



AMPER POWER

Innovate, Integrate, Illuminate

GUANGDONG AMPER POWER TECHNOLOGY CO LTD

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GUANGDONG AMPER POWER
TECHNOLOGY CO LTD

TRANSFORMER CATALOGUE

An Innovation-Integration-Intelligent Power Consumption Solution Provider



TRANSFORMER CATALOGUE

TRANSFORMER CATALOGUE

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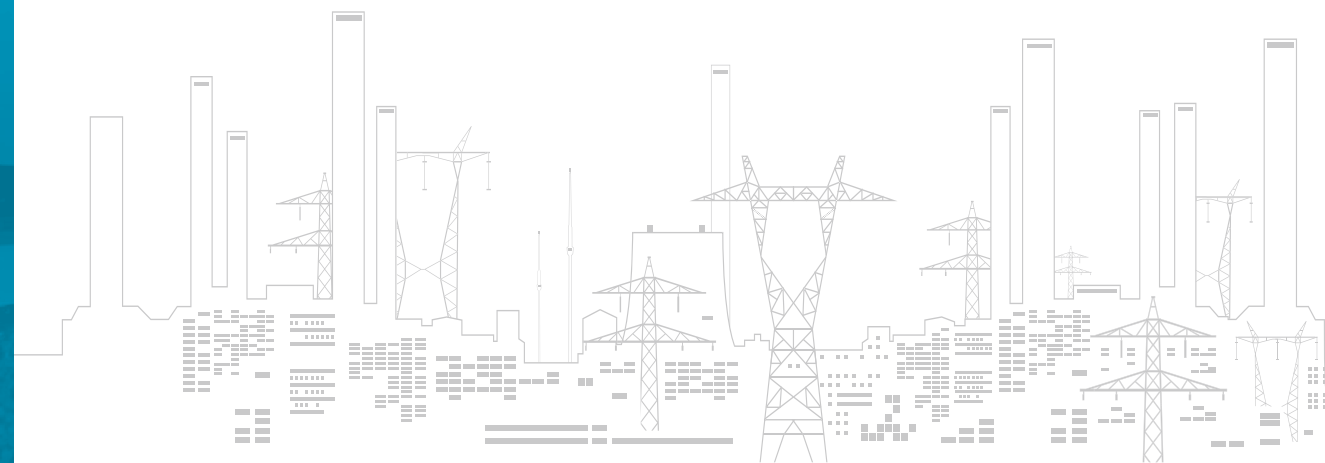
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VISION

To be the trusted leader in power consumption solutions, uniting innovation, integration, and intelligence.

MISSION

Empowering sustainable energy futures through innovation and integrated solutions.

CORE VALUES

Act with Integrity, Collaborate without Limits, Innovate without Fear.

PROFILE · AMPER POWER

Guangdong Amper Power Technology Co., Ltd. is a joint venture established by Singapore-based RELIANT INTERNATIONAL ENGINEERING PTE. LTD (with its domestic subsidiary GUANGDONG RELIANT M&E ENGINEERING CO.,LTD) and Amper Electric (China) Co., Ltd with shareholdings of 70% and 30%, respectively. Leveraging RELIANT INTERNATIONAL's over 20 years of global EPC design and customer service expertise, as well as Amper Electric's two decades of production experience, the company is committed to expanding its range of power products, particularly in the field of new energy project power equipment, to further develop sales channels and optimize industrial structure.

Amper Power Technology is a modern enterprise integrating R&D, production, sales, and service, specializing in providing power equipment and solutions. Equipped with state-of-the-art facilities and a team of highly skilled management professionals, the company has established a comprehensive sales and information network across the nation and beyond. Our technical service team is capable of responding to customer needs in major countries and regions across five continents within 24 hours.

With a proven track record of successful projects, such as the Singapore Changi Airport generator set project, the Philippines package substation project, the Singapore Ministry of Defense oil transformer replacement project, and more, AMPER POWER has emerged as a leader in the power equipment industry. Our main products include generator sets, new energy storage equipment, high and low voltage switchgear, combined substations (American-style box transformers), prefabricated substations (European-style box transformers), 35kV and below wind and photovoltaic power generation Chinese-style box transformers, and technical development services for new power products.



Amper Electric (China) Co., Ltd, one of the shareholders, was established in June 2006, and is located in the High-tech Zone (DaWang), Zhaoqing, Guangdong, China. The manufacturing facility covers an area of 66,600 m², with a registered capital of RMB 220 million (USD 33 million). Specializing in the production, research, and development of power transformers and switchgears, the company is a permanent member of the Guangdong Machinery Industry Association and the Guangdong Electric Industry Association. The company's main products include:

- Oil-Immersed Power Transformers (up to 110 kV)
- Amorphous Alloy Transformers
- Prefabricated Substations
- Photovoltaic Prefabricated Substations
- Rectifier Transformers
- Resin Cast Dry-Type Transformers (up to 35 kV)
- Pad Mounted Transformers
- Wind Power Prefabricated Substations

CERTIFICATES

COMPANY HISTORY

2006

Amper Electric (China) Co., Ltd. was founded; the first transformer (TR) was produced.

2008

Prefabricated substations and LV/MV switch panels were launched.

2010

A 20,000 kVA large-capacity oil-immersed transformer was produced.

2016

The total sales capacity of transformers reached 25 million kVA.

2019

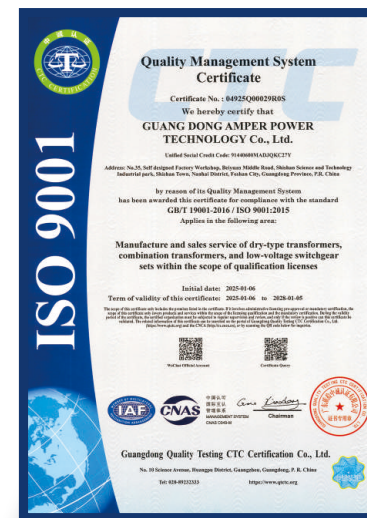
Dry-type and oil-immersed transformers were exported to Singapore.

2022

A prefabricated substation (6,350 kVA) was exported to Europe.

2024

Amper Power Technology Co., Ltd. was established, focusing on overseas markets.



