

## XGN15-12(L · R)

box-type stable type AC metal sealed switchgear



### Brief Introduction

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XGN15-12(L)/T630-25 or XGN15-12(L · R)/T100-31.5 box-type fixed AC metal enclosed switchgear is mainly used for looped network power supply or biradial power supply of electric power system with 3-phase AC 50Hz and rated voltage 10KV. It also can be used for terminal power supply as the control device of electric energy and protection device of utilization equipment. More over, it also can be suitable for this switchgear to be installed in the box substation, especially compact box substation.

### Service Environmental Condition

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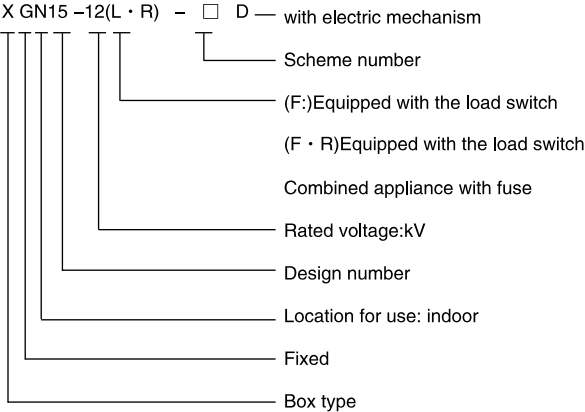
1. Altitude:  $\leq 1000\text{m}$
2. Ambient temperature:  $-25^{\circ}\text{C} \sim +40^{\circ}\text{C}$
3. Relative humidity: The daily average value is not more than 95% and the monthly mean value is not more than 90%.
4. The surrounding air shall not be polluted by corrosive gas and flammable gas as well as water vapor and so on obviously.
5. No location of recurrent strenuous vibration

# COMPLETE SETS OF EQUIPMENT

## XGN15-12(L · R)

box-type stable type AC metal sealed switchgear

### Model&meaning



## XGN15-12(L · R)

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### Main structure of switch cabinet

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It consists of such parts as bus compartment, 3-position load switch compartment (or circuit breaker compartment), cable compartment, actuator, interlocking mechanism and low-voltage control room as well as measuring circuit or metering circuit and so on. Every compartment is separated by the steel plate so that the fault part avoids affecting the adjacent compartment.

It conforms to the GB3906 and IEC298 standard and so on.

#### 1. Bus compartment

The bus compartment is arranged on the upper part of cabinet body. The main buses are connected together in the bus compartment and they pass through the whole array of switch cabinet. The arrangement of bus is horizontal and it can be spread out conveniently.

#### 2. Load switch compartment

There is a 3-position load switch installed in the switch compartment. The casing of load switch is poured by the epoxy resin. The SF<sub>6</sub> gas is refilled as the arc-extinguishing and insulating medium in the compartment. There are 2 transparent plastic end covers by means of thermal forming installed at the leading end of operating shaft. The contact state can be observed through it. The SF<sub>6</sub> gas density gauge or gas density apparatus with alarm contact is installed in the switch compartment according to the client requirement.

#### 3. Cable compartment

The cable compartment is mainly used for cable connection. For the connection of single-core cable, the simplest non-shielded cable head is used. At the same time, there are such elements as lightning arrester, current transformer and lower grounding switch and so on also can be contained in the enough room. There are observation window and safety interlocking device in the cabinet door as per the standard design. The back plate in the cable compartment is equipped with the sealing cover and appropriate size of cable clamp with support. The frame in front of door at the back plate in the cable compartment can be dismantled for easy cable installation.

#### 4. Actuator & interlocking mechanism and low-voltage control room

The low-voltage room with interlocking functions as the screen control at the same time. The low-voltage room is equipped with the spring actuator with position indicator and mechanical interlocking device. The auxiliary contact, tripping coil, emergency tripping mechanism, capacitor-type charged display device, key lock and electrical operation device are installed in the low-voltage room. At the same time, the control circuit and metering instrument as well as protection relay also can be installed in the spacing of low-voltage room. There are 2 same low-voltage rooms installed in the 750mm wide cabinet and more accessories can be installed in this size of cabinet.

