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

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**Electromagnetic compatibility - Generic standards - Part 7: Immunity  
requirements for equipment intended to perform functions in a  
safety-related system (functional safety) in industrial locations**

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### foreword

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 Part 7 of the General Standard for Electromagnetic Compatibility. The General Standard for Electromagnetic Compatibility has published the following parts.

- Immunity in residential, commercial and light industrial environments (GB/T 17799.1);
- Immunity test in industrial environment (GB/T 17799.2);
- Emissions in residential, commercial and light industrial environments (GB 17799.3);
- Emission in industrial environment (GB 17799.4);
- High altitude electromagnetic pulse (HEMP) immunity of indoor equipment (GB/T 17799.5);
- Immunity in the environment of power plants and substations (GB /Z 17799.6);

--- Part 7. Immunity requirements for equipment used to perform safety-related system functions (functional safety) in industrial locations (GB/T 17799.7).

This document is modified to adopt IEC 61000-6-7:2014 "Electromagnetic Compatibility (EMC) Part 6-7. General Standards Used in Industrial Sites

Immunity Requirements for Equipment Performing Safety-Related System Functions (Functional Safety).

The technical differences between this document and IEC 61000-6-7:2014 and their reasons are as follows.

--- Deleted the parameter indicators related to 60Hz in Table 2 to Table 6, including 60Hz and 60Hz in the test levels of Table 2, Table 4 to Table 6

180Hz frequency point, and the requirements of the duration of 12 cycles, 30 cycles and 300 cycles in the test level of Table 3, to apply

In my country's national conditions (see Chapter 7);

--- In Table 7 and Table 8, the frequency range and services related to mobile communications in my country have been added for ease of use (see Chapter 7).

The following editorial changes have been made to this document.

--- In order to be consistent with our country's standard system, the name of the standard is changed to "General Standard for Electromagnetic Compatibility Part 7. Used in Industrial Sites

Immunity requirements for equipment performing safety-related system functions (functional safety);

--- Deleted the note about the French version only in the definition of the term "controlled equipment" (see 3.1.7);

--- Added the abbreviations "ESD" and "UPS" (see 3.2);

--- Added "for reference only" in the header of Table 8 to be consistent with Table 7 (see Chapter 7);

--- Adjusted references.

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

## Introduction

Electromagnetic compatibility is the ability of electrical and electronic equipment or systems to function properly in their electromagnetic environment without causing adverse effects to anything in that environment.

Ability to withstand electromagnetic disturbances. Electromagnetic compatibility is one of the important factors affecting the environment and product quality, and its standardization work has

aroused widespread attention at home and abroad. In this regard, the IEC 61000 series of publications developed by the International Electrotechnical Commission (IEC)

Common standards in the fields of industry, electrical engineering and energy, transportation, social undertakings and health, quality and safety of consumer goods, etc., divided into

There are six categories. overview, environment, limit values, testing and measurement techniques, installation and mitigation guidelines, and general standards. my country has launched a series of publications

The domestic transformation work has been carried out, and the corresponding national standard system has been established.

In this standard system, the "General Standard for Electromagnetic Compatibility" is a basic standard for general aspects in the field of electromagnetic compatibility, which aims to describe different

Emission and immunity requirements in the same environment, etc., are proposed to be composed of 8 parts.

--- Immunity in residential, commercial and light industrial environments (GB/T 17799.1). Intended for residential, commercial and light industrial environments

Electrical and electronic equipment used in specifies its immunity to continuous and transient, conducted and radiated disturbances, including electrostatic discharge degree test requirements.

--- Immunity test in industrial environment (GB/T 17799.2). Intended for use in an industrial environment and does not yet have a dedicated product

The product or product-group immunity standard for electrical and electronic equipment specifies its immunity to continuous and transient, conducted and

Immunity test requirements for radiated disturbances.

--- Emissions in residential, commercial and light industrial environments (GB 17799.3). Intended for use in residential, commercial and light industrial environments

Emission test requirements for continuous and transient, conducted and radiated disturbances of electrical and electronic equipment used.

--- Emission in an industrial environment (GB 17799.4). The purpose is to specify the continuity of electrical and electronic equipment used in industrial environments

and emission test requirements for transient, conducted and radiated disturbances.

---Indoor equipment high-altitude electromagnetic pulse (HEMP) immunity (GB/T 17799.5).  
The purpose is to regulate the electrical and

HEMP immunity requirements for electronic equipment.

--- Immunity in the environment of power plants and substations (GB /Z 17799.6). The  
purpose is to regulate the generation, transmission and distribution of power systems  
Immunity requirements for the equipment used and associated communication systems.

--- Part 7.Immunity requirements for equipment used to perform safety-related system  
functions (functional safety) in industrial locations (GB/T 17799.7).

The purpose is to determine the immunity test requirements related to continuous and  
transient, conducted and radiated disturbances of equipment including electrostatic  
discharge.

--- Part 8.Launch of special equipment in commercial and light industrial places (GB/T  
17799.8). intended to provide for commercial and light

Emission test requirements for specialized equipment used in industrial locations.

This document focuses on the immunity test requirements related to continuous and  
transient, conducted and radiated disturbances of equipment including electrostatic  
discharge.

Applicable to electrical and electronic equipment intended to be used in safety-related  
systems, for the supplier to declare that the equipment used in safety-related systems is  
resistant to

It is used when the immunity of electromagnetic disturbance is used, and it is also used by  
designers, system integrators, installers and evaluators of safety-related systems when  
evaluating

Used in declarations made by suppliers and to provide guidance to product committees.

General Standard for Electromagnetic Compatibility Part 7.Industry

Used in places to perform safety-related system functions (functional

Safety) Immunity requirements for equipment

## 1 Scope

This document is used by suppliers when declaring the electromagnetic immunity of  
equipment used in safety-related systems.

Designers, system integrators, installers and evaluators of safety-related systems should