

ICS 13.220.10

CCS C 84



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

GB/T 47441-2026

**Fire emergency rescue equipment - General specification for
detection equipment**

消防应急救援装备 侦检装备通用技术条件

Issued on: April 30, 2026

Implemented on: May 1, 2027

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

5	Technical Requirements
5.1	General Requirements
5.1.1	Identification
5.1.2	Appearance and Assembly
5.2	Safety Requirements
5.3	Detection Performance Requirements
5.3.1	Hazardous Chemicals Firefighting and Detection Equipment
5.3.2	Performance of Biological Contamination Firefighting Detection Equipment
5.3.3	Performance of Nuclear Radiation Firefighting and Detection Equipment
5.3.4	Performance of Individual Soldier Protective Reconnaissance Equipment
5.3.5	Performance of accessories and other measuring instruments
5.3.6	Operation and display performance
5.8	Environmental adaptability requirements
6	Test Methods
6.2	Safety Performance Test
6.3	Detection Performance Test
6.3.1	Performance Test of Firefighting Detection Equipment for Hazardous Chemicals
6.3.2	Performance Test of Biological Pollution Firefighting Detection Equipment
6.3.3	Performance Test of Nuclear Radiation Firefighting and Detection Equipment
6.3.4	Testing of Individual Soldier Protective Reconnaissance Equipment
6.3.5	Testing or verification of accessories and other measuring instruments
6.3.6	Operation and display performance test
6.8	Environmental adaptability test
7	Inspection Rules
7.3	Type Testing
8	Marking, Packaging, Transport and Storage
8.2	Packaging

5.1.1 Identification

5.1.1.1 Chinese labels should be provided on the switches, buttons, indicator lights, displays, and other locations of the detection equipment.

5.1.1.2 Key locations of the detection equipment (such as power supply, ports, etc.) should be marked with Chinese prompts or warnings.

5.1.2 Appearance and Assembly

5.1.2.1 The appearance of each component of the detection equipment should be clean and flat, without obvious defects such as cracks or deformation.

5.1.2.2 All components of the detection equipment should be assembled completely and securely, without any defects or looseness, and should be easy and reliable to operate.

5.2 Safety Requirements

5.2.1 Explosion-proof requirements Individual protective detection equipment and fire detection equipment that needs to be carried into dangerous areas, along with their associated long-range communication transmission devices and gas-generating equipment. All collection devices must have corresponding explosion-proof functions. This is necessary in situations where explosive gas environments are continuously, frequently, or for extended periods. Detection equipment used in such locations should meet the explosion-proof rating requirements of Ex(ia).

5.2.2 Protection Requirements Fire detection equipment used in open-air operations should meet the IP65 protection rating in GB/T 4208-2017 and should be resistant to steam condensation. Function.

5.2.3 Insulation performance Under normal temperature conditions, the insulation resistance between the AC live terminals and the outer casing of the detection equipment should not be less than 20MΩ.

5.2.4 Dielectric Strength Under normal temperature conditions, the AC energized terminals and the casing of the detection equipment should be able to withstand a frequency of 50Hz ± 0.5Hz. A withstand voltage test of 500V±50V for 60s±5s is conducted. No surface arcing or breakdown should occur during the test. It should then be able to work normally.

5.3.1 Hazardous Chemicals Firefighting and Detection Equipment

5.3.1.1 Types of Detectable Substances 5.3.1.1.1 Portable fire detection equipment used for detecting hazardous chemical gases should be able to detect no fewer than 50 types of hazardous chemical gases (covering...). The "Classification Information Table of Hazardous Chemicals" includes qualitative detection and identification capabilities for all gases marked "highly toxic," applicable to portable disinfectants for liquids or solids. The detection and defense equipment should be capable of handling no fewer than 500 types of hazardous chemicals, both liquid and solid (covering all notes in the "Hazardous Chemicals Classification Information Table"). It has the capability to detect and identify highly toxic liquids and solids. 5.3.1.1.2 Gas chromatography-mass spectrometry, liquid

chromatography-mass spectrometry, etc., should be able to qualitatively identify no less than 20,000 chemical substances (covering the categories listed in the "Hazardous Chemicals Classification"). The list includes all hazardous chemicals marked "highly toxic" in the "Chemical Classification Information Table," and concisely displays the physicochemical properties of the detected substances. and handling methods. 5.3.1.1.3 Fire detection equipment nominally capable of quantitative analysis shall have a resolution not exceeding 0.005% or the lowest possible risk of harm to the human body. The value is 10%, and its indication error should not exceed 5%FS. 5.3.1.1.4 The response time of the detection equipment should not exceed 10 seconds.

