JST POWER EQUIPMENT



Medium Voltage Packaged Unit Substation

JST Power Equipment is more than a manufacturer – we are a solutions innovator at the cutting edge of transformer and switchgear technologies. We continually work to create products with higher efficiencies, lower costs and advanced features. Each year we make substantial investments in the research and development of new products and manufacturing techniques. We regularly innovate on behalf of our customers, collaborating with them to find solutions to their specific challenges. We continually work to create products with higher efficiencies, lower costs and advanced features.

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The JST Difference

First and Focused on Uptime



JST Power Equipment developed and marketed the first independent pole-operated breaker with a three-phase system that helps utilities improve their delivery performance by isolating outages to prevent a whole-system shutdown.

Delivering Complete Unit Substations and Single Source Accountability

A turnkey transformer and switchgear package streamlines everything from installation to troubleshooting and service –not to mention, acquiring and implementing new substations for growing companies. With a single point of contact at JST Power Equipment, our customers can easily access support when and where they need it.

Beyond Manufacturing—Addressing Operational Obstacles

A lot of providers talk about being a partner, but what does that really mean? At JST Power Equipment our role is to provide solutions and listen to our customers challenges and goals to ultimately provide customized product and system solutions that allow you to better compete in your marketplace.

What Does That Look Like Exactly?

What keeps you up at night?

One OEM manufacturer said lack of spare parts was a major time and resource drain in their production process. While assembling a 70+ ton piece of equipment, if a small part breaks or a connector fails, the entire line is stopped, the equipment is removed, and the order is put on hold until the replacement part arrives. The real issue is that this approach could take 8 to 12 weeks, or require cannibalization of future projects.

The JST Solution.

The equipment on that line is a system that JST can build, and the real answer is providing a vending machine-type solution where all parts are stocked and ready on-site, on demand. Should a component fail on the line, a part is immediately accessed, and a fix is available within minutes. JST provides parts inventory—and the flexibility for the factory to pay as it uses parts—to keep operations up and running efficiently. On-site inventory is a game changer for production, employee satisfaction and customer experience.

The Bottom Line.

Rather than expecting customers to select systems from a predetermined lineup, JST Manufacturing focuses on problem-solving. This means we'll never force a solution. Instead, we'll engineer the answer.



Market Segments



Market Segments

JST delivers systems to the following market segments:

- Renewables: wind, solar, and BESS
- Utilities: power generation and substations
- Construction: industrial and commercial
- Data centers, cryptocurrency and mining
- Marine
- Industrial/Manufacturing

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Overview

The YB-series medium voltage prefabricated substation is a box made up of the HV/LV switchgear, distribution transformer, metering devices for electric energy and compensation devices for power factor, etc., serving as complete sets of power distribution and transformation unit in the power distribution and transformation grid with a rated frequency of 50Hz/60Hz. The product shall comply with standards such as the High-voltage/Low-voltage Prefabricated Substation (GB17467-2010) and Technical Conditions for Ordering of 3~38kV Box-type Substations (DLT537-2002), etc.

The series of products can replace traditional civil substations to realize functions such as HV/LV switching, control protection, metering, compensation, etc. These products feature obvious advantages such as small floor area, easy and rapid installation, safe and reliable operation, flexible movement, low investment, attractive appearance and coordination with the surroundings, and are designed for use in high-rise buildings, residential districts, municipal facilities, industrial and mining enterprises, oilfields, ports, airports, construction site, roads, wind power plants, etc. The products work in both indoor and outdoor settings.