## COMPLETE SETS OF EQUIPMENT

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### Main Technical parameter

Serial number	Item		Unit	Technical parameter	
				XGN15-12L	XGN15-12(L · R)
1	Rated voltage		kV	12	
2	Rated frequency		Hz	50	
3	Rated insulating level	1min Power-Frequency withstand voltage	kV	对地及相间 42, 隔离断口 48 For ground, interphase 42; isolating fracture 48	
		Rated lightning impulse withstand voltage	kV	对地及相间 75, 隔离断口 85 For ground, interphase 75; isolating fracture 85	
4	Rated current of main bus		A	630	
5	Rated current		A	630	100
6	Rated closed-loop breaking current		A	630	
7	Rated breaking current of resistive load		A	630	
8	Rated cable charged breaking current		A	10	
9	Rated transfer current		A		1700
10	No-load transformer breaking capacity		kVA	1250	
11	Rated making current (peak value)		kA	63	
12	Rated short-time withstand current (2s)		kA	25	
13	Rated peak-value withstand current		kA	63	
14	Rated short-circuit breaking current		kA		31.5(expectancy)
15	Peak-value withstand current of grounding circuit		kA	63	
16	Short-time withstand current of grounding circuit (2s)		kA	25	
17	Mode of self-contained fuse				S □ LAJ
18	Rated voltage of auxiliary circuit		V	≤ 220, -110	
19	Protection degree			IP3X	
20	Mechanical life	Load switch	Times	5000	
		Grounding switch	Times	2000	

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Reference table of fuse protection transformer

Capacity of transformer(kVA)	50	100	125	160	200	250	315	400	500	630	800	1000	1250
Rated current of fuse(A)	10	16	16	16	20	25	31.5	40	50	63	63	80	100

Type of switch cabinet

1.Cabinet of load switch

The cabinet of load switch is mainly used for leading-in cabinet in the looped network wiring and radiation wiring. This cabinet is typically equipped with a 3-position load switch and actuator. Only 3-position load switch can be placed at one of switching-on, switching-off and grounding as well as operating position. Therefore, it can prevent the false operation. The cable compartment can be entered in when the load switch is located in the grounding state. The position indicator of load switch meets the IEC60129A2 (1996) requirement. The operator can check if the switch is in the switching-off or grounding state through the observation window behind the door of low-voltage compartment. The operator also can observe the cable connection and fault indicator (if it is installed) easily from the window at the front door.

Basic equipment

- shell
- 3-position load switch
- Actuator equipped with mechanical position indicating device
- Interlocking device
- Bus
- Cable back plate equipped with strutting piece for cable

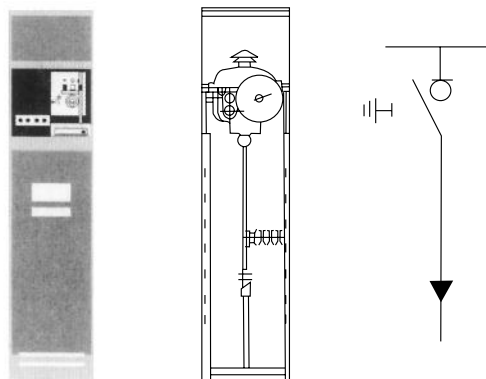
Option of switch cabinet

- Charged indicator
- Auxiliary contact of every position: 2NOs + 2 NCs
- gas density gauge or gas density apparatus with alarm contact
- Electrical operating device
- Current transformer
- Voltage transformer (instead of cable connection)
- Pressure-relief channel
- Control cable channel
- Earth bus
- Lightning arrester

## COMPLETE SETS OF EQUIPMENT

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Serial number	Name of item		Unit	Data
1	Rated current		A	630
2	Rated short-time withstand current		kA	25
3	Rated short-circuit duration		S	2
4	Physical dimension	Width	mm	375/500
		Depth		940
		Height		1635/1885

