

## Summary

XGN15-12 AC metal enclosed ring network switchgear is a compact and expandable metal enclosed ring network switchgear that uses FLN□-12 SF6 load switch as the main switch and the whole cabinet is air insulated, suitable for distribution automation. The utility model has the advantages of simple structure, flexible operation, reliable interlocking, convenient installation, etc. Satisfactory technical solutions can be provided for various applications and different user requirements.

The main switch of XGN15-12 AC metal enclosed ring network switch cabinet adopts the FLN36-12, FLN48-12 SF6 load switch produced by our company, or the SFG SF6 load switch produced by ABB. VS1, VD4/S, ISM vacuum circuit breakers or HD4/55SF6 circuit breakers can also be equipped according to the needs of users. The load switch and circuit breaker can be operated manually or electrically, and the distribution automation function can be realized after the electric operating mechanism, PT, CT, FTU and communication device are selected.

## Main purpose

◇ XGN15-12 AC metal enclosed ring network switch cabinet is applicable to power system with rated voltage of 12kV and rated frequency of 50Hz, and is widely used in industrial and civil cable ring network and power supply terminal.

◇ XGN15-12 AC metal enclosed ring network switch cabinet is especially suitable for the following places: urban residential areas and industrial and mining enterprises power distribution, small secondary substations, switching stations, box type substations, shopping malls, airports, subways, wind power generation, hospitals, stadiums, railways, bridges, tunnels, etc.

## Environmental conditions

- ◇ Altitude: no more than 2000m;
- ◇ Ambient temperature: minimum temperature - 25°C; The highest temperature is +40°C;
- ◇ Ambient humidity: daily average value shall not exceed 95%; The monthly average value shall not exceed 90%;
- ◇ Seismic capacity: Grade 8;
- ◇ The surrounding air is free of explosive and corrosive gases, and the installation site is free of violent vibration and impact.

## Reference Standards

GB/T 191 Packaging Pictorial marking for storage and transport (ISO 780:1997, MOD)

GB 1985-2004 High voltage alternating current disconnectors (IEC 62,271-102:2002, MOD)

GB 3804-2004 3.6kV-40.5kV high-voltage AC load switch (IE060265-1:1998, MDO)

GB 3906-1991 3-35kV AC metal enclosed switchgear (neq IEC 60298: 1990)

GB 4208-1993 Degrees of protection provided by enclosures (IP code) legv IEC 60529:1989)

GB/T 5582-1993 Pollution level of external insulation of high-voltage power equipment (eqv IEC 507: 1991)

GB/T 6388 Transport package shipping mark

GB 9969.1 General rules for instructions of industrial products

GB/T 11022-1999 Common technical requirements for high-voltage switchgear and controlgear standards (eqv IEC 60,694: 1996)

GB/T 11023-1989 Test method for sulfur hexafluoride gas sealing of high-voltage switchgear

GB/T 13384 General specification for packaging of mechanical and electrical products

GB/T 14436 General rules for industrial product assurance documents

GB 16926-1997 AC high-voltage load switch fuse combination device (eqv IEC 60420: 1990)

JB/T 8754-1998 Method for Model Preparation of High Voltage Switchgear

DL/T404-1997 Ordering technical conditions for indoor AC high-voltage switchgear (neq IEC 60298: 1981)

## 型号含义 Type meaning

F L N □ - 12 / 630



X G N 15 - 12 - □



## 技术参数 Technical parameter

名称 Name	单位 Unit	负荷开关柜 Load switch cabinet	组合电器柜 Combined electrical cabinet	断路器柜 Circuit breaker cabinet
额定电压 Rated voltage	kV	12	12	12
额定频率 Rated frequency	Hz	50/60	50/60	50/60
额定电流 Rated current	A			
主母线 Main bus	A	630	630	630
分支母线 Branch bus	A	630	125(视熔断器额定电流而定) (Depends on the rated current of the fuser)	630
额定绝缘水平 Rated insulation level	kV			
工频耐压(相间及相对地) Power frequency withstand voltage (phase to phase and phase to ground)	kV	42	42	42
工频耐压(断口间) Power frequency withstand voltage (between fractures)	kV	48	48	48
工频耐压(控制和辅助回路) Power frequency withstand voltage (control and auxiliary circuit)	kV	2	2	2
雷电冲击耐压(相间及相对地) Residual impulse withstand voltage (phase to phase and phase to ground)	kV	75	75	75
雷电冲击耐压(断口间) Lightning impulse withstand voltage (between fractures)	kV	85	85	85
额定短时耐受电流(r.m.s) Rated short-time withstand current (r.m.s)	kA			
主回路 Main circuit	kA	20/3s	-	25/2s
接地回路 Grounding circuit	kA	20/25	-	25/2s
额定峰值耐受电流(peak) Rated peak withstand current (peak)	kA	50	-	63
额定短路关合电流(peak) Rated short-circuit making current (peak)	kA	50	80	63
额定短路开断电流 Rated breaking current of lang circuit	kA	-	31.5	25
额定转移电流 Rated transfer current	A	-	1700	-
额定有功负载开断电流 Rated Active load breaking current	A	630	-	-
额定闭环开断电流 Rated closed-loop breaking current	A	630	-	630
额定电缆充电开断电流 Rated cable charging breaking current	A	10	-	15
防护等级 Degree of protection		IP3X	IP3X	IP3X
机械寿命 Mechanical life	次 Times			
负荷开关 Load switch		5000	5000	10000
接地开关 Earthing switch		2000	2000	2000

## Unit three position SF6 load switch

FLN36-12 three position SF6 load switch

### ◆ Introduction

◇ FLN36-12 SF6 load switch is a medium voltage switchgear developed by our company according to the relevant standards of China's power system. Its performance indicators fully comply with IEC and national standards, and it is the main switching element of the ring network cabinet.

It is applicable to three-phase 50Hz AC loop network power supply or double amplitude radio power supply system with rated voltage of 12kV, and is used for installation in distribution room or box type substation.

### ◆ Structural characteristics

◇ FLN36-12 load switch adopts double break and rotary moving contact, which has the following three states: closing; Opening; Grounding.

◇ The load switch uses SF6 as the arc extinguishing and insulation medium. The switch is sealed by the upper and lower shells cast with epoxy resin, with good insulation performance.

◇ In case of internal arcing, there is a structural weakness at the rear of the enclosure, which will be flushed out. Then the arc relief valve on the cabinet will flush out and guide the overpressure air flow out of the cabinet, with good safety performance.

◇ Each load switch is sealed and maintenance free for life(30 years).

◇ The relative pressure of SF6 gas in the load switch is 0.045Mpa.

◇ Mechanical life of load switch: 5000 times of closing opening; 2000 minutes -- grounding.

◇ FLN36-12 load switch and operating mechanism are arranged in the removable upper unit, which can easily change the load switch cabinet into the load switch+fuse combination electrical cabinet, or change the load switch+fuse combination electrical cabinet into the load switch cabinet.

### ◆ Operating mechanism

◇ FLN36-12 is equipped with K-type operating mechanism, referred to as incoming switch. Three position interlocking function; The main switch can be opened or closed manually or electrically; The grounding switch can be opened or closed manually; Mechanical position indication with main switch and grounding switch.