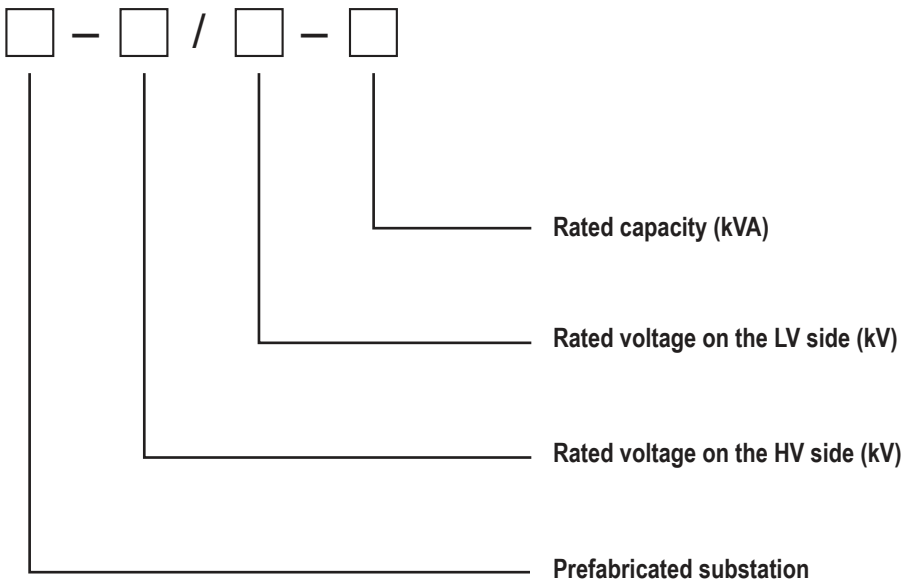
The Model and Meaning

Model of the box-type substation: YB-□/□-capacity (□ depending on the rated voltage on the HV/LV side)

Rated capacity: 30~3,800kVA; if the capacity is larger than 3,800kVA, consult the technicians of the Company to provide a separate scheme.

HV/LV rated voltage: The rated voltage ratio (7.2, 15, 27, 38 generally on the HV side; 0.27, 0.315, 0.4, 0.48, 0.52 and 0.69 generally on the LV side) on the HV and LV side.

Example: YB-15/480-2,500



Operating Conditions

Maximum temperature: +40°C; minimum temperature: -10°C (ordinary areas) and -25°C (alpine regions)

Enclosure: Rated for outdoor use.

Ground acceleration: Suited for standard and seismic applications.

This product is intended to be installed with predefined conduit entries and an approved surface to support weight. The packaged substation will greatly reduce labor and commissioning time on-site.

If any special service conditions are
If any special services are required for installation, inform JST of any requirements.

The special service conditions (if any) shall be proposed by and confirmed prior to order placement..

Main Technical Parameters

	Description	Unit	Parameters			
MV Equipment	Rated voltage	kV	7.2	15	27	38
	Rated frequency	Hz	50/60			
	Rated current of main circuit	A	630		1250	
	Rated short-time withstand current of the main circuit	kA	20			
	Rated peak withstand current of the main circuit	kA	50			
	Rated short-circuit duration	S	3			
	Power-frequency withstand voltage, interphase, ground-to-ground and ordinary fracture/isolating fracture	kV	32/36	43/49	95/110	
	Lightning impulse withstand voltage, interphase, ground-to-ground and ordinary fracture/isolating fracture	kV	60/70	5/85	185/215	
LV Equipment	Rated voltage	kV	Less than or equal to 1			
	Rated current of main circuit	A	10 — 4000			
	Rated short-time withstand current	kV	15	30	50	
	Rated peak withstand current	kV	30	63	105	
	Rated current of branch circuits and number of circuit	Line A	Customized			
	Reactive compensation capacity	kVAR	0 —— 30%			
Transformer	Rated capacity	kVA	50 —— 5000			
	Rated voltage on the primary side	kV	3 —— 35			
	Rated voltage on the secondary side	kV	Less than or equal to 1 (except for power transformation)			

