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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 11024.3-2019

Shunt capacitors for a.c. power systems having a rated voltage above 1 000 V -- Part 3: Protection of shunt capacitors and shunt capacitor banks

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Foreword

GB/T 11024 "Parallel capacitors for AC power systems with a nominal voltage above 1000V" is divided into four parts.

--- Part 1. General;

--- Part 2. Aging test;

--- Part 3. Protection of shunt capacitors and shunt capacitor banks;

--- Part 4. Internal fuses.

This part is the third part of GB/T 11024.

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

This part replaces GB /Z 11024.3-2001 "Parallel capacitors for AC power systems with a nominal voltage of 1kV or higher. Part 3.

The protection of the coupling capacitor and the shunt capacitor bank, compared with GB /Z 11024.3-2001, the main technical changes are as follows.

--- The rated voltage of the fuse is selected according to GB/T 15166.4 (see 5.2.2);

--- The coefficient in the energy calculation formula has been verified to use "159" in the original IEC text (see 5.3.2, 5.3.1 of the.2001 edition);

---Modified the energy limit of the jet fuse (see 5.3.2, 5.3.1 of the.2001 edition);

--- Change the "volume" to "volume" (see Figure 2, Figure 2 of the.2001 version);

--- Revised the formula for calculating the maximum peak value of the inrush current when the capacitor bank is put into the power supply (see 9.2.2, version 9.2.2 of.2001);

--- Added provisions on simultaneous switching (see 9.3).

This part uses the redrafting method to modify the use of IEC /T S60871-3.2015 "nominal voltage 1000V or more AC power system

Parallel capacitors - Part 3. Protection of shunt capacitors and shunt capacitor banks. Technical differences with IEC /T S60871-3.2015

And its reasons are as follows.

---About the normative reference documents, this part has made technical adjustments to adapt to China's technical conditions, adjustments

The situation is reflected in Chapter 2, "Regulatory Citations", and the specific adjustments are as follows.

* Replace IEC 60871-1 with GB/T 11024.1 modified to adopt international standards;

* Replace IEC 60871-4 with GB/T 11024.4 modified to international standards;

* Replace IEC 60549 with GB/T 15166.4 modified to international standards.

---Applicable to capacitors specified in GB/T 11024.1, the insulation level and voltage level are applicable to IEC TS60871-3.2015

The difference in IEC 60871-1 (see Chapter 1);

--- Modified the rated current of the fuse in the external fuse, according to the rated current of the capacitor 1.37 times ~ 1.50 times (see

5.2.1);

---Modified the power bearing capacity of the fuse base (see 5.2.1);

---Modified the fuse of the jet fuse, the corresponding value of the partial melting current (see Table 1);

--- Added imbalance detection and protection to determine the setting of relay protection (see Chapter 6);

--- Adjusted the name of some types of unbalanced protection (see Chapter 6);

--- Added Figure 7b), because the neutral point ungrounded star connection is widely used in China's 66kV and below systems [see

Figure 7b)];

--- The allowable value of the initial imbalance is adjusted according to the general protection principle of China (see 6.6);

--- The formula for modifying the maximum peak value of the inrush current is due to the maximum peak value of the inrush current when the capacitor bank is put into the power

supply in the international standard.

Calculate the formula without taking into account the power supply effects (see 9.2.2);

--- Removed the requirement that "for economic reasons, two discharge reactors are usually connected between two-phase lines and wires", this wiring

The formula has been banned in China (see IEC 60871-3.2015, 10.1.3).

This section has made the following editorial changes.

--- Rewritten Chapter 1 in accordance with the requirements of GB/T 1.1-2009.

1 Scope

This part of GB/T 11024 specifies the protective guidelines for shunt capacitors and shunt capacitor banks.

This section applies to capacitors in accordance with GB/T 11024.1.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated version applies to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 11024.1 Parallel capacitors for AC power systems with nominal voltages up to 1000 V. Part 1. General

(GB/T 11024.1-2019, IEC 60871-1.2014, MOD)

GB/T 11024.4 Parallel capacitors for AC power systems with nominal voltages up to 1000 V. Part 4. Internal fuses

(GB/T 11024.4-2019, IEC 60871-4..2014, MOD)

GB/T 15166.4 High-voltage AC fuses - Part 4. Fuse for external protection of shunt capacitors (GB/T 15166.4-2008,

IEC 60549. 1976, MOD)

3 Terms and definitions

The terms and definitions defined in GB/T 11024.1, GB/T 11024.4, and GB/T 15166.4 apply to this document.

4.1 Overview

The internal fuse of the shunt capacitor is a selective current limiting fuse disposed inside the capacitor. According to GB/T 11024.4

The internal fuse is designed to isolate the faulty capacitor component, allowing the rest of the capacitor unit and the capacitor to be connected.

The capacitor bank of the element continues to operate.

The internal fuse action is caused by breakdown of the capacitor element. The faulty component is instantly disconnected by the action of the component fuse without interruption

The operation of the capacitor.

The number of capacitors connected in parallel externally and the short-circuit current achievable by the power system do not affect the current limit of the internal fuse.

It should be noted that the internal fuse does not provide protection against short circuits between the internal wires or short circuits between the live parts and the case, and both cases

Both may cause the casing to burst.

4.2.1 Rated current

There are no definitions and test methods for component fuse rated current.