GIM Series
Gas-insulated Switchgear

36 / 40.5kV, …3150A, …31.5kA

For Medium Voltage Primary Distribution

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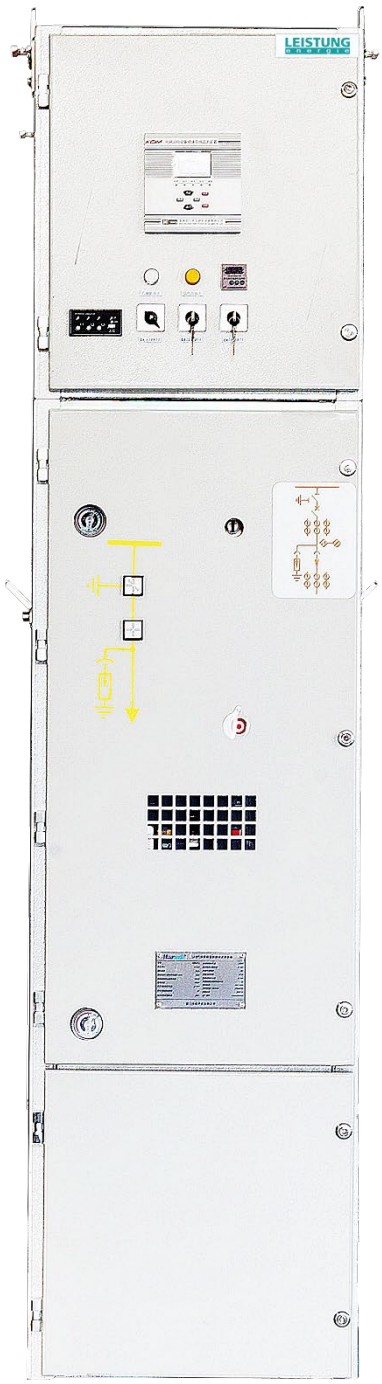
Contents

Product Outline



Product outline

GIM gas insulated switchgear is a new generation of double gas tank gas-insulated switchgear designed and developed by Leistung Energie. It adopts advanced high-voltage composite insulation and gas sealing technology, combined with reliable production process, to meet the requirements of usage in various harsh environmental conditions, and provide the best solution to users.

GIM gas insulated switchgear has complete specifications and excellent performance parameters:

- Rated voltage: 40.5kV
- Rated current: up to 3150A
- Rated short circuit breaking current: up to 31.5KA
- Rated peak withstand current: up to 80kA
- Annual leakage rate of SF_6 gas: ≤ 0.1%
- Gas box protection level: up to IP65

Product Features

CERTIFICATE
of Conformity

TÜVRheinland

Registration No.: AK 50392669 0001
Report No.: 50108145 001

CERTIFICATE
of Conformity

TÜVRheinland

Registration No.: AK 50392668 0001
Report No.: 50108143 001

CERTIFICATE
of Conformity

TÜVRheinland

Registration No.: AK 50428464 0001
Report No.: 50220660 001

Holder: LEISTUNG ENERGIE LIMITED
453,Malong Road, Torch Pack,
Torch Hi-Tech Industrial Development Zone,
Xiamen,Fujian 361006
P. R. China

Product: High-voltage switchgear and controlgear
(Cubicle fixed type gas insulated metal-enclosed switchgear)

Identification: Type Designation: (XGN)(GIM)-40.5(Z)/T1250-31.5
Ur:40.5kV;Ir:1250A;fr:50Hz;Ik:31.5kA;tk:4s
Serial No.:E2000125001-05
Internal arc classification: IAC A FLR 31.5 kA, 1 s
Type Test :Sub-clause 6.106 was performed according to IEC 62271-200:2011.
Remark :Refer to test report 50220660 001 for details.

Tested acc. to: IEC 62271-200:2011

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Certification Body

Date 06.03.2019

Jie Zhang

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

Product features

The GIM gas insulated switchgear adopts SF6 gas, with excellent insulation performance, as the insulation medium, integrates high-voltage components such as bus, isolation / grounding switch, vacuum circuit breaker, measurement and protection transformer, cable connectors etc. as one body, completely enclosed in the metal shell filled with SF6 gas, so that it has the following functional characteristics to meet the needs of users for high performance and quality:

High security

■ The design is in full conformity with the requirements of GB, DL, IEC, DIN VDE and the standards of major industrialized countries in the world, and can operate safely all over the world

■ The complete set of product type tests and severe environmental tests conducted by authoritative testing institutions have been passed to ensure the safe operation of the equipment under specific working conditions, including:

- Conventional type test items
- Leakage test
- Gas status measurement
- Internal arcing test (AFLR 31.5kA 1s)
- High altitude dielectric test (4000m)

■ The primary live part is fully sealed and gas insulated to prevent contact with charged body to the maximum extent and ensure the safety of operation

■ Its circuit breaker and three-position switch can realize effective interlock, to ensure that the operators are in a safe condition all time

Product Features

High Sensitive Helium Mass Spectrometer Leak Detection Equipment

Voltage Withstand Test of Switchgear

High reliability

■ Efficient assembly lines and advanced production technology ensure the stability of product quality;

• The gas tank is welded by robot laser welding system imported from German, to ensure tightness of gas tank and maintenance-free

• Realize large-scale assembly line production and the standardization of products to ensure the consistent high quality

■ Accurate inspection equipment and strict quality management system guarantee the reliability of products;

• High-precision fixture and high-sensitive helium mass spectrometry leak detection equipment will minimize the factors in affecting the quality

• ISO9001 quality management system to improve the lean production ability of the factory and ensure reliability and quality of products

■ Imported aluminum zinc plate material, high strength stainless steel rivet riveting and double bending process ensure the quality and reliability

