

Cylinder Module Test Transformer System

Voltage up to 2400kV (single module 750kV)



Fivestar HV Testing Equipment Co., Ltd

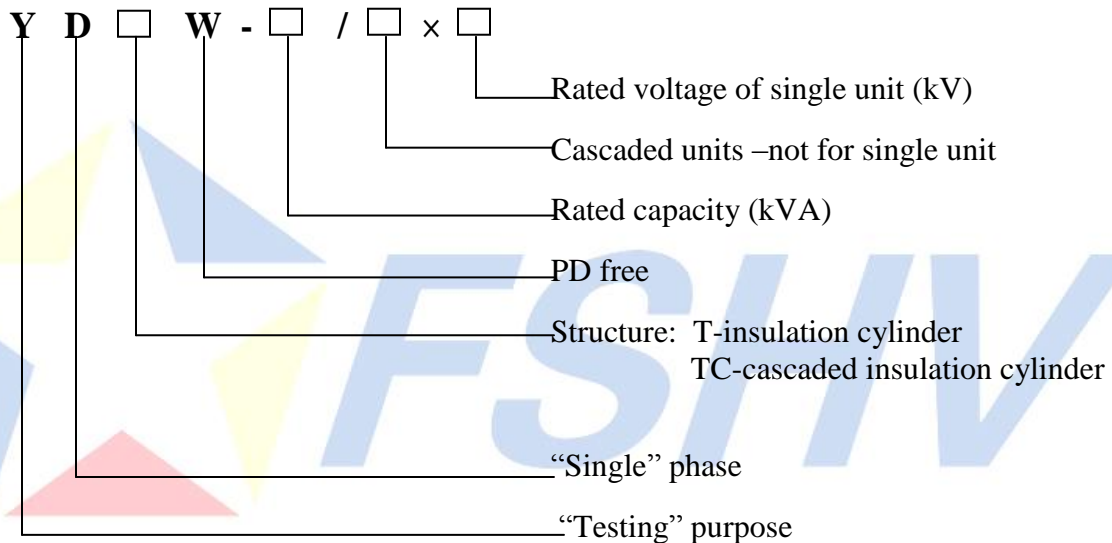
● Introduction

AC test transformer systems are conventional AC high voltage test equipments, mainly designed for medium capacitance testing objects, particularly for tests requiring stable voltage even if the load changes under voltage (corona, wet & pollution tests).

Especially when the load is inductive (like inductive voltage transformers), tests need resistive current, AC test transformer systems are the only choice.

● Model description

Model No. refers to JB/T.3837-1996 <Transformer series product model description method> , the structure as followed,



● Ambient condition

1. Altitude: $\leq 1000\text{m}$
2. Ambient temperature: $-10^{\circ}\text{C} \sim +45^{\circ}\text{C}$
3. Relative humidity: $\leq 90\%$ (25°C)
4. Max daily average temperature: $+30^{\circ}\text{C}$
5. Max yearly average temperature: $+20^{\circ}\text{C}$
6. Max daily temperature difference: $\leq 15^{\circ}\text{C}$
7. Atmospheric pressure: 0.1Mpa
8. Anti-seismic capability: 8
9. Usage location: indoor, no conducting dust, no fire sparks and explosive danger, no corrosive metal and insulating air.

10. Require good grounding system, grounding resistance $<0.5\Omega$.

11. Waveform of power supply: sine wave, waveform distortion $\leq 3\%$

● **Application**

AC test transformer systems are mainly used for voltage withstand insulation test of various insulation material, insulation structure and other electrical equipments (as followed), to conduct AC voltage test, partial discharge test and other science research.

- **Transformers and Reactors**
- **Power Cables**
- **HV Capacitors**
- **HV Insulators**
- **HV Bushings**
- **Surge Arresters**
- **GIS / AIS Switchgears**
- **Motors / Generators**
- **Other HV Apparatus**



Applications covered include testing according to IEC, ANSI/IEEE and other national standards.

