



TENGYI ELECTRIC

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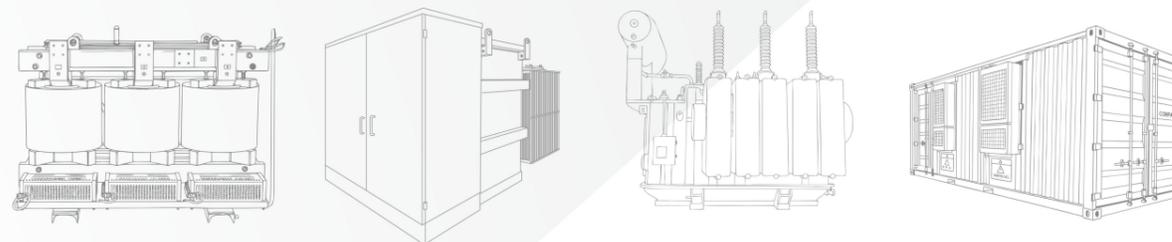
Product Brochuer

## CHINA TENGYI ELECTRIC

Innovative And Comprehensive Solutions

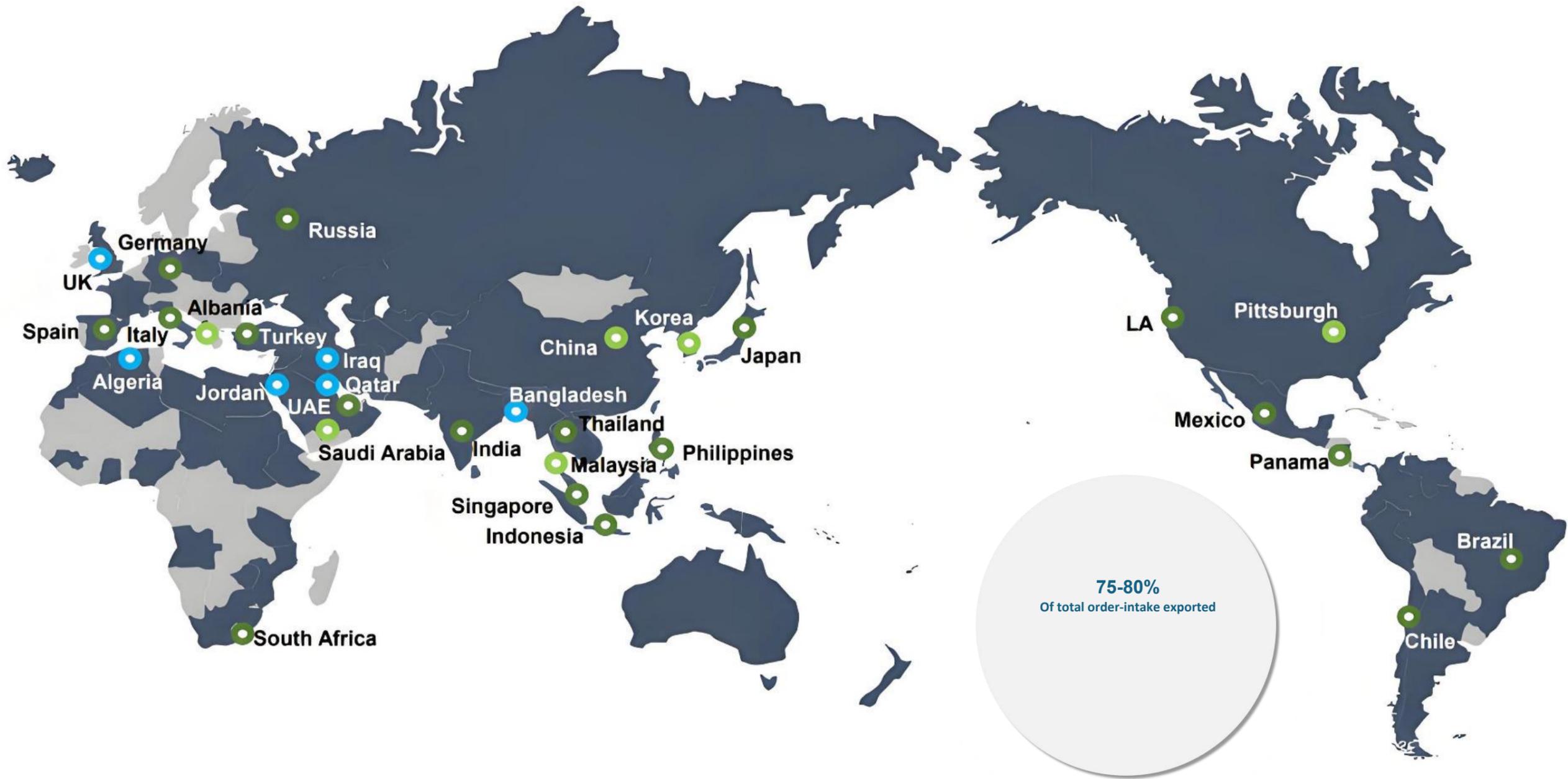
For The Generation,transmission And Distribution Of Electric Power.

[www.tengyielectric.com](http://www.tengyielectric.com) wahtsapp:+86 18239933006



## ABOUT US

We are a professional transformer manufacturer and electric equipment supplier, who has been working in electric industry for more than 20 years. Our advantage is that we can produce transformer based on multiple standards such as ANSI/IEEE, CSA, IEC, AS/NZ and etc You will get the quickest response and superior service being working with us.



Building transformer that Last 30+ Years of Durable Service Life for Global Power Partners.

# Quality Advantage

First-class craftsmanship, advanced equipment, and reliable raw materials - Tengyi Electric strictly controls every step of the transformer production process. We provide global customers with reliable transformer products with a lifespan exceeding 30 years.

## THREE MAJOR CONTROL SYSTEMS

### 2. Manufacturing

- At any stage, non-conforming products are detected through by QC engineers who issue NCRs.
- If NCR is not closed, the product can not be proceeded to the next operation.

