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Green Power

LIGHTS UP THE WAY
TO THE **FUTURE**

- Medium Voltage Switchgear and Components



GREENPOWER
global procurement & manufacture

Green Power

LIGHTS UP THE WAY
TO THE **FUTURE**



- *Environment Friendly*
- *Save Energy and Resource*
- *One-Stop Solutions Concept*
- *Customer Value Increasing*



About Us

GreenPower promotes environmental awareness, and aims to create unprecedented happiness and wealth for our investors, employees, clients and partners. By focusing in the mid-to-high voltage and low voltage field, and professionally working on R&D, manufacturing, marketing and service of high-end green intelligent switchgears, equipments and products. GreenPower sets to become a well-respected global company in the power industry.

GreenPower, is jointly established by a number of state-owned excellent industrial electrical professional manufacturers, we committed to meet the procurement needs of clients. It is a professional procurement service provider with entity of industrial electrical.

GreenPower provides ONE-STOP solutions service for all customers in the International area. It is located in the time-honored electrical industrial city, a collection of world-class brand of industrial electrical products, excellent brand of domestic electrical products as the basis.

Innovative business philosophy, strong professional supply team, expert technical guidance, advanced Information network management platform, fast logistics, which makes GreenPower as your procurement expert by your side.

GreenPower adheres to its own brand and multi-brand integration, marketing differentiated development strategy. The products involving low voltage, medium voltage and high voltage transmission and distribution products and industrial automation products.

It covering all aspects of distribution, logistics, warehousing, professional and technical engineering services, systems integration and complete sets of manufacturing. Stable business foundation for cooperation with customers and suppliers, and has established a good reputation to maintain its leading position in the market competition.

Human quests for transcendence, with transcendence we make progress, when the pursuit of unlimited become a belief, our dream began to realize.

Hard-working, dedicated GreenPower people, will be adhering to its past glory, beginners mind, let go sailing, to face the fierce competition in the future, and always help customers make the best choice, and strive to become the best and most reliable procurement service provider in the field of industrial electrical.



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1. GPN2S/GPN2E-40.5kV Cubicle type Gas Insulated Switchgear

a. Summary

Cubicle type Gas Insulated Switchgear (CGIS) is an indoor, factory-assembled, metal-enclosed, cubicle type gas-insulated switchgear for single busbar applications, including "Green Type" GPN2E-40.5, GPN2N-40.5 and "Standard Type" GPN2S-40.5.

The "Green type" GPN2N-40.5 is innovated to use pure nitrogen as insulation gas for the series product with Non-SF₆ gas insulation technology, which has brought the genuine green environmental protection of gas insulated switchgear.

The "Green type" GPN2S-40.5 incorporates the advanced technologies of mixed gas-insulated (SF₆+N₂) and vacuum breakers, allowing the equipment to operate in a more reliable and environmentally friendly manner.

The "Standard type" GPN2E-40.5 is of 100% SF₆ insulated, high performance and easy use.

With modern digital manufacturing and automatic testing coupled with sensor, monitor and protection technology, CGIS is ideal fit for power distribution demands. CGIS is particularly suited to industries with high reliability requirements such as Power Networks, Mining, Rail Transportation, Petrochemical Plants, Wind Farms and Metropolitan Rail Systems.

Normal operating conditions

The switchgear is fundamentally designed for the normal service conditions for indoor switchgear to GB 3906, DL/T404 and IEC 62271-200. The following limit values, among others, apply:

b. Ambient air temperature:

Maximum air temperature: +45°C

Minimum air temperature: -25°C

Daily average maximum temperature: +35°C

Humidity:

Daily average value of relative humidity: ≤ 95%

Monthly average value of relative humidity: ≤ 90%

Daily average value of water vapor pressure: ≤ 2.2 × 10⁻³MPa

Monthly average value of water vapor pressure: ≤ 1.8 × 10⁻³MPa

Altitude: ≤ 1000m

The ambient air is not significantly polluted by dust, smoke, corrosive and/or flammable gases, vapours or salt.

c. Special service conditions

The product can also be applied for many special service conditions.

In case the service conditions exceed the normal service conditions, which are out of the standard GB 11022 and IEC 62271-1, please consult with GP in advance for confirmation:

Altitude higher than 1000m.

Higher environmental temperature.

Lower environmental temperature.

Others special environmental conditions.

d. Reduce greenhouse gas emissions

CGIS incorporates the advanced technologies of pure Nitrogen or mixed gas-insulated (SF₆ + N₂) and vacuum breakers, a fundamental choice made by GP to assist in reducing the greenhouse effect. SF₆ (sulphur-hexafluoride) is on the list of greenhouse gases in the Kyoto Protocol, with a Global Warming Potential (GWP) of 23,000. Many other medium voltage switchgear systems use SF₆ gas as the only insulating medium. Leakage of SF₆ gas from switchgear contributes to the threat of the greenhouse effect and associated climate change.

With our commitment to protection of the environment, CGIS helps reduce greenhouse gas emissions by utilising mixed gas-insulated technology together with vacuum switching technology.

A 100% or 50% reduction in SF₆ is achieved by using Nitrogen (N₂) mixed gas-insulated breakers. Nitrogen is the largest component of air and its arc decomposition product is non-toxic. Joined together by plug-in connectors and the modular nature of the panels ensures ease of installation and extension without the need for extra gas handling activities on-site.

e. Advantage

- **70% Reduction In Switchroom Size**

An optimized electric field design combined with excellent insulating performance, results in a compact switchgear product that operates safely and reliably.

Save 70% space compared with air-insulated switchgear.

Retrofitting into existing switchroom is easy.

Reduce cost of substation land.

- **Maximum Safety For Operator And Equipment**

The minimum functional pressure of the cubicle is 0.00MPa(20°C). That means, even under such severe conditions, it still maintains the rated insulation level and keeps all its rated functionality. Thanks to the low pressure of gas, even if gas is escaping from the switchgear, the cubicle can still continue to be energized. Reliable electrical and mechanical interlocks are designed between the circuit breaker and three-position switch to prevent misoperation.

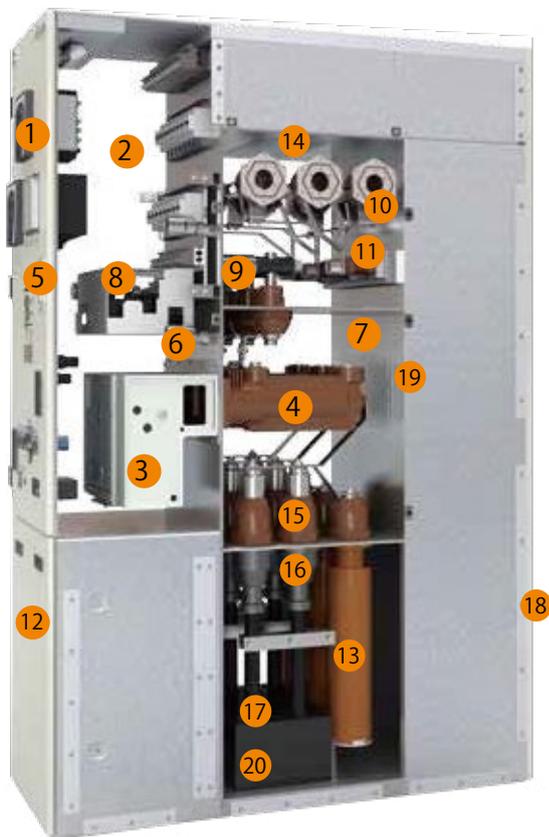
- **Easy Installation/Low Operation And Maintenance Cost**

Panels in the middle can easily be removed for maintenance without moving neighbouring panels, increasing availability.

f. Technical parameters

General		Unit	Standard type GPN2S-40.5	Green Type GPN2E-40.5	Green Type GPN2N-40.5
Rated voltage		kV	36/38/40.5	36/38/40.5	36/38/40.5
Rated power frequency withstand voltage (1min)	To earth/phase to phase	kV	95	95	95
	Across isolating distance	kV	118	118	118
	To earth/phase to phase	kV	185	185	185
	Across isolating distance	kV	215	215	215
Rated frequency		Hz	50/60	50/60	50/60
Rated current		A	630, 800, 1250, 1600, 2000, 2500, 3150	630, 800, 1250, 1600, 2000, 2500	1250, 2500
Single capacitor bank breaking capacity		A	400/400	400/400	400/400
Rated cable charging breaking current		A	50	50	50
Rated shortcircuit breaking current		kA	20/25/31.5	20/25/31.5	31.5
Rated short circuit making current(peak)		kA	50/63/80	50/63/80	80
Rated short time withstand current and endurance time		kA/s	20/3, 25/3, 31.5/3s	20/3, 25/3, 31.5/3s	31.5/3s
Rated peak withstand current		kA	50/63/ 80	50/63/ 80	80
Operating sequence			O-0.3s-CO-180s-CO	O-0.3s-CO-180s-CO	O-0.3s-CO-180s-CO
Gas system insulated gas			100%SF ₆	50%SF ₆ +50%N ₂	100%N ₂
Annual leakage rate		%/Y	≤ 0.1	≤ 0.1	≤ 0.1
Rated gas pressure (abs, 20°C)		MPa	0.12	0.12	0.12
Alarm pressure (abs, 20°C)		MPa	0.11	0.11	0.11
Minimum operating pressure (abs, 20°C)		MPa	0.10	0.10	0.10
Degree of Protection					
Gas tank			IP65	IP65	IP65
Enclosure			IP4X	IP4X	IP4X
Motor and trip coil					
Circuit breaker charging motor		W	90	90	90
Rated power of closing coil		W	220	220	220
Rated power of opening coil		W	220	220	220
Rated voltage of auxiliary circuit		V	DC 24, 48, 110, 220; AC220	DC 24, 48, 110, 220; AC220	DC 24, 48, 110, 220; AC220
1 min power frequency withstand voltage of auxiliary circuit		kV	2	2	2
Dimensions and Weight					
Dimension (W × D × H)1250A		Mm	600 × 1600 × 2400	600 × 1500 × 2400	800 × 1700 × 2300
Dimension (W × D × H)2500A		Mm	800 × 1600 × 2400	800 × 1500 × 2400	900 × 1700 × 2300
Weight 1250A		kg	800 ~ 1000	800 ~ 1000	800 ~ 1000
Weight 2500A		kg	1100 ~ 1400	1100 ~ 1400	1100 ~ 1400

g. Structure of the standard type GPN2S-40.5 and green type GPN2E-40.5



Standard type GPN2S-40.5kV



Green type GPN2E-40.5kV

- | | | |
|---|--|--|
| 1. Protection and control Unit | 9. 3-position switch | 16. Cable terminal |
| 2. Low voltage compartment | 10. Main busbar | 17. Cables |
| 3. VCB mechanism | 11. Main busbar gas tank | 18. Rear cover |
| 4. Embedded pole vacuum circuit breaker | 12. Front cover | 19. Pressure relief device of VCB gas tank |
| 5. Low voltage compartment door | 13. Surge arrester | 20. CT |
| 6. Gas density indicator | 14. Pressure relief device of main busbar gas tank | |
| 7. VCB gas tank | 15. Inner-cone cable bushing | |
| 8. 3-position switch mechanism | | |



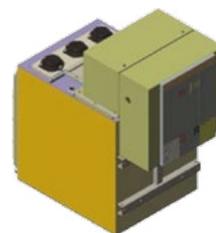
Standard type:
GPN2S-40.5 VCB



IST 3-position mechanism

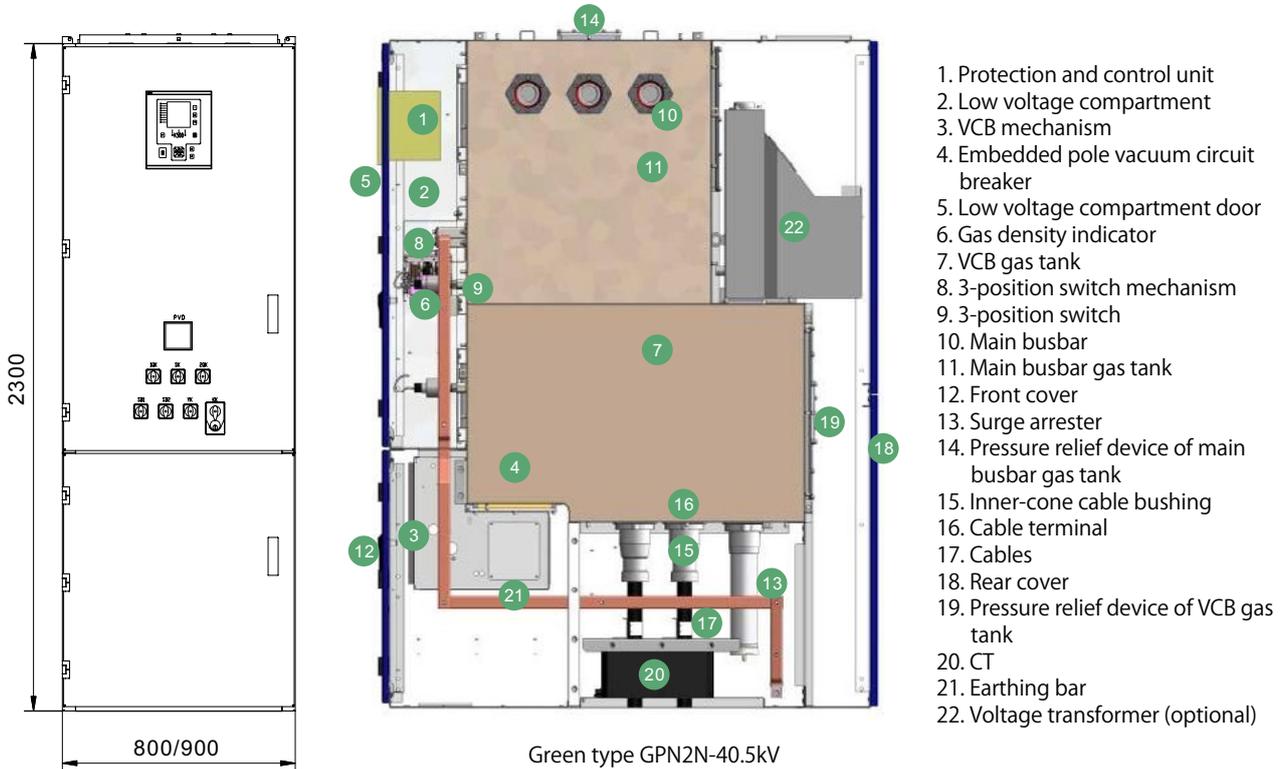


IST 3-position switch



GPN2S VCB gas tank

h. Structure of the GPN2N green type (No-SF₆)



Vacuum circuit breaker is fixed mounted, while its three-phase embedded poles are arranged vertically into the circuit breaker gas tank.

Due to the vacuum switching technology, an arc is limited in the vacuum interrupter, reducing the exhaust volume of insulation gas. Vacuum switching is of high performance in frequent short-circuit and numerous on-load switching applications.