● **Configuration**

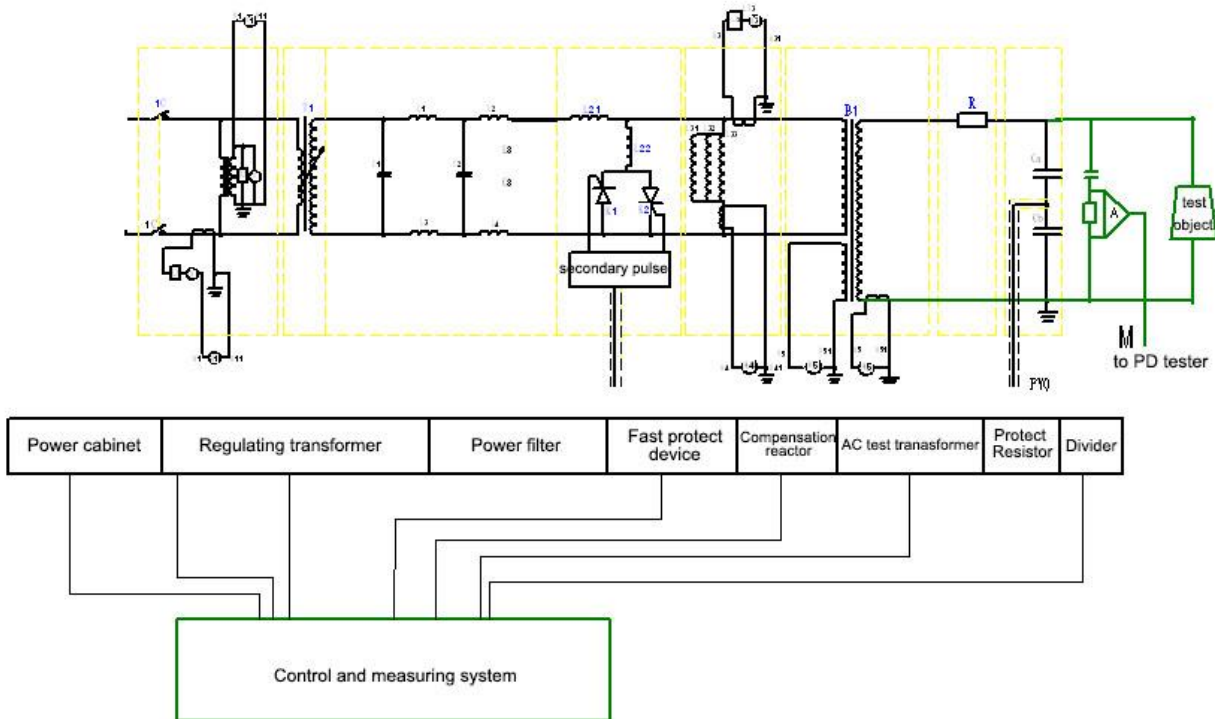
| Basic components | Optional |
|----------------------------|--|
| Regulating transformer | Isolation transformer |
| Compensation reactor | Power filter |
| AC test transformer | HV filter |
| Protect resistor | Electronic fast protect device |
| Capacitor divider | Switchgear cabinet (primary / secondary) |
| Control and measure system | etc |

● **Main technical parameters**

1. PD level (insulation cylinder type):
 - 1) 50kV~300kV transformer, PD $\leq 3\sim 5\text{pC}$ at 100%Ur.
 - 2) 300kV~600kV transformer, PD $\leq 5\text{pC}$ at 100%Ur, PD $\leq 3\text{pC}$ at 80% Ur.
 - 3) 600kV~1000kV transformer, PD $\leq 5\text{pC}$ at 100%Ur, PD $\leq 3\text{pC}$ at 80%Ur.
 - 4) More than1000kV transformer, PD $\leq 5\sim 10\text{pC}$ at 100%Ur, PD $\leq 5\text{pC}$ at 80% Ur.