◇ FLN36-12 is equipped with A-type operating mechanism, referred to as outgoing switch. Three position interlocking function; The main switch can be opened or closed manually or electrically; The main switch can be tripped by button or tripping device operation; The grounding switch can be opened or closed manually; It has the mechanical position indication of the main switch and the grounding switch, as well as the mechanical indication when the fuse is blown.

◆ Optional parts ◇ Auxiliary contact: closing position: 2 normally open - 2 normally closed; Opening position: 2 normally open - 2 normally closed; Grounding position: 2 normally open - 2 normally closed; ◇ Shunt tripping coil: used for A-type operating mechanism; ◇ Mechanical trip button: used for A-type operating mechanism; ◇ Electric operation: equipped with motor drive device and control unit, the load switch can be electrically opened and

## 技术参数 Technical parameter

名称 Name	单位 Unit	参数 Parameter	
额定电压 Rated voltage	kV	12	
额定频率 Rated frequency	Hz	50/60	
额定电流 Rated current	1min 工频耐受电压, 相间及对地 / 断口间 1min power frequency withstand voltage, phase to phase and to ground/fracture	A	630
	额定雷电冲击耐受电压, 相间及对地 / 断口间 Rated lightning impulse withstand voltage, phase to phase and to ground/break to break	kV	42/48
额定绝缘水平 Rated insulation level	kV	75/85	
辅助回路 1min 工频耐受电压 1min power frequency withstand voltage of auxiliary circuit	kV	2	
额定短时耐受电流 / 持续时间 Rated short-time withstand current/duration	kA/S	20/3	
额定峰值耐受电流 Rated peak withstand current	kA	50	
额定短路关合电流 Rated short-circuit making current	kA	50	
额定开断电流 Rated breaking current	有功负载电流 Active load current	A	630
	闭环开断电流 Closed loop breaking current	A	630
	空载变压器 No load transformer	kVA	1250
	电缆充电电流 Cable charging current	A	10
额定转移电流 Rated transfer current	A	1700	
额定充气压力 (20℃) Rated inflation pressure (20℃)	Mpa	0.045	
气体年相对泄漏率 Annual relative gas leakage rate		0.5%	
机械寿命 Mechanical life	负荷开关 Load switch	次 Times	5000
	接地开关 Earthing switch	次 Times	2000
相间距 (中心距) Phase spacing (center distance)	mm	210	

## FLN48-12 three position SF6 load switch

### ◆ Introduction

FLN48-12 SF6 load switch is a new type of SF6 load switch developed and produced by our company. It is applicable to 10kV power distribution system and conforms to the corresponding IEC standards and national standards. It has passed the type test in the National High Voltage Electrical Apparatus Testing Center and is widely used in fixed AC metal enclosed switchgear.

◆ Structural characteristics ◇ FLN48-12 load switch has the following three states: closing; Opening; Grounding. The load switch uses SF6 as the arc extinguishing and insulating medium, and the switch shell is equipped with two windows made of thermoplastic materials for observation.

◇ Each load switch is sealed and maintenance free for life (30 years).

◇ The relative pressure of SF6 gas in the load switch is 0.045Mpa.

◇ FLN48-12 switch is equipped with a capacitive voltage divider for voltage indication.

◇ Mechanical life of load switch: 5000 times of closing opening; 2000 minutes -- grounding.

◇ FLN48-12 load switch and operating mechanism are arranged in the removable upper unit, which can easily change the load switch cabinet into the load switch+fuse combination electrical cabinet, or refuse to change the load ◇ switch+fuse combination electrical cabinet into the load switch cabinet.

### ◆ Operating mechanism

◇ FLN48-12 is equipped with UES-K3 operating mechanism, referred to as incoming switch

◇ FLN48-12 is equipped with UES-A3 operating mechanism, referred to as outgoing switch

### Optional parts

◇ Auxiliary contact: closing position: 2 normally open - 2 normally closed; Opening position: 2 normally open - 2 normally closed; Grounding position: 2 normally open - 2 normally closed;

◇ Shunt tripping coil: used for UES-A3 operating mechanism;

◇ Mechanical trip button: used for UES-A3 operating mechanism;

◇ Electric operation: equipped with motor drive device and control unit, the load switch can be electrically opened and closed.

## SFG type three position SF6 load switch

### ◆ Introduction

SFG load switch unit is a new type of SF6 load switch originally produced by ABB, which is applicable to 10kV power distribution system and widely used in fixed AC metal enclosed switchgear.

### ◆ Structural characteristics

◇ SFG load switch has the following three states: closing; Opening; Grounding.

◇ The load switch uses SF6 as the arc extinguishing and insulating medium, and the switch shell is provided with two windows made of thermoplastic materials for observation.

◇ Each load switch is sealed and maintenance free for life (30 years).

◇ The relative pressure of SF6 gas in the load switch is 0.045Mpa.

◇ SFG switch is equipped with a capacitive voltage divider for voltage indication.

◇ Mechanical life of load switch: 5000 times of closing opening; 2000 minutes -- grounding.

◇ SFG type load switch and operating mechanism are arranged in the removable upper unit. It is convenient to change load switch cabinet into load switch+fuse combination electrical cabinet, or change load switch+fuse combination electrical cabinet into load switch cabinet.

### ◆ Operating mechanism

SFG is equipped with UES-K3 operating mechanism, referred to as incoming switch.

SFG is equipped with UES-A3 operating mechanism, referred to as outgoing switch.

### ◆ Optional parts

◇ Auxiliary contact

Closing position: 2 normally open - 2 normally closed

Opening position: 2 normally open - 2 normally closed

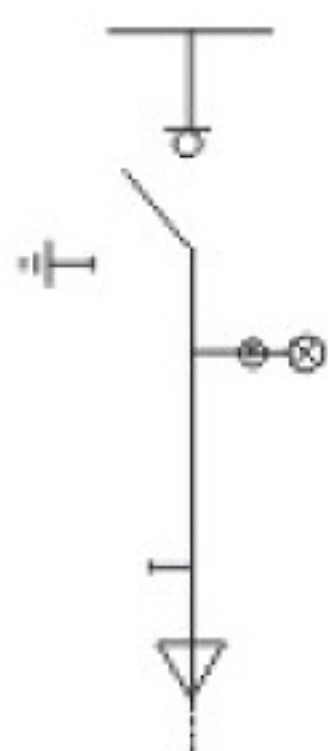
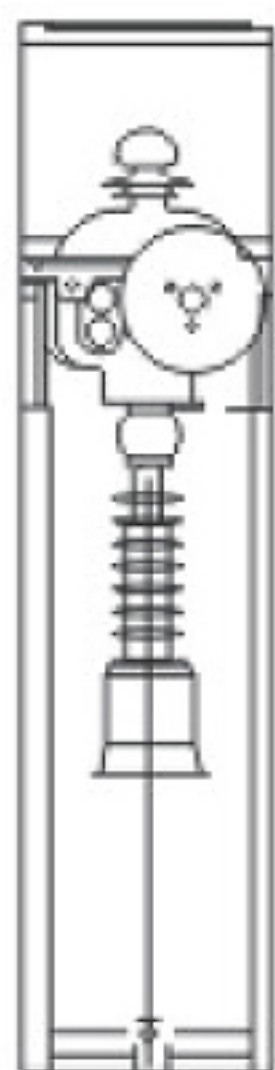
Grounding position: 2 normally open - 2 normally closed

◇ Shunt tripping coil: used for UES-A3 operating mechanism

◇ Mechanical trip button: used for UES-A3 operating mechanism

◇ Electric operation: equipped with motor drive device and control unit, the load switch can be electrically opened and closed.

