

HUADE SWITCHGEAR

Enviromentally Friendly Non SF6, Dry Air GIS Switchgear

**TYPE : HG3-36/40.5 KV ,
Rating : 2000A , 31.5 kA /3sec**



Shenyang Huade High Technology Electric Co., Ltd

Product Overview

HG3 Green Cubical type gas-insulated switchgear (Green C-GIS) is an environment-friendly gas-insulated metal-enclosed switchgear independently developed by Huade High-tech, which uses clean air as the insulating medium. With international leading technical level, it is a new generation of medium voltage switchgear integrating vacuum arc extinguishing technology, APG solid sealing technology, gas insulation technology and interface insulation technology, complying with standards like IEC62271, GB11022, GB3906 and DL/T404. Passing all type tests and China national new product technical appraisal, the product is widely applied to various power systems, such as power transmission and transformation station network, urban power supply network, large industrial and mining enterprises, petrochemical industry, metallurgy and urban rail transit.

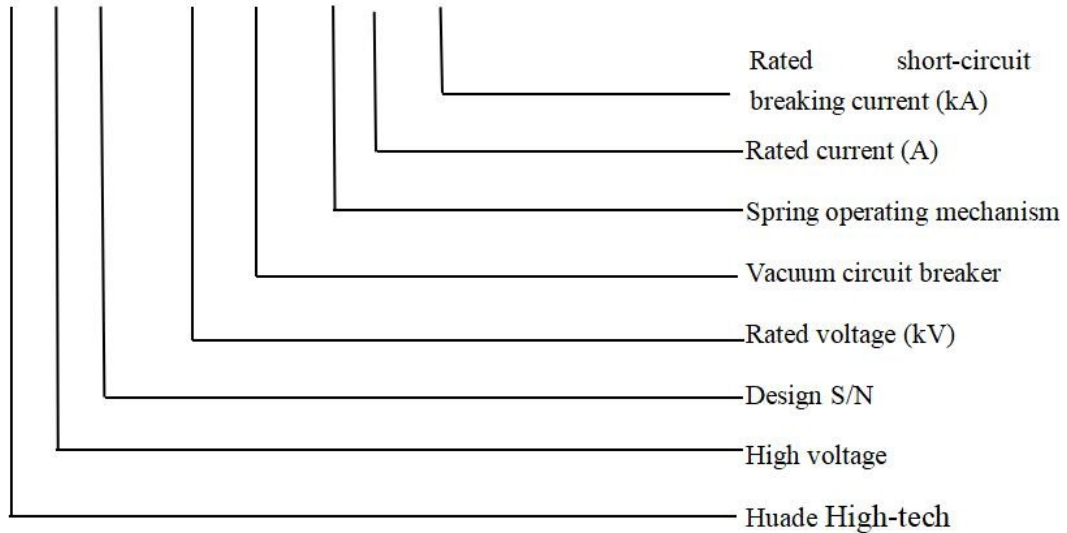
Key Features:

- ❖ **Eco-Friendly Design:** Utilizes clean air as an insulating medium, eliminating the need for SF6 gas and reducing toxic emissions, ensuring minimal impact on the environment.
- ❖ **Compact and Efficient:** Miniaturized with a modular design, the switchgear features a compact structure, small size, and a minimal footprint, maximizing space efficiency.
- ❖ **Robust Construction:** High voltage components are sealed within a stainless steel enclosure, providing waterproof and dustproof performance. Resistant to environmental factors and altitude, ensuring safety and maintenance-free operation.
- ❖ **Flexible Configuration:** Offers flexible and diversified primary schemes to meet various system wiring requirements, enhancing adaptability.
- ❖ **Intelligent Control:** Equipped with an intelligent control and protection unit, featuring powerful control, protection, and measurement functions, meeting the automation needs of distribution networks.
- ❖ **Reliable Operation:** Incorporates reliable mechanical and electrical interlocking mechanisms, effectively preventing mis-operation and ensuring convenient and dependable operation.



Product model description

H G 3-40.5 (Z)/T□-□



Normal service conditions

Ambient Temperature:

- Maximum: +55°C
- Minimum: -25°C

Environmental Conditions:

- Suitable for locations without fire, explosion hazard, chemical corrosion, severe pollution, or excessive vibration.