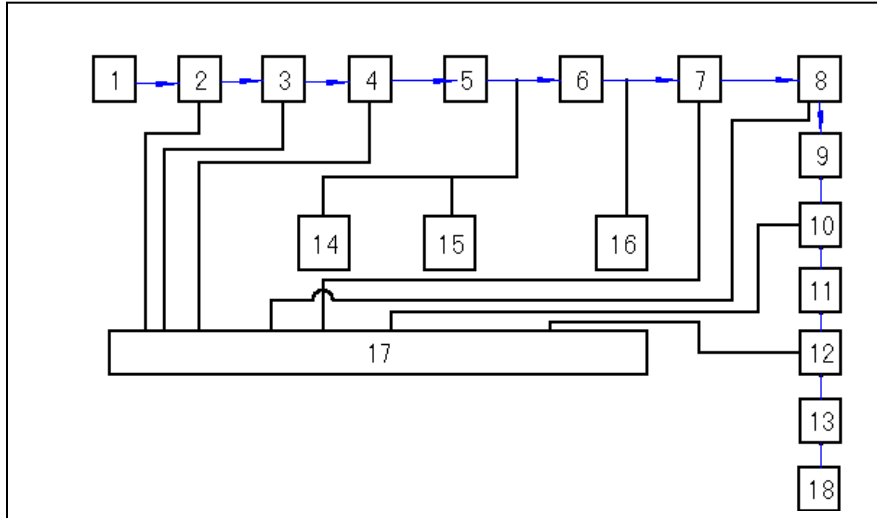
2. Uneven rate: The cascaded test transformer voltage distribution uneven rate $\leq \pm 5\%$.
3. Duty cycle: 60mins at 100% U_r and 100% I_r , continuous duty at 80% U_r and 80% I_r .
4. System waveform distortion: voltage during 10%-100% U_r , when the distortion of regulator input voltage $< 3\%$, the system output voltage distortion $\leq 5\%$.
5. Short circuit impedance: impedance of single unit test transformer is 3%~12%, two units in series impedance is 8%~15%, three units in series impedance is 15%~22%.
6. Structural type: insulation shell epoxy glass winding.

● Work Principle



Test transformer steps up the voltage coming from the regulating transformer. The controls act on the regulating transformer to adjust precisely the input voltage of the transformer and thus the test voltage.

If needed, a compensating reactor can be connected between the regulating and the test transformers and compensates the capacitive power required for the test object. This way, the regulating transformer and power line filter ratings can be kept small, and the requirements for the power supply are reduced.



1. Power supply (provided by user, 0.22kV, 0.38kV, 3kV, 6kV, 10kV are available)
2. Primary switchgear cabinet (optional)
3. Regulating transformer (column / contact / inductive type)
4. Secondary switchgear cabinet (optional)
5. Isolation transformer (optional)
6. Power noise filter (optional)
7. Electronic fast protect device(TPU-2000, optional)
8. PD free AC test transformer
9. Protect resistor
10. PD free capacitor divider and coupling capacitor
11. Conductive pole (optional)
12. Triple harmonic filter (optional)
13. Quintuple harmonic filter (optional)
14. Compensation reactor (optional)
15. Control desk(manual/auto)
16. Test object(provided by user)

● AC Test Transformer

1. Introduction

YDTW / YDTCW series AC test transformers are of module type and oil insulated, inner insulating materials are transformer oil, shells are insulating cylinders, which are made of epoxy resin fiberglass.

The high voltage can directly feed to test object without bushing, and modules are allowed to stack in cascade to reach very high voltage levels by keeping reasonable floor space.



Rated voltage of single module can be up to 750kV, and stacking up to 4 modules is available.

