

AGN-12

- former XGN15-12D

Ring Main Unit

User's Manual



Catalogue

1. General Description	2
2. Technical Parameter for Ring Main Unit	3
3. Structure and Fundamental Component for Ring Main Unit	4
3.1 AGN-12/24 II Type Ring Main Unit Structure	4
3.2 AGN-12/24 II Type Ring Main Unit Fundamental Component	5
3.3 AGN-12/24 III Type Ring Main Unit Structure	6
3.3.1 AGN-12/24 II Type Ring Main Unit Structure Ingredient	7
3.3.2 AGN-12/24 II Type Ring Main Unit Fundamental Component	8
4. Structure and Fundamental Component for Ring Main Unit with Circuit Breaker.....	9
4.1 Structure for Circuit Breaker Ring Main Unit	9
4.2 HD4 Type SF6 Circuit Breaker	10
4.3 BP Series Vacuum Circuit Breaker with Permanent Magnetic Mechanism	10
4.4 VDM6-12 Type Vacuum Circuit Breaker with Permanent Magnetic Mechanism.....	11
4.5 SFLDJ-12 Type HV Fuse	12
4.6 SPAJ140C Type Compound Over Current and Earth Fault Relay	12
5. Types of Ring Main Unit and Primary Programm	13
5.1 Basic Types and Main Programm	13
5.2 Primary Programm	14
5.3 Application Examples	16
6. Installation for Ring Main Unit	17
6.1 AGN-12/24 II Type Ring Main Unit's Dimension 、 Installation Basics	17
6.2 AGN-12/24 III Type Ring Main Unit's Dimension 、 Installation Basics	18
7. Transportation Maintenance and Order	19
7.1 Transportation and Storage	19
7.2 Maintenance	19
7.3 Order	19

1. General Description

AGN-12/24 (former XGN15-12) unit type SF6 ring net cabinet with SF6 load switch as main switch, for whole cabinet is suitable for electric distribution automatization and compact also expandable metal close switchgear. It characters in its simple structure, flexible operation, reliable interlocking and convenient installation etc., which can provide the satisfactory technical projects both for different application occasions and users. With the adoption of sensor technology and the protection relay up to date, plus the advanced technology and flexible assembly project, AGN-12 unit type SF6 ring net cabinet can completely meet the requirement of continuously variable market. It can take self-produced AFL-12/24 load switch or SFG type SF6 load switch by ABB; also according to user's demand can be assembled with the internationally top-ranking BP series vacuum circuit breaker with permanent magnetic mechanism made by RZVA or HD4 type SF6 circuit breaker made by RZVA or HD4 type SF6 circuit breaker made by ABB or with our VDM6-12 type vacuum circuit breaker with permanent magnetic mechanism. Operational methods for the main switch inside ring main unit can be either manual or electric power driven. And It can meet the requirement of "Four Controls" when matched with FTU and RTU.

1、 Purpose

- 1.1 AGN-12/24 type unit SF6 ring main unit is suitable for the electrical system with AC 50Hz and the voltage of 12kV, and widely used for the terminal of industrial and civil cable ring net and the power supply.
- 1.2 Especially suitable for the following sites: urban residential district distribution, small-scale secondary transformer substation, switching substation, cabinet type transformer substation, mining and industrial enterprise, supermarket, airport, metro, electricity generation by wind power, hospital, railway and tunnel etc.

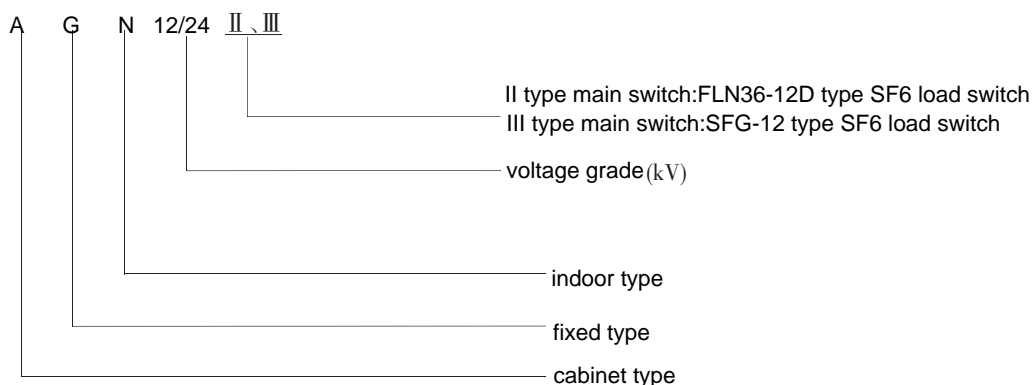
2、 Normal Service Conditions

- 2.1 Altitude $\leq 2500\text{m}$
- 2.2 Ambient temperature: $45^{\circ}\text{C} \sim -35^{\circ}\text{C}$; maximum temperature difference $\leq 25^{\circ}\text{C}$
- 2.3 Average value of daily relative humidity $\leq 95\%$
Average value of monthly relative humidity $\leq 90\%$
- 2.4 Anti-earthquake capacity: earthquake intensity ≤ 8 degree
- 2.5 Be kept away from the places without drastic shake and impulse, without fire, chemical corrosion and explosion.

3、 Standard

IEC298. 265. 129. 694. 420. 56. 529. 932
GB3804. 3906. 11022

4、 Meaning of Model



2. Technical Parameter for Ring Main Unit

Technical Parameter and Dimension

No.	Item	Unit	Parameters		
1	Rated voltage	kV	12	24	
2	Rated current	A	630 / 1250 *		
3	Rated frequency	Hz	50 / 60		
4	1min Power frequency withstand voltage	Common value	kV	42	50
		Across insulate distance	kV	48	60
5	Lightning impulse withstand voltage	Common value	kV	75	125
		Across insulate distance	kV	85	145
6	Rated short time withstand current	Main loop	kA	25 / 2s	20/2s
		Earth loop	kA	20 / 2s	16/2s
7	Rated withstand current (peak)	kA	63	50	
8	Rated transfer current	A	1700	1000	
9	Rated active load and close circuit breaking current	A	630		
10	Rated cable charge breaking current	A	50 and 10		
11	Unloaded transformer breaking current	A	20	20	
12	Cable charge breaking current in earthing malfunction	A	100	80	
13	Rated short circuit breaking current	kA	20**		
14	Rated short circuit making current	kA	63	50	
15	Protection degree		IP3X		
16	Load break switch life	Times	5000		
17	Earth switch life	Times	2000		
Load switch cabinet	width	[mm]	375, 500, 650, 750		
	depth	[mm]	840, 900,980		
	height	[mm]	1600, 1850		
Circuit breaker cabinet	width	[mm]	650, 750		
	depth	[mm]	840, 900,980		
	height	[mm]	1600, 1850, 2150		

