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Replacing GB 16796-1997

Safety requirements and test methods for security alarm equipment

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Foreword

All the technical contents in this Standard are mandatory.

This Standard replaces GB 16796-1997 *Safety Requirements and Test Methods for Security Alarm Equipment*.

Main differences between this Standard and GB 16796-1997 are as follows:

- Added the general test conditions;
- Added the temperature rise and ignition technical requirements for the device under fault conditions;
- Added the technical requirements for the anti-acoustic pressure;
- Added the technical requirements for the components, batteries, monitors and displays;
- Modified the description of the accessible part;
- Modified the technical requirements and measurement methods of the creepage distance and the electric clearance;
- Modified the technical requirements and test methods of lightning protection;
- Modified the technical requirements of the power cord;
- Modified the technical requirements of the contact resistance;
- Modified the technical requirements of the anti-laser radiation;
- Modified the technical requirements of the anti-ionization radiation;
- Modified the technical requirements of the anti-microwave radiation;
- Modified the technical requirements of the anti-ultrasonic pressure.

Annex A, Annex B and Annex C of this Standard are normative.

This Standard was proposed by the Ministry of Public Security of the People's Republic of China.

This Standard shall be under the jurisdiction of Standardization Technical Committee for Security & Protection Alarm Systems of China (SAC/TC 100).

Safety requirements and test methods for security alarm equipment

1 Scope

This Standard specifies the basic safety technical requirements, test methods and inspection rules which shall be followed by security alarm equipment in the areas such as marking, anti-electric shock, anti-lightning, anti-overheating, anti-implosion & burst inside, anti-laser radiation, anti-ionization radiation, anti-microwave radiation, anti-ultrasonic pressure and mechanical safety. It is the fundamental basis of safety requirements for the design, manufacture, installation, use, inspection, and formulating all kinds of security alarm equipment.

This Standard applies to a various security alarm equipment.

2 Normative references

The articles contained in the following documents have become part of this Standard when they are quoted herein. For the dated documents so quoted, all the modifications (excluding corrections) or revisions made thereafter shall not be applicable to this Standard. For the undated documents so quoted, the latest editions shall be applicable to this Standard.

GB 4208-2008 Degrees of protection provided by enclosure (IP code) (IEC 60529:2001, IDT)

GB 4793.1-2007 Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements (IEC 61010-1:2001, IDT)

GB 4943-2001 Safety of information technology equipment (idt IEC 60950-1:1999)

GB 7247.1-2001 Safety of laser products - Part 1: Equipment classification, requirements and users guide (idt IEC 60825-1:1993)

GB 8898-2001 Audio, video and similar electronic apparatus - Safety requirements (eqv IEC 60065:1998)

GB/T 17626.5-2008 Electromagnetic compatibility - Testing and measurement techniques - Surge immunity test (IEC 61000-4-5:2005, IDT)

3 Terms and definitions

For the purpose of this Standard, the following terms and definitions shall apply.

3.1

Accessible part

The places, after the product is installed properly, where are accessible by using articulated test-finger (see Annex A).

3.2

Basic insulation

The insulation added by the dangerous charged components to provide basic protection against electric shock.

[See 2.6.3 of GB 8898-2001]

3.3

Supplementary insulation

The independent insulation that is used except the basic insulation, so as to provide protection against electric shock in the event of the failure of the basic insulation.

[See 2.6.5 of GB 8898-2001]

3.4

Reinforced insulation

The single insulation that is added for dangerous charged components; the anti-electric shock grade is equivalent to double insulation.

[See 2.6.6 of GB 8898-2001]

3.5

Double insulation

Insulation that has simultaneously both the basic insulation and supplementary insulation.

[See 2.6.4 of GB 8898-2001]

3.6

[See 3.4.2 of GB 7247.1-2001]

3.13

Accessible emission limit

The allowable maximum emission limits within the specified category.

[See 3.16 of GB 7247.1-2001]

3.14

Irradiance

The quotient OF the radiation flux $d\Phi$ reflected on the surface-element at a point of the surface AND the area dA of that surface-element.

Symbols: $E=d\Phi/dA$ Measurement unit: W/m^2 ($W \cdot m^{-2}$)

[See 3.35 of GB 7247.1-2001]

3.15

Ionization radiation

A kind of radiation that is generated by sufficient energy to make the electrons leave the atom.

3.16

Microwave radiation

It generally refers to the radiation with the wavelength range of 1mm~30cm.

3.17

Exceed sound press

The sound intensity of which the frequency range is 20 kHz~100 kHz.

4 Test conditions

4.1 Test guidelines

4.1.1 If a test specified in this Standard may be destructive, then a model prototype which can stand for the evaluated state is allowed to use.

4.3 Fault conditions

According to the structure and schematic diagram of the equipment, determine the fault conditions that may easily cause damages. According to the most convenient principle, when exerting the following fault conditions successively, it shall not damage the equipment, cause fire or electric shock:

- a) Reversed polarity of power supply;
- b) Short circuit of output end;
- c) Hand-touching input end;
- d) The leads connected wrongly (except for the leads can not be connected wrongly by structural constraints);
- e) Stop the forced cooling of the fan;
- f) Secondary winding transformer is short circuit; short circuit of primary winding and secondary winding, short circuit of each winding with core and shield if there exists any core and shield;
- g) The two poles of the capacitor are shorted; if there is enclosure, each pole is shorted to the metal enclosure;
- h) In above test, if there is fault display, the test is 2min; if there is no fault display, the test is 4h; during the test, it shall not damage the equipment or cause a fire or electric shock.

Note: If fuse is disconnected or can not operate properly, then it is deemed as fault display.