2. Main parameters

| Model (single module) | Rated Capacity (kVA) | High voltage (kV) | Low voltage (kV) | Dimension (mm) | Weight (kg) |
|--------------------------|-------------------------|----------------------|---------------------|-------------------|----------------|
| YDTW-5/50 | 5 | 50 | 0.22/0.38 | Φ320×450 | 42 |
| YDTW-50/50 | 50 | 50 | 0.22/0.38 | Φ850×945 | 360 |
| YDTW-10/100 | 10 | 100 | 0.22/0.38 | Φ758×982 | 380 |
| YDTW-20/100 | 20 | 100 | 0.22/0.38 | Φ690×900 | 300 |
| YDTW-50/100 | 50 | 100 | 0.22/0.38 | Φ850×1000 | 400 |
| YDTW-100/100 | 100 | 100 | 0.22/0.38 | Φ940×1340 | 800 |
| YDTW-15/150 | 15 | 150 | 0.22/0.38 | Φ1165×1400 | 500 |
| YDTW-75/150 | 75 | 150 | 0.22/0.38 | Φ1120×1490 | 1100 |
| YDTW-150/150 | 150 | 150 | 0.38/0.6 | Φ1350×1570 | 1400 |
| YDTW-20/200 | 20 | 200 | 0.22/0.38 | Φ1165×1850 | 760 |
| YDTW-100/200 | 100 | 200 | 0.22/0.38 | Φ1450×1950 | 1800 |
| YDTW-200/200 | 200 | 200 | 0.38/0.6 | Φ1800×1950 | 3100 |
| YDTW-25/250 | 25 | 250 | 0.22/0.38 | Φ1250×2200 | 1150 |
| YDTW-250/250 | 250 | 250 | 0.38/0.6 | Φ2000×2200 | 3100 |
| YDTW-500/250 | 500 | 250 | 3/6 | Φ2000×2600 | 5800 |
| YDTW-1000/250 | 1000 | 250 | 3/6 | Φ2200×2600 | 8200 |
| YDTW-30/300 | 30 | 300 | 0.22/0.38 | Φ1350×2300 | 1350 |
| YDTW-150/300 | 150 | 300 | 0.38/0.6 | Φ1450×2500 | 2100 |
| YDTW-300/300 | 300 | 300 | 0.38/0.6 | Φ1700×2500 | 3700 |
| YDTW-600/300 | 600 | 300 | 0.6/3 | Φ2000×2650 | 6100 |
| YDTW-900/300 | 900 | 300 | 3/6 | Φ2000×2650 | 7400 |
| YDTW-1200/300 | 1200 | 300 | 3/6/10 | Φ2200×2800 | 8800 |



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|---------------|------|-----|---------|------------|-------|
| YDTW-350/350 | 350 | 350 | 0.6/3/6 | Φ2000×2800 | 3600 |
| YDTW-375/375 | 375 | 375 | 0.6/3 | Φ2000×3200 | 4000 |
| YDTW-700/375 | 700 | 375 | 0.6/3/6 | Φ2000×3400 | 9600 |
| YDTW-400/400 | 400 | 400 | 0.6/3 | Φ2000×3500 | 4100 |
| YDTW-800/400 | 800 | 400 | 3/6 | Φ2200×3600 | 10000 |
| YDTW-1200/400 | 1200 | 400 | 3/6 | Φ2600×4200 | 12000 |
| YDTW-1600/400 | 1600 | 400 | 3/6/10 | Φ2600×4200 | 16000 |
| YDTW-250/500 | 250 | 500 | 0.6/3 | Φ2600×4500 | 7800 |
| YDTW-500/500 | 500 | 500 | 0.6/3 | Φ2600×4500 | 9800 |
| YDTW-1000/500 | 1000 | 500 | 3/6 | Φ3000×4600 | 16000 |
| YDTW-150/500 | 150 | 500 | 0.6/3 | Φ2600×4500 | 6800 |
| YDTW-2000/500 | 2000 | 500 | 3/6/10 | Φ3000×4600 | 23000 |
| YDTW-165/550 | 165 | 550 | 0.6/3 | Φ3400×5000 | 9100 |
| YDTW-550/550 | 550 | 550 | 3/6/10 | Φ3400×5000 | 14000 |
| YDTW-1100/550 | 1100 | 550 | 3/6/10 | Φ3400×5100 | 22000 |
| YDTW-2200/550 | 2200 | 550 | 3/6/10 | Φ3400×5100 | 31000 |
| YDTW-300/600 | 300 | 600 | 0.6/3/6 | Φ3400×5000 | 7600 |
| YDTW-600/600 | 600 | 600 | 3/6/10 | Φ3400×5000 | 16000 |
| YDTW-2400/600 | 2400 | 600 | 3/6/10 | Φ3400×5100 | 26000 |
| YDTW-4800/600 | 4800 | 600 | 6/10 | Φ3400×5100 | 35000 |

Other models are possible upon request.

| Model (cascaded modules) | Capacity (kVA) | High voltage (kV) | Low voltage (kV) | Dimension (mm) | Weight (kg) |
|-----------------------------|-------------------|----------------------|---------------------|-------------------|----------------|
| YDTCW-5/2×50 | 5 | 100 | 0.22/0.38 | Φ415×950 | 83 |
| YDTCW-10/2×80 | 10 | 160 | 0.22/0.38 | Φ470×1100 | 120 |
| YDTCW-20/2×100 | 20 | 200 | 0.22/0.38 | Φ850×1950 | 700 |



