

ICS 29.260.20

CCS K 35



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

GB/T 20936.1-2022

Replacing GB/T 20936.1-2017

**Gas detectors for explosive atmospheres - Part 1: Performance
requirements of detectors for flammable gases**

Issued on: December 30, 2022

Implemented on: July 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 and Definitions	2
3.1 Gas properties	2
3.2 Detector Type	3
3.3 Sensor	4
3.4 Sampling components	4
3.5 Signals and Alarms	5
3.6 Time	5
3.7 Others	6
4 General requirements	6
4.1 General	6
4.2 Structure	7
4.3 Sign	11
4.4 User Manual	11
5 trials	12
5.1 Overview	12
5.2 General requirements for testing	12
5.3 Normal test conditions	14
5.4 Test method	16
Appendix A (Normative) Performance Requirements	24
Appendix B (informative) Determination of response time	29
Reference	31

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 1 of GB/T 20936 "Gas Detectors for Explosive Atmospheres". GB/T

20936 has issued the following

part.

- Part 1.Performance requirements for combustible gas detectors;
- Part 2.Selection, installation, use and maintenance of combustible gas and oxygen detectors;
- Part 3.Guidelines for functional safety of fixed gas detection systems;
- Part 4.Performance requirements for open path combustible gas detectors.

This document replaces GB/T 20936.1-2017 "Gas detectors for explosive atmospheres - Part 1.Performance requirements for combustible gas detectors"

Compared with GB/T 20936.1-2017, except for structural adjustment and editorial changes, the main technical changes are as follows.

- Added failure effects that do not adversely affect safety-related functions (see 4.2.1);
- Increased the visual and auditory indication of portable equipment (see 4.2.2.1);
- Increased the functional limit of display value drop and measured value below zero (4.2.2.5);
- Added requirements for fault indication, sensor disconnection and zero drift conditions below the minimum supply voltage fault limit (see 4.2.4);
- Added zero and sensitivity adjustment requirements (see 4.2.5);
- Added the requirements contained in the instruction manual (see 4.4);
- Added the test gas (methane, propane or butane) required for general-purpose gas detectors (see 5.3.2);
- Changed the selection of calibration measurement points (see 5.4.3.2, 5.4.3.2 of the.2017 edition);
- Increased the requirements for the response of semiconductor and catalytic sensors to different gases when exposed to high gas concentrations (see 5.4.3.3);
- Increased temperature range and stabilization period (see 5.4.6);
- Added the requirement for the device to prompt the user (see 5.4.14);
- Added requirements for output functions higher than the minimum supply voltage fault limit (see 5.4.18);
- Added the test methods and requirements of the electromagnetic compatibility test (see 5.4.21).

This document is modified to adopt IEC 60079-29-1.2016 "Explosive Atmospheres Part

29-1. Gas Detectors Combustible Gas Detectors

Performance Requirements".

The technical differences between this document and IEC 60079-29-1:2016 and their reasons are as follows.

--- Replaced IEC 60079-0 (see Chapter 3) with the normatively quoted GB/T 3836.1 to adapt to my country's technical conditions, increase

Operability;

--- Replaced ISO /IEC 80079-20-1 (see 5.2.1) with the normatively quoted GB/T 3836.11 to adapt to my country's technical regulations

components, increase operability;

--- Replaced IEC 60068-2-6 (see 5.4.12.1 and 5.4.12.2.1) with the normatively quoted GB/T 2423.10 to adapt to our country

Technical conditions, increase operability;

--- In 5.4.18 voltage fluctuation test, change "rated voltage 115% and 80%" to "rated voltage 115% and 75%" to

Specific conditions suitable for Class I equipment;

--- Replaced IEC 61326-1:2012 (see 5.4.21.1 and 5.4.21.2) with the normatively referenced GB/T 18268.1 to suit I

The country's technical conditions, increase operability.

The following editorial changes have been made to this document.

--- In order to coordinate with existing standards, change the name of the standard to "Gas Detectors for Explosive Atmospheres Part 1. Combustible Gas Detectors

Performance Requirements";

--- Modified the Note 1 on Class I detectors in the scope;

--- In 5.3.6, 5.3.7 and 5.3.8, examples of test temperature, pressure and humidity of coal mine underground products have been added;

--- Incorporates the content of the IEC 60079-29-1:2016/AMD1:2020 amendment, the outer margin position of the terms involved

marked with a vertical double line (||);

--- Replaced the informative reference IEC 60050-426 with GB/T 2900.35, and moved it from Chapter 2 to References;

--- Replaced the informative referenced international documents with Chinese documents,

and revised the 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

GB/T 20936 "Gas Detectors for Explosive Atmospheres" aims to establish the basic requirements for the performance of various combustible gas detectors, and to provide Guidance for application, in the form of a sub-standard, includes the following parts.

- Part 1. Performance requirements for combustible gas detectors;
- Part 2. Selection, installation, use and maintenance of combustible gas and oxygen detectors;
- Part 3. Guidelines for functional safety of fixed gas detection systems;
- Part 4. Performance requirements for open path combustible gas detectors.

From 2007 to 2009, my country adopted the IEC 61779 series to formulate GB 20936 "Electrical Equipment for Combustible Gas Detection".

It is divided into 4 parts, respectively specifying the general requirements and test methods, as well as the performance requirements of Class I and Class II detectors with different measurement ranges.

In 2017, my country adopted the IEC 60079-29 series and released the new GB/T 20936 "Gas Detectors for Explosive Atmospheres", of which

GB/T 20936.1 mainly integrates the original Part 2~Part 4 based on the original Part 1, while GB/T 20936.2, GB/T 20936.3 and

GB/T 20936.4 is a newly formulated part (only the original standard number is used).

On the basis of adopting the main technical content of IEC 60079-29-1:2016, this revision has been appropriately modified to adapt to my country's

specific situation. This document, as a standard for special explosion-proof equipment, is a supplement and modification to the general requirements of GB/T 3836.1.

Gas detectors for explosive atmospheres

Part 1. Performance requirements for combustible gas detectors

1 Scope

This document specifies portable, mobile and stationary combustible gas or

General requirements and test methods for the structure and performance of vapor