CEEG 中电电气

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Amorphous Alloy Dry Type Transformer

Energy saving Environmental protection Security Reliable

Domestic industry sales leader of amorphous alloy dry type transformer

Three phase three-column structure patented technology

Meet with new energy efficiency standard GB 20052

CEEG 中电电气

Delivering Premium Power To The World

CONTENTS

Company Introduction

CEEG Transformer Co.,Ltd (CEEG) is a collection of amorphous alloy dry type transformer, epoxy cast dry type transformer and explosion-proof electrical products research and development, manufacturing, sales, technical services as one of the national high-tech enterprises. The company was formally established in 2006, located in Nanjing Economic and Technological Development Zone, with a modern plant of more than 40,000 square meters, with a full set of automatic cutting, vacuum impregnation, large CNC turning and milling, testing and other first-class transformer production and inspection equipment; Has reached the international advanced level of 20,000 square meters of transformer manufacturing workshop, with an annual output of 2.2 million kVA mining explosion-proof transformer production capacity, is one of the national amorphous alloy dry type transformer, epoxy cast dry type transformer, explosion-proof transformer R & D production base. CEEG in the rapid development of the safe use of products as the primary index of research and development, since the product put on the market, with the scale, quality, service and other advantages quickly won the trust of the majority of users, products have been in Shenhua Group, Anhui Tongling Mining Group, Pingdingshan Coal Group, Jincheng Coal Group, Kailuan Group and other large coal industry groups safe operation. China Telecom, China Mobile, China Unicom, Huawei Technology, China Metallurgical Group, China Nuclear Group, Inner Mongolia First Machinery, Inner Mongolia Pingzhuang Energy, Jialing Motorcycle and many other well-known enterprises have formed a good partnership with our company.

On the basis of existing products, the company is also constantly developing new projects to enrich our product line. At present, the company is also developing isolation transformers, split transformers, energy storage transformers and other special transformers for large capacity and high voltage projects."To build the industry's first brand" is our firm goal, "quality first, customer first" is the fundamental concept we believe in. In the future development, CEEG will be committed to the research and development of amorphous alloy products and explosion-proof electrical products, to provide safe, reliable, energy saving, environmental protection, stable equipment support, to provide users with value services.

Quality management system certificate

Environmental Management System certificate

Occupational Health and safety management system certificate

SCBH17-2500 Level II Energy Efficiency Report

SCBH19-2500 Level I Energy Efficiency Report

SCRBH19-2500 Level I Energy efficiency report

Seismic Test Report

Energy-saving product certification certificate

Energy-saving product certification certificate

Historical Background: Carbon peak Carbon neutrality

In the face of global Climate warming caused by carbon emissions,General secretary XiJinPing In September 2020, on the seventy-fifth session of the United Nations General Assembly put forward the vision of "China striving to achieve the peak of carbon emissions by 2030 and striving to achieve carbon neutrality by 2060."Subsequently, the "3060 target" was included in the 14th Five-Year Plan, and the Central Economic Work Conference for the first time listed carbon peak and carbon neutrality as one of the annual key tasks.In March 2021, the relevant targets were also written into the government work report for the first time.

“Carbon peak” It means that the annual carbon emissions of a certain region or industry reach the highest value in history, which is the historical inflection point of carbon emissions from increasing to decreasing, and marks the transition of economic development from high energy consumption and high emissions to clean and low energy consumption mode.

“Carbon neutrality” It refers to the total amount of carbon directly and indirectly emitted by human activities in a certain area within a certain period of time, and the total amount of carbon absorbed by afforestation and industrial carbon sequestration offset each other to achieve "net zero emissions" of carbon.

Comply with the development situation Practice concept of green energy

The new transformer efficiency standards "power transformer limited value of energy efficiency and energy efficiency grade" GB20052-2020 (hereinafter referred to as the "energy efficiency standards") has been published and implemented.On December 20, 2020, the General Office of the Ministry of Industry and Information Technology, the General Office of the General Administration of Market Regulation, and the General Department of the National Energy Administration officially issued the Notice of the Transformer Energy Efficiency Improvement Plan (2021-2023) (hereinafter referred to as the Notice).The "Notice" clearly determines the overall development goal of the next three years to 2023, high efficiency and energy saving transformers in line with the newly revised "energy efficiency standards" Class 1、2 energy efficiency standards of power transformers in the network operation ratio increased by 10%, the proportion of new high efficiency and energy saving transformers in the year reached more than 75%.

Kilowatt-hour saving

Saved 0.4kg of standard coal,
Reduce emissions of 0.272kg carbon dust
0.997 kg of carbon dioxide (CO2)

Compared with the traditional transformer, the amorphous alloy transformer with a capacity of 2500kVA can save 21, 000 degrees of electricity a year.Taking 50 amorphous alloy transformers as an example, it can save 1.05 million KWH of electricity a year, reduce the consumption of 420 tons of coal, and reduce carbon dioxide (CO2) for the air by nearly 1050 tons.

The carbon emissions’ equivalent to nearly ***2500*** *diesel cars with a load of* ***30*** *tons,*

to run

1000 *kilometers.*

What is Amorphous Alloy Strip ...

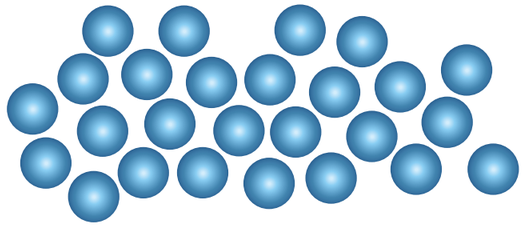
Amorphous alloy dry type transformer introduction

Amorphous alloy dry type transformer was developed in the 1970s. It is a new type of power transformer that uses amorphous alloy instead of silicon steel sheet as core material.Compared with the silicon steel sheet as a core transformer, the no-load loss is reduced by about 70%-80%, and the no-load current is reduced by about 85%. It is a distribution transformer with ideal energy-saving effect at present.The products are suitable for places with low power distribution utilization and high flammable, explosive and fire protection requirements, such as rural power grids, high-rise buildings, commercial centers, subways, airports, stations, industrial and mining enterprises and power plants.

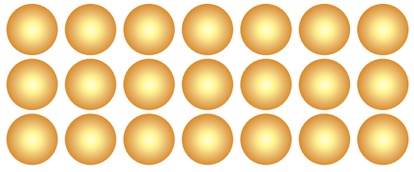
Amorphous Alloy Strip

Amorphous alloy strip is synthesized by iron, cobalt, carbon,silicon, boron and other elements in a certain proportion. Under the condition of high-temperature melting, it is cooled by a high-speed rotating wheel at 10^6℃/S. The metal has no obvious lattice interface to form an irregular amorphous structure.