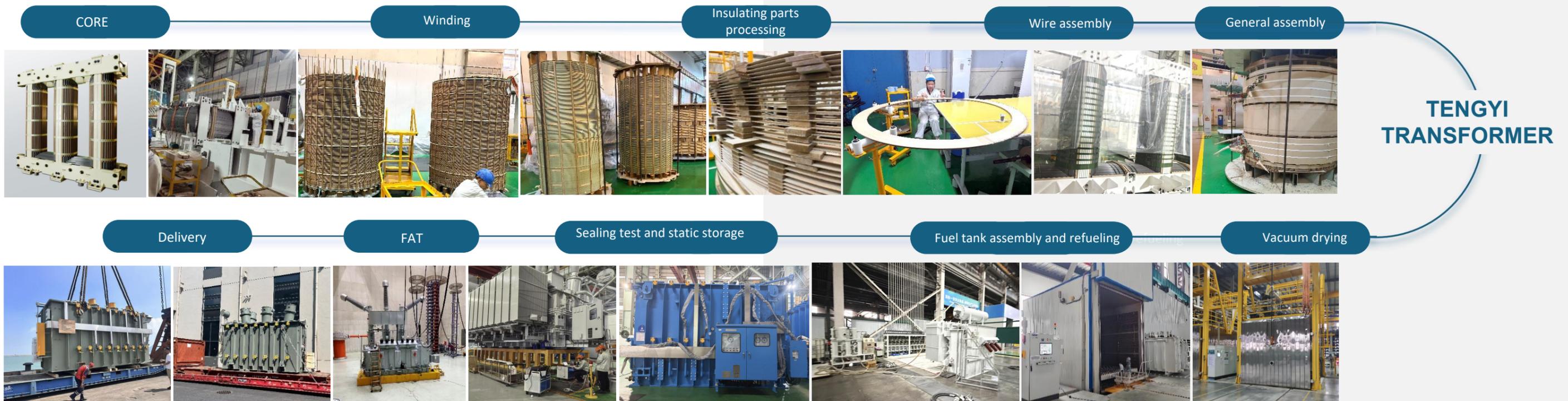
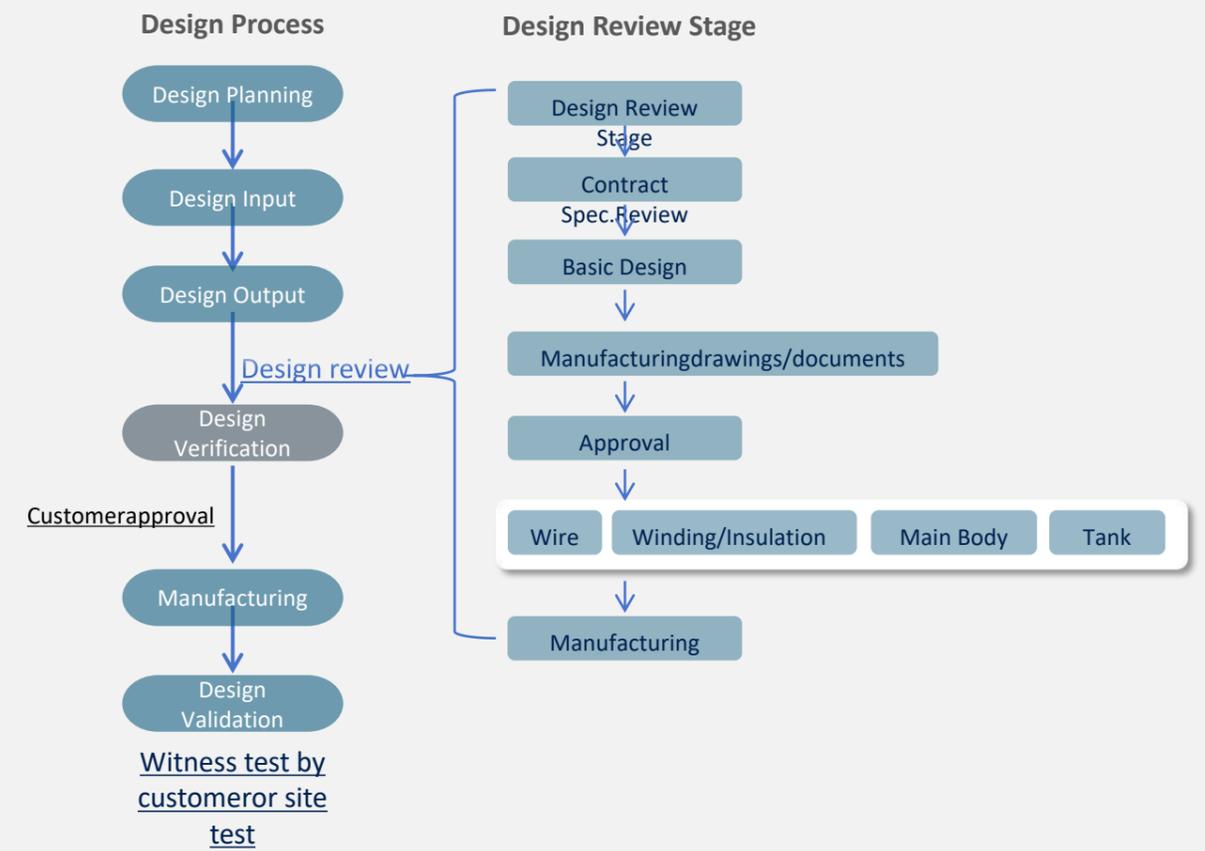


### 3. Material Procurement

- Effective Supplier Management
- Semi-annual supplier evaluation
- 3 strike-out for non-conforming material/component
- Approval after re-audit for new suppliers

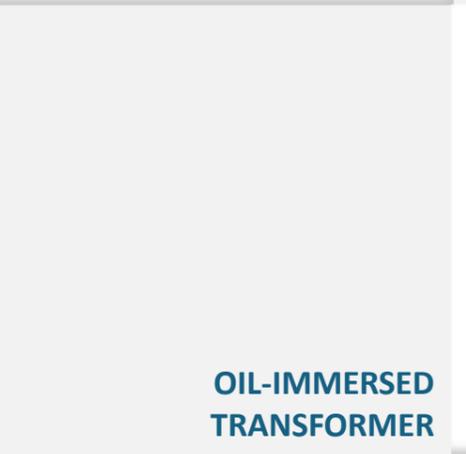
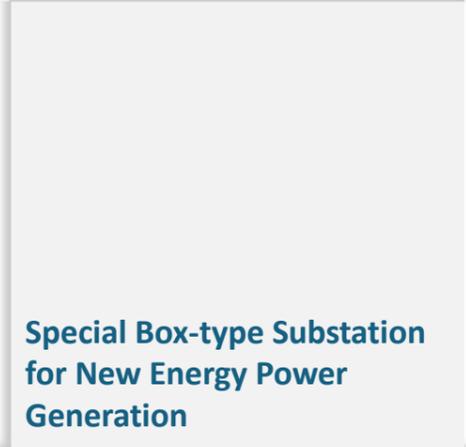
### 1. Design Review

- Preparation, review and approval of design document
- Distribution of drawing and revision control
- Design change request, review and approval
- of revised drawing



## Main Product List

Contact us to customize various transformer products according to your technical requirements. At the same time, we also offer OEM production services.

	<b>POWER TRANSFORMER</b>		<b>DRY-TYPE TRANSFORMER</b>		<b>PAD MOUNTED TRANSFORMER</b>
	<b>SINGLE PHASE PAD MOUNTED TRANSFORMER</b>		<b>OIL-IMMERSED TRANSFORMER</b>		<b>SINGLE PHASE POLE MOUNTED TRANSFORMER</b>
	<b>Special Box-type Substation for New Energy Power Generation</b>		<b>Compact Substation</b>	<b>OTHERS</b>	<b>Standard Accessories</b>

## PRODUCTS

### ● POWER TRANSFORMER 66KV-500KV



#### Characteritcs &Dimensions

##### Ratings

- Frequency: 60Hz 50Hz
- Capacity: 100 MVA and below
- High Voltage: 110kV and below
- Low Voltage: 35KV and below

Three(two)winding power transformer with OLTC(with off load is also available) Vehicle-mounted mobile transformer substation can also be made