#### 2. Combined electrical cabinet with load switch and fuse

The combined electrical cabinet with load switch and fuse is mainly used for transformer protection. This type of cabinet is equipped with a 3-position load switch and one individual auxiliary grounding switch. The making of grounding switch built in the load switch can enable the contact on the fuse to ground. However, the making of individual auxiliary grounding switch can enable the contact under the fuse to ground. The actuator is double spiral spring type. It has the function that the fuse melts and the automatic tripping can be performed. Only when the load switch is located at the grounding position, it can be entered into the cable compartment. The position indicator of SF6 load switch meets the IEC60129A2 (1996) requirement. The operator can observe that the switch is located at the switching-off or grounding position or not from the observation window at the rear side of low-voltage compartment door. The operator also can observe the cable connection and fault indicator easily from the window at the front door.

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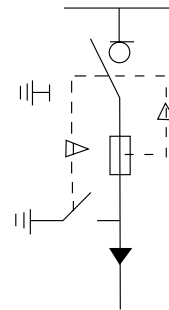
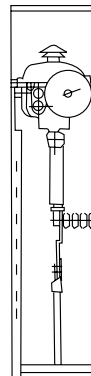
box-type stable type AC metal sealed switchgear

## Basic equipment

- Shell
- 3-position load switch
- Actuator equipped with mechanical position indicating device
- Interlocking device
- Bus
- Fuse tripping device with indicator
- EF-type grounding switch
- Fuse pedestal
- Shell of cable compartment
- Cable back plate equipped with strutting piece for cable

## Option of switch cabinet

- Charged indicator
- Auxiliary contact of every position: 2NOs + 2 NCs
- Gas density gauge or gas density apparatus with alarm contact
- Electrical operating device
- Emergency tripping mechanism
- Pressure-relief channel
- Control cable channel
- Voltage transformer (instead of cable connection)
- Tripping coil
- Earth bus



## COMPLETE SETS OF EQUIPMENT

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Serial number	Name of item		Unit	Data
1	Rated current of fuse		A	100
3	Length of fusion tube		mm	292
4	Physical dimension	Width	mm	375/500/625
		Depth		940
		Height		1635/1885

#### 3. Bus contact cabinet

The bus contact cabinet is used for connection between the cable and bus. The connecting base is installed in this cabinet to fix the cable. The CT can be installed in the 500mm cabinet. If there is no grounding switch in the cabinet, the front door is fixed. Only the tool can be used to open the front door.

#### Basic equipment

- Shell
- Bus support
- Interlocking device (it is equipped with this device if there is a grounding switch)
- Bus
- The cable back plate is equipped with the cable support
- Connector connecting several cables

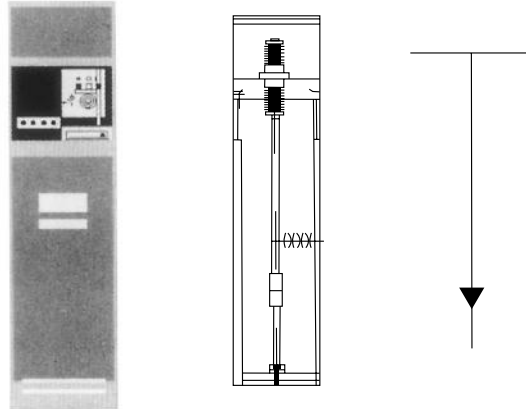
#### Option of switch cabinet

- Charged indicator
- Current transformer
- Grounding switch under CT
- Pressure-relief channel
- Control cable channel
- Earth bus
- Lightning arrestor



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Serial number	Name of item		Unit	Data
1	Rated current		A	630/1250
2	Rated short-time withstand current		kA	25
3	Rated short-circuit duration		S	2
4	Physical dimension	Width	mm	375/500
		Depth		940
		Height		1635/1885

4. Section cabinet

The section cabinet can be used together with the bus lifting cabinet. The width of standard cabinet is 375mm. It is equipped with a FLN36B-12D 3-position load switch used for bus sectioning.