* rated current of fuse combination decided by the fuse current

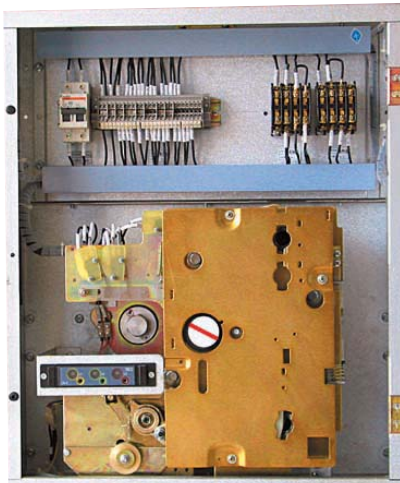
3. Structure and Basic Components of Ring Main Unit

3.1 AGN-12/24 II type ring main unit structure

There are total 4 parts for the unit type SF6 ring main unit:

- ① bus-bar chamber
- ② switch chamber
- ③ cable chamber
- ④ operation mechanism, interlocking mechanism and low-voltage control chamber

The entire AGN-12/24 type switch cabinet includes the upper unit and the lower unit, the upper unit is structured by bus-bar chamber, load switch, operating mechanism chamber and low-pressure chamber, which can be assembled to be a complete cabinet with the cable chamber of lower unit, also separated from the lower unit (see the picture). It is safe and convenient to check/repair and reconstruct the equipment inside the the upper unit and can be realized to replace the entire upper unit if necessary.



1 bus-bar chamber

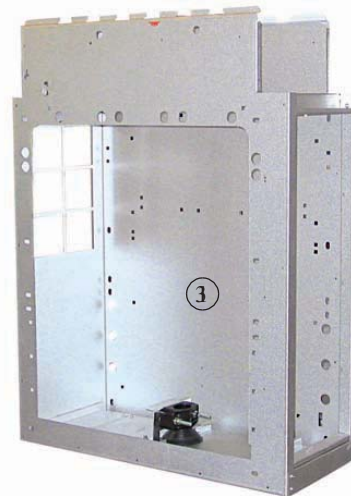
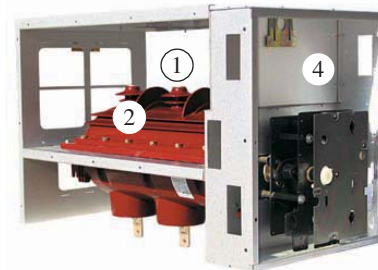
The bus-bar chamber is on the upper part of cabinet. Inside the bus-bar chamber, the main bus-bars are connected together throughout the switch cabinet.

2 switch chamber

Inside the switch chamber is installed a FLN36-12D type SF6 load switch the crust of which is made by epoxide resin casting, and the SF6 gas is the insulating medium. There can be installed the SF6 gas densi-meter or the gas densitor with the alarm touching point.

3 cable chamber

The cable chamber is mainly used for the cable connection, the single-core or three-core cable can be connected with the simplest non-shielding cable head, meanwhile the ample space can hold arrester, current mutual-inductor, lower earth switch etc. According to the standard design, there are observation window and safety interlocking device on the cabinet door. And the sealed cover and cable clip are attached with the bottom plate of cable chamber. The bottom plate of cable chamber and the front door frame are detachable, which is convenient for cable installation.



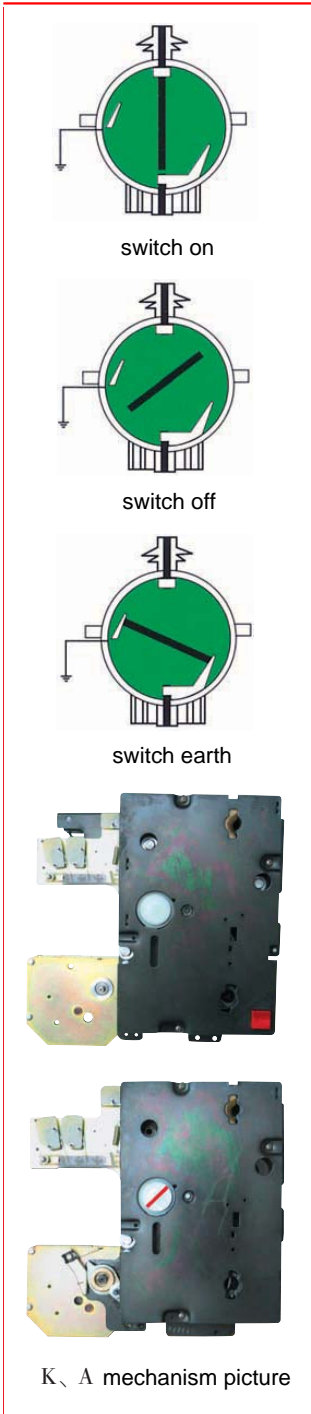
upper and lower unit cabinet

4 operation mechanism, interlocking mechanism & low-voltage control chamber

The mechanism chamber with interlocking meanwhile works as control panel. Inside mechanism chamber are installed the spring operating mechanism and mechanical interlocking device all with position indicator, also can be installed the auxiliary touching point, breaking coil, tripping mechanism in urgency, capacitive electrification indicator, key and motor device. The low-pressure chamber can hold control loop measuring meter and protection relay. The cabinet of 750mm width has two same low-pressure chambers for more accessories.

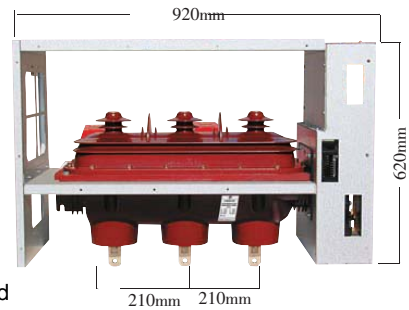
3. Structure and Basic Components of Ring Main Unit

3.2 AGN-12/24 II type ring main unit basic components



1. AFL-12/24 type switchgear is developed and produced by the company itself according to the requirement of domestic electrical system through absorbing the foreign technology, the main components of which are all the imported original binding.

The switchgear has double-fracture, switching on/off and earth switch, reversible contactor, with SF6 as arc extinguishing medium. Reversible contactor lies in the die casting epikote crust that strengthens the structure. Every switch is permanently sealed after charged by SF6 gas with the relative pressure of 0.4bars, the gas leakage can be detected by helium detector. It is not limited for the vertical or horizontal installation, the typical installation inside the ring main unit is to place a separating steel plate between cable chamber for the horizontal installation, which isolates the bus-bar from cable connector to conform with the most strict safety requirement for running maintenance. There are a weak point of structure behind the crust, in case inside happens the arcing when the load switch breaks and makes current, it would be pushed open, then the arc leakage valve on the top of cabinet is pushed open to lead the over-pressure gas flow out of cabinet.



Upper unit
 load switch +
 insulating switch
 + earth switch

2. Operating Mechanism

2.1 Double-function and single-spring operation mechanism: K style

- function of switching on/off :
switch on / off independently by operating arm or motor
- earth switch function :

Switch on / off independently by operating lever, the operation energy is provided by compressed spring, connector would be on or off after the spring released.

2.2 Double-function and double-spring operation mechanism: A style

- function of switching on/off
Switch on / off independently by operating lever and motor, the operation energy is provided by compressed spring, connector would be on or off after the spring released.

Switch on / off independently by button (O) or tripping unit or tripping device.

- earth switch function

Switch on / off independently by operating lever, the operation energy is provided by compressed spring, connector would be on or off after the spring released.