Rated capacity (kVA)	Voltage ratio and taprange(KV)			Connection Symbol	No-load loss (kW)	F Full-load loss(kW)	No-load current (%)
	HV	MV	LV				
6300				YNynOd11 YNd11	8.9	44.0	0.66
8000					10.6	53.0	0.62
10000					12.6	62.0	0.59
12500					14.7	74.0	0.56
16000					17.9	90.0	0.53
20000	110	36	6.3		21.1	106.0	0.52
25000	115	37	6.6		24.6	126.0	0.48
31500	121	38.5	10.5		29.4	149.0	0.48
40000	±	±	21		34.8	179.0	0.44
50000	10×1.5%	10×1.5%			41.6	213.0	0.44
63000					49.2	256.0	0.40

We are able to make products up to 100MVA capacity, with MR,ABB or China top brand tap changer

### ● DRY-TYPE TRANSFORMER



#### Characteritcs &Dimensions

##### Ratings

- Frequency:60Hz 50 Hz
- Capacity:20MVA and below
- High Voltage:35kV and below
- Low Voltage:10kV and below

#### Three Phase

Capacity( KVA)	HV(K V)	Tap Range	LV( KV)	Vector Group	Short - Circuited Impedance( %)	No-load loss (W)	Loadloss(W)	No-load Current(%)	Insulation Class	Weight(kg)	Overall Dimension(mm)			Gauge( mm)	
											L	W	H		
30	6, 6.3, 10, 10.5, 11	±5% ±2*2.5%	0.4	Yyn0 Dyn11	4	190	710	2.3	F		900	660	760	550*550	
50						270	1000	2.2			360	1000	660	790	550*550
80						370	1380	1.7			470	1050	660	820	550*550
100						400	1570	1.7			520	1080	660	860	550*550
125						470	1850	1.5			620	1120	760	900	660*660
160						540	2130	1.5			790	1200	760	950	660*660
200						620	2530	1.3			880	1240	820	1100	660*720
250						720	2760	1.3			1000	1100	820	1160	660*720
315						880	3470	1.1			1120	1110	820	1240	660*720
400						980	3990	1.1			1360	1110	820	1360	660*720
500						1160	4880	1.1			1460	1140	820	1430	660*720
630						1340	5880	0.9			1530	1280	820	1350	660*720
630						1300	5960	0.9			1570	1280	820	1300	660*720
800						1520	6960	0.9			1850	1290	820	1430	660*720
1000						1770	8130	0.9			2320	1420	960	1480	820*910
1250						2090	9690	0.9			2690	1430	960	1620	820*910
1600						2450	11730	0.9			3130	1460	960	1750	1070*910
2000						3050	14450	0.7			3600	1900	1255	1940	1070*1205
2500	3600	17170	0.7	4560	2030	1255	2020	1070*1205							

1.We are able to design and make product up to 20MVA at 35kV

2.Cast resin transformer in amorphous iron core is also available by us

## PRODUCTS

### ● PAD MOUNTED TRANSFORMER



#### Characteritcs &Dimensions

##### Ratings

- Frequency: 60Hz 50Hz
- Capacity: 100 MVA and below
- High Voltage: 110kV and below
- Low Voltage: 35KV and below

##### Three Phase

Three(two)winding power transformer with OLTC(with off load is also available) Vehicle-mounted mobile transformer substation can also be made

Configuration	Power	W (mm)	H (mm)	D (mm)	W1 (mm)	D1 (mm)	D2 (mm)	H1 (mm)	Weight (kg)
Standard configuration	≤125kVA	2000	1582	1116	1180	503	575	1240	2000
	160~500kVA	2000	1580	1350	1330	503	655	1340	2950
	630kVA	2000	1710	1560	1420	632	775	1480	3400
	800kVA	2000	1710	1600	1420	632	775	1480	3000
	1000kVA	2000	1710	1820	1420	632	815	1480	4000
	1250kVA	2000	1710	1840	1560	632	795	1480	4800
Extra configuration	1600kVA	2205	1710	1920	1630	632	920	1530	5700
	≤125kVA	2200	1900	1240	1180	632	575	1240	2200
	160~500kVA	2200	1900	1474	1330	632	655	1340	3150
	630kVA	2200	1900	1560	1420	632	775	1480	3600
	800kVA	2200	1900	1690	1420	632	775	1480	3800
1000kVA	2200	1900	1780	1420	632	812	1480	4200	

We can also design and produce single phase pad mount transformer.

### ● SINGLE PHASE PAD MOUNTED TRANSFORMER



#### Characteritcs &Dimensions

##### Ratings

- Frequency: 60Hz
- Capacity: 10kVA to 333kVA
- High Voltage: 20kV and below
- Low Voltage: 120/240/277/480V

##### Single Phase 7620/13800V

Compliant with the IEEE C57.12 standard and the efficiency value of DOE 2016,also compliant CSA standard

CAPACITY (KVA)	8	(%)	(%)	CORE LOSS (W)	COPPER LOSS (W)	DIMENSION(MM)			OIL (L)	TOTALW.T (kg)
						W	D	H		
10	97.2	3	1.9	45	180	440	520	940	30	100
15	97.3	3	1.8	58	215	450	530	970	30	130
25	97.5	2.8	1.7	82	295	500	580	980	40	180
37.5	97.7	2.6	1.6	110	400	520	600	1000	40	220
50	98.1	1.9	1.5	140	490	540	630	1060	45	280
75	98.2	1.8	1.4	200	700	590	670	1100	55	380
100	98.3	1.7	1.3	260	900	680	680	1120	60	450
167	98.4	1.6	1.2	450	1500	710	800	1190	80	580
250	98.5	1.5	1.1	650	2250	980	950	1350	215	980
333	98.6	1.4	1.0	800	3000	1040	960	1400	240	1100

We are able to make products over 333kva for your demands.

## PRODUCTS

### ● OIL-IMMERSED TRANSFORMER



S-M series are energy-saving transformers, the iron cores are using high quality high permeability oriented silicon steel sheet, optimized design, making on-load loss ratio is 27% averagely lower than S11 type they are only next to a new generation of energy-saving products which are S(B)H15 type amorphous alloy transformers, so they have very high performance-price ratio. Apply to power plant (station), substation (power distribution station) and industrial, business, building etc.

Rated capacity (KVA)	Voltage Combination (KV)		Connection Symbol	No-load loss (kW)	Full-load loss (KW)	No-load current (%)	Impedance (%)	Weight(kg)		Outline Dimension(mm)			Gauge (mm)
	HV	LV						Oil Weight	Total Weight	L	W	H	
30	6 6.3 10 10.5 20 11 ±5% or ±2 x2.5%	0.4	Dyn11 Yyn0	80	630/600	2.3	4	65	290	740	550	900	400×400
50				100	910/870	2		75	370	780	530	940	400×400
63				110	1090/1040	1.9		85	440	800	540	980	400×400
80				130	1310/1250	1.9		95	505	840	620	1000	400×400
100				150	1580/1500	1.8		105	555	850	700	1020	400×400
125				170	1890/1800	1.7		115	645	860	680	1090	550×550
160				200	2310/2200	1.6		130	780	920	760	1110	550×550
200				240	2730/2600	1.5		140	855	930	860	1130	550×550
250				290	3200/3050	1.4		165	1000	1220	790	1180	550×550
315				340	3830/3650	1.4		190	1200	1290	840	1240	550×550
400				410	4520/4300	1.3		215	1380	1310	860	1290	660×660
500				480	5410/5150	1.2		240	1560	1390	910	1230	660×660
630				570	6200	1.1		280	1890	1480	940	1360	660×660
800				700	7500	1		350	2500	1580	980	1480	820×820
1000				830	10300	1		535	3110	1750	1100	1530	820×820
1250				970	12000	0.9		540	3630	1810	1180	1620	820×820
1600	1170	14500	0.8	655	4240	1890	1350	17250	820×820				

**Note:**

For rated capacity for 500 kVA and below transformers, above the diagonal values of loss of load application in Dyn11 connection group, below the diagonal load loss value applicable to Yyn0 connected node.