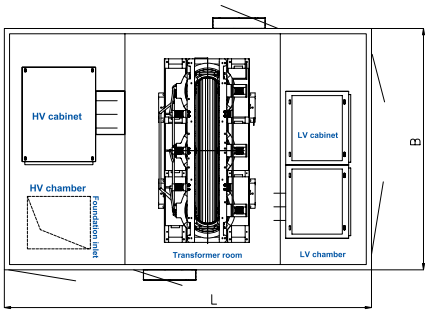


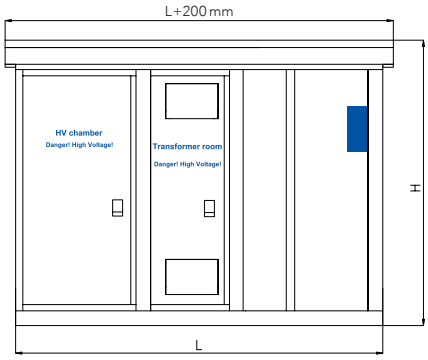


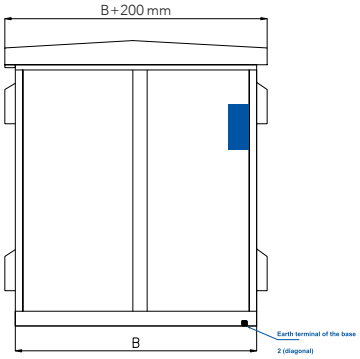
JST POWER EQUIPMENT

Main Technical Parameters

TRADITIONAL LAYOUT

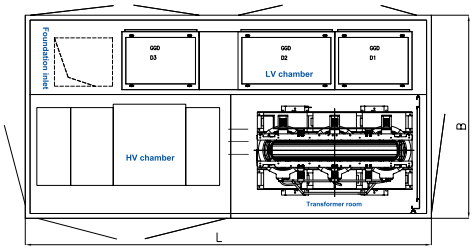


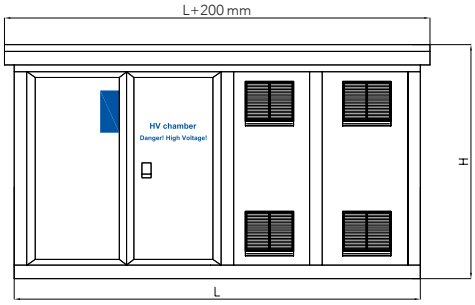


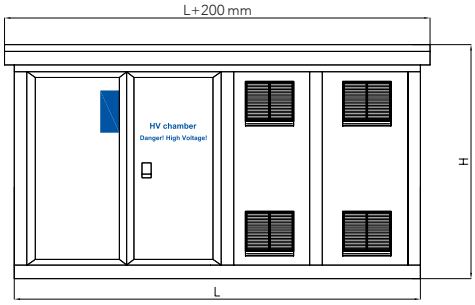


Transformer Capacity (kVA)	L (mm)	L (in)	B (mm)	B (in)	H (mm)	H (in)
200-630	3300	129.921	2300	90.5512	2400-2700	94.4882-106.2992
800-1250	4500	177.1654	2300	90.5512	2400-2700	94.4882-106.2992

CUSTOM LAYOUT







Transformer Capacity (KVA)	L (mm)	L (in)	B (mm)	B (in)	H (mm)	H (in)
200-630	3600	141.7323	2100	82.6772	2400-2700	94.4882-106.2992
800-1250	4500	177.1654	2100	82.6772	2400-2700	94.4882-106.2992

Note: Contact manufacturer for additional specifications.







Structural Characteristics



The product is characterized by rigid structure, high flexibility, compact layout, small floor area, and safe and reliable operation and can be made into a permanent structure if the transformer capacity and the power supply scheme allow.

J100Clad, J10X and J20X shall be used for the HV equipment of the Company shall be used for the HV equipment; GGD fixed switchgear for box-type substations/GCK drawer-type switch cabinets/B cabinets shall be used for the LV equipment. The dry type transformers provided will be created from JST cast resin technology. These high-quality transformers are considered the best in the industry. The oil-immersed transformer may also be used, following the user's requirements; the Schneider/ABB/VEI/JST pressure-operated or SF6 load switches are generally selected for the HV part. The load switch is characterized by small volume, favorable electrical performance, easy operation, safe and reliable operation, and easy maintenance, so the electrical performance can completely comply with the requirements of drawings as well as other requirements proposed by the client.

The incoming and outgoing lines can be separated into cable incoming and outgoing lines, overhead incoming lines, and cable outlets. The overhead incoming and outgoing lines may be used as necessary for overhead distribution systems.