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|------------------|------|------|-----------|-------------|-------|
| YDTCW-100/2×100 | 100 | 200 | 0.22/0.38 | Φ1250×1950 | 2100 |
| YDTCW-50/2×125 | 50 | 250 | 0.38/0.6 | Φ1450×2400 | 1400 |
| YDTCW-250/2×125 | 250 | 250 | 0.6/3 | Φ1800×2500 | 3300 |
| YDTCW-150/2×150 | 150 | 300 | 0.38/0.6 | Φ1800×3200 | 3600 |
| YDTCW-300/2×150 | 300 | 300 | 0.6/3 | Φ1800×3200 | 5100 |
| YDTCW-200/2×200 | 200 | 400 | 0.38/0.6 | Φ1800×3700 | 3800 |
| YDTCW-400/2×200 | 400 | 400 | 0.6/3 | Φ2000×3800 | 4500 |
| YDTCW-250/2×250 | 250 | 500 | 0.6/3 | Φ2750×5100 | 5600 |
| YDTCW-500/2×250 | 500 | 500 | 0.6/3 | Φ2750×5100 | 7800 |
| YDTCW-1000/2×250 | 1000 | 500 | 0.6/3 | Φ2750×5100 | 9800 |
| YDCTW-300/2×300 | 300 | 600 | 0.6/3 | Φ2750×5500 | 8000 |
| YDCTW-600/2×300 | 600 | 600 | 3/6/10 | Φ2750×5670 | 11000 |
| YDCTW-1200/2×300 | 1200 | 600 | 3/6/10 | Φ3000×5670 | 17000 |
| YDTCW-375/2×375 | 375 | 750 | 0.6/3 | Φ2870×6300 | 14000 |
| YDTCW-750/2×375 | 750 | 750 | 3/6/10 | Φ3000×6500 | 17000 |
| YDTCW-1500/2×375 | 1500 | 750 | 3/6/10 | Φ3000×6500 | 20000 |
| YDTCW-400/2×400 | 400 | 800 | 0.6/3/6 | Φ3200×7600 | 15000 |
| YDTCW-800/2×400 | 800 | 800 | 3/6/10 | Φ3200×7600 | 24000 |
| YDTCW-1600/2×400 | 1600 | 800 | 3/6/10 | Φ3200×7800 | 29000 |
| YDTCW-500/2×500 | 500 | 1000 | 0.6/3/6 | Φ3200×9100 | 22000 |
| YDTCW-1000/2×500 | 1000 | 1000 | 3/6/10 | Φ3700×9100 | 30000 |
| YDTCW-2000/2×500 | 2000 | 1000 | 3/6/10 | Φ3700×9100 | 42000 |
| YDTCW-4000/2×500 | 4000 | 1000 | 6/10 | Φ4000×9200 | 62000 |
| YDTCW-550/2×550 | 550 | 1100 | 3/6 | Φ4000×10500 | 24000 |
| YDTCW-1100/2×550 | 1100 | 1100 | 3/6/10 | Φ4000×10500 | 32000 |
| YDTCW-2200/2×550 | 2200 | 1100 | 3/6/10 | Φ4000×10500 | 44000 |
| YDTCW-1200/2×600 | 1200 | 1200 | 3/6/10 | Φ4300×12000 | 50000 |



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|---|------|------|--------|-------------|--------|
| YDTCW-2400/2×600 | 2400 | 1200 | 3/6/10 | Φ5400×14600 | 56000 |
| YDTCW-4800/2×600 | 4800 | 1200 | 3/6/10 | Φ5400×15500 | 61000 |
| YDTCW-1200/3×400 | 1200 | 1200 | 3/6/10 | Φ5000×11000 | 52000 |
| YDTCW-1500/3×500 | 1500 | 1500 | 3/6/10 | Φ5300×15100 | 58000 |
| YDTCW-3000/3×500 | 3000 | 1500 | 3/6/10 | Φ5400×15100 | 64000 |
| YDTCW-1650/3×550 | 1650 | 1650 | 6/10 | Φ5800×15300 | 66000 |
| YDTCW-3300/3×550 | 3300 | 1650 | 6/10 | Φ5900×15300 | 80000 |
| YDTCW-3600/3×600 | 3600 | 1800 | 6/10 | Φ6300×16800 | 81000 |
| YDTCW-4500/3×600 | 4500 | 1800 | 6/10 | Φ6500×16800 | 95000 |
| YDTCW-7200/3×600 | 7200 | 1800 | 10 | Φ6500×16800 | 135000 |
| YDTCW-6750/3×750 | 6750 | 2250 | 10 | Φ7200×18000 | 140000 |
| Other models are possible upon request. | | | | | |