### ● SINGLE PHASE POLE MOUNTED TRANSFORMER



## Characteristics & Dimensions

### Ratings

- Frequency: 60Hz
- Capacity: 10kVA to 333kVA
- High Voltage: 20kV and below
- Low Voltage: 120/240/277/480V

### Single Phase 7620/13800V

Compliant with the IEEE C57.12 standard and the efficiency value of DOE 2016, also compliant CSA standard

CAPACITY (KVA)	$\eta$ (%)	$\epsilon$ (%)	$I_0$ (%)	CORE LOSS (W)	COPPER LOSS (W)	DIMENSION(MM)			OIL (L)	TOTAL WT (kg)
						W	D	H		
10	97.2	3	1.9	45	180	440	520	940	30	100
15	97.3	3	1.8	58	215	450	530	970	30	130
25	97.5	2.8	1.7	82	295	500	580	980	40	180
37.5	97.7	2.6	1.6	110	400	520	600	1000	40	220
50	98.1	1.9	1.5	140	490	540	630	1060	45	280
75	98.2	1.8	1.4	200	700	590	670	1100	55	380
100	98.3	1.7	1.3	260	900	680	680	1120	60	450
167	98.4	1.6	1.2	450	1500	710	800	1190	80	580
250	98.5	1.5	1.1	650	2250	980	950	1350	215	980
333	98.6	1.4	1.0	800	3000	1040	960	1400	240	1100

We are able to make products over 333kva for your demands.

## PRODUCTS

### ● Special Box-type Substation for New Energy Power Generation



#### ● Product Overview

The special-purpose box-type substation for new energy power generation is a type of high-voltage/low-voltage prefabricated substation (hereinafter referred to as the substation). It integrates high-voltage switchgear, transformer body, and protective fuses in an oil tank, together with low-voltage switchgear and corresponding auxiliary equipment. It is a special booster device that steps up the voltage from new energy grid-connected inverters (or AC generators) to 10kV or 35kV via a step-up transformer, then transmits the power to the grid through 10kV or 35kV lines. It is an ideal supporting equipment for new energy power generation systems.

#### ● Product Features

- **Compact & Efficient:** Small footprint, externally mounted radiators for optimal heat dissipation.
- **Safe & Reliable:** Fully sealed oil tank prevents oxidation and moisture ingress; IP54 protection for HV/LV compartments, IP68 for transformer body.
- **Smart & Durable:** Remote monitoring capability; shot-blasted cabinet resists corrosion, wind and sand.
- **High Performance:** Advanced circuit breakers with high breaking capacity and excellent protection.

#### ● Operating Conditions

- Ambient air temperature:  $-40^{\circ}\text{C} \sim +45^{\circ}\text{C}$
- Altitude:  $\leq 4500\text{m}$  (design for high altitude type when  $>2000\text{m}$ )
- Outdoor wind speed:  $\leq 35\text{m/s}$
- Relative humidity: Daily average  $\leq 95\%$ , monthly average  $\leq 90\%$
- Pollution class: II, III, IV
- Earthquake intensity: 8 degrees
- Installation site: Free from fire, explosion hazards, severe pollution, chemical corrosion, and severe vibration

### ● Compact Substation



#### ● Structural Features

The box-type substation consists of three parts: high-voltage compartment, low-voltage compartment, and transformer. As a prefabricated substation with a Hua-type structure, it is mainly used as a step-up box-type substation for new energy power generation. Its key structural difference from traditional box-type substations is that the transformer is placed outside the enclosure, which effectively solves the heat dissipation problem. Heat generated during transformer operation is quickly dissipated by natural air flow. The transformer is tightly connected to the substation enclosure via side outgoing lines, and a partition inside the enclosure separates it into high-voltage and low-voltage compartments. It is an ideal product for new energy power generation.

#### ● Electrical Features

The high-voltage side of the box-type substation can flexibly adopt technical solutions of vacuum circuit breakers or combined electrical appliances (load switch + fuse). These can be used as independent electrical units in 12kV and 40.5kV Hua-type box-type substations, featuring a rational structure and simple, reliable operation. Both the vacuum circuit breakers and combined electrical appliances (load switch + fuse) on the high-voltage side are equipped with mechanical interlocks to prevent misoperation. The combined electrical appliances (load switch + fuse) are also fitted with signal transmission devices, enabling real-time monitoring of their operating status and remote control functions from the backend.

#### ● Protection Class

This product operates in relatively harsh environments, requiring high resistance to wind and sand, as well as excellent thermal insulation and heat dissipation performance. The protection class must meet operational requirements to effectively protect internal components and extend their service life.

Component Protection Class Transformer unit I P68  
Substation enclosure Not less than IP54

## PRODUCTS

### ● European-Style ESS Inverter-Boost All-in-One Unit



#### ● Product Overview

The European-style energy storage inverter-boost integrated machine temporarily stores green energy such as solar and wind energy in the battery system, and when necessary, the energy storage inverter inverts and outputs it to the three-phase AC step-up transformer. It can effectively solve the instability and periodicity problems of wind and photovoltaic energy.

The integrated machine consists of an energy storage converter (PCS), bus bridge, low-voltage room (communication + power distribution), dry-type transformer, high-voltage room (equipped with vacuum load switch/circuit breaker), and the integrated machine housing.

#### ● Product Features

- Compact, highly integrated design with a small footprint
- Factory prefabricated, wired, and tested; delivered as a complete containerized unit
- Easy installation, low foundation cost, fast commissioning, minimal maintenance, unattended operation
- Internal dry-type transformer for stable, maintenance-free, fire-safe performance
- Corrosion- and UV-resistant enclosure with wind/sand protection
- Remote-controlled HV vacuum switch/circuit breaker for full protection

#### ● Operating Conditions

- Ambient installation temperature: -40~+45°C
- Altitude: ≤4500m (customized for high altitudes above 2000m)
- Outdoor wind speed: ≤35m/s
- Pollution class: Class II, III, IV
- Seismic intensity: 8 degrees

### ● American-Style ESS Inverter-Boost All-in-One Unit



#### ● Product Overview

The American-style energy storage inverter-boost integrated machine stores solar and wind energy in a battery system, and feeds it to a three-phase AC step-up transformer via an inverter when needed. It effectively addresses the instability and intermittency of wind and photovoltaic energy.

The unit consists of an energy storage converter (PCS), bus bridge, low-voltage room (communication + power distribution), oil-immersed transformer (with oil-immersed load switch + fuse), high-voltage room, and enclosure.

