

MANUFACTURING



Cast-resin Dry-type
Transformer Manufacturing

TEST CAPABILITY

For all products design and manufacturing,, Pearl Electric could fulfill all the routine, type and special test items specified by IEC standards, with the only exception of short-circuit withstand test.



• Test Bay for Dry Type Transformer



• C2 Test



• E2 Test



• F1 Test

PRODUCT FEATURES

1 FEATURE

Advantages:

01

Low loss, low noise, low partial discharge and high reliability.

03

HV coil is of epoxy resin cast under vacuum and high pressure conditions with much better product performance.

02

Great anti-short circuit capability, high anti-lightning impulse capability.

04

Simulation analysis is adopted for core model design, thus to avoid cavity resonance and effectively reduce the noise level. Simulation calculation and analysis for HV coil model is also applied, thus to substantially improve product's anti-lightning capability.

Core

The core is made of high quality grain-oriented cold-rolled silicon steel of high magnetic conductivity, by using 45 five-step overlapping method to reduce the no-load loss and no-load current. Simulation analysis method is applied for the core design, thus to precisely and effectively calculate the vibration frequency and scale. Flexible connections are adopted between the core and coils, core and clamps. With the these measures, transformer's noise level has been improved by 10~15dB over the conventional products.

LV Coil

For LV coils above 400kVA capacity, superior foil conductors are adopted for winding manufacturing, thus to obtain better amper-turn balance and less transverse magnetic flux leakage, and finally to greatly improves transformer's anti-short circuit capability. By reasonably designing the oil passage within the coils, coil's heat dispersion effect is greatly increased. Thus the reasonable design has decreased temperature rise and improved product's overload capability.

HV Coil

HV and coils is manufactured with superior wire conductors, insulated reinforced with fiber glass. The HV coils are cast under vacuum and high pressure conditions in Germany HÜBERS Vacuum Cast Machine, resulting the best resin penetration and very low partial discharge (partial discharge for 11kV product could be lower than 5pC). Optimized structure is adopted for HV coils to improve transformer's electric field. And Lightning impulse simulation calculation was adopted for coil model design, thus to substantially improve product's anti-lightning capability.

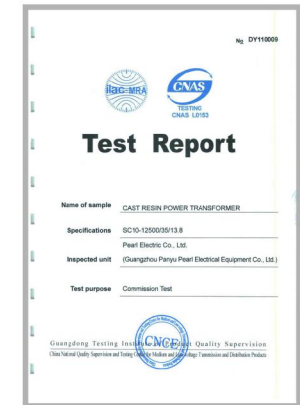
MAJOR TEST REPORTS



CE Test Report for Dry Type Transformer



CE Test Report for Dry Type Transformer



CNCE Test Report for 16MVA, 38.5kV Cast-resin Dry-type Transformer

MORE TEST REPORTS AVAILABLE

For all products developed and supplied by pearl Electric, type and special tests have been carried out in internationally-recognized independent test lab, and test reports have been obtained, including:

- C2/E2/F1 test report for cast-resin dry-type transformer
- Aging test report for cast-resin dry-type transformer
- Aseismatic report for cast-resin dry-type transformer
- Type and special test reports for class 1E dry-type transformer for nuclear power station application
- Type and special test reports for various traction/excitation transformers
- Type and special test reports for amorphous alloy core dry-type and oil type transformers
- Test reports for three-proof (salt-fog, mildew, humid-heat) performance
- Type and special test reports for different types of pre-fabricated substation/pad-mounted transformer/mini-sub/Kiosks
- Type and special test reports for transformers of wind farm/solar plant application
- Certificates for energy-conservation product

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GENERAL OUTLINE DRAWINGS

DRY TYPE TRANSFORMER (Normal LOSS)

Insulation Level:

11/12/75/28kV; 22/24/125/50kV;
33/36/170/70kV

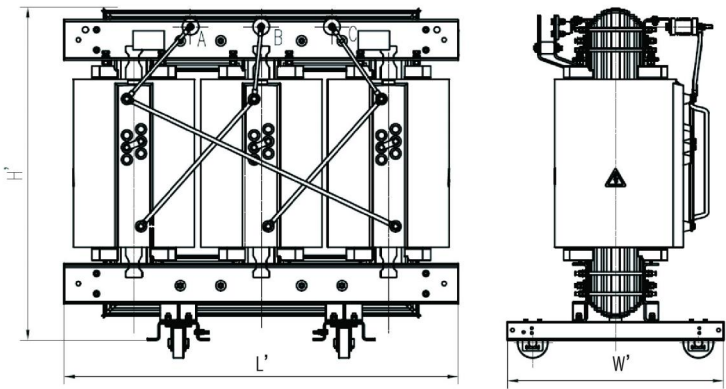
Vector Group:

Dyn11, Yyn0 or customer specified

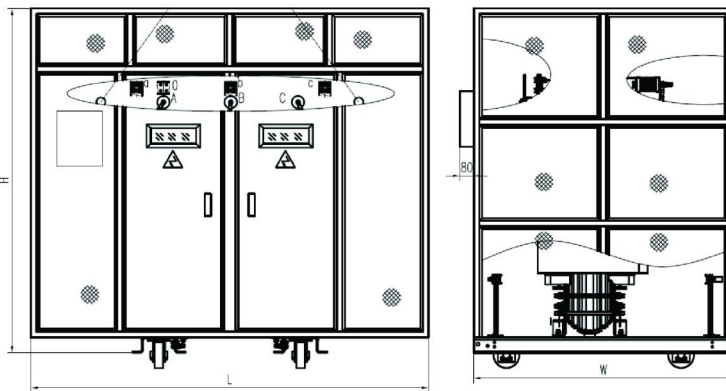
Reference standards for design,
manufacturing and test:

IEC 60076

Without protective enclosure



With protective enclosure



Rating (kVA)	Highest Level (kV)	Impedance (%)	No Load Losses (kW)	Load Losses at 75 °C (kW)	Load Losses at 120 °C (kW)	Without Enclosure				With Enclosure				Noise Level (dB)
						Length(L') (mm)	Width(W') (mm)	Height(H') (mm)	Weight (kg)	Length(L) (mm)	Width(W) (mm)	Height(H) (mm)	Weight (kg)	
160	12	4	610	2300	2630	1260	740	1150	950	1700	1300	1600	1250	50
	24	4	650	2300	2630	1490	740	1270	1200	2000	1400	1700	1550	50
	36	6	900	2490	2850	1800	850	1390	1300	2500	1500	1800	1750	51
250	12	4	820	3100	3550	1270	740	1200	1000	1700	1300	1600	1300	53
	24	4	880	3300	3780	1510	740	1340	1450	2000	1400	1800	1850	53
	36	6	1200	3365	3850	1800	850	1480	1600	2500	1500	1900	2050	54
315	12	4	950	3600	4120	1310	850	1200	1100	1700	1350	1600	1450	54
	24	4	1030	4000	4580	1570	850	1390	1700	2100	1450	1900	2100	55
	36	6	1350	4240	4850	1800	1070	1550	1800	2500	1550	2000	2300	55
400	12	4	1150	4300	4920	1370	850	1260	1350	1800	1350	1700	1700	55
	24	4	1200	4800	5500	1600	850	1440	1950	2100	1450	1900	2350	56
	36	6	1550	4940	5650	1870	1070	1620	2100	2600	1550	2000	2600	56
500	12	4	1300	5100	5840	1450	850	1300	1600	1900	1350	1700	1950	56
	24	4	1500	5600	6410	1670	850	1570	2200	2200	1450	2100	2650	56
	36	6	1850	5985	6850	1930	1070	1650	2450	2700	1550	2200	3000	56
630	12	4	1500	6400	7320	1500	850	1380	1850	1900	1450	1800	2200	57
	24	4	1650	6800	7790	1760	850	1690	2650	2300	1550	2200	3150	57
	36	6	2100	6990	8000	2090	1070	1810	3000	2800	1650	2300	3600	57
800	12	5	1700	7700	8810	1630	1070	1400	2150	2000	1450	1800	2550	58
	24	5	2000	8200	9390	1790	1070	1710	2750	2300	1550	2200	3250	59
	36	6	2500	8390	9600	2140	1200	1850	3300	2900	1650	2300	3900	59
1000	12	5	1850	8000	9160	1670	1070	1540	2550	2100	1450	1900	2950	59
	24	5	2200	8900	10190	1880	1200	1730	3150	2400	1550	2200	3650	59
	36	6	2950	96000	11000	2250	1070	1920	4000	3000	1650	2300	4650	59
1250	12	5	2500	10500	12020	1760	1070	1620	3100	2200	1450	2000	3550	61
	24	5	2800	11500	13170	2000	1070	1810	3900	2500	1550	2300	4450	61
	36	6	3500	11700	13400	2390	1200	2000	5000	3100	1650	2400	5700	61
1600	12	6	2800	12300	14080	1970	1070	1660	3900	2400	1600	2100	4400	62
	24	6	3100	14000	16030	2120	1070	1880	4550	2600	1700	2400	5150	62
	36	8	3800	14240	16300	2450	1200	2050	5200	3200	1800	2500	6000	62
2000	12	6	3500	14900	17060	2020	1070	1800	4400	2400	1600	2200	4950	63
	24	6	4000	17500	20040	2210	1070	2050	5300	2700	1700	2500	5950	63
	36	8	4500	17900	20500	2560	1200	2120	5900	3300	1800	2600	6700	63
2500	12	6	4300	18300	20950	2120	1070	1920	5300	2500	1600	2300	5850	65
	24	6	5000	20000	22900	2420	1070	2170	6650	2900	1700	2700	7350	65
	36	8	5500	20530	23500	2680	1200	2340	6900	3400	1800	2800	7750	65

DRY TYPE TRANSFORMER (LOW LOSS)

