

ICS 29.240.01

CCS K 45



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

GB/T 22390.4-2008

**Control and protection equipment of HVDC transmission
systems - Part 4: DC protection equipment**

高压直流输电系统控制与保护设备 第4部分：直流系统保护设备

Issued on: September 24, 2008

Implemented on: August 1, 2009

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine;
Standardization Administration of the PRC**

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Foreword

According to the 2003 National Science and Technology Science and Technology Platform project focused "DC power transmission system core technology and infrastructure standard Research "(Project No. 2003DIA7J034) requirements formulated standard" HVDC system control and protection equipment. " GB/T 22390 "HVDC system control and protection equipment" is divided into six parts.

--- Part 1. Operator Control System;

--- Part 2. AC and DC station control system equipment;

--- Part 3. DC pole control system equipment;

--- Part 4. DC system protection equipment;

--- Part 5. DC line fault location device;

--- Part 6. Converter Station transient fault recorder. This section GB/T Part of 422,390. This section proposed by the China Electrical Equipment Industry Association and the China Electricity Council. This part of the National Standardization Technical Committee of HVDC equipment (SAC/TC333) centralized. This part mainly drafted by: Nanjing NARI-RELAYS Electric Co., XJ Group Co., Ltd., Beijing Network of DC engineering technology Ltd., China Southern Power Grid Co., Ltd., Xuchang Relay Research Institute, Chinese Academy of Sciences electricity. The main drafters of this section. malondialde Eileen Chang, Yu Tao, Yao Zhiqing, Maoshi Tao, around, Li Yaping, Li Yan, Li Zhiyong, Wang Mingxin, Han Wei, Shiyan. This section first release. HVDC system control and protection equipment Part 4. DC system protection equipment

1 Scope

China's national standard for the DC protection equipment of a high voltage direct current transmission scheme. It is Part 4 of GB/T 22390 and specifies the technical requirements,

the test methods, the inspection rules, the packaging, transport and storage, the marking and documentation, the complete supply and the quality assurance for DC system protection equipment, applying to the protection of a 500 kV class bipolar HVDC system. Protecting a direct current system is a different problem from protecting an alternating one, and the difference is why this part exists separately. An AC circuit breaker clears a fault at a current zero, which the alternating waveform provides a hundred times a second. Direct current has no zero, and high-voltage DC breakers were not generally available when these schemes were built - so a DC fault is not cleared by opening a breaker on the DC side. It is cleared by the converter itself: the control forces the rectifier into inversion, drives the current to zero within milliseconds, and the fault is extinguished by the machine that created the current. Protection therefore does not trip a breaker; it commands the control system, and the boundary between protection and control is far less distinct than in an AC substation. The protections themselves cover what can go wrong in the DC circuit: pole-to-earth and pole-to-pole faults on the line, faults in the valve hall and on the valve itself, commutation failure and its repetition, DC overvoltage and overcurrent, differential protection across the pole and across the neutral bus, earth electrode line faults, and the loss of one pole with transfer to the surviving one. Their speed, selectivity, redundancy and coordination with the control are the substance of the requirements. Issued on 24 September 2008 and in force since 1 August 2009.

This section GB/T 22390 specifies the technical requirements of DC system protection equipment $\pm 500\text{kV}$ HVDC system, the test Methods, inspection rules, packaging, transportation, storage, marking, labeling, instruction manual, complete sets of supply and quality assurance. This section applies to $\pm 500\text{kV}$ HVDC DC system protection equipment (hereinafter referred to as the device).

2 Normative references

The following documents contain provisions which, through reference

GB/T 22390 in this section constitute provisions of this section. For dated reference documents Member, all subsequent amendments (not including errata content) or revisions do not apply to this section, however, encouraged to reach under this section Parties to research agreement to use the latest versions of these documents. For undated reference documents, the latest versions apply to this section.

GB/T 2887-2000 General specification for computer sites

GB/T 2900.49 Electrotechnical terminology - Power System Protection (GB/T 2900.49-2004,

IEC 60050 (448).1995, IDT)

GB 4208-1993 housing protection (IP Code) (eqv

IEC 60529. 1989) Basic testing method

GB/T 7261-2000 and the relay means

GB/T 9361-1988 computer site security requirements

GB 9969.1-1998 Instructions General Industrial Products

GB/T 11287-2000 Electrical relays - Part 21. Measuring relays and protection equipment vibration, shock, bump and seismic Test Section 1. Vibration tests (sinusoidal) (idt IEC 60255-21-1. 1988) GB/T 13498 HVDC term (GB/T 13498-2007, IEC 60633.1998, IDT)

GB/T 14285 Technical Specification for automatic protection and safety devices

GB/T 14537-1993 and measure impact crash tests (idt

IEC 60255-21-2. 1988) relays and protection equipment