CE certification (Europe)



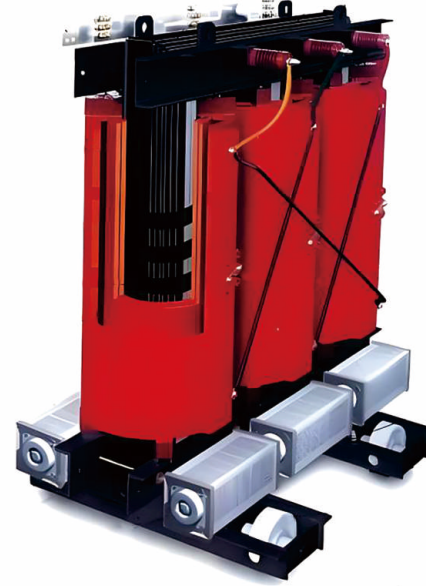
TUV Test Report of Oil-immersed Transformer



Type Test Report of Dry-type Transformer

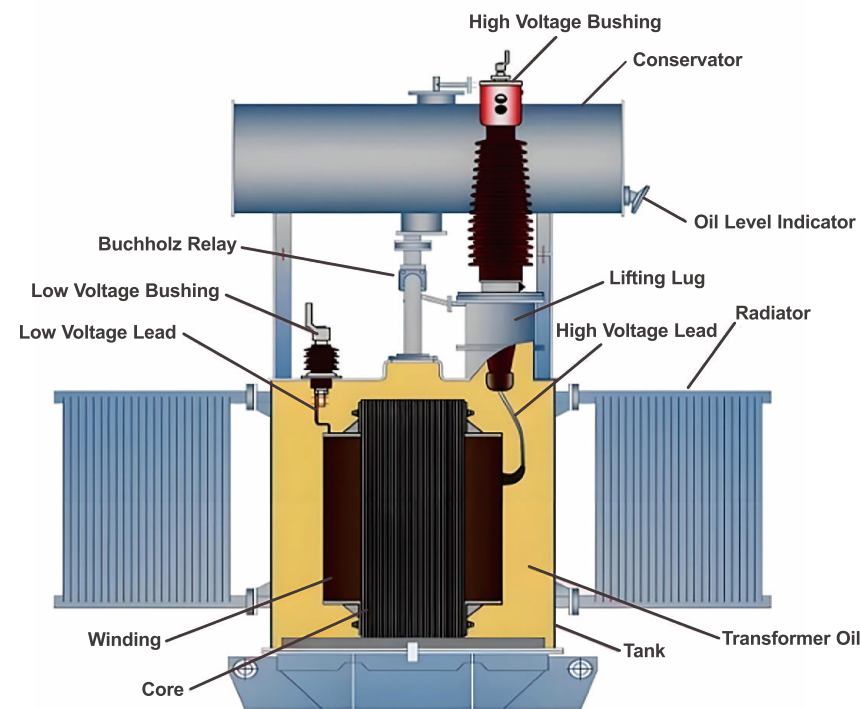
Dry Type Transformer

- **Safe, Pollution-Free, and Fire-Resistant:** The transformer can be installed in load centers. It is maintenance-free, easy to install, and has low operating costs.
- **Highly Moisture-Resistant:** The transformer can operate normally at 100% relative humidity and can be energized without pre-drying, even after prolonged service interruptions.
- **Low Partial Discharge, Low Losses, Low Noise, and Efficient Heat Dissipation:** With a forced air-cooling system, the transformer can operate at up to 140% of its rated capacity for emergency situations.



Oil-Immersed Transformer

- **Safe and Easy Installation:** Designed for straightforward and secure setup.
- **Energy-Efficient and Cost-Effective:** Features low losses, high efficiency, and reduced operating costs.
- **Low Partial Discharge, Low Noise, and Efficient Heat Dissipation:** Ensures reliable performance with minimal environmental impact.
- **Corrosion Protection (Up to C5) and High Protection Level (Up to Ip68):** Provides durability in harsh conditions.
- **Advanced Temperature Monitoring System:** Guarantees safe and reliable operation of the transformer.



Protection System Overviews

Dry type transformer temperature control system

Temperature Control System

The temperature control system integrates temperature measurement and control functions. It utilizes a temperature sensor (PT100) to collect temperature signals from the transformer, enhancing system reliability. The system's anti-interference performance fully complies with the JB/T7631-2005 standard for "Resistance Temperature Detectors for Transformers."

The system can provide 4-20mA analog output for transformer winding and core temperature, or offer RS422/RS485 computer interfaces (convertible to RS232), as requested, meeting the needs of modern power operation automation management.

With advanced and reliable performance, a simple and practical design, and flexible installation options, the system caters to various user requirements. The IP20-rated version can be directly mounted on the panel, while the IP00-rated version is designed for wall-mounted installation in transformer rooms, facilitating uninterrupted system maintenance.

Air Cooling System

Dry-type transformers utilize two cooling methods: Natural Air Cooling (AN) and Forced Air Cooling (AF).

Natural Air Cooling (AN): Under normal operating conditions, the transformer can continuously deliver 100% of its rated capacity.

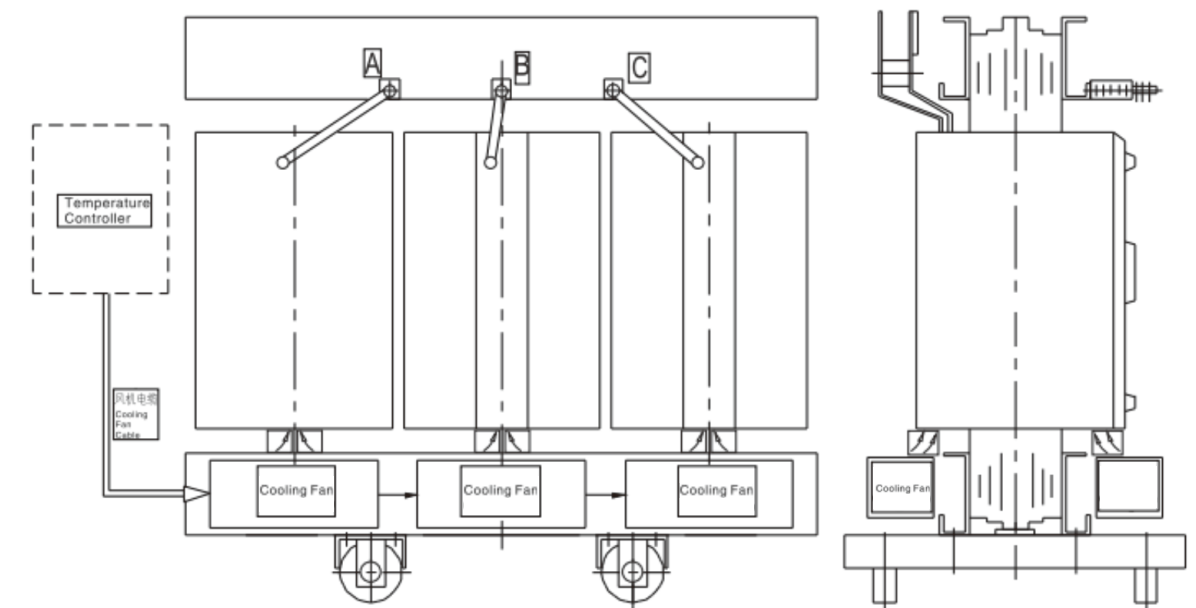
Forced Air Cooling (AF): Under normal operating conditions, the transformer's output capacity can be increased by 50%. This method is suitable for emergency or intermittent overload operations. However, due to significant increases in load loss and impedance voltage, continuous long-term overload operation with Forced Air Cooling (AF) is not recommended.

