

Wireless Smoking, Vaping & Bullying Alarm Sensor

Wireless Sensor Network Based on LoRa Technology



RA02G Datasheet

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Introduction

RA02G is an indoor sensor with smoking, noise, and anti-tamper detection. New functions such as power outage detection, sensitivity adjustment, audio alerts customization, and PoE splitter connection are now added. The new RA02G makes indoor monitoring easier and flexible than you ever imagined.

Features

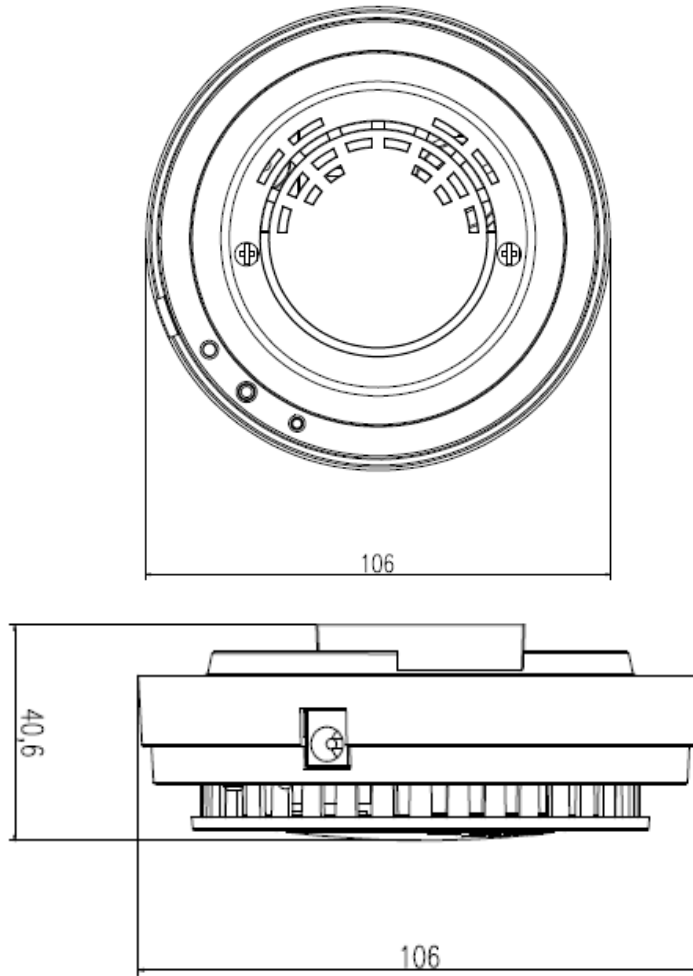
- Power adapter (input: 100–240VAC, 50/60HZ; output: DC 12V/1A)
- Battery backup power (2* AAA 1.5V batteries)
- Highly accurate and stable smoking sensor
- Sensitivity adjustment for smoking and noise detection
- Upload audio alerts through Type-C cable
- IP5X (not waterproof)
- SX1262 wireless communication module
- Compatible with LoRaWAN™ Class C
- Frequency hopping spread spectrum
- Applicable to third-party platforms: Actility/ThingPark, TTN, MyDevices/Cayenne

Applications

- Residential buildings, hotels, schools, hospitals, banks, office buildings, libraries, museums, meeting rooms, airports, and stations
- Toilets, elevators, and storage rooms

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Dimensions



Ø106mm x 40.6mm

Electrical Specifications

Electric

Input Power	DC12V/1A (Power adapter)
Battery Backup	2* 1.5V AAA alkaline batteries
Power Consumption	Monitoring: <100mA; Sounding alarm: <200mA
Receiving Current	11mA @3.3V
Transmitting Current	120mA @3.3V

Note: The electrical specifications may vary due to the power supply voltage.