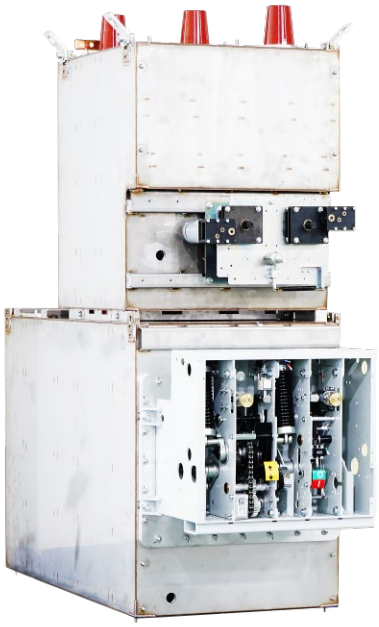
■ Each gas tank is equipped with a pressure release device to effectively prevent the accidental rise of internal gas pressure

■ Metal armored design, high voltage conductor completely sealed, gas tank protection grade up to IP65 to ensure equipment from being affected by the external environment

■ The operating mechanism of circuit breaker and disconnecting switch is located outside the gas tank, which is convenient for maintenance and repair, and ensures reliable operation

■ Comprehensive measures to prevent misoperation, which are fully meet the interlocking system requirements and protect the safety of personnel and equipment

Product Features



Modular GasTank Design Structure

Gas Tank Pressure Release Device

Wide adaptability

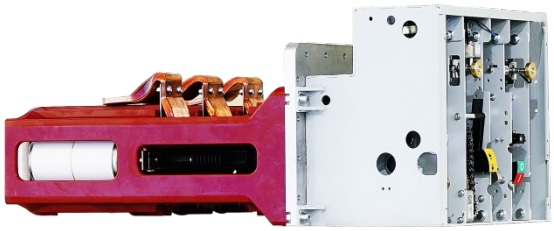
- Completely functional schemes and available for various combinations can meet different load requirements
- Modular design of structure make it convenient for equipment assembly, maintenance, expansion and flexible operation
- Wall or back-to-back installation can realize operation in front of cabinet
- Both traditional current / voltage transformer and electronic current / voltage transformer can be selected with various choices
- Top expansion connection mode is adopted for the main bus, which is convenient for installation and flexible expansion, and does not need to deal with the gas system

Economy and environmental protection

- More compact cabinet reduces the occupation of valuable space and investment on infrastructure
- More convenient operation to reduce operating intensity
- Longer service life to save new investment
- Less maintenance requirements to reduce operating costs
- Lower average product life cycle cost

Product Features

Solid Insulated Bus Bushing



Indoor Medium Voltage
Vacuum Circuit Breaker

Three Position Rotary Disconnector

Technical innovation

■ Application of solid insulated bus bushing

• The main bus adopts solid insulation technology and new epoxy resin material to ensure the high insulation performance of the product

• Plug in design and there is no need to charge or deflate on site, so as to avoid the influence of installation environment and ensure the tightness of gas tank

• Simple cabinet assembly, low requirements for infrastructure accuracy, efficient and convenient installation can effectively save cost of actual operation and maintenance

■ Special indoor medium voltage vacuum circuit breaker for inflatable cabinet

• Equipped with high performance vacuum interrupter with features of miniaturization, low resistance, high breaking and improved insulation reliability

• Modular operation mechanism layout and integrated design with polar pole to ensure high precision and stable transmission

• The circuit breaker has passed rigorous verification and is E2, M2, C2 and S2 products with excellent electrical performance and high reliability

■ Three position rotary disconnector

• Three operation positions: connection, isolation and grounding. And watch band connection mechanism ensures stable performance

• Reliable drive and interlock system to realize mechanical and electrical interlocking with circuit breaker to prevent misoperation

• It can be operated manually or electrically and can support remote control to meet the requirements of unattended substation

Major Parameters

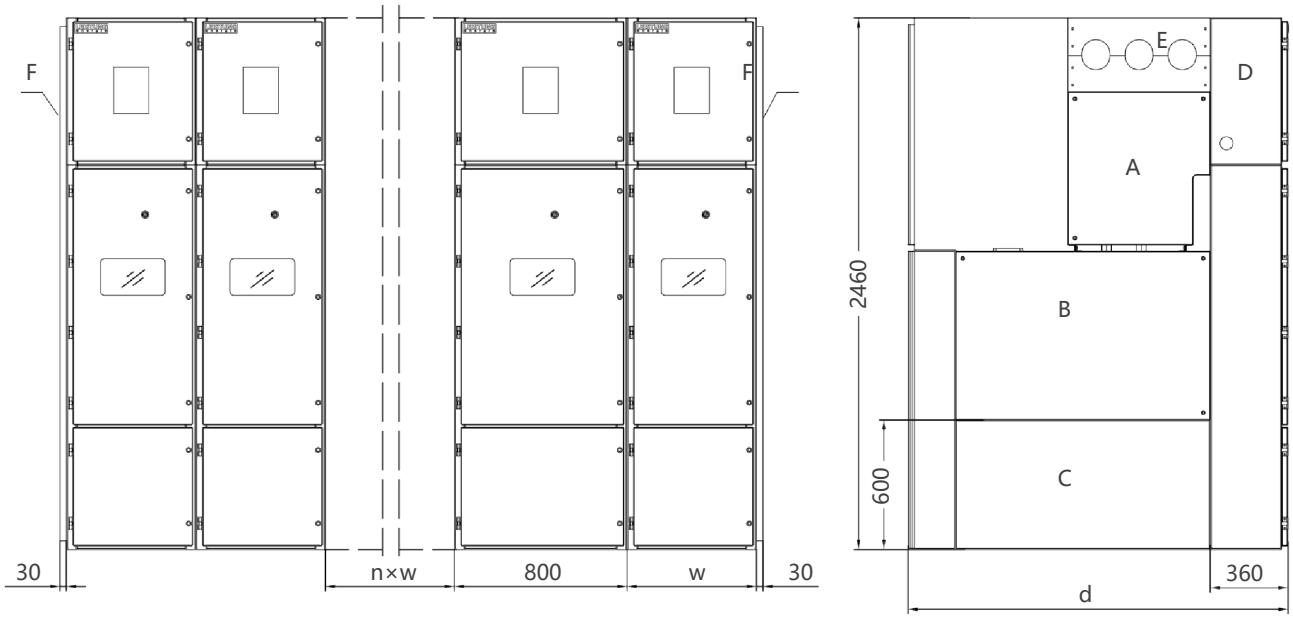
No.	Technical Parameters			Unit	Data
1	Rated voltage			kV	36 / 40.5
2	Rated frequency			Hz	50
3	Rated current			kV	630/800/1250/1600/2000/2500/3150
4	Insulation level	1min power frequency withstand voltage	Phase to earth, phase to phase, between open contacts of breaker	kV	95
			Between open contacts of disconnecting switch		118
		Rated lightning impulse withstand voltage (peak)	Phase to earth, phase to phase, between open contacts of breaker		185
			Between open contacts of disconnecting switch		215
		Power frequency withstand voltage of auxiliary and control circuits		V	2000
5	Rated short-circuit breaking current			kA	20/25/31.5
6	Rated short-circuit closing current			kA	50/63/80
7	Rated short-time withstand current				20/25/31.5
8	Rated peak withstand current				50/63/80
9	Rated duration of short-circuit			s	4
10	Rated cable-charging breaking current			A	50
11	Rated operation sequence			-	O-0.3s-CO-180s-CO
12	Rated supply voltage of auxiliary circuit			V	DC24,48,110,220/AC220
13	Rated inflation pressure (gauge pressure at 20 ℃)			MPa	0.13
14	Min. working pressure (gauge pressure at 20℃)				0.12
15	Release pressure of pressure relief device (gauge pressure at 20 ℃)				0.24
16	Annual gas leakage rate			%	≤0.1%
17	Protection level		Sealed gas box	-	IP65
18			Switchgear		IP4X