PT installation



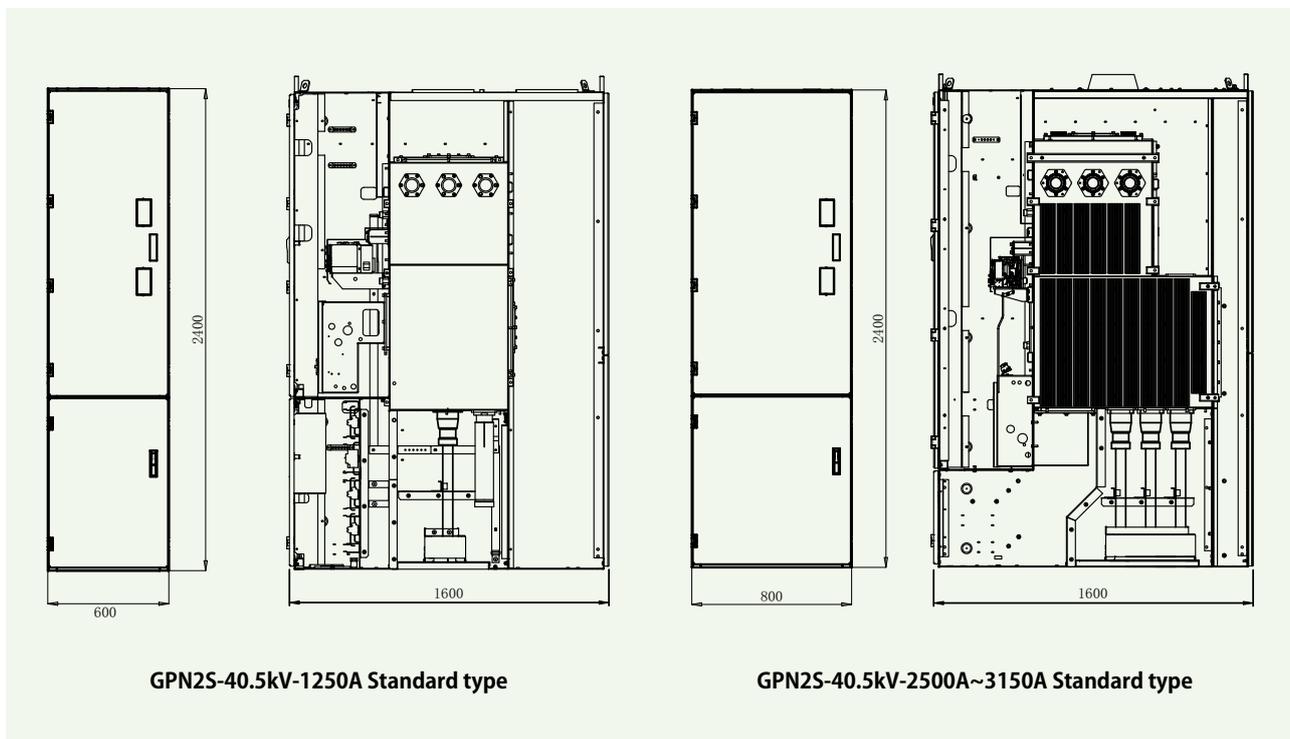
CT in cable compartment



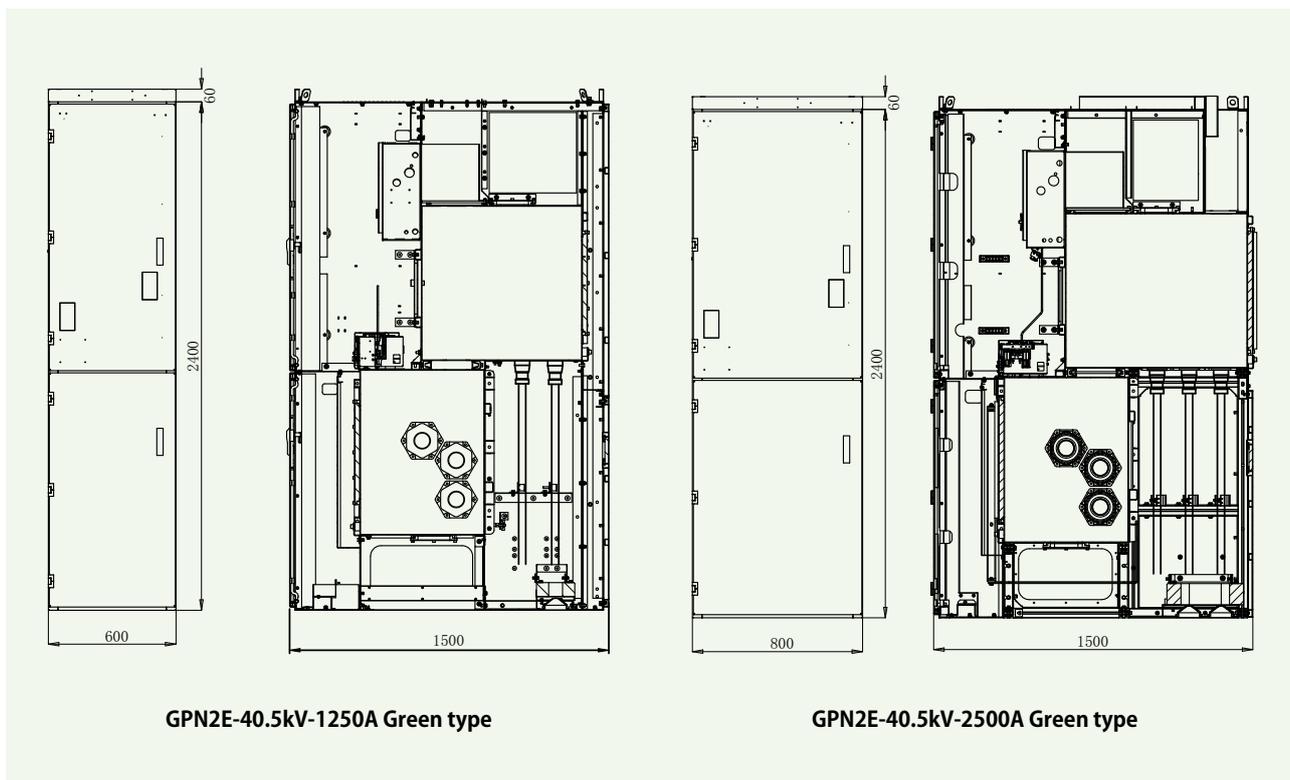
The vacuum interrupter of the VCB is of an optimized design, the ceramic insulator is compact with high insulation level and a high current breaking capability. The contacts are made of Copper-Chromium, with excellent abrasion resistance, long electrical endurance, and high short circuit breaking capacity.

The embedded poles are assembled on the flange plate of the frame. The vacuum interrupter and terminals are fixed inside the embedded pole by APG epoxy molding process.

i. Outline dimension of GPN2S-40.5kV standard type



j. Outline dimension of GPN2E-40.5kV green type



2. GPN1 □ -40.5kV Removable AC Metal-clad Enclosed Switchgear

a. Summary

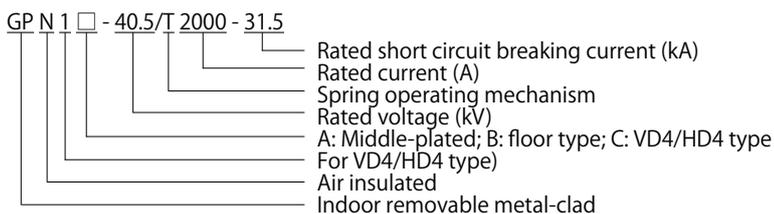
GPN1-40.5kV removable AC metal-clad switchgear (short for switchgear as below) applies to 40.5kV, 3 phase, AC and 50/60Hz electrical power network for receiving and distributing power energy and also for control, monitor and protection. It is applicable in general power system and occasions with frequent operation. The product conforms to GB 3906 "3~35kV AC Metal Enclosed Switchgear", GB/T 11022 "The common technical clauses of High Voltage Switchgear and controlgear Standard", DL/T 404-1997 "Order Technical term of Indoor AC High Voltage Switchgear" and IEC-298 "1~52kV AC Metal Enclosed Switchgear and Controlgear standard".



b. Ambient condition

Ambient temperature: -25°C ~+45°C , daily average: ≤35°C
 Altitude: 1000m(Standard); can up to 4500m for special ordering;
 Relative humidity: daily average ≤ 95%, monthly average ≤ 90%;
 Earthquake intensity≤8 degree;
 Applicable occasions should be free from corrosives, inflammables and vapor.

c. Model



d. Product feature

The switchgear is an assembly unit and the circuit breaker adopts handcart floor model. It owns simply change and well exchange after equipping with advanced composite insulation vacuum circuit breaker. Lead screw nut propulsion mechanism is installed in the handcart frame for preventing from fault operating and damaging propulsion mechanism, the handcart can be remove easily; All of the operation steps can be carried out at closing condition; It is compulsory locking among main switch, handcart and panel door to meet five protection; wide space for connecting several cables in cable cubicle. Earthing switch is used in earthing and loop short circuit, protection degree of enclosure is IP3X, IP2X under opening condition.

e. Technical specification

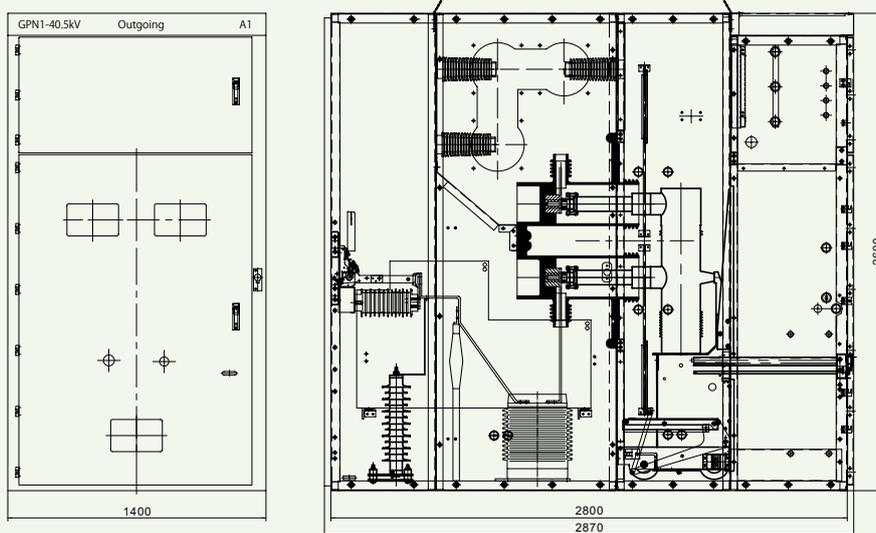
No.	Item	Unit	Data
1	Rated voltage	kV	36/38/40.5
2	Rated current	A	1250, 1600, 2000, 2500
3	Rated frequency	Hz	50/60
4	Rated short circuit breaking current	kA	25, 31.5
5	4s rated short time withstand current	kA	25, 31.5
6	Rated short circuit making current (peak)	kA	63, 80
7	Rated peak withstand current(peak)	kA	63, 80
8	Rated lightning impulse withstand voltage	kV	185 (across open contacts: 215)
	Main circuit 1min power frequency withstand voltage	kV	95 (across open contacts: 110)
	Auxiliary circuit 1min power frequency withstand voltage	kV	2
9	Outline dimension(W)*(D)*(H)	mm	1400/2800/2600 (GPN1 type) 1200/2600/2400 (For VD4/HD4 type)
10	Protection degree		IP3X (compartment IP2X)
11	Weight	kg	1000-1850 (GPN1 type) 850-1850 (For VD4/HD4 type)

f. Structure feature

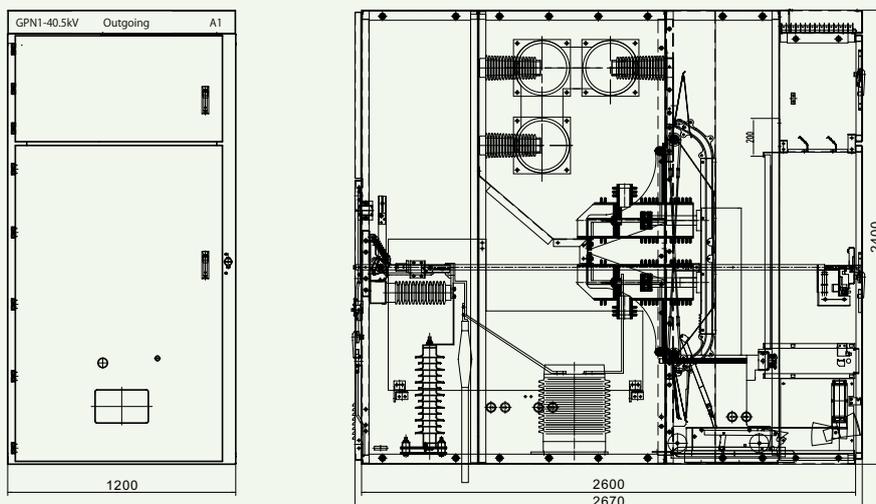
The switchgear divides into enclosure and handcart, the enclosure is made of aluminum-zinc plated steel sheet after processed by CNC machine and multi-bending, then is assembled with bolts. So it has strong mechanical strength and can guarantee the neatness and good appearance. It consist of relay compartment, handcart compartment, cable compartment, protection degree is IP2X when CB handcart is on opening and testing position.

The switchgear is metal-clad removable type, main circuit adopts composite insulation processing, emergency spreading to other parts. CT and earthing switch are mounted in cable compartment and busbar compartment. The protection degree of enclosure is IP3X, the protection and large space for several cables. The structural design of new completely insulated VCB or SF₆ CB and spring operating mechanism is integrated console model with such excellence of well exchange and simply change.

g. Outline dimension of the switchgear



GPN1-40.5 Structure drawing of standard type



GPN1(C)-40.5 Structure drawing for VD4/VH4 type

Note: 1. Motorized feeding for the VCB is available. Any special additional requirement of application, please contact us for technical disclosure.
2. Here only show the outgoing schematic for reference. For the other schematic, Please consult with GP for more details.

3. GPVN-40.5kV Indoor AC High Voltage Vacuum Circuit Breaker

a. Summary

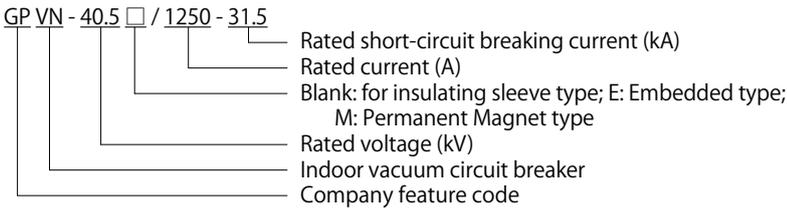
GPVN-40.5kV indoor vacuum circuit breaker is a product designed and produced by our company and Xi'an High-voltage Electric Apparatus Institute. The VCB is of rated voltage 40.5kV, three-phase and AC 50/60Hz. It applies to mining firms, power house and substation acting as protection and control electric apparatus. It is also applicable in occasions with frequent operation.

b. Ambient condition

1. Altitude: 1000m(Standard); can up to 4500m for special ordering;
2. Ambient temperature: -25°C ~+45°C ;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity:≤8 degree;
5. Applicable occasions should free from inflammables, explosives, corrosives and severe vibration.



c. Model



d. Structure feature

1. The arc-extinguish chamber is on the upper part and the mechanism is on the lower part. This structure is convenient for debug.
2. Complex insulating structure using air and organic material; Compact dimension and small weight.
3. Vacuum arc-extinguish chamber of Cutler-Hammer Company (USA) and domestic ZMD are both applicable for the VCB. Both two kinds of chambers extinguish arc by vertical magnetic field and featuring with low cut-off and good on-off capability with asymmetry.
4. Simple spring operation mechanism is free from maintenance within 10000 times of operations.
5. Lead-screw propeller, easy and stable operation and good self-locking capability.

