

JB

**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

JB/T 501-2006

Replacing JB/T 501-1991

Test guide for power transformers

电力变压器试验导则

(English Translation)

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1 Scope

This standard specifies procedures and methods of routine tests, type tests and special tests for oil-immersed type and dry-type power transformers.

This standard applies to the tests of oil-immersed type and dry-type power transformers.

This standard may apply to special transformers.

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of this standard. For dated reference, subsequent amendments to (excluding any corrigendum), or revisions of, any of these publications do not apply. However, parties to agreements based on this standard are encouraged to investigate the possibility of applying the latest editions of the standards indicated below. For undated references, the latest edition of the document referred to applies.

GB/T 311.6-1983 High voltage test techniques - Part 5: Sphere-gaps for voltage measurement (eqv IEC 60052:1960)

GB/T 507-2002 Insulating liquids - Determination of the breakdown voltage at power frequency (eqv IEC 60156:1995)

GB 1094.1-1996 Power transformers - Part 1: General (eqv IEC 60076-1:1993)

GB 1094.2-1996 Power transformers - Part 2: Temperature rise (eqv IEC 60076-2:1993)

GB 1094.3-2003 Power transformers - Part 3: Insulation levels, dielectric tests and external clearances in air (eqv IEC 60076-3:2000)

GB/T 1094.4-2005 Power transformers - Part 4: Guide to the lightning impulse and switching impulse testing - Power transformers and reactors (IEC 60076-4:2002, MOD)

GB 1094.5 Power transformers - Part 5: Ability to withstand short circuit (GB 1094.5-2003, IEC 69076-5:2000, MOD)

GB/T 1094.10 Power transformers - Part 10: Determination of sound levels (GB/T 1094.10-2003, IEC 60076-10:2001, MOD)

GB/T 5654-1985 Measurement of relative permittivity, dielectric dissipation factor at power frequency and volume resistivity of insulating liquids

GB 6450 Dry-type power transformers (GB 6450-1986, eqv IEC 60726:1982)

GB/T 6451-19 Specification and technical requirements for three-phase oil-immersed power transformers

GB 7597-1987 Method of sampling for transformer and turbine oils in electric power industry

GB/T 7600-1987 Determination of water content in transformer oils in service by coulometric method

GB/T 7601-1987 Determination of water content in transformer oils in service by gas chromatographic method

GB/T 10228-1997 Specification and technical requirements for dry-type power transformers

GB/T 16274-1996 Specification and technical requirements for oil immersed power transformers 500kV

GB/T 16927.1-1997 High voltage test techniques - Part 1: General test requirements (eqv IEC 60060-1:1989)

GB/T 17623-1998 Determination of componental contents of gases dissolved in insulating oil by gas chromatography method

DL/T 423-1991 Determination of air content in insulating oil by vacuum differential pressure method

3 Main symbols

U_r - rated voltage, V;

I_r - rated current, A;

S_r - rated power, kVA;

K - voltage ratio;

R - resistance, ohm;

T - temperature, °C;

R_{xg} - phase resistance, ohm;

R_{xn} - line resistance, ohm;

K_{Δ} - air density correction factor;

K_d - air density;

f_r - rated frequency, Hz;

P_0 - no-load loss, W ;

I_0 - no-load current, %;

P_k - load loss corrected to reference temperature, W;

Z_k - short-circuit impedance corrected to reference temperature, %;

Z_i - short-circuit impedance, ohm;

P_r - resistance loss, W;

θ - average temperature, °C;

$\Delta\theta$ - temperature rise, K;

Z_0 - zero sequence impedance, ohm/phase;