Note:

The insulation test was carried out under the minimum air pressure of 0.1Mpa or 1bar (abs, 20 ℃)

Outline Dimension and Structure

Outline Dimension of GIM Switchgear

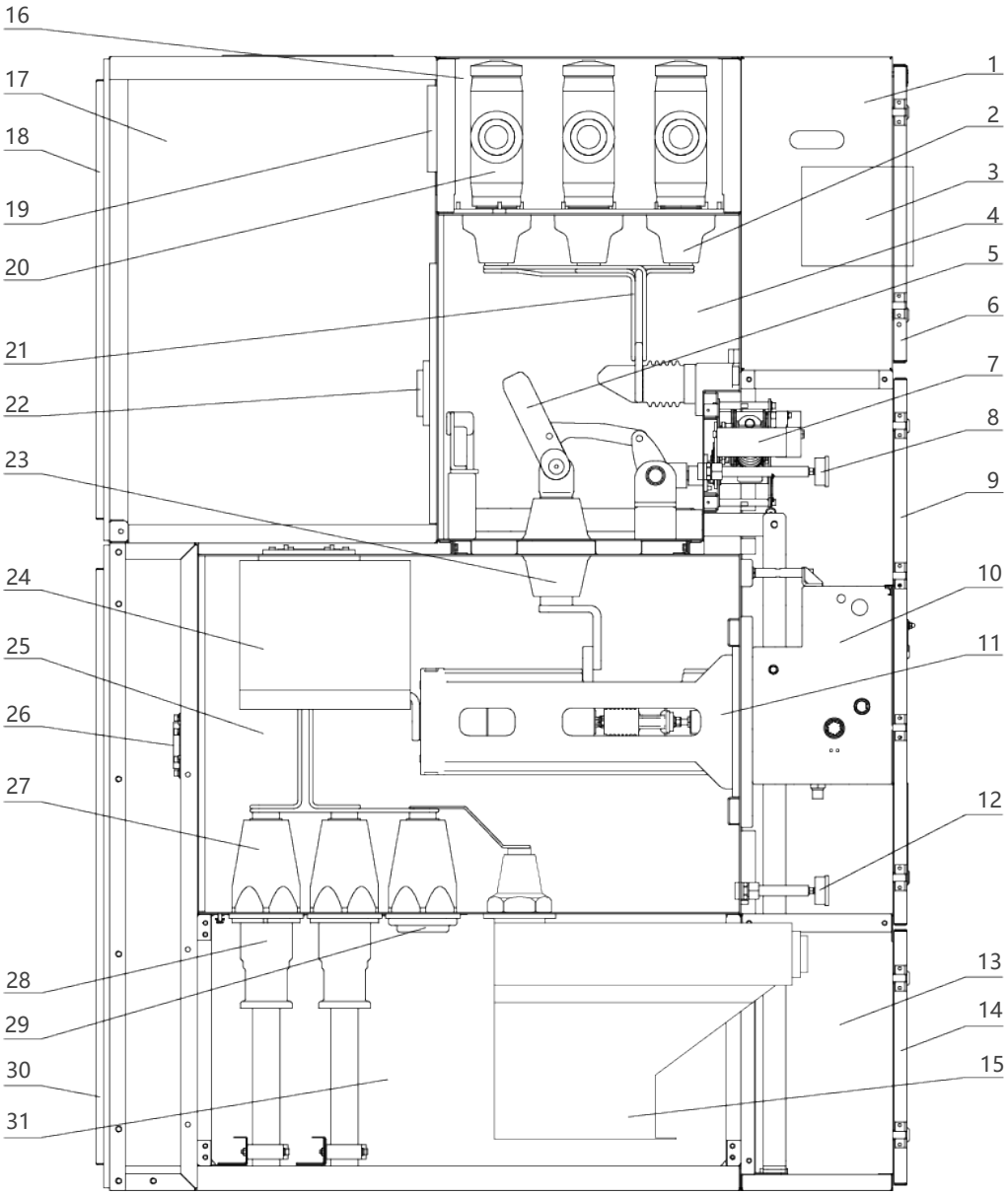


A. Three position switch gas tank B. Breaker compartment C. Cable compartment D. Low voltage compartment E. Insulated bus compartment F. end cover

GIM Switchgear	Single-bus Scheme		Double-bus Scheme	
Rated current (A)	≤1250A	> 1600A	≤1250A	> 1600A
Cabinet Width w (mm)	600	800	600	800
Cabinet depth d (mm)	1760		1930	
Weight approx. (kg)	900	1200	1100	1400

