

ICS 91.120.40

CCS M 04



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

GB/T 38121-2023

Replacing GB/T 38121-2019

Protection against lightning - Thunderstorm warning systems

Issued on: May 23, 2023

Implemented on: December 1, 2023

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

Preface	
Introduction	
1 Scope	1
2 Normative references	1
3 Terms, Definitions and Abbreviations	2

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 replaces GB/T 38121-2019 "Thunderstorm Early Warning System for Lightning Protection": Compared with GB/T 38121-2019, except for the structure

In addition to adjustments and editorial changes, the main technical changes are as follows:

a) The scope of the standard has been changed (see Chapter 1, Chapter 1 of the:2019 edition);

b) Deleted the terms "dwell time", "atmospheric electric field meter", "lightning", "lightning strike", "physical damage", "lightning strike point", "thunderstorm" and the corresponding abbreviations

Language (see Chapter 3 of the:2019 edition);

c) Added the terms "static field detector", "effective alarm rate", "lightning-related conditions", "warning rate", "null alarms", "total number of alarms" and

Corresponding abbreviations (see Chapter 3);

d) Deleted the abbreviations "EMI", "OI", "RFI", "RFM" and "RF" (see Chapter 3 of the:2019 edition);

e) Changed "classification of thunderstorm detectors and their performance" to "description of thunderstorm detectors and their performance", deleted the classification of thunderstorm detectors, added

Added the technical parameters of thunderstorm detectors (see Chapter 5, Chapter 5 of the:2019 edition);

f) Changed the "Example of one alert" (see Figure 3, Figure 3 of the:2019 edition);

g) Change "Early Warning Evaluation" to "Performance Evaluation", and the content of this chapter has been changed (see Chapter 9, Chapter 8 of the:2019 edition);

h) The role of the appendix "Test Methods for Thunderstorm Detectors" has been changed from "informative" to "normative" (see Appendix E, Appendix F of the:2019 edition);

This document is equivalent to IEC 62793:2020 "Lightning Protection for Thunderstorm Warning System":

The following minimal editorial changes have been made to this document:

--- In order to coordinate with existing standards, change the name of the standard to "Lightning Protection and Thunderstorm Warning System";

--- For ease of understanding, a note is added to the definition in 3:1:12;

--- In order to conform to the usage habits of our country, change "x" in Table 1 to "sqrt";

--- The area shown in the monitoring area (MA) and surrounding area (SA) in Figure 3b) is inconsistent with the legend and has been corrected;

--- Correct the denominator in the calculation formula of false alarm rate and effective alarm rate in Appendix D from 20 to 18: According to formula (2), formula (3) and

The definition of the total number of alarms (TNA), TNA is the sum of the number of false alarms, valid alarms, and invalid alarms, and the numbers 12 and 12 in Table D:2

The individual case in No: 19 did not issue an alarm and should not be counted in TNA, so TNA should be 18:

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

Lightning activities in nature, especially ground lightning, pose a great threat to human life and property: directly or indirectly caused by lightning

casualties occur every year:

Lightning will have the following effects:

---It can affect large-scale sports, cultural and political activities, and suspend activities and evacuate people if necessary;

---It can affect industrial activities, such as unexpected interruption of production process due to lightning strike and power failure;

---It can interrupt all kinds of transportation, such as people's daily travel, as well as the transmission of energy and information;

--- With the widespread use of lightning-sensitive electronic components in industry, transportation and communication industries, the number of lightning strike accidents has increased year by year;

---It may pose a threat to operations with environmental risks, such as operations with sensitive, flammable, explosive or chemical substances;

---It can cause fire:

Over the past few decades, related technical systems, including those dedicated to real-time monitoring of natural atmospheric electrical activity and lightning, have been experienced extraordinary development: These systems provide real-time high-quality and valuable information on the occurrence of thunderstorms, if coordinated with detailed action planning

tuned for more valuable applications:

Although this information allows users to take anticipated temporary precautionary measures, it should be noted that system users need to act in accordance with relevant regulations:

All actions to be taken based on the monitoring information are formulated first: The effectiveness of measures depends to a large extent on the risks involved and the proposed measure: This document gives possible measures (see Appendix C):

Like many natural phenomena, lightning and thunderstorms are subject to statistical uncertainty: Although it is not possible to obtain the occurrence of a single lightning strike

Precise information on time and place, but the statistical parameters identified in this document can help users choose appropriate protective measures:

Lightning Protection Thunderstorm Warning System

1 Scope

This document describes the characteristics of a thunderstorm warning system so that measures can be taken to prevent lightning hazards:

Both thunderstorm detectors and/or detection networks composed of them (such as lightning location systems) can be used as thunderstorm warning systems:

This document specifies the basic requirements for detectors and detection networks used to accurately collect lightning-related parameters and provide real-time information on lightning activities:

This document describes the application of the data collected by the above-mentioned detectors and detection networks in the form of early warning and historical data:

This document includes:

- * A general description of the technologies available for thunderstorm warning systems;
- * Guidance on alert methods;
- * Informative examples of possible preventive measures:

This document does not apply to the following situations:

- a) Lightning protective devices, such devices as specified in IEC 62305 (all parts) [1];
- b) Rain, hail, wind and other related phenomena accompanying thunderstorms;
- c) Thunderstorm detection technology based on satellite and radar;
- d) Portable equipment (devices in which the sensor position is not fixed):

NOTE: Due to calibration and testing reasons, portable devices may not be sufficient to provide an effective early warning:

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text: Among them, dated references

For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to

this document:

IEC 60068-2-75:2014 Environmental testing Part 2-75: Test method Test Eh: Hammer test (Environmental

Note: GB/T 2423:55-2006 Environmental testing for electrical and electronic products Part 2: Test method Test Eh: Hammer test (IEC 60068-2-75:

1997, IDT)

Note: GB/T 4208-2017 enclosure protection level (IP code) (IEC 60529:2013, IDT)

IEC 61000-6-4 Electromagnetic compatibility (EMC) Part 6-4: Generic standards for emissions in industrial environments [Electromagnetic

Note: GB 17799:4-2022 General Standard for Electromagnetic Compatibility Part 4: Emissions in Industrial Environments (IEC 61000-6-4:2018, IDT)

IEC 61180 High-voltage test technology definition, test and procedure requirements, test equipment for low-voltage equipment [High-voltage test tech-

Note: GB/T 17627-2019 High-voltage test technology definition, test and procedure