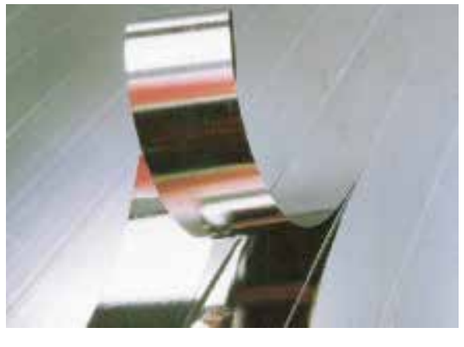
Atomic model



Amorphous amorphous alloy sheet



Crystalline silicon steel sheet

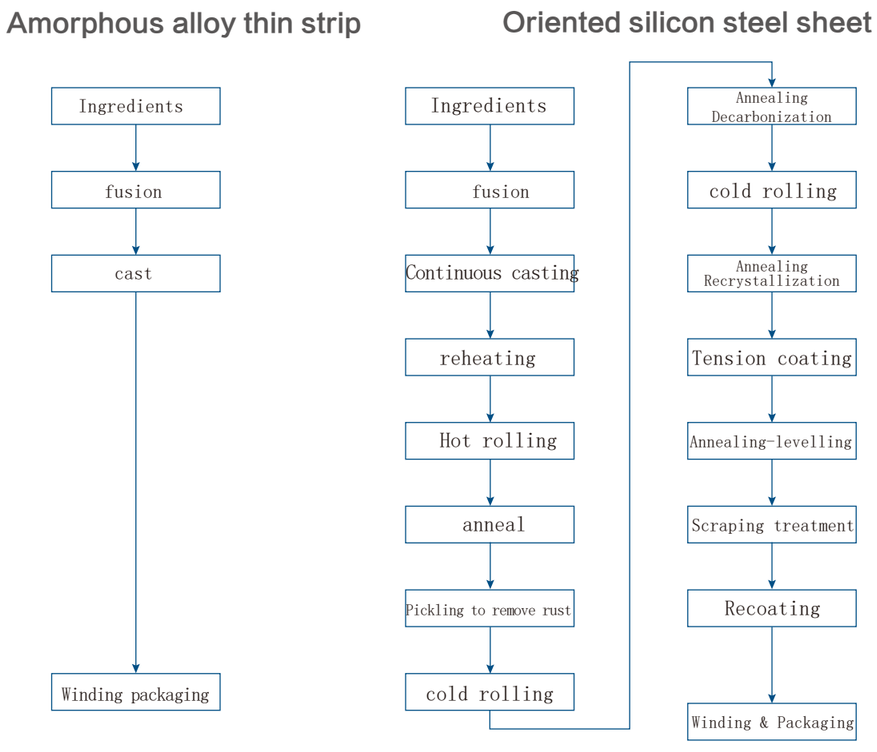


Amorphous alloy strip

Silicon steel sheet

Comparison between Amorphous Alloy Strip and Silicon Steel Sheet

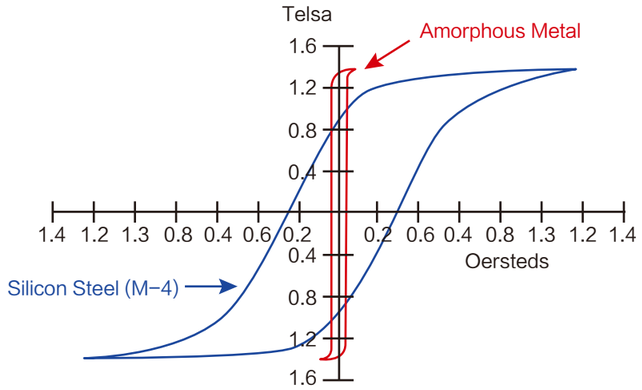
Manufacturing process comparison



Fabrication process diagram of amorphous alloy thin strip and oriented silicon steel sheet

By comparing the manufacturing process of amorphous alloy strip VS oriented silicon steel sheet, it can be seen that the manufacturing process of amorphous alloy strip is very simple, and the production process consumes a small amount of energy, which is a typical environmental protection material. The manufacturing process of silicon steel sheet is complex and consumes a lot of energy, which belongs to high energy consumption products. Use less energy-consuming products, that is, save more precious energy!

Comparison of magnetization curves



Magnetization curve of amorphous strip and oriented silicon steel sheet

The enclosed area surrounded by the excitation curve in the figure represents the energy lost by the magnetic material in the form of heat in the alternating cycle of magnetic field. It can be clearly seen from the figure that the enclosed area of the excitation curve of amorphous strip and silicon steel sheet is very different under the magnetic flux density of about 1.4T. According to the measured data, the amorphous iron loss is about 10% of that of silicon steel sheet, but when it is actually used as the core material of transformer, No-load losses can be reduced by 70% ~ 80%, which is a revolutionary development of metallurgical materials.

It is concluded that the amorphous strip has the following advantages: High permeability and low exciting power; Low

Comparison of characteristic parameters

	Characteristic	Amorphous Alloy 2605SA1	Oriented silicon steel sheet
Magnetism Characteristics	Iron loss W13/50Hz(25℃) Saturation flux density(25℃) Curie temperature	0.1W/kg 1.56T 415℃	0.86W/kg 2.0T 745℃
Physical Characteristics	Density Lamination coefficient Hardness Hv Resistance coefficient	7.18g/cm3 >85% 860 130μΩcm	7.65g/cm^3 >94% 180 45μΩcm
Dimesnsion	Width Thickness	142,170,213mm 0.025mm	～950mm 0.3mm
Others	Annealing	In magnetic field/ 380℃~400℃	750℃～850℃

Unique characteristics of amorphous alloy strip and amorphous alloy transformer

Characteristics of amorphous alloy strip:

1. The unit iron loss is low, which is 70% ~ 80% lower than that of silicon steel sheet;
2. The thickness is very thin, only 0.025mm, and the filling coefficient is low;
3. High resistance coefficient and small eddy current loss;
4. The manufacturing process is greatly simplified, energy-saving and pollution-free;
5. High hardness and high cutting requirements;
6. It must be annealed and fragile;
7. Mechanical stress is sensitive, which will affect the performance after stress.

Amorphous alloy transformer features:

1. Ultra low loss, energy saving and high power efficiency
2. Low operating temperature, slow insulation aging and long service life
3. Flame retardant, explosion-proof, no pollution, high fire rating
4. High mechanical strength, strong short-circuit resistance, safe and reliable operation
5. Fast investment recovery

Comparison between three-phase three column and three-phase five column

Appearance		
Category	Three phase five column	Three phase three column
Asembly	Many parts and components complex assembly and shape	Few components simple assembly and appearance
Weight	5%~10%heavier	Lighter
Insulation and temperature rise	The side column core needs to be separated by insulating material to avoid insulation problems with the coil. The side column iron core blocks the coil, and the heat dissipation effect is poor.	No concern of iron core side column, the insulation is considered as the same as that of conventional trans-former, which is safe and reliable. No block for the coil from side column, the temperature rise is low.
Others	The transformer is a traditional design structure with large volume, heavy weight and large floor area. The primary side can only adopt D connection method. When adopting Y connection method, it is easy to produce harmonics, resulting in phase voltage imbalance.	The transformer is a new structure with small volume and light weight, which can effectively reduce the floor area. Any connection method at the primary and secondary sides of the transformer can be used.

The traditional amorphous alloy transformer is a three-phase five column structure. CEEG has developed a three-phase three column structure through technical innovation and process improvement, and obtained a patent, which is the first in China. The appearance of three-phase three column amorphous alloy transformer is closer to that of ordinary silicon steel sheet transformer. It is lighter and smaller than three-phase five column structure. The company's original core technology and assembly process have obtained a number of patents, patent numbers: 200810238258.6, 20082015857.5, 200820215858.X, 200820215812.8, 200820215814.7.

Model Description

SCRBH Amorphous Alloy Transformer

S CR B H □ - □ / □ - □

- NX1-Class one energy efficiency NX2-Class two energy efficiency
- Rated Voltage (kV)
- Rated Capacity (kVA)
- Performance code
- Amorphous alloy iron core
- Foil wound coil
- Winding type high voltage
- Three phase

Remarks: Performance Code

SCRBH19: Class one energy efficiency amorphous alloy dry type transformer,

SCRBH17: Class two secondary energy efficiency amorphous alloy dry type transformer.

SCBH Cast Resin Amorphous Alloy Transformer

S C B H □ - □ / □ - □

- NX1-Class one energy efficiency NX2-Class two energy efficiency
- Rated Voltage (kV)
- Rated Capacity (kVA)
- Performance code
- Amorphous alloy iron core
- Foil wound coil
- Epoxy resin casting
- Three phase

Remarks: Performance Code

SCBH19 represents primary energy efficiency amorphous alloy dry-type transformer,

SCBH17 represents secondary energy efficiency amorphous alloy dry-type transformer.

Comparison with other dry type transformers

Model		SCRBH Series	SCB Series
Main materials		Amorphous strip, Nomex Paper	Silicon steel sheet, epoxy resin
Insulation system		Segmented cylindrical coil is adopted for high voltage	The high voltage is cylindrical coil
Energy consumption		The no-load loss is about 70% lower than that of ordinary dry transformer	Ordinary
Initial investment		10% ~ 20% higher	100%
Manufacturing cycle		No mold, fast production cycle	Need high voltage coil casting mold, long production cycle
Cost performance		Recoverable excess investment in 2-3 years	Good
Safety	Thermal shock resistance	Good	Normal, may crack
	Mechanical properties	High mechanical strength, never crack	High mechanical strength and possible cracking
	Electrical strength	Low dielectric constant, uniform electric field distribution and low partial discharge	High dielectric constant and uneven electric field distribution
	Overload capacity	Long term safe load 120%, maximum 150%	Overload for a short time with fans
Environmental Protection	Environment	Non flammable resin, non-toxic	Halogenated hydrocarbon toxic gas is released during combustion
	After service life	Recyclable	Non recyclable
	Repair	Repairable	Non repairable

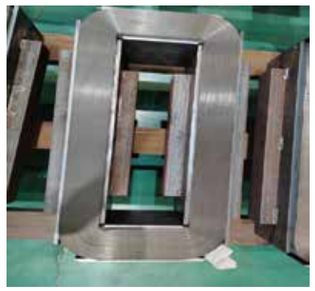
Production Process of Amorphous Alloy Core

CEEG has an independent production process of amorphous alloy iron core, and can control various process levels and parameters of amorphous iron core by itself.