The framework of the prefabricated substation is made of U-steel, and has relatively high strength and rigidity. The enclosure design includes double-sided steel and encased composite insulation boards. The flame-resistant polystyrene foam contained in the composite boards can reduce the influence of solar radiation on the temperature inside the box. Heat can therefore escape via ventilation holes located around the lower layer of the top cover.

The high-end compact box-type substation simulating a log cabin is designed with a steel plate case and is decorated with wood panel construction outside it, reflecting the environmentally friendly concept of a return to nature in cities. The case of the box-type substation has excellent weather resistancein the open air, and can mitigate the influence of outdoor temperature on the box-type substation, so that an attractive appearance can be sustained during the maintenance-free service.

Natural ventilation and forced ventilation are designed to realize favorable ventilation cooling, and both the transformer and the LV chamber are designed with air ducts. The exhaust fan has temperature control devices and can be started and shut down automatically as per the preset temperature, to guarantee full-load operation of the transformer.

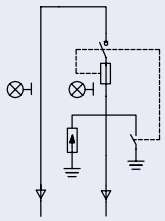
The box structure can prevent entry of dirt and rainwater, and long-term service conditions can be met, with a long service life and an attractive look (the shape may be designed and fabricated according to the user's requirements).





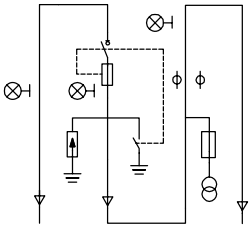
Main Circuit Scheme

Primary Drawing of the HV Main Circuit, with Scheme Number and Description



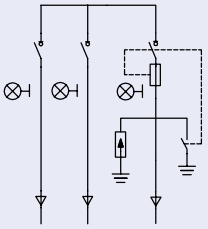
H1 Terminal, Without Metering

H11, With Live Display Devices
H12, Without Live Display Devices



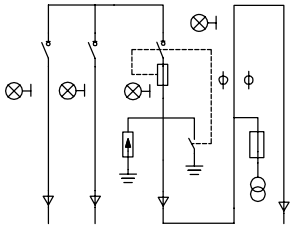
H2 Single-Terminal, With Metering

H21, With Live Display Devices
H22, Without Live Display Devices
H23 Metering, in Front of the Main Switch



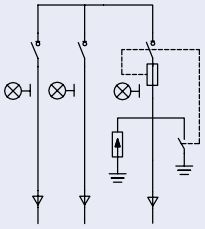
H3 Ring Net, Without Metering

H31, With Live Display Devices
H32, Without Live Display Devices



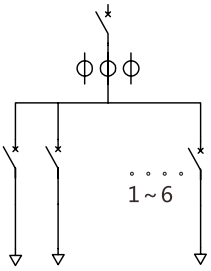
H4 Ring Net, With Metering

H41, With Live Display Devices
H42, Without Live Display Devices
H43, Metering, in Front of the Main Switch



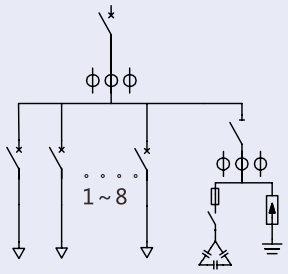
H5 Double Terminal

H51, With Live Display Devices
H152, Without Live Display Devices



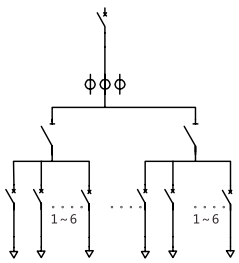
L1 Uncompensated, Single-Stage System

L102, Two-Circuit Outgoing Lines
L103, Three-Circuit Outgoing Lines
L104, Four-Circuit Outgoing Lines
L105, Five-Circuit Outgoing Lines
L106, Six-Circuit Outgoing Lines
L107, Seven-Circuit Outgoing Lines
L108, Eight-Circuit Outgoing Lines