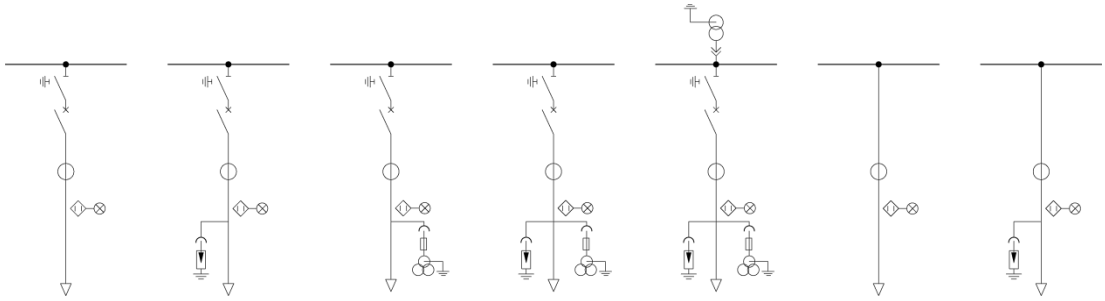
Fundamental Structure of the Switchgear

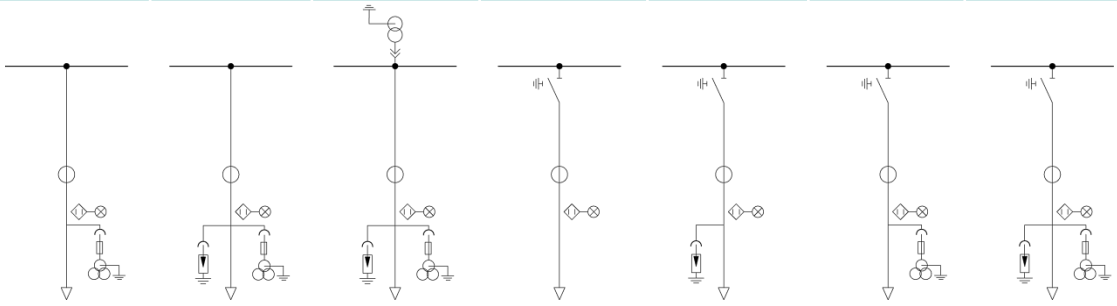
Structure diagram of the switchgear



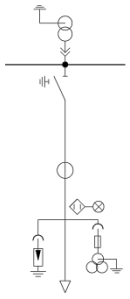
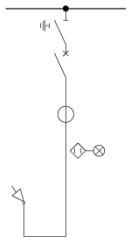
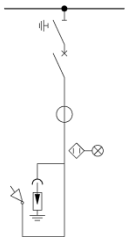
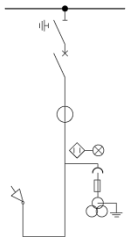
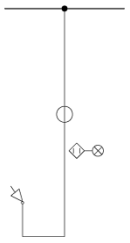
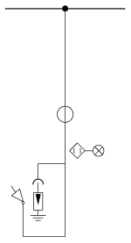
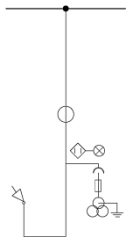
1. Low voltage control room
2. bus bushing
3. Protection and control unit
4. Three position switch gas tank
5. Three position switch
6. Control room door
7. Three position switch operating mechanism
8. Three position switch gas tank monitoring valve
9. Circuit breaker chamber door
10. Operating mechanism of vacuum circuit breaker
11. Vacuum circuit breaker
12. Circuit breaker gas tank monitoring valve
13. Cabinet frame
14. Cable room door
15. Voltage transformer (plug in type)
16. Insulated bus chamber
17. Pressure release channel
18. Sealing plate of pressure release channel
19. Insulated bus chamber pressure release valve
20. Insulated bus
21. Branch bus
22. Three position switch gas tank pressure release valve
23. Gas box connecting Bushing
24. Built-in current transformer (optional)
25. Circuit breaker gas tank
26. Gas box pressure release valve of circuit breaker
27. Inner cone socket
28. Incoming and outgoing cables
29. Insulation plug
30. Lower sealing plate of pressure release channel
31. Cable chamber

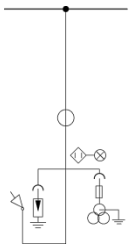
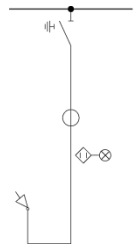
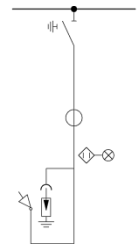
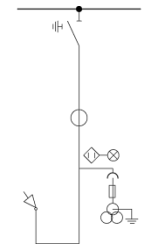
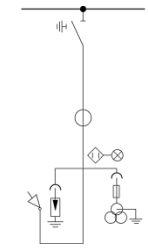
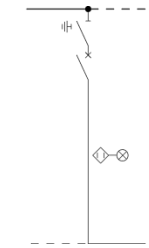
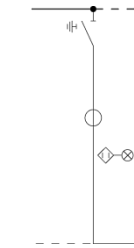
Primary Wiring Diagram

Scheme No.	1	2	3	4	5	6	7
Primary wiring scheme							
Vacuum circuit breaker	1	1	1	1	1		
Three-position switch	1	1	1	1	1		
Current transformer	3	3	3	3	3	3	3
Voltage transformer				3	6		
High voltage fuse				3	3		
Live displaying	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lightning arrester		3			3		3
Remark	Cable in & out cabinet					Bus Riser	

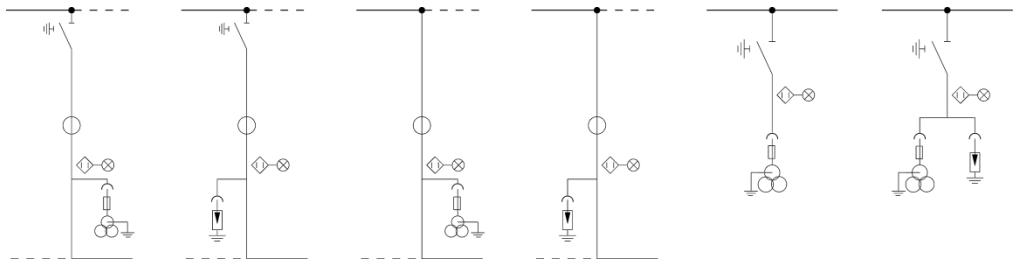
Scheme No.	8	9	10	11	12	13	14
Primary wiring scheme							
Vacuum circuit breaker							
Three-position switch				1	1	1	1
Current transformer	3	3	3	3	3	3	3
Voltage transformer	3	3	6			3	3
High voltage fuse		3	3			3	
Live displaying	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lightning arrester		3	3		3		3
Remark	Bus Riser			Bus Riser			