For both Natural Air Cooling (AN) and Forced Air Cooling (AF), it is essential to ensure that the transformer room has adequate ventilation. If the transformer is installed in a basement or other poorly ventilated environments, additional ventilation equipment must be installed. The required ventilation rate is (2-4) m³/min per kW of loss (P₀ + P_k).

The number of fans, their power, and power supply configuration are detailed in the table below.

The Forced Air Cooling System is controlled by a temperature controller that operates based on the transformer's temperature changes, enabling automatic activation and deactivation.

The dimensions of the Forced Air Cooling System (fans) do not exceed the transformer's main body dimensions (a*b*c).



Oil-Immersed Transformer Protection System

1.Oil Level Indicator

Installation Location: Mounted on the side of the transformer tank or on the conservator.

Function: Monitors the oil level in real-time to ensure it remains within safe limits. Provides alarm contacts for high and low oil levels.

2.Oil Temperature Indicator

Installation Location: Mounted on the top or side of the tank, with the temperature probe immersed in the oil.

Function: Monitors the top oil temperature to prevent overheating. Provides high-temperature alarm and trip contacts.

3.Winding Temperature Indicator

Installation Location: Mounted on the top or side of the tank, with the temperature probe immersed in the oil.

Function: Indirectly measures winding temperature using the "thermal simulation" method, based on top oil temperature and the copper-oil temperature difference. Prevents overheating and provides high-temperature alarm and trip contacts.

4.Pressure Relief Valve

Installation Location: Mounted on the top of the tank, near the high-voltage side.

Function: Provides overpressure protection. Automatically opens to release pressure when the internal pressure exceeds the threshold. Triggers a mechanical signal flag or electrical alarm contact after activation.

5.Buchholz Relay

Installation Location: Installed on the pipe connecting the tank and the conservator.

Function: Triggers when gas accumulates inside the transformer (indicating partial discharge or faults). Provides alarm contacts for minor and major gas accumulation.

Transformer protection terminal X1			
Explanation	Terminal serial number	Terminal Number	Explanation
	1	101	Tripping
	2	103	
	3		
	4	201	Min.level
	5	203	Max.level
	6	205	
	7	301	Alarm
	8	302	
	9	303	Tripping
	10	304	
	11	305	
	12	306	PT100
	13	307	
	14	401	
	15	402	Alarm
	16	403	
	17	404	Tripping
1YE:1	18	405	
1YE:2	19	406	PT100
1YE:3	20	407	
	21	501	
	22	503	Min. pressure
	23	505	Max. pressure
	24		
	25		
	26		
	27		
	28		
	29		
Current terminal X2			
CT:S1	1	501	
	2		
	3	503	
CT:S2	4		

Vacuum pressure gauge

Winding thermometer

BWY Oil—top thermometer

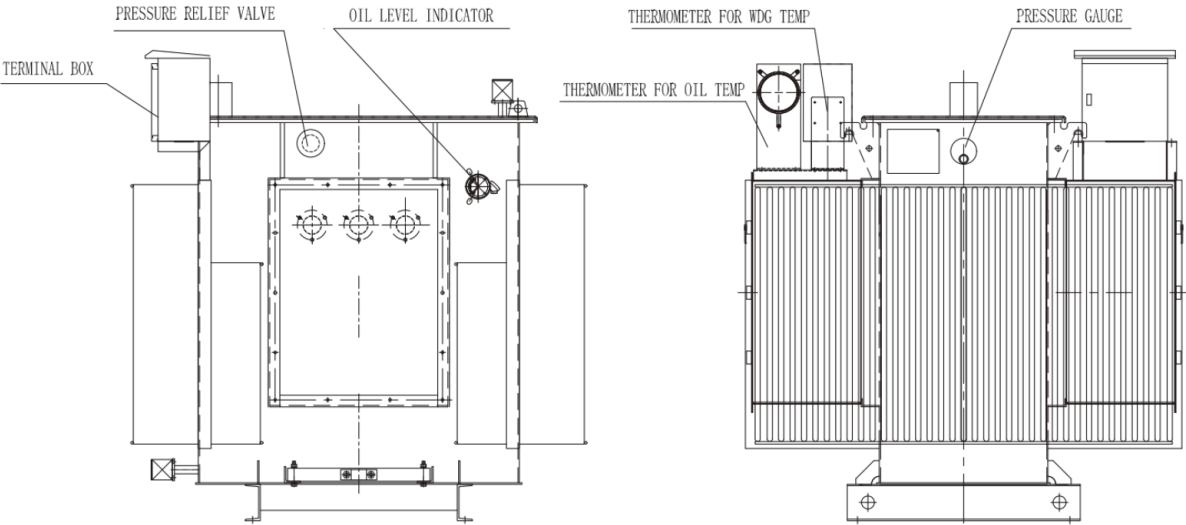
YZF Oil level gauge

YSF Pressure relief valve

Wiring Diagram of Protection System for Oil-Immersed Transformers (Reference)

Applicable Standards

- IEC 60076-1 Power transformers – Part 1: General
- IEC 60076-2 Power transformers – Part 2: Temperature rise
- IEC 60076-3 Power transformers – Part 3: Insulation levels, dielectric tests and external clearances in air
- IEC 60076-4 Power transformers – Part 4: Guide to lightning impulse and switching impulse testing – Power transformers and reactors
- IEC 60076-5 Power transformers – Part 5: Ability to withstand short-circuit
- IEC 60076-8 Power transformers – Part 8: Application guide
- IEC 60076-10 Power transformers – Part 10: Determination of sound levels
- IEC 60076-10-1 Power transformers – Part 10-1: Determination of transformer and reactor sound levels – User guide
- IEC 60076-11 Power transformers – Part 11: Dry-type transformers
- IEC 60076-12 Power transformers – Part 12: Loading guide for dry-type power transformers



Distribution Diagram of Protection Devices for Oil-Immersed Transformers (Reference)

TECHNICAL PARAMETERS

Dry Type Transformer Specifications

Technical Parameters of 10kV Class Dry-Type Transformers

Rated Capacity (kVA)	500	630	800	1000	1250	1600	2000	2500	3000	3500	4000
Rated Voltage (kV)	10(11,10.5,10,6.6,6.3,6)/0.4(0.433,0.415)										
Tap Range	±2*2.5%										
Impedance (%)	4;6;8										
Vector Group	Dyn11 or Yyn0										
Insulation Level (kV)	LI75/0;AC28/3										
Winding Material	Copper or Aluminium										
No-Load Loss (W)	1160	1300	1520	1770	2090	2450	3050	3600	4100	4500	4950
Load Loss (at 120°C, W)	4880	5960	6960	8130	9690	11700	14400	17100	20500	23000	26500
Noise Level (dB) (Sound Pressure Level)	50	50	50	50	52	52	52	52	54	54	54
No-Load Current (%)	1.0	0.8	0.8	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4