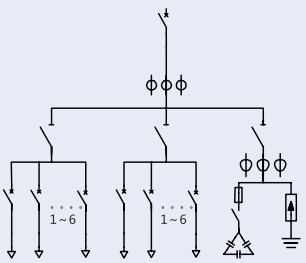
L2 Uncompensated, Single-Stage System

L202, Two-Circuit Outgoing Lines
L203, Three-Circuit Outgoing Lines
L204, Four-Circuit Outgoing Lines
L205, Five-Circuit Outgoing Lines
L206, Six-Circuit Outgoing Lines
L207, Seven-Circuit Outgoing Lines
L208, Eight-Circuit Outgoing Lines



L3 Uncompensated, Multi-Stage System

L301, “1+2” Circuit Outgoing Lines
L302, “2+2” Circuit Outgoing Lines
L303, “2+3” Circuit Outgoing Lines
L304, “2+4” Circuit Outgoing Lines
L305, “3+3” Circuit Outgoing Lines
L306, “3+4” Circuit Outgoing Lines
L307, “4+4” Circuit Outgoing Lines
L308, “5+5” Circuit Outgoing Lines
L309, “6+6” Circuit Outgoing Lines



L4 Uncompensated, Multi-Stage System

L401, “1+2” Circuit Outgoing Lines
L402, “2+2” Circuit Outgoing Lines
L403, “2+3” Circuit Outgoing Lines
L404, “2+4” Circuit Outgoing Lines
L405, “3+3” Circuit Outgoing Lines
L406, “3+4” Circuit Outgoing Lines
L407, “4+4” Circuit Outgoing Lines
L408, “5+5” Circuit Outgoing Lines
L409, “6+6” Circuit Outgoing Lines

Transport and Rigging

LIFTING

The series of product shall not be handled with a forklift generally, and the indoor products may be moved via a steel-pipe roller; the outdoor product shall be lifted via a crane, according to relevant safety specifications for hoisting. The hoisting equipment shall be selected based on the nominal weight on the nameplate, and it shall be guaranteed that the included angle among the hoisting steel wires is not more than 60° during hoisting, and stable landing shall be guaranteed. If bottom hoisting is adopted, special lifting appliances shall be used to prevent damage to the top cover.

INSPECTION AND ACCEPTANCE

The packing list shall be checked to see whether the number of each item corresponds with the real objects.

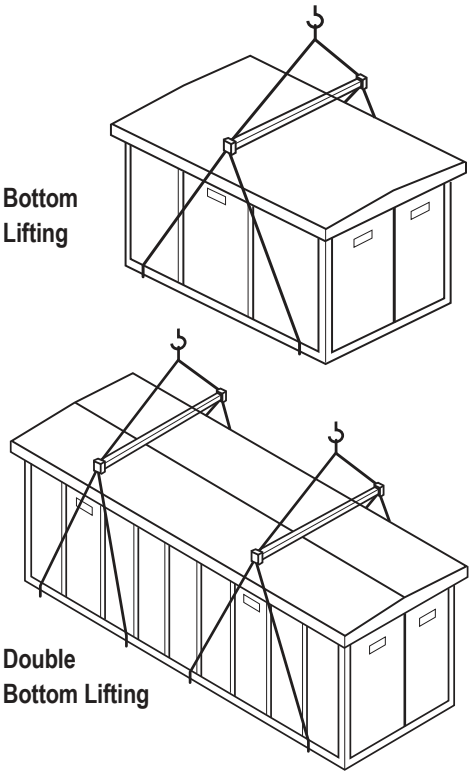
Check whether the product is correct on the order contract, such as the product model, rated capacity and the route scheme.

Check whether the delivery documents are complete.

Check the appearance for damage and deformation; check the internal electrical appliances and connection for loosening, disconnection and damage.

TRANSPORTATION

The inclination shall not exceed 30° during product transportation. The vulnerable elements (such as the energy meters) during transportation may be removed before long-distance transportation. Anti-shock packages shall be used separately, and such elements shall be recovered after arriving at the destination. The product shall be placed at the normal usage position during transportation, and the transporting tools shall be fixed firmly to the base or the packing place. The products shall be free from movement and obvious shaking during transportation. Other positions are not allowed except for the hook at the base and the lifting rings at the top.