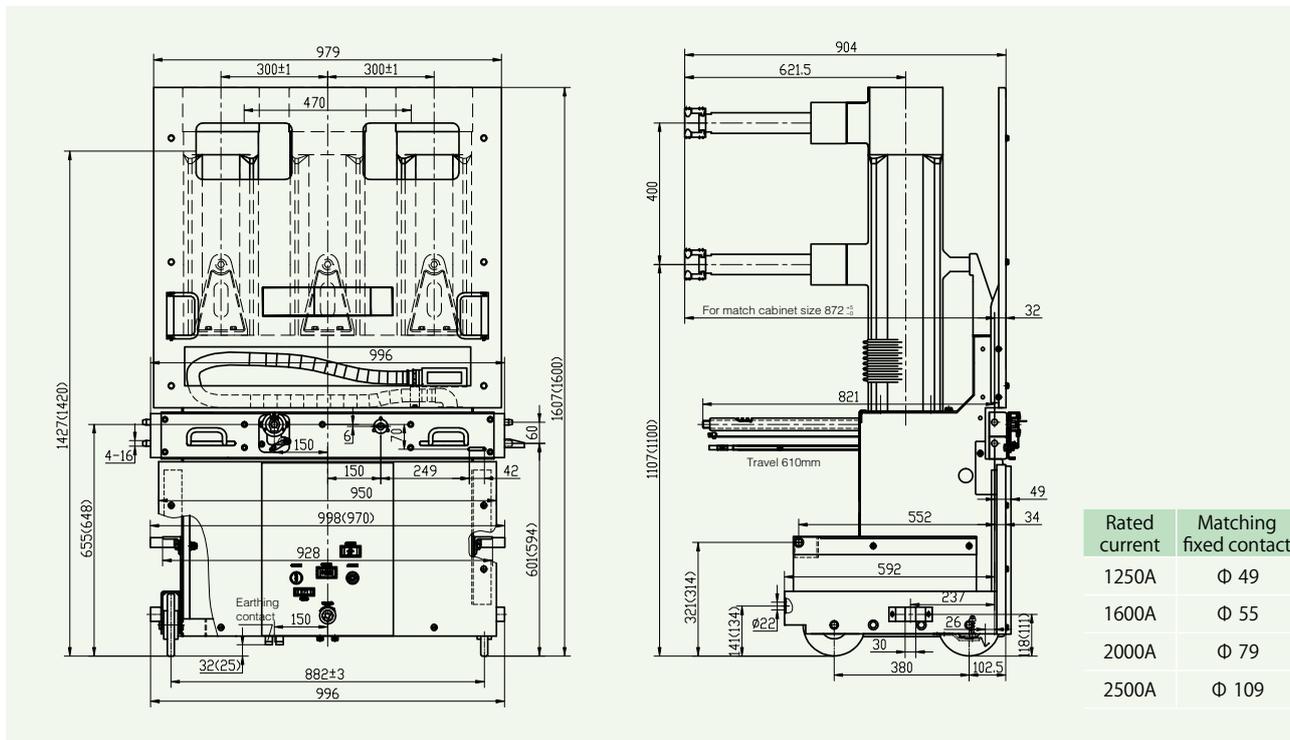
e. Technical specification

No.	Item	Unit	Data
1	Rated voltage	kV	36/38/40.5
2	1min. Power frequency withstand voltage	kV	95 (118, isolating distance)
3	Lightning impulse withstand voltage(peak)	kV	185 (215 isolating distance)
4	Rated current	A	630,1250,1600,2000, 2500
5	Rated short-circuit breaking current	kA	20, 25, 31.5
6	Rated short-circuit making current(peak)	kA	50, 63, 80
7	4s rated short-time withstand current	kA	20, 25, 31.5
8	Rated peak withstand current	kA	50, 63, 80
9	Rated operation sequence		O-0.3s-CO -180s-CO
10	Breaking times of rated short circuit breaking current	Times	30
11	Mechanical life	Times	10000; 20000 (for magnet type)
12	Rated frequency	Hz	50/60
13	Rated breaking current of capacitor bank	A	400

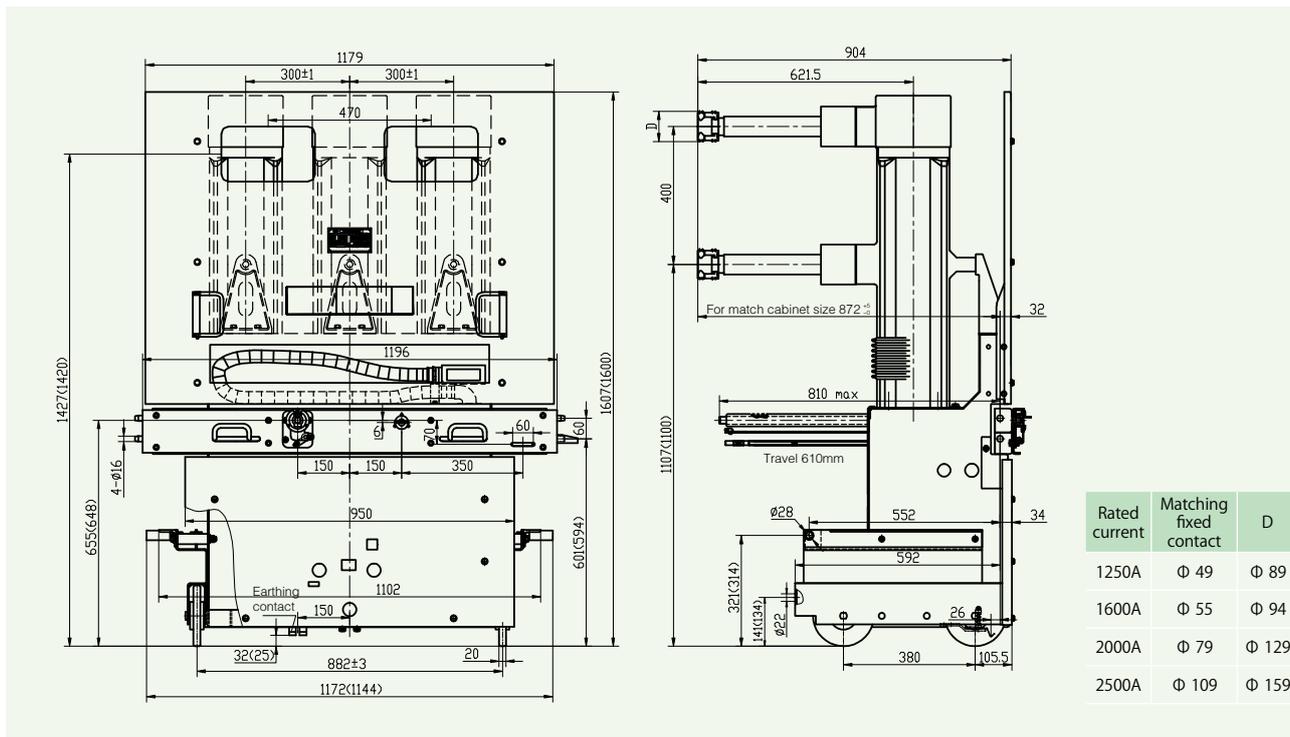
f. Technical specification of storage motor of operating mechanism

No.	Rated voltage	Rated output power	Normal operate voltage
HDZ-22301B	DC110V AC110V DC220V AC220V	≤230W	85%-110% rated voltage

g. Outline and dimension of installation



GPVN-40.5kV VCB handcart outline dimension for GPN1-40.5kV



GPVN-40.5kV VCB handcart outline dimension

Note: 1. Motorized feeding for the VCB is available. Any special additional requirement of application, please contact us for technical disclosure.
2. Here only VCB schematic for reference. For the PT truck, Bus truck, fuse truck, etc. Please consult with GP for more details.

4. GPN1-24kV Removable AC Metal-clad Enclosed Switchgear

a. Summary

GPN1-24kV removable AC metal-clad switchgear (short for panel as below) is a new product, designed and developed by us, based on the introduction of advanced foreign design and manufacturing technology. The panel applies to 3.6~24kV, 3phase AC 50Hz or 60Hz network for receiving and distributing power energy and also for control, monitor and protection. It can be arranged for single busbar, single busbar sectionalizing system. It accords to IEC298 "AC Metal Enclosed Switch and Control Equipment above 1kV and below 52kV" IEC 694 "Standard Common Clauses for High Voltage Switchgear", GB3906 "3~35kV AC Metal Enclosed Switchgear" DL404 "Order Specification for Indoor AC High Voltage Switchgear", DIN, VDE0670 "AC Switchgear at Rated Voltage Over 1kV" and so on. It has perfect and reliable prevention function against false operation.



b. Ambient condition

Ambient temperature: -25°C ~+45°C , daily average: ≤35°C
 Altitude: 1000m(Standard); can up to 4500m for special ordering;
 Relative humidity: daily average ≤95%, monthly average ≤90%;
 Earthquake intensity ≤8 degree;
 Applicable occasions should be free from inflammables, explosives, corrosives and severe vibration.

c. Model



Note: Suitable for ABB/ Siemens, Schneider etc. brands of Vacuum circuit breakers.

d. Structure feature

The enclosure is complete made of aluminum-zinc plated steel sheet by CNC machine and multi-bending, high precise dimension, short production cycle, good mechanical strength and nice appearance. The handcart frame can sort into CB handcart, PT handcart, measuring handcart and so on. The handcart has isolating/testing position and working position in cubicle, each position is equipped with a locating device to ensure that the handcart will not move at random when in specified position. A special guide rail is installed in CB compartment for the handcart to move between isolating/testing position and working position. The movable curtain plate made of insulating sheet is installed on the back wall of handcart compartment. The busbar is led from one cubicle into another cubicle under the supporting of insulation bushing, and connects with the fixed contact box through the branch bus. The main busbar and inter busbar are round copper bars with rectangular section. Current transformer and the earthing switch can be mounted on the back wall of cable compartment. Potential transformer and the lightning arrester can be mounted inside it. The meter compartment includes relay components, meters electrified indicator and specified secondary equipments. The control circuits are laid in the neck grave with sufficient space and metal cover plate.

e. Technical specification

Item	Unit	Data	
Rated voltage	kV	24	
Rated frequency	Hz	50/ 60	
Rated current	A	630,1250, 1600, 2500, 3150, 4000	
Rated insulation level	1min power frequency (phase to earth / across open contacts)	kV	65
	Lightning impulse withstand voltage (phase to earth / across open contacts)	kV	125
Rated short time withstand current(4s)		kA	20, 25, 31.5
Rated peak withstand current		kA	50, 63, 80

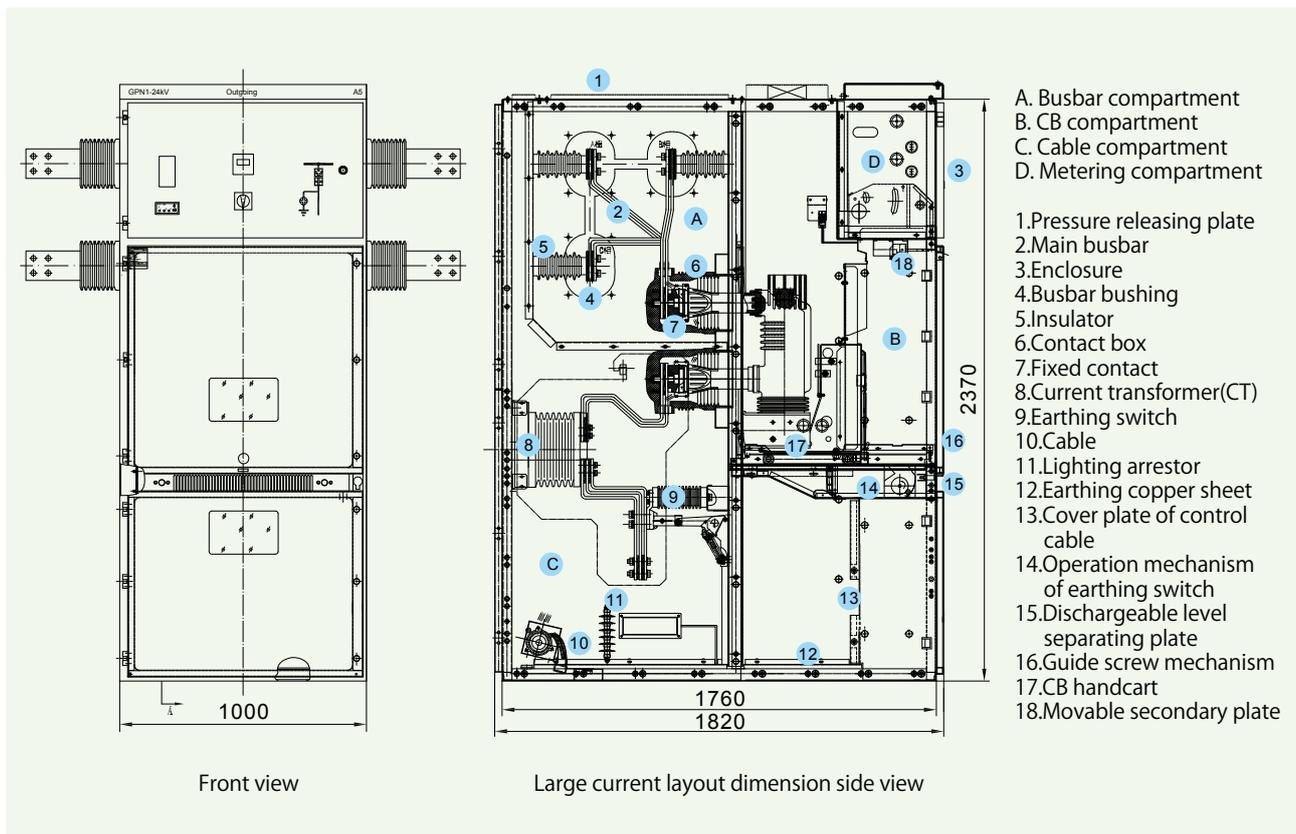
Protection degree		Enclosure: IP4X, door open: IP2X
Outline dimension(width x depth x height)	mm	1000(800)x1820(1500)x2430(2300)
Weight	kg	1200-1500

1. The short circuit capacity of CT shall be separately considered;
2. The diagram of back overhead outgoing line should have additional cubicle.

f. Technical specification of GPNV-24kV vacuum circuit breaker

Item	Unit	Data	
Rated voltage	kV	24	
Rated frequency	Hz	50,60	
Rated current	A	630, 1250, 1600, 2500, 3150, 4000	
Rated insulation level	1min power frequency (phase to earth / across open contacts)	kV	65
	Lightning impulse withstand voltage (phase to earth / across open contacts)	kV	125
	Rated short time withstand current(4s)	kA	20, 25, 31.5
	Rated peak withstand current	kA	50, 63, 80
	Rated symmetrical short-time breaking current	kA	20, 25, 31.5
	Rated operating sequence		O-0.3s-CO-180s-CO
	Opening time	ms	60
	Arcing time	ms	15
	Breaking time	ms	65
	Control voltage	V	~110~220