Independent production process of amorphous alloy core

Loading material

Cutting



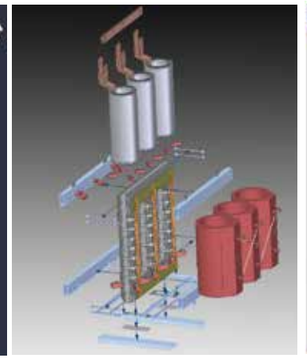
Forming

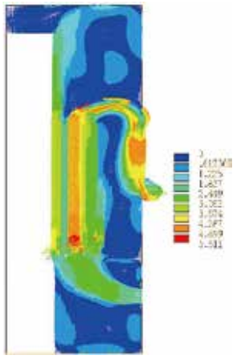
Gluing and fastening

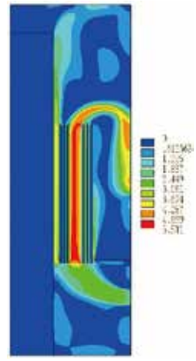
Assembly and gluing

Annealing

Unique Design and Manufacturing Process



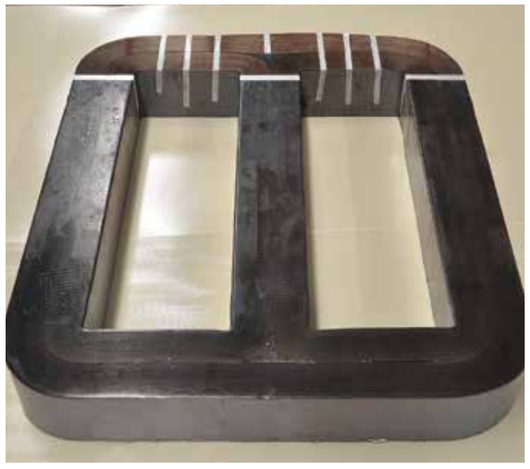




+ DESIGN

Advanced electromagnetic design optimization software is adopted to improve the accuracy and speed of amorphous alloy dry-type transformer design, and realize design automation and optimization.

Powerful simulation analysis ability, for each series of products, through the flow field, temperature field, leakage magnetic field, short circuit force and other simulation analysis, to ensure product safety and reliability.



+ CORE

It is made of high-quality amorphous strip in the form of three-phase and three column. It is annealed under the strength of DC electric field to obtain the excellent characteristics of low iron loss and low exciting current. The surface of the core is coated with special resin to prevent moisture and corrosion. The core has simple structure, high mechanical strength, resistance to high-order harmonics, and the iron loss is 70% ~ 80% lower than that of conventional products.

+ LV FOIL WOUND COIL

High quality copper foil and class H insulating material are wound on the formed insulating cylinder. The insulation layer is Nomex Paper, impregnated into a solid piece by VPI vacuum pressure, the upper and lower ends are resin end sealed, and the lead copper bar and copper foil are welded by argon arc through special equipment. The coil has high mechanical strength, strong short-circuit resistance and strong ability to prevent dust, moisture and salt fog.

+ HV WINDING COIL

It adopts multi-layer segmented cylindrical structure and longitudinal multi airduct structure, with strong heat resistance, impluse resistance and surge resistance. Nomex Paper wrapped flat copper wire is used as conductor, Nomex Paper as layer insulation and H-grade material as end insulation. High and low pressure winding, It is cured by VPI vacuum pressure impregnation and high-temperature baking. A solid whole, The upper and lower ends are resin end sealed, with good heat dissipation performance and no cracking.

+ ASSEMBLY

The coil is used as the main load-bearing body, supported on a separate winding system and pressed and fixed, and the core is of mounting structure, so that the core is not under pressure, reducing the influence of radial shrinkage and expansion on the core in case of short circuit. The overlapping part of core adopts special glue end sealing process to ensure the minimum stress of the core.

+ Intelligent annealing furnace for amorphous alloy iron core

+ High temperature oven

+ VPI vacuum pressure impregnation

+ German Heidrich vacuum casting tank

+ Testing Center

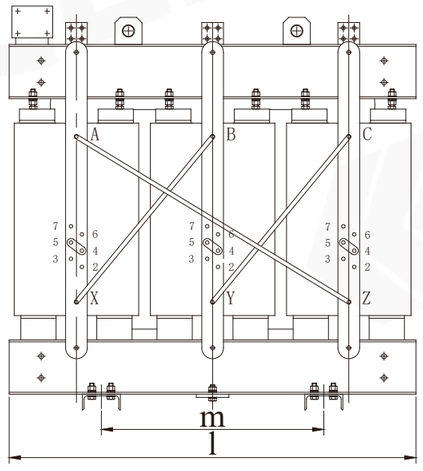
Technical Parameters

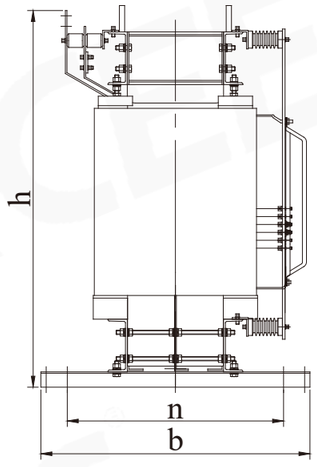
10kV SCRBH15 / SCBH15 Series three-phase three-column amorphous alloy dry distribution transformer

Rated Capacity: 30-2500kVA HV: 10kV LV: 0.4kV
Vector Group: Dyn11, Yyn0 Insulation Level: LI75AC35/LI0AC3

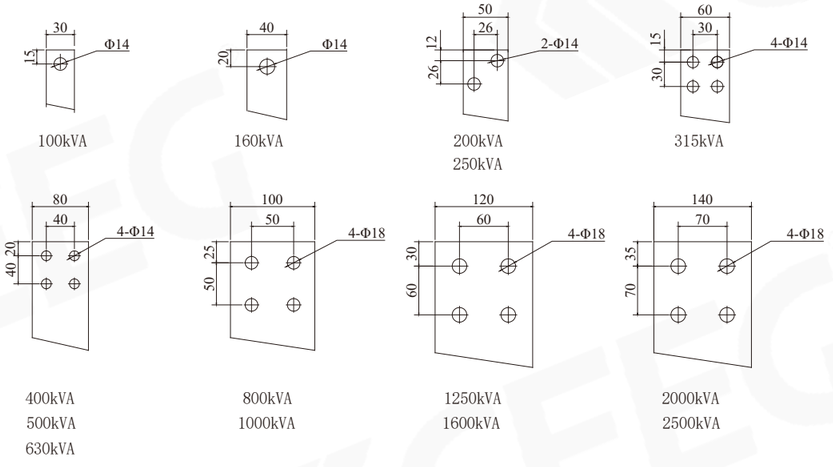
Capacity kVA	P0 (W)	Pk (W)			I0%	Uk%	LPA (AN) dB	Transformer Dimensions l×b×h (IP00)(mm)	Enclosure Dimensions l×b×h (IP00)(mm)	Mounting Dimensions m×n(mm)
		100℃(B)	120℃(F)	145℃(H)						
100	124	1.48	1.57	1.69	0.5	4	50	1210×765×1224	1650×1300×2200	660×550
160	162	2.00	2.13	2.28	0.4	4	51	1290×765×1294	1700×1300×2200	660×550
200	190	2.37	2.53	2.71	0.4	4	52	1120×860×1241	1600×1350×2200	660×660
250	219	2.59	2.76	2.96	0.4	4	52	1230×880×1080	1650×1400×2200	660×660
315	266	3.27	3.47	3.73	0.3	4	54	1230×880×1185	1650×1400×2200	660×660
400	295	3.75	3.99	4.28	0.3	4	54	1310×900×1260	1750×1400×2200	660×660
500	342	4.59	4.88	5.23	0.3	4	55	1340×980×1220	1750×1450×2200	660×820
630	390	5.61	5.96	6.40	0.3	6	56	1440×980×1230	1850×1450×2200	820×820
800	456	6.55	6.96	7.46	0.3	6	57	1510×980×1310	1950×1500×2200	820×820
1000	523	7.65	8.13	8.76	0.2	6	57	1625×1170×1390	2050×1550×2200	820×1070
1250	618	9.10	9.69	10.30	0.2	6	59	1590×1190×1400	2000×1600×2200	820×1070
1600	722	11.00	11.70	12.50	0.2	6	60	1580×1220×1470	2000×1700×2200	1070×1070
2000	950	13.60	14.40	15.50	0.2	6	62	1670×1240×1540	2100×1750×2200	1070×1070
2500	1140	16.10	17.10	18.40	0.2	6	62	1815×1250×1660	2250×1750×2250	1070×1070

Note: The data given in this manual is for planning and selection purposes only. Final data may vary.