2.3 optional components

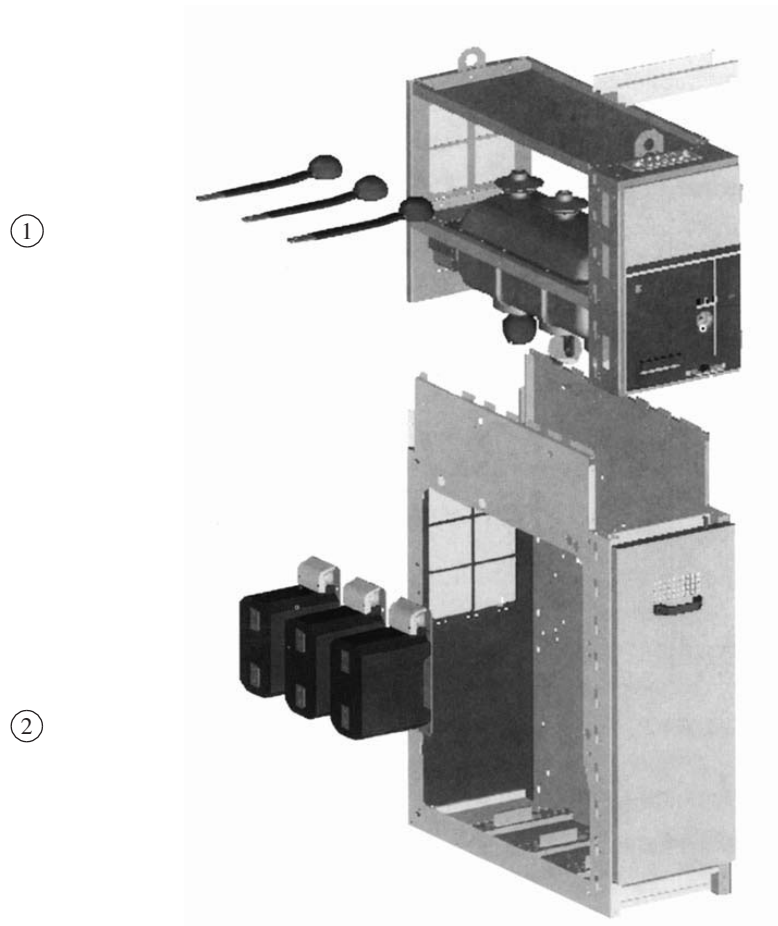
motor operation: AC 220V 110V
 DC 220V 110V

auxiliary switch 5 often on and 5 often off

- tripping coil
(used for A type mechanism)
AC 220V 110V
DC 220V 110V
- fuse auxiliary indication switch
- communication interface
of RTU and FTU
- malfunction indicator

3. Structure and Fundamental Component for Ring Main Unit

3.3 AGN-12/24 III Type Ring Main Unit Structure



①

Upper Unit

- SFG LBS with switching on/off and earth switch
- operating mechanism with mechanical position indicator
- crust of busbar chamber
- integrated low-pressure chamber
- interlocking device
- bus bar
- control cable tank

②

Lower Unit

- crust
- current mutual-inductor
- earth switch
- voltage mutual-inductor
- cable bottom plate matched with cable strutting pieces

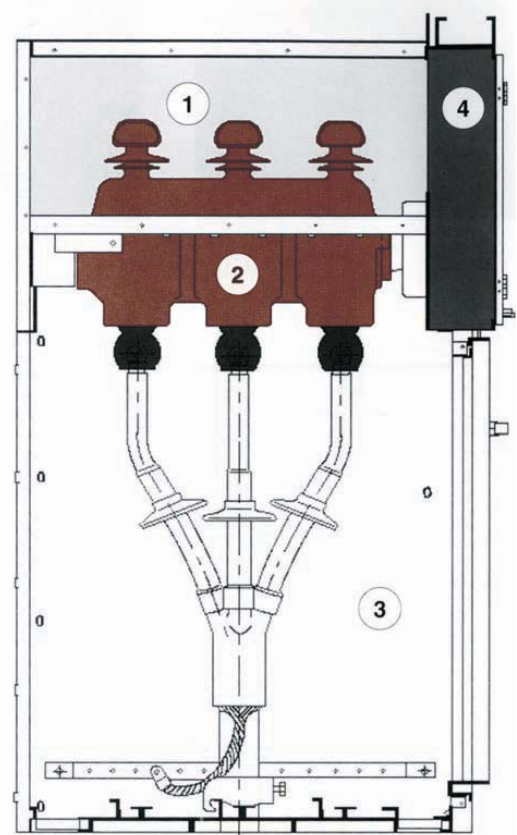
3. Structure and Basic Components of Ring Main Unit

3.3.1 AGN-12/24 III type ring main unit structure

There are total 4 parts for the unit type SF6 ring main unit:

- ① bus-bar chamber
- ② switch chamber
- ③ cable chamber
- ④ operation mechanism, interlocking mechanism and low-voltage control chamber

The entire AGN-12/24 II type switch cabinet includes the upper unit and the lower unit, the upper unit is structured by bus-bar chamber, load switch, operating mechanism chamber and low-pressure chamber, which can be assembled to be a complete cabinet with the cable and convenient to check, repair and reconstruct the equipment inside the chamber of lower unit, also separated from the lower unit. It is safe the upper unit and can be realized to replace the entire upper unit if necessary.



1 Bus-bar chamber

The bus-bar chamber is on the upper throughout the switch cabinet. the main bus-bars are connected together

2 Load break switch

Inside the switch chamber is installed a SFG-12 type SF6 load switch produced by ABB the crust of which is made by epoxy casting, and the SF6 gas is the insulating medium.

There can be installed the SF6 gas meter or the gas densitor with the alarm touching point.

3 Cable chamber

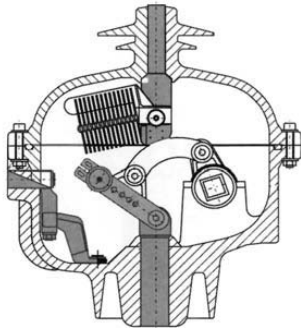
The cable chamber is mainly used for the cable connection, the single-core or three-core cable can be connected with the simplest non-shielding cable head, meanwhile the ample space can hold arrester, current mutual-inductor, lower earth switch etc. According to the standard design, there are observation window and safety interlocking device on the cabinet door. And the sealed cover and cable clip are attached with the bottom plate of cable and the front door frame are detachable, which is convenient for cable installation.

4 Operation mechanism, interlocking

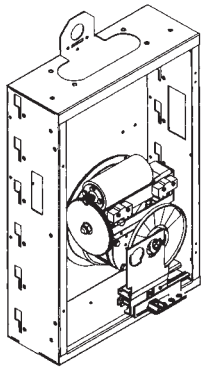
mechanism and low-voltage control chamber The LV chamber with interlocking meanwhile works as control panel. Inside mechanism chamber are installed the spring operating mechanism and mechanical interlocking device all with position indicator, also can be installed the auxiliary touching point, breaking coil, tripping mechanism in urgency, capacitive electric indicator, key and motor device. The low-pressure chamber can hold control loop measuring meter and protection relay. The cabinet of 750mm width has two same low-pressure chambers for more accessories.