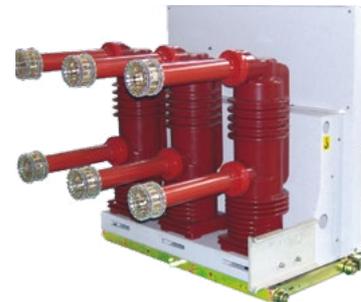
g. Structure schematic drawing of GPN1-24kV section drawing of feeder panel



5. GPVN-24 □ Indoor AC High Voltage Vacuum Circuit Breaker

a. Summary

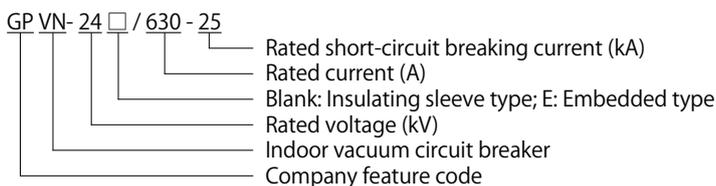
GPVN-24kV Model indoor AC High Voltage vacuum circuit breaker is a type of holistic sealed High Voltage switchgear with small volume and compact structure. It applies to power system of rated voltage 24kV, three-phase AC 50/60Hz, and used to control and protect electric apparatus and circuit with frequent operations. This product conforms to IEC62271-100 & GB1984, JB3855 and DL403.



b. Ambient condition

Ambient temperature: $-25^{\circ}\text{C} \sim +45^{\circ}\text{C}$, daily average: $\leq 35^{\circ}\text{C}$
 Altitude: 1000m; can up to 4500m for special ordering;
 Relative humidity: daily average $\leq 95\%$, monthly average $\leq 90\%$;
 Earthquake intensity ≤ 8 degree;
 Applicable occasions should be free from inflammables, explosives, corrosives and severe vibration.

c. Model



d. Product feature

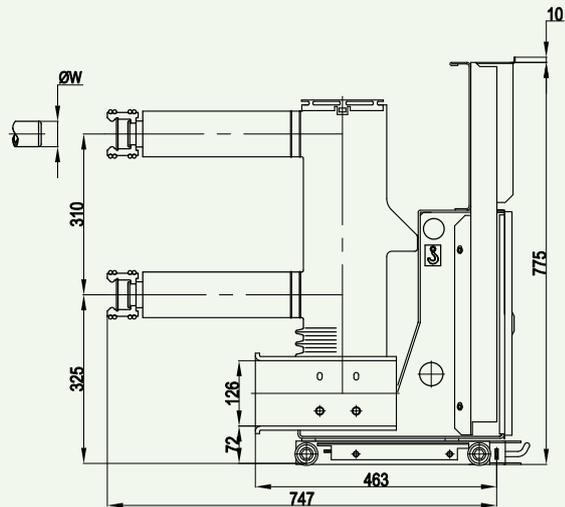
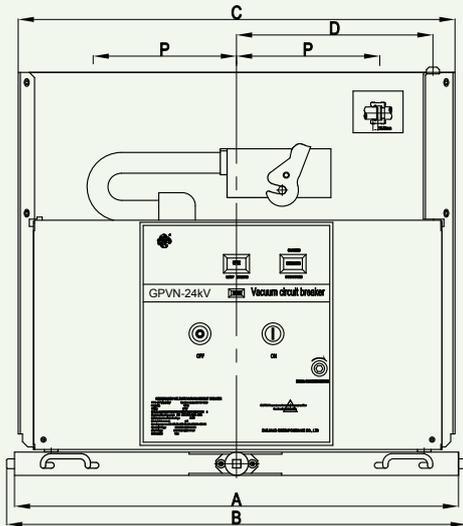
1. Holistic structure;
2. Sealed arc-extinguishing chamber;
3. High quality vacuum arc-extinguishing;
4. Sound mechanical feature;
5. Various mounting methods.

e. Technical specification

No.	Item	Unit	Data						
1	Rated voltage	kV	24						
2	Rated frequency	Hz	50/60						
3	Rated current	A	630	1250	1600	2000	2500	3150	4000
4	Rated short-circuit breaking current	kA	20	25	31.5	31.5			
5	Rated short-circuit making current	kA	50	63	80	80			
6	Rated short-circuit withstand current(4s)	kA	20	25	31.5	31.5			
7	Rated peak withstand current	kA	50	63	80	80			
8	Rated out-of-step breaking current	kA				12.6	12.6		
9	Rated breaking current of out-of-phase earth fault	kA	17.4	21.7	27.4	27.4			
10	Rated breaking times of short-circuit breaking current	Times	50						
11	Rated operating sequence		O-0.3s-CO-180s-CO						
12	Rated breaking current of single capacitor bank	A	630						
13	Rated breaking current of back-to-back capacitor bank	A	400						
14	1min. Power frequency withstand voltage	kV	50						
15	Lightning impulse withstand voltage	kV	125						
16	Mechanical life	Times	20000						
17	Closing time	ms	75						
18	Opening time	ms	60						
19	Storage time under rated voltage	s	10						



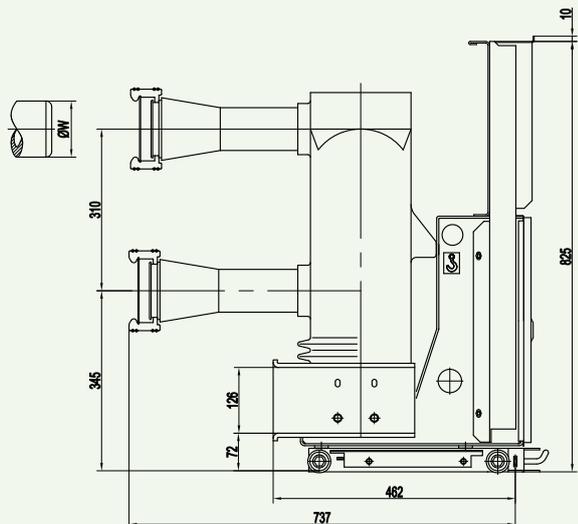
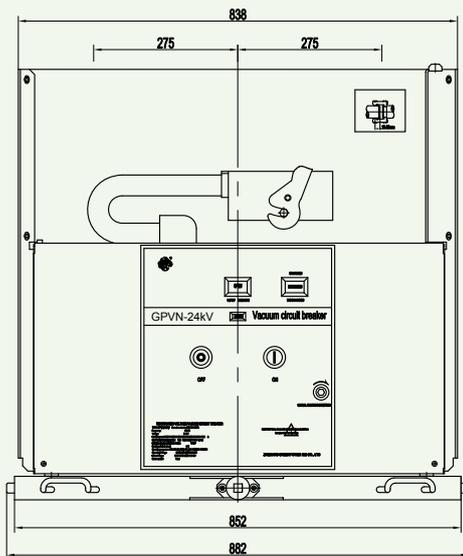
f. Dimension of GPVN-24/630A~1250A(275/210)



Rated current	P	A	B	C	D	W
630A	210	652	682	638	277	Φ 35
1250A	210	652	682	638	277	Φ 49
630A	275	852	882	838	377	Φ 35
1250A	275	852	882	838	377	Φ 49
1600A	275	852	882	838	377	Φ 55

Note:
Fixed type and motorized type breaker are available.

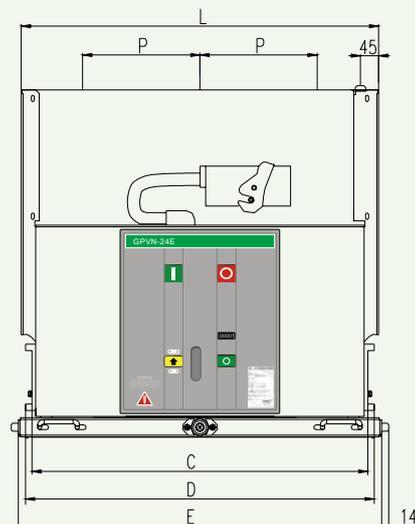
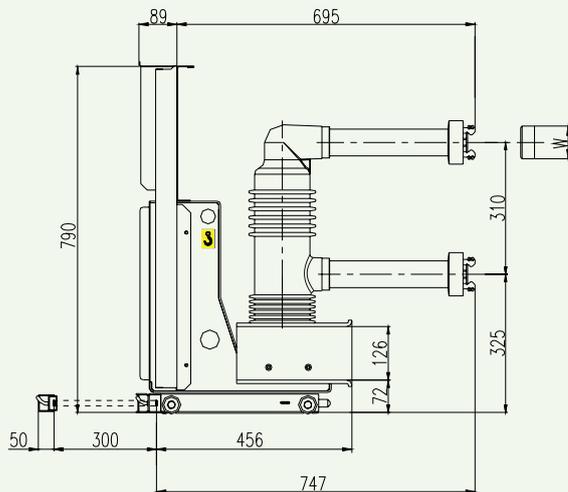
g. Dimension of GPVN-24/1600A~3150A(275)



Rated current	P	W
1600A	275	Φ 79
2000A	275	Φ 79
2500A	275	Φ 109
3150A	275	Φ 109

Note:
1. Fixed type and motorized type breaker are available.
2. Here only VCB schematic for reference. For the PT truck, Bus truck, fuse truck, etc. Please consult with GP for more details.

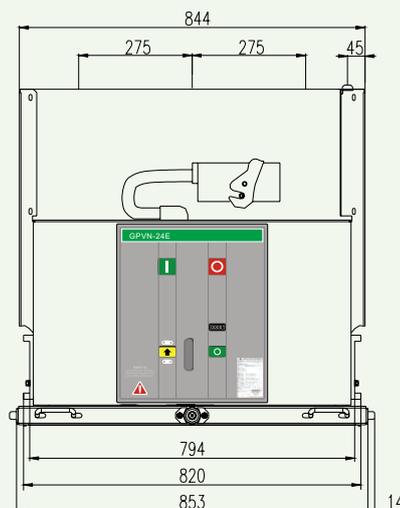
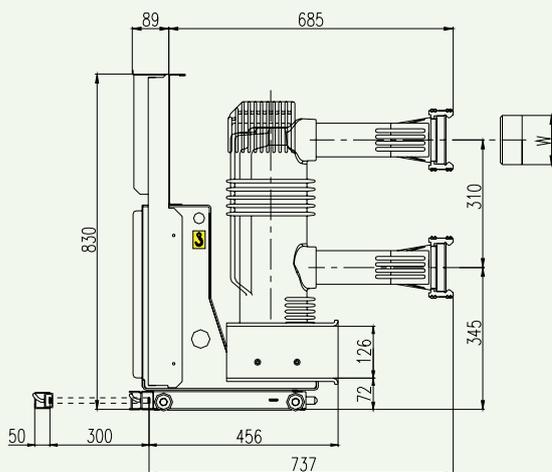
h. Dimension of GPVN-24E/(630~1250A) breakers



Rated current	P	C	D	E	L	W
630A	210	612	638	653	648	Φ 35
1250A	210	612	638	653	648	Φ 49
630	275	794	820	853	844	Φ 35
1250A	275	794	820	853	844	Φ 49

Note:
Fixed type and motorized type breaker are available.

i. Dimension of GPVN-24E/(1600~3150A) breakers



Rated current	W
1600A	Φ 79
2000A	Φ 79
2500A	Φ 109
3150A	Φ 109

Note:
1. Fixed type and motorized type breaker are available.
2. Here only VCB schematic for reference. For the PT truck, Bus truck, fuse truck, etc. Please consult with GP for more details.

6. GPN1-17.5kV Removable Switchgear and Vacuum Circuit Breaker

a. Summary of GPN1-17.5KV Removable AC Metal-clad Enclosed Switchgear

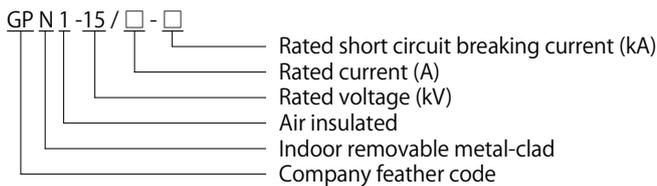
GPN1-17.5kV removable AC metal-clad switchgear (short for panel as below) is specially designed and developed by us, based on the introduction of advanced foreign design and manufacturing technology. The panel applies to 13.8kV~17.5kV 3 phase AC 50/60Hz network for receiving and distributing power energy and also for control, monitor and protection. It can be arranged for single busbar, single busbar sectionalizing system or double busbar. It accords with IEC298 "AC Metal Enclosed Switch and Control Equipment above 1kV and below 52kV "IEC 694 "Standard Common Clauses for HV Switchgear ", DIN. VDE " AC Switchgear at Rated Voltage Above 1kV ", GB 3906 " 3~35kV AC Metal Enclosed Switchgear " and so on. It has perfect and reliable prevention function against misoperation.



c. Ambient condition

Ambient temperature: -25°C ~45°C , daily average: ≤35°C
 Altitude: 1000m(Standard); can up to 4500m for special ordering;
 Relative humidity: daily average ≤95%, monthly average ≤90%;
 Earthquake intensity ≤8 degree;
 Applicable occasions should be free from inflammables, explosives, corrosives and severe vibration.

d. Model



Note: Suitable for ABB/ Siemens, Schneider etc. brands of vacuum circuit breakers.

e. Main technical parameters table for 17.5kV switchgear and cabinet

No.	Name		Unit	Data
1	Rated voltage		kV	15/17.5
2	Rated insulation level	1 min power frequency withstand voltage (RMS)	kV	50
		Lighting impulse withstand voltage (peak)		95
3	Rated current		A	630~4000
4	Rated short-circuit opening current		kA	50
5	Rated power frequency		Hz	50/60
6	Rated short-circuit making current(peak)		kA	130
7	Rated peak withstand current		kA	130
8	Rated short-time withstand current		kA	50
9	Electrical life		times	20
10	Rated short-circuit current duration		s	4
11	Mechanical life of VCB		times	10000
12	Protection degree of cubicle			Enclosure IP4X, IP2X(VCB door opened)
13	Outline dimension (W*D*H)		mm	800/1000*1500/1670*2300
14	Weight		Kg	500~1200

7. GPVN-17.5kV Indoor AC High Voltage Vacuum Circuit Breaker

a. Summary

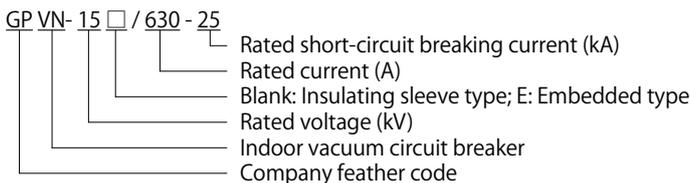
GPVN -15/17.5kV Model indoor AC high voltage vacuum circuit breaker is a type of holistic and completely sealed high voltage switchgear, it has compact dimension and small volume. The VCB applies to power system of rated voltage 13.8~17.5kV, three-phase and AC 50/60Hz. It is applicable in occasions with frequent operations, acting to protect and control line and electric apparatus. The product conforms to IEC62271-200, GB1984, JB3855 and DL1403 and passes type test.