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Smoke Detector

Operating Voltage	5VDC
Operating Current	100mA (typical value)
Comprehensive Response Time	≤10 seconds
Lifetime	3 years

Vibration Detector

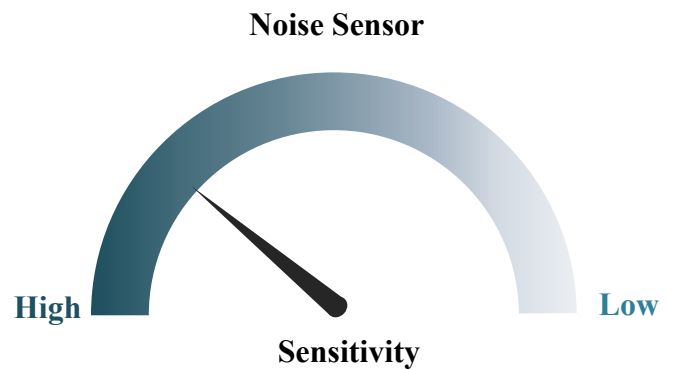
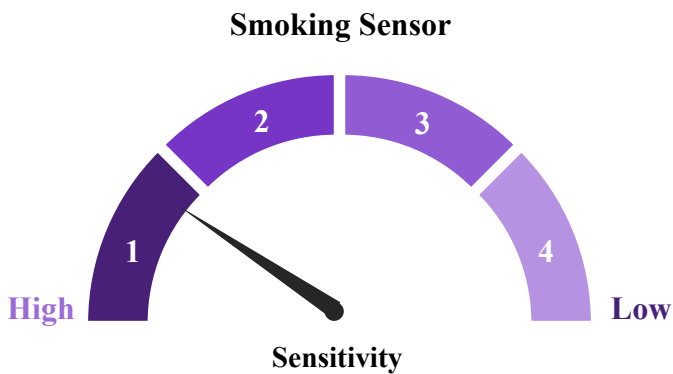
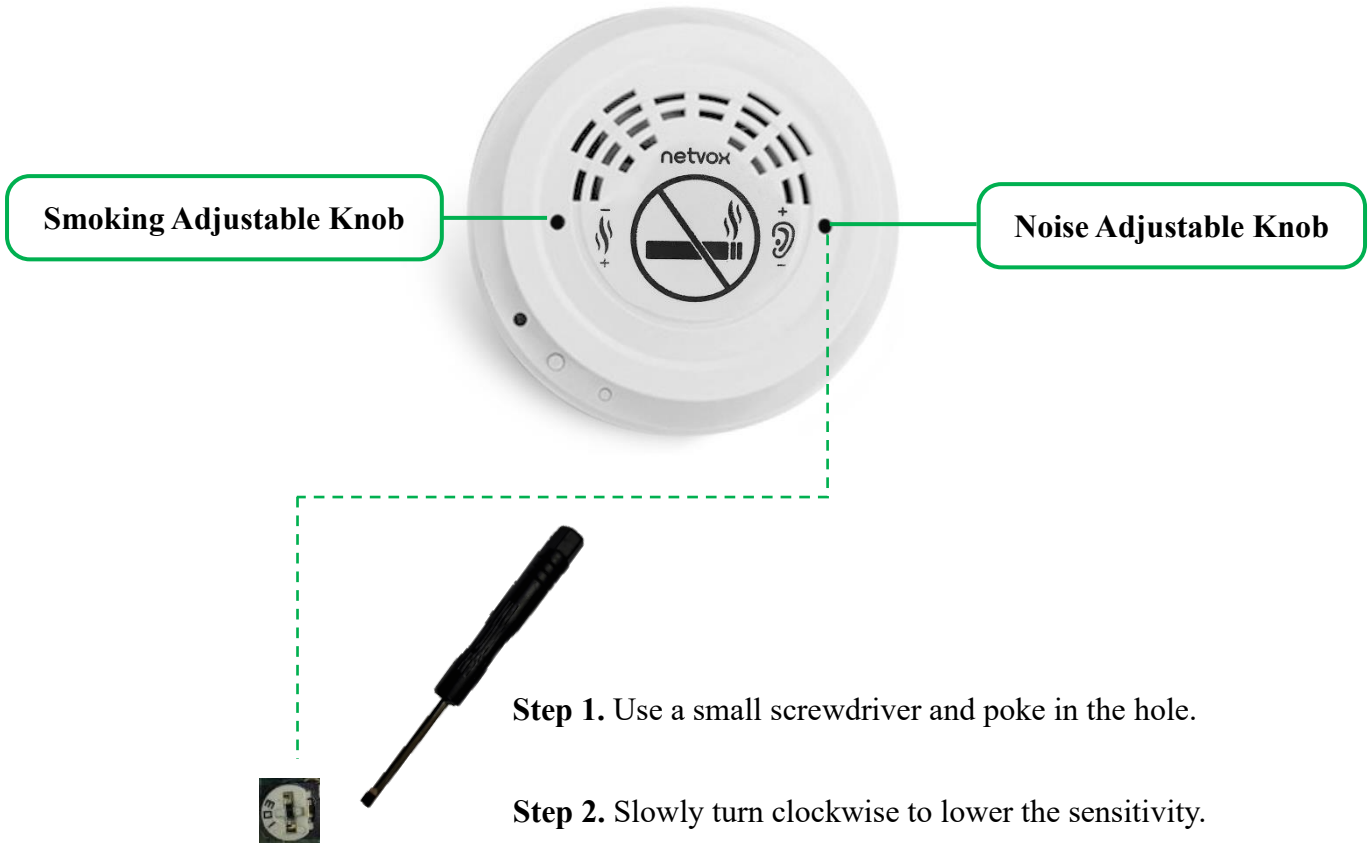
Type	Omnidirectional ball switch
Voltage	<6V
Current	2uA–10mA
Insulation Resistance	>10MΩ
Trigger Rate	100% (amplitude > 1 mm, frequency > 20 Hz)
Trigger Frequency	>50Hz