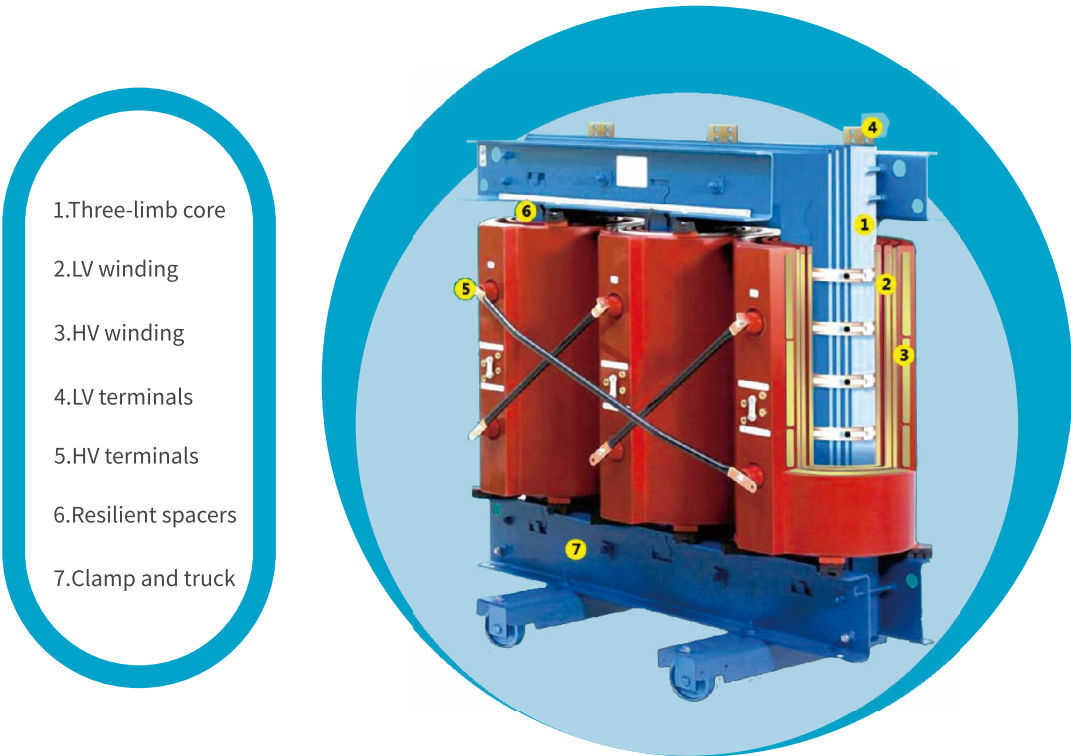
Technical Parameters of 20kV Class Dry-Type Transformers

Rated Capacity (kVA)	500	630	800	1000	1250	1600	2000	2500	3000	3500	4000
Rated Voltage (kV)	20(24,22,18,15.75,13.8)/0.4(0.433,0.415)										
Tap Range	±2*2.5%										
Impedance (%)	6										
Vector Group	Dyn11 or Yyn0										
Insulation Level (kV)	20(24,22,18):LI125/0;AC50/3 15.75(13.8):LI95/0;AC38/3										
Winding Material	Copper or Aluminium										
No-Load Loss (W)	1350	1530	1750	2070	2380	2790	3240	3870	4300	4900	5300
Load Loss (at 120°C, W)	5790	6840	8260	9780	11500	13800	16300	19300	22500	24800	28700
Noise Level (dB) (Sound Pressure Level)	52	52	52	52	52	52	52	52	54	54	54
No-Load Current (%)	1.0	0.8	0.8	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4

Technical Parameters of 35kV Class Dry-Type Transformers

Rated Capacity (kVA)	500	630	800	1000	1250	1600	2000	2500	3000	3500	4000
Rated Voltage (kV)	35(38.5, 33)/0.4(0.433,0.415)										
Tap Range	±2*2.5%										
Impedance (%)	6										
Vector Group	Dyn11 or Yyn0										
Insulation Level (kV)	LI170/0;AC70/3										
Winding Material	Copper or Aluminium										
No-Load Loss (W)	1620	1860	2160	2430	2830	3240	3820	4450	4700	5100	5500
Load Loss (at 120°C, W)	6650	7690	9120	10400	12700	15400	18200	21800	23500	26200	29900
Noise Level (dB) (Sound Pressure Level)	52	52	52	52	52	52	52	52	54	54	54
No-Load Current (%)	1.0	0.8	0.8	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4

Note: The impedance and losses of the transformer are reference values and can be customized according to requirements.