## Structure and components of load switch cabinet



- ◆ Basic structure
- ◇ XGN15-12 load switch cabinet consists of the following four parts:
  - ◆ Bus room
  - ◇ The busbar chamber is arranged at the upper part of the cabinet. In the busbar chamber, the main busbar is connected together and runs through the whole row of switchgear.
  - ◆ Load switch
  - ◇ FLN36-12 or FLN48-12 or SFG type three position SF6 load switch can be selected. The shell of the load switch is made of epoxy resin, SF6 gas is filled as arc extinguishing and insulating medium, and the load switch can be equipped with SF6 barometer and observation hole.
  - ◆ Cable room
  - ◇ The load switch cabinet has ample cable room, which is mainly used for the connection of power cables, so that single core or three core cables can be connected with the simplest unshielded cable head (indoor terminal). At the same time, the ample space can also be used to install snow shelters, current transformers, voltage transformers and other components, as standard configuration. The cabinet door has observation windows and safety interlocks. The cable base plate shall be equipped with cable sealing ring, support frame and cable clamp of appropriate size as required. The bottom plate of the cable chamber and the front frame of the door can be removed to facilitate cable installation.
  - ◇ The low-voltage chamber interlocked by the operating mechanism, interlocking mechanism and low-voltage control room functions as a control panel at the same time. The low-voltage chamber is equipped with a spring operating mechanism with a position indicator and a mechanical interlocking device. It can also be equipped with auxiliary contacts, capacitive live displays, key locks and electric operating devices. At the same time, the low-voltage chamber space can also be used to install control loops and measuring instruments. Two identical low-voltage chambers are installed on a 750 mm wide cabinet, More accessories can be installed.
  - ◇ The upper part of the cabinet includes busbar chamber, load switch, operating mechanism and low-voltage chamber, which are separated from the cable chamber at the lower part. Therefore, equipment maintenance, overhaul and updating can be carried out on the upper part of the cabinet.

◆ Basic components

The whole load switch cabinet is divided into upper unit and lower unit, which can safely and conveniently repair and reform the equipment installed in the upper unit, and can replace the entire upper unit.

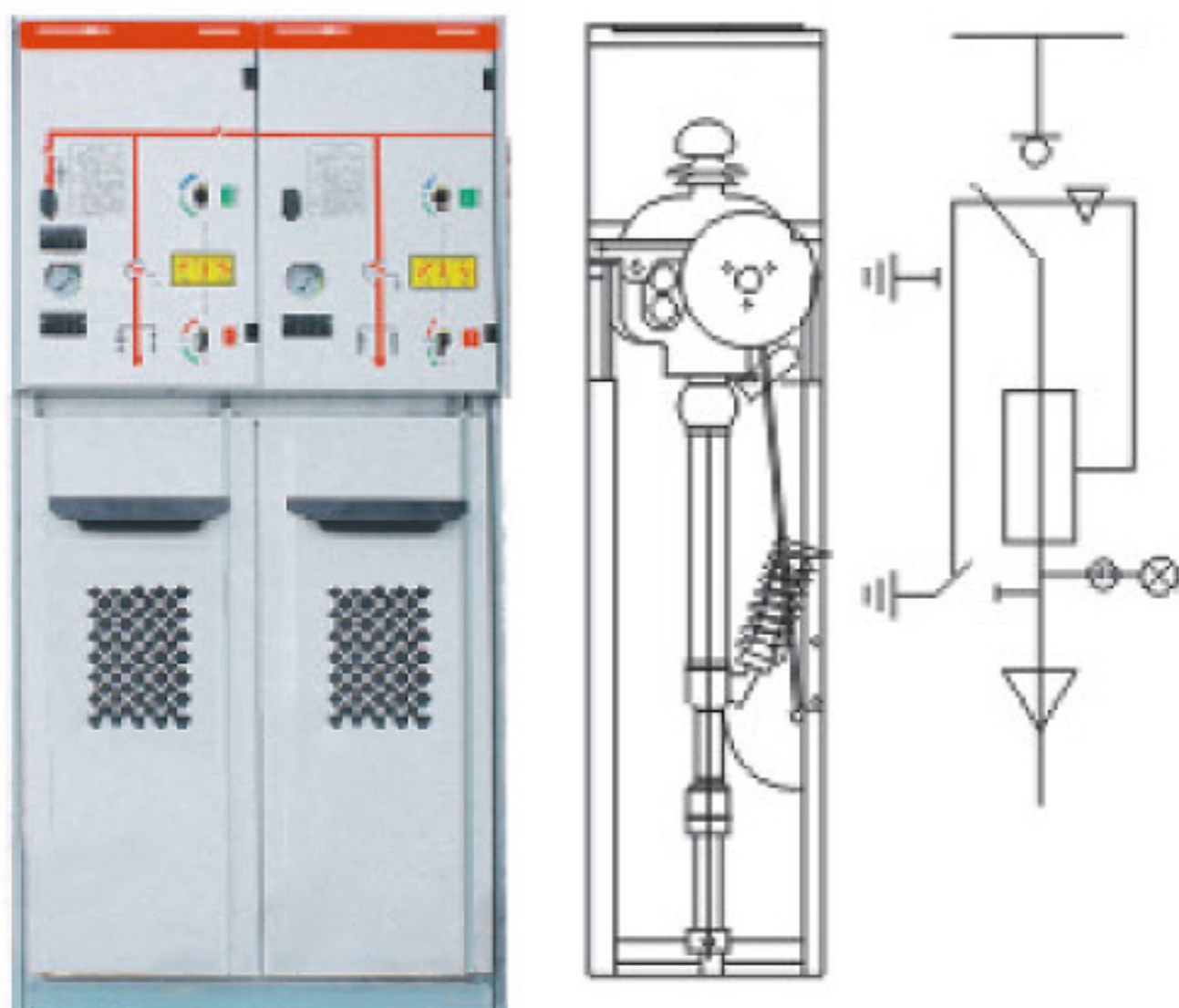
Upper unit, including:

- ◇ Three position SF6 load switch
- ◇ Mother chamber shell
- ◇ Integrated low-voltage chamber
- ◇ Interlocking device
- ◇ Bus bar

Lower unit, including:

- ◇ Cable chamber shell
- ◇ Bottom plate of cable chamber with cable support
- ◇ Optional components
  - ◇ Integrated live display or portable live display plug-in interface
  - ◇ Auxiliary contact at each position: 2NO+2NC
  - ◇ SF6 gas pressure monitor with alarm contact
  - ◇ Electric operating mechanism
  - ◇ Current transformer
  - ◇ Voltage transformer (instead of cable connection)
  - ◇ Arrester
  - ◇ Grounding bus
  - ◇ Short circuit ground fault indicator
  - ◇ Cold shrinkable indoor cable terminal
  - ◇ Pressure release channel
  - ◇ Control cable
  - ◇ Channel

**Structure and components of combination**



#### Basic structure

◇ XGN15-12 load switch+fuse combination electrical cabinet is mainly used for transformer protection. This type of cabinet is equipped with a FLRN36-12 or FLRN48-12 or SFG type three position SF6 load switch and an independent auxiliary grounding switch. The closing of the grounding switch embedded in the load switch can ground the upper contact of the fuse, while the closing of the independent auxiliary grounding switch can ground the lower contact of the fuse breaker.

