
AP-PGN-10/0.4-1000		Capacity of dry transformer ≤5,500 kVA Transformer ratio 6.6/0.4kV Uk=6%	20ft standard substation 6,058* 2,438* 2,896 (excluding air conditioner)	The total width of RM6 is no more than 1052	A maximum of 5 LV cabinets for Blockset, with 20 outgoing lines of 200A	Overseas distribution/ degree of protection of enclosures > IP4X

BIOSCO prefabricated substation standard scheme

General requirements

Degree of protection of enclosures: 10K; maximum grade of corrosion prevention C5M; degree of protection of HV/LV chamber IP54; UPS≤10Ah (220V); normal outdoor service condition stipulated in GB/T 11022-2020 (IEC62271-1:2017).

Intelligent signals

Accessing communication protocol: Modbus RTU
Accessing transmission medium: CAT5 shielded network cable/optical fiber
Uplinking communication protocol: IEC870-104/IEC61850
Uplinking transmission medium: optical fiber (the wavelength is the same as that of upper computer)

Acceptable/uplinkable signals:

Remote signaling:

1. Transformer overtemperature alarm signal (non-electric signal)
2. Transformer high temperature trip signal (non-electric signal)
3. Light gas alarm (oil transformer)
4. Heavy gas alarm (oil transformer)
5. HV side switch status signal (Modubus RTU)
   Main switch (circuit breaker or load switch) status
   Three-position switch status
   Status of grounding switch
6. LV side switch status signal (Modubus RTU)
   Frame circuit breaker status

Remote control (support electrical operating):

1. Opening and closing of circuit breaker /load switch
2. Three-position switch
3. Grounding switch (AIS)

Telemetry

1. Transformer oil level temperature signal (oil transformer: 4 - 20 mA)
2. Ambient temperature in each chamber in box transformer (Modbus RTU)
3. HV/LV side current, voltage and frequency (Modubus RTU)

SOE

1. Forwarding protection device SOE

Interpretation of scheme No.

- PV - photovoltaic scheme, AP - airport scheme;
- M - ladder-shaped layout, P - T-shaped layout;
- Oil-immersed transformers, G - dry transformers;
- N - single split transformers, S - double split transformers (PV), double transformers (AP);

Schneider Electric (China) Co., Ltd.

Schneider Electric (China) Co., Ltd.	Schneider Electric Building, No. 6, East WangJing Rd., Chaoyang District, Beijing	Post code: 100102	Tel.: (010) 84346699	Fax: (010) 65037402
■ **Shanghai Branch**	Floor 6, 8-9 & 11-13, Changfeng International Building, No.89, Yunling East Road, Putuo District, Shanghai	Post code: 200062	Tel.: (021) 60656699	Fax: (021) 60768981
■ **Guangzhou Branch**	Unit 02-05, Floor 20, Kingold Century Finance Center Tower, No.62, Jinsui Road, Zhujiang New City, Tianhe District, Guangzhou City	Post code: 510623	Tel.: (020) 85185188	Fax: (020) 85185195
■ **Wuhan Branch**	B11, Financial Harbour, No.77, Guanggu Avenue, East Lake High-tech Development Zone, Wuhan City	Post code: 430205	Tel.: (027) 59373000	Fax: (027) 59373001
■ **Xi'an Branch**	2F, No.26, Zhangbaba Road, Guodu Sub-district, Chang'an District, Xi'an City	Post code: 710065	Tel.: (029) 65692599	Fax: (029) 68798831
■ **Shenzhen Branch**	Floor 7 (Unit A-C) and Floor 8, China Energy Storage Building, No.3099, Keyuan South Road, Nanshan District, Shenzhen City	Post code: 518000	Tel.: (0755) 36677988	Fax: (0755) 36677982
■ **Chengdu Branch**	Floor 5, Building 7, D Area, Tianfu Software Park, No.599, Century City South Road, Chengdu Hi-Tech Industrial Development Zone	Post code: 610041	Tel.: (028) 66853777	Fax: (028) 66853778
■ **Urumqi Office**	1807, HFC, No.3331, Exhibition Middle Street, Midong District, Urumqi	Post code: 830002	Tel.: (0991) 6766838	Fax: (0991) 6766830
■ **Hohhot Office**	Room 402, Floor 4, Datang Jinzuo, No.7, Yingbin North Road, Xincheng District, Hohhot	Post code: 010010	Tel.: (0471) 6537509	Fax: (0471) 5100510
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■ **Shenyang Office**	Room F9-412, No. 860-6, Shenyang International Software Park, Shangshengou Village, Dongling District, Shenyang City	Post code: 110167	Tel.: (024) 23964339	Fax: (024) 23964296
■ **Dalian Office**	Room 201-I, Building 17, Dalian Software Park, No. 267, Wuyi Road, Shahekou District, Dalian City	Post code: 116023	Tel.: (0411) 84769100	Fax: (0411) 84769511
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■ **Schneider Electric Training Institute**	Schneider Electric Building, No. 6, East WangJing Rd., Chaoyang District, Beijing	Post code: 100102	Tel.: (010) 84346699	Fax: (010) 84501130

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Schneider Electric(China)Co.,Ltd.

Schneider Electric Building, No. 6,
East WangJing Rd., Chaoyang District
Beijing 100102 P.R.C.
Tel: +8617714096167

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