Primary Wiring Diagram

Scheme No.	15	16	17	18*	19*	20	21
Primary wiring scheme							
Vacuum circuit breaker		1	1	1			
Three-position switch	1	1	1	1			
Current transformer	3	3	3	3	3	3	3
Voltage transformer	6			3			3
High voltage fuse	3			3			3
Live displaying	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lightning arrester	3		3			3	
Remark	Isolation lifting cabinet		Aerial cable in & out cabinet			Aerial cable lifting cabinet	

Scheme No.	22	23	24	25	26	27	28
Primary wiring scheme							
Vacuum circuit breaker						1	
Three-position switch		1	1	1	1	1	1
Current transformer	3	3	3	3	3		3
Voltage transformer	3			3	3		
High voltage fuse	3			3	3		
Live displaying	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lightning arrester	3		3		3		
Remark	Top cable Riser	Top cable isolation Riser				Bus Section Panel	Section isolation cabinet

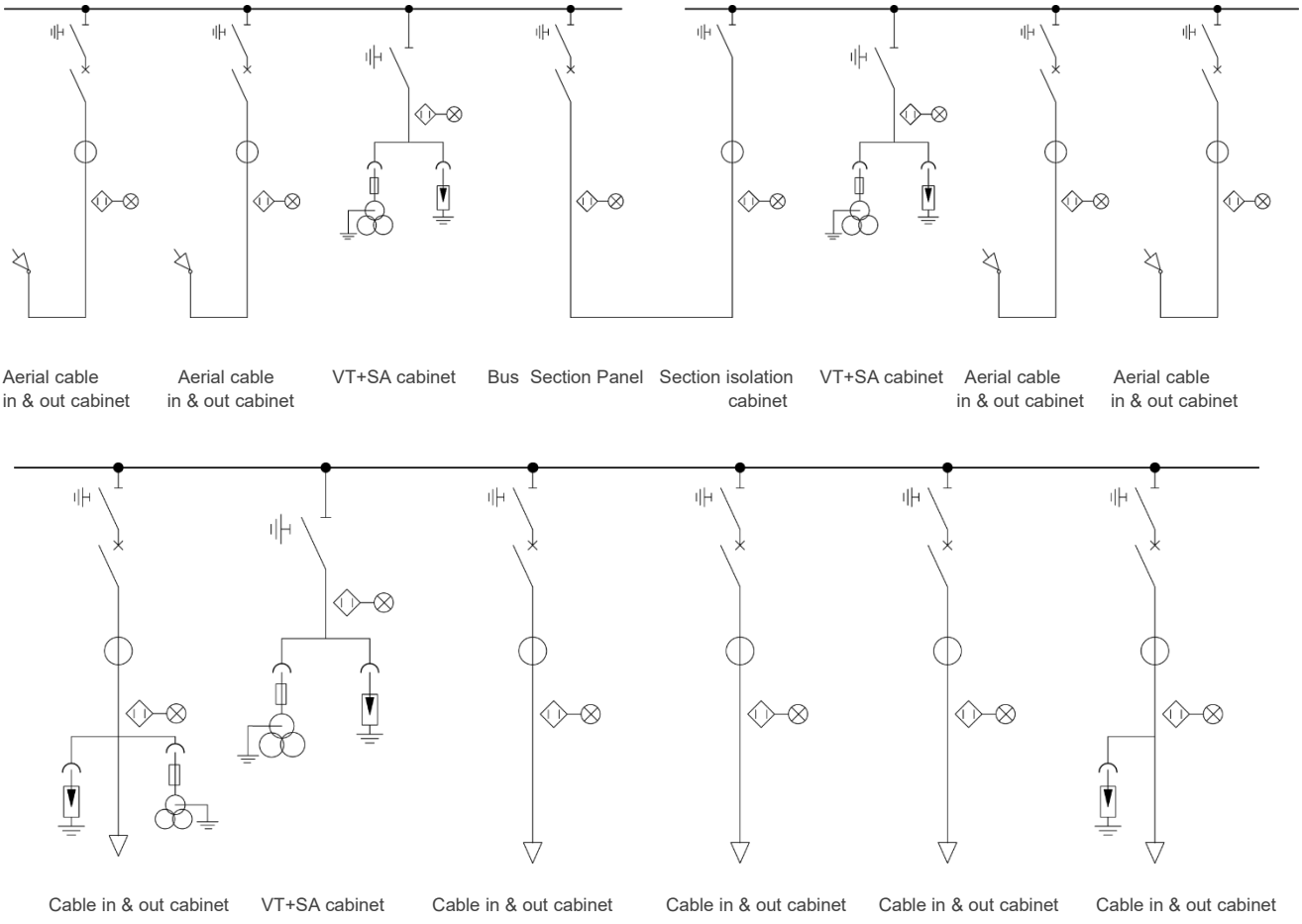
Primary Wiring Diagram

Scheme No.	29	30	31	32	33	34
Primary wiring scheme						
Vacuum circuit breaker						1
Three-position switch	1	1				
Current transformer	3	3	3			
Voltage transformer				3	3	3
High voltage fuse				3	3	3
Live displaying	Yes	Yes	Yes	Yes	Yes	Yes
Lightning arrester		3		3		3
Remark	Section isolation cabinet		Bus Riser cabinet		VT cabinet	VT + SA cabinet

Note:
The models of all components in the diagram shall be subject to those used in the actual project.