Relative Humidity:

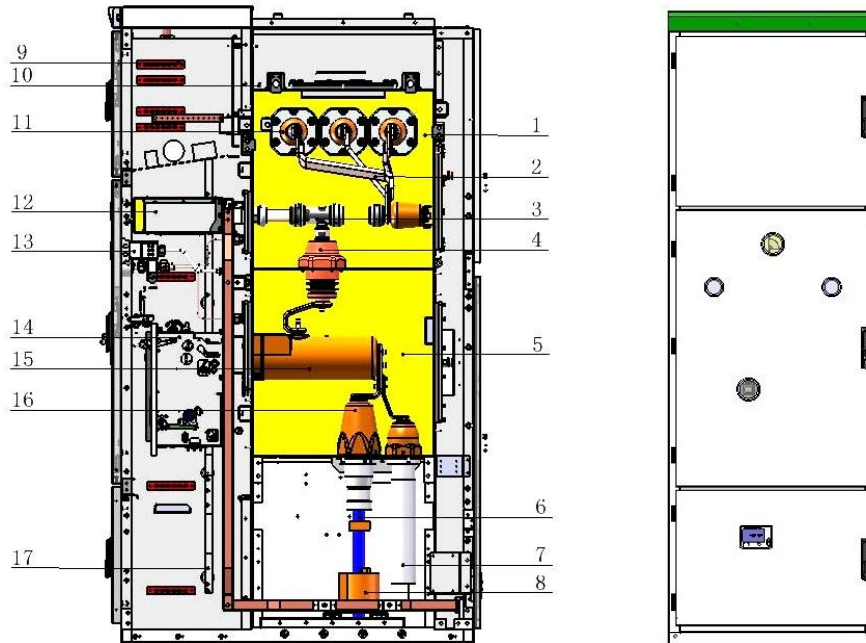
- Daily Average: ≤95%
- Monthly Average: ≤90%

Altitude:

- Operating Altitude: ≤3000m

~~Not to be used for outdoor applications~~
~~used for indoor applications~~

Product structure

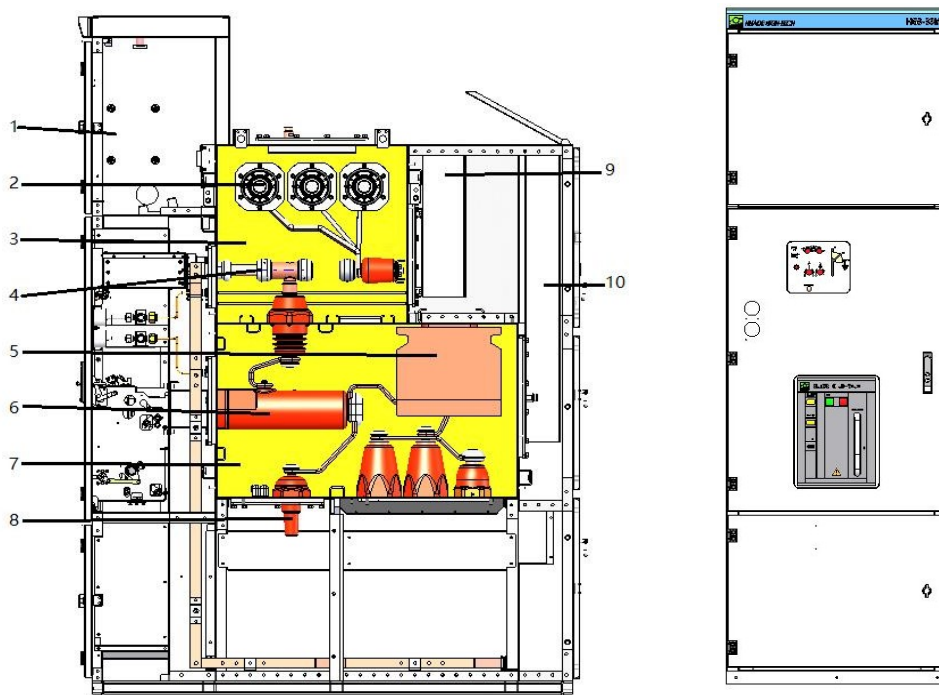


1-main bus compartment, 2-branch bus, 3-EDS, 4-wall bushing, 5-CB compartment, 6-cable, 7-lightning arrester, 8-current transformer, 9-low-voltage compartment, 10-pressure relief channel, 11-main bus, 12-EDS mechanism, 13-gas pressure gauge, 14-breaker mechanism, 15- circuit breaker, 16-cable bushing, 17-enclosure

