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Auto Tracking and Targeting Jet Suppression System

自动跟踪定位射流灭火系统

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Auto Tracking and Targeting Jet Suppression System

1 Scope

This Standard stipulates the definition, classification, model, performance requirements, test methods, inspection rules, marking, packaging, storage, transportation and instruction manual of auto tracking and targeting jet suppression system (hereinafter referred to as system).

This Standard is applicable to various auto tracking and targeting jet suppression systems, which take water or foam mixture as the jet medium; utilize infrared rays, digital images or other fire detection components for automatic targeting of early fires; adopt automatic control technology to implement fire suppression.

2 Normative References

Through the reference in this Standard, clauses of the following documents become clauses of this Standard. In terms of references with a specific date, all the subsequent modification sheets (excluding the corrected content) or the revised editions are not applicable to this Standard. However, all parties that reach an agreement in accordance with this Standard are encouraged to explore the possibility of adopting the latest version of these documents. In terms of references without a specific date, the latest version is applicable to this Standard.

GB/T 2423.1-2008 *Environmental Testing for Electric and Electronic Products - Part 2: Test Methods - Tests A: Cold* (IEC 60068-2-1:2007, IDT)

GB/T 2423.2-2008 *Environmental Testing for Electric and Electronic Products - Part 2: Test Methods - Tests B: Dry Heat* (IEC 60068-2-2:2007, IDT)

GB/T 2423.3-2006 *Environmental Testing for Electric and Electronic Products - Part 2: Testing Method - Test Cab: Damp Heat, Steady State* (IEC 60068-2-78:2001, IDT)

GB/T 2423.10-2008 *Environmental Testing for Electric and Electronic Products - Part 2: Tests Methods - Test Fc: Vibration* (IEC 60068-2-6:1995, IDT)

GB 4351.1-2005 *Portable Fire Extinguishers - Part 1: Performance and Construction* (ISO 7165:1999, NEQ)

3 Terms and Definitions

The following terms and definitions are applicable to this Standard.

3.1 Auto Tracking and Targeting Jet Suppression System

Auto tracking and targeting jet suppression system refers to various indoor and outdoor fixed jet suppression systems which utilize infrared rays, digital images or other fire detection components to detect fire and temperature for automatic tracking and targeting of early fires; adopt the mode of automatic control to implement fire suppression. The system is constituted of fire suppression device, which is equipped with detection component and automatic control part, as well as fire-fighting liquid supply part. The fire suppression device is divided into automatic tracking and targeting fire cannon suppression device (hereinafter referred to as automatic fire cannon suppression device) and automatic tracking and targeting jet suppression device (hereinafter referred to as automatic jet suppression device).

3.2 Targeting Time

Targeting time refers to the time from the start of test fire to the start of system jet.

3.3 Jet Radius

Jet radius refers to the length of the horizontal projection of the fire suppression device to the farthest jet landing point, or, the radius of the circular projection of the ground plane of the maximum jet protection range.

3.4 Maximum Protection Radius

Maximum protection radius refers to 90% of the length of the horizontal projection of the fire suppression device to the farthest jet landing point, or, the radius of the circular projection of the ground plane of effective spray projection range.

3.5 Monitory Radius

Monitory radius refers to the length of the horizontal projection of the detection component of the fire suppression device to the center point of test fire that can be effectively detected.

3.6 Working Pressure

Working pressure refers to fire suppression device's rated outlet pressure.

4 Classification and Model

4.1 Classification

4.1.1 In accordance with flow, it may be classified into:

a) Rated flow is larger than 16 L/s: automatic fire cannon suppression device;

able to normally start and jet.

5.5 Insulation Resistance

In accordance with 6.6, fire suppression device shall receive insulation resistance test. The insulation resistance between the external live terminals of the fire suppression device and the casing shall be larger than 20 MΩ.

5.6 Dielectric Strength

In accordance with 6.7, fire suppression device shall receive dielectric strength test. It shall be able to withstand voltage test for 1 min under the frequency of 50 Hz and the voltage of 1,500 V. There shall be no phenomenon of breakdown or flashover.

5.7 Resistance to Ambient Light Interference

In accordance with 6.8, fire suppression device shall receive ambient light interference test. During the test, the fire suppression device shall not trigger malfunctions, such as starting and jetting.

5.8 Voltage Fluctuation Adaptability

In accordance with 6.9, fire suppression device shall receive voltage fluctuation adaptability test. Within the rated voltage range of -10% ~ + 10%, it shall be able to normally start and function.

5.9 Vibration Resistance

In accordance with 6.10, fire suppression device shall receive vibration resistance test. After the test, the fire suppression device shall not manifest shedding, cracking or obvious deformation; it shall be able to normally function.

5.10 Fire Suppression Performance

In accordance with 6.11, fire suppression device shall receive fire suppression performance test. Starting from automatic jetting, within 3 min, the automatic fire cannon suppression device and injection-type automatic jet suppression device shall extinguish Level-1A fire suppression; within 6 min, spraying-type automatic jet suppression device shall extinguish Level-1A fire suppression.

5.11 Requirements for Automatic Control

5.11.1 Requirements for intelligent detection and targeting and linkage decision management

Fire suppression device shall be equipped with the function of intelligent detection and targeting and linkage decision management, which shall be normally functioning.

angle and horizontal slewing angle of fire suppression device. The result shall comply with the requirements in 5.1.

