

Vibration and Temperature Sensor

RW160-AS&RW161-AS

Execution standard: GB/T3836.1-2021 GB/T3836.4-2021
MT209-1990 (except interference interference and reliability)
MT /T 210-1990 Q/RH 048—2021
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catalogue

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warning:

- * Before installation and use, read the instruction manual and install and operate in strict accordance with the methods specified in the instructions
- * Do not modify the circuit without authorization
- * Model, specifications and electrical parameters of associated short circuit and components shall not be modified during maintenance
- * Do not replace batteries in explosion-proof places. The product shell contains aluminum, when used in zone 0, must prevent the ignition hazard caused by impact or friction!
- * The product shell contains plastic material, with a potential electrostatic charge hazard! Friction should be avoided in use! Please wipe it with a wet cloth when cleaning.
- * Please take attention that changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- * This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
 - (1) This device may not cause harmful interference, and
 - (2) This device must accept any interference received, including interference that may cause undesired operation.
- * This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

1. Overview

1.1 Purpose and scope of application

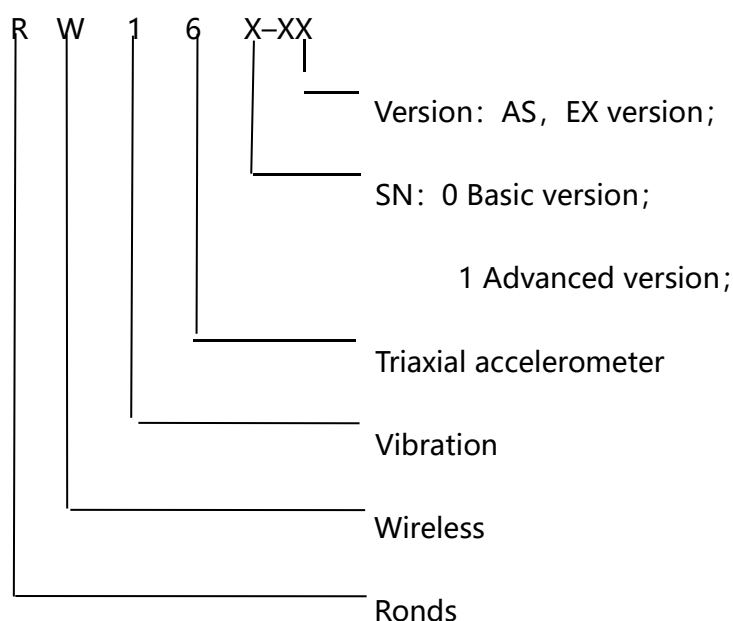
The general vibration temperature sensor (hereinafter referred to as sensor) can monitor the equipment and upload the vibration data for a long time.

The sensor has intrinsically safe explosion-proof function, meeting GB 3836.1-2010 Explosive Environment-Part 1: General Requirements for Equipment, and GB 3836.4-2010 Explosive Environment-Part 4: Equipment protected by intrinsically safe "i"; the explosion-proof mark is Exia II C T4 Ga.

1.2 Functional features

- (1) Wireless transmission, eliminating the signal, power supply, network, such as a large number of wiring work
- (2) The transmission frequency of Lora free frequency band, long transmission distance, strong anti-interference ability, easy for industrial field use
- (3) Low-power consumption design, which can monitor and report the vibration data for a long time
- (4) Small volume, suitable for a variety of industrial site installation
- (5) Support for temperature measurement

1. 3 Model description



Current product models are as follows: basic version RW160-AS, high version RW161-AS, basic version and high version function difference, about Chinese explosion-proof version and English explosion-proof version (only nameplate model is different, using different language), Chinese / English explosion-proof version of the hardware components are consistent, only the nameplate and function of different version.

Basic version:

- (1) Frequency response: 10-900Hz ($\pm 3\text{dB}$) and 10-1 kHz ($\pm 3\text{dB}$)
- (2) Analysis frequency: Z-axis piezo: 500Hz, 1000Hz

The XY axis, MEMS 1000Hz

- (3) Measurement definition acquisition: Z-axis piezo
Acquisition length: 1K, 2K, and 4K
- (4) Battery life: 5 years (estimated at 25°C ($\pm 2^\circ\text{C}$), 30 minutes as collection interval, decreased at both low and high temperatures)

Advanced version:

- (1) **Frequency response: 10-900Hz ($\pm 3\text{dB}$) XY, 10-10 kHz Z ($\pm 3\text{dB}$)**
- (2) Analysis frequency: Z-axis piezo 500Hz, 1000Hz, 2000Hz, 5000Hz, 10000Hz
The XY axis, MEMS 1000Hz
- (3) Measurement definition acquisition: Z-axis piezo
Acquisition length: 1K, 2K, 4K, 8K, and 16K
- (4) Battery life: 3 years (estimated at temperature 25°C ($\pm 2^\circ\text{C}$), as defined by conventional measurement, collecting waveform every 48h, based on 8K acceleration waveform in XY and Z axis directions, service life decreased at both low and high temperatures)

1.4 Use of environmental conditions

1.4.1 Working environment conditions

- a) Ambient temperature: $-40^\circ\text{C} \sim +70^\circ\text{C}$;
- b) Average relative humidity: 95%HR (+ 25°C);
- c) Atmospheric pressure: 70 kPa $\sim$ 110 kPa;
- d) The situation without water accumulation;
- e) Area 0 hazardous place with II A, II B, II C hazardous gas, but no corrosive gas destroying insulation.

1.4.2 Suitable storage and transportation conditions

- a) High temperature: $+85^\circ\text{C}$;
- b) Low temperature: -40°C ;
- c) Average relative humidity: + 95%HR (+ 25°C);
- d) Vibration: 50 m/s^2 ;
- e) Impact: 500 m/s^2 .

1.5 Safety features

Explosion-proof type: intrinsically safe type, explosion-proof mark: Ex ia IIC T4 Ga.

2. Working principle and structural characteristics

2.1 Working principle

The schematic diagram of the sensor is shown in Figure 1.

The sensor can collect temperature, vibration and other data, and report data using lora.

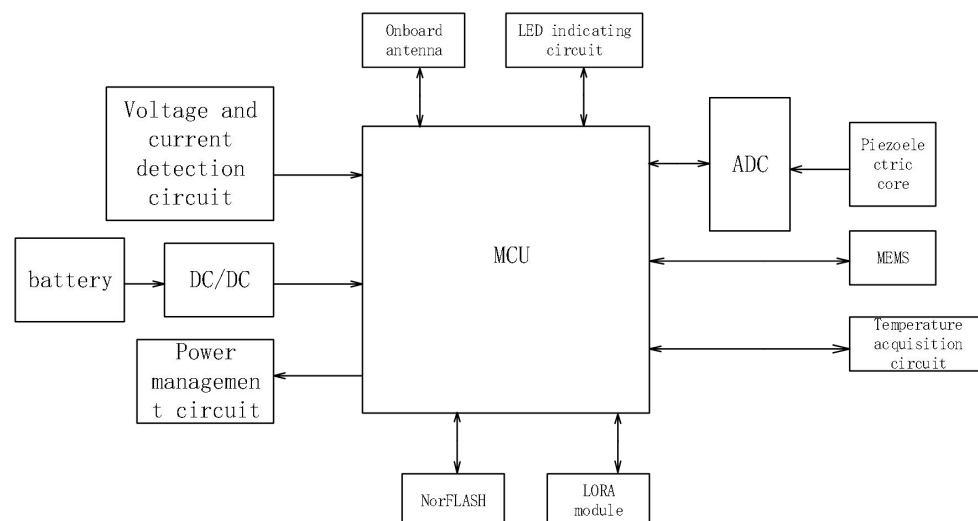


Figure 1 Schematic block diagram of the general vibration temperature sensor circuit

2.2 Structural features

.12.2 The sensor structure is shown in Figure Figure 2.

2.2.2 The sensor housing is made of 304 stainless steel, aluminum alloy material and flame retardant PC material, and the top cover is made of flame retardant PC material.



Figure 2 Structural appearance diagram of the general vibration temperature sensor

3. Key technical indexes

3.1 Operating voltage and current

A) Operating voltage: rated voltage 3.6V, Korean emperor (maximum open circuit voltage 3.9V, after fuse cold resistance maximum short circuit current 0.78A); Yiwei (maximum open circuit voltage 3.9V, after fuse cold resistance maximum short circuit current 0.78A); Guangxi Ruiyi (maximum open circuit voltage 3.9V, after fuse cold resistance maximum short circuit current 0.78A);

B) Operating current: 50 mA;

c) Fuse parameters: the cold resistance of the disposable fuse used by the sensor at the minimum service temperature -40°C is not less than 5 Ω;