Primary Wiring Diagram

Project application example



Gim-40.5 Typical Primary Scheme Diagram

Installation method

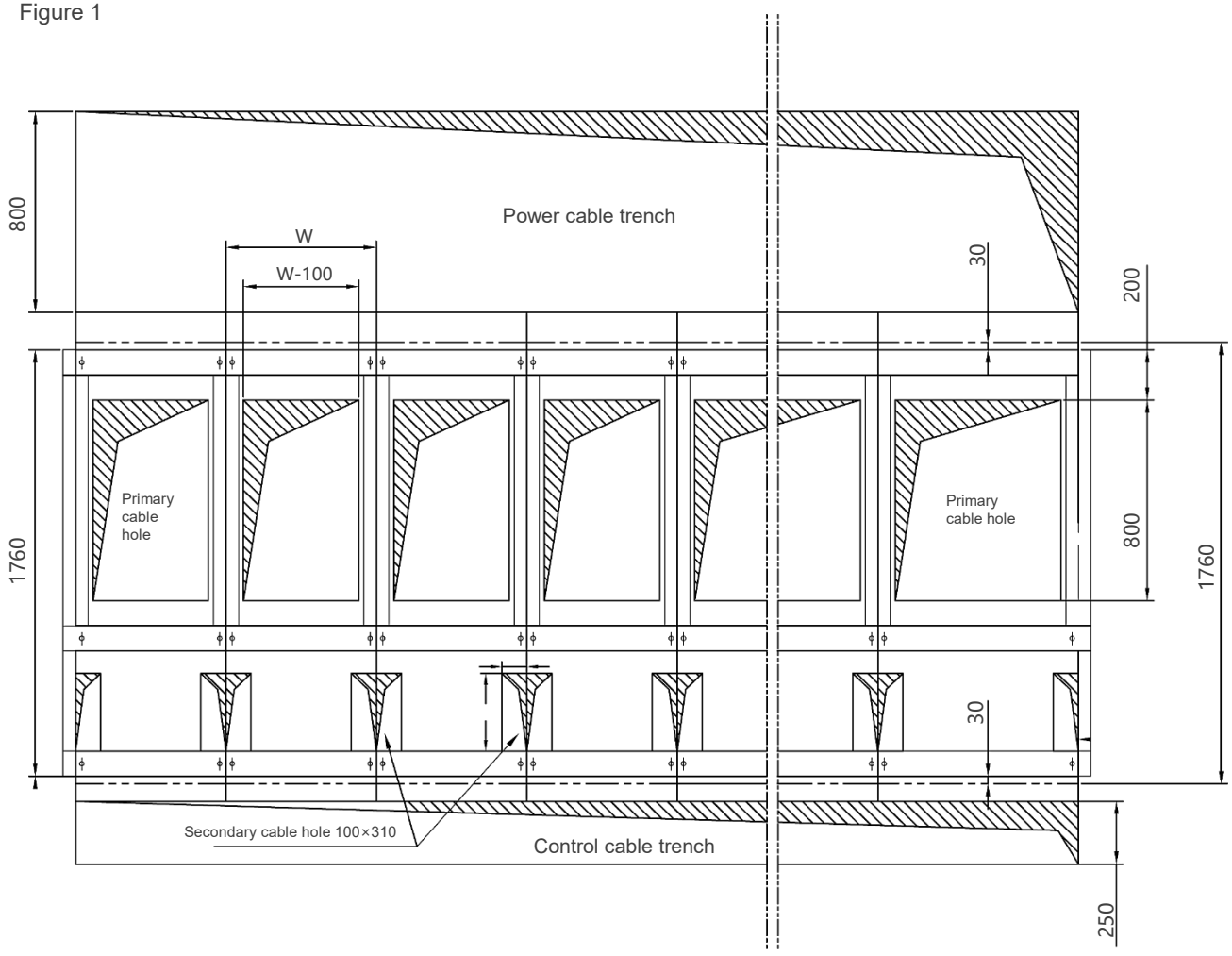
GIM-40.5 switchgear cabinet is recommended to be installed on suitable and permanent foundation frame or channel steel, and qualified professional personnel shall be employed for embedding;

For the installation hole size of GIM-40.5 switchgear on the foundation or channel steel, see the following figure:

When embedding the foundation frame, standard of IEC/ GB is recommended to follow , especially the tolerance of flatness and straightness, which should be taken as the prerequisite to ensure the high quality of the installation of switchgear;