XGN15-12 load switch+fuse combination electrical cabinet consists of the following four parts:

#### ◇ Bus bar room

The busbar chamber is arranged at the upper part of the cabinet. In the busbar chamber, the main busbar is connected together and runs through the whole row of switchgear.

#### ◇ Load switch

FLN36-12, FLN48-12 or SFG type three position SF6 load switch can be selected. The shell of the load switch is made of epoxy resin, filled with SF6 gas as arc extinguishing and insulating medium. The load switch can be equipped with SF6 barometer and observation hole. Only when the load switch is in the grounding position can it enter the cable chamber.

#### ◇ Cable room

The load switch cabinet has ample cable room, which is mainly used for the installation of fuses and lower grounding switches, as well as the connection of power cables. Single core or three core cables can be connected with the simplest unshielded cable head (indoor terminal). As a standard configuration, the cabinet door has an observation window and a safety interlock device. The cable base plate shall be provided with cable sealing ring, support frame and cable clamp of appropriate size as required. The bottom plate of the cable chamber and the front frame of the door can be removed to facilitate cable installation.

The operating mechanism, interlock mechanism and low-voltage control room operating mechanism are of double spring type, with automatic tripping function when fuse is fused. The low-voltage chamber with interlocking functions as a control panel at the same time. The low-voltage room is equipped with spring operating mechanism and mechanical interlock device with position indicator, as well as auxiliary contact, tripping coil, emergency tripping device, capacitive electrified display, key lock and electric operating device. At the same time, the low-voltage room space can also be used to install control loops, measuring instruments, etc.

#### ◆ Basic components

##### ◇ Upper unit, including:

- ◇ Three position SF6 load switch
- ◇ Operating mechanism equipped with mechanical position indicator
- ◇ Integrated low-voltage chamber
- ◇ Fuse trip device with indicator
- ◇ Bus compartment shell
- ◇ Interlocking device
- ◇ Bus bar

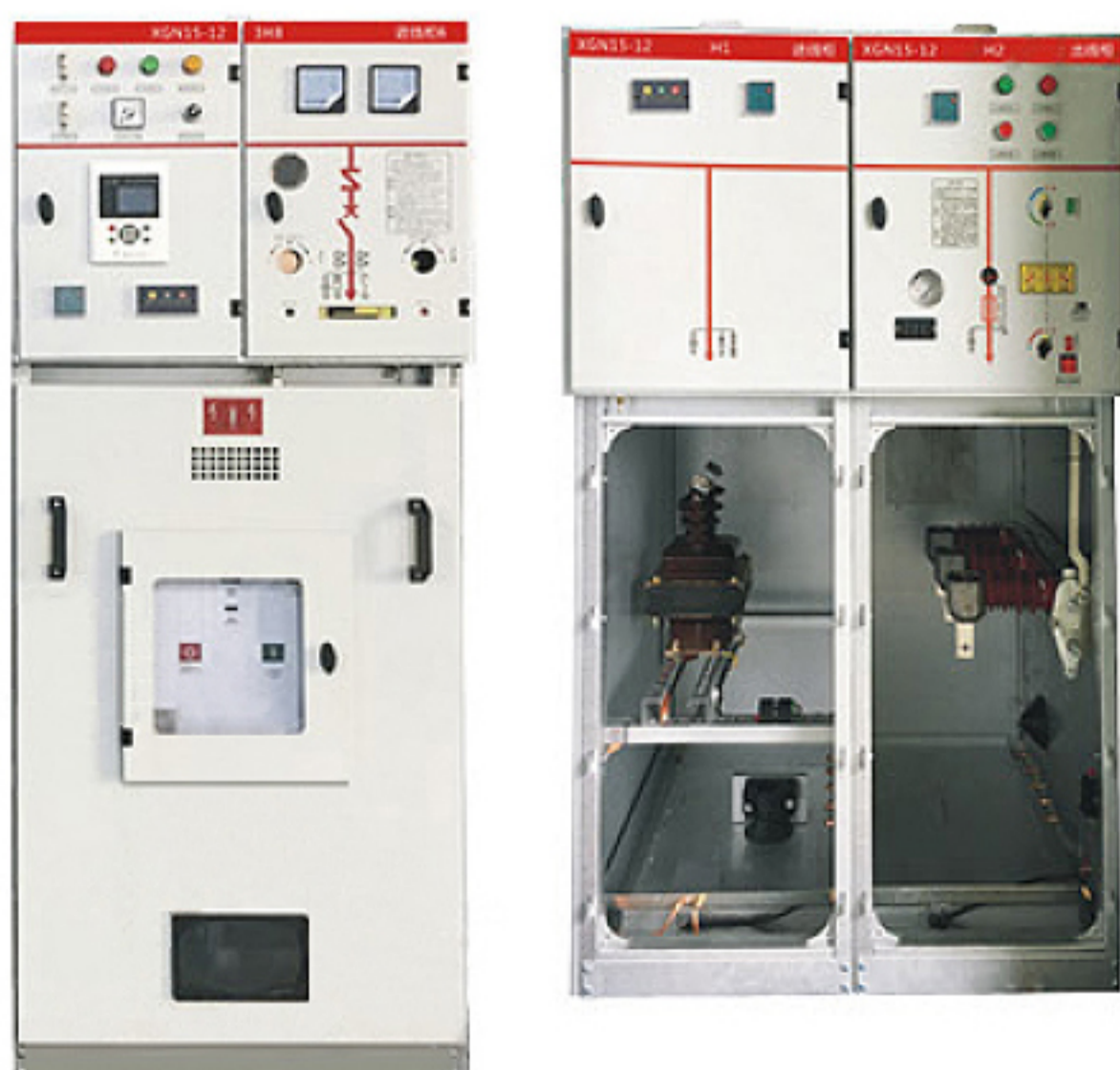
##### ◇ Lower unit, including:

- ◇ Grounding switch
- ◇ Fuse socket
- ◇ Cable chamber shell
- ◇ Bottom plate of cable chamber with cable support

##### ◆ Optional components

- ◇ Integrated live display or portable live display interface
- ◇ Auxiliary contact at each position: 2NO+2NC
- ◇ SF6 gas pressure monitor with alarm contact
- ◇ Emergency trip mechanism
- ◇ Trip coil
- ◇ Electric operating mechanism
- ◇ Voltage transformer (instead of cable connection)
- ◇ Grounding bus
- ◇ Short circuit ground fault indicator
- ◇ Cold shrinkable indoor cable terminal
- ◇ Current limiting fuse
- ◇ Pressure release channel
- ◇ Control cable channel

#### Structure and basic components of circuit breaker cabinet



断路器柜 Circuit breaker cabinet

#### ◆ Basic structure

◇ XGN15-12 circuit breaker cabinet is mainly used as incoming cabinet of main power supply or standby power supply in ring network power supply system and intermediate section cabinet of dual power supply system. The circuit breakers can be VS1 type VD4/5, ISM vacuum circuit breakers or HD4/S type SF6 circuit breakers with slightly different dimensions.