● Typical reference list

| No. | Model | Description | Qty | Customer | Country |
|-----|------------------|-------------------------------------|-----|---|---------------|
| 1 | YDTCW-8000/4×600 | 8000kVA 4×600kV AC Test Transformer | 1 | Suzhou Electrical Apparatus Science Academy Co.,Ltd | China |
| 2 | YDTCW-4800/2×600 | 4800kVA 2×600kV AC Test Transformer | 1 | Areva (India) Transformer Co., Ltd | India |
| 3 | YDTCW-4800/2×600 | 4800kVA 2×600kV AC Test Transformer | 1 | Areva (Wuhan) Transformer Co., Ltd | Areva, China |
| 4 | YDTCW-4500/3×600 | 4500kVA 3×600kV AC Test Transformer | 1 | Alstom T&D Technology Center (China) Co., Ltd | Alstom, China |
| 5 | YDTCW-2500/2×500 | 2500kVA 2×500kV AC Test Transformer | 1 | | |
| 6 | YDTCW-1000/2×500 | 1000kVA 2×500kV AC Test Transformer | 1 | Beijing ABB High Voltage Switchgear Co., Ltd | ABB,China |
| 7 | YDTCW-800/2×500 | 800kVA 2×500kV AC Test Transformer | 1 | Hefei ABB Transformer Co., Ltd | ABB,China |
| 8 | YDTW-250/250 | 250kVA 250kV AC Test Transformer | 1 | | |



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|----|------------------|-------------------------------------|---|--|------------|
| 9 | YDTW-500/500 | 500kVA 500kV AC Test Transformer | 1 | Zhongshan ABB Transformer Co., Ltd | ABB,China |
| 10 | YDTW-300/150 | 300kVA 150kV AC Test Transformer | 1 | Tangshan NGK HV Porcelain Insulator Co., Ltd | NGK,China |
| 11 | YDTCW-500/2×250 | 500kVA 2×250kV AC Test Transformer | 1 | Luneng Fuji Electric Co., Ltd | Fuji,China |
| 12 | YDTW-40/200 | 40kVA 200kV AC Test Transformer | 1 | Power Utah Group Company Limited | Thailand |
| 13 | YDTW-200/200 | 200kVA 200kV AC Test Transformer | 1 | Nissin Electric Co., Ltd. | Japan |
| 14 | YDTW-1200/400 | 1200kVA 400kV AC Test Transformer | 1 | GoldStar Motor Co., Ltd | Korea |
| 15 | YDTCW-7200/3×600 | 7200kVA 3×600kV AC Test Transformer | 1 | Henan Pinggao Electric Co., Ltd | China |
| 16 | YDTCW-2000/2×500 | 2000kVA 2×500kV AC Test Transformer | 1 | | |
| 17 | YDTCW-3300/3×550 | 3300kVA 3×550kV AC Test Transformer | 1 | State Grid Electric Research Institute | China |
| 18 | YDTCW-4800/2×600 | 4800kVA 2×600kV AC Test Transformer | 1 | Xi'an HV Apparatus Research Institute | China |
| 19 | YDTCW-7500/2×370 | 750kVA 2×375kV AC Test Transformer | 1 | Chint Electric Co., Ltd | China |
| 20 | YDTCW-3000/3×500 | 3000kVA 3×500kV AC Test Transformer | 1 | Xi'an HV Switchgear Co., Ltd | China |
| 21 | YDTW-600/600 | 600kVA 600kV AC Test Transformer | 1 | TBEA Transformer Co., Ltd | China |
| 22 | YDTW-2000/500 | 2000kVA 500kV AC Test Transformer | 1 | Taikai Transformer Co., Ltd | China |
| 23 | YDTCW-1000/2×500 | 1000kVA 2×500kV AC Test Transformer | 1 | Xi'an Tasman Electric Equipment Co., Ltd | China |

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