LV terminal bus



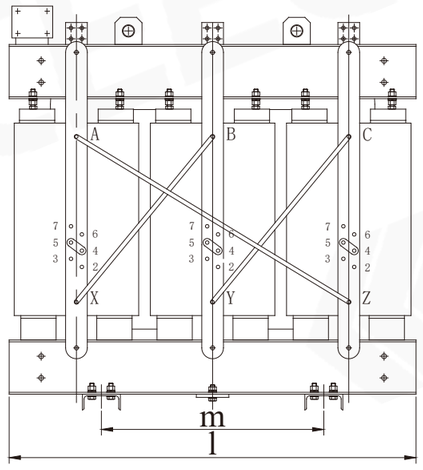
Technical Parameters

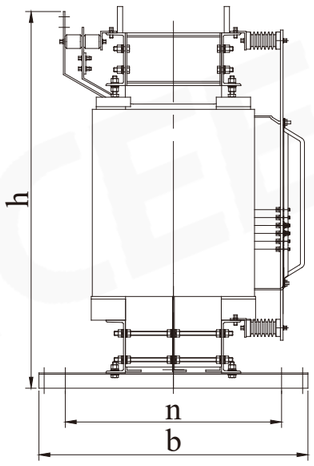
10kV SCRBH17 / SCBH17 Series Class two Energy efficient three-phase three-column amorphous alloy dry distribution transformer

Rated Capacity: 30-2500kVA HV: 10kV LV: 0.4kV
Vector Group: Dyn11, Yyn0 Insulation Level: LI75AC35/LI0AC3

Capacity kVA	P0 (W)	Pk (W)			I0%	Uk%	LPA (AN) dB	Transformer Dimensions l×b×h (IP00)(mm)	Enclosure Dimensions l×b×h (IP00)(mm)	Mounting Dimensions m×n(mm)
		100℃(B)	120℃(F)	145℃(H)						
200	170	2. 13	2. 27	2. 44	0. 4	4	50	1170×860×1270	1600×1350×2200	660×660
250	195	2. 33	2. 48	2. 66	0. 4	4	50	1260×860×1140	1650×1350×2200	660×660
315	235	2. 94	3. 12	3. 35	0. 3	4	52	1280×880×1220	1700×1400×2200	660×660
400	265	3. 37	3. 59	3. 85	0. 3	4	52	1350×920×1260	1750×1450×2200	660×660
500	305	4. 13	4. 39	4. 70	0. 3	4	53	1390×980×1260	1800×1550×2200	660×820
630	350	5. 05	5. 36	5. 76	0. 3	6	54	1500×980×1290	1900×1550×2200	820×820
800	410	5. 89	6. 26	6. 71	0. 3	6	55	1570×980×1350	1950×1550×2200	820×820
1000	470	6. 88	7. 31	7. 88	0. 2	6	55	1620×1170×1430	2000×1650×2200	820×1070
1250	550	8. 19	8. 72	9. 33	0. 2	6	57	1630×1210×1470	2050×1650×2200	820×1070
1600	645	9. 94	10. 55	11. 32	0. 2	6	58	1640×1230×1530	2050×1750×2200	1070×1070
2000	850	12. 24	13. 00	14. 00	0. 2	6	60	1740×1230×1590	2150×1750×2200	1070×1070
2500	1020	14. 53	15. 44	16. 60	0. 2	6	60	1830×1250×1680	2250×1800×2200	1070×1070

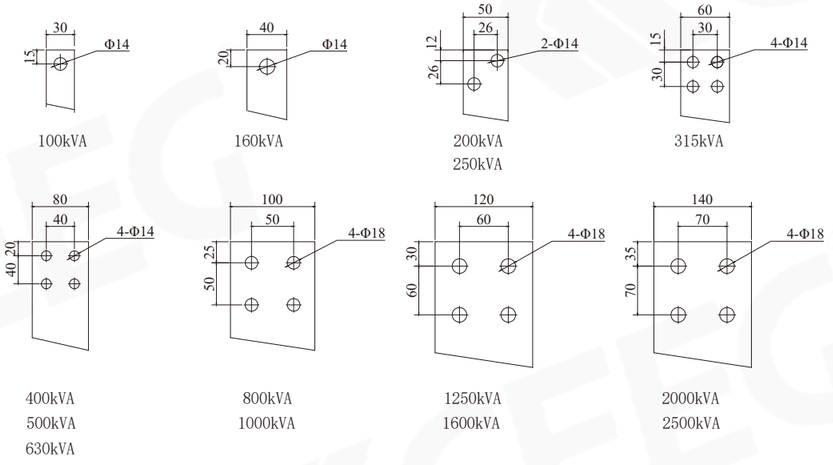
Note: The data given in this manual is for planning and selection purposes only. Final data may vary.





Meet with various outlet methods:
Upper in and upper out, upper in and lower out, upper in and side out.
Lower in and upper out, lower in and lower out, lower in and side out.

LV terminal bus



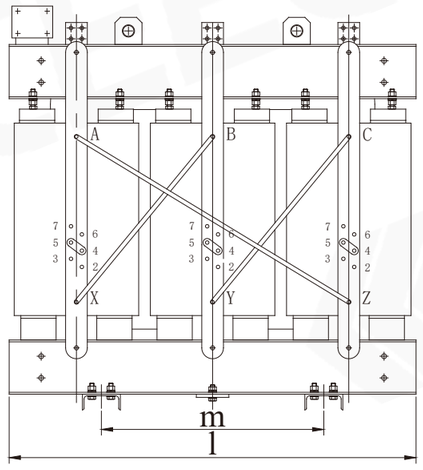
Technical Parameters

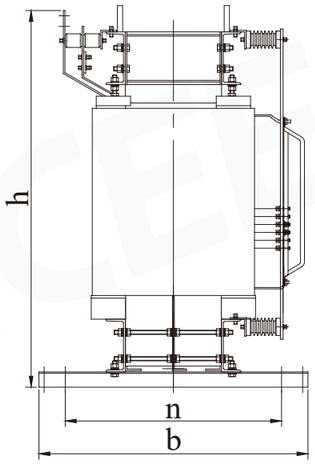
10kV SCRBH19 / SCBH19 Series Class one Energy efficient three-phase three-column amorphous alloy dry distribution transformer

Rated Capacity: 30-2500kVA HV: 10kV LV: 0.4kV
Vector Group: Dyn11, Yyn0 Insulation Level: LI75AC35/LI0AC3

Capacity kVA	P0 (W)	Pk (W)			I0%	Uk%	LPA (AN) dB	Transformer Dimensions l×b×h (IP00)(mm)	Enclosure Dimensions l×b×h (IP00)(mm)	Mounting Dimensions m×n(mm)
		100℃(B)	120℃(F)	145℃(H)						
200	140	2.13	2.27	2.44	0.4	4	50	1210×860×1310	1600×1350×2200	660×660
250	160	2.33	2.48	2.66	0.4	4	50	1300×860×1175	1700×1350×2200	660×660
315	195	2.94	3.12	3.35	0.3	4	52	1310×880×1250	1700×1400×2200	660×660
400	215	3.37	3.59	3.85	0.3	4	52	1390×920×1270	1800×1450×2200	660×660
500	250	4.13	4.39	4.70	0.3	4	53	1440×980×1290	1850×1550×2200	660×820
630	290	5.05	5.36	5.76	0.3	6	54	1540×980×1330	1950×1550×2200	820×820
800	335	5.89	6.26	6.71	0.3	6	55	1610×980×1390	2000×1550×2200	820×820
1000	385	6.88	7.31	7.88	0.2	6	55	1650×1170×1450	2050×1650×2200	820×1070
1250	455	8.19	8.72	9.33	0.2	6	57	1670×1200×1510	2100×1650×2200	820×1070
1600	530	9.94	10.55	11.32	0.2	6	58	1680×1230×1580	2100×1750×2200	1070×1070
2000	700	12.24	13.00	14.00	0.2	6	60	1770×1235×1640	2150×1750×2200	1070×1070
2500	840	14.53	15.45	16.60	0.2	6	60	1860×1250×1700	2250×1800×2250	1070×1070

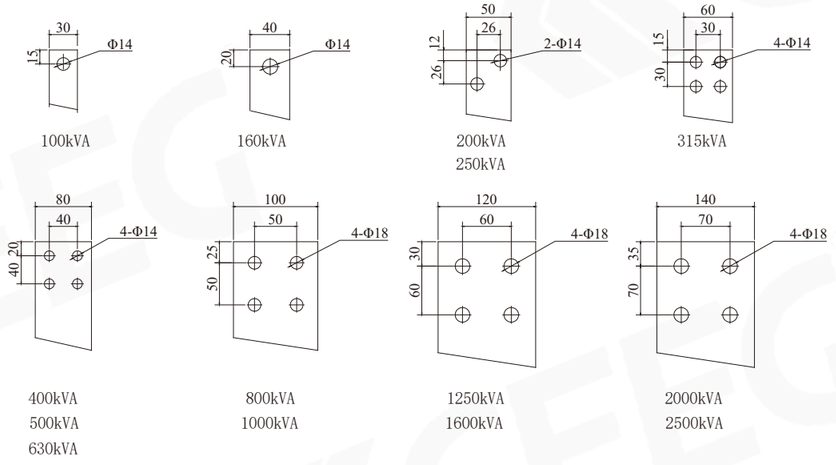
Note: The data given in this manual is for planning and selection purposes only. Final data may vary.