◇ The circuit breaker cabinet consists of instrument room, bus bar room, load (isolation) switch room, circuit breaker room and cable room from top to bottom. CT, PT, lightning arrester, grounding switch and relay protection device can be configured according to user needs, with reliable "five prevention" interlocking function.

◇ The operating mechanism of VS1 vacuum circuit breaker is spring energy storage type, which can be operated by AC or DC or manually. It is the largest domestic vacuum circuit breaker in use at present. Its main electrical circuit and operating mechanism are designed integrally, with stable quality and reliable performance. Composite insulation of main electrical circuit, small size. It can be installed by handcart or fixed type. Corresponding to 630A rated current specification, the rated short circuit breaking current reaches 25kA.

◇ VD4/S type vacuum circuit breaker or HD4/S type SF6 circuit breaker is specially designed by ABB for the ring network switchgear, and its breaking capacity is sufficient to cope with various states, including the operation of normal switching equipment or branch network and the breaking of short circuit current under special circumstances. These two types of circuit breakers A, B and C are arranged longitudinally, easy to install, small in size and light in weight. The rated short-circuit breaking current reaches 25kA.

◇ German ISM permanent magnetic mechanism vacuum circuit breaker is specially designed for assembling 10kV ring network cabinet. Its permanent magnetic operating mechanism is an electromagnetic operating mechanism with electronic control, online detection elements and permanent magnetic protection.

#### ◆ Main features

◇ Circuit breaker: ABB original VD4/S vacuum circuit breaker

Or VD4/M circuit breaker

ABB original IID4/S SF6 circuit breaker

◇ From top to bottom, there are instrument room, busbar room, load (isolation) switch room, and cable room of circuit breaker room;

◇ CT, PT, lightning arrester, grounding switch and SPAJ40C overcurrent and short-circuit fault relay protection device can be configured according to user needs;

◇ It has reliable "five prevention" interlocking function.

#### ◆ Double power incoming cabinet

This equipment is composed of two electrically operated load switches and a full set of standby automatic switching devices. In order to realize the automatic switching function of the system, the system introduces the verification mode of live display in addition to the traditional PT acquisition voltage in the judgment of whether there is voltage, and the equipment can be set to the following two working modes according to the actual situation:

◇ Incoming line is one main line and one standby line

◇ Two incoming lines are standby for each other

#### ◆ Auxiliary equipment

◇ Remote control and monitoring unit

This unit can provide effective protection, remote control and monitoring systems: provide a ready to use RTU factory solution for distribution network automation. No external control box is required. All electronic components, batteries and modems are installed in an independent box behind the standard panel of the switch.

Combined overcurrent and earth fault relay

#### Other cabinet types



分断柜 Breaking cabinet

#### ◆ Bus connection cabinet

◇ The busbar connection cabinet is used for the connection of cable and busbar, and the cabinet is equipped with electrical clamp for fixing electrical system. Current transformer, lightning arrester and other components can also be selected. 375mm or 500mm wide,

#### ◆ Bus section cabinet

◇ The busbar section cabinet is always used together with the busbar lifting cabinet. The basic cabinet is 375mm wide and equipped with a FLN36-12 or FLN48-12 or SFG type three position SF6 load switch for bus sectioning.

#### ◆ Bus lifting cabinet

◇ The busbar lifting cabinet connects the busbar with the bottom of the section cabinet equipped with load switch. When the cabinet width is 750mm, it can be used as a metering cabinet.

#### ◆ Measuring cabinet

◇ The metering cabinet is used to measure voltage, current and power. The front upper door and lower door are equipped with special lead sealing for the convenience of the power supply department.

#### ◆ Double power incoming cabinet

◇ This equipment is composed of two electric load switch counters and a full set of standby automatic switching devices, in order to realize the automatic switching function of the system. The system judges whether there is voltage except for the traditional PT acquisition voltage.

◇ The verification mode of live display is also introduced, and the equipment can be set to the following two working modes according to the actual situation:

◇ Incoming line is one main line and one standby line

◇ Two incoming lines are standby for each other

#### ◆ Outdoor ring network cabinet/branch box with switch cable

◇ The box body is made of aluminum zinc steel plate or stainless steel plate with plastic sprayed surface. The thickness is not less than 1.5mm, and it has strong corrosion resistance. Except for the main cabinet frame, other box parts are sheet metal components, which are light in weight and elegant in appearance,

◇ There is no fastener on the surface of the box for disassembly, and the anti-theft property is good, The box has IP3X protection grade and good rain proof performance.

The top cover is an air sandwich double-layer structure. And is provided with a vent; The air inlet is set at the box panel and has a removable dust-proof filter screen; The air outlet is set at the top of the box and hidden under the eaves to form air convection from bottom to top, so that the box has good heat insulation and ventilation effects; The top cover has a drainage angle of 3 degrees.

◇ The box has a sealed floor with cable inlet to prevent moisture in the cable trench from entering the box.

◇ Door and lifting lug shall be sealed with sealing strip; The side door can be opened according to the user's needs; The door lock is rainproof structure; When the door is opened, the limited pull hook makes the door easy to fix.

### Auxiliary equipment



故障指示器  
Fault indicator



凝露控制器  
Condensation controller



光端机  
Optical transceiver



DAT-1L 型配电自动化终端  
DAT-1L distribution automation terminal



熔断器  
Fuse

#### ◆ Fault indicator

◇ DJD-1 short-circuit grounding fault indicator adopts logic circuit to realize over-current alarm and delay reset functions, and can also be reset manually. Three short circuit fault sensors are installed on three-phase power cables, one ground fault sensor is installed on a three core cable, and the display unit is fixed on the panel of the switch cabinet. The sensor and the display unit are connected through optical fiber or cable. The short circuit grounding fault indicator helps the line patrol personnel to quickly determine the fault section, eliminate the fault in time, and shorten the fault outage time.

#### ◆ Condensation controller

◇ The condensation controller is composed of temperature (humidity) sensor, control unit and heater. When the ambient temperature (humidity) reaches the preset range. The control unit activates the heating circuit. It can monitor the temperature and humidity of the installation environment of the switch cabinet in real time, make the environmental temperature index meet the working requirements, and effectively prevent condensation. Technical parameters of typical condensation controller are as follows:

◇ Condensation start control: 85%RH  $\pm$  5% RH (20°C)

◇ Condensation stop: 75%RH  $\pm$  5% RH

◇ Response speed: typical value  $\leq$  35

◇ Output: 1 time of working voltage, rated power resistive load AC220V 3A

◇ Rated power of heater: 75-100W

#### ◆ FTU and communication device

◇ XGN15-12 series unit type metal enclosed ring network switchgear can be configured with DAT-1L and other types of distribution automation terminals (feeder automation terminal unit, FTU). The switchgear can be incorporated into the data acquisition and monitoring system (SCADA system) of the distribution automation system through the optical fiber communication system to achieve the remote control, telemetry and tele-signaling functions of the switchgear. With the master station software, it can also realize the functions of fault isolation, recovery and network reconfiguration of the distribution network. The typical DAT-1L distribution automation terminal has the following main functions:

◇ Information acquisition and processing function

It includes 48 channels of remote signaling, 8 channels of telemetry, 8 channels of remote control and 1 channel of DC.