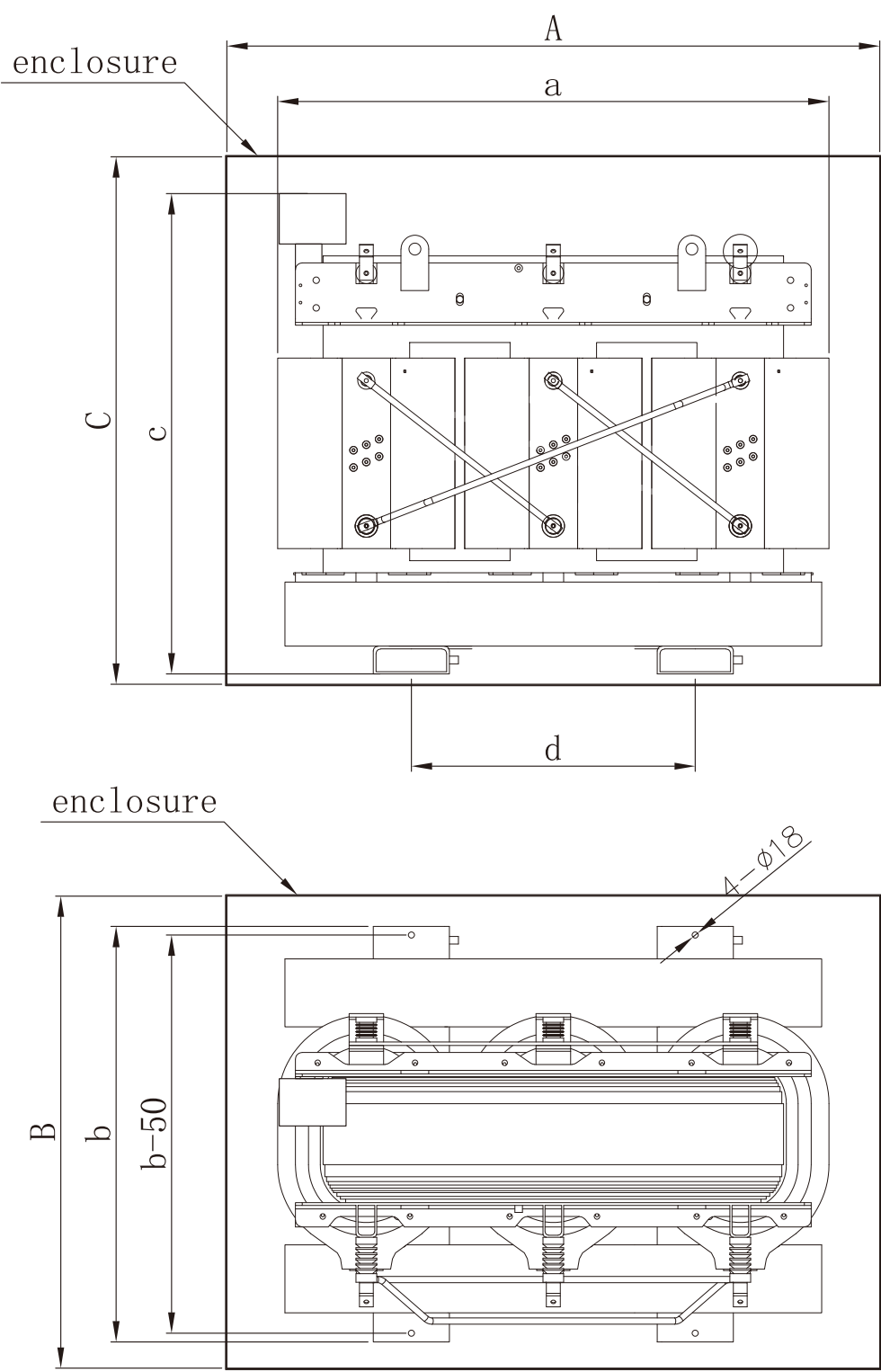


TECHNICAL PARAMETERS

Dimensions And Weight of Dry-Type Transformers

Voltage Level	Capacity (kVA)	Gt (kg)	Dimension(mm)						
			a	b	c	A	B	C	d
10kV	500	1800	1120	850	1345	1500	1300	1600	660
	630	2000	1320	850	1428	1600	1350	1800	660
	800	2300	1350	850	1443	1600	1350	1800	660
	1000	2850	1430	1070	1543	1700	1400	1800	820
	1250	3250	1480	1070	1548	1800	1400	1800	820
	1600	4050	1560	1070	1784	1900	1500	2000	820
	2000	4700	1630	1070	1845	2100	1500	2200	820
	2500	5400	1720	1070	1915	2300	1600	2200	820
	3000	6300	2050	1070	2100	2500	1700	2300	1070
	3500	6950	2300	1070	2230	2700	1800	2400	1070
	4000	7900	2450	1070	2400	2900	1900	2500	1070
20kV	500	2100	1510	850	1635	2100	1500	2000	660
	630	2485	1650	850	1650	2200	1550	2200	660
	800	2715	1610	1070	1760	2200	1550	2200	660
	1000	3480	1800	1070	1740	2300	1600	2200	820
	1250	4035	1880	1070	1880	2400	1600	2200	820
	1600	4800	1970	1070	1880	2400	1650	2200	820
	2000	5250	2040	1070	1930	2500	1650	2400	820
	2500	6775	2210	1070	1990	2600	1700	2400	820
	3000	7500	2380	1070	2180	2800	1900	2500	1070
	3500	8400	2480	1070	2350	3000	1950	2600	1070
	4000	9100	2600	1070	2530	3100	2000	2600	1070
35kV	500	2490	1770	850	1735	2400	1700	2200	660
	630	2805	1810	850	1815	2500	1800	2200	660
	800	3310	1900	1070	1900	2800	1850	2200	660
	1000	3800	1920	1070	2000	2800	1900	2400	820
	1250	4875	2150	1070	1950	2800	1900	2400	820
	1600	5100	2170	1070	1990	2900	1900	2400	820
	2000	5925	2280	1070	2080	3100	2200	2600	820
	2500	6845	2310	1370	2280	3300	2200	2800	820
	3000	8060	2500	1370	2480	3400	2200	2800	1070
	3500	9100	2650	1370	2630	3500	2200	3000	1070
	4000	9800	2800	1370	2710	3700	2300	3100	1070

Note: A, B, and C correspond to the length, width, and height dimensions, respectively, including the indoor enclosure.
The dimensions and weight are based on copper winding data, and the final data is subject to the drawings provided by AMPER POWER.



Outline Dimension Diagram of Dry-Type Transformers

TECHNICAL PARAMETERS

Oil-Immersed Transformer Specifications

Technical Parameters of 10kV Class Oil-Immersed Transformers

Rated Capacity (kVA)	500	630	800	1000	1250	1600	2000	2500	3000	3500	4000
Rated Voltage (kV)	10(11,10.5,10,6.6,6.3,6)/0.4(0.433,0.415)										
Tap Range	±2*2.5%										
Impedance (%)	4;4.5;5.5										
Vector Group	Dyn11 or Yyn0										
Insulation Level (kV)	LI75/0; AC28/3										
Winding Material	Copper or Aluminium										
No-Load Loss (W)	680	810	980	1150	1360	1640	1960	2310	2600	2900	3300
Load Loss (at 75°C, W)	5150	6200	7500	10300	12000	14500	17800	20700	23400	25700	28900
Noise Level (dB) (Sound Pressure Level)	52	52	52	52	53	53	54	54	54	54	54
No-Load Current (%)	1.0	0.8	0.8	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4

Technical Parameters of 20kV Class Oil-Immersed Transformers

Rated Capacity (kVA)	500	630	800	1000	1250	1600	2000	2500	3000	3500	4000
Rated Voltage (kV)	20(24,22,18,15.75,13.8)/0.4(0.433,0.415)										
Tap Range	±2*2.5%										
Impedance (%)	4;4.5;5.5										
Vector Group	Dyn11 or Yyn0										
Insulation Level (kV)	20(24,22,18):LI125/0;AC50/3 15.75(13.8):LI95/0;AC38/3										
Winding Material	Copper or Aluminium										
No-Load Loss (W)	680	810	980	1150	1350	1630	1950	2340	2700	2980	3400
Load Loss (at 75°C, W)	5660	6820	8250	11330	13200	15950	19140	22220	24800	26500	30500
Noise Level (dB) (Sound Pressure Level)	52	52	52	52	53	53	54	54	54	54	54
No-Load Current (%)	1.0	0.8	0.8	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4

Technical Parameters of 35kV Class Oil-Immersed Transformers

Rated Capacity (kVA)	500	630	800	1000	1250	1600	2000	2500	3000	3500	4000
Rated Voltage (kV)	35(38.5, 33)/0.4(0.433,0.415)										
Tap Range	±2*2.5%										
Impedance (%)	6.5										
Vector Group	Dyn11 or Yyn0										
Insulation Level (kV)	LI170/0; AC70/3										
Winding Material	Copper or Aluminium										
No-Load Loss (W)	680	830	980	1150	1400	1690	1990	2360	2800	3070	3530
Load Loss (at 75°C, W)	6910	7860	9400	11500	13900	16600	19700	23200	25900	27700	32500
Noise Level (dB) (Sound Pressure Level)	52	52	52	52	53	53	54	54	54	54	54
No-Load Current (%)	1.0	0.8	0.8	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4

Note: The impedance and losses of the transformer are reference values and can be customized according to requirements.