Basic equipment

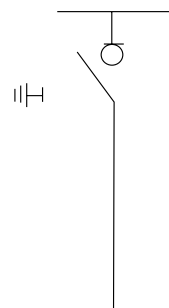
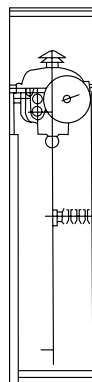
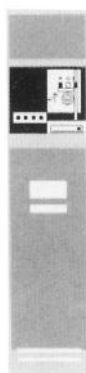
- Shell
- 3-position load switch
- Actuator equipped with mechanical position indicating device
- Interlocking device
- Bus

## COMPLETE SETS OF EQUIPMENT

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- Option of switch cabinet
- Charged indicator
  - Auxiliary contact of every position: 2NOs + 2 NCs
  - Gas density gauge or gas density apparatus with alarm contact
  - Electrical operating device
  - Pressure-relief channel
  - Control cable channel
  - Current transformer
  - Voltage transformer
  - Earth bus



Serial number	Name of item	Unit	Data
1	Rated current	A	630
2	Rated short-time withstand current	kA	25
3	Rated short-circuit duration	S	2
4	Physical dimension	Width	375/500
		Depth	940
		Height	1635/1885

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**5. Bus lifting cabinet**

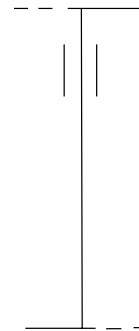
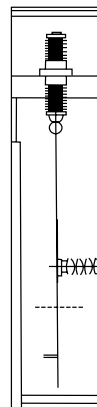
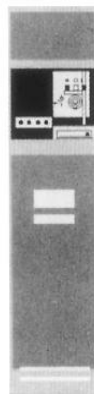
The bus lifting cabinet connects the bus with the top installed with the load switch. The width of this cabinet is up to 500mm. it can be used as the metering cabinet. 3 voltage transformers and 3 current transformers can be accommodated in the space of this cabinet. The front panel is fixed on the cabinet and the special tool must be used to open the front panel. There is an observation window in the front door plate.

**Basic equipment**

- Shell
- Switch substitute
- Lower cover plate

**Option of switch cabinet**

- Current transformer
- voltage transformer
- Grounding switch equipped with the position indicator
- Auxiliary contact of grounding contact: 2NOs + 2 NCs
- Pressure-relief channel
- Control cable channel
- Earth bus



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Serial number	Name of item		Unit	Data
1	Rated current		A	630/1250
2	Rated short-time withstand current		kA	25
3	Rated short-circuit duration		S	2
4	Physical dimension	Width	mm	500
		Depth		940
		Height		1635/1885

#### 6.section metering cabinet

The section metering cabinet is mainly used for measurement and metering. This type of cabinet includes two individually operated FLN36B-12D 3-position load switches. Two load switches are arranged at both ends of section bus. The load switch is interlocked with the front door of switch cabinet. The front door of switch cabinet can be opened only when two load switches are located at the grounding position.

#### Basic equipment

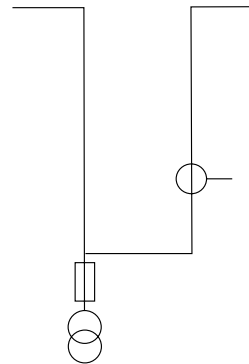
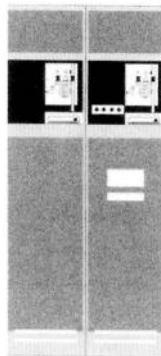
- Shell (right side)
- 3-position load switch
- Actuator equipped with mechanical position indicating device
- Interlocking device
- Bus
- Shell (left side)
- 3-position load switch
- Actuator equipped with mechanical position indicating device
- Interlocking device
- Bus