◇ Parameter setting function

It has the function of parameter remote setting and local setting.

◇ Timing function

Receive commands from master station or sub station and keep synchronization with system clock.

◇ Equipment self diagnosis and self recovery function

Regularly detect important internal chips, report errors to the sub station or master station and reflect the internal working conditions with power on and software self recovery functions; With watchdog to monitor the running state of the program.

◇ Fault detection function

It can quickly detect faults and actively report the fault information and nature to the master station or sub station for fault isolation. It includes zero sequence over-current and over-voltage detection, line overload detection and line three-phase over-current detection.

◇ Communication function

It has two RS232, two RS232/RS485 four serial ports, one CAN bus port and rich protocol library (IEC600870-5-101, DNP3.0, MODBUS, CAN2.OB, etc.).

◇ Local debugging function

With LCD module, keyboard and good human-computer interface, the special debugging interface RS232 can also be used for local debugging of portable computers. The panel has various operation indicators.

#### ◆ High voltage current limiting fuse

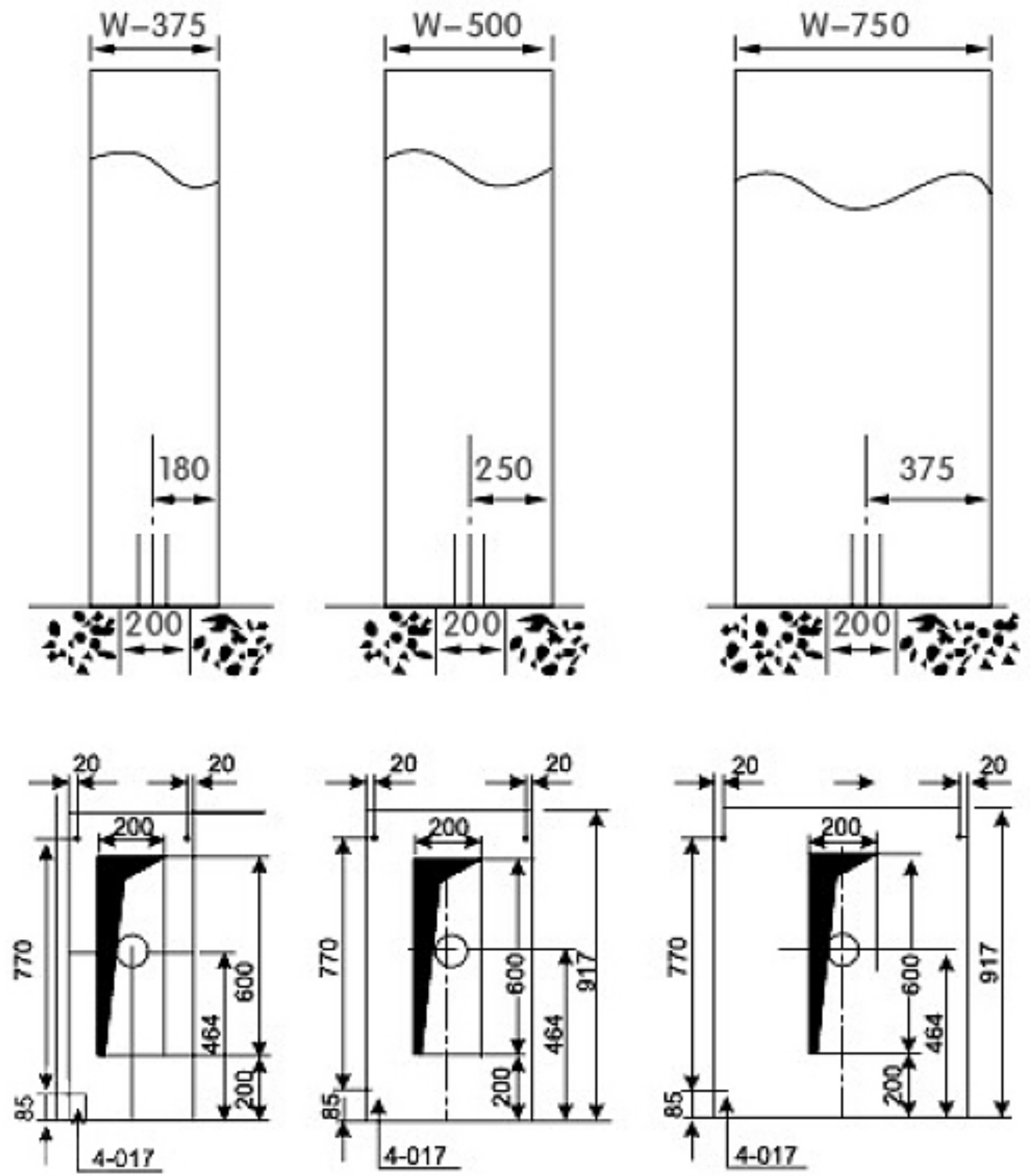
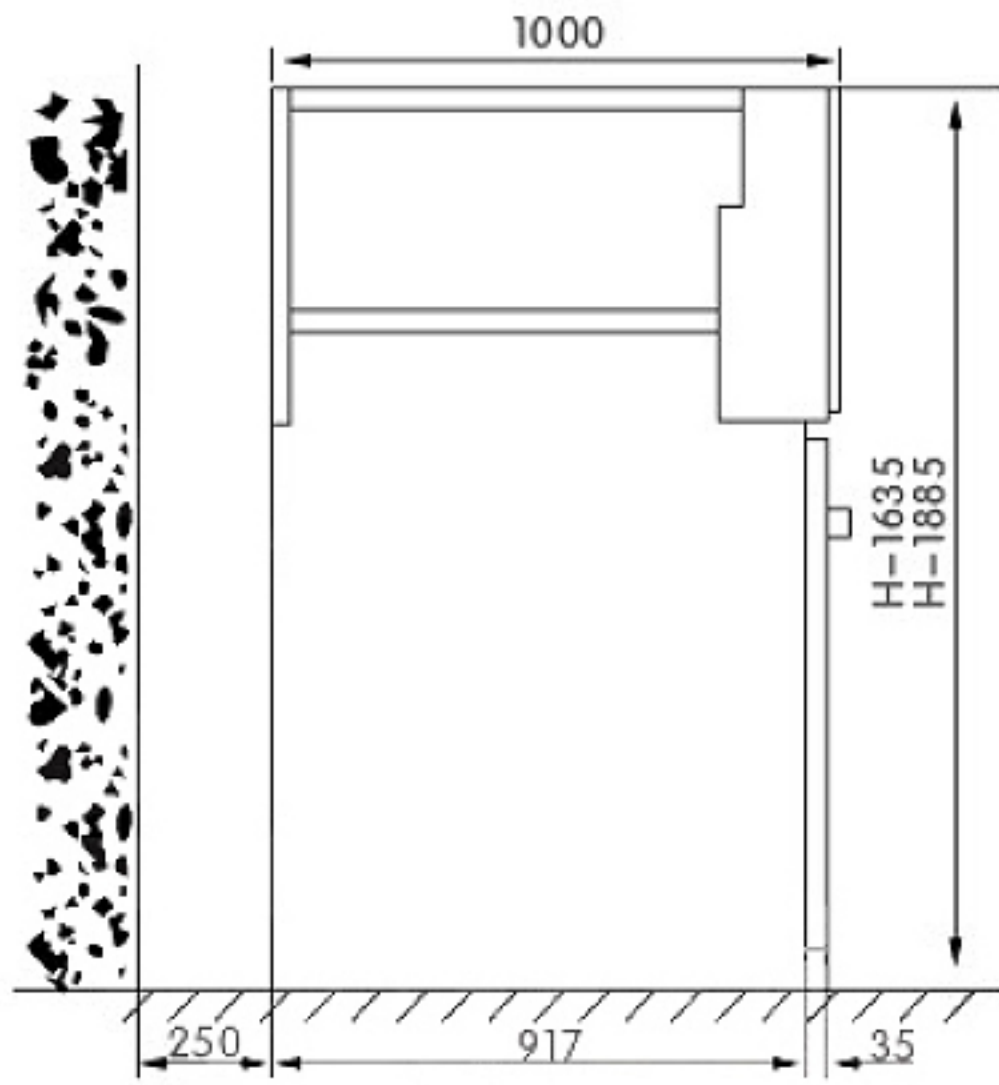
The product is applicable to indoor AC 50Hz, rated voltage 12kV system. The length of 12kV is 292mm.