HG3-40.5 Typical structure

- ✧ The product adopts three-phase common tank structure design, which is composed of core gas box tank, low-voltage compartment, operating mechanism compartment, cable compartment, etc.
- ✧ The gas tank is made of non-magnetic stainless steel plate through laser cutting and laser welding, and the non-welding sealing connection surface is sealed by O-ring. The gas tank has the advantages of high mechanical strength, strong deformation resistance, neat and beautiful appearance and high dimensional precision, ensuring extremely high air tightness.

- ✧ The bus, earthing disconnecting switch and circuit breaker are installed in separate gas compartment. The vacuum circuit breaker adopts a spring operating mechanism, the vacuum arc-extinguishing chamber is horizontally arranged in a embedded pole mode, the isolating switch and the grounding switch are combined into the EDS, share a moving contact and are arranged on the bus side, and the operating mechanism is arranged outside the gas tank.
- ✧ The gas tank is equipped with a pressure relief device and a gas pressure gauge with temperature compensation function. When the internal pressure exceeds a certain limit value, the pressure relief device will automatically open to release gas to ensure the safety of operators and other equipment.
- ✧



- 1) Low voltage compartment 2) Main bus 3) Main bus compartment 4) EDS 5) Current transformer 6) Circuit breaker 7) CB compartment 8) Cable test bushing 9) Pressure relief channel 10) Pressure relief device

HG3-36 Typical structure

Technical parameters

No.	Item		Unit	Technical parameters		
1	Voltage		kV	36	40.5	
2	Rated frequency		Hz	50, 60		
3	Rated insulation level	Power frequency withstand voltage (1min)	Phase to phase, phase to earth	kV	70	95
		Lighting impulse withstand voltage	across the isolating distance open contact gap	kV	80	118
			Phase to phase, phase to earth	kV	170	185
		Power frequency withstand voltage of auxiliary and control circuit (1min)	across the isolating distance open contact gap	kV	195	215
				kV	2	
4	Rated current		A	630,1250, 2500,3150		
5	Rated short-circuit breaking current		kA	25, 31.5		
6	Rated short circuit making current		kA	65, 82		
7	Rated short-time withstand current		kA	25, 31.5		
8	Rated peak withstand current		kA	65, 82		
9	Rated short-circuit duration		s	4		
10	Partial discharge		pC	≤20		
11	Insulation gas			Clean air		
12	Water content in gas compartment		ppm	≤150		
13	Annual leakage rate		%	≤0.1		
14	Rated gas-filling pressure (20°C, rel.)		Mpa	0.13		
15	Alarm pressure (20°C, rel.)		Mpa	0.11		
16	Minimum functional pressure (20°C, rel.)		Mpa	0.10		
17	Rated operating sequence			O-0.3s-CO-15s-CO O-0.3s-CO-180s-CO		
18	Vacuum circuit breaker grade			M2 E2 C2		
19	VCB mechanical life		Time	10000		
20	EDS mechanical life		Time	3000		
21	Rated single capacitor bank breaking current		A	630		
22	Rated back-to-back capacitor bank breaking current		A	400		
23	Protection level (switchgear enclosure/ gas compartment)			IP41/IP67		
24	Loss of service continuity category			LSC2A		
25	Internal arc fault IAC		AFLR	25kA/1s 31.5kA/0.5s		

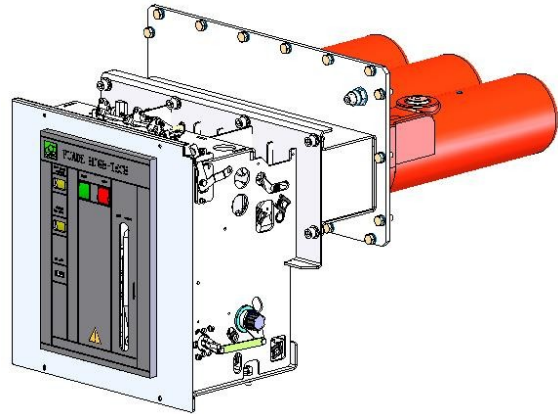
Note:

SF₆ gas can be used as insulating gas according to customer requirements.