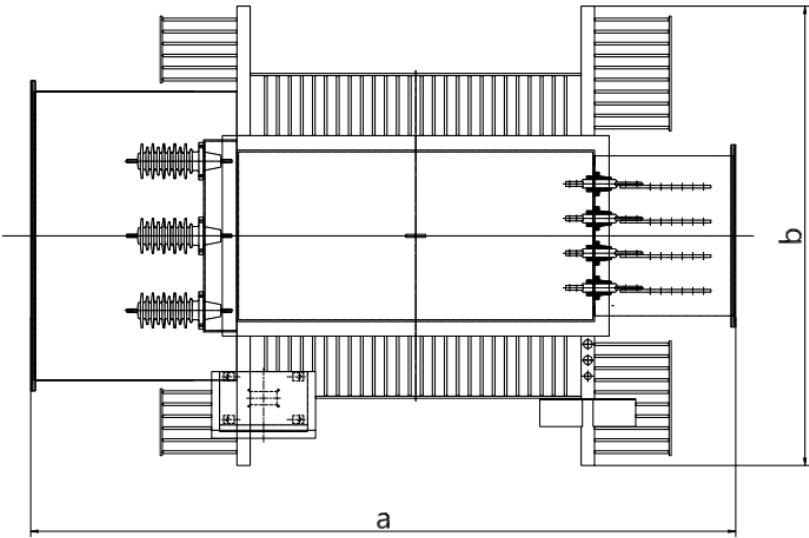
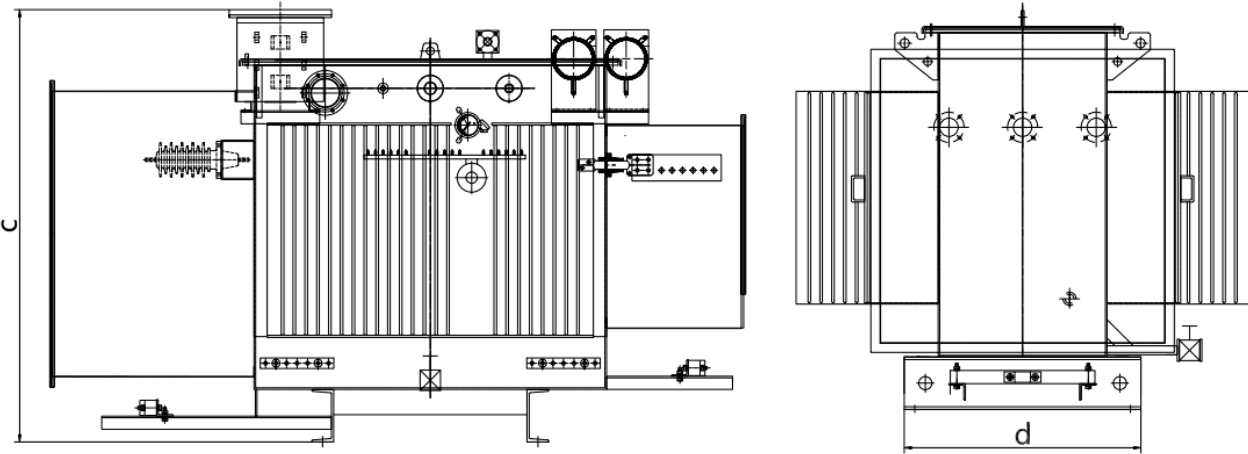


TECHNICAL PARAMETERS

Dimensions And Weight of Oil-Immersed Transformers

Voltage Level	Capacity(kVA)	Gt(kg)	Dimension(mm)			
			a	b	c	d
10kV	500	1600	1400	950	1315	660
	630	1900	1520	1000	1320	660
	800	2200	1610	1100	1350	820
	1000	2500	1650	1150	1435	820
	1250	3150	1800	1250	1500	820
	1600	3900	1820	1270	1525	820
	2000	4600	1900	1280	1725	820
	2500	5500	2200	1500	2100	820
	3000	6200	2300	1580	2200	1070
	3500	7050	2450	1620	2280	1070
	4000	8100	2570	1700	2350	1070
20kV	500	1700	1550	990	1350	660
	630	2100	1630	1050	1470	660
	800	2500	1750	1100	1550	820
	1000	2800	1850	1150	1600	820
	1250	3400	1980	1250	1700	820
	1600	4200	2050	1370	1825	820
	2000	4900	2200	1450	1900	820
	2500	5900	2350	1500	2100	820
	3000	6600	2470	1550	2290	1070
	3500	7300	2600	1600	2370	1070
	4000	8500	2730	1680	2450	1070
35kV	500	1900	1700	1000	1350	660
	630	2300	1800	1150	1500	660
	800	2700	1930	1200	1580	820
	1000	3200	2050	1350	1650	820
	1250	4000	2200	1580	1770	820
	1600	4900	2300	1670	1890	820
	2000	5700	2400	1750	2010	820
	2500	6800	2600	1890	2230	820
	3000	7300	2700	1950	2300	1070
	3500	8050	2830	2060	2380	1070
	4000	8800	2990	2200	2540	1070

Note: A, B, and C correspond to the length, width, and height dimensions, respectively, including the indoor enclosure.
The dimensions and weight are based on copper winding data, and the final data is subject to the drawings provided by AMPER POWER.



Outline Dimension Diagram of Oil-Immersed Transformer

Testing

Our product testing center maintains strong collaborative relationships with national laboratories such as the National Transformer Quality Supervision and Inspection Center, Suzhou Electrical Apparatus Research Institute, and the National High Voltage Metrology Station. Equipped with over 100 devices and instruments, including an acoustic and electrical shielding room, a 900kW synchronous generator set, impulse voltage generators, impulse chopping devices, and automated routine testing systems, the center is capable of performing all routine tests, type tests, and some special tests. Adhering to international standards and standardized testing procedures, we meet the diverse testing needs of our clients.