# 外形尺寸及基础安装尺寸 Overall dimensions and foundation installation dimensions

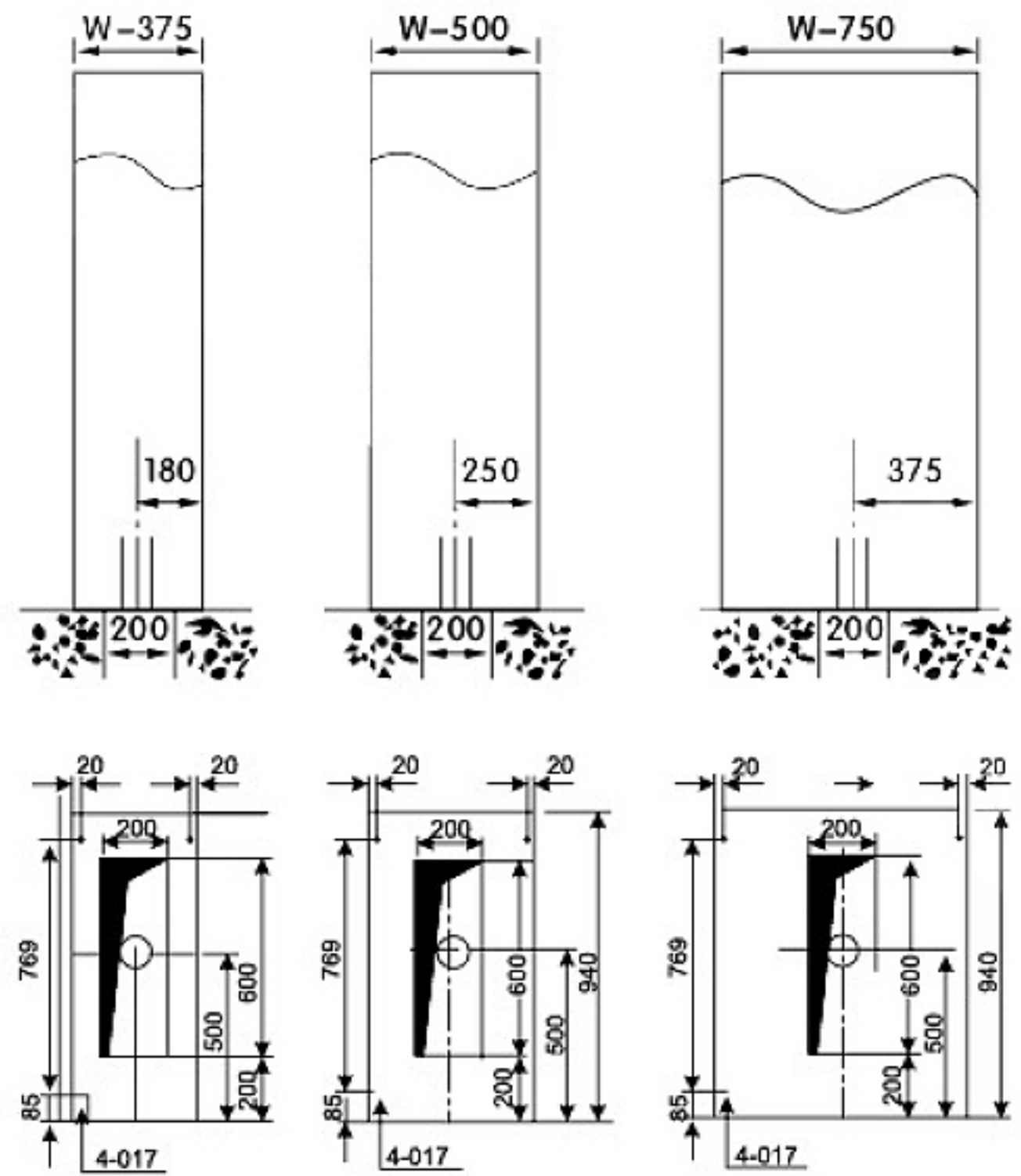
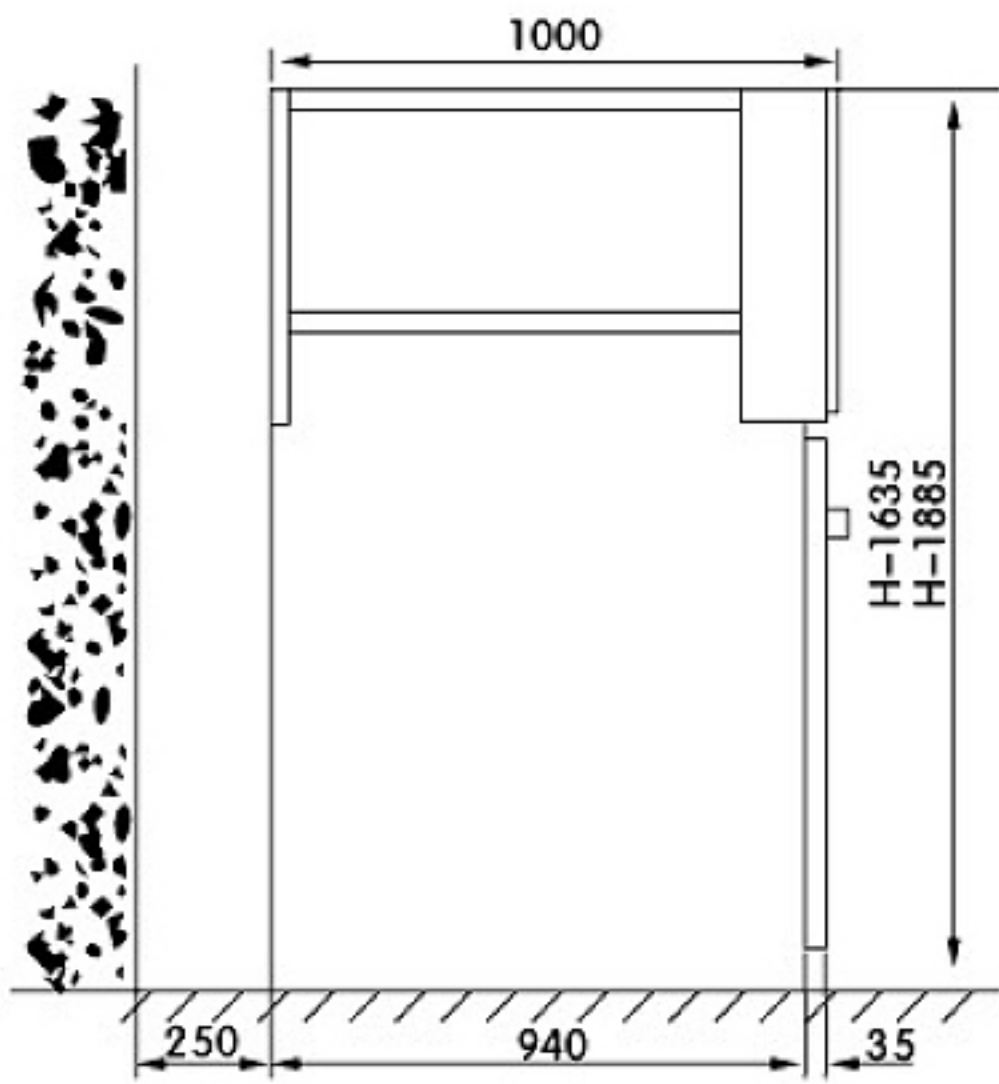
XGN15-12 I型外形安装尺寸