b. Product feature

1. Holistic structure
2. Sealed spark chamber
3. Effective vacuum arc-extinguish
4. Good mechanical behavior
5. Various mounting approach

c. Model



d. Ambient condition

Ambient temperature: -25°C ~45°C , daily average: ≤35°C
 Altitude: 1000m(Standard); can up to 4500m for special ordering;
 Relative humidity: daily average ≤95%, monthly average ≤90%;
 Earthquake intensity ≤8 degree;
 Applicable occasions should be free from inflammables, explosives, corrosives and severe vibration.

e. Main technical parameters table for 17.5kV vacuum circuit breaker

No.	Name	Unit	Data	
1	Rated voltage	kV	15/17.5	
2	Rated frequency	Hz	50/60	
3	Rated current	kA	630~4000	
4	Rated short-circuit opening current	kA	50	
5	Rated short-circuit making current(peak)	kA	130	
6	Rated peak withstand current	kA	130	
7	Rated short-time withstand current	kA	50	
8	Electrical life	times	20	
9	Rated short-time withstand current	kV	4	
10	Rated operating sequence		O-180s-CO-180s-CO	
11	Rated insulation level	1 min power frequency withstand voltage(RMS)	kV	38
		Lighting impulse withstand voltage (peak)	A	95
12	Mechanical life	times	10000	
13	Weight	kg	110~170	

8. GPN1-12kV Removable AC Metal-clad Enclosed Switchgear

a. Summary

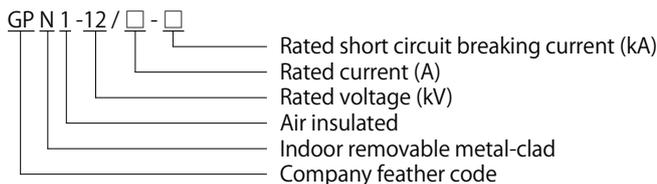
GPN1-12kV removable AC metal-clad switchgear (short for panel as below) is a new product, designed and developed by us, based on the introduction of advanced foreign design and manufacturing technology. The panel applies to 3.6~12kV 3phase AC 50Hz network for receiving and distributing power energy and also for control, monitor and protection. It can be arranged for single busbar, single busbar sectionalizing system or double busbar. It accords with IEC298 "AC Metal Enclosed Switch and Control Equipment above 1kV and below 52kV "IEC 694 Standard Common Clauses for High Voltage Switchgear ", DIN. VDE " AC Switchgear at Rated Voltage Above 1kV ", GB 3906 " 3~35kV AC Metal Enclosed Switchgear and so on. It has perfect and reliable prevention function against misoperation.



b. Ambient condition

Ambient temperature: -25°C ~+45°C , daily average: ≤35°C
 Altitude: 1000m(Standard); can up to 4500m for special ordering;
 Relative humidity: daily average ≤95%, monthly average ≤90%;
 Earthquake intensity ≤8 degree;
 Applicable occasions should be free from inflammables, explosives, corrosives and severe vibration.

c. Model



Note: Suitable for ABB/ Siemens, Schneider etc. brands of vacuum circuit breakers.

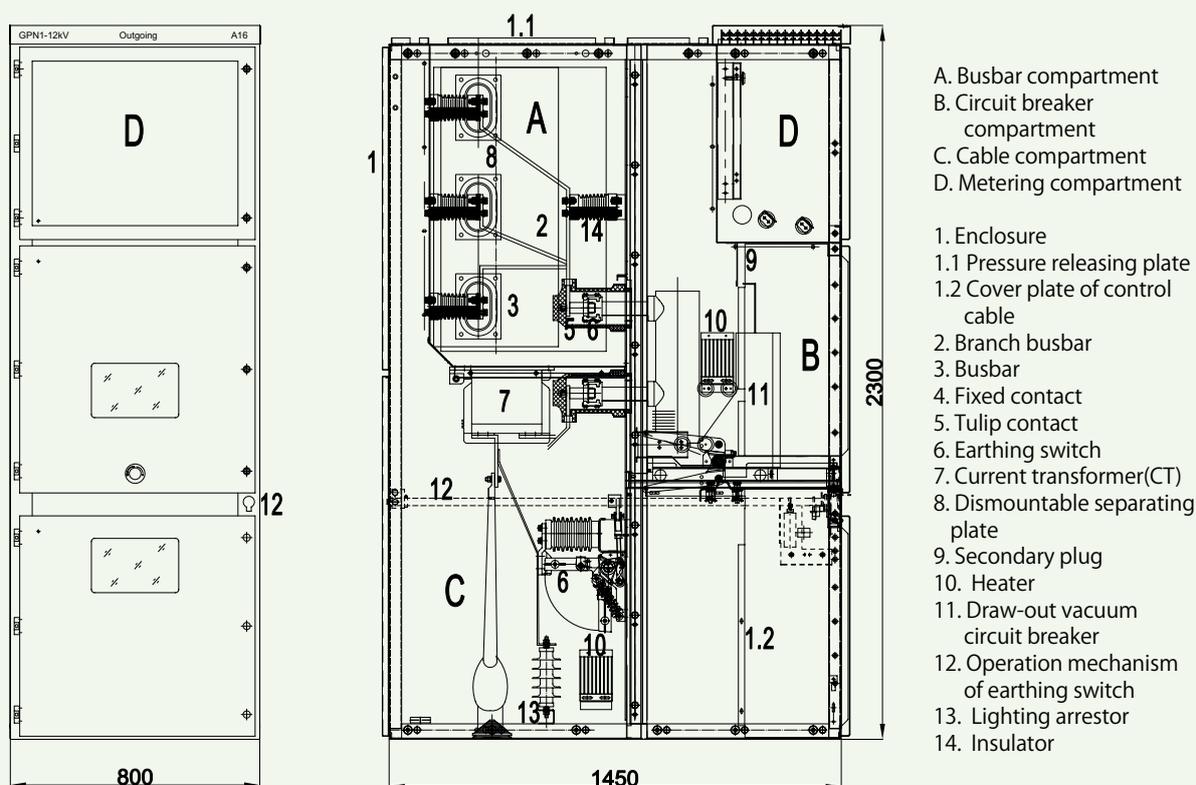
d. Products feature

- 1) This product is applicable for our own made GPNV-12kV embedded or insulating sleeve vacuum circuit breaker or ABB's VD4 vacuum circuit breaker.
- 2) Our production configuration GPC vacuum contactor - fuse combination or ABB company's VC vacuum contactors, which can be composed of F-C loop cubicle, to meet the electricity system of power plants and demand of other industrial and mining enterprises.
- 3) Using excellent aluminum-zinc clad steel plate by precision CNC machining equipment assembled into the cabinet, and the use of double bending process, greatly improve the strength of the cabinet.
- 4) Door surface by epoxy resin electrostatic powder spray process, resistance of corrosion, oxidation, impact and strong adhesion.
- 5) Cabinet fully enclosed structure is realized fully armored, the functional units are completely separated. When the door is closed, it can achieve the operation of circuit breaker and earthing switch.
- 6) Precision screw drive mechanism, ensure the trolley with good interchangeability.
- 7) Perfect primary plan to meet the various needs of users, and enables double trolley plan.
- 8) Fast grounding switch for earthing and short circuits, and to achieve electric (Motorized) operation.
- 9) Simple and effective "Five Safety" interlock mechanism can reliably prevent misuse and ensure operator's safety.
- 10) Switchgear is belonging to Arc-proof type, on the top of bus compartment, Vacuum circuit breaker compartment, and cable terminal compartment are equipped with pressure relief devices.
- 11) Cable compartment has ample space, can be easily connected to a plurality of cables, and make sure the installation height of the cable plug.
- 12) Strict protection rating (IP4X), to effectively prevent foreign matter or pest invasion.
- 13) Optional secondary system following the security monitoring device has a self-diagnostic function and data communication, intelligent integrated computer, to achieve remote control, remote telemetry, remote viewing, remote adjustment.
- 14) Meet GB3906, GB / T11022, DL404 and IEC60298, IEC62271-1 standards, and through a comprehensive test type test and plateau test (3000 m).
- 15) Passed electromagnetic compatibility tests in the high voltage equipment test laboratory.

e. Technical specification

Item	Unit	Data	
Rated voltage	kV	6~12	
Rated frequency	Hz	50/60	
Rated current	A	630~4000	
Rated insulation level	1min power frequency (Phase to earth / across open contacts)	kV	42/48
	Lightning impulse withstand voltage (Phase to earth/across open contacts)	kV	75/85
Main busbar rated current	A	1250,1600,2000,2500,4000	
Sub-busbar rated current	A	630,1250,1600,2000,2500,3150	
Rated short time withstand current(4s)	kA	16,20,25,31.5,40,50	
Rated peak withstand current	kA	40,50,63,80,100,125	
Protection degree		Enclosure IP4X, IP2X(VCB door opened)	
Outline dimension(width/depth/height)	mm	650(800,1000) /1500(1300,1670,2000) /2300	
Weight	kg	500~1200	

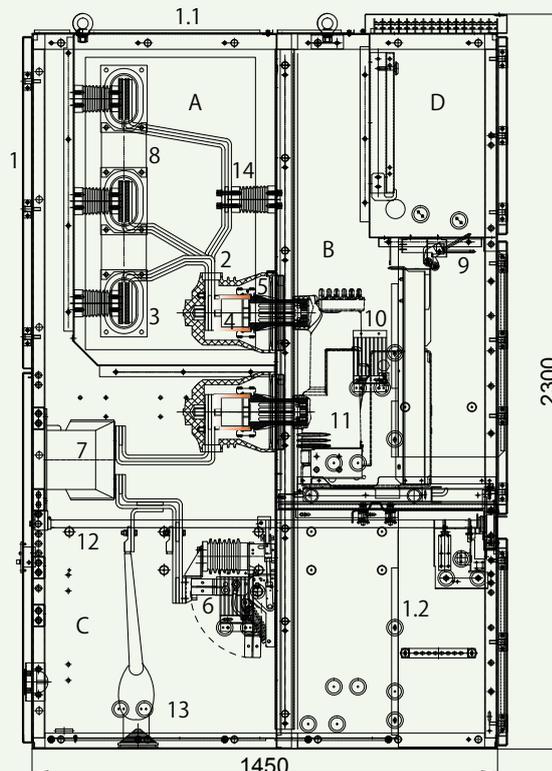
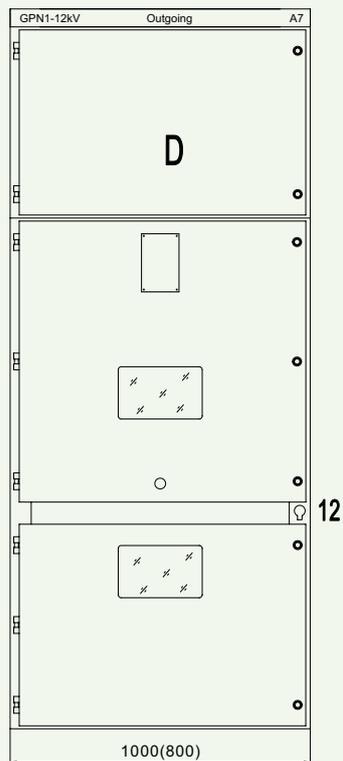
f. Structure drawing of cubicle 630A~1250A



Note: here only show the outgoing schematic for reference. For the other schematic, Please consult with GP for more details.



g. Structure drawing of cubicle 1600A~4000A



- | | | |
|--|---|--|
| <ul style="list-style-type: none"> A. Busbar compartment B. Circuit breaker compartment C. Cable compartment D. Metering compartment | <ul style="list-style-type: none"> 1. Enclosure 1.1 Pressure releasing plate 2. Branch busbar 3. Busbar 4. Fixed contact 5. Tulip contact 6. Earthing switch 7. Current transformer(CT) | <ul style="list-style-type: none"> 8. Dismountable separating plate 9. Secondary plug 10. Heater 11. Draw-out vacuum circuit breaker 12. Operation mechanism of earthing switch 13. Lighting arrestor 14. Insulator |
|--|---|--|

Note: here only show the outgoing schematic for reference. For the other schematic, Please consult with GP for more details.

h. Vacuum circuit breaker plan

Rating current of Branch bus (Ie)	Width (W)	Depth (D)	Height (H)
Ie≤1250A	650	1350 or 1450 or 1550 or 1610	2300
	800		
Ie≤1600A	800	1550 or 1610	2300
1600A≤Ie≤4000A	1000	1550 or 1610	2300

i. Vacuum contactor plan

Rating current of Branch bus (Ie)	Width (W)	Depth (D)	Height (H)
Ie≤400A	650	1400 or 1500 or 1600 or 1660	2300

Note: See page 26/27 for more information of F-C circuit plan.

9. GPVN -12kV Indoor AC High Voltage Vacuum Circuit Breaker

a. Summary

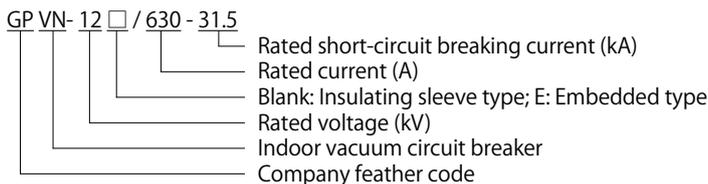
GPVN -12kV Model indoor AC high voltage vacuum circuit breaker is a type of holistic and completely sealed High Voltage switchgear, it has compact dimension and small volume. The VCB applies to power system of rated voltage 7.2~12kV, three-phase and AC 50/60Hz. It is applicable in occasions with frequent operations, acting to protect and control line and electric apparatus. The product conforms to IEC62271-100, GB1984, JB3855 and DL1403 and passes type test.



b. Product feature

1. Holistic structure
2. Sealed spark chamber
3. Effective vacuum arc-extinguish
4. Good mechanical behavior
5. Various mounting approach

c. Model



d. Ambient condition

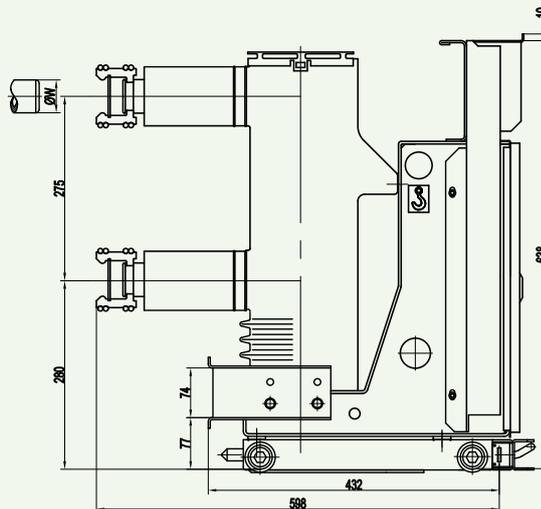
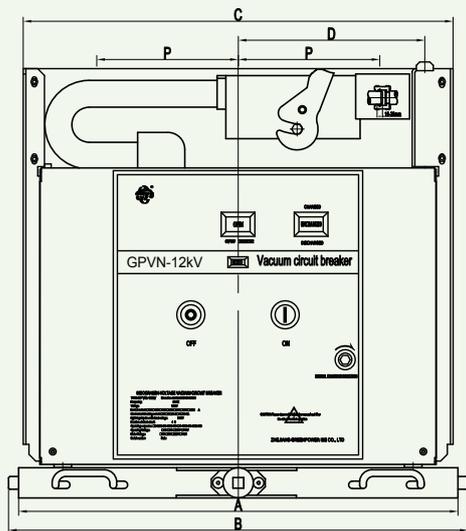
Ambient temperature: -25°C ~+45°C , daily average: ≤35°C
 Altitude: 1000m(Standard); can up to 4500m for special ordering;
 Relative humidity: daily average ≤95%, monthly average ≤90%;
 Earthquake intensity ≤8 degree;
 Applicable occasions should be free from inflammables, explosives, corrosives and severe vibration.