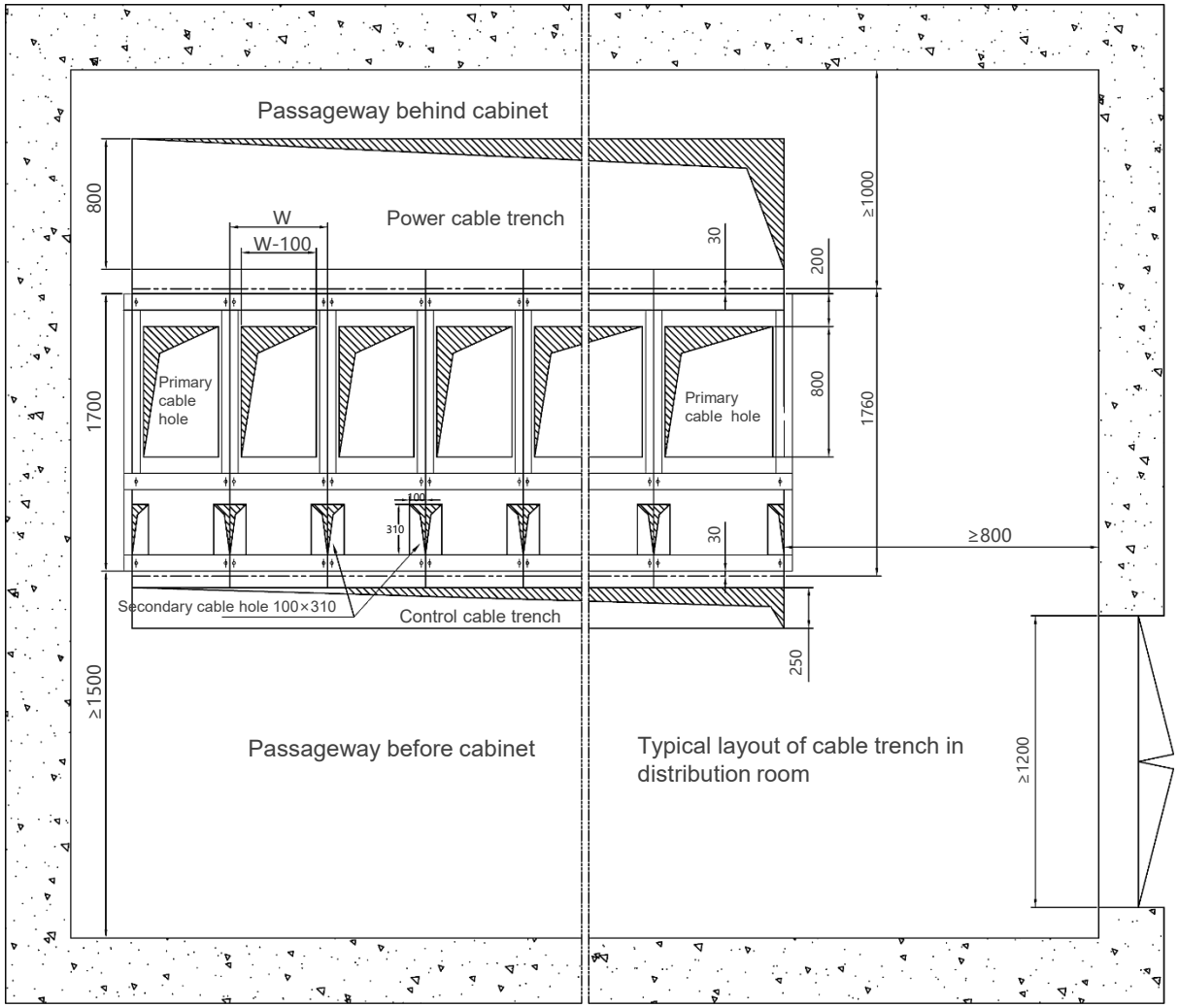
The allowable tolerance of flatness: ± 1 mm / m^2; the allowable tolerance of straightness: maximum 1 mm / m, and the total length of the frame shall not exceed 2 mm.

Figure 1



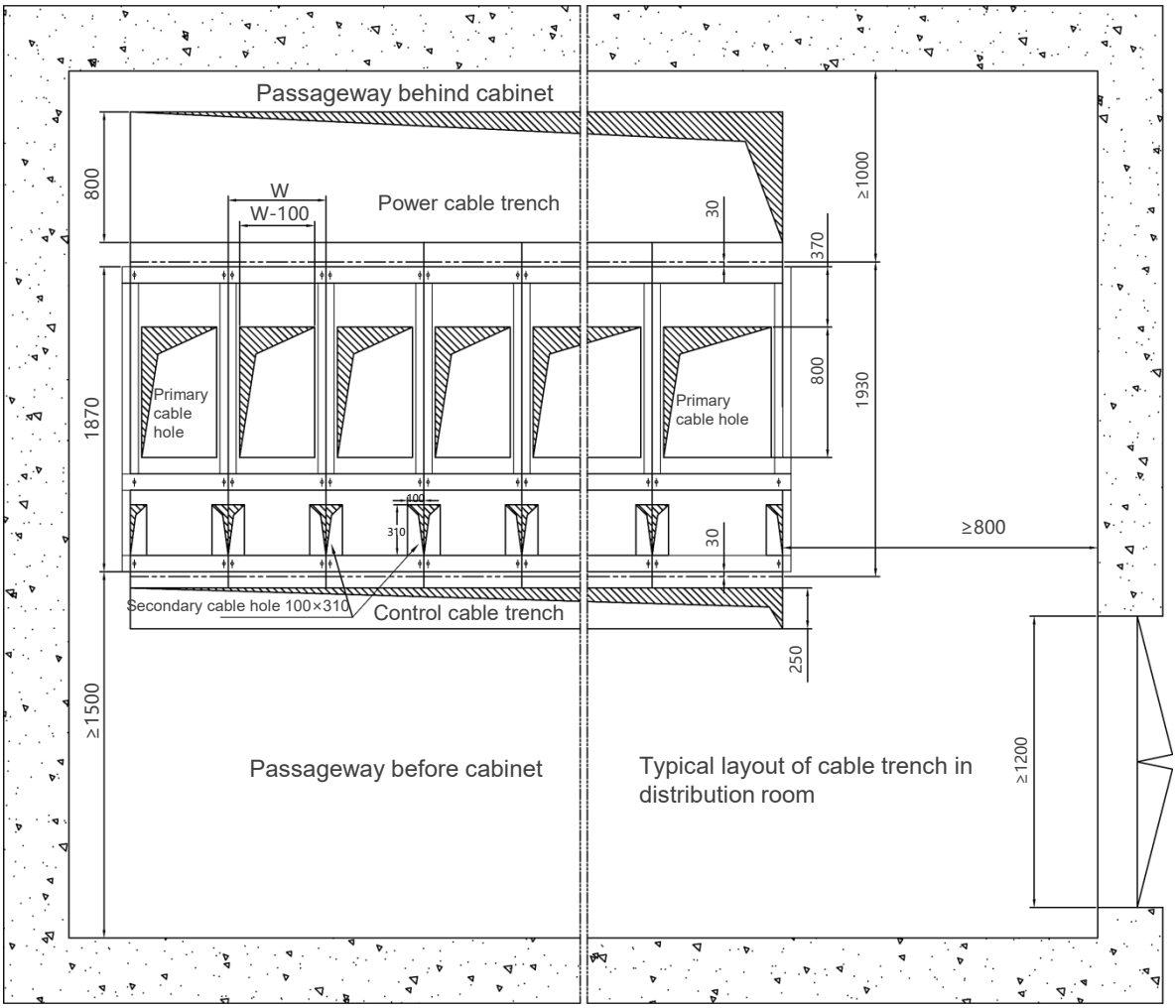
Typical Layout of Cable Trench in Distribution Room