#### ● Product Features

- Compact, highly integrated design with a small footprint
- Factory prefabricated, wired and tested; delivered as a complete containerized unit
- Easy installation, low foundation cost, fast commissioning, minimal maintenance, unattended operation
- Oil-immersed transformer for high cost-performance, excellent heat dissipation and low noise
- Corrosion- and UV-resistant enclosure with wind and sand protection
- Oil-immersed load switch and full-range fuse protection for high-voltage section, ensuring safety, reliability and easy maintenance

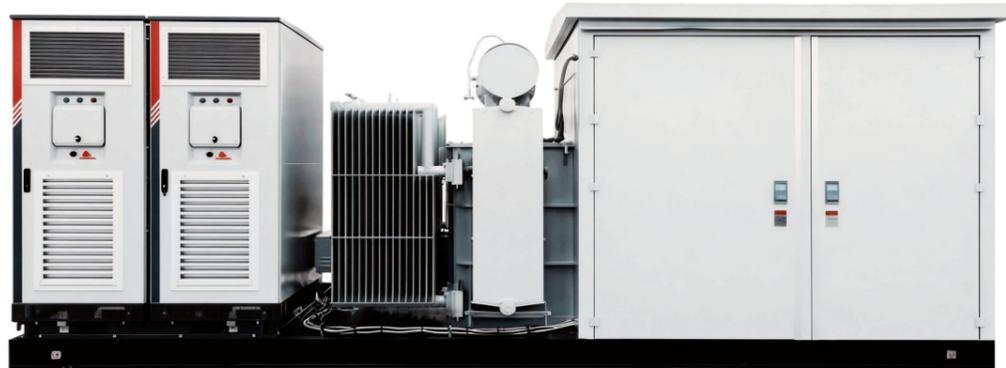
#### ● Operating Conditions

- Ambient installation temperature: -40~+45°C
- Altitude: ≤4500m (customized for altitudes >2000m)
- Outdoor wind speed: ≤35m/s
- Pollution class: II, III, IV
- Seismic intensity: 8 degrees

## PRODUCTS

### ● Chinese-Style ESS Inverter-Boost All-in-One Unit

An ideal supporting device for new energy energy storage systems



#### ● Product Overview

**Chinese-Style** Energy Storage Inverter and Boost Integrated Machine temporarily stores green energy such as solar and wind energy in the battery system, and inverts it through the energy storage inverter to the three-phase AC step-up transformer when necessary. It can effectively solve the problems of instability and periodicity of wind/photovoltaic energy.

The integrated machine consists of an energy storage inverter (PCS), busbar truss, low-voltage room (communication + power distribution), oil-immersed transformer, high-voltage room (equipped with vacuum load switch/circuit breaker), and the integrated machine housing.

#### ● Product Features

- Compact, highly integrated, small footprint
- Factory prefabricated and shipped as a containerized unit
- Easy installation, low civil cost, fast commissioning, low maintenance, unattended operation
- Oil-immersed transformer: high cost-performance, excellent heat dissipation, low noise
- Corrosion- and UV-resistant enclosure, wind/sand proof
- Remote-controlled vacuum load switch/circuit breaker for full protection

#### ● Operating Conditions

- **Ambient temperature:** -40~+45°C
- **Altitude:** ≤4500m (customized for >2000m)
- **Outdoor wind speed:** ≤35m/s
- **Pollution class:** II, III, IV
- **Seismic intensity:** 8 degree

### ● Energy Storage Converter & Booster Integrated Cabin

Cutting-edge equipment for deep integration of PV, storage, and charging



#### ● Product Overview

The Energy Storage Inverter & Boost Integrated Cabin integrates an inverter system, transformer system, photovoltaic system, and charging system, enabling energy conversion between storage batteries, PV panels, and the power grid. It stores wind and PV energy in batteries during off-peak hours and serves as a power supply during peak demand or grid outages, effectively mitigating the volatility and intermittency of renewable energy, improving utilization efficiency, and supporting grid load shifting. Additionally, it integrates EV charging pile functionality to provide stable, efficient, and reliable power for new energy vehicles.

#### ● Product Features

- All-in-one design with high/low-voltage, monitoring, fire protection, and more.
- Combines DC inversion and AC boosting in a standard 10ft/20ft prefab cabin for easy installation.
- Durable for harsh environments like high-altitude, cold, coastal, and desert areas.
- Cell-level temperature control boosts efficiency and battery lifespan.
- Modular design enables auto-balancing and easy expansion.
- Multi-layer monitoring and PACK-level fire protection ensure safety.

#### ● Operating Conditions

- **Location:** Outdoor
- **Altitude:** ≤4500m (customized for >2000m)
- **Temperature:** -40°C ~ +45°C
- **Pollution Class:** III
- **Seismic Resistance:** 8 degrees
- **Protection Class:** IP33D, IP54

## PRODUCTS

### ● Inverter and Booster Integrated Box-Type Substation

Effectively resolves conflicts between power supply, land use and the environment



#### ● Product Overview

- The Inverter & Boost Integrated Compact Substation is an all-in-one solution for photovoltaic systems, eliminating the need for separate DC inversion and AC boosting equipment. It reduces construction work and power loss by integrating low-voltage, high-voltage, and transformer sections in a compact, space-saving layout.
- This unit converts PV-generated DC power into stable, usable high-voltage AC, with built-in protection and metering for reliable performance.

### ● Prefabricated Cabin Substation

Flexible site selection, high factory integration, and lower overall construction cost



#### ● Product Overview

The main function of the Prefabricated Cabin Substation is to convert low-voltage AC power generated by power generation systems in the new energy sector into medium-voltage AC power and feed it into the grid. This substation integrates low-voltage cabinets, transformers, ring main units, auxiliary power supplies, and other equipment into a steel-structured container, providing a highly integrated power transformation and distribution solution for medium-voltage grid connection scenarios in ground power stations.

#### ● Product Features

- **Smart**  
Real-time monitoring of the operating status of low-voltage cabinets, transformers, and ring main units. Online detection of electrical parameters, with current and voltage measurement accuracy up to Class 0.5. Supports remote control of the main circuit breakers in low-voltage cabinets and ring main units, as well as remote query of the substation's operational information.
- **Simple**  
Internal equipment is prefabricated and pre-installed. Compact 20ft container structure, adaptable to various transportation conditions and easy to install.
- **Reliable**  
Robust and reliable structural design. Protection class of low-voltage and medium-voltage compartments: IP54.
- **Rapid Deployment**  
Enables quick deployment. Only low-voltage incoming and medium-voltage outgoing connections are required on-site.

## PRODUCTS

### ● Primary Equipment Prefabricated Cabin

New-type intelligent and automated equipment



#### ● Product Overview

The Primary Equipment Cabin is an indispensable key component of the power system. Its core function is to isolate, connect, break, switch, and protect electrical circuits. It integrates circuit breakers, disconnectors, load switches, instrument transformers, surge arresters, earthing switches, control devices, measuring instruments, and other electrical components to jointly monitor, regulate, and ensure the safe operation of the power system.