e. Technical specifications

No.	Item	Unit	Data						
1	Rated voltage	kV	7.2~12						
2	Rated frequency	Hz	50/60						
3	Rated current	A	630,1000,1250	1600	2000,2500,3150	4000			
4	Rated short-circuit breaking current	kA	20	25	31.5	31.5	40	40	50
5	Rated short-circuit making current	kA	50	63	80	80	100	100	125
6	Rated short-time withstand current	kA	20	25	31.5	31.5	40	40	50
7	Rated peak withstand current	kA	50	63	80	80	100	100	125
8	Rated pull-out breaking current	kA			12.6	12.6	16	16	20
9	Rated out-of-phase earthing fault breaking current	kA	17.4	21.7	27.4	27.4	34.7	34.7	43.5
10	Rated short-circuit breaking current breaking time	Times	50				30	30	12
11	Rated operation sequence		O-0.3s-CO-180s-CO				O-180s-CO-180s-CO		
12	Rated breaking current of single capacitor bank	A	630						
13	Rated breaking current of back to back capacitor bank	A	400						
14	1 min. Power frequency withstand voltage	kV	Phase to phase/ to earth: 42, across open contacts:48						
15	Lightning impulse withstand voltage	kV	Phase to phase/ to earth: 75, across open contacts:85						
16	Mechanical life	Times	20000						
17	Closing time	ms	≤ 75						
18	Opening time	ms	≤ 60						
19	Power storage time under rated voltage	s	≤ 10						

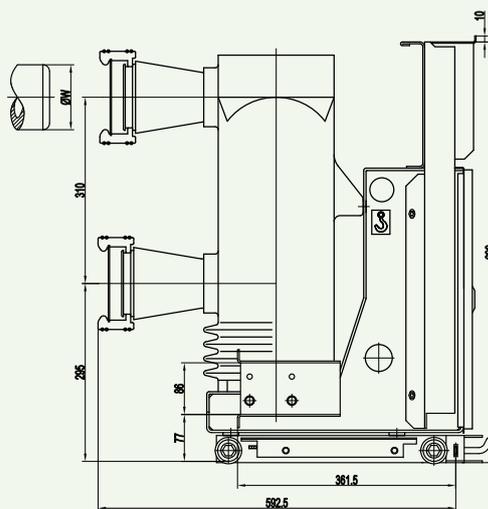
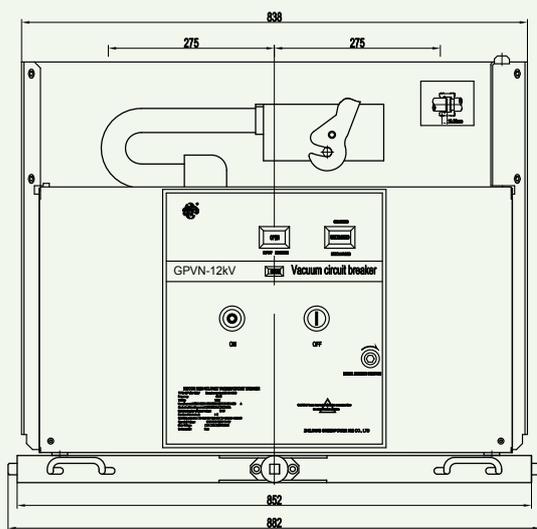


f. Outline dimension of GPVN-12kV



Rated current	Rated Short Circuit Breaking Current	P	A	B	L	D	W
630A	25kA/31.5kA	150	502	532	490	202	Φ 35
		210	652	682	638	277	
1250A	25kA/31.5kA	150	502	532	490	202	Φ 49
		210	652	682	638	277	
1600A	31.5kA/40kA	210	652	682	638	277	Φ 55
		275	852	882	838	377	

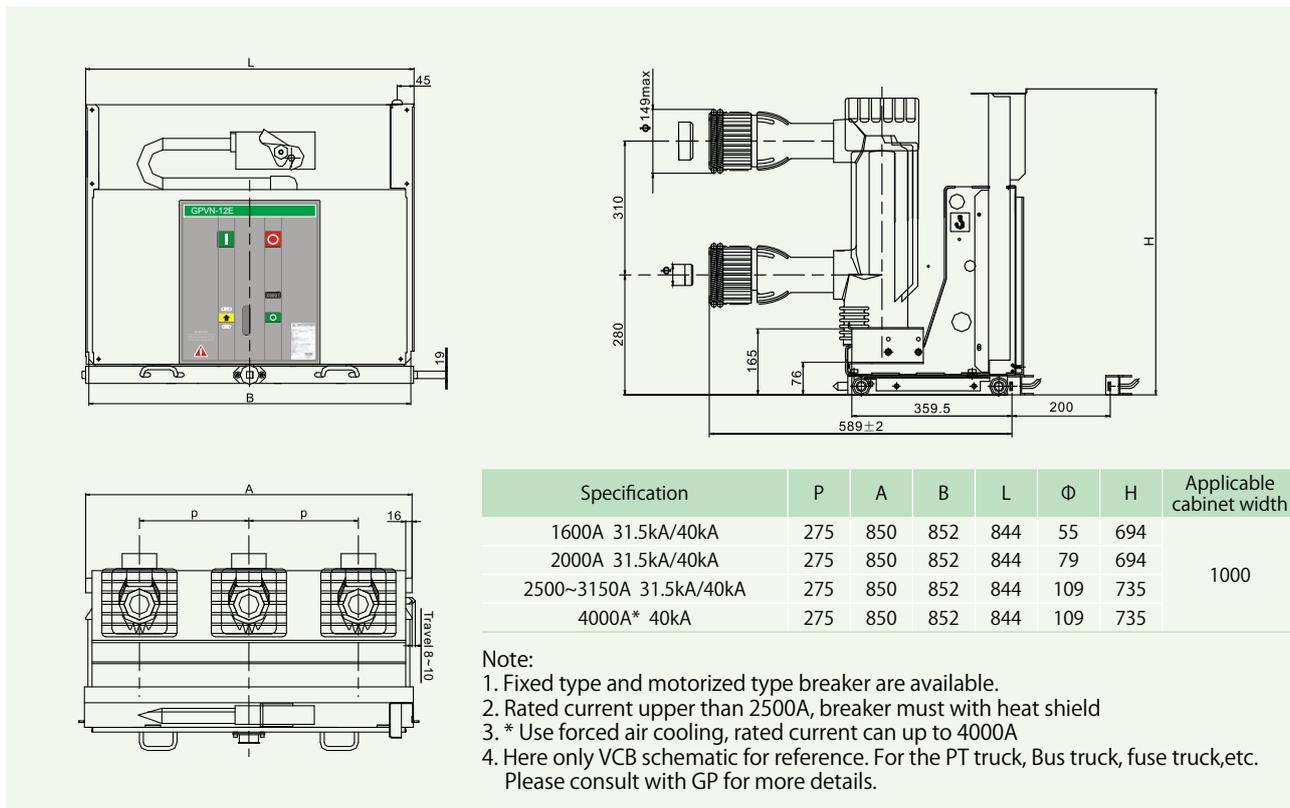
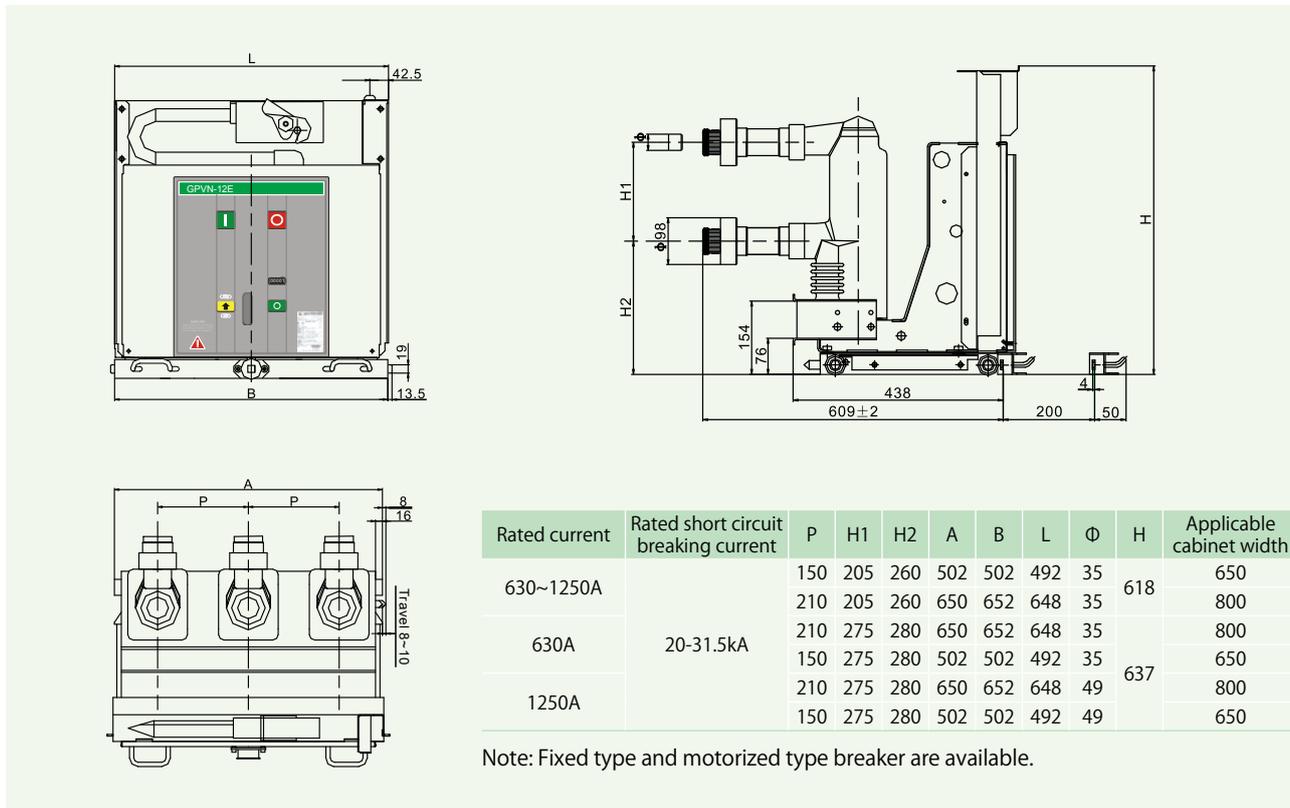
Note:
Fixed type and motorized type breaker are available.



Rated current	Rated short Circuit breaking current	P	W
1600A, 2000A	31.5kA, 40kA	275	Φ 79
2500A, 3150A			Φ 109
4000A			Φ 109

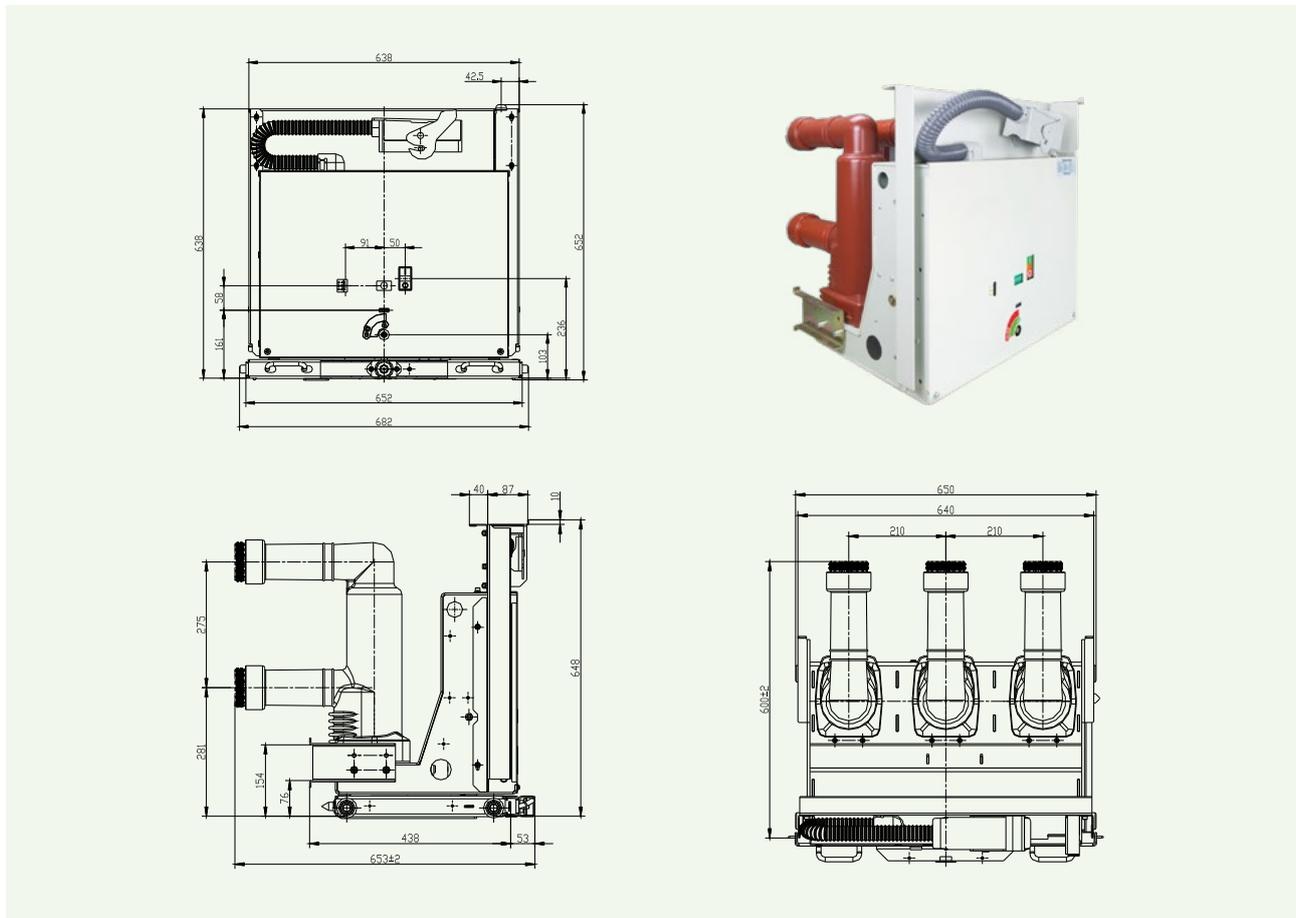
Note:
1. Fixed type and motorized type breaker are available.
2. Here only VCB schematic for reference. For the PT truck, Bus truck, fuse truck, etc. Please consult with GP for more details.

g. Outline dimension of GPVN-12E



10. 12/17.5kV Embedded-Pole Permanent Magnet Circuit Breaker

a. Dimension of GPVN-12/M1250-31.5



b. Main parameters of GPVN-12/M1250-31.5

Items	Unit	Data 1	Data 2
Rated Voltage	kV	12	17.5
Rated current	A	1250	1250
Rated Power frequency withstand voltage	kV	42	38
Rated Impulse withstand voltage	kV	75	95
Rated short-circuit breaking current	kA	31.5	31.5
Rated short-circuit close peak current	kA	80	80
Rated short-time withstand current	kA	31.5	31.5
Rated short-time withstand time	s	4	4
Rated frequency	Hz	50/60	50/60
Mechanical life	times	50000	50000
Close-open operation circle under rated current	times	30	30
Close time, not more than	ms	<25	<25
Open time, not more than, include	ms	<15	<15
Bound time	ms	0	0
Open jump		<1/5 open distance	<1/5 open distance
Rated operation circle	kg	105	105
Auxiliary switch		6NO+6NC	6NO+6NC

11. GPVC Vacuum Contactor - Fuse Combination Apparatus

a. Main features of GPVC vacuum contactor - fuse combination apparatus(F-C circuit).