5 Technical requirements and test methods

5.1 Equipment safety classification

According to different anti-electric shock protective measures provided by the equipment, the equipment can be divided into three classes:

Class I equipment: anti-electric shock does not only rely on basic insulation but also take additional safety measure design; when the basic insulation fails, there are measures to make protection (earthing) conductor of fixed-lines in facilities connect with the accessible conductive components, so that the accessible conductive components will not produce dangerous charged equipment.

requirements of transportation on the structure.

5.3 Marking

5.3.1 Contents of the marking

The equipment shall be marked with the following contents at least:

- a) Name or registered trademark of the manufacturer;
- b) Model and name of equipment;
- c) Nature of the power supply (AC, DC, or DC-AC) and polarity;
- d) Rated value or rated voltage range of the supply voltage;
- e) Rated current value and model of fuse tube;
- f) Nature and function of terminal;
- g) Safety class level;
- h) Safety warning symbol.

If the above contents can not be marked on the equipment, it shall be given in the instructions.

Test method: Visual inspection.

5.3.2 Rubbing resistance of the marking

The marking shall not be easily erased.

Test method: rub for 15s with a cotton ball soaked in water; then rub for 15s with cloth soaked in gasoline. After rubbing, the marking shall still be clear and identifiable.

5.4 Anti-electric shock

5.4.1 Accessible part

Equipment structure shall ensure that the accessible part is not charged; and the charged part shall be protected by covering or insulation material.

Class I equipment shall be fitted with protective earth terminal or connector to reliably connect the accessible conductive components to the earth terminal or connector of the output jack.

Test method: Via inspection, the accessible part shall be connected to the output earth terminal.

5.6.1 Safety

The equipment shall be able to work safely under normal operating conditions, and shall not spread when it was lighted; when the operating personnel contact the accessible parts, the scald risk shall not be presented.

5.6.2 Temperature rise

5.6.2.1 The temperature of accessible parts shall not exceed the value specified under normal conditions in Table 2 of GB 8898-2001.

Test method: When measuring under normal working conditions, the surface temperature is measured by point temperature gauge or any appropriate method after operating for 4h.

5.6.2.2 When equipment is operating under fault conditions, the temperature of any part shall not produce the following situations:

- a) There is fire phenomenon around equipment;
- b) Abnormal heat damage arising in internal equipment.

During the test, any flame inside equipment shall be turned off within 10s; the soldering tin is allowed to be softened.

The temperature of accessible parts shall not exceed the value specified under fault conditions in Table 2 of GB 8898-2001.

Test methods: Each failure test shall be lasted for 1h; if there is sign of electric shock, fire hazard or personal danger found on the equipment, the test shall be lasted for another 4h; use any appropriate method for measuring the temperature of the accessible parts.

5.6.3 Inflaming retarding

For equipment with non-metallic enclosure, the flame retardancy shall be provided. The enclosure shall not burn, after five times of burning, each time of 5 s.

Test method: Adopt Bunsen burner or other burner; the burning gas is methane or natural gas; the diameter of the flame is 9.5mm; the height of the blue flame is 20mm; burn the sample for 5 times with this flame (burn for 3 times when the included angle between the flame and the sample surface is 45°; and burning for 2 times when it is 90°), and 5s for each time, the sample shall not be burned-fired.

5.7 Anti-implosion and explosion

5.7.1 Components

For those components that easily cause explosion due to over-heating or overloading, If

Test method: According to the radiation waveband of light source, choose the corresponding radiation illuminance meter and laser power meter to test at various space-points, in non-lighting working area, where the operating personnel may contact; the leaked light irradiance value shall not exceed allowable values; for lighted workspace, test at a distance not less than 100mm from equipment; if it exceeds allowable value, the following measures shall be taken:

- a) Good light shield shall be provided to prevent scattered light radiation leak from exceeding the allowable value;
- b) Emission indicator shall be provided to indicate during operation;
- c) Light pass port of 0.5W and above laser light source shall be fitted with a light valve;
- d) Provide the necessary information in the instructions: wavelength or wavelength range, beam diameter and divergence angle, the maximum average output power, maximum beam emission intensity, safe use instructions.

Test method: Visual inspection.

5.9 Ionization radiation

Structure of the equipment shall be able to prevent human body injury due to ionization radiation.

Unless otherwise specified, the exposure rate at any position that is 5cm away from the equipment surface shall not be more than 0.5mR/h.

Test methods: Measure with dosimeter. In normal operation condition, use the dosimeter with effective area of 10cm² to measure the exposure rate at any point that is 5cm away from the equipment surface.

5.10 Microwave radiation

Microwave radiation of the equipment shall meet the technical requirements state in 12.4 GB 4793.1-2007.

Test method: Refer to 12.4 in GB 4793.1-2007.

5.11 Sound pressure and ultrasound pressure

Sound pressure and ultrasound pressure of the equipment shall meet the technical requirements stated in 12.5 of GB 4793.1-2007.

Test method: Refer to 12.5 in GB 4793.1-2007.

5.12 Mechanical safety

Annex C

(Normative)

Safety marking symbols

Safety marking symbols are shown in Table C.1.

Table C.1 Safety marking symbols

Serial No.	Marking	Meaning	Remarks
1		Warning	Red
2		DC	Black
3		AC	Black
4		AC-DC	Black
5		1A fuse tube	Black
6		Protective earth terminal	Black
7		Measuring earth terminal	Black
8		High voltage	Red
9		Ionization radiation	Yellow
10		Strong-light or laser	Border symbol is black Background is yellow
Note: The above markings can be used in combination; text such as  1kV can also be added.			

_____ **END** _____

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