#### ● Product Features

- **Functional Integration:** The cabin cleverly integrates power supply, distribution, and control functions into one unit, achieving comprehensive functional integration and improving system efficiency.
- **High Intelligence:** Adopting advanced sensors, measurement, communication, and information processing technologies, it enables intelligent, automated, and highly efficient operation of the power system.
- **Durability:** The cabin resists environmental factors such as rust and corrosion during long-term use, ensuring continuous and stable operation.
- **Compact & Convenient:** Designed following standardized principles, it integrates circuit control elements into a compact unit. It is easy to install, not restricted by site conditions, and convenient for daily inspection and control.
- **Safety:** With an integrated design, connections between devices are tighter, reducing failure rates. All equipment inside the prefabricated cabin uses high-quality products, further enhancing the reliability of the power system.
- **Energy Saving & Environmental Protection:** Equipped with high-efficiency energy-saving transformers and other devices, it reduces energy consumption. The prefabricated cabin's enclosure uses environmentally friendly materials, minimizing environmental impact.

#### ● Operating Conditions

- **Ambient Installation Temperature:** -40~+45°C
- **Altitude:** ≤4500m (customized for high altitude above 2000m)
- **Outdoor Wind Speed:** ≤35m/s
- **Pollution Class:** II, III, IV
- **Seismic Intensity:** 8 degrees

### ● Secondary Equipment Prefabricated Cabin

New-type intelligent control equipment



#### ● Product Overview

The Secondary Equipment Cabin integrates secondary equipment, cabin structure, HVAC, lighting, fire protection, security, and imaging systems into one unit. Following the principles of safety, applicability, universality, and economy, it uses containerized secondary combined equipment to achieve "standardized design, factory prefabrication, and assembled construction". This effectively shortens the project cycle, improves construction efficiency and quality, and delivers energy savings, land savings, and environmental protection.

#### ● Product Features

- **Highly Integrated:** Combines secondary equipment, HVAC, lighting, and fire protection in a compact layout, significantly reducing footprint and installation work while improving construction efficiency and quality.
- **Modular Design:** Available in standard 20ft, 30ft, and 40ft container sizes, it supports customization and expansion for easy maintenance, upgrades, and scalability to meet unique user needs.
- **Efficient Operation:** Enables fast monitoring and control tasks, with efficient heat dissipation and optimized electrical layout ensuring stable performance even in harsh environments.
- **High Reliability:** Features a robust structure and comprehensive protection to resist environmental interference and damage, ensuring safe and stable operation.
- **Intelligent Control:** Supports automated operation and remote control, enabling remote monitoring and management via an intelligent system for enhanced efficiency and convenience.

#### ● Operating Conditions

- **Ambient Installation Temperature:** -40~+45°C
- **Altitude:** ≤4500m (customized for altitudes >2000m)
- **Outdoor Wind Speed:** ≤35m/s
- **Pollution Class:** II, III, IV
- **Seismic Intensity:** 8 degrees

## PRODUCTS

### ● All-in-One Energy Storage Cabinet ESS3-100-215

Independently developed, safe and controllable, with efficient iteration



#### Product Parameter

AC Side		DC Side	
Parameter	Value	Parameter	Value
Grid Voltage	400Vac	Grid Voltage	400Vac
Connection Mode	3-phase 4-wire	Connection Mode	3-phase 4-wire
Rated Power	100kW	Rated Power	100kW
Rated Current	150A	Rated Current	150A
Frequency	50/60Hz	Frequency	50/60Hz
Power Factor	1 (Leading) ~ 1 (Lagging)	Power Factor	1 (Leading) ~ 1 (Lagging)

Parameter	Value	Parameter	Value
Isolation Mode	Non-isolated	Max Efficiency	≥87%
Dimension (W×H×D)	1000×2400×1300mm	Weight	~2500kg
Depth of Discharge	≤90% DOD	Temperature Control	Liquid Cooling & Heating
Operating Temp.	-20°C ~ +50°C	Noise	≤75dB
Lifespan	6000 cycles @25°C, 0.5CP	IP Rating	IP55
Altitude	≤2000m (derating above)	Fire Protection	Perfluorohexanone + Multi-sensor Detection

#### ● Product Overview

- The 100kW/(215–261kWh) full liquid-cooled energy storage cabinet uses a unified wind-liquid cooling design. It integrates battery, BMS, PCS, EMS, and fire protection systems, and supports peak shaving, load management, and dynamic expansion for flexible deployment.

#### ● Product Features

- Safe & Reliable:** Uses long-life LFP batteries and advanced BMS, with multi-level protection and a fire suppression system for stable operation.
- Flexible Expansion:** Modular design enables on-demand deployment, rapid scaling, and high space efficiency.
- Easy Maintenance:** Modular battery packs allow single-sided servicing; intelligent monitoring quickly locates faults.
- Technical Advantages:** Intelligent temperature control for outdoor use, supports grid-tied operation, low voltage ride-through, and full event logging.
- Full Liquid Cooling:** Both converter and battery pack use liquid cooling. At 45°C ambient, it maintains 18°C supply temp, 5kW cooling capacity, and EER 2.63, keeping batteries <40°C with <3°C cell-to-cell variance.

#### ● Application Scenarios

- Basic: Single cabinet grid-tied
- Multiple cabinets grid-tied (up to 8 units, optional accessories)
- Single/multiple cabinets off-grid (optional accessories, <200kW total)
- Grid dispatch (requires software upgrade)
- Anti-reverse flow & transformer protection (requires CTs and meters)

### ● All-in-One Energy Storage Cabinet ESS5-30-52

Independently developed, safe and controllable, with efficient iteration



Item	Standard Version
Capacity	43kWh (with 280Ah - 48 strings), 46.6kWh (with 280Ah - 52 strings), 52kWh (with 314Ah - 52 strings)
Rated Power	30kW
Charge/Discharge Rate	0.5C
Battery Type	LiFePO <sub>4</sub> , 280~320Ah, compliant with GB/T 36276
Battery Dimensions	Width: 173.9±0.8mm Height: 207.2±0.8mm Thickness: 71.7±0.8mm
Cycle Life	≥6000 times
Efficiency	≥82%
Operation Mode	Grid-tied, Off-grid
Charge/Discharge Switching Time	100ms
Protection Grade	IP54
Dimensions	Length 1300mm, Width 1000mm, Height 1360mm
Operating Temperature	-20~50°C
Operating Humidity	5%~95% (no condensation)
Operating Noise	≤75dB
Operating Altitude	≤3000m
Cooling Method	Battery Pack: Liquid cooling; PCS: Air cooling
Pack Quantity	1
Rated AC Voltage	380~400V
Wiring Method	Three-phase three-wire or three-phase four-wire
Fire Protection	Perfluorohexanone or aerosol
BMS	Compliant with GB/T 34131
PCS	Compliant with GB/T 34120 and GB/T 34133, supports grid-tied and parallel expansion operation
EMS	Supports local setting operation, implements fixed time-of-use peak-valley tariff strategies. Supports uploading data, events, and alarms to the EMS system via LAN port using 104 or MQTT protocol.

#### ● Product Overview

- This 50kWh high-end liquid-cooled PACK cabinet fills a global product gap. It doubles as a stacking base for industrial equipment and supports peak-valley arbitrage in low-power commercial/industrial scenarios.