Noise Detector

Type	Condenser microphone
Direction	Omnidirectional
Sensitivity	-36 ± 3db
Frequency	20 – 10000Hz
Current Consumption (Max.)	0.5mA
Operating Temperature	-20 – 70 °C
Dimensions	φ9.7 x 6.5 mm

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Sensitivity Adjustment



4 levels (45° for one level)	Level	-
Level 1 > 2 > 3 > 4	Sensitivity	Turn clockwise for lower sensitivity

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Testing Results of Noise Sensor

Noise Type	Detectable decibel value (set sensor dB to the lowest)	Detectable decibel value (set sensor dB to the highest)
100Hz	90dB	109dB
1KHz	100dB	>110dB
10KHz	103dB	>110dB
Knocking Sound	73dB	92dB
Music	85dB	>110dB

Note: The testing results were obtained when the horizontal distance between RA02G and noise was 1 meter.

Audio Alerts

The decibel value was tested when RA02G was triggered, and the default audio alerts sounded.

Audio alerts	dB
Smoking alarm	53dB
Noise alarm	62dB
Anti-tamper alarm	62dB

Note:

- (1) The testing results were obtained when the horizontal distance between RA02G and the detector was 1 meter.
- (2) The maximum volume is level 30.

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Frequency

Frequency Range	863MHz-928MHz 470MHz-510MHz
TX Power	US915 20dbm AS923 16dbm AU915 20dbm CN470 19.15dbm EU868 16dbm KR920 14dbm IN865 20dbm
Rx Sensitivity	-136dBm (LoRa, Spreading Factor = 12, Bit Rate = 293bps) -121dBm (FSK, Frequency deviation = 5kHz, Bit Rate = 1.2kbps)
Antenna Type	Build-in antenna
Communication Range	10 km (line of sight) Note: The communication distance depends on the environment.
Data Transfer Rate	LoRa: 0.3kbps – 50kbps FSK: 1.2kbps – 300kbps (Note: One modulation is required.)
Modulation	LoRa / FSK
Available Frequency	EU863-870, US902-928, AU915-928, KR920-923, AS923-1, AS923-2, AS923-3, IN865-867, CN470-510 (Note: Configured before shipment)

Physical Properties

Dimensions	Ø106 mm x 40.6 mm
Length of Adapter Cable	1.5m
Ambient Temperature Range	-10°C to 55°C
Ambient Humidity Range	<90%RH (no condensation)
Mounting	Screws