3. Structure and Basic Components of Ring Main Unit

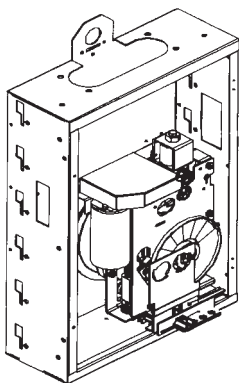
3.3.2 AGN-12/24 III Basic Components of Ring Main Unit



single spring operation mechanism UESK3



single spring operation mechanism with motor UESK3



double spring operation mechanism with motor UESK3

1. SFG type load switch
There are three statuses below for SFG load switch:

— switch on —switch off —earth switch

SF6 is used as the arc-extinguishing and insulating medium for load switch on the crust of which are set two thermoplastic windows for observation. Every load switch is sealed and free of maintenance all of life (30 years). The relative pressure of the SF6 gas inside it is 0.47bars. There is capacitive voltage divider that displays voltage inside SFG switch the mechanical life of which is 5000 times of switching on -switching off and 1000 times of switching off -to earth.

Inside the detachable upper unit are installed the switch and operation mechanism.

2. UES-K3 / 2

single spring operation mechanism

Single-spring operation mechanism matches with SFG load switch to control switching-on /off and to earth. During the operation, there must be installed the complete-set IVFJ220001 R2 center interlocking device before UES-K3/2. Single-spring operation mechanism closes and opens the load switch by making use of the energy stored in the flat spring. The complete operating angle is about $180^\circ(90^\circ + 90^\circ)$. By clockwise, operation mechanism closes the load switch and by counterclockwise closes the earth switch.

Under the normal conditions, there is no need to check and repair the operation mechanism throughout the whole time limit for use, the mechanical life for it is 5000 times of switching on/off and 1000 times of switching off -to earth.

UEMC40K8U/1 type motor operation device can be matched with UES-K3/2 single-spring operation mechanism by installation.

Centre interlocking device

Inside the switch cabinet are installed the new-type centre interlocking device which can avoid the wrong operation, be suitable for many kinds of interlocking way, and can be additionally matched with padlock and key lock.

Position and operation indication

Different colors of labels can be used for the position indication.

Manual Operating Handle

use the type of 1VFJ220002R2 operating

Switch Cabinet

— SFG matches with UES-K3

— SFG matches with UES-A3

Optional Components

— motor operation: AC 220V 110V

DC 220V 110V

— auxiliary switch:

position on 2 often on -2 often off

position off 2 often on -2 often off

earth position 2 often on -2 often off

— tripping coil matches with UES-A3

— mechanical tripping button UES-A3

— fuse burn-out auxiliary switch

handle to avoid the wrong operation.

3. UES-A3/2

double spring operation device

SFG load switch and SDF cabinet are used with UES-A3/2 together.

The switching on/off and to earth for load switch are controlled by the same operation mechanism. UESA3/2 is also used to drive EF earth switch. During the operation, before UESA3/2 must be installed the complete-set IVFJ220001R2 centre interlocking device.

UES-A3/2 uses the energy stored in two flat springs. K spring is used to close and break the load switch for normal operation, A spring to quickly open the load switch.

When A spring is operated, it stores energy for K spring meanwhile, During the normal operation and would not be released unless the signals from fuse, shunt tripping coil or manual button are received by it. Under the other conditions, the use of UES-A3/2 is similar with that of UES-K3/2. After tripping, operating axis must return back to the on position. The complete manual operating angle is about $180^\circ(90^\circ + 90^\circ)$, clockwise operation closes the load switch and counterclockwise operation closes the earth switch.

Under the normal conditions, there is no need to check and repair the operation mechanism throughout the whole time limit for use.

4. Structure and Basic Components of Ring Main Unit with Circuit Breaker

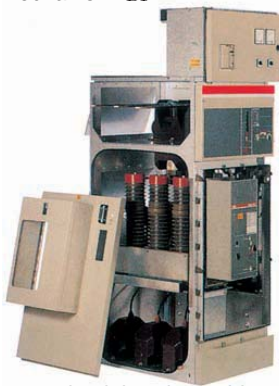
4.1 Structure of Ring Main Unit with Circuit Breaker



the front of circuit breaker with permanent magnetic mechanism BP



the flank of circuit breaker with permanent magnetic mechanism BP



circuit breaker cabinet

The ring main unit matched with circuit breaker is mainly used as the main electric source inside ring net power supply system, the inlet cabinet of reserve electric source and the middle segment cabinet of two-source power supply system.

Whether AGN-12/24 II or AGN-12/24 III, they all can be matched with circuit breaker as the main switch, just the slight difference on the dimension.

■ The circuit breakers installed in XGN15-12 type ring main unit include:

1. vacuum circuit breaker with permanent magnetic mechanism (imported from and originally installed by Ukraine, some parts inside vacuum arc-extinguishing chamber is produced by ABB Germany)
 - BP1-12/1000-20
 - BP2-12/1000-31.5
 - BP2-12/1600-31.5
2. SF6 circuit breaker (imported from and originally installed by ABB)
 - HD4-12/630-25
 - HD4-12/1250-25
3. vacuum circuit breaker with permanent magnetic mechanism (assembled by our company by the imported components)

VDM6-12/1250-25

VDM6-12/1250-31.5

VDM6-12/2500-31.5

■ Installation way
fixed type of front installation, lorry style of front installation, fixed type of flank installation

■ Main structure

1. Meter chamber, bus-bar row chamber, load (isolating) switch chamber, circuit breaker chamber, cable chamber from the top to the bottom
2. According to the needs of users, install CT, PT, arrester, earth switch, the protection device of overcurrent and short circuit fault relay
3. The interlocking can be realized for circuit breaker and load (isolating) switch.
4. Circuit breaker can meet the requirement of "four remote control" when switch is installed with motor operation mechanism and FTU, RTU.

■ Dimension (mm)

Height : 1850 2200

Width : 750

Depth : 840 900 1000



simple mid-ships cabinet

4. Structure and Basic Components of Ring Main Unit with Circuit Breaker



4.2 HD4 Type SF6 Circuit Breaker (Original part by ABB)

HD4 type SF6 circuit breaker is specially designed for ring main switch cabinet, whose break capacitance can sufficiently deal all kinds of statuses including the operation of normal control and protection device and branch network also turning on and turning off short-circuit under the special conditions. The new generation of HD4 is made by the most up-to-date SF6 break technology, plus the simple structure, which needs very few energy. Such a simple energy-storage operation mechanism has the advantage of long mechanical life during operation. The circuit breaker can realize the automatic reclosing operation by the adoption of spring operation mechanism.