#### ● Product Features

- Safe & Reliable:** Long-life LFP batteries + advanced BMS, with multi-level protection and fire suppression for stable operation.
- Flexible Expansion:** Modular, highly integrated design for on-demand deployment and rapid scaling.
- Easy Maintenance:** Single-sided servicing via modular battery packs; intelligent monitoring for quick fault location.
- Technical Advantages:** Outdoor-ready with intelligent temperature control, grid-tied support, low voltage ride-through, and full logging.
- Intelligent Liquid Cooling:** 48/52-string design maintains ≤20°C supply temp at 45°C ambient, with 1kW cooling capacity and EER ≥2.6. Batteries stay <40°C, cell variance <3K.

#### ● Application Scenarios

- Small industrial peak-valley arbitrage & backup power
- Power for charging vehicles and medium equipment
- Large-scale energy storage for overseas users

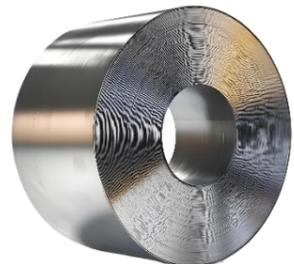


**Corrugated tank**

A corrugated tank is often used as the outer casing of transformers. Its walls have a wavy, corrugated design, which increases the surface area for better heat dissipation. The corrugations also provide flexibility to accommodate the expansion and contraction of transformer oil due to temperature changes, helping to reduce internal pressure.

**Enameled Wire**

Enameled copper (aluminum) rectangle wire consists of a copper or aluminum conductor shaped into a rectangular cross-section and coated with an insulating enamel layer. It is widely used in transformers, motors, and reactors, offering advantages such as compact coil winding, better space utilization, excellent electrical properties, and improved heat dissipation.



**CRGO & HIB Steel**

The product complies with national and international standards. It can be customized in thickness (0.1 - 0.5mm) and specifications, meeting the requirements of the power and new energy fields. Using silicon steel sheets, it enables efficient energy conversion with outstanding performance!

**Iron Core**

This product is suitable for scenarios such as 10kV-500kV power transformers and new energy inverters, and supports customized non-standard sizes. It offers flexible selection and outstanding performance, helping to achieve efficient energy conservation in power transmission and transformation systems!



**On Load Tap changer**

OLTC is used when continuous voltage variation on load is required or to maintain the secondary voltage even when the primary voltage fluctuates. Hyundai Electric is using resistive jansen type OLTC which is in the most common use globally.

**Temperature**

- Oil Temperature Indicator .Indicates the maximum temperature in Oil. Winding Temperature Indicator Indicates the maximum temperature in winding



**Bushing**

The bushing is selected according to the insulation class, current, color and current transformer of the bushing. . Up to 30 kV class : Solid Type. 60 kV class and over : Condenser bushing. Otherwise stated, products of Hyundai Electric follow the IEC standards and the standard color is brown.

**Oil Level Indicator**

The Oil Level Indicator is an apparatus to indicate the oil level of oil immersed transformer tank or conservator. Small Transformer : Prismatic type Oil Level Indicator-Medium & Large Transformer : Dial type Oil Level Indicator



# PRODUCTS



## Buchholz Relay

It is installed at the middle of the connection pipe between conservator and tank. Whenever an abnormality such as gas generation and rapid increase in pressure occurs, the contact inside the relay activates.

## Dehydrating Breather

Dehydrating breather is used to minimize the contact between oil and atmospheric moisture. The size of this device is determined according to oil volume. The moisture absorbent (Silica gel) can be reused after drying. The dehydrating breather is connected to transformer tank or conservator through pipe line and located at a suitable height to check the breather at the standing point of operator.



The accessories are carefully selected by our design team to meet your specific technical requirements, featuring both domestic and international brands with tailored models and functions. We're here to ensure every detail aligns perfectly with your needs.

- CORE
  -   
- Steel Plate
  -  
- Coil
  -  
- Bushing
  -   

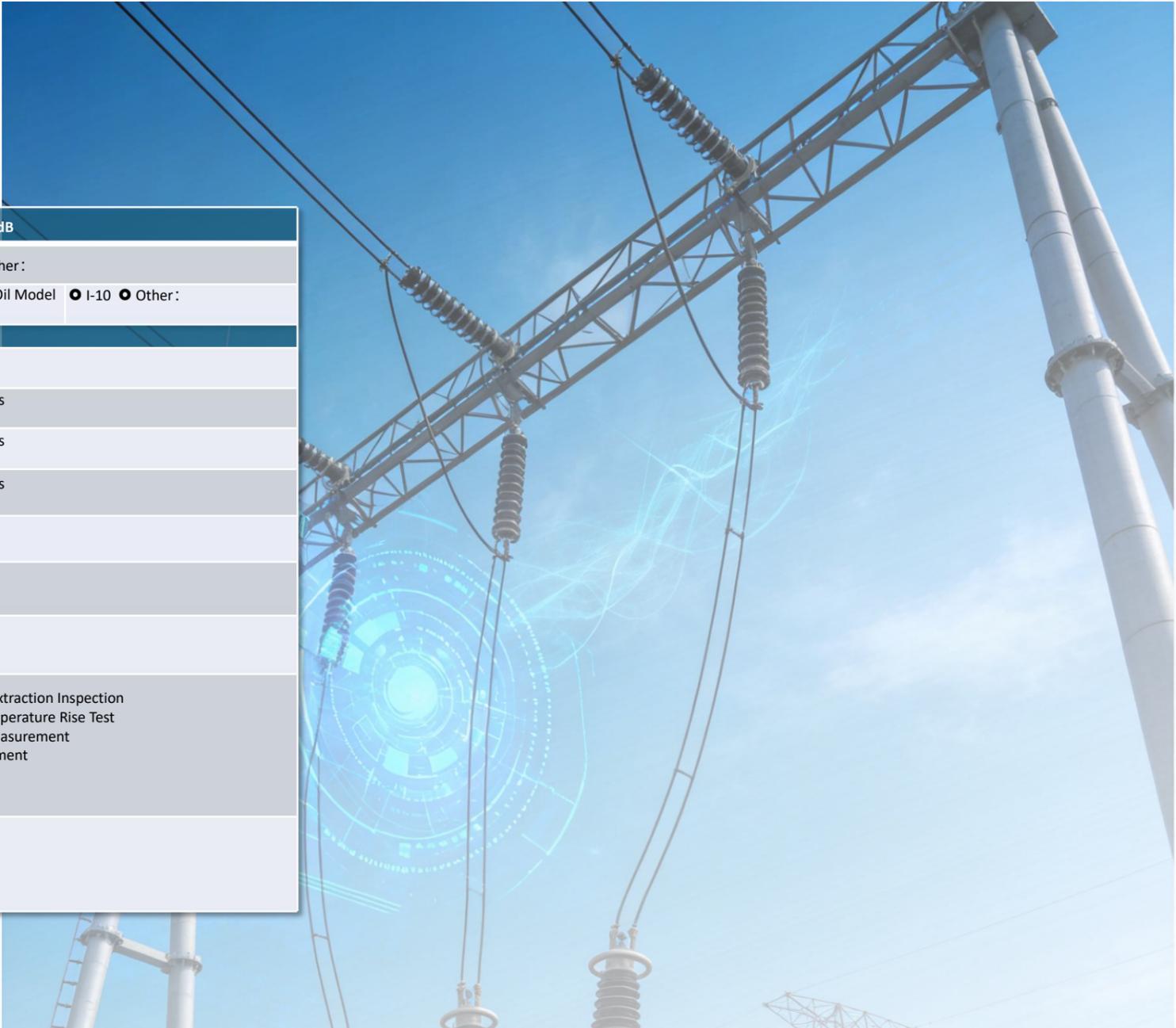
- Tap Changer
  -    
- Insulation
  -   
- Oil
  -    
- Relay
  -    
  -   

