

JJF

**INDUSTRY STANDARD OF THE
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**Program of Pattern Evaluation of Combustible - Gas Alarm
Detectors
(English Translation)**

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1 Scope

This program of pattern evaluation applies to the combustible-gas alarm detectors (including combustible gas detector, hereinafter referred to as "detector") used in non-shaft operating environment and civil place.

2 Normative References

JJG 693-2011 "Alarm Detectors of Combustible Gas"

GB 12358-2006 "Gas Monitors and Alarms for Workplace-General Technical Requirements"

GB 15322-2003 "Combustible Gas Detector"

GB 16808-2008 "Combustible Gas Alarm Control Units"

GB/T 17626.2-2006 "Electromagnetic Compatibility (EMC) -- Testing and Measurement Techniques -- Electrostatic Discharge Immunity Test"

GB/T 17626.3-2006 "Electromagnetic Compatibility-Testing and Measurement Techniques-Radiated Radio-frequency Electromagnetic Field Immunity Test"

3 General

The detector is divided into catalytic combustion type, thermal conductivity type, semiconductor type and infrared absorption type - according to the test principle; divided into diffusion type and inhalation type - according to sampling type; divided into portable type and fixed type - according to usage mode. The detector mainly consists of detecting element, amplifying circuit, alarm system and displayer. It is used to monitor the concentration of combustible gas exist in the environment.

4 Technical Data and Experimental Prototype Submitted by

Application Organization

4.2 Experimental Prototype

The application organization shall provide the prototypes it produced and file an application for a single product or series products. In case of application for a single product, three prototypes shall be provided for non-fixed-type equipment; six prototypes, of which three prototypes shall be used for the long-term stability test, shall be provided for fixed-type equipment.

5.1 Requirements for Measurement Unit

The detector shall adopt the legal measurement units.

5.2 Requirements for Accuracy (Maximum Permissible Error)

The maximum permissible error of the detector shall comply with JJG 693-2011 "Alarm Detectors of Combustible Gas".

5.3 Requirements for Legal Measurement Marking and Measuring Devices

Identification

The legal measurement marking and measuring device identification shall be indicated on the detector and easily seen - such as nameplate, panel and gauge-head and the marking.

Serial number and description must be distinguishable and firmly reliable.

5.4 Requirements for Installation Marking

The detector, whose accuracy will be affected by the improper installation, shall be provided with the installation instructions marking.

6 Measuring Requirements

The measuring requirements are detailed in Table 1.

7.2 Alarm Function and Alarm Operate Value

When the indication on the detector reaches the alarm set value, the detector shall produce sound and light alarm. When the detector produces the alarm signal, the detector with output control function shall start the output control function. When it is in under-voltage state, the battery-powered detector shall produce the sound or light index signal obviously which must be different from the alarm signal.

7.4 Adaptability of Supply Voltage

7.4.1

With the supply voltage being $\pm 15\%$ of the rated supply voltage, the indicated error on the AC powered detector shall be in accordance with those specified in Table 1.

7.5.1 Insulation resistance (not applicable to the battery-powered detector)

At the normal test conditions, the insulation resistance of the detector shall not be less than 100 Mohm; after the damp heat test, the insulation resistance of the detector shall not be less than 1Mohm.

7.6.1 High-temperature test

With the detector being in the normal monitoring state (the test temperature of 55 °C or 70 for outdoor use)°C, the test shall last 2h.

7.6.3 Constant damp heat test

With the detector being in the normal monitoring state (40, 93%), the test °C shall last continuous 2h. During the test, the detector shall be able to work normally. Upon the test duration is reached, the indicated error shall not exceed $\pm 10\%FS$. After the test, the detector shall be free from coating damage or corrosion.

7.8.1 Radio-frequency electromagnetic field radiation immunity test

Field strength. 10V/m; frequency range. 80MHz~1000MHz. During the test, the detector shall be able to work normally; after the test, the indicated error shall be in accordance with those specified in Table 1.

7.8.2 Electrostatic discharge immunity test

Discharge voltage. 8kV; discharge times. 10. During the test, the detector shall be able to work normally; after the test, the indicated error shall be in accordance with those specified in

Table 1.

8 Lists of Pattern Evaluation Items

The pattern evaluation items of the detector are detailed in Table 3.

9.1.1.1 Test purposes

To test whether the indicated error of the detector complies with Table 1 under the test conditions.

9.1.1.5 Data processing

The indicated error at all points Δt_{ac} is calculated according to Formula (1) and the maximum absolute value of Δt_{ac} is the indicated error.

9.1.2.1 Test purposes

To test whether the repeatability of the detector complies with Table 1 under the test conditions.

9.1.2.2 Test conditions

Same as 9.1.1.2.

9.1.2.3 Test equipment

Same as 9.1.1.3.

9.1.2.4 Test procedure

With stable preheating, provide the gas reference material at a concentration about 40% of full span and record the stable indication c_i on the detector, and remove the gas reference material. Conduct six such operations at the identical condition.

9.1.3.1 Test purposes

To test whether the response time of the detector complies with Table 1 under the test conditions.