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Option of switch cabinet

- Charged indicator
- Auxiliary contact of every position: 2NOs + 2 NCs
- Gas density gauge or gas density apparatus with alarm contact
- Emergency tripping mechanism
- Tripping coil
- Electrical operating device
- Voltage transformer
- Current transformer
- Pressure-relief channel
- Control cable channel
- Earth bus



Serial number	Name of item		Unit	Data
1	Rated current		A	630
2	Rated short-time withstand current		kA	25
3	Rated short-circuit duration		S	2
4	Physical dimension	Width	mm	750
		Depth		940
		Height		1635/1885

## COMPLETE SETS OF EQUIPMENT

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#### 7. Circuit breaker cabinet

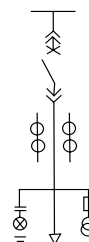
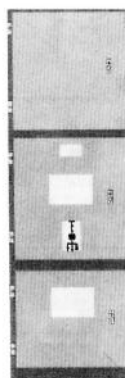
The circuit breaker cabinet is used as the inlet cabinet for switch cabinet whose rated current is 1250A. This circuit breaker cabinet is equipped with the removable VS1<sup>+</sup> vacuum circuit breaker. The operator can observe the position of circuit breaker trolley and state of circuit breaker through the observation window on the door of circuit breaker compartment. The operator also can observe the cable connection from the observation window on the cable compartment door. This circuit breaker cabinet can be equipped with the current and voltage transformer simultaneously.

#### Basic equipment

- Shell
- Bus
- Removable VS1<sup>+</sup> vacuum circuit breaker
- Cable inlet equipped with cable support
- Earth bus

#### Option of switch cabinet

- Current transformer
- Voltage transformer
- Charged indicator
- Pressure-relief channel
- Insulating partition



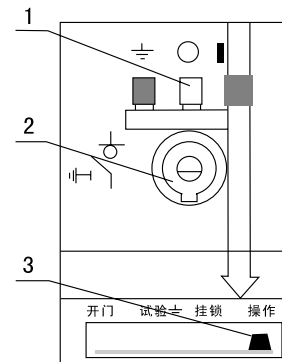
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Serial number	Name of item		Unit	Data
1	Rated voltage		kV	12
2	Power-Frequency withstand voltage (1min)		kV	42
3	Rated lightning impulse withstand voltage		kV	75
4	Rated frequency		Hz	50
5	Rated current of main bus		A	1250
6	Rated peak-value withstand current		kA	80
7	Rated short-time withstand current		kA	31.5
8	Rated short-circuit duration		S	4
9	Auxiliary supply voltage		V	AC: 220 DC: 110/220
10	Physical dimension	Width	mm	800
		Depth		1010
		Height		1885

Operation

- 1. Operating procedure of actuator
- 1.1 Manual operation of load switch



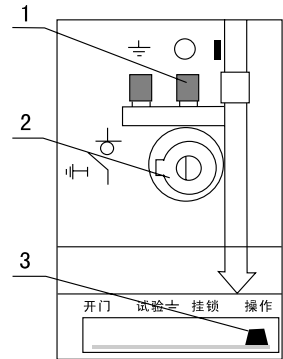
## COMPLETE SETS OF EQUIPMENT

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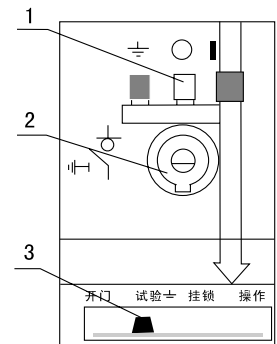
#### A. Switching-on of load switch

The position indicator of load switch is placed at the position shown in the right figure (1). The selector is placed at the position shown in the operating position figure (3). Check that the axle groove shall face downward and the position is shown in the figure (2). When the fuse is installed, the groove is located at the switching-on position. This is why the fuse is burned out or due to electrical operation. The axle groove has been rotated downward before the switch operates to the switching-on position. The operating handle is inserted in the hole and the guide key aligns to the axle groove. It is rotated about 80° in the clockwise direction until the switch is switched on. If the switchgear is equipped with the double-spring actuator, the rotating torque must be enlarged when it rotates to the terminal until the switch is switched on finally. The operation shall be completed continuously at a time.