## Partial presentation of implemented projects



# Product Technical Specifications

		Noise	<input checked="" type="radio"/> IEC60076 Standard <input type="radio"/> Other: ___dB
Frequency*	<input checked="" type="radio"/> 50Hz <input type="radio"/> 60Hz <input type="radio"/> Other:	Insulating Oil Type	<input checked="" type="radio"/> Mineral oil <input type="radio"/> Vegetable oil <input type="radio"/> Other:
Phase*	<input type="radio"/> Single-phase <input checked="" type="radio"/> Three-phase	Insulating Oil Brand	Insulating Oil Model <input type="radio"/> I-10 <input type="radio"/> Other:
Number of Windings*	<input type="radio"/> Double-winding <input type="radio"/> Double-winding secondary splitting <input type="radio"/> Three-winding	Accessories	
Material of Winding*	<input checked="" type="radio"/> Copper (CU) <input type="radio"/> Aluminium (AL)	Tap Changer	<input checked="" type="radio"/> Specified Brand:
Tap-Changer for Voltage Regulation	<input checked="" type="radio"/> On-Load Tap-Changer (OLTC) <input type="radio"/> Off-Circuit Tap-Changer <input type="radio"/> Other:	Oil level gauge	<input type="radio"/> With Contacts <input type="radio"/> Without Contacts <input checked="" type="radio"/> Specified Brand:
Tapping Range	<input checked="" type="radio"/> ±2×2.5% <input type="radio"/> ±3×2.5% <input type="radio"/> Other:	Gas relay	<input type="radio"/> With Contacts <input type="radio"/> Without Contacts <input checked="" type="radio"/> Specified Brand:
Vector Group*	<input checked="" type="radio"/> Dyn11 <input type="radio"/> Yyn0 <input type="radio"/> Yd11 <input type="radio"/> YNd11 <input type="radio"/> Dy11y11 <input type="radio"/> Other:	pressure relief valve	<input type="radio"/> With Contacts <input type="radio"/> Without Contacts <input checked="" type="radio"/> Specified Brand:
Impedance Voltage*	<input checked="" type="radio"/> IEC60076 Standard <input type="radio"/> IEEE <input type="radio"/> Other: %	Oil Thermometer	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Specified Brand:
Impedance Tolerance Range	<input checked="" type="radio"/> IEC ≤10(±7.5%) <input type="radio"/> IEC > 10(±10%) <input type="radio"/> IEEE (±7.5%) <input type="radio"/> Not required <input type="radio"/> Other:	Winding Thermostat	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Specified Brand:
Loss Standard/ Energy efficiency rating	<input checked="" type="radio"/> IEC L1 <input type="radio"/> Tiers2 <input type="radio"/> Not required <input type="radio"/> DOE <input type="radio"/> Other:	Current Transformer	<input type="radio"/> Yes <input type="radio"/> No
No-Load loss	W	Factory Acceptance Test	<input checked="" type="radio"/> Sealing Integrity Test <input type="radio"/> Core Extraction Inspection <input checked="" type="radio"/> Voltage Ratio Measurement <input type="radio"/> Temperature Rise Test <input type="radio"/> No-load loss and no-load current measurement <input type="radio"/> Load loss and load current measurement <input type="radio"/> Winding Resistance Measurement <input type="radio"/> Other:
Efficiency Requirements	%	Other Requirements	
Loss tolerance	<input checked="" type="radio"/> Positive Deviation: ___% <input type="radio"/> Negative Deviation		
Insulation and Heat Resistance Rating*	<input checked="" type="radio"/> A (105°) <input type="radio"/> E(120°) <input type="radio"/> B(130°)		
Temperature rise*	Top Oil Winding		
Insulation Level (Applicable or not)	Primary : ___kV, LI: ___kV, LIC: ___kV, AC: ___kV Secondary : ___kV, LI: ___kV, LIC: ___kV, AC: ___kV Tertiary : ___kV, LI: ___kV, LIC: ___kV, AC: ___kV		



## ● Ordering Instructions for Energy Storage Projects

Serial No.	Items to Confirm	Specific Confirmation Content	Remarks
1	High Voltage Scheme	Confirm the details of the high voltage scheme corresponding to the energy storage project	Core basic parameters; the scheme specifications must be clarified
2	Transformer Parameters	1. High voltage rated voltage; 2. Rated capacity; 3. Energy efficiency standard	All three parameters must be clarified to avoid inconsistent specifications
3	Battery Cabin Power Supply Power	Confirm the AC side power supply power required for the battery cabin	Match the operation needs of the battery cabin and accurately calculate the power
4	Measurement Requirements	1. Whether there are measurement requirements; 2. If yes, distinguish between self-use/assessment use; 3. Clarify the measurement range	The purpose and range of measurement must be clarified to facilitate the configuration of corresponding measurement equipment
5	Integrated Machine Power Supply	Confirm whether the integrated machine needs dual power supply (whether to configure a dual power switch)	The configuration requirement of the dual power switch must be confirmed simultaneously
6	Brand Requirements for Internal Components of Box Transformer	Confirm whether the user has designated brands for internal components of the box transformer (such as switch brand, high voltage cabinet brand, etc.)	If there is no designation, configure according to conventional standards; if there is a designation, the brand and model must be clarified

## ● Ordering Instructions for Photovoltaic Projects

Serial No.	Items to Confirm	Specific Confirmation Content	Remarks
1	High Voltage Scheme	Confirm the details of the high voltage scheme corresponding to the photovoltaic project	Core basic parameters; the scheme specifications must be clarified
2	Transformer Parameters	1. High voltage rated voltage; 2. Rated capacity; 3. Energy efficiency standard	All three parameters must be clarified to avoid inconsistent specifications
3	Measurement Requirements	1. Whether there are measurement requirements; 2. If yes, distinguish between self-use/assessment use; 3. Clarify the measurement range	The purpose and range of measurement must be clarified to facilitate the configuration of corresponding measurement equipment
4	Inverter Integration Requirements	Confirm whether the inverter needs to be integrated on the box transformer base	Integration of the inverter on the box transformer base is not recommended
5	Inverter Parameters	1. Number of inverters; 2. Power of a single inverter	Both parameters must be clarified to match the needs of the photovoltaic project
6	Brand Requirements for Internal Components of Box Transformer	Confirm whether the user has designated brands for internal components of the box transformer (such as switch brand, high voltage cabinet brand, etc.)	If there is no designation, configure according to conventional standards; if there is a designation, the brand and model must be clarified

## ● STRATEGIC COOPERATION

GridFort Solutions Group, Securing the Foundations of Tomorrow's Energy. We underpin critical infrastructure modernization, deploying resilient grid-to-generation architectures and ensuring seamless delivery from blueprint to lasting operation.

