

ICS 31.060.70

CCS K 42



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

GB/T 26870-2011

**Industrial a.c. networks affected by harmonics - Application of
filters and shunt capacitors**

滤波器和并联电容器在受谐波影响的工业交流电网中的应用

(English Translation)

Issued on: July 29, 2011

Implemented on: December 1, 2011

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

Table of Contents

Preface

1 Scope and Purpose

2 Normative reference document

3 Terms and definitions

4 Overview

4.1 AC harmonics

4.2 Reactive power

5 Resonance problem and its solution

5.1 Introduction

5.2 Equivalent impedance diagram from the power supply side and equivalent impedance from the load bus

5.3 Example of Series Resonance

5.4 Parallel Resonance Example

5.5 Methods to prevent resonance

Foreword

This standard is drafted in accordance with the rules given in GB/T 1.1-2009 and GB/T 20000.2-2009.

This standard uses the re-drafting method to modify IEC 61642.:1997 "filters and shunt capacitors in harmonic-affected industrial exchanges Application in Power Grid "(English version).

The main technical differences between this standard and IEC 61642 are as follows.

--- in the "1.2 normative reference document" to increase GB/T 14549-1993 "power quality utility grid harmonics";

--- "" Capacitor for electric arc furnace "in" 1.1 Scope and Purpose "and" This standard does not apply to the following capacitors " in the "4.4" filter type ", according to Chinese customary call, the" second-order filter --- band-pass filter "renamed" single-tuning Filter "," second-order filter --- a resistive element damping filter "renamed" second-order high-pass filter. " this standard is mainly related to IEC 61642 made the following editorial changes.

- The example calculation part of the original IEC standard is incorrect, has been modified, and a detailed example is calculated in the preparation note.

Description of the process and numerical changes.

This standard is proposed by China Electrical Equipment Industry Association.

This standard is under the jurisdiction of the National Power Capacitor Standardization Technical Committee (SAC/TC45).

The drafting unit of this standard. Shandong Taikai Power Electronics Co., Ltd., Xi'an Senbao Electrical Engineering Co., Ltd., Xi'an High Voltage Electric Research Institute Limited liability company, Qingdao Hengshun Electric Co., Ltd., Anshan City Hengli Electric Equipment Manufacturing Co., Ltd., Guilin power capacitors have Limited liability company, Hefei Warwick Automation Co., Ltd., Shenzhen Sanhe Electric Power Technology Co., Ltd., Anhui Electric Power Research Institute, Shenzhen Central China Electric Power Technology Co., Ltd., Guangdong Power Grid Company Electric Power Research Institute, Shanghai Cooper Power Capacitor Co., Ltd., Anhui Ma'anshan City Jin Ju filter complete sets of equipment Co., Ltd., Beijing China Si Electrical Technology Co., Ltd., Sichuan Bohong Power Filter Design Research Co., Ltd., Jiang Jiangsu Province Jiangyin Mayor Group limited liability company.

1 Scope and purpose

This standard gives guidance on the use of passive AC filters and shunt capacitors used to suppress harmonics and reactive power compensation in the industry.

See, including low pressure and high pressure. The proposed measures in this standard apply to harmonics of more than once to 25 (including 25).

This standard does not apply to the following capacitors.

Capacitor for induction heating devices [see GB/T 3984 (all parts)];

Series capacitors for power systems [see GB/T 6115 (all parts)];

Coupling capacitors and capacitive voltage dividers (see GB/T 19749);

Power electronic capacitors [see GB/T 17702 (all parts)];

AC motor capacitors [see GB/T 3667 (all parts)];

Tubular fluorescent lamps and other discharge lamp line capacitors (see GB 18489 and GB/T 18504);

A capacitor for suppressing radio interference;

A capacitor for use in various electrical equipment and as a component thereof;

And a capacitor used for superimposing an AC voltage having a DC voltage.

The purpose of this standard is to analyze the parallel capacitors and filters in the harmonic voltage and harmonic current affected by the industrial AC power grid in the conventional

Application of the problems, and give recommendations.

2 Normative reference documents

The following documents are indispensable for the application of this document. For dated references, only the dated edition applies to this article. For undated references, the latest edition (including all modifications) applies to this document.

Power quality - Harmonics of public power grid GB/T 14549-1993

3 Terms and definitions

The following terms and definitions apply to this document.

Harmonic

The periodic communication is carried out to decompose the Fourier series to obtain an integer multiple of the fundamental frequency greater than 1.

[GB/T 14549-1993, definition 3.4] 3.2 Harmonic number the ratio of the harmonic frequency f_h to the fundamental frequency f_1 .

[GB/T 14549-1993, definition 3.5]