Bottom Lifting

Double Bottom Lifting

Maintenance & Repair

The electrical equipment (including the switchgear and transformers) inside the product shall be checked and maintained regularly, per the requirements in the installation instructions and relevant provisions. Impact with hard objects should be avoided, as it could damage the anti-corrosion protective coating.

The door of the HV/LV switchgear may be opened or the panel may be removed for ordinary maintenance from the front side. In case of overhaul or replacement of main equipment, the fixed nut of the top cover shall be removed. Lift the top cover away and then lift out the transformer or the switchgear for overhaul or replacement.

Ordering Information

The orderer shall provide the following data related to the product during ordering:

1. Type and capacity of the transformer and configuration of accessories.
2. Wiring scheme of the HV/LV chamber and the specifications and model of electrical elements.
3. The enclosure is routinely offered in ivory white or in light green. If a special color is needed, provide factory with sample. Customizing is required in case of special color requirements.
4. Other client requirements may be requested during ordering.

Installation

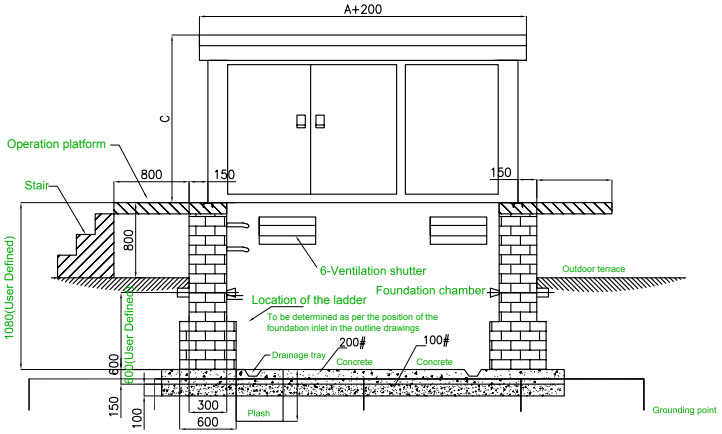
THE INSTALLATION

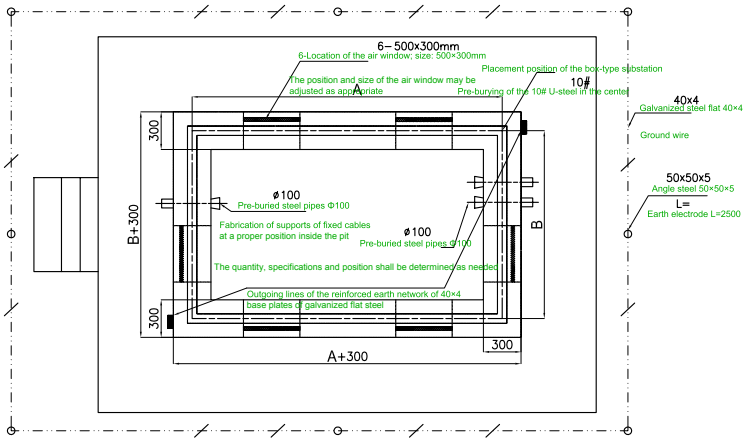
The work concerning the foundation, earth system, cable trenches, and embedded incoming and outgoing cables and protective tubes shall be done well before installation. The product shall be installed in the following areas: (a) non-low-lying areas, and (b) well-ventilated areas. Placement near existing underground public facilities shall be avoided as much as possible.

The installation foundation of the product may be built by refering to the foundation scheme recommended in the foundation drawings. However, the ventilation area of the products is not less than the ventilation area of the original foundation drawings. The foundation scheme of the products designed in accordance with the user's requirements shall be provided by the plant in the delivery documents. The foundation shall be built to prevent small animals from entering the bottom of the product.

The user shall build the earth system for compatibility with the geological conditions at the installation place and relevant provisions. The earthing resistance is required to be less than 4Ω regardless of earthing modes. The cable trenches shall be excavated in advance, and the cables and protective tubes shall be pre-buried. The inner diameter of the protective tube shall not be less than 1.5 times the outer diameter of the cables, and the bending radius of the cables shall be more than 10 times the outer diameter of the cables.