The special structure for the switch break can unbelievably protect prolonging the mechanical life. The switch is placed vertically with divided separated pole-type structure. The switch makes use of the energy of electric arc to extinguish arc. When circuit breaker switches off, between the fixed and reversible connectors inside the arc-extinguishing chamber would be generated electric arc, the high temperature and ionization effect generated by which makes the SF6 gas pressure rockets up inside the arc-extinguishing chamber, with the enhancement of gas pressure and the gradual separation of arcing connectors, SF6 gas pressure spouts the gas out of arc-extinguishing chamber by force through ejection nozzle, which makes the electric arc sparse, cooled down, ruptured and stops the restrike of arc, therefore the switch operation only needs few energy to more strengthen the reliability of long-term running. This switch has the advantages below:

1. short arcing durative time, the insulating intensity inside arc-extinguishing chamber restores rapidly.
2. guarantee the safety and reliability even in the most formidable environment.
3. capacitive current that can break low-value.
4. simple operation mechanism, quick switching on/off, long mechanical life.
5. reduce the exhaustion of connectors and arc-extinguishing chamber, i.e. to prolong electric life.
6. more allowed operation times, but only little maintenance.
7. light style structure, compact and stable.

Standard parts:

- motor operation
- manual operation
- auxiliary connecting point (2 often on and 2 often off)
- tripping with position connecting point
- tripping switching-on coil

Optional parts:

- gas pressure control on signal connecting point
- S5 solid over-current relay
- PR511-PR512 over-current relay
- LV tripper
- interlocking coil

4.3 BP Series Vacuum Circuit Breaker with Permanent Magnetic Mechanism (by RZVA Ukraine)

BP series vacuum circuit breaker with permanent magnetic mechanism is a hi-tech product which is designed especially to match with 10Kv ring main unit with the most up-to-date HV switch technology of the 21st century, whose permanent magnetic operation mechanism is an electronic control with in-line check components.

It has the below advantages:

△ simple and three-phase discrete structure. Every phase includes vacuum arc-extinguishing chamber, upper and lower wiring terminal. The permanent magnetic operation mechanism is on the bottom of switch which itself has the "three remote control" interface.

△ reliable capacity in conformity with all of the requirements of IEC and GB standards, no bounce for switching on, no rebound for switching off, 100000 times of reliable operation under the rated short-circuit current.

△ longevity, free of maintenance, 25 years of continuous operation under normal condition.

△ small dimension: 520 length x 210 width x 570 height (mm)

4. Structure and Fundamental Components of the Circuit Breaker for Ring Main Unit

4.4 VDM6-12 Type

Vacuum circuit breaker with permanent magnetic mechanism



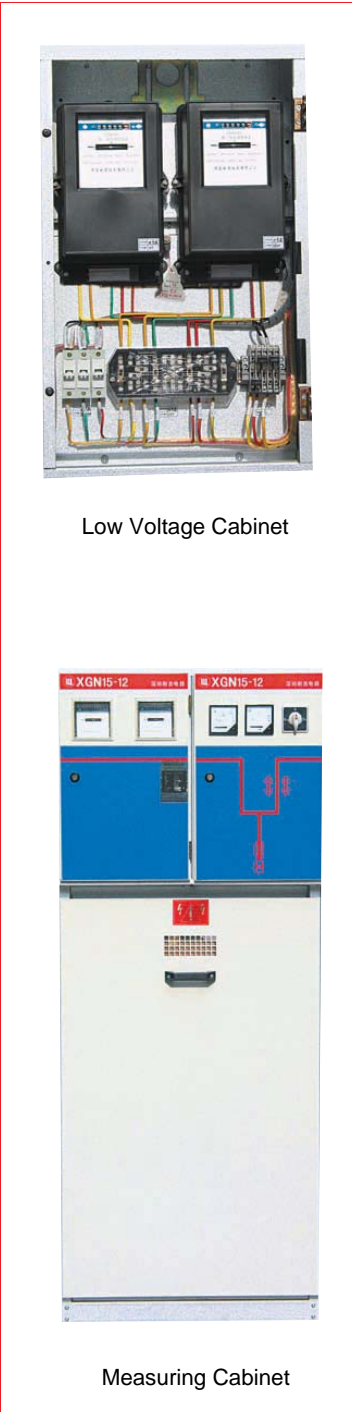
■ Features Introduction

- ◇ Simple structure: separate three-pole structure, less spare parts for permanent magnetic mechanism, extremely high reliability, and more simple than the traditional spring mechanism with hundreds of spare parts.
- ◇ Excellent performance: switching on/off three phase non-synchronism is within 0.5ms, the consistency between the switching on/off time and average speed is extremely good, the over-zero phase select break can be realized. The operating electrical source of mechanism is compatible for alternating current and direct current, with the wide range of voltage.
- ◇ Small-sized: dimension 570 width x 420 depth x 560 height with only 60 kilogram, phase distance 210, suitable for different kinds of switch cabinet, cable branch cabinet and distribution switching substation.
- ◇ Skipping-proof: no need for additional skipping-proof relay because of the skipping-proof function of permanent magnetic mechanism itself.
- ◇ Complete functions: electric switching on/off and manual switching off, also switching on by the attached hand electricity-generating device.
- ◇ Longevity: 10000 times for electric life, more than 100000 times for mechanical life, 50 times of break for the rated short-circuit current.
- ◇ Free of maintenance: no need for mechanical locking, high reliability for the whole equipment running, more than 30 years of service under normal conditions, repair expense be saved.

Technical Parameter

No.	Item	Unit	Parameters	
1	Rated voltage	kV	12	
2	Rated current	A	1250	1600 2500
3	Rated short circuit break current	kA	25	31.5
4	Rated short circuit making current	kA	63	80
5	Rated peak withstand current	kA	63	80
6	Rated short time withstand current	kA	25	31.5
7	Rated thermo stable time	S	3	
8	Automatic reclosing operation sequence		off—0.3S—on/off—180S—on/off	
9	Rated single capacitor bank making current	A	630	
10	Rated back-to-back capacitor bank making current	A	400	
11	Rated out-of-phase earth malfunction break current	kA	25×0.866	31.5×0.866
12	Insulating level	Lightning impulse withstand voltage(peak value)	kV	75
		Imin power frequency withstand voltage	kV	42
13	Mechanical life	times	100000	
14	Electric life	Rated current break times	times	10000
		Rated short circuit current break times	times	100

4. Structure and Fundamental Components of the Circuit Breaker for Ring Main Unit

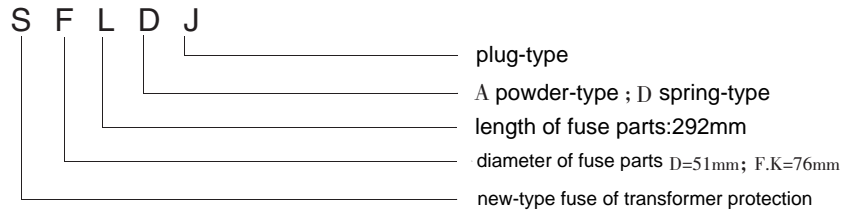


Low Voltage Cabinet

Measuring Cabinet

4.5 SFLDJ series fuse

The product is suitable for indoor AC 50Hz and the rated voltage of 12kV.
 The introduction for model No. as below:



fuse chosen and ordered for transformer protection, see the below format

transformer capacitance	transformer primary voltage 10kV	fuse model *	rated current of fuse [A]
100		12kVSDL □ J	16
125		12kVSDL □ J	16
160		12kVSDL □ J	16
200		12kVSDL □ J	20
250		12kVSDL □ J	25
300 / 315		12kVSDL □ J	31.5
400		12kVSDL □ J	40
500		12kVSDL □ J (SFL □ T)	50
630		12kVSDL □ J (SFL □ T)	63
750 / 800		12kVSFL □ J	80
1000		12kVSFL □ J	80
1250		12kVSFL □ J	100
1600		12kVSFL □ J	