- 1) APG process solid epoxy resin sealing technology.
- 2) Modular, streamlined design.
- 3) Frequent operation, long life, maintenance-free.
- 4) Limiting role of the fuse can be save cost mostly.
- 5) Products through the entire type test and plateau test (3000 m)
- 6) It can be equipped with fuse in a variety of sizes.
- 7) GPVC handcart fitted directly to the middle placed metal clad switchgear;
- 8) Widely used in thermal power plants, metallurgical, petrochemical, mines and other industrial and mining enterprises
- 9) Products meet GB / T 14808, GB / T 11022, IEC 60470 and other standards.



b. Ambient condition

- 1) Ambient temperature: -25°C ~+45°C , daily average:≤35°C
- 2) Altitude: 1000m(Standard); can up to 4500m for special ordering;
- 3) Relative humidity: daily average ≤95%, monthly average ≤90%;
- 4) Earthquake intensity ≤8 degree;
- 5) Applicable occasions should be free from inflammables, explosives, corrosives and severe vibration.

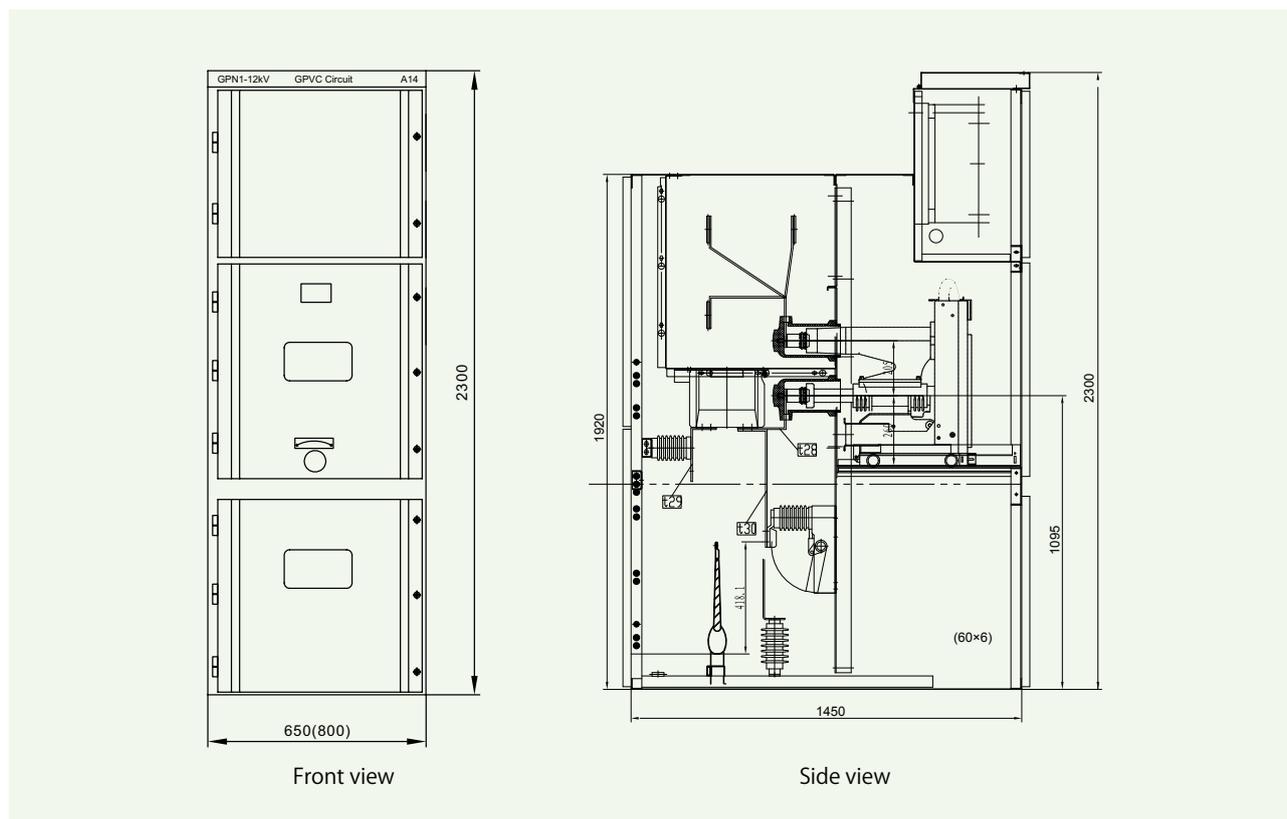
c. Main technical parameters of GPVC vacuum contactor-fuse combination apparatus

Items	Unit	Data		
Rated Voltage	kV	3.6	7.2	12
1min Power frequency withstand voltage	kV	20	32	42
Lighting impulse withstand voltage	kV	46	60	75
Rated current	A	400	315	200
Rated short-time withstand current (4s)	kA	4		
Rated peak withstand current	kA	10		
Expected short-circuit breaking current	kA	50		
Expected short-circuit close current	kA	130		
Main circuit resistance	uΩ	≤250+RFuse		
Max. transfer current	A	4000	4000	3200
Rated current breaking times	times	250,000		
Mechanical life	Mechanical hole-type	times	300,000	
	Electrical hold-type	times	500,000	
Main circuit resistance	uΩ	≤150		

d. Plan of the GPVC vacuum contactor-fuse combination

Plan number	Plan - 1	Plan - 2	
Primary plan			
	Rated current (A)	~400	~400
Main components	Vacuum contactor-Fuse combination - GPVC	1	1
	Current transformer LZZBJ	3	3
	Voltage transformer JDZ10 or JDZX10		
	High voltage fuse XRNM-10	3	3
	Earthing switch GPJN15-12		1
	Voltage monitor device	As Users requirement	As Users requirement
Remarks	Motor driving	Motor driving	

e. Outline dimension of GPVC installed switchgear



12. GPR-24(12)kV Series Ring Main Unit Switchgear

a. Summary

GPR-24 series Ring Main Unit is an extensible, SF₆ insulated switchgear, with rated voltage of 12&24 kV. All its HV live parts are contained in an air-tight gas tank, which is made from stainless steel of 3mm. The whole switching assembly is SF₆ insulated, and free from any external influence, ensuring it great reliability of service and maintenance free. By plug-in type busbar extension, GPR-24 series Ring Main Unit can be of free combination and full modularization. The busbar extension has passed type test for power and thermal stability, and is fully insulated and shielded, exhibiting high reliability and safety. GPR-24 series Ring Main unit is suitable for all MV network up to 24 kV, all compact power stations, power distribution substations in all important industries, such as petrol-chemical industry, metallurgical and mining industries, and all transformer substations and wind power system.



b. Features

1. Advanced process technique for gas tank

The digital-controlled laser cutting and punching system and three-dimension and five-axis laser welding system imported from Germany with ensure the gas tightness and uniformity of all gas tanks.

The fully automatic and integral helium leak detection system, made by SEILER Vakuumentchnik GmbH, through detecting of Helium leakage by mass spectrograph, brings gas leakage rate per year down to less than 0.02%, ensuring the life span of gas tank of over 30 years.

Advanced process technique for parts .

All epoxy resin insulated parts, including insulated poles, are manufactured by fully-automatic and digitally controlled epoxy resin vacuum mixing/pressure gelatinizing system from Hedrich (Germany) .

The busbar connector, cable connector, end-plug and other silicone rubber insulated parts are manufactured by fully-automatic and digitally controlled silicone rubber mixing/pressure gelatinizing system from VOGEL(Switzerland).

2. Excellent solutions for products

With small and compact structure, the basic functional units K, T, V, B and C have uniform dimension: 350*800*1380 mm (width*depth*height) .

Complete solutions:

Single version: load break switch unit, switch-fuse unit, vacuum circuit breaker unit, busbar subsection unit, cable unit, metering unit, etc.

Block version can be made up of two, three, four, five or six functional units.

Single units and block version can be connected by busbar connectors flexibly.

3. Strong adaptability to the environment

The primary conductive system is fully sealed in the SF₆ gas tank and will not be influenced by the outside environment, independent of the impact of dew, dust, salt fog, etc. Therefore, GPR-24 series can be applied at various severe service conditions.

c. 12kV Technical data

Description		Unit	LBS unit	Switch-fuse unit	VCB unit	Busbar subsection unit
Rated voltage		kV	12	12	12	12
Power frequency withstand voltage (1min)	Phase to phase/earth	kV	42	42	42	42
	Across the isolating distance	kV	48	48	48	48
Impulse withstand voltage	Phase to phase/earth	kV	75, (95)*	75, (95)*	75, (95)*	75, (95)*
	Across the isolating distance	kV	85, (110)*	85, (110)*	85, (110)*	85, (110)*
Rated frequency		Hz	50,60	50,60	50,60	50,60
Rated current		A	630	①	630	630
Rated short circuit breaking current		kA		②	20,(25)*	
Rated short time withstand current		kA/s	20/3, (20/4, 25/1)*		20/3, (20/4, 25/3)*	20/3, (20/4, 25/1)*
Rated peak withstand current		kA	50, (63)*		50, (63)*	50, (63)*
Rated short circuit making current		kA	50, (63)*	②	50, (63)*	50, (63)*
Rated transfer current		A		1800		
Rated active load breaking current		A	630			630

Rated closed loop breaking current	A	630		630
5% rated active load breaking current	A	31.5		31.5
Rated operating sequence				O-0.3s-CO-180s-CO
Mechanical lifetime	Ops.	5000	5000	10000
Electrical lifetime		E3		E2
Thickness of stainless steel	mm			3.0
Rated SF ₆ pressure	kPa			30 (at 20°C , 101.3kPa)
Annual leakage rate				< 0.02%
Water treatment test				12kV 24 hours (at 30 kPa under the water)
Internal arc test				20kA 1s
Protection degree	Gas tank			IP 67
	Fuse holder			IP 67
	GPR enclosure			IP 4X

Notes:

① Rated current of switch-fuse unit depends on the rating of fuse: ≤125A

② Rated short circuit breaking/making current of switch-fuse unit depends on the rating of fuse

* Values in brackets are for special requirements, please contact manufacturer or supplier for more information

d.24kV Technical data

Description	Unit	LBS unit	Switch-fuse unit	VCB unit	Busbar subsection unit	
Rated voltage	kV	24	24	24	24	
Power frequency withstand voltage (1min)	Phase to phase/earth	kV	50, (65)*	50, (65)*	50, (65)*	50, (65)*
	Across the isolating distance	kV	64, (79)*	64, (79)*	64, (79)*	64, (79)*
Impulse withstand voltage	Phase to phase/earth	kV	95, (125)*	95, (125)*	95, (125)*	95, (125)*
	Across the isolating distance	kV	110, (145)*	110, (145)*	110, (145)*	110, (145)*
Rated frequency	Hz	50, 60	50, 60	50, 60	50, 60	
Rated current	A	630	①	630	630	
Rated short circuit breaking current	kA		②	20		
Rated short time withstand current	kA/s	20/3, (20/4)*		20/3, (20/4)*	20/3, (20/4)*	
Rated peak withstand current	kA	50		50	50	
Rated short circuit making current	kA	50	②	50	50	
Rated transfer current	A		1400			
Rated active load breaking current	A	630			630	
Rated closed loop breaking current	A	630			630	
5% rated active load breaking current	A	31.5			31.5	
Rated operating sequence				O-0.3s-CO-180s-CO		
Mechanical lifetime	Ops.	5000	5000	10000	5000	
Electrical lifetime		E3		E2	E3	
Thickness of stainless steel	mm			3.0		
Rated SF ₆ pressure	kPa			30 (at 20°C , 101.3kPa)		
Annual leakage rate				< 0.02%		
Water treatment test				24kV 24 hours (at 30 kPa under water)		
Internal arc test				20kA 1s		
Protection degree	Gas tank			IP 67		
	Fuse holder			IP 67		
	GPR enclosure			IP 4X		

Notes:

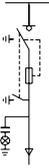
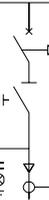
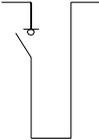
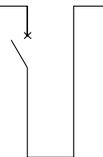
① Rated current of switch-fuse unit depends on the rating of fuse: ≤100A

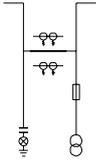
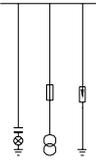
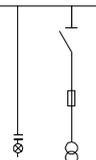
② Rated short circuit breaking/making current of switch-fuse unit depends on the rating of fuse

* Values in brackets are for special requirements, please contact manufacturer or supplier for more information

e. GPR24 Series overview

1. Single tank type

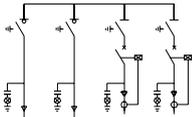
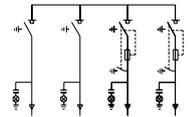
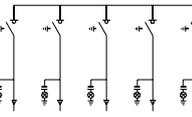
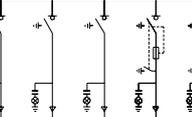
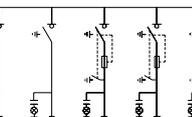
No.	Type	Name	Primary Diagram	Dimension (W*D*Hmm)/Weight(kg)		Description
				12kV	24kV	
1	GPR24-K	Load break switch panel		350 x 800 x 1380 /160	350 x 800 x 1380 /160 (370 x 850 x 1380 /190)*	For switching connection between in/out cable and busbar earthed, with short circuit making capacity.
2	GPR24-T	Switch-fuse panel		350 x 800 x 1380 /190	350 x 800 x 1380 /190 (480 x 850 x 1380 /230)*	For control and protection for transformer up to 1250kVA
3	GPR24-V1	Vacuum circuit breaker panel		350 x 800 x 1380 /200	350 x 800 x 1380 /200 (480 x 850 x 1380 /240)*	For incoming/outgoing circuit, can be equipped with microcomputer protection unit
4	GPR24-V2	Vacuum circuit breaker panel		350 x 800 x 1380 /200	350 x 800 x 1380 /200 (480 x 850 x 1380 /240)*	For incoming/outgoing circuit, can be equipped with microcomputer protection unit
5	GPR24-B	Busbar subsection panel		350 x 800 x 1380 (On right side of block type, width: 400mm) /135	350 x 800 x 1380 /135 (480 x 850 x 1380 /150)*	For busbar connection.
6	GPR24-V	Busbar coupling VCB		350 x 800 x 1380 /180	350 x 800 x 1380 /180 (480 x 850 x 1380 /220)*	For busbar connection, used in block type only
7	GPR24-C	Rising panel		350 x 800 x 1380 /100	350 x 800 x 1380 /100 (370 x 850 x 1380 /110)*	For in/out cable connection

8	GPR24-M	Metering panel		600 x 800 x 1380 /210	800 x 1000 x 1380 /210 (800 x 1000 x 1380 /220)*	For metering power/energy consumption
9	GPR24-PT	PT panel		600 x 800 x 1380/180	800 x 1000 x 1380/180 (800 x 1000 x 1380/210)*	For monitoring voltage of busbar, providing lost voltage signal
10	GPR24-P	Power supply panel		600 x 800 x 1380/170	600 x 800 x 1380/170 (600 x 850 x 1380/180)*	For providing DC 24V/48V, AC220V supply

Note:

1. Values in brackets marked with "*" are the products at 24kV, power frequency withstand voltage of 65/79kV;
2. If there are too many secondary components in the configuration, an additional compartment for them can be installed on top of the panel, its height is 400mm.