6.2 Performance Test

6.2.1 Measurement of rated pressure, flow, maximum protection radius, jet radius and monitoring radius

Fix the fire suppression device at the minimum installation height. On the test pipeline, install a flowmeter with an accuracy of not lower than ± 1%; a pressure gauge with an accuracy of not less than Level-1.6 and a measuring range of (0 ~ 2.5) MPa.

Manually control the nozzle to be in a horizontal state. Turn on the fire suppression device to let it jet; maintain it at the rated working pressure; then, jet under the rated pressure. After around 1 min, use a tape with an accuracy of ± 1 cm to measure the distance from the farthest trace to the projection directly underneath the nozzle, which is the jet radius. 90% of the jet radius (rounded off) is the maximum protection radius.

Ignite the test fire; use a tape with an accuracy of ± 1 cm to measure the length of the horizontal projection of the center point of the test fire that can be effectively detected by the detection component of the system, which is the monitoring radius.

The flow may be directly measured through a calibrated flowmeter. Or, in accordance with the flow of fire suppression device, an appropriate volume of measuring tank may be selected. Wait till it reaches the rated pressure and becomes stable, turn to the measuring tank for jetting; the jetting time shall be not less than 30 s; immediately remove it. Then, measure the volume or the mass of water in the measuring tank. Through calculation, obtain the flow of the fire suppression device.

The test result shall all comply with the requirements in Table 1.

6.2.2 Measurement of targeting time

Respectively fix the fire suppression device at the minimum installation height and the maximum installation height. At the measured maximum protection radius, use test fire to induce the system to initiate the action of targeting, aim at the target and jet. Use an electronic stopwatch with an accuracy of not lower than ± 0.1 s to measure the time from the start of the test fire to the start of the jet of the fire suppression device, which is the targeting time. The measurement result shall comply with the stipulations in Table 1. The test fire is: add 30 mm height of clean water to a 570 mm diameter oil pan (height: 70 mm), then, add 500 mL of automotive gasoline; ignite the gasoline on the oil pan.

6.3 High Temperature Test

In accordance with GB/T 2423.2-2008, conduct the test. Connect the system to the power supply, so that it could enter the normal monitoring state. Put the fire

6.9 Voltage Fluctuation Adaptability Test

Use a voltage regulator and electrotechnical instrument to respectively adjust the power supply voltage to ± 10% of the rated voltage. The test result shall comply with the requirements in 5.8.

6.10 Vibration Resistance Test

6.10.1 The test method shall comply with the requirements in GB/T 2423.10-2008. During the test, the fire suppression test shall be in non-working state. The test conditions shall comply with the following stipulations:

a) Range of frequency cycle: 10 Hz ~ 150 Hz ~ 10 Hz;

b) Amplitude (single amplitude): 0.19 mm;

c) Scanning rate: one octave / min;

d) Vibration direction: three directions: *XYZ*;

e) Frequency-sweeping number: 2 frequency-sweeping cycles.

6.10.2 In accordance with the result of vibration response, respectively conduct the test in accordance with the following three circumstances. Each test shall be successively conducted in the three directions *XYZ* of the sample:

a) When resonance frequency is not found, at the frequency of 150 Hz, conduct fixed frequency vibration test with the amplitude of 0.19 mm and the duration of 10 min;

b) When there are not more than 4 resonance frequencies being found, on each resonance point, conduct resonance test with the set amplitude of 0.19 mm and the duration of 10 min;

c) When there are more than 4 resonance frequencies being found, within the frequency cycle range of 10 Hz ~ 150 Hz ~ 10 Hz, conduct resonance test with the amplitude of 0.19 mm and the frequency-sweeping rate of double frequency / min. The duration of resonance is 1 h in each direction.

The test result shall comply with the requirements in 5.9.

6.11 Fire Suppression Test

6.11.1 Automatic fire cannon suppression device and injection-type automatic jet suppression device

At the minimum installation height and the maximum installation height, respectively place Level-1A fire test model inside the maximum protection radius of the fire

c) When production is resumed after one year of suspension, or, normal production exceeds two years;

d) When a national quality supervision institution proposes a request for type inspection.

7.1.2 The content of type inspection is all the items stipulated in this Standard. The inspection result shall all satisfy the stipulations of this Standard.

7.1.3 The quantity of test samples for type inspection is 3 sets. The test procedure shall comply with the stipulations of Appendix A.

7.2 Exit-factory Inspection

7.2.1 Before exiting factory, exit-factory inspection shall be conducted.

7.2.2 Exit-factory inspection shall be conducted in accordance with the stipulations in 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 5.13 and 5.15. The result shall all comply with the stipulations of this Standard.

8 Marking, Packaging, Storage, Transportation and Instruction Manual

8.1 Marking

8.1.1 The nameplate of product shall include the following content: manufacturer name and trademark, product name, model and specification, serial No. of implemented standard, product No., working pressure, flow, jet flow radius, maximum protection radius, monitoring radius, minimum and maximum installation height, etc.

8.1.2 The surface of packaging box shall be printed with product name, specification, quantity, external dimensions of packaging box, gross weight, manufacturer name, address and contact information.

8.2 Packaging

The packaging of product shall ensure that product is not damaged or loosened in normal transportation, and that product complies with user’s demands and the regulations of the transportation department.

8.3 Storage

The storage warehouse shall be well-ventilated, dry and clean. Products shall not be heavily pressed.

8.4 Transportation

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