Meet with various outlet methods:
Upper in and upper out, upper in and lower out, upper in and side out.
Lower in and upper out, lower in and lower out, lower in and side out.

LV terminal bus



Comparison of no-load loss of 10kV dry type distribution transformers at various energy consumption levels under the GB20052-2020 standard

Capacity (kVA)	No-load loss (Class one)			No-load loss (Class two)			No-load loss (Class three)		
	Silicon steel sheet (W) SCB18	amorphous alloy(W) SCRBH19	no-load loss reduce(%)	Silicon steel sheet (W) SCB14	amorphous alloy(W) SCBH17	no-load loss reduce(%)	Silicon steel sheet(W) SCB12	amorphous alloy(W) SCBH15	no-load loss reduce(%)
200	360	140	61.1%	420	170	59.5%	495	200	59.6%
250	415	160	61.4%	490	195	60.2%	575	230	60.0%
315	510	195	61.8%	600	235	60.8%	705	280	60.3%
400	570	215	62.3%	665	265	60.2%	785	310	60.5%
500	670	250	62.7%	790	305	61.4%	930	360	61.3%
630	750	290	61.3%	885	350	60.5%	1040	410	60.6%
800	875	335	61.7%	1035	410	60.4%	1215	480	60.5%
1000	1020	385	62.3%	1205	470	61.0%	1415	550	61.1%
1250	1205	455	62.2%	1420	550	61.3%	1670	650	61.1%
1600	1415	530	62.5%	1665	645	61.3%	1960	760	61.2%
2000	1760	700	60.2%	2075	850	59.0%	2440	1000	59.0%
2500	2080	840	59.6%	2450	1020	58.4%	2880	1200	58.3%

Show in the above table -No-load loss data of each energy efficiency class, we can see even the Class-Three energy efficiency transformer in amorphous alloy, its no-load loss is far lower than that of the Class-One energy efficiency transformer in silicon steel.

Therefore, supposing there are requirements for “Green construction”,lower load rate and long time no-load operation, in this case the Class-Two & Three energy efficiency transformers in amorphous alloy, which should be considered in priority. In the era of "carbon peak" and "carbon neutral", amorphous alloy transformers will become the main force of energy-saving transformers. Whether it is a silicon steel transformer or an amorphous alloy transformer, the Class-One energy efficiency is better than the Class-Two, and much better than Class -Three, however, the cost of equipment will be higher than lower one, the higher energy efficiency class will be the higher cost, it need to consider the quality/cost in total.

Annual electricity consumption under different load rates between SCRBH15 and SCB14 seriers prodcts

Annual electricity consumption of SCB14 at different load rates						
TYPE	NO-load loss SCB14(W)	load loss SCB14(W)	Annual power saving (kWh) Load rate100%	Annual power saving (kWh) Load rate85%	Annual power saving (kWh) Load rate50%	Annual power saving (kWh) Load rate30%
500/10	790	4390	45377	34705	16535	10381
1000/10	1205	7315	74635	56853	26576	16323
1600/10	1665	10555	107047	81389	37701	22907
2000/10	2075	13005	132101	100487	46658	28430
2500/10	2450	15445	156760	119215	55287	33639
Annual electricity consumption of SCB15 at different load rates						
TYPE	NO-load loss SCBH15(W)	load loss SCBH15(W)	Annual power saving (kWh) Load rate100%	Annual power saving (kWh) Load rate85%	Annual power saving (kWh) Load rate50%	Annual power saving (kWh) Load rate30%
500/10	360	4880	45902	34040	13841	7001
1000/10	550	8130	76037	56274	22623	11228
1600/10	760	11730	109412	80898	32346	15906
2000/10	1000	14450	135342	100215	40406	20152
2500/10	1200	17170	160921	119183	48114	24049

Analysis of economic operation of Class two energy efficiency under the GB20052-2020 standard

Capacity (kVA)	No-load loss (Class two)		No-load loss reduce(%)	Annual power saving(kWh)	Service life (year)	Savings (yuan)
	Silicon steel sheet (W) SCB14	Amorphous alloy(W) SCRBH17				
200	420	170	59.5%	2190	3	6570
500	790	305	61.4%	4249	3	12746
1000	1205	470	61.0%	6439	3	19316
1600	1665	645	61.3%	8935	3	26805
2500	2450	1020	58.4%	12527	3	37580

Taking a SCRBH17-2500kVA amorphous alloy dry-type transformer as an example, compared to the SCB14 dry-type transformer, it will save 12527 kilowatt hours of electricity per year. Calculated at 1 yuan per kilowatt hour, it will save approximately 12,500 yuan per year; Within the service life of at least 30 years of amorphous dry-type transformer, the cumulative electricity cost savings will exceed 370,000 yuan. The initial equipment investment cost of a SCRBH17 amorphous alloy dry-type transformer is about 10% higher than that of the SCB14 series dry-type transformer. The operating cost saved in about 2-3 years can recover the increased equipment cost. The annual savings of remaining 27 years are all profits and benefit for customers.

Analysis of economic operation of Class one energy efficiency under the GB20052-2020 standard

Capacity (kVA)	No-load loss(Class one)		No-load loss reduce (%)	Annual power saving (kWh)	Service life (year)	Savings (yuan)
	Silicon steel sheet SCB18 (W)	Amorphous alloy SCRBH19 (W)				
100	230	90	60.90%	1226.4	3	3679.2
500	670	250	62.70%	3679.2	3	11037.6
1000	1020	385	62.30%	5562.6	3	16687.8
1600	1415	530	62.50%	7752.6	3	23257.8
2500	2080	840	59.60%	10862.4	3	32587.2

Note: under the condition that the amorphous alloy transformer and silicon steel transformer both had same load loss, and the electricity charge fee is 1.0 yuan/kWh.

At any load rate, amorphous alloy transformers have greater energy-saving advantages than silicon steel transformers under the same capacity and energy efficiency class. For example, a semi-enclosed SCRBH19-2500kVA dry type transformer in amorphous alloy, to compare with SCB18 dry-type transformer in silicon steel, 10,862 kWh of electricity will be saved each year.

Calculated by 1 yuan/kWh, about 11,000 yuan will be saved each year; During the service life(at least 30 years) of an amorphous dry type transformer, the accumulated electricity cost will be saved by more than 300,000 yuan.

Qingdao Yunlu’s researching and developing technology of amorphous alloy is in the leading position of a China, its 2023 new type strip were successfully developed, no-load loss can be reduced by 30%-40% than conventional type. The saving operation cost for 1 years’ service which will cover the increased original equipment cost.

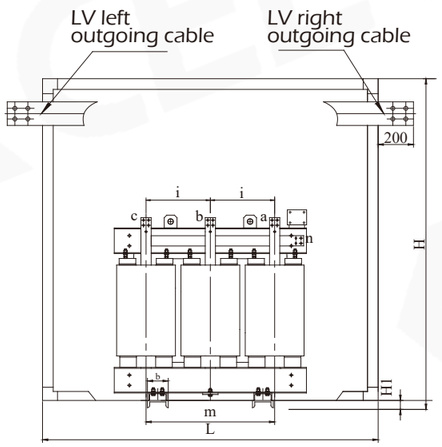
Technical Parameters and Overall Dimensions

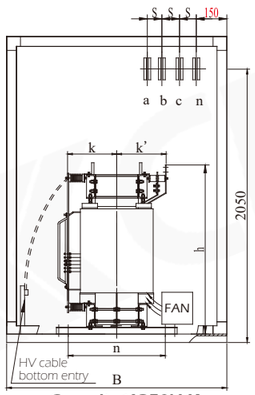
20kV SCRB)H15 amorphous alloy transformer

Rated Capacity: 200-2500kVA HV: 20kV LV: 0.4kV
Vector Group: Dyn11, Yyn0 Insulation Level: LI75AC35/LI0AC3