Main components

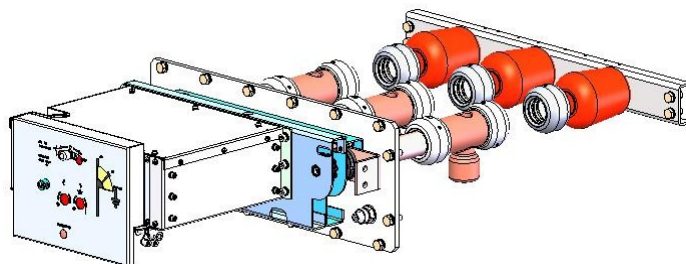
Vacuum Circuit Breaker

- ✧ The vacuum circuit breaker adopts the embedded poles, effectively reduces the insulation distance, and realizes the moving sealing connection between the circuit breaker mechanism and the embedded poles through the bellows. The rated short-circuit current breaking times are 30 times, and the mechanical service life reaches 10,000 times.
- ✧ The embedded pole is casted by APG process production equipment imported from Germany, so that the installation of the vacuum interrupter is simpler, the stability is good, and the mechanical strength is high.
- ✧ The circuit breaker is matched with the earthing disconnecting switch to realize line side earthing.



Earthing disconnecting switch (EDS)

- ✧ The disconnecting switch adopts direct-acting three-position structure design and is horizontally arranged to realize the functions of working, isolation and earthing, and has both manual and motor operations.
- ✧ The switching operation power is small, the transmission structure is simple, and the operation is stable and reliable.
- ✧ The direct-acting structure effectively ensures the uniformity of the isolating distance and the interphase electric field.
- ✧ The electric connection adopts the spring contact finger, the moving contact moves stably, the electric conductivity is strong, and the mechanical abrasion is small.
- ✧ Different operating handles are used for isolation and earthing, and perfect mechanical and electrical interlocking is provided to prevent mis-operation.





Voltage transformer

- Inductance type, single-phase and plug-in design
- All-metal shell shielding
- Connect to the system through Size2 standard inner cone plug
- Epoxy resin cast insulation, not affected by external environment



Current transformer

- set on incoming and outgoing cables
- Not affected by dielectric stress
- Ring core structure, arranged outside of the gas tank



Lightning arrester

- With silicone rubber insulated plug-in terminals
- All-metal shell shielding
- Easy installation and reliable performance
- Use standard plug connector



Cable terminal (Size 3)

- For use with Size 3 inner cone socket
- Enclosure earthing, safe and reliable



Silicone bus connector


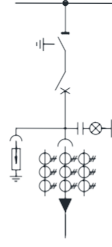
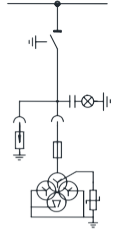
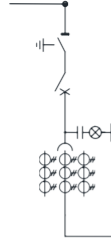
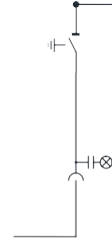
- The panel bus adopts special bus connector, which effectively solves the problems of conductive connection and insulation between panels, making the panel connection faster and more flexible.
- For electrical connection between gas tanks



Insulation plug (Size 3)

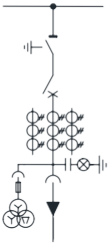
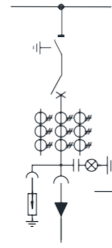
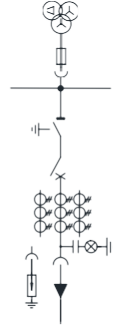
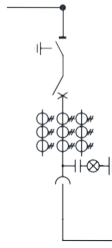
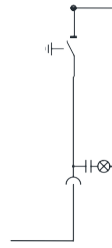
- For use with Size3 inner cone socket
- Enclosure earthing, safe and reliable