3.2 Measurement range

Vibration acceleration (Z triaxial) measurement range: (0~50) g (g: gravity acceleration $g=9.8\text{m/s}^2$), vibration acceleration (X, Y axial) measurement range: (0~16) g (g: gravity acceleration $g=9.8\text{m/s}^2$), resolution of 0.01m / s²;

3.3 Basic error

Allowable basic error of vibration measurement: $\pm 3\text{dB}$;

3.4, and the linearity degree

Linearity: 2%;

3.5 Signal output mode

Lora wireless mode:

(1) Transmission distance: 1000 meters without interference

3.6 Protection level: IP68.

4. Dimensions, weight, and material materials

4.1 Overall dimensions: 46.8 mm 104 mm (diameter height, including mounting seat).

4.2 Machine weight: about 265 grams (including the mounting seat).

4.3 Shell material: upper cover: flame retardant PC, shell: stainless steel, aluminum alloy, flame retardant PC.

5. Notes for installation and operation

(1) Before using the product, please read the operation manual in detail.

(2) The product shall be used and maintained by personnel or specialized personnel trained for some time.

(3) The use should be avoided as far as possible: knock, fall, close to the high temperature source for a long time and long-term use in the high corrosion environment, so as not to affect the performance.

(4) correctly install the sensor to ensure the sensor sensitivity and the accuracy of the measurement data.

(5) Do not allow to replace the original device or structure, so as not to affect the explosion-proof performance.

(6) Only the specified type of battery:

Brand: Yiwei / Emperor manufacturing / Guangxi Ruiyi, model: ER26500 / XL-145F / ER26500, specification parameters: 3.6V 8.5Ah (Emperor / Yiwei) / 9Ah (Guangxi Ruiyi) lithium thionyl chloride battery

(7) The sensor shell is made of 304 stainless steel, when installed and used to prevent the ignition risk caused by impact or friction.

(8) The upper cover shell of the product is made of flame retardant PC material and the surface area is less than 100 square cm. Potential static electricity hazard, avoid friction in use! Please wipe it with a wet cloth when cleaning.

6. Installation and use

6.1 Production date and validity period of the certificate

a) Production date: see "Product Factory Inspection Report" for details;

b) Validity period of the certificate: see the "Explosion-proof Qualification Certificate" for details.

6.2 Installation method

Magnetic seat + adhesive, bolt + screw hole, bolt+ welding

Note: It is recommended to adopt the installation mode of rotary seat + screw hole, rotary seat + welding for the large vibration range of the field equipment

6.3 Methods of use

- A) Use the supporting debugging instrument configuration.
- B) Use it with the gateway, and set up the same wireless frequency band.
- c) The battery shall be replaced in strict accordance with the relevant requirements of "Repair and maintenance" in Article 4.

7. Maintenance and maintenance

7.1 Maintenance

- 1) Please read the instructions carefully before use, and follow the operation steps.
- 2) Do not alter any parameters of the sensor circuit.
- 3) Do not use the battery other than the instruction manual.
- 4) The battery replacement should be done in a safe place.
- 5) The pouring parts shall be replaced as a whole

7.2 Maintenance

7.2.1 When using, the designated personnel shall be responsible for the daily maintenance and maintenance of the sensors.

7.2.2 Maintenance and maintenance personnel must carefully read and be familiar with the Operation Manual of General Vibration Temperature Sensor and related circuit diagrams, and be familiar with the inner and external structure and circuit principle of the sensor.

7.2.3 In use, the maintenance and maintenance personnel should often check whether the sealing part of the sensor is pressed and whether the cover screws are fastened.

8. Common fault handling

- 1) If the data cannot be uploaded, first check whether there is power in the battery. If not, please replace the battery.
- 2) If the data upload is not timely, first check the wireless signal quality of the

installation location to ensure that there is no shielded equipment around.

9. Transportation, storage

9.1 When transporting and handling sensors, be careful and careful to avoid severe vibration and impact.

9.2. When the sensor is stored, do not put it in the place directly dripping with water.

10. Out of the box and check

10.1 Pay attention to safety when opening the box to avoid damage to the equipment or human injury.

10.2 After opening the box, check whether the equipment appearance is damaged and whether the accessories are complete.

10.3, attached list

- A) 1 copy of manual
- B) 1 sensor
- C) One copy of the product qualification certificate
- D) 1 copy of the packing list

Producer: **Anhui Ronds Science & Technology Incorporated Company**

Address: #59, branch road of biomedical park, high-tech district, Hefei, Anhui, China

Postcode: 230000

Tel.: (0551) 65335195