1. Routine Test

- Winding Resistance Measurement
- Voltage Ratio Measurement and Vector Group Verification
- Insulation Resistance Measurement
- Separate-Source AC Withstand Voltage Test
- Induced AC Withstand Voltage Test
- No-Load Loss and No-Load Current Measurement
- Short-Circuit Impedance and Load Loss Measurement
- Partial Discharge Measurement
- Product Sealing Test (Applicable to oil-immersed transformers)
- Transformer Oil Test (Applicable to oil-immersed transformers)

2. Type Test

- Temperature Rise Test
- Lightning Impulse Test

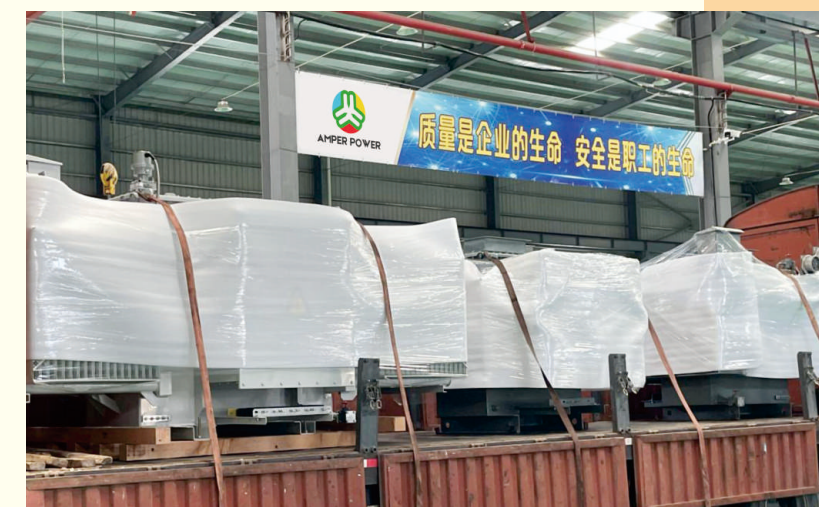


Temperature Rise Test



Routine Tests

Packaging



Transformer Maintenance

Dry-Type Transformer Maintenance

1.Commissioning

- Before commissioning, adjust the tap position according to the transformer nameplate, tap indicator, or on-load tap-changer manual.
- If the transformer is equipped with a temperature controller or temperature display, refer to the respective manual. After proper calibration, commission the transformer first, followed by the temperature controller or display.
- The transformer should be energized at no load. The inrush current peak can reach 10-15 times the rated current but decays rapidly, typically within 0.2 seconds to 10% of the peak. Users can avoid the inrush current peak by adjusting the delay time of protection devices or the settings of instantaneous protection devices.
- After commissioning, gradually increase the load and check for abnormal noises. Avoid applying a full load immediately.
- Overload operation should comply with IEC 60076 part 12: Loading guide for dry-type power transformers or the overload capability curves in our company's technical manual.
- After de-energizing, the transformer can generally be re-energized without additional measures. However, if condensation occurs in high humidity, the transformer must be dried before re-energizing.

2.Transformer Maintenance

To ensure reliable operation, perform regular inspections and maintenance.

- In dry and clean environments, inspect annually or less frequently. In dusty or chemically polluted environments, inspect every 3 to 6 months.
- During inspection, remove excessive dust, especially from insulators and spacers.
- Check for loose fasteners and connections, signs of rust or corrosion on conductive parts, and tracking or carbonization on insulation surfaces. Take corrective actions if necessary.
- After several years of operation (recommended: 5 years), measure the insulation resistance to assess the transformer's condition. Additional tests are generally not required.

3.Common Fault Handling

The table below outlines common transformer faults and recommended troubleshooting steps, which should be performed after de-energizing the equipment.

No.	Common Fault Symptoms	Possible Causes	Troubleshooting Steps
1	Abnormal Noise	1) Loose components due to long-term operation; 2) High voltage; 3) Load fluctuation.	1) Check if spacers are loose; 2) Check if fan and fan bracket mounting bolts are loose; 3) Check if panel mounting bolts are loose; 4) Check if high-voltage connecting rods and other bolts are loose.
2	Partial Flashover	1) Loose components due to long-term operation; 2) High voltage; 3) Load fluctuation.	1) Check for unreliable grounding points; 2) Check if spacers are damp; 3) Check for foreign objects inside the transformer; 4) Check if excessive dust has accumulated on the transformer body.
3	Local Overheating	1) Loose mounting bolts.	1) Check if casting nuts or busbar mounting bolts are loose and tighten if necessary.
4	Temperature controller high-temperature alarm, displaying "a(b, c, d)-H-"	1) PT100 open circuit; 2) Measured temperature exceeds the upper limit.	1) Replace PT100; 2) Check transformer load and coil temperature, compare with normal values; 3) Reduce capacity or shut down.
5	Temperature controller high-temperature alarm, displaying "a(b, c, d)-E-"	1) PT100 short circuit.	1) Replace Pt100.

No.	Common Fault Symptoms	Possible Causes	Troubleshooting Steps
6	No display or indicator lights after power-on.	1) Power cord disconnected or not properly connected; 2) Fuse blown.	1) Connect the power supply; 2) Replace the fuse.
7	Temperature controller high-temperature trip.	1) Non-internal fault, other protection devices activated; 2) Temperature controller fault; 3) Internal transformer fault.	1) Re-energize; 2) Check the protection circuit and temperature controller for faults; replace faulty components; 3) Check the output side grid and equipment for faults; 4) Perform necessary electrical tests; shut down and repair the transformer if faulty.

Oil-Immersed Transformer Maintenance

Operation Precautions

1.1 Before energizing, ensure the transformer's grounding parts and neutral points are properly grounded. The grounding resistance must comply with national standards.

1.2 Rated Operation Conditions:

(1) The transformer can operate according to the nameplate specifications under specified cooling conditions.

(2) For oil-immersed transformers, the allowable top oil temperature should be monitored. The maximum top oil temperature should not exceed 95°C, and it is recommended to avoid frequently exceeding 85°C to prevent rapid aging.

(3) At rated capacity, the transformer can operate continuously if the voltage does not exceed the corresponding tap voltage (or as per special contract terms).

1.3 Permissible Overloads:

(1) Transformers can operate under normal and emergency overload conditions. Normal overloads can be used regularly, with values determined by load curves, cooling medium temperature, and pre-overload load. Emergency overloads are allowed during contingencies, such as when one transformer fails and no backup is available.

(2) The permissible emergency overload values are as per the table above.

Emergency Overload Ratio to Rated Load	1.3	1.45	1.6	1.75	2.0
Duration (minutes)	120	80	45	20	10

1.4 During operation, regularly inspect temperature and oil level indicators, as well as protective devices such as gas relays and signal thermometers, to ensure their reliable operation. Frequently check all flanges and seals for oil leaks. Perform dielectric strength tests on the transformer oil at least once a year. If the moisture content in the oil continuously increases or other abnormalities are detected, conduct additional dielectric strength tests and filter the oil. If the oil's insulation performance significantly deteriorates, inspect the transformer for internal faults. If the oil temperature rises abruptly under normal load, investigate the cause. If the issue cannot be resolved, shut down the transformer and perform a thorough inspection of the core to identify and repair problems promptly.

