

**HZSF - 521 Series  
SF6 Decomposition Detector**

**User Manual**

Dear user:

Thank you for choosing HZSF - 521 series SF<sub>6</sub> decomposition detector.

We hope that this instrument can make your work easier and more enjoyable, so that you can get the feeling of office automation in the test and analysis work.

Before using the instrument, please read this manual, and operate and maintain the instrument according to the manual to prolong its service life. "Just a light press, the test will be completed automatically" is the operating characteristics of this instrument.

If you are satisfied with this instrument, please tell your colleagues; if you are not satisfied with this instrument, please call (0312) 6775656 to tell you to serve you at all times-Baoding Huazheng Electric Manufacturing Co., Ltd., our company will definitely make you satisfied !

## **Mention below**

In order to use the instrument correctly and effectively, it is recommended to read this manual carefully before operation and strictly follow the operation steps.

In the measurement to maintain the on-site air circulation, exhaust do harmless treatment.

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## I. Overview

Faults of SF6 electrical equipment are divided into body internal faults and operating mechanism faults. The internal faults involving solid insulation pose the greatest threat to the safety of equipment. The internal faults can be divided into discharge and overheating, and the discharge types can be divided into suspended potential discharge, ground discharge and inter-turn discharge.

At present domestic and foreign commonly used electrical tests are generally carried out in the state of power failure, and the biggest safety hazard insulation but the detection rate is very low. SF6 decomposition detector produced by the company is intelligent, with high sensitivity, stability and convenient operation. It can automatically diagnose and put forward treatment Suggestions according to the detected concentration, providing a simple and effective means for the early detection of internal faults of SF6 electrical equipment.

## II. Main technical indexes

1. Minimum detection quantity: 0.1 PPM
2. Stability: When the temperature changes from 20°C to 40°C, the maximum drift of zero point  $\leq \pm 0.1$  ppm
3. Accuracy: When measuring  $\leq 2$  ppm, the error  $\leq \pm 0.1$  ppm  
When  $> 2$  ppm was measured, the error was  $\leq \pm 0.2$  ppm
4. Repeatability: SO<sub>2</sub> and H<sub>2</sub>S are  $\leq 2\%$
5. Measurement range: 0~100ppm (customizable)
6. Temperature range: -40°C~+50 °C
7. Humidity range:  $\leq 95\%$  RH
8. Atmospheric pressure: 86kPa~106kPa
9. Self-contained power supply: built-in rechargeable battery, which can work continuously for more than 10 hours after being fully charged
10. Shape: 252×310×98mm
11. Weight: 2.5kG
12. Communication: RS232

### III.Main functions and characteristics

SF6 decomposition detector can quickly detect and judge the early faults inside SF6 electrical equipment (circuit breaker, transformer, TRANSFORMER, GIS and bushing, etc.) in the field by simultaneously monitoring SO2 and H2S decomposition products.

This instrument can be widely used in SF6 electrical equipment in electric power, railway, metallurgical and petrochemical industries.

SF6 electrical equipment internal gas by the pressure reducing valve, airway after entering instruments, two road into the SO2 and H2S sensor for testing at the same time, the SO2 and H2S concentration into corresponding electrical signal, through the operational amplifier, filter circuit, sent to the microprocessor and A/D converter, the analog signal is converted into the corresponding digital signals, the LCD display detection concentration of actual value.The memory number can be compared by the microprocessor logic with the expert diagnosis system to determine the type of fault.

The structure diagram of the instrument is shown in Figure 1:

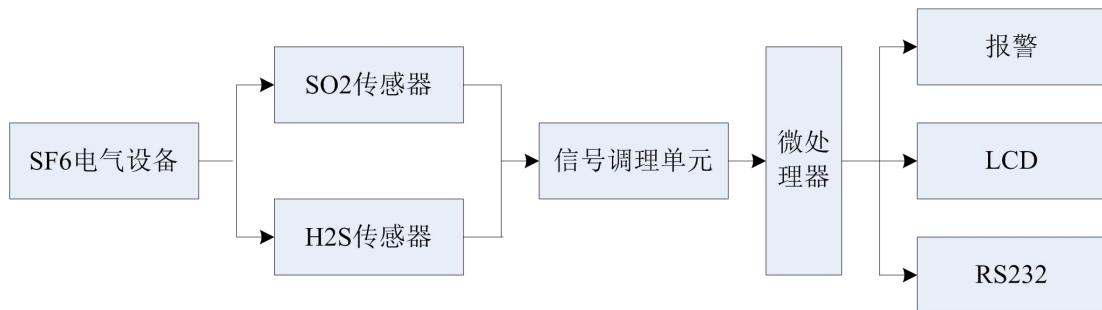


FIG. 1 Block diagram of instrument flow

### Panel shows



FIG. 2 Schematic diagram of instrument front panel

"▲" key: Used to move cursor up and set values

"▼" key: Used to move the cursor down and set values

"◀" key: Used to move the cursor left and set the value

"▶" key: Used to move the cursor to the right and set the value

Cancel key: Used to cancel and return to the parent menu

Ok key: Used to confirm the action

## The system menu