The product shall be placed upright on the base according to the provisions for hoisting during installation, and shall be welded to the U-steel reserved on the original foundation. The HV and LV cables shall be linked as required, and the earthing terminal of the earth system shall be linked firmly. The shielding layer and armor of the cables shall also be earthed reliably.





TECHNICAL SPECIFICATIONS

1. Please refer to the outline drawings for layout of the box-type substation.
2. Provide the earth network before construction of the foundation; the earthing resistance shall be less than 4Ω (measured).
3. The foundation of the box-type substation shall be bricked by the mortar and be poured by concrete as a whole, or be poured by concrete completely.
4. The louver is reserved around the foundation; each louver shall be >500*300 mm.
5. The bottom of the foundation chamber shall be provided with a complete drainage system to prevent ponding.
6. The steel pipes and foundation steps shall be pre-buried inside the foundation. For the position of the earthing terminal at the base of the box-type substation, please see the layout of the box-type substation.
7. Construction requirements of corresponding buildings shall be followed.
8. The base of the box-type substation may be welded to the U-steel pre-buried inside the foundation.

Energization

INSPECTION BEFORE OPERATION

The following items shall be checked before power transmission upon completion of installation:

1. The interior of the product and the surface of each component are dry, clean and free of foreign substances.
2. Check movable elements such as the operating mechanism and the switches to see whether they are flexible, reliable and accurate. For the products installed with temperature control, temperature/humidity, fans, condensation controllers, etc., check the requirements for electrical performance and the installation instructions for these products.
3. Check the electrical elements and equipment (including the transformer and the HV/LV switchgear), to see whether the mounting bolts are tightened.
4. Check the auxiliary circuits and control circuits to see whether the set value of electrical appliances is correct, whether the transformation ratio and wiring pole of instruments and transformers are correct, and whether all electrical elements are normal. The problems identified in inspection shall be solved immediately. If such problems cannot be solved by the user, please notify the plant.

The following tests shall be made before operation of the prefabricated power station:

1. Test on winding DC resistance of transformer.
2. Inspection on earthing of the transformer core and tests on insulation of the penetration bolts.
3. Tests on insulation resistance: under a dry environment, the HV-to-LV and the earthing insulation resistance shall not be less than 300MΩ; the LV-to-ground insulation resistance shall not be less than 100MΩ; under a humid environment, the insulation resistance of each rated voltage of 1,000V shall not be less than 2MΩ.
4. Tests on the power-frequency withstand voltage: the test voltage shall be 85% of the routine test voltage for delivery of the transformer. The time shall be determined by reference to the routine test report value for delivery. If the HV switchgear is linked to the transformer with HV insulating cables, the tests on the power-frequency withstand voltage of the transformer shall be carried out together with the wires. If the HV armored cables are used for connection, the cables and the connection between the transformer and the HV switchgear shall be removed during tests. The cables shall be subject to tests on withstand voltage separately. As for the test requirements, see relevant provisions.
5. The HV switchgear shall be subject to power-frequency withstand testing for 1-minute.
6. Before operation of the LV switchgear, a 500V megger shall be used to measure the insulation resistance. The resistance measured shall not be lower than 0.5MΩ.

Note: if such product is put into operation in a high-humidity weather, the electrical appliances inside the products must be checked and dried before power transmission. Such operation is only allowed after it is proven qualified through the first 5 tests.

Operation

1. Disconnect all the HV/LV switches; close the door of the switchgear and that of the transformer chamber. Note: the earthing switch on the HV incoming line side must be disconnected, or short circuit of three phases to ground will be triggered.
2. Close the stage-1 switch in front of the HV incoming lines.
3. Close the main HV switch and observe whether the instruments are normal; check whether the transformer can be powered on normally.If not it shall be powered off for inspection.
4. Close the main LV switch and the main switch for capacitance compensation; check various indicators and instruments to see whether they are normal. If not such indicators and instruments shall be powered off for inspection.
5. Close the branch switch and link the load; check various indicators and instruments to see whether they are normal.

See the installation instructions of the HV/LV switches and transformers for the specific operation steps and methods.

JST POWER EQUIPMENT

HEADQUARTERS

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