#### B. Switching-off of load switch

The position indicator of load switch is placed at the position shown in the right figure (1). The selector is placed at the position shown in the figure (3). Check that the axle groove shall face downward and the position is shown in the figure (2). The operating handle is inserted in the hole and the guide key aligns to the axle groove. It is rotated about 80° in the counter-clockwise direction until the switch is switched off.



#### C. Operation of load switch to the grounding position

The position indicator of load switch is placed at the position shown in the right figure (1). The selector is placed at the inspection (testing) position shown in the figure (3). Check that the axle groove shall be located at the downward position and the position is shown in the figure (2). The operating handle is inserted in the hole and the guide key aligns to the axle groove. It is rotated about 80° in the counter-clockwise direction until the switch acts up to the grounding position.

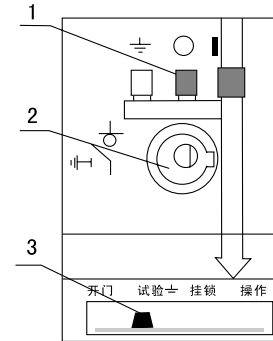


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#### D. Operation of load switch from the grounding position to the switching-off position

The position indicator of load switch is placed at the position shown in the right figure (1). The selector is placed at the inspection (testing) position shown in the figure (2). Check that the axle groove shall be located at the horizontal position and the position is shown in the figure (2). The operating handle is inserted in the hole and the guide key aligns to the axle groove. It is rotated about 80° in the counter-clockwise direction until the switch acts up to the switching-off position.



#### 1.2 Electrical operation of load switch

For the actuator, the electrical operation can be adopted. It can be divided into local or remote operation.

#### 2. door opening of cable compartment

When the switch is at the grounding position, the selector is located at the door-open position. The door of cable compartment can be opened to remove.

Hint: Door-open: The handle is picked up to lift up the door → Remove the door

Door-close: Lift up the door at first and place it on the threshold → Close the door → Then move the door downward.

Door Opening and closing of actuator chamber door: Rotate the handle in the clockwise direction and open the door immediately. Rotate the handle in the counter-clockwise direction and close the door immediately.

#### 3. Charging indicating device

If the looped-network cabinet is equipped with the voltage display, it shall be prompted that the switch cabinet is charged or not charged according to the requirement of IEC61243-5 standard.

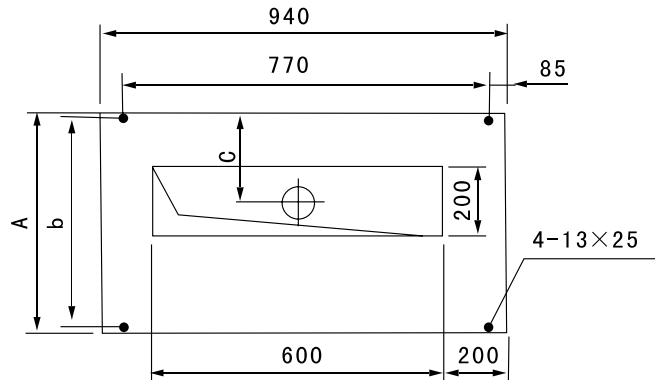
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#### Foundation installation dimension

Scheme num	001 005 009 010 011 012	002 003 004	006 007 008	013 014	015
Cabinet width	375	500	625	750	800
Cabinet of installation hole	335 × 770	460 × 770	585 × 770	710 × 770	760 × 770
Foundation dimension	188	288			400



#### Ordering instruction

The client must provide the following technical data when ordering:

1. Wiring scheme number of main circuit and main circuit diagram, arrangement diagram and plan layout
2. Schematic diagram of secondary circuit for switch cabinet
3. Model, specification and quantity of all electrical elements in the switch cabinet
4. The client shall indicate if the installation of low-voltage box is required.

Summary sheet of electrical equipment

The client shall indicate when the switch cabinet is used in the special environmental condition.