

ICS 29.180
CCS K 41



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

GB/T 1094.18-2016

**Power transformers -- Part 18: Measurement of frequency
response**

电力变压器 第18部分：频率响应测量

(English Translation)

Issued on: August 29, 2016

Implemented on: March 1, 2017

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China**

Table of Contents

Preface
1 Scope
2 Terms and definitions

Foreword

GB 1094 "Power Transformers" currently contains the following parts.

- Part 1. General;
- Part 2. temperature rise of liquid immersion transformers;
- Part 3. Insulation level, insulation test and external insulation air gap;
- Part 4. Guidance on lightning shock and operational impact tests for power transformers and reactors;
- Part 5. Ability to withstand short circuits;
- Part 6. Reactors;
- Part 7. Guidelines for oil - immersed power transformers;
- Part 10. Sound level determination;
- Part 10.1. Guidelines for the application of sound levels;
- Part 11. Dry - type transformers;
- Part 12. Guidance for dry - type power transformers;
- Part 14. Design and application of liquid immersion transformers using high temperature insulating materials;
- Part 16. Transformers for wind power generation;
- Part 18. Frequency response measurements.

This section is part 18 of GB 1094.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part uses the re-drafting method to modify IEC 60076-18.:2012 "Power Transformers Part 18. Frequency Response Measurements".

The technical differences between this part and IEC 60076-18.:2012 are as follows.

In order to adapt to China's national conditions, the original table 1 in the "phase 1 outlet" "phase 2 outlet" "phase 3 outlet" were used "A phase outlet End "" B phase out of the terminal "" C phase outlet "instead;

In order to adapt to our national conditions, "A, U, R or 1", "B, V, S or 2", "C, W, T or 3" in the original table 2 "A-phase outlet" "B-phase outlet" "C-phase outlet" instead.

This part also makes editorial changes to IEC 60076-18.:2012.

- Amend Annex A, Appendix B and Appendix C of the original text to appendix C, appendix A and appendix B of this section.

This part is made by China Electrical Equipment Industry Association.

This part is part of the National Standardization Technical Committee of Transformers (SAC/TC44).

This part of the drafting unit. Guangdong Power Grid Co., Ltd. Electric Power Research Institute, Shenyang Transformer Research Institute Co., Ltd., China Qualification Assessment National Accreditation Center, China Southern Power Grid Science Research Institute Co., Ltd., State Grid Jilin Electric Power Co., Ltd. Electric power research Hospital, Wolong Electric Group Beijing Huatai Transformer Co., Ltd., Baoding Tianwei Insulation Electric Co., Ltd., TBEA Hengyang Transformer Limited company, Hainan Witt Electric Group Co., Ltd., Pearl Electric Co., Ltd., Guangdong Orian Power Equipment Co., Ltd.

This part of the main drafters. Lin Chunyao, Zhang Xianzhong, Chen Di, Liu Jie, Zhou Dan, Zhao Linjie, Ao Ming, He Baozhen, Guo Man Sheng, Xie Wenying, Xu secret, Cai Dingguo, Wang Wenguang.

Power transformer

Part 18. Frequency response measurements

1 Scope

This part of GB 1094 specifies the method and equipment for the frequency response measurement of the equipment at the site and at the factory.

The measurement can also be used to measure the running equipment. Interpretation of the results of the analysis does not belong to the normative content of this part, only attached Some guidance is given in document A. This section applies to power transformers, reactors and the like.

2 Terms and definitions

The following terms and definitions apply to this document.

Frequency response in a certain frequency range, one end of the voltage source excitation

by the two ends of the measured voltage amplitude and phase angle difference.

Note 1: The frequency response measurement result is the amplitude ratio and the phase angle difference at the specific frequency in a certain frequency range.

Note 2: The measured voltage is through the impedance of the voltage, and therefore also with the current.

Frequency response analysis; FRA Detection of damage by frequency response measurements.

Note: The abbreviations SFRA (Swept Frequency Response Analysis) and IFRA (Pulse Frequency Response Analysis) are used to refer to the sweep voltage source excitation and pulse voltage Frequency Response Analysis of Source Excitation. This part applies to SFRA and IFRA when the measuring device meets the requirements of Chapter 5.

Power lead sourcelead is connected to the lead on the voltage source of the measuring device used to provide the input voltage to the test object.

Reference lead

Vin

Is connected to the lead on the reference channel of the measuring device used to measure the input voltage of the test object.

Response lead response Vout Connected to the lead on the response channel of the measuring device used to measure the output voltage of the test object.

End-to-end measurement the frequency response measurement on a single coil (phase winding), the power supply lead and the reference lead (Vin) are connected to one end of the coil, and the response lead (Vout) to the other end.

Measurement of capacitive connection for the measurement of the frequency response of two adjacent coils (in-phase windings), the power supply leads of the measuring instrument and the reference lead (Vin) are connected to a winding