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

GB/T 18268.31-2022

**Electrical equipment for measurement, control and laboratory use - EMC requirements -
Part 31: Immunity requirements for safety-related systems and for equipment intended to
perform safety-related functions (functional safety) - General industrial applica**

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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 of Standardization Documents"

drafted.

This document is part 31 of GB/T 18268 "Electromagnetic Compatibility Requirements for Electrical Equipment for Measurement, Control and Laboratory Use".

GB/T 18268 has released the following parts.

--- Part 1. General requirements;

--- Part 21. Test configuration and working conditions of sensitivity test and measurement equipment for special requirements without electromagnetic compatibility protection and performance criteria;

--- Part 22. Particular requirements for portable test, measurement and monitoring equipment for low-voltage distribution systems, test configuration, operating conditions and performance criteria;

--- Part 23. Special requirements Test configuration, operating conditions and performance criteria for transmitters with integrated or remote signal conditioning;

--- Part 24. Particular requirements for insulation monitoring devices in accordance with IEC 61557-8 and insulation fault determination in accordance with IEC 61557-9

Test configuration, working conditions and performance criteria of the bit equipment;

--- Part 25. Test configuration, working conditions and performance of field devices with special requirements interfaces complying with IEC 61784-1, CP3/2

able to judge;

--- Part 26. Particular requirements for in vitro diagnostic (IVD) medical devices;

--- Part 31. Immunity requirements for safety-related systems and equipment intended to

perform safety-related functions (functional safety) for general industry application;

--- Part 32. Immunity requirements for safety-related systems and equipment intended to perform safety-related functions (functional safety)

Industrial applications in magnetic environments.

This document is identical to IEC 61326-3-1:2017 Electromagnetic Compatibility Requirements for Electrical Equipment for Measurement, Control and Laboratory Use No. 3-1

Part. Immunity requirements for safety-related systems and equipment intended to perform safety-related functions (functional safety) for general industrial applications.

The following editorial changes have been made to this document.

--- In order to harmonize with existing standards, the standard name has been modified.

Please note that some content of this document may be patented. The issuing agency of this document assumes no responsibility for identifying patents.

Introduction

GB/T 18268 (all parts) proposes electromagnetic compatibility requirements for electrical equipment for measurement, control and laboratory use. GB/T 18268 has

The published standard consists of 9 parts.

--- Part 1. General requirements. The purpose is to specify electromagnetic properties of electrical equipment for professional, industrial process, industrial manufacturing and educational use

Compatibility immunity and emission requirements, these electrical equipment is powered by less than AC 1000V or DC 1500V power supply or electrical

battery, or operate from the line under test, including equipment and computing devices used in industrial and non-industrial locations.

--- Part 21. Test configuration and working conditions of sensitivity test and measurement equipment for special requirements without electromagnetic compatibility protection

and performance criteria. The purpose is to specify in more detail the equipment with test and measurement circuits [internal and/or external circuits of the equipment]

Test configuration, operating conditions and performance criteria. As specified by the manufacturer, these devices are not intended to be used for operational and/or functional reasons.

Electromagnetic compatibility protection.

--- Part 22. Particular requirements for portable test, measurement and monitoring equipment for low-voltage distribution systems, test configuration, operating conditions and performance criteria. The purpose is to specify in more detail the test, measurement or monitoring equipment for the protection of low-voltage distribution systems, consisting of batteries and

(or) Equipment powered by the circuit under test, test configuration, operating conditions and performance criteria for portable equipment.

--- Part 23. Special requirements Test configuration, operating conditions and performance criteria for transmitters with integrated or remote signal conditioning. target

The key is to specify in more detail the conversion function, which is characterized by the conversion of non-electrical energy into process-related energy, with the assistance of an auxiliary energy source.

Test configuration, operation of transmitters containing electrical signals and output signals at one or more ports, including measurement of electrochemical and biomass

Conditions and performance criteria.

--- Part 24. Particular requirements for insulation monitoring devices in accordance with IEC 61557-8 and insulation fault determination in accordance with IEC 61557-9

Test configuration, operating conditions and performance criteria for bit equipment. The purpose is to specify the insulation according to IEC 61557-8 in more detail

Test configuration, operating conditions and performance criteria for monitoring devices and insulation fault location equipment according to IEC 61557-9.

--- Part 25. Test configuration, working conditions and performance of field devices with special requirements interfaces complying with IEC 61784-1, CP3/2

able to judge. The purpose is to specify that the interface meets the special requirements of the field device electromagnetic compatibility test of IEC 61784-1, CP3/2.

--- Part 26. Special requirements for in vitro diagnostic (IVD) medical devices. The purpose is based on the characteristics of in vitro diagnostic medical equipment and

Electromagnetic environment, specifies the basic requirements for its electromagnetic compatibility immunity and emission.

--- Part 31. Immunity requirements for safety-related systems and equipment intended to perform safety-related functions (functional safety) for general industry

application. The purpose is to specify the expected performance of SIL1 to SIL3 in IEC 61508 in the electromagnetic environment of indoor and outdoor industrial sites

Immunity requirements for industrial systems and equipment for safety functions.

--- Part 32. Immunity requirements for safety-related systems and equipment intended to perform safety-related functions (functional safety)

Industrial applications in magnetic environments. The purpose is to specify the specific electromagnetic environment resulting from the use of mitigation measures in indoor and outdoor industrial sites

Immunity of systems and equipment for industrial applications intended to perform safety functions as specified in IEC 61508 SIL1 to SIL3

degree requirements.

Functional safety is part of the overall safety of the equipment under control (EUC) and EUC control systems that rely on electrical safety

the correct operation of the relevant system. To achieve this goal, all equipment components involved in safety-related systems performing safety functions can be

Work in the prescribed manner under relevant conditions.

GB/T 20438 is the basic safety standard for functional safety of electrical/electronic/programmable electronic safety-related systems. it specifies the implementation

All requirements for functional safety. Adequate electromagnetic disturbance immunity is one of the requirements.

GB/T 20438 separates application considerations from the design of electrical and electronic safety-related systems. Overall Safety Requirements Specification (SSRS)

All relevant requirements for the intended application are specified, as follows.

- a) The definition of functional safety is based on a risk assessment of the intended application whose function is to reduce risk.
- b) The appropriate Safety Integrity Level (SIL) for each safety function is based on the risk assessment of the intended application.
- c) The definition of the environment (including electromagnetic environment) in which the system is expected to work is in accordance with the requirements of GB/T 20438.

The requirements for each safety function are specified in one or more System Safety Requirements Specifications (SSRS). Therefore, according to

GB/T 20438 requires that considering the immunity of electromagnetic phenomena, the electromagnetic environment and electromagnetic phenomena are first considered in SSRS.