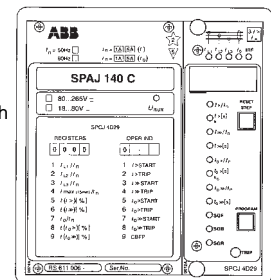
*Take into the consideration that fuse matches with switch, A must not be chosen for □

4.6 Combined Over-current and Earth Fault Relay SPAJ 140C

- static protecting relaySPA
- over-current measuring relay J
- mechanical structure code 1
- type identification code 40
- type code with serial communication device C

Features

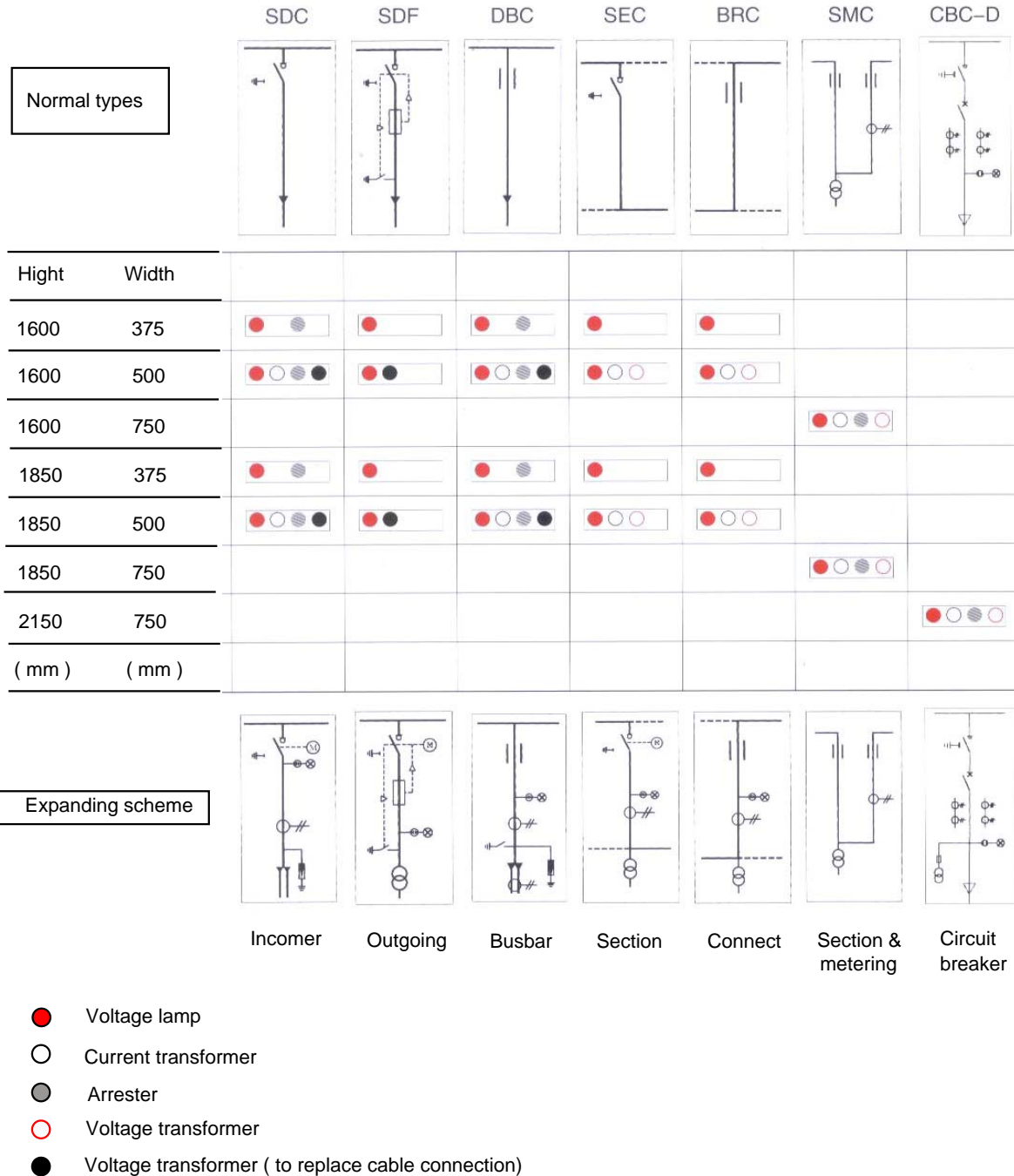
- three-phase definite low value over-current components with definite time-lag or inverse time lag
- three-phase high definite value over-current components with instant and definite time-lag function
- low definite value non-direction earth fault protection with definite time-lag or inverse time-lag
- high definite value non-direction earth fault protection with instant or definite time-lag function
- internal circuit breaker malfunction protection loop
- output relay device
- wide range of data communication device through serial channel
- highly flexible on design, simply choose the corresponding working way according to different application conditions
- the value measured by current and the stored fault value are all displayed in digital.
- continuous self-checking unit that can automatically check the internal fault.



SPAJ 140 C type over-current and earth fault relay

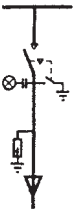
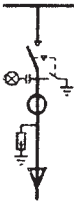



5. Ring Main Unit Types and Primary Scheme

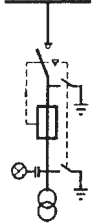

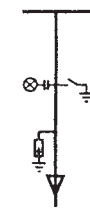
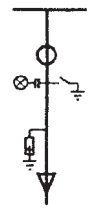
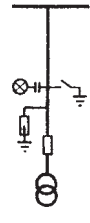
5.1 Normal Types and Main Programm



5. Ring Main Unit Types and Primary Scheme

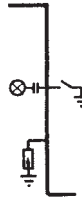
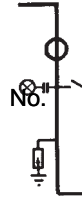
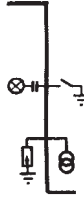
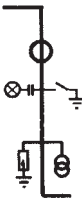
5.2 Primary scheme


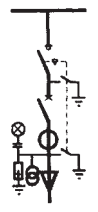
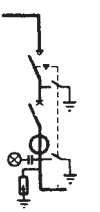

No.		01	02	03	04	05
main loop	Programm Drawing					
dimension	width mm	375 or 500	500	500	750	500
	height mm	1850/1600	1850/1600	1850/1600	1850/1600	1850/1600
main component	interlocking way					
	load switch	1	1	1	1	1
	fuse					3
	current mutual-inductor		2 or 3		2 or 3	
	voltage mutual-inductor			2 or 3	2 or 3	
	arrestor	3	3	3	3	
	potential indicator	1	1	1	1	1

No.		06	07	08	09	10
main loop	Programm Drawing					
dimension	width mm	500	375	375	375	500
	height mm	1850/1600	1850/1600	1850/1600	1850/1600	1850/1600
main component	interlocking way					
	load switch	1				
	fuse	3				
	current mutual-inductor				2 or 3	
	voltage mutual-inductor	2 or 3				2 or 3
	arrestor			3	3	3
	potential indicator	1		1	1	1