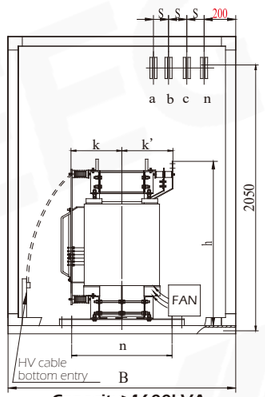
Capacity kVA	P0 (kW)	Pk (kW)	I0%	Uk%	Transformer Dimensions			Gauge m×n(mm)	Enclosure Dimensions			Gauge m×n(mm)
					l(mm)	b(mm)	h(mm)		l(mm)	b(mm)	h(mm)	
200	0.23	2.94	0.6	6	1300	760	1420	660×660	1900	1500	2000	660×660
250	0.26	3.42	0.5	6	1360	760	1480	660×660	2000	1500	2000	660×660
315	0.3	4.08	0.5	6	1400	760	1540	660×660	2000	1500	2100	660×660
400	0.36	4.84	0.5	6	1450	920	1540	820×820	2100	1700	2100	820×820
500	0.41	5.79	0.5	6	1480	920	1580	820×820	2100	1700	2100	820×820
630	0.48	6.84	0.5	6	1500	920	1630	820×820	2100	1700	2200	820×820
800	0.55	8.26	0.4	6	1520	920	1680	820×820	2200	1700	2200	820×820
1000	0.64	9.78	0.4	6	1560	920	1720	820×820	2200	1700	2300	820×820
1250	0.74	11.5	0.4	6	1580	1200	1780	1070×1070	2200	1900	2300	1070×1070
1600	0.86	13.8	0.3	6	1600	1200	1860	1070×1070	2200	1900	2400	1070×1070
2000	1.06	16.3	0.3	6	1600	1200	1850	1070×1070	2200	1900	2400	1070×1070
2500	1.29	19.3	0.3	6	1680	1200	2000	1070×1070	2300	1900	2500	1070×1070

Note: The data given in this manual is for planning and selection purposes only. Final data may vary.

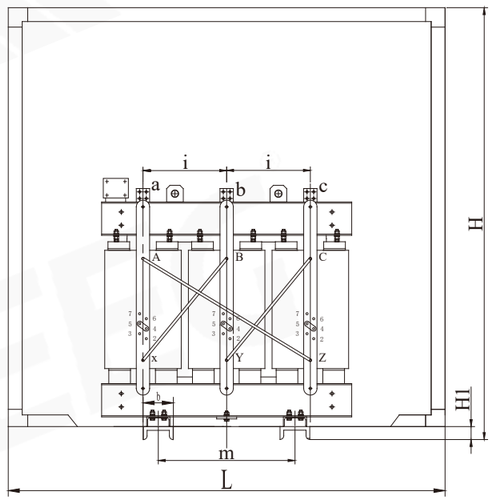


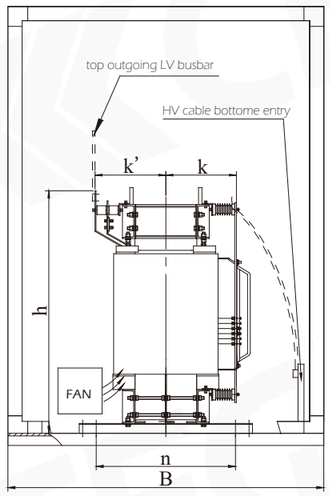


Capacity≤1250kVA



Capacity≥1600kVA





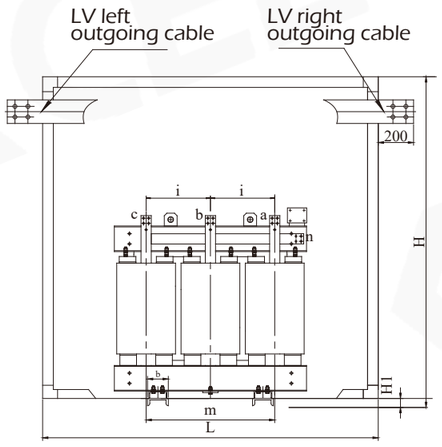
Technical Parameters and Overall Dimensions

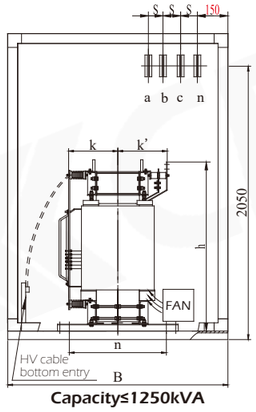
35kV SCRBH15 amorphous alloy transformer

Rated Capacity: 30-2500kVA HV: 35kV LV: 0.4kV
Vector Group: Dyn11, Yyn0 Insulation Level: LI75AC35/LI0AC3

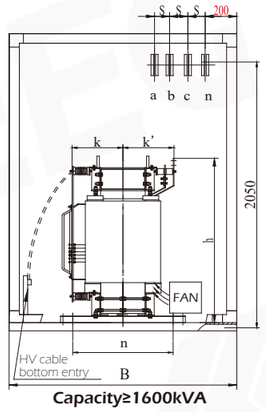
Transformer Dimensions									Enclosure Dimensions			
Capacity kVA	P0 (kW)	Pk (kW)	I0%	Uk%	l(mm)	b(mm)	h(mm)	Gauge m×n(mm)	l(mm)	b(mm)	h(mm)	Gauge m×n(mm)
200	0.28	3.32	0.8	6	1600	800	1610	660×660	2400	1600	2200	660×660
250	0.31	3.8	0.7	6	1630	800	1650	660×660	2500	1600	2200	660×660
315	0.37	4.51	0.7	6	1670	800	1690	660×660	2500	1600	2200	660×660
400	0.43	5.41	0.6	6	1740	1000	1720	820×820	2600	1800	2300	820×820
500	0.5	6.65	0.6	6	1870	1000	1770	820×820	2700	1800	2300	820×820
630	0.58	7.69	0.6	6	1940	1000	1830	820×820	2800	1800	2400	820×820
800	0.68	9.12	0.5	6	2000	1200	1980	1070×1070	2800	2000	2500	1070×1070
1000	0.75	10.4	0.5	6	2050	1200	2050	1070×1070	2900	2000	2600	1070×1070
1250	0.88	12.7	0.5	6	2100	1200	2060	1070×1070	2900	2000	2600	1070×1070
1600	1	15.4	0.4	6	2100	1200	2100	1070×1070	2900	2000	2600	1070×1070
2000	1.25	18.2	0.4	6	2150	1400	2200	1270×1270	3000	2200	2700	1270×1270
2500	1.48	21.8	0.4	6	2200	1400	2200	1270×1270	3000	2200	2700	1270×1270

Note: The data given in this manual is for planning and selection purposes only. Final data may vary.

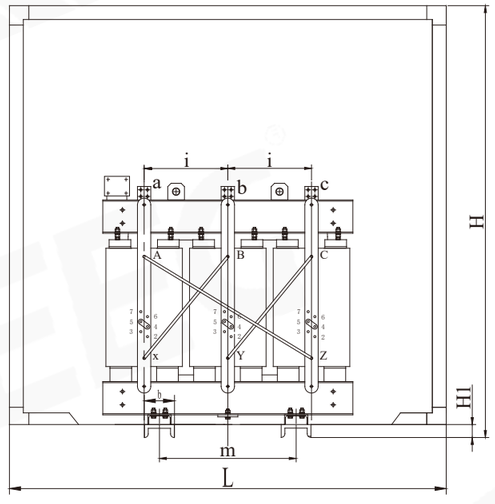


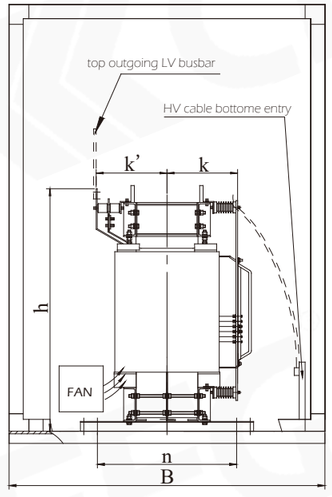


Capacity≤1250kVA



Capacity≥1600kVA





Accessories

+ Enclosure

The enclosure is mainly indoor type, which can prevent the entry of solid foreign matters, resist accidental impact, provide a safety barrier for live parts, and can be customized according to customer needs.
Enclosure protection grade: IP20, IP23, IP30, etc,
Enclosure material: iron, stainless steel, aluminum alloy.

+ Temperature Controller

The temperature detection and control of transformer is realized by PT thermistor embedded in low-voltage coil, and the output digital signal is realized through RS232 / 485 communication interface:
LED circuit displays the temperature value of three-phase winding;
Display the temperature value of the hottest group of windings;
Overtemperature alarm and overtemperature trip;
Audible and visual alarm and starting fan.

+ Air Cooling Device

The cooling methods of amorphous alloy dry-type transformer are divided into natural air cooling (AN) and forced air cooling (AF).
Under normal use, natural air cooling can continuously output 100% of the rated capacity; Forced air cooling can achieve "temporary" capacity increase of 50%, which is suitable for all kinds of emergency overload or intermittent overload operation.