XGN15-12 Type I overall installation dimensions



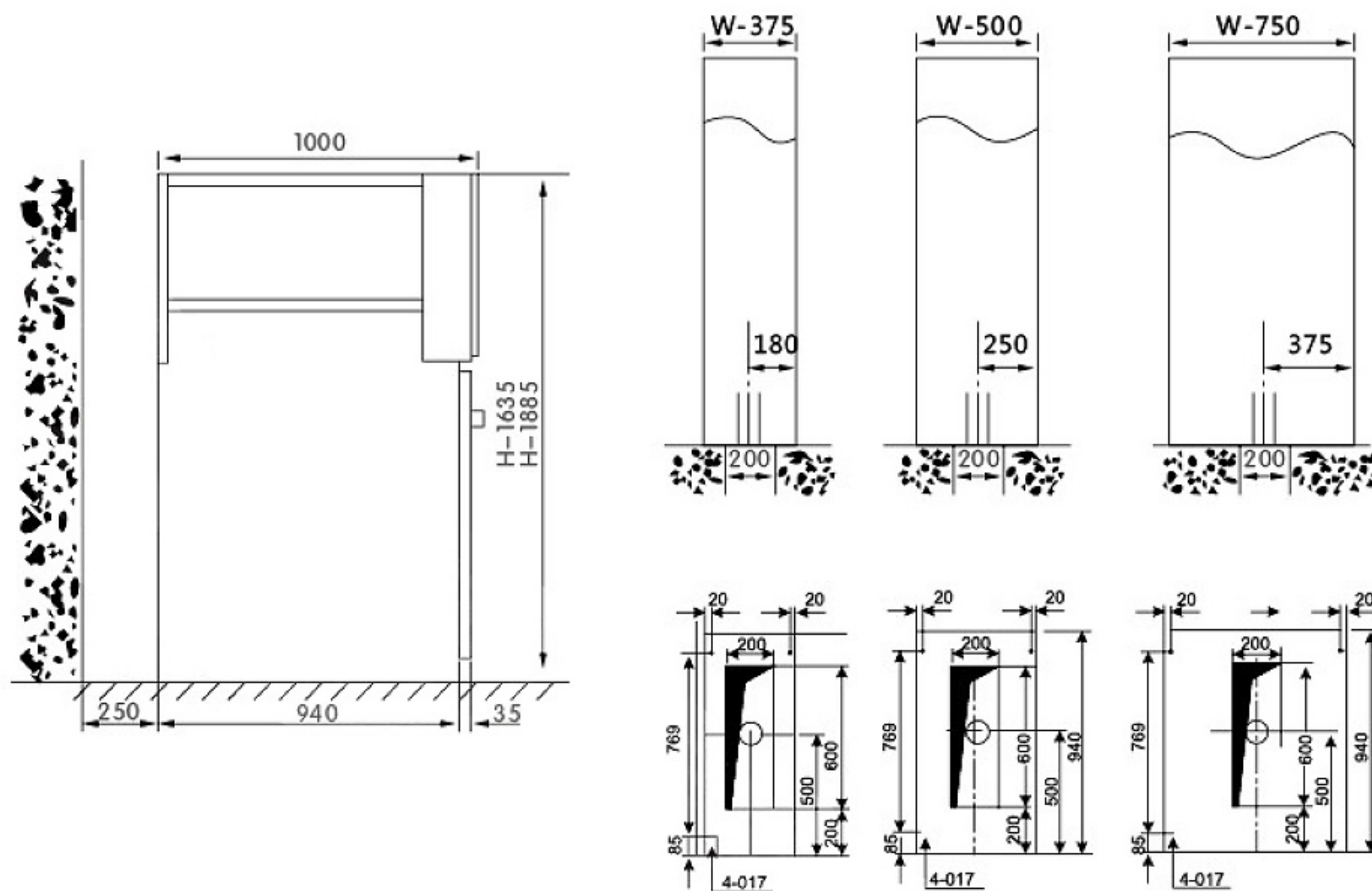
XGN15-12 II型外形安装尺寸

XGN15-12 Type II overall installation dimensions



I 型 (FLN36)

II 型 (FLN48)



III型 (ABB-SFG)

### Ordering Instructions

- ◆ Transportation and storage
  - ◇ The switch cabinet can be transported by shoveling when it is fixed on the bottom plate, and it shall be lifted or shoveled when it is not fixed on the bottom plate.
  - ◇ The switchgear (even with external packaging) should not be stored in the open air for a long time. The switchgear stored for a long time shall be stored in a dry and ventilated indoor warehouse. The validity of the external packaging of the switchgear shall not exceed 1 year.

### ◆ Product completeness

The following documents and accessories will be handed over together with the switchgear when it leaves the factory

- ◇ Product certificate
- ◇ Product installation and operation manual
- ◆ Packing list
- ◇ Engineering design data of products
- ◇ Switch cabinet accessories: each installation combination is configured with one load switch operating handle

### ◆ Ordering data

Users shall provide the following information when ordering products:

- ◇ Main circuit wiring scheme
- ◇ Layout plan of switch cabinet installation
- ◇ Schematic diagram of auxiliary circuit and control circuit in switch cabinet(if necessary)
- ◇ Other written materials with special requirements.