



NEMOTO & CO.,LTD

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NIS-05A SPECIFICATIONS

(Revised: November 11, 1999)

1. Scope :

This specification sheet is for Ionization Smoke Chamber Model NIS-05A (Radiation source = 0.5 μ Ci of Am-241) manufactured by Nemoto & Co., Ltd., Tokyo, Japan for applications to smoke detectors.

2. Method of detection :

Ionization type, 2 chambers with a source

3. Radiation source :

Nuclide ; Americium 241

Radioactivity ; 16.6KBq. - 20.4KBq. Ave. 18.5 KBq. (0.5 μ Ci)

4. Operational conditions :

Power supply ; DC 6.0 - 12.0 V

Operational ambient conditions ;

Temperature 0 - 50°C

Humidity Less than 95% (No dew condensation)

5. Maximum ratings :

Supply voltage ; DC 24 V

Ambient conditions;

in operation ; Temperature 0 - 50°C

Humidity Less than 95%

in storage ; Temperature -25 - 80°C

Humidity Less than 95%

6. Shape, dimensions, weight ;

Shape & Dimensions ; As per attached drawing

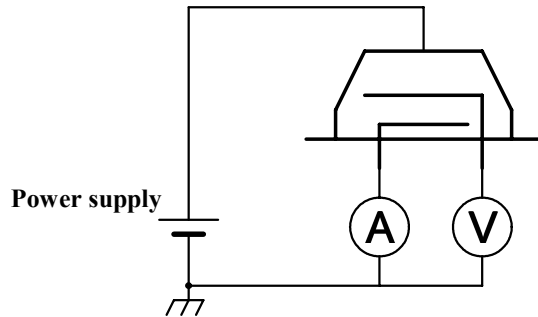
Weight ; 13.7 g.



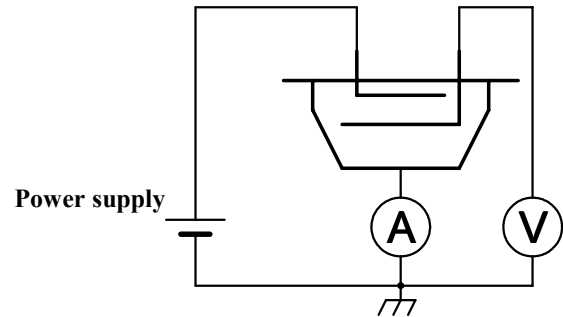
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7. Measuring circuit



Normal polarity



Reverse polarity

8. Ratings :

Test conditions; at 25°C, 60% RH

Items	Specifications	
	Normal polarity	Reverse polarity
Supply voltage	DC 9V	DC 9V
Current consumption	15 +/- 2 pA	12 +/- 2 pA
Output voltage	5.5 +/- 0.5 V in clean air	4.3 +/- 0.5V
Sensitivity	1.2 +/- 0.3 V	0.8 +/- 0.3 V

(Under 2%/foot of smoke, Tested according to UL 217)

9. Characteristics :

9-1. Sensitivity characteristics

Table 1

Test conditions; at 25°C, 60% RH

Smoke Concentration (%/foot)	Output Variation (ΔV)	
	Normal polarity	Reverse polarity
0	0	0
1	0.6 +/- 0.2	0.4 +/- 0.3
2	1.2 +/- 0.3	0.8 +/- 0.3
3	1.7 +/- 0.3	1.2 +/- 0.3
4	2.1 +/- 0.4	1.5 +/- 0.4

Gray smoke test according to UL 217

Air velocity; 0.16m/sec.



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9-2. Supply voltage dependency

Table 2 Test conditions; at 25°C, 60% RH

Supply voltage (V)	Output voltage (V)	
	Normal polarity	Reverse polarity
6	3.2 +/- 0.4	3.4 +/- 0.4
9	5.5 +/- 0.5	4.3 +/- 0.5
12	7.8 +/- 0.6	5.0 +/- 0.6

9-3. Temperature & Humidity dependency

Table 3 Temperature dependency (Humidity; 60% RH)

Temperature (°C)	Output (V)
0	5.2 +/- 0.5
25	5.5 +/- 0.5
50	5.8 +/- 0.5

Table 4 Humidity dependency (Temperature; 25°C)

Humidity (%C)	Output (V)
30	5.6 +/- 0.5
60	5.5 +/- 0.5
90	5.4 +/- 0.5

10. Durability tests :

10-1. Heat resistance test

Test method	Criteria
At +80°C +/- 5°C for 72 hrs. without electrified	To maintain the characteristics shown in Heading No. 8 after test. To show neither deforming, nor discoloring, nor cracks.



