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NB

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

NB/T 42064-2024

Replacing NB/T 42064-2015

**Guide to the testing of AC metal-enclosed switchgear and
controlgear for rated voltages above 3.6 kV and up to and
including 40.5 kV**

3.6 kV~40.5 kV 交流金属封闭开关设备和控制设备试验导则

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Foreword

This document was issued on 24 May 2024 by the National Energy Administration of the PRC and takes effect on 24 November 2024.

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

It is classified under ICS 19.020, Chinese classification K 40.

It replaces NB/T 42064-2015, which is superseded.

This document was drafted in accordance with the rules given in GB/T 1.1-2020 Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents.

This document replaces NB/T 42064-2015 Guide to the testing of AC metal-enclosed switchgear and controlgear for rated voltages above 3.6 kV and up to and including 40.5 kV. Compared with NB/T 42064-2015, apart from structural adjustments and editorial changes, the main technical changes are as follows:

a) the clause and subclause numbering has been rearranged;

- b) the standard cited has been changed to GB/T 3906-2020 AC metal-enclosed switchgear and controlgear for rated voltages above 3.6 kV and up to and including 40.5 kV, replacing GB/T 3906-2006;
- c) for a complete type test report, the insulation test of the cable test circuit has become a test item to be carried out when applicable, see 7.1 and 6.1 of the 2015 edition;
- d) for the type test on insulation performance, the requirements have been added for the verification test of the protection of persons against dangerous electrical effects and for the partial discharge test, when applicable, see 7.1;
- e) the requirement on the number of test objects has been deleted, see 6.2 of the 2015 edition;
- f) Table 2 has been added;
- g) test requirements have been added for the switching assembly when identical switching devices are assembled inside a common metal enclosure, see 7.5.1;
- h) the test procedure for combined 50 Hz and 60 Hz testing has been added, see 7.5.1;
- i) requirements have been added for the earthing function test, see 7.5.2;
- j) requirements have been added for the test conditions of the internal arc test, see 7.7.2;
- k) a requirement has been added on criterion 4 of the pass criteria of the internal arc test, and the explanation of criterion 5 has been deleted, see 7.7.4 and 6.16 of the 2015 edition;
- l) requirements have been added for the arrangement of the indicators in the internal arc test, see 7.7.7;
- m) requirements have been added for the test voltage of the internal arc test, see 7.7.8;
- n) requirements have been added for the supply arrangement of the internal arc test, see 7.7.10;
- o) requirements have been added for arc ignition in the internal arc test, see 7.7.11.

Please note that some of the content of this document may be the subject of patent rights. The issuing body of this document assumes no responsibility for identifying patents.

This document was proposed by the China Electrical Equipment Industry Association.

This document is under the administration of the Standardization Technical Committee on Short-circuit Testing Technology of the Energy Industry (NEA/TC 10).

The versions of this document and of the document it replaces are as follows: first issued in 2015 as NB/T 42064-2015; this is the first revision.

1 Scope

NB/T 42064-2024 is the Chinese guide to type testing AC metal-enclosed switchgear and controlgear from 3.6 kV to 40.5 kV. It exists because the product standard, GB/T 3906-2020, says what the switchgear must achieve but leaves room for interpretation in how the tests are run and how the results are written up, and a certificate that means different things in different laboratories is not a certificate at all. This document closes that gap: it defines exactly which five kinds of type test report may be issued - complete, insulation performance, temperature rise, short-circuit and making and breaking performance, and internal arc performance - what each one certifies, which clauses of GB/T 3906-2020 each must cover, and the rule that a combined report must name every test item it verifies in its title. The heart of it is the internal arc test, and that is where most of the changes in this revision land. An internal arc in a switchgear cubicle is the accident that kills switchroom operators: a fault inside the sealed enclosure turns into a plasma at thousands of degrees, the air in the compartment expands explosively, and the question the IAC classification answers is whether the doors stay shut, the exhaust goes where it was designed to go, and the cotton indicators standing in for a person's clothing do not ignite. This edition adds requirements for the test conditions, for the arrangement of the indicators, for the test voltage, for the supply arrangement and for arc ignition, tightens the fourth pass criterion and removes the explanation of the fifth. It also adds the test requirements for identical switching devices assembled inside a common metal enclosure, the procedure for combined 50 Hz and 60 Hz testing, and the earthing function test; it makes the verification test for protection of persons against dangerous electrical effects and the partial discharge test part of the insulation report when applicable; and it clarifies that the weak area of an enclosure is an area the manufacturer marks, not a point. It was issued on 24 May 2024 by the National Energy Administration, took effect on 24 November 2024, and replaces NB/T 42064-2015.

This document specifies the procedure by which a laboratory carries out type tests on AC metal-enclosed switchgear and controlgear for rated voltages above 3.6 kV and up to and including 40.5 kV, in accordance with GB/T 3906-2020.

This document applies to the process of testing AC metal-enclosed switchgear and controlgear for rated voltages above 3.6 kV and up to and including 40.5 kV in accordance with GB/T 3906-2020 and of issuing the report.

2 Normative references

The contents of the following documents constitute indispensable provisions of this document through normative reference in the text. For dated references, only the edition corresponding to that date applies to this document. For undated references, the latest edition, including all amendments, applies to this document.

GB/T 1984-2014 High-voltage alternating current circuit-breakers

GB/T 1985 High-voltage alternating current disconnectors and earthing switches

GB/T 3804-2017 3.6 kV to 40.5 kV high-voltage alternating current switches

GB/T 3906-2020 AC metal-enclosed switchgear and controlgear for rated voltages above 3.6 kV and up to and including 40.5 kV

GB/T 11022-2020 Common specifications for high-voltage alternating current switchgear and controlgear standards

GB/T 14808 High-voltage alternating current contactors, contactor-based controllers and motor starters

GB/T 16926 High-voltage alternating current switch-fuse combinations

GB/T 16927.1-2011 High-voltage test techniques - Part 1: General definitions and test requirements

3 Terms and definitions

No terms and definitions need to be defined in this document.

4 Normal and special service conditions

Clause 4 of GB/T 3906-2020 applies.

5 Ratings

Clause 5 of GB/T 3906-2020 applies.

6 Design and construction

If the enclosure is burnt through, the term weak area in 6.103.2.4 of GB/T 3906-2020 shall not be understood as a strictly limited local point. In some circumstances the burnt-through area may cover a larger area of the enclosure, the size of the area depending on the magnitude of the current and on the duration of the arcing.

The weak area shall be an area marked by the manufacturer, within which the arc will not produce longitudinal arc drawing.

7 Type tests

7.1 Procedure for issuing the type test report

When metal-enclosed switchgear and controlgear has been verified as satisfying the specified technical requirements, each laboratory issues, according to need, one or more of the following kinds of type test report, see Table 1; the rated parameters contained in the report are given in Table 2.