Figure 2



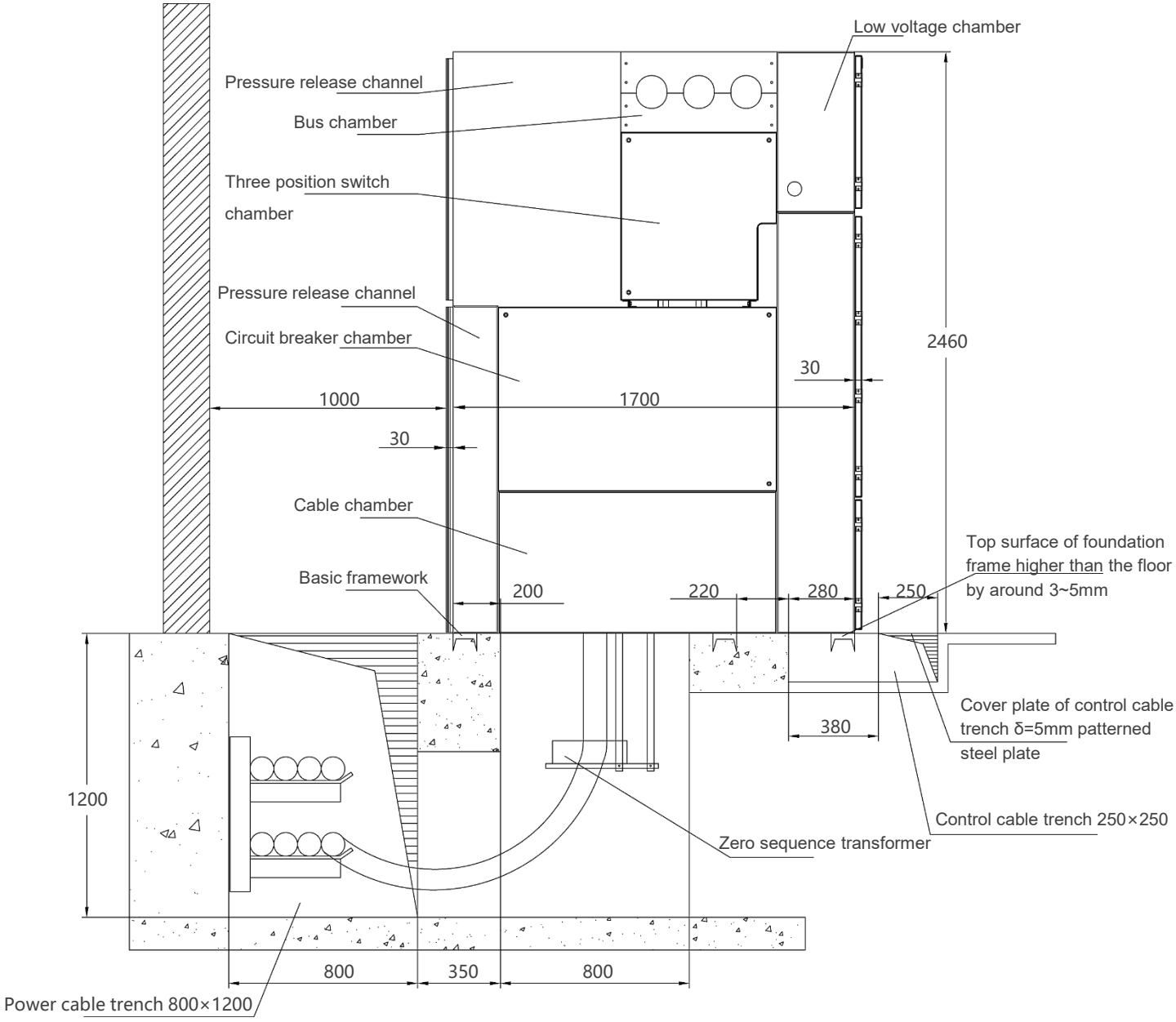
Layout Plan of Switchgear GIM-40.5 (Single Bus Scheme)

Figure3



Layout Plan of Switchgear GIM-40.5 (Double Bus Scheme)

Figure 4



Suitable Cable Trench for GIM-40.5 Switchgear

Application Range

Areas of application

• Power plant and power grid system in polluted and humid environment in coastal area

• Plateau substation in high altitude and cold environment of inland area

• Large industrial and mining enterprises such as petrochemical and metallurgical enterprises

• High rise buildings in densely populated areas and cities

• Urban infrastructure projects, such as subway, etc.

Normal operation conditions

• Operating temperature: -15℃ (indoor)~+40℃

• Daily average temperature (maximum): 35℃

• Altitude: Less than 4000m

• Max. seismic intensity: 8 degrees

• Surrounding air environment: the switchgear shall be installed in the place without fire, explosion, serious pollution, chemical corrosive gas and violent vibration

Special operation conditions

• If the altitude is more than 1000m, it is necessary to negotiate with the manufacturer to take necessary measures to strengthen the insulation

• When the ambient temperature exceeds + 40 ℃, the current carrying capacity of the switchgear will be reduced by a certain coefficient, which must be confirmed by the manufacturer when ordering.

Ordering Instruction

Ordering instruction

Please provide following technical documents when ordering GIM switchgear:

- Main wiring scheme number, purpose and single line system diagram, rated voltage, rated current and rated short-circuit breaking current
- Layout plan of distribution room and arrangement diagram of switchgear cabinet, etc.
- Indicate the model, specification and quantity of main electrical components in the switchgear cabinet
- Requirements for control, measurement and protection functions of switchgear shall be indicated
- If the switchgear is used in special environment, it should be specified in the order list
- Other special requirements to be explained

Delivery document, attachment & spare parts

- Delivery document include:
  a. Product certificate and factory inspection report
  b. Product manual
  c. Primary, secondary wiring diagram and switchgear cabinet arrangement diagram
  d. Packing List

- Attachment
  a. Manual energy storage rod of circuit breaker
  b. Three position disconnecting switch operating handle

Notes

Leistung Energie/Catalog/GIM/202204/EN

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