5. Ring Main Unit Types and Primary Scheme

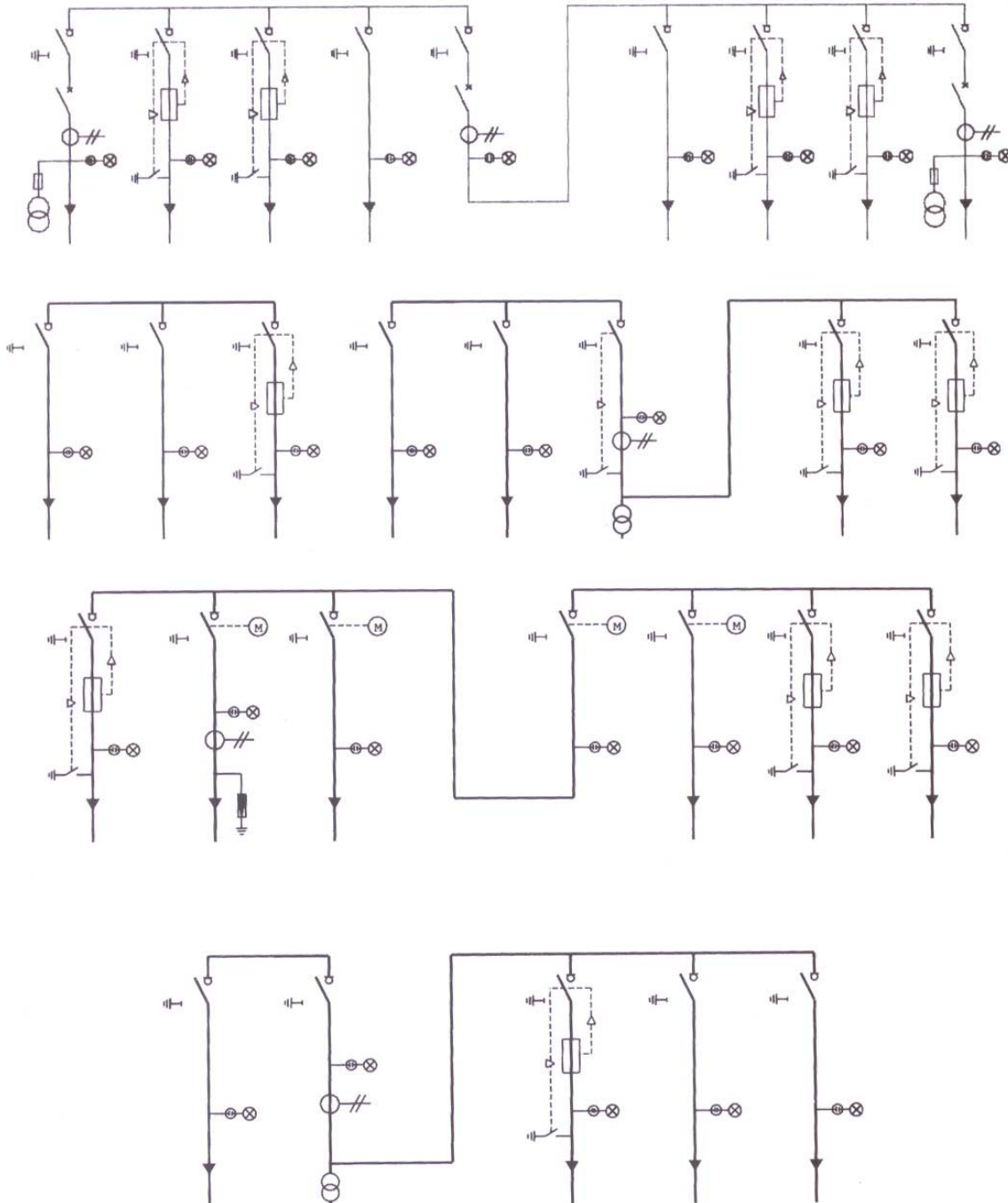
5.2 Primary scheme

No.		11	12	13	14
main loop	Programm Drawing				
dimension	width mm	375 或 500	500	500	750
	height mm	1850 / 1600	1850 / 1600	1850 / 1600	1850 / 1600
main components	connecting way	left \ right	left \ right	left \ right	left \ right
	load switch				
	current mutual-inductor		2 or 3		2 or 3
	voltage mutual-inductor			2 or 3	2 or 3
	arrestor	3	3	3	3
potential indicator	1	1	1	1	

No.		15	16	17	18
main loop	Programm Drawing				
dimension	width mm	750	750	750	750
	height mm	1850	1850	1850	1850
main components	connecting way				
	circuit breaker	1	1	1	1
	load switch		1	1	1
	current mutual-inductor	2 or 3	2 or 3	2 or 3	2 or 3
	voltage mutual-inductor		2 3		2 or 3
	arrestor	3	3	3	3
	potential indicator	1	1	1	1

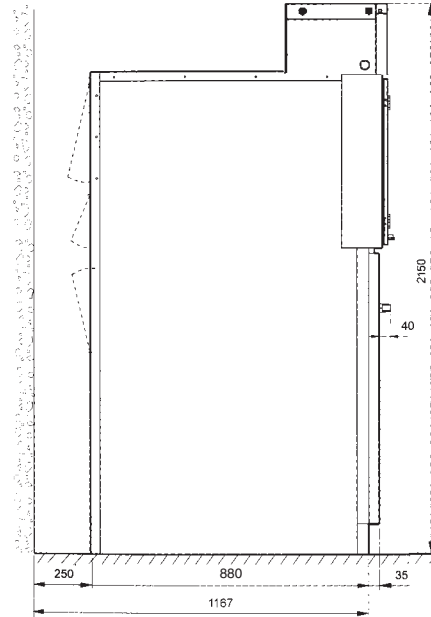
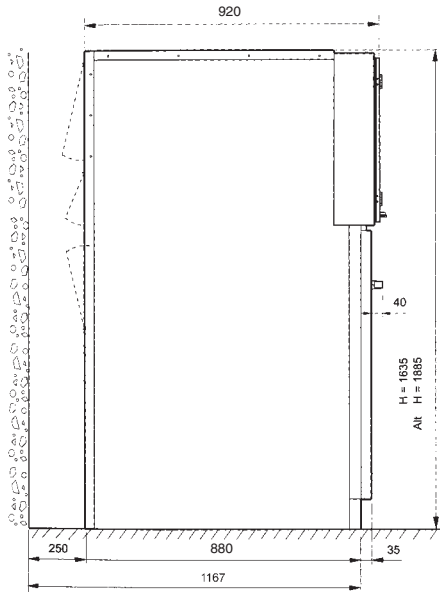
5. Ring Main Unit Types and Primary Scheme