Rating (kVA)	Highest Level (kV)	Impedance (%)	No Load Losses (kW)	Load Losses at 75 °C (kW)	Load Losses at 120 °C (kW)	Without Enclosure				With Enclosure				Noise Level (dB)
						Length(L) (mm)	Width(W) (mm)	Height(H) (mm)	Weight (kg)	Length(L) (mm)	Width(W) (mm)	Height(H) (mm)	Weight (kg)	
160	12	4	460	2300	2630	1260	740	1150	950	1700	1300	1600	1250	48
	24	6	530	2300	2630	1520	740	1250	1100	2000	1400	1700	1450	50
	36	6	720	2490	2850	1800	850	1390	1300	2500	1500	1800	1750	51
250	12	4	610	3100	3550	1270	740	1200	1000	1700	1300	1600	1300	51
	24	6	710	3300	3780	1570	740	1320	1350	2100	1400	1800	1750	52
	36	6	960	3365	3850	1800	850	1480	1600	2500	1500	1900	2050	54
315	12	4	770	3600	4120	1310	850	1200	1100	1700	1350	1600	1450	52
	24	6	820	4000	4580	1570	850	1370	1550	2100	1450	1900	1950	53
	36	6	1080	4240	4850	1800	1070	1550	1800	2500	1550	2000	2300	55
400	12	4	870	4300	4920	1370	850	1260	1350	1800	1350	1700	1700	53
	24	6	950	4800	5500	1570	850	1400	1700	2100	1450	1900	2100	54
	36	6	1240	4940	5650	1870	1070	1620	2100	2600	1550	2000	2600	56
500	12	4	1040	5100	5840	1450	850	1300	1600	1900	1350	1700	1950	54
	24	6	1200	5600	6410	1690	850	1550	1950	2200	1450	2100	2400	54
	36	6	1480	5985	6850	1930	1070	1650	2450	2700	1550	2200	3000	56
630	12	5	1140	6400	7320	1500	850	1380	1850	1900	1450	1800	2200	55
	24	6	1320	6800	7790	1750	850	1630	2350	2300	1550	2200	2850	55
	36	6	1680	6990	8000	2090	1070	1810	3000	2800	1650	2300	3600	57
800	12	5	1290	7700	8810	1630	1070	1400	2150	2000	1450	1800	2550	56
	24	6	1600	8200	9390	1840	1070	1670	2700	2300	1550	2200	3200	56
	36	6	2000	8390	9600	2140	1200	1850	3300	2900	1650	2300	3900	59
1000	12	5	1550	8000	9160	1670	1070	1540	2550	2100	1450	1900	2950	56
	24	6	1760	8900	10190	1870	1070	1690	3000	2400	1550	2200	3500	56
	36	6	2360	96000	11000	2250	1200	1920	4000	3000	1650	2300	4650	59
1250	12	5	1740	10500	12020	1760	1070	1620	3100	2200	1450	2000	3550	58
	24	6	2240	11500	13170	2030	1070	1780	3700	2500	1550	2300	4250	58
	36	6	2800	11700	13400	2390	1200	2000	5000	3100	1650	2400	5700	61
1600	12	6	2190	12300	14080	1970	1070	1660	3900	2400	1600	2100	4400	58
	24	6	2490	14000	16030	2120	1070	1880	4550	2600	1700	2400	5150	58
	36	8	3040	14240	16300	2450	1200	2050	5200	3200	1800	2500	6000	62
2000	12	6	2790	14900	17060	2020	1070	1800	4400	2400	1600	2200	4950	59
	24	6	3200	17500	20040	2210	1070	2050	5300	2700	1700	2500	5950	59
	36	8	3600	17900	20500	2560	1200	2120	5900	3300	1800	2600	6700	63
2500	12	6	3290	18300	20950	2120	1070	1920	5300	2500	1600	2300	5850	60
	24	6	4000	20000	22900	2420	1070	2170	6650	2900	1700	2700	7350	61
	36	8	4400	20530	23500	2680	1200	2340	6900	3400	1800	2800	7750	65

Notes:

- 1.The above are standard product design. However, customized design is available upon request.
- 2.Due to consistent design improvement, these parameters are subject to changes without notice in advance.

TEMPERATURE CONTROL SYSTEM

Transformer's reliability and service lifetime are greatly depending on those of the coils. However, over-temperature is the key cause for degrading of transformer's insulation system. Therefore, the multi-functional temperature control system is designed to ensure transformer's reliability, which is realized through the Pt100 platinum resistor buried within the coils to monitor the coil's operation temperature. The measured values will be displayed on the display panel. Then, different functions could be carried out according to the pre-settings, for example, the fan start/stop and over-temperature alarm/trip, thus to ensure system reliability and prolong transformer's service lifetime.



AIR FORCED COOLING SYSTEM

Under air forced cooling conditions, the transformer output capacity could be increased by 40%~50%, for various emergency overloading or periodic overloading. However, no matter with air forced cooling or air natural cooling, good air-ventilation facilities should be equipped, thus to guarantee transformer's proper performance.



PROTECTIVE ENCLOSURE

The protective enclosure could provide further safety protection for operators and prevent invasion of different foreign objects. The protective enclosure could be IP20 or above upon request and the materials could be aluminum alloy, stainless steel, composite board and etc. However, addition of protective enclosure may affect transformer's heat-dispersion effect. Please consult manufacturer for more advices.