HG3-40.5Typical Primary Schem

Model HG3-40.5kV											
SLD											
Equipment Name		Incoming Panel		Outgoing Panel		Outgoing Panel		Coupling Panel		Bus Riser Panel	
No.	Components Name	Type	Qty.	Type	Qty.	Type	Qty.	Type	Qty.	Type	Qty.
1	Rated Current of Main Busbar	2500A/1250A	1	2500A/1250A	1	2500A/1250A	1	2500A/1250A	1	2500A/1250A	1
2	Rated Current of Branch Busbar	2500A/1250A	1	1250A	1	1250A	1	2500A/1250A	1	2500A/1250A	1
3	Vacuum Circuit Breaker	2500A/1250A	1	1250A	1			2500A/1250A	1		
4	Earthing disconnecter switch	2500A/1250A	1	1250A	1	1250A	1	2500A/1250A	1	2500A/1250A	1
Dimension(W*D*H)		900*2000*2600 800*1800*2600		700*1650*2600		800*1650*2600		900*2000*2600 700*1650*2600		900*2000*2600 700*1650*2600	

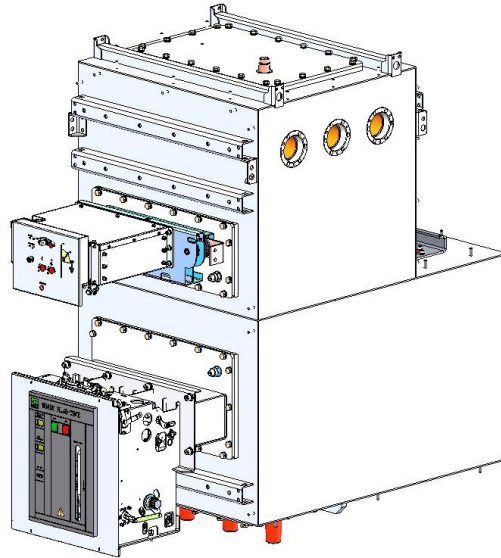
HG3-40.5Note: If other dimensions required, please consult with the manufacturer.

HG3-36Typical Primary Scheme

Model: HG3-36kV											
SLD											
Equipment Name		Incoming Panel		Outgoing Panel		Outgoing Panel		Coupling Panel		Bus Riser Panel	
No.	Components Name	Type	Qty.	Type	Qty.	Type	Qty.	Type	Qty.	Type	Qty.
1	Rated Current of Main Busbar	2500A/1250A	1	2500A/1250A	1	2500A/1250A	1	2500A/1250A	1	2500A/1250A	1
2	Rated Current of Branch Busbar	2500A/1250A	1	1250A	1	1250A	1	2500A/1250A	1	2500A/1250A	1
3	Vacuum Circuit Breaker	2500A/1250A	1	1250A	1	1250A		2500A/1250A	1		
4	Earthing disconnecter switch	2500A/1250A	1	1250A	1	1250A	1	2500A/1250A	1	2500A/1250A	1
Dimension(W*D*H)		900*1950*2600 800*1850*2600		800*1850*2600		800*1850*2600		900*1950*2600 800*1850*2600		900*1950*2600 800*1850*2600	

HG3-36Note: If other dimensions required, please consult with the manufacturer.

Gas Tank Assembly



Product features

Circuit Breaker (CB)

- ◇ The cable is pre-earthed by a EDS (Earthing disconnecter switch), and the cable is earthed by a vacuum circuit breaker.

- ◇ The vacuum circuit breaker adopts embedded pole mode and is horizontally installed in the gas tank of the circuit breaker, which is maintenance-free in the whole life cycle of the switchgear.

- ◇ The vacuum circuit breaker is provided with an optimized vacuum interrupter which is a miniaturized product with a ceramic shell and has extremely high insulation level, and the contact is made of CuCr alloy, and has the characteristics of long electric service life, low current cut-off value and strong short-circuit current breaking capacity.

- ◇ Three embedded poles of the vacuum circuit breaker are fixed on a flange plate of the frame. The vacuum interrupter and the upper and lower outgoing terminals are sealed in epoxy resin by a special injection machining process (APG).