+ Bar

Conventional incoming mode of transformer: bottom incoming and top outgoing lines, bottom incoming and bottom outgoing lines, bottom incoming and side outgoing lines, etc;
The side outgoing zero line of the transformer is located on the top. For the switchgear with the zero line led out from the bottom, it is recommended that the transformer zero line still enter the switchgear from the top.

Use & Installation

a. The installation site shall not be flooded by water, the altitude shall not exceed 1000m, and the ambient temperature shall not be higher than 40 ℃. The relative humidity is 100%, and the environment is 40 ℃ to - 25 ℃ (- 25 ℃ requires on-load tap changer and temperature controller).
b. The installation site shall be clean, free of conductive dust and corrosive gas, and have good ventilation or artificial ventilation conditions.
c. During product installation, it shall be 300mm away from walls and other obstacles, and there shall be a distance of 300mm between adjacent transformers. For distribution boxes and other places with limited installation space, the above distance can be adjusted appropriately.

a. The products can be partially disassembled and transported (such as on-load tap changer, temperature controller, air cooling device, enclosure, etc. can be packaged separately) or packed as one piece in packaging boxes for transportation.
b. During the lifting process of the package, ropes shall be hung on sleepers at the four corners at the bottom of the package. Special lifting devices should be used to lift the products after the package is opened. It can be lifted 100 mm-150 mm above the ground first, and then formally lifted after there is no abnormality.
c. During transportation, there shall be no upward and downward slope greater than 15 ° on the road. In order to ensure that the vehicle can bear the load evenly, the product center of gravity shall be located on the vertical centerline of the vehicle during loading. In order to prevent displacement and rollover during transportation, the long axis direction of the product shall be consistent with the transportation direction, and the product shall be firmly bound on the vehicle.

a. After opening the package, remove the protective device and check the external conditions, especially paying attention to the mechanical integrity of the coil and iron core, the compression degree of the coil and iron core, and the bolt fastening at the connection.
b. After inspection, all fasteners, coils and iron core pressing parts must be tightened in turn without any looseness.
c. Use dry compressed air or clean cloth to clean the dust and dirt on the product.
d. When the storage time is long and there are water droplets or condensation on the transformer surface, it shall be dried until the insulation resistance of the coil is qualified.

a. Measure the DC resistance of high and low voltage windings
(whether the data is consistent with the data given in the factory test certificate).
b. Check the grounding of the iron core to see whether the grounding is reliable and whether foreign matters are overlapping.
c. Test insulation resistance

a. Before putting into operation, the transformer shall be put into trial operation under no-load, and the protection system shall be checked and adjusted after 3 times of swith on/off.
b. When the product leaves the factory, the tap positions of voltage regulation at the high-voltage side are connected according to the rated position. Voltage adjustment is required during operation. Corresponding tap connection can be carried out according to the decomposition voltage indicated on the nameplate (when there is no excitation voltage regulation), and it must be carried out when the transformer power supply is cut off.

References

China Mobile

China Unicom

China Telecom

Sinopec Jiujiang Branch

Wuxi Metro

Qingdao Olympic Games sailing base

Huitengxile Wind Farm in Inner Mongolla Autonomous Region

Beijing-Xiong'an intercity railway

Sinopec Petroleum Construction Shengli Co., Ltd.

CNOOC Zhongjie Petrochemical Co., Ltd.

State Grid Beijing Electric Power Co., Ltd.

State Grid Anhui Electric Power CO., Ltd.

DTCO (datong coal mine group)

Huaneng Jimo Wind Power Co., Ltd.

Beijing Eastern Petrochemical CO., Ltd. Materials and Equipment Supply Centre

Shenhua Materials Group CO., Ltd.

State Grid Liaoning Electric Power Company

SEPCOIII Electric Power Construction Co., Ltd.

State Grid Shaanxi Electric Power Co., Ltd.

State Grid Tianjin Electric power Co., Ltd.

WISDRI (Wuhan) Automation Co., Ltd.

Beijing Shougang Steel Co., Ltd.

Baoshan Iron & Steel Co., Ltd.

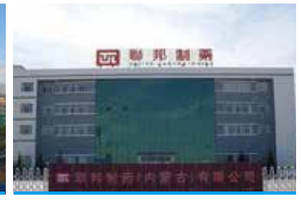
CSIC Shipping Co., Ltd

CGGC

CLP Zhangbei Wind Power Co., Ltd

CNPE

The 404 Ltd.,CNI



United Laboratories (Inner Mongolia) Co., Ltd

Siemens China

Mengniu Dairy (Ma'anshan) Co., Ltd

Nanjing Panda FPD Technology Co., Ltd.

Department of service of the State Council

ARIMT

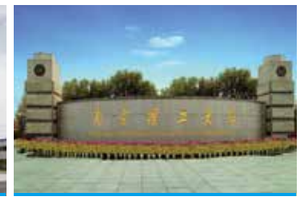
CEC-CEDA

Electrical Engineering Co.,Ltd. of China Railway 12th Bureau Group

TGOOD

Beijing Ludian Electric Power Construction Co. Ltd.

HNAC



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Communication Industry

China Mobile Co., Ltd
China Mobile Anhui Co., Ltd
Anqing Branch of China Mobile Anhui Co., Ltd
Ma'anshan branch of China Mobile Anhui Co., Ltd
China Mobile Anhui Co., Ltd. Wuhu Branch
China Mobile Anhui Co., Ltd. Huangshan branch
China Mobile Anhui Co., Ltd. Bozhou branch
Bengbu Branch of China Mobile Anhui Co., Ltd
China Mobile s Group Jiangsu Co., Ltd
China Mobile Jiangsu Co., Ltd. Taizhou Branch
China Mobile Jiangsu Co., Ltd. Wuxi Branch
China Mobile Jiangsu Co., Ltd. Yancheng branch
China Mobile Huaian call base
China Mobile s Group Zhejiang Co., Ltd
Ningbo Branch of China Mobile s Group Zhejiang Co., Ltd
China Mobile s Group Shanghai Co., Ltd
China Mobile Hubei Co., Ltd
China Mobile s Group Hebei Co., Ltd
China Mobile s Group Chongqing Co., Ltd
China Mobile Gansu Co., Ltd
China Mobile Group Qinghai Co., Ltd
China Mobile s Group Jilin Co., Ltd
China Mobile Ningxia Co., Ltd
China Mobile Guizhou Co., Ltd
China Mobile International Information Port Phase I Project
China Telecom Co., Ltd
China Telecom Nanjing Branch
China Telecom Zhejiang Branch
China Telecom Shanghai Branch
China Telecom Hangzhou Branch
Smart cloud service base of China Telecom Shaanxi company
China United Network Co., Ltd
Unicom Cloud Data Co., Ltd
Langfang data branch of China United Network Co., Ltd
Hohhot data branch of China United Network Co., Ltd
Zhongbing CommunicationTechnology Co., Ltd
Guangdong Runlian Information Technology Co., Ltd

Highway Tunnel Industry

HuBei	Shibai Expressway
	Yangzuo Expressway
	Shanxi wangfan Expressway
	Shuozhou Ring Expressway
Shanxi	Changping Expressway
	Yuanshen Expressway
	Yangquan West Ring Expressway
	Wangzhuang Expressway
	Temporary departure Expressway
	Yonglan Expressway
HuNan	Yan Ru Expressway and tunnel
	Shuangzhou Road, Lengshuitan, Yongzhou
	BIDU Expressway
GuiZhou	Yande Expressway
	Dasi Expressway
GuangDong	Gaopu Road, Tianhe District
JiangXi	Jiujiang Yangtze River Highway Bridge
	Jingmu Expressway
	Qinglan Expressway
GanSu	Dangdi Expressway
	Gansu Provincial Highway Tunnel
HeNan	Dengru Expressway
GuangXi	Nanning outer ring road and tunnel
	Gonghe Yushu highway
QingHai	Tongtianhe tunnel
	Hecashan tunnel
SiChuan	Da Shan Expressway
YunNan	Dali Expressway
FuJian	Jinjishan tunnel

Military Industry

Material procurement department of 92304 unit of CPLA
96311 army material procurement Station
Unit 96542 of the Chinese people's Liberation Army
Equipment Department of 96101 unit of the CPLA
Inner Mongolia North Heavy Industry Group Co., Ltd
Inner Mongolia First Machinery Group Co., Ltd
North engineering design and Research Institute Co., Ltd
China North Vehicle Research Institute
Jinxi axle Co., Ltd
Jinxi Industrial Group Co., Ltd
Changzhi Qinghua Machinery Factory
East China Institute of optoelectronic integrated devices