1.5 If abnormal noises, fluctuating oil levels, pressure relief valve activation, or severe oil leaks occur, immediately shut down the transformer for a thorough inspection.

1.6If the transformer frequently operates under overload or experiences multiple short circuits, inspect the core annually.

1.7 The transformer is set to the rated tap position at the factory. Adjust the tap position if the supply voltage is too high or low. Note: Off-circuit tap changers must be adjusted with the power off, while on-load tap changers can be adjusted under load. Refer to the switch manual for details.

1.8 For fully sealed transformers, monitor the oil level closely, as the core may absorb oil, and the tank's corrugated parts may expand and contract with temperature changes, causing oil levels to drop. Replenish oil as needed to maintain the proper level.

1.9 For other protective devices, refer to the product manual. However, if condensation occurs in high humidity, the transformer must be dried before re-energizing.

Ordering Instructions

Dry-Type Transformer Ordering Checklist				
Please check or fill in the table below.				
No.	Item			
1	Customer Name			
2	Project Name			
3	Installation Location	Indoor ☐	Outdoor ☐	Other ☐
4	Ambient Temperature	50 ☐	45 ☐	40 ☐
5	Corrosion Protection Level	C4H ☐	C4 ☐	C3 ☐
6	Transformer Capacity (kVA)			
7	Quantity			
8	No-Load Voltage Ratio			
9	Vector Group	Dyn11 ☐	Yd11 ☐	Other ☐
10	Impedance Voltage (%)	6 ☐	4 ☐	Other ☐
11	Tap Changer Type	Off-Circuit Tap Changer ☐	On-Load Tap Changer ☐	
12	Tap Range	±2*2.5%	±3*2.5%	Other ☐
13	Winding Material	Copper ☐	Aluminum ☐	
14	Frequency (Hz)	50 ☐	60 ☐	
15	Insulation Class	F ☐	H ☐	
16	Temperature Rise (K)	100 ☐	125 ☐	Other ☐
17	Insulation Level (kV)	IEC Standard ☐		Other ☐
18	No-Load Loss (W)			
19	Load Loss (W) (at 120°C)			
20	Efficiency (%)			
21	Cooling Method	AN ☐	ANAF ☐	
22	Enclosure Required	No ☐	Yes ☐	
23	Enclosure Material	Aluminum Alloy ☐	Steel Plate ☐	Other ☐
24	Enclosure Color Code	RAL7033 ☐	RAL7035 ☐	Other ☐
25	Enclosure Protection Level	IP20 ☐	IP23 ☐	Other ☐
26	Low Voltage Outlet	Bottom Outlet ☐	Top Outlet ☐	Other ☐
27	High Voltage Inlet	Bottom Inlet ☐	Top Inlet ☐	Other ☐
28	Inlet/Outlet Cover Material	Epoxy Board ☐	Aluminum Plate ☐	Other ☐
29	Off-Circuit Tap Changer Lock	No ☐	Yes ☐	
30	Temperature Protection Requirements			
31	Third-Party Testing Required	No ☐	Yes ☐	
32	Other Special Instructions (if any)			

Oil-Immersed Transformer Ordering Checklist				
Please check or fill in the table below.				
No.	Item			
1	Customer Name			
2	Project Name			
3	Installation Location	Indoor ☐	Outdoor ☐	Other ☐
4	Ambient Temperature	50 ☐	45 ☐	40 ☐
5	Corrosion Protection Level	C4H ☐	C4 ☐	C3 ☐
6	Transformer Capacity (kVA)			
7	Quantity			
8	No-Load Voltage Ratio			
9	Vector Group	Dyn11 ☐	Yd11 ☐	Other ☐
10	Impedance Voltage (%)	6 ☐	4 ☐	Other ☐
11	Tap Changer Type	Off-Circuit Tap Changer ☐	On-Load Tap Changer ☐	
12	Tap Range	±2*2.5%	±3*2.5%	Other ☐
13	Winding Material	Copper ☐	Aluminum ☐	
14	Frequency (Hz)	50 ☐	60 ☐	
15	Top Oil Temperature (K)	50 ☐	60 ☐	
16	Winding Temperature (K)	55 ☐	65 ☐	
17	Insulation Level (kV)	IEC Standard ☐		Other ☐
18	No-Load Loss (W)			
19	Load Loss (W) (at 75°C)			
20	Efficiency (%)			
21	Cooling Method	ONAN ☐	KNAN ☐	ONAF ☐
22	Oil Type	Mineral Oil ☐	Natural Ester Oil ☐	Silicone Oil ☐
23	Dimension Requirements	Yes ☐	No ☐	
24	Enclosure Color Code	RAL7033 ☐	RAL7035 ☐	Other ☐
25	High Voltage Inlet	Bottom Inlet ☐	Top Inlet ☐	Other ☐
26	Low Voltage Outlet	Bottom Outlet ☐	Top Outlet ☐	Other ☐
27	High Voltage Cable Specifications	Quantity ()	OuterDiameter (mm)	
28	Low Voltage Cable Specifications	Quantity ()	OuterDiameter (mm)	
29	Inlet/Outlet Cover Material	Epoxy Board ☐	Aluminum Plate ☐	Other ☐
30	High Voltage Cable Box	Yes ☐	No ☐	
31	Low Voltage Cable Box	Yes ☐	No ☐	
32	Oil Temperature Gauge	With Contacts ☐	Without Contacts ☐	
33	Winding Temperature Gauge	With Contacts ☐	Without Contacts ☐	
34	Gas Pressure Gauge	With Contacts ☐	Without Contacts ☐	
35	Oil Level Indicator	With Contacts ☐	Without Contacts ☐	
36	Pressure Relief Valve	With Contacts ☐	Without Contacts ☐	
37	Rapid Pressure Rise Relay	With Contacts ☐	Without Contacts ☐	
38	Oil Conservator	No ☐	Yes ☐	
39	Third-Party Testing Required	No ☐	Yes ☐	
40	Other Special Instructions (if any)			

SERVICE INTRODUCTION

Rapid Professional Service

With its core team having over 20 years of industry experience, the company has established a complete and rigorous user service system, a professional and dedicated customer service team, and advanced and comprehensive overhaul and maintenance equipment, which can provide customers with considerate service guarantee.

- A mature team of security engineers to provide customers with excellent equipment installation and commissioning projects;
- A sufficient reserve of spare parts can provide customers with fast service guarantees and a reliable supply of spare parts;
- Complete service system can provide customers with complete equipment operation training;
- Years of service accumulation can provide customers with full life cycle equipment maintenance assurance plans and programs;

For More Information

To know more about Amper Power's products and services, please make phone call at 0757-86689161 or send an email to Sales@amperpower.com.

Innovate, Integrate, Illuminate