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10-2. Low temperature resistance

Test method	Criteria
At -30°C +/- 5°C for 72 hrs. without electrified	To maintain the characteristics shown in Heading No. 8 after test. To show neither deforming, nor discoloring, nor cracks.

10-3. High humidity resistance

Test method	Criteria
At +40°C +/- 5°C, 85 +/- 5% for 72 hrs. without electrified	To maintain the characteristics shown in Heading No. 8 after test. To show neither deforming, nor discoloring, nor cracks.

10-4. Vibration test

Test method	Criteria
Vibrated with amplitude of 0.25mm at every 5Hz from 10 – 35 Hz for 15 min. with sympathetic vibration. If no sympathetic vibration occurs, to be vibrated at 35Hz for 4 hours.	To maintain the characteristics shown in Heading No. 8 after test. To show neither deforming, nor discoloring, nor cracks.

10-5. Impact test

Test method	Criteria
Dropped from a height of 1m on to a wooden plate with three different directions.	To maintain the characteristics shown in Heading No. 8 after test. To show neither deforming, nor discoloring, nor cracks.



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11. Remarks :

1. Measurement of output voltages ;

Output voltages are to be measured with an electrometer having an impedance of 10^{14} or greater, or with an exclusively designed measuring circuit using an IC for smoke detectors. Usual testers with an impedance of around 100M may not be adequate for accurate measurements.

2. Contamination with a flux ;

Upon assembling of NIS-05A onto your smoke detectors, please pay attention that a soldering flux would not get inside the chamber. Washing or cleaning up should be required if the inside of the chamber is contaminated with a flux.

3. Connection of output lead wire ;

The lead wire of NIS-05A should be connected in air with the input terminal of your circuit, or the connected point should be supported with a teflon post so that the connected point would not touch to your PCB. Accurate output voltages can not be measured if the current leaks onto the PCB.

4. Moisture protection ;

The connection point of the output wire of NIS-05A and an input terminal of an IC or an FET should be protected with a silicone resin or the like. Current leakage under highly humid conditions would be minimized.

5. Electrical shielding ;

Because of a sensor of a tiny current, NIS-05A is easily affected by electrical noises from the outside. It is therefore recommended to shield the sensor, especially the connection point must be electrically shielded.

Packing

1,000 pieces packed in an export carton.

Dimensions ; 435(D) x 490(W) x 275(H) mm

Gross weight ; 14.5 Kgs.



Since 1941

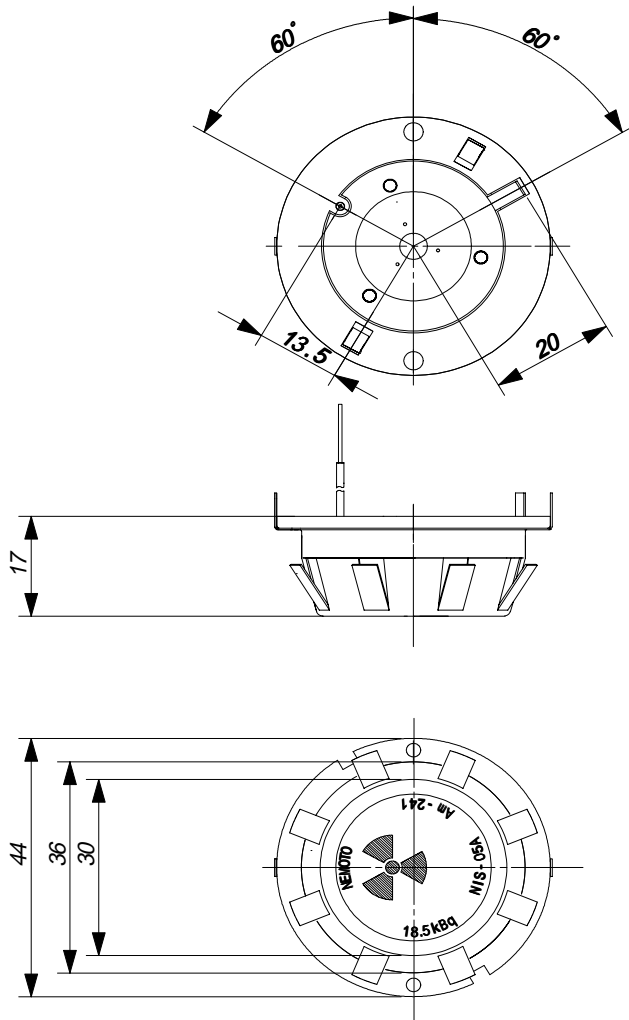
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12 Drawings



Parts	Material
Mount	PBT
Electrodes	SUS304
Output Wire	FEP wire

NIS-05A