5.3 Applications

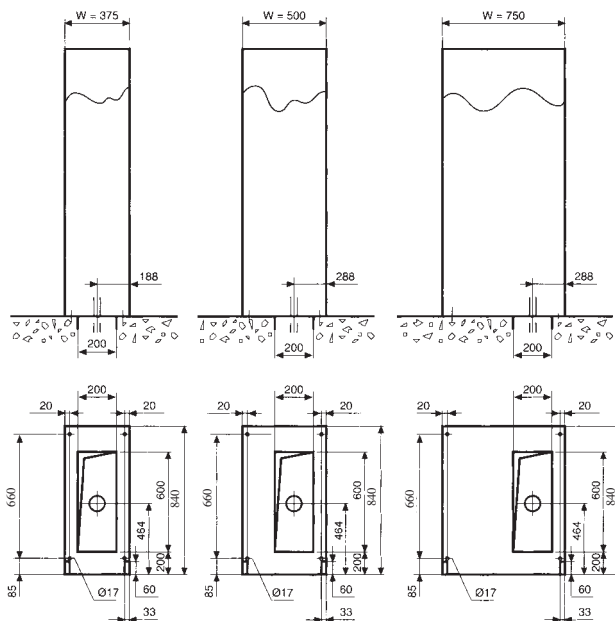


6. Installation for Ring Main Unit

6.1 Dimension of AGN-12/24 II Type

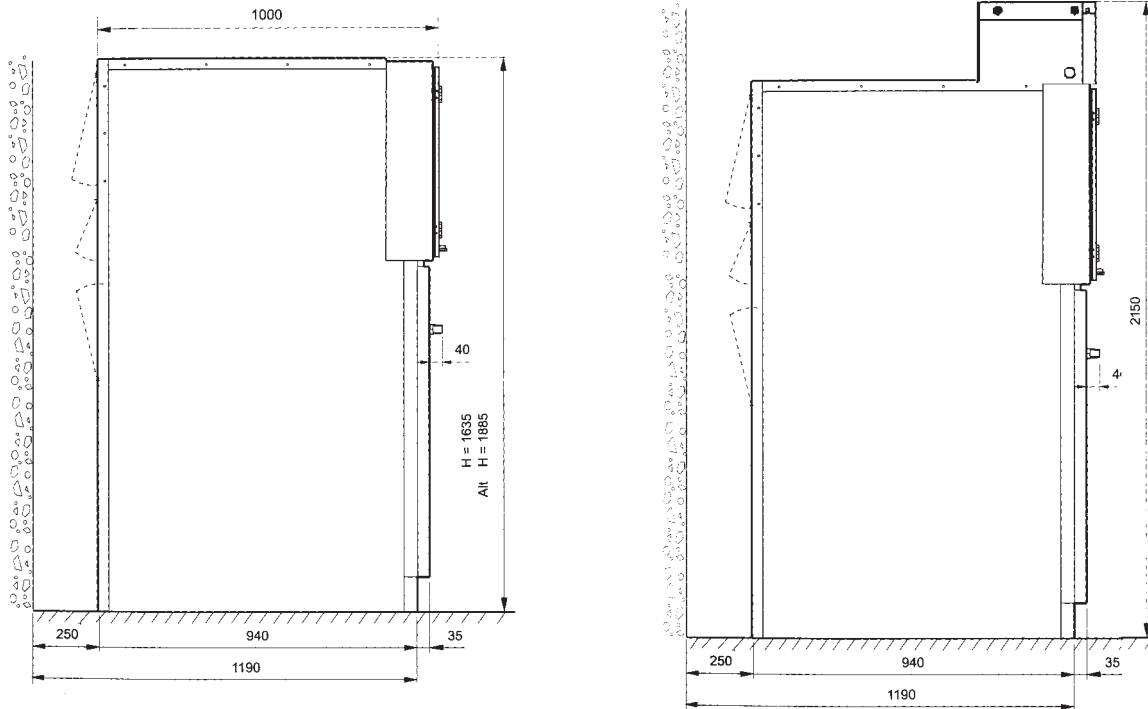


Fundamental Installation Dimension for II Type Ring Main Unit

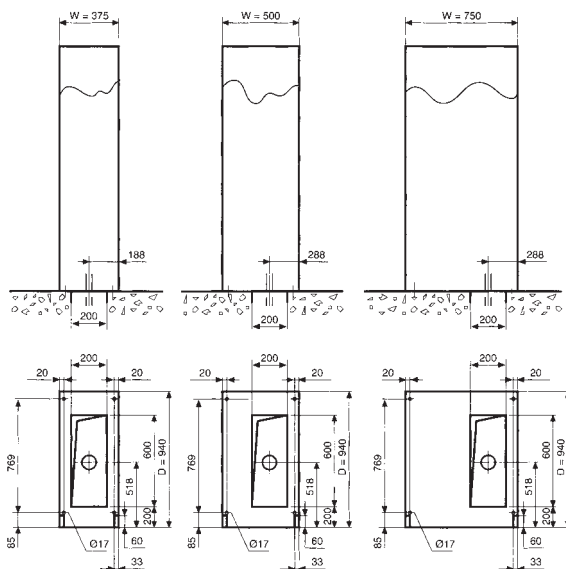


6. Installation for Ring Main Unit

6.2 Dimension of AGN-12/24 III Type



Fundamental Installation Dimension for III Type Ring Main Unit



7. Transportation, Maintenance and Order

7.1 Transportation and Storage

- ◆ The switch cabinet can be transported by fork truck if guaranteed to be fixed on the bottom plate, and by handling or removing the entire entity if not fixed on bottom plate, but any case it should be transported vertically, no allowance for inversion in order not to damage the internal components.
- ◆ The switch cabinet (even for that with outer package) should not be exposed outside for storage for a long time. The switch cabinet that needs the long-term storage should be put in the dry and ventilative indoor warehouse. The period of validity of outer package of switch cabinet is normally no more than 1 year.

7.2 Maintenance

- ◆ Ring main unit is free of maintenance for 3 years under the normal conditions.
- ◆ There is no need of maintenance and any lubrication for the single-spring and dual-spring operation mechanism of load switch.
- ◆ The relay protection device should be checked by the requirement of the manufacturer before put into the running.
- ◆ The maintenance periodicity for ring main unit is normally one time every year.

Maintenance by the below requirement:

- (1) Fasten all the electrical connectors (main bus bar, switch, cable, measuring meter) required by Installation and Operation Instruction
- (2) Clean all the parts by dust collector (main switch, auxiliary switch, tripping mechanism, motor etc.) and check the appearance
- (3) Have a switching on/off operation for all switches including earth switch
- (4) Turn on auxiliary control electric source not giving the remote control signal to have a electrical order operation
- (5) Clean the busbar chamber and cable chamber

7.3 Order

Complete-set Product

The below documents are attached with the switch cabinet when out of factory:

- ◆ Qualification Certificate of Product
- ◆ Installation and Operation Instruction
- ◆ Packing List
- ◆ Engineering Design Document of Product
- ◆ Accessory of switch cabinet: one operating handle of load switch attached with each integration

The customer should offer the following information for order:

- ◆ Wiring Programm of Main Loop and Special Technical Requirement
- ◆ Plane Installation Arrangement Plan of Switch Cabinet
- ◆ Specification of component inside switch cabinet and the schematic diagram of auxiliary loop and control loop
- ◆ Other written documents specially required

Qualification Certificate