2. GPR24 Block type-1 for 12kV & 24kV (power frequency withstand voltage: 50/64kV)

No.	Type	Unit combination	Primary diagram	Dimensions(WxDxHmm)	Weight (kg)
1	GPR24-KKV	2 load breaker switch units and 1 vacuum circuit breaker unit		1050 x 800 x 1380	50
2	GPR24-KKTT	2 load breaker switch units and 2 switch-fuse unit		1400 x 800 x 1380	700
3	GPR24-5K	5 load breaker switch units		1750 x 800 x 1380	800
4	GPR24-KKKTT	3 load break switch units and 2 switch-fuse units		1750 x 800 x 1380	860
5	GPR24-KKTTT	2 load break switch units and 3 switch-fuse units		1750x800x1380	890

Notes:

1. If there are too many secondary components in the configuration, an additional compartment for them can be installed on top of the GPR, its height is 400mm

13. GP-NER Series 10~40.5kV Neutral Earthing Resistors Device

a. Summary

GP-NER Series neutral earthing resistors are applied to city electric power customer such as large-scale industrial enterprise, airport, harbor, metro ect., large generators and service power supply system in power plant, others.

The components of GP-NER series neutral earthing resistors are made of special stainless steel electric-heat metal imported from US. They are with outstanding characters such as high temperature-resistant capability, excellent anti-oxidation performance, strong tensile characteristics, high resistivity and stable resistance value, what's more, it can sustain electric and thermodynamic performance even under 1000°C , which enables safe and reliable operation.

According to different connection mode or various customer requests, are can provide epoxy resin to cast dry type transformer, zero sequence current transformers, single-phase disconnecting switches. Heater and thermo/humidity controllers etc.



b. Performance features

GP-NER series neutral earthing resistor components are made of stainless steel alloy that is composed of special composition and used specially for neutral earthing resistor. The primary characteristics are as follow:

High temperature-resistant: The melting point is at 1375~1500 °C , and its max working temperature is 1000°C .

Strong capacity of tensile strength: the intensity is at 700 Mpa, and mechanical intensity keeps constant at the high temperature of 900~1000°C .

High resistivity: The resistivity is 1.25 Ω .m, which is propitious to reduce the size of resistor component.

Stable resistance value: The resistance temperature coefficient is 1.05x10⁻² Ω /°C , resistance value increase at high temperature is little, that is good for the sensitivity of protection.

High anti-oxidation performance: Resistance also has a high anti-oxidation performance even at the temperature of 1000°C , which is deeply suitable for seriously contaminative environment.

High tenacity: Resistor elements can keep high tenacity when the temperature changes acutely.

Various type: According resistor's current, there are several kinds of elements such as strap, grid, Spiral Wound, Ribbed Wound, smooth winding types etc.

Resistor modularized: each type resistor are made of standard components, by series connection or parallel connection to achieve kinds of parameters, elements can be replaced easily.

Optimal heat-dissipation design: the cabinet structure possess the optimal cooling air current passageway. The effect of heat dissipation is very good and there are no local overheat spots and burn spots.

Long operation life: The guarantee life is 30 years. Some resistors have operated for more than 50 years.

c. Applied standards:

DL/T780-2001 Neutral earthing resistors in electrical power distribution system

GB6450 Dry type electrical transformer

IEE32-1972 Technology terms and test of neutral earthing resistors

GB/T11022-1999 Electrical equipment delivery testing criterion of electric device installation other national criterion and electric power industry standards.

d. Parameters of products

Voltage: 0.4kV~110kV;

Rated current: optional;

Nominal resistance: optional;

Current duration: 10s, 30s, 60s, 10mins, continuous;

Incoming and outgoing line: top in bottom out, bottom in and out, side in and out, side in bottom out, etc;

Installation site: indoor / outdoor;

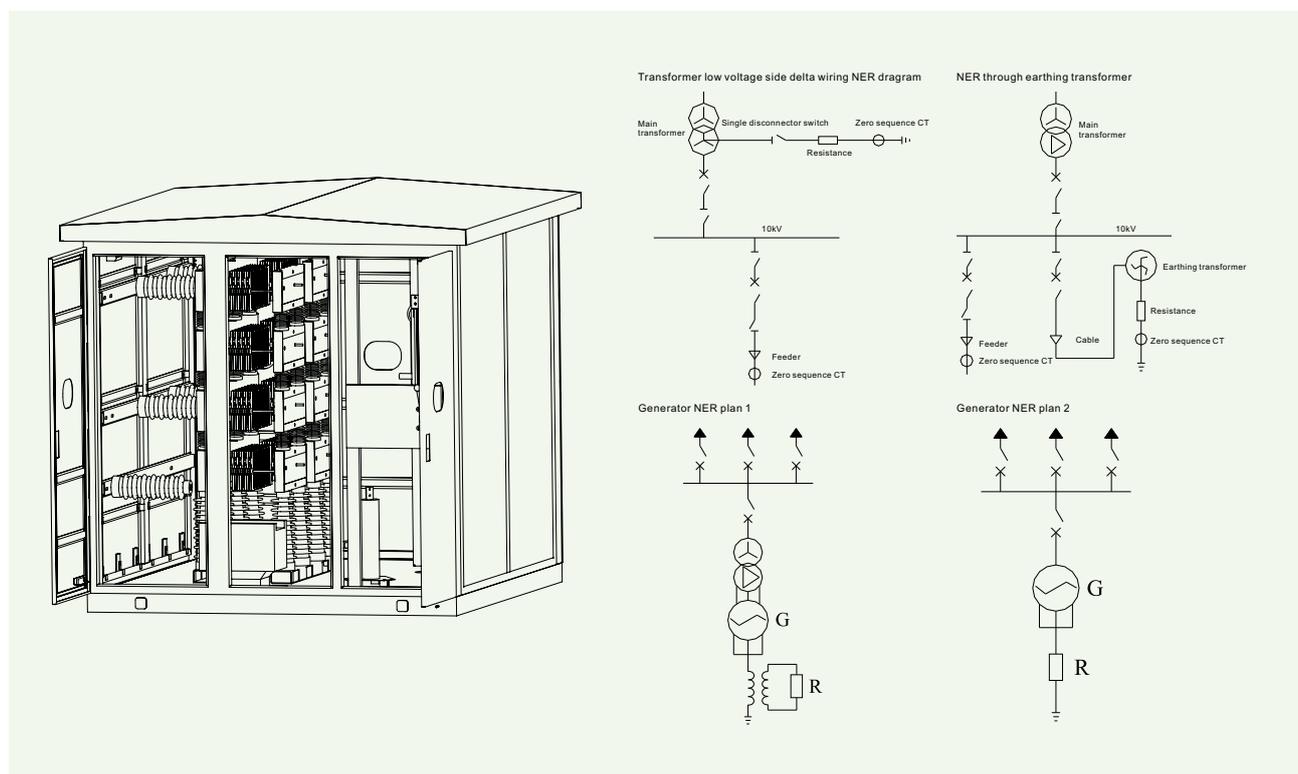
Allowable temperature rise: 760 °C for 10s, 30s, 60s and 610°C for 10min and 385°C for continuous

Zero sequence current transformer: Optional.

e. Main technical parameters

Type	System voltage (kV)	Resistor rated voltage (kV)	Short-time allowed through-flow(s)	Short-time through-flow time (s)	Normal resistance value	Outline dimension WxDxH (mm)	Weight (kg)
GP-NER-6.3/100-10	6.3	3.64	100	10	36.4		200
GP-NER-6.3/200-10	6.3	3.64	200	10	18.2	920x1050x1650	250
GP-NER-6.3/400-10	6.3	3.64	400	10	9.09		300
GP-NER-6.3/600-10	6.3	3.64	600	10	6.06		350
GP-NER-6.3/1000-10	6.3	3.64	1000	10	3.64		400
GP-NER-10/100-10	10	5.77	100	10	57.7	920x1050x1800	400
GP-NER-10/200-10	10	5.77	200	10	28.9		450
GP-NER-10/400-10	10	5.77	400	10	14.4		500
GP-NER-10/600-10	10	5.77	600	10	9.62	920x1300x1900(with disconnecter switch)	550
GP-NER-10/1000-10	10	5.77	1000	10	5.77		600
GP-NER-20/400-10	20	11.5	400	10	28.7		1500
GP-NER-20/600-10	20	11.5	600	10	19.2	1400x1800x2400	1500
GP-NER-35/200-10	35	20.2	200	10	101		2000
GP-NER-35/400-10	35	20.2	400	10	50.5	1600x2600x2400 (indoor)	2000
GP-NER-35/600-10	35	20.2	600	10	33.7	1600x2600x2540 (outdoor)	2000
GP-NER-35/1000-10	35	20.2	1000	10	20.2		2000
GP-NER-35/1300-10	35	20.2	1300	10	15.5	2400x2600x2400 (indoor)	2500
GP-NER-35/2000-10	35	20.2	2000	10	10.1	2400x2600x2540 (outdoor)	2500

f. Outline view and primary diagram



14. GPJ-Z High Voltage Tester Kit Equipment

a. Summary

Oil-immersed Light type is a new high-voltage test transformer equipment, this series of products using CD core devices improve shock tolerance, high voltage primary winding and secondary winding coaxial wound on the core, thereby reducing leakage flux, increasing the coupling between windings, the product has compact structure, versatility, easy to carry. It is suitable for power systems and power users in the field for testing of various insulating properties of high-voltage electrical equipment, electrical equipment testing and is necessary for preventive test transformer.

GPJ series light except for the exchange of high-voltage test transformer frequency voltage withstand test, if with the same voltage level and the same capacity capacitors, high voltage silicon stack and DC micro-ammeter, can be assembled into a DC high voltage test device that can measure high voltage DC leakage current test.



b. Technical Features

Excellent selection, reliable quality, good Stability
A large voltage margin, small power sound, small Partial Discharge
Volume very light
Any special technical requirement, please consult with GP for more details.

No.	Items	Data	
1	Supply	220-240V/ 50-65Hz (Frequency)	
2	Capacity	6050VA	
3	AC Voltage/ Current	110KV/55mA	
4	DC Voltage/ Current	150kv/18mA	
5	Voltage accuracy	2.5%	
6	Current accuracy	2.5%	
7	Temperature	Working Temperature: 0-50°C Stocking temperature: -20-60°C	
8	Equipment List:	1. Test transformer	1 pc
		2. Control box	1 pc
		3. Micro ammeter	1 pc
		4. Limited current resistance	1 pc
		5. Discharging bar	1 pc
		6. Testing line	1 pc
		7. Inner silicon core	1 pc

c. GPJ-Z-75/25 Technical Specifications and data sheet

No.	Items	Data	
1	Supply	220-240V/ 45-65Hz (Frequency)	
2	Capacity	1870VA	
3	AC Voltage/ Current	75KV/25mA	
4	DC Voltage/ Current	110kv/10mA	
5	Voltage accuracy	2.5%	
6	Current accuracy	2.5%	
7	Temperature	Working Temperature: 0-50°C Stocking temperature: -20-60°C	
8	Equipment List:	1. Test transformer	1 pc
		2. Control box	1 pc
		3. Micro ammeter	1 pc
		4. Limited current resistance	1 pc
		5. Discharging bar	1 pc
		6. Testing line	1 pc
		7. Inner silicon core	1 pc

15. GP8671D Insulation tester 500/1000/2500/5000V

Technical data:

1. Rated voltage: 500V, 1000V, 2500V, 5000V;
2. Test range: 0~19999M Ω ;
3. Relative tolerance: ≤4%+ 1d;
4. Resolution: 0.01M Ω, 0.1M Ω, 10.0M Ω ;
5. Voltage loading: 1000V/20M Ω ;
6. Voltage drop about: 10%
7. Supply: Single 3k battery R6P(1.5V)*6 or AC220V/50Hz



16. GPVA-404 CT/PT Analyzer



Technical data:

Test standard according to	IEC60044-1, IEC60044-2, IEC60044-5, IEC60044-6, GB1207, GB1208, GB16847, GBT4703, C57.13
Input supply voltage	AC220V ± 10%, 50Hz/60Hz ± 10%
Output voltage	0.1~180V (AC)
Output current	0.001~5A (RMS)
Output power	500VA
Max The highest equivalent turning point voltage	45KV
Current range	0~10A (Auto range: 0.1/0.4/2/10A) Tolerance < ± 0.1%+0.01%FS
Voltage range	0~200 V (Auto range: 1/10/70/200V) Tolerance < ± 0.1%+0.01%FS
Turns ratio measurement range	1~35000, 1~2000 Tolerance <0.05%; 2000~35000 tolerance <0.1%
Phase position measurement	Accuracy ± 2min, Resolution: 0.01min
Secondary winding resistance measurement range	0~8K Ω (Auto range: 2/20/80 Ω /800 Ω /8k Ω) Tolerance<0.2%RDG+0.02%FS, Max resolution: 0.1m Ω
Temperature measure	-50~100°C, Tolerance <3 °C
CT Secondary loading measurement	0 ~ 160ohm(2/20/80ohm/160ohm) Tolerance: 0.2%RDG+0.02%FS Max resolution: 0.001ohm
PT secondary loading measurement	0 ~ 80kohm(800ohm/8kohm/80kohm) Tolerance: 0.2%RDG+0.02%FS, Max resolution: 0.1ohm
PT turns ratio measurement	1~30000; 1~5000 Tolerance <0.2%; 5000~30000 Tolerance <0.5%
Can be selected according to the standard, automatic evaluation of the test results to determine eligibility of the transformers	
Can test difference and the angle difference of current transformer under the rated loading and under operating loading in the same time.	
Having a function to automatically generate WORD format test reports	
It has the function of mass production test reports in WORD format, all test documents can be selected into a WORD format specification report in one time.	
Can automatically compare Excitation curve and the historical stored curve.	
Data storage group	Larger than 1000 groups
Working condition	temperature: -10°C~ 50°C , humidity: ≤ 90%
Dimension	485mm × 356mm × 183mm
Weight	15Kg