Power Industry

Tianjin electric power company
State Grid Shaanxi Electric Power Company
Liaoning Electric Power Co., Ltd
Jiaxiang County power supply company
Cangzhou Power Supply Company
ZHENFENG Power Supply Bureau
Wuxi Guangying Industrial Co., Ltd
Tianjin Jinghai power supply Co., Ltd
Anhui Electric Power Fanchang power supply Co., Ltd
Zhenjiang Dazhao Group Co., Ltd
Jinhua power switch Co., Ltd
Beijing Jingdian Boyuan engineering Co., Ltd

Metallurgical Industry

Nanjing Iron and Steel United Co., Ltd
Beijing General Research Institute of mining and metallurgy
Nanjing Iron and Steel Co., Ltd
Tangshan Guofeng iron and Steel Co., Ltd
Beijing Shougang electromechanical Co., Ltd. Motor Factory
MCC South Engineering Technology Co., Ltd

Petrochemical Industry

Tangshan Zhonghao Chemical Co., Ltd
Chongqing Huage biochemistry Co., Ltd
Henan energy and chemical group heavy equipment Co., Ltd
China rubber (Anshan) Chemical Industry Co., Ltd
Sinopec Qingdao Petrochemical Co., Ltd
Anyang Chemical Industry Group Co., Ltd
Jiangsu Chengxing Phosphorus Chemical Co., Ltd
Jiangsu Jingshen Salt Chemical Co., Ltd
Daqing Zhonglan Petrochemical Co., Ltd
Zhongyan Jintan Salt Chemical Co., Ltd
Hubei Dayukou Chemical Co., Ltd

Coal Industry

Zaozhuang Mining Group Gaozhuang Coal Industry Co., Ltd
Shaanxi Hengyuan coal power group Co., Ltd
Inner Mongolia Pingzhuang Energy Co., Ltd
Shaanxi Hengyuan coal power group electrification Co., Ltd
Zibo Mining Group material supply Co., Ltd
Shenhua Baorixile Energy Co., Ltd
Shenfu Economic Development Zone Bay Coal Mine Co., Ltd
Shanxi Jinmei group equipment and materials Co., Ltd
Shaanxi guojiahe Coal Industry Co., Ltd
Shaanxi coal industry Huangling Jianzhuang Mining Co., Ltd
Huainan Mining (Group) Co., Ltd

Tobacco Industry

Sichuan Tobacco Industry Co., Ltd
Baofeng Jinye Tobacco Co., Ltd
Tianshui cigarette factory of Gansu Tobacco Industry Co., Ltd

Pharmaceutical Industry

Huabei Pharmaceutical Co., Ltd
Chinese Academy of Medical Sciences
China Resources Shuanghe Pharmaceutical Co., Ltd
Huazhong Pharmaceutical Company Limited
Baofeng People's Hospital

Olympic projects
Olympic Sports Center Hockey training ground
Beijing Olympic Stimulant Testing Center
Beijing Olympic 2008 Urban Road bicycle racing
Beijing Olympic Transport Command Center
Beijing Olympic Sports Center Gymnasium
Olympic Badminton Stadium of Beijing University of Technology
Qingdao International Sailing Center for the 29th Olympic Games
National Olympic Sports Center Comprehensive Training Hall
Beijing Wukesong Basketball Stadium
...
Nuclear power projects
CGN Engineering Co., Ltd
Lingdong Nuclear Power Co., Ltd
Shandong Nuclear Power Co., Ltd
Qinshan Nuclear Power Company
Jiangsu Nuclear Power Co., Ltd
...
Wind power projects
Datang International Shanxi Zuoyun Wind Farm
Jiangsu Dafeng 200MW Wind Farm
Jiangsu Dongtai 200MW Wind Farm
Inner Mongolia North Longyuan Wind Power Generation Co., Ltd
Inner Mongolia Ximeng Zheligantu Wind Farm
Datang Sanmenxia Wind Power Generation Co., Ltd
...
Thermal power projects
Datang International Power Generation Company Co., Ltd
Huadian Changsha Power Plant 2 * 600MW
Huaneng Luohuang Power Plant Phase III Expansion Project (2 * 600MW)
Shandong Weifang Power Plant 670MW
Tongliao Power Plant
...
Export projects
UCC cement production line with a daily output of 10000 tons in the United Arab Emirates
Dujiapo Coal Fired Power Plant in West Mon State, India
Conference Hall of the Ministry of Foreign Affairs of C ô te d'Ivoire
Nepal Civil Servant Hospital
PINKE Gymnasium in Senegal
...

Transportation projects
Shanghai Yangtze River Tunnel and Bridge
Baoshen Railway
Beijing–Kowloon railway
Beijing South railway station Project of Beijing Railway Bureau
Shanghai–Nanjing Expressway
Shenzhen Metro Co., Ltd
Hong Kong–Shenzhen Western Corridor
Beijing Subway Line 15
Chengdu–Dujiangyan railway
South Datong–Puzhou railway
Chongqing Metro Line 3
Urumqi Lanxin Line
Chongqing Metro Line 6
Jinqin Railway
Shenshuo Railway
...
Bridge projects
Runyang Bridge
Shenzhen Hong Kong Bridge
Sunan Bridge
Sutong Bridge
Hangzhou Bay Bridge
Jingyue Bridge
Edong Bridge
Guangdong Hong Kong Cross Sea Bridge
...
Airport projects
Guangzhou New Baiyun International Airport
Hohhot Baita Airport
Nanchang Changbei Airport
Capital International Airport
MAPUTO International Airport
...
Aerospace projects
Aerospace Group
Shenzhou 5 Satellite Launch Base
Capital Aerospace Machinery Company
...
Coal projects
China Shenhua Energy Co., Ltd
Mesa Coal Industry (Group) Co., Ltd
Huainan Mining (Group) Co., Ltd
Ordos City Wulan Coal Group Co., Ltd
Sichuan Coal Industry Group Co., Ltd
Xinwen Mining Group Material Supply and Marketing Co., Ltd
Yankuang Group Co., Ltd
...

Typical references of some data center projects

Item	Project Name	Model (kVA)	Qty	Year
1	China Mobile Beijing International Information Port (phase I, phase II)	2000、2500	18	2011
2	China Telecom Shanghai Information Park data center	2000、2500	6	2012
3	China Mobile Changchun high tech Zone production center (phase I)	2000、2500	15	2012
4	China Unicom Northwest (Hohhot) base (phase I)	2500	11	2013
5	China Unicom Zhongyuan (Zhengzhou) data base (phase I)	2500	20	2013
6	A-1, A-3 data room building of China Unicom Northwest (Hohhot) base	2500	64	2013
7	China Mobile Beijing International Information Port (phase I and phase II)	2000、2500	24	2013
8	IDC room project of smart cloud service base phase 1.1 of China Telecom Shaanxi Branch	2000	18	2014
9	China Telecom headquarters information Park (Inner Mongolia, Guizhou, Beijing, Shanghai)	2000、2500	62	2015
10	Nanjing Telecom Jishan information hub phase I Project	2500	16	2015
11	China Unicom North China (Langfang) base (phase I)	2500	32	2015
12	China Resources Data Center	2000、1600	12	2015
13	Centralized transformer procurement of China Telecom Zhejiang Branch	2000、2500	56	2016

References Added

14	IDC room of Hangzhou Telecom Yiqiao	2000	6	2016
15	China Unicom Heilongjiang data center	2000	8	2017
16	Baidu building, Jishan information hub phase II, Nanjing Telecom	2000、2500	28	2017
17	IDC room in textile city of China Telecom Zhejiang company	2000	6	2017
18	Zhenhai Nordic Industrial Park data center of China Telecom	2000	10	2017
19	Jinhua Telecom Second Ring North Road Internet building data center	2000	5	2017
20	Shanghai Telecom Zhenru data center	2000、2500	12	2018
21	Qingdao Telecom Data Center	2000	12	2018
22	Xiamen Telecom Strait data center	2000	12	2018
23	Hangzhou Iron and steel cloud computing data center	2000	14	2018
24	China Telecom Zhejiang Information Park (Yuhang)	1600	6	2019
25	China Mobile Hangzhou Research Institute (Yuhang)	2000	4	2019
26	Guangxi Nanning data center of China ASEAN Information Park	2500、2000	16	2019
27	Xiong'an High Speed Rail Station	2500	12	2020
28	Huawei General Contracting Hubei Telecom Broadband R&D Center	2500	16	2020
29	Beijing Beijing Tianjin Hebei Data Center of China Telecom	2500、2000	64	2021

Service Network & Contact Information

CEEG adopts the national unified customer service hotline and the internet-based CCRP network platform as information communication and customer response platforms. We promise to provide feedback on customer opinions and suggestions within 24 hours. For urgent requirements such as customer maintenance and installation guidance services, 24 after-sales outlets across the country will immediately provide support and response.