- ◇ Opening/closing release: DC220V /DC110V optional; charging motor: DC220V/ DC110V optional

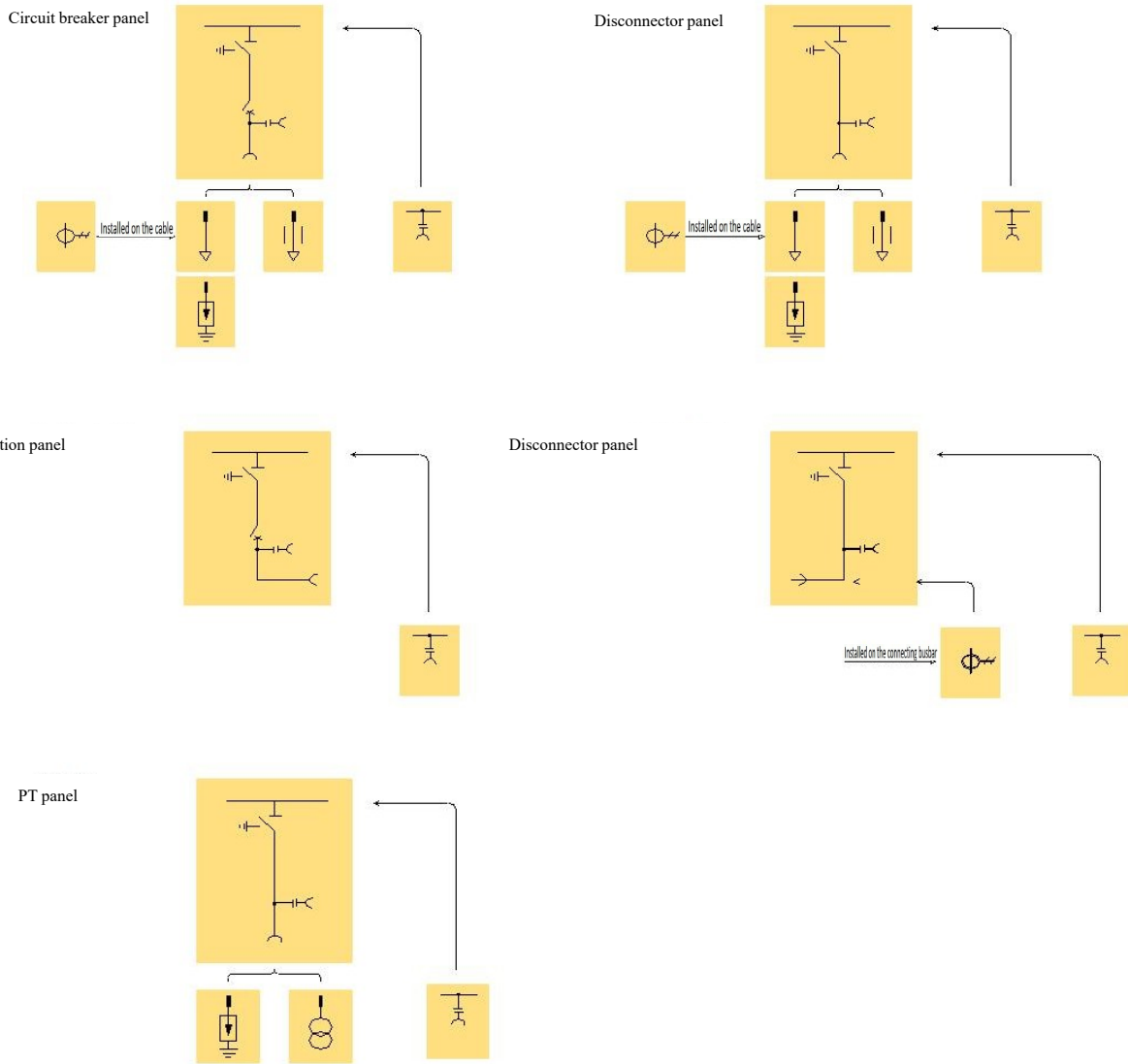
- ◇ Earthing disconnecting switch (EDS)

- ◇ The disconnecting switch operation method is divided into motor operation and manual operation, and the motor operation and manual operation are interlocked, and the operation panel is provided with padlock locking protection.

- ◇ Ensure that the circuit breaker is in the open position before operating

the EDS.

Unit panel and modular unit combination



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