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

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**High-voltage test techniques - Measurement of partial
discharges by electromagnetic and acoustic methods**

高电压试验技术 电磁和声学法测量局部放电

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Foreword

This document was issued on 30 December 2022 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 July 2023.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

It is classified under ICS 19.080, Chinese classification K40.

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1. Structure and Drafting Rules for Standardization Documents" drafting.

This document is equivalent to IEC TS62478.2016 "High Voltage Test Technology Electromagnetic and Acoustic Method for Partial Discharge Measurement", file type

The technical specification of IEC is adjusted to the national standard of our country.

Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents.

This document is proposed by China Electrical Equipment Industry Association.

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This document is drafted by. East China Electric Power Test Research Institute Co., Ltd., Xi'an High Voltage Apparatus Research Institute Co., Ltd., Xi'an Jiaotong University

Science, China Electric Power Research Institute Co., Ltd., State Grid Shaanxi Electric Power Co., Ltd. Electric Power Research Institute, State Grid Hebei Electric Power Co., Ltd.

Electric Power Research Institute, State Grid Henan Electric Power Company Electric Power Research Institute, State Grid Sichuan Electric Power Company Electric Power Research Institute, Ningbo

Vocational and Technical College, State Grid Ningxia Electric Power Co., Ltd. Electric Power Research Institute, China Institute of Metrology, State Grid Economic and Technological Research Institute have

Co., Ltd., China Southern Power Grid Research Institute Co., Ltd., State Grid Tibet Electric Power Co., Ltd. Electric Power Research Institute, State Grid Hubei Electric Power

Co., Ltd. Marketing Service Center (Metering Center), State Grid Sichuan Electric Power Company Aba Power Supply Company, Xinjiang TBEA Automatic Control Equipment Co., Ltd.

Division, Siyuan Electric Co., Ltd., State Grid Zhejiang Electric Power Co., Ltd. Electric Power Research Institute, Shanghai Jiaotong University, China Southern Power Grid

Technology Co., Ltd., State Grid Smart Grid Research Institute Co., Ltd., Wuhan University, Xi'an Xidian Lightning Arrester Co., Ltd., Zhongke (Shenzhen

Shenzhen) Energy Internet of Things Co., Ltd., Xi'an Xidian Switch Electric Co., Ltd., Inner Mongolia Electric Power (Group) Co., Ltd. Inner Mongolia Electric Power Division

Research Institute Branch, Beijing Jiaotong University, Pinggao Group Co., Ltd., Guangxi Power Grid Co., Ltd. Electric Power Research Institute, Shijiazhuang Branch

Lin Electric Equipment Co., Ltd., Gansu Electric Apparatus Research Institute, China Yangtze Power Co., Ltd., Shandong University, Xi'an Maorong Electric Power Equipment

Co., Ltd., North China Electric Power University, Electric Power Research Institute of Guangdong Power Grid Co., Ltd., Electric Power Scientific Research of State Grid Chongqing Electric Power Company

Institute, State Grid Liaoning Electric Power Co., Ltd. Electric Power Research Institute, Hangzhou Kelin Electric Co., Ltd., Shandong Taikai Complete Electric Co., Ltd.

Division, Xiamen Smarts Intelligent Electric Co., Ltd., State Grid Anhui Electric Power Co.,

Ltd. Electric Power Research Institute, Yunnan Power Grid Co., Ltd.

Electric Power Research Institute, State Grid Shanghai Electric Power Company Jinshan Power Supply Company, Jiangsu Rugao High Voltage Electric Appliance Co., Ltd.

The main drafters of this document. Si Wenrong, Zhang Xiaoyong, Li Junhao, Fu Chenzhao, Lei Min, Li Yanming, Wang Chunjie, Zhou Wei, Li Qiang, Zhao Xuefeng,

Gao Shuguo, Wang Ting, Wang Tian, Su Chunqiang, Liu Hongliang, Zhang Chenmeng, Shen Jianwei, Wang Jiansheng, Wu Xutao, Liu Na, Du Shangan, Pu Lu, Hu Liangrong, Gao Chao,

Wang Dafei, Guo Yue, Wang Sike, Wang Daxing, Wei Peng, Xu Tiejun, Chang Jiasen, Zhao Lin, Wang Hui, Lu Qifu, Ju Dengfeng, Guan Weimin, Han Shuai, He Jumou,

Wang Wei, Wang Jianwen, Wang Ling, Zhang Wei, Che Chuanqiang, Sun Jixing, Lin Lin, Rao Xiajin, Duan Hongmin, Yan Qi, Wu Zhiguo, Li Qingquan, Wang Guoli, Yuan Peng,

Li Teng, Ma Guoming, Li Xingwang, Wang Jiayi, Xie Cheng, Li Yong, Jin Xin, Xie Wei, Zheng Weixia, Shen Wei, Sang Zhongqing, Zhu Taiyun, Peng Jing, Yang Yang, Zhang Yu,

Sun Jingjing, Xie Dong, Fan Xingcai.

Introduction

Partial discharges can generate electromagnetic and acoustic signals, radiate light and cause chemical decomposition of insulating materials; these physical and chemical effects can be

It can be detected by various diagnostic methods and corresponding sensing elements (sensors). In addition to IEC 60270 describing so-called conventional electrical inspection

Partial discharge can also be measured using unconventional methods (see Appendix A, Appendix B and Appendix C).

This document gives recommendations for the special requirements of the application of these two types of unconventional detection methods, electromagnetic and acoustic, and is the basis for measurement in this direction.

Fundamentals of partial discharge.

Electromagnetic and Acoustic Measurement of High Voltage Test Technology

Partial Discharge

1 Scope

GB/T 42287-2022 covers detecting partial discharge by the signals it radiates rather than by the current it draws. Partial discharge is a small electrical breakdown inside insulation

that does not bridge the whole gap - it erodes the material a little at a time, and over years it turns a sound transformer, cable or switchgear into a failure. The classical measurement, of apparent charge in the circuit, is precise but needs the equipment de-energised and connected to a test set. Electromagnetic and acoustic methods work differently: a discharge radiates a fast pulse in the HF, VHF and UHF bands and an audible acoustic pulse through the structure, both detectable by sensors placed outside the equipment while it stays in service. That makes them the practical tools for monitoring installed plant, and the acoustic method has the further advantage of locating the discharge by time of arrival. This document describes electromagnetic and acoustic measurement methods for partial discharges in the insulation of electrical equipment. Under ICS 19.080 and CCS K40, it is written for utilities and industrial operators doing condition assessment, for diagnostic service providers, and for equipment manufacturers.

This document describes electromagnetic (HF/VHF/UHF) and acoustic measurement methods for partial discharges in the insulation of electrical equipment.

This document is applicable to partial discharge sensors of different application scenarios, different frequency ranges and different sensitivities, as well as the corresponding positioning, measuring

measurement system calibration or sensitivity check.

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text. Among them, dated references

For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to

this document.

GB/T 20833.1 Winding insulation of rotating electrical machines Part 1.Off-line partial discharge measurement (GB/T 20833.1-2021,

IEC 60034-27-1.2017, IDT)

measurements)

Note. GB/T 7354-2018 High Voltage Test Technology Partial Discharge Measurement (IEC 60270.2000, MOD)

3 Terms and Definitions

The following terms and definitions apply to this document.