5.3.1.2 Performance of remote fire detection equipment 5.3.1.2.1 Fire remote detection equipment should be able to detect day and night, and visible light video and infrared thermal imaging video should support manual and automatic switching. 5.3.1.2.2 The fire-fighting remote detection equipment shall be capable of detecting at least 100 types of hazardous chemical gases (covering those listed in the "Hazardous Chemicals Classification Information Table"). It possesses qualitative detection and identification capabilities for gases marked as "highly toxic," and has the function of monitoring and judging spread trends. It can be vehicle-mounted, ship-mounted, and airborne, and can dynamically detect and identify such gases. Implement wide-area detection with a detection distance of no less than 500m. Detection equipment nominally equipped with on-the-move detection capabilities should be able to perform detection while in motion. Investigation. 5.3.1.2.3 The fire-fighting remote detection equipment should be able to instantly identify the names and relative concentrations of hazardous chemical gases, and be able to display the detection and monitoring results on video. The results, including the names, values, and location images of hazardous chemical gases, should be able to dynamically display the distribution and diffusion trends of the gases and provide real-time alarms. 5.3.1.2.4 Fire remote detection equipment should be able to identify multiple mixed gases simultaneously. 5.3.1.2.5 Remote detection equipment for fire protection used for gas leaks should be able to remotely detect and monitor gas leaks in urban areas, and quantitatively identify the leaks. The detection distance for combustible gas concentration should not be less than 100m.

5.3.2 Performance of Biological Contamination Firefighting Detection Equipment

5.3.2.1 Firefighting detection equipment with biological agent detection capabilities should be able to detect and identify, but not limited to, *Bacillus anthracis*, *Yersinia pestis*, and *Clostridium difficile*. *Rungella*, *Meredithomyces*, *Tularemia*, *Ricin*, *Abrus precatorius*, *Staphylococcal enterotoxin B*, *Botulinum toxin type A*, *Shigella neurotoxin I*. Thirteen biological warfare agents, including Ebola virus, Marburg virus, and smallpox virus.

5.3.2.2 Biological pollution fire detection equipment should be able to complete the quantitative analysis of the detected substance within 20 minutes.

5.3.3 Performance of Nuclear Radiation Firefighting and Detection Equipment

5.3.3.1 Firefighting detection equipment with nuclear radiation detection capabilities should at least have gamma-ray detection capabilities, displaying gamma dose rate and gamma dose, and classifying... It features low and high gamma dose rate and low and high gamma dose alarm functions.

5.3.3.2 The gamma-ray energy response error should not exceed $\pm 50\%$.

5.3.4 Performance of Individual Soldier Protective Reconnaissance Equipment

5.3.4.1 Individual soldier protective detection equipment should have corresponding explosion-proof functions and meet the explosion-proof level requirements of Ex(ia).

5.3.4.2 Individual soldier protective detection equipment should have oxygen content and combustible gas alarm functions, and its technical requirements should respectively comply with JJG365- The relevant regulations of.2008 and JJG693-2011.

5.3.4.3 For individual soldier protective detection equipment with gamma-ray radiation alarm function, its technical requirements shall comply with the relevant provisions of JJG393-2018. Regulation.

5.3.4.4 The detection performance of individual protective detection equipment with other hazardous chemical detection functions should meet the relevant national or industry standards. Require.

5.3.5 Performance of accessories and other measuring instruments

5.3.5.1 Fire detection equipment accessories such as gas composition collection devices should meet the relevant standards or technical requirements and must be carried into hazardous areas. It should have corresponding explosion-proof functions.

5.3.5.2 Auxiliary measuring instruments for fire detection and monitoring of various types of gases, temperatures, acids and alkalis, water quality, etc., and for fixed monitoring of known hazardous chemicals. Four-in-one, six-in-one, and other monitoring instruments, as well as other biological pollution detection and nuclear radiation pollution detection instruments, should meet the relevant standards or technical requirements. Technical requirements.

5.3.6 Operation and display performance

5.3.6.1 Fire detection equipment that can detect and identify fewer than 2,000 substances should be able to display the name of the identified substance in Chinese.

5.3.6.2 Portable fire detection equipment should be easy to operate, and all operations should be completed within 3 steps.

5.4 Communication Transmission Performance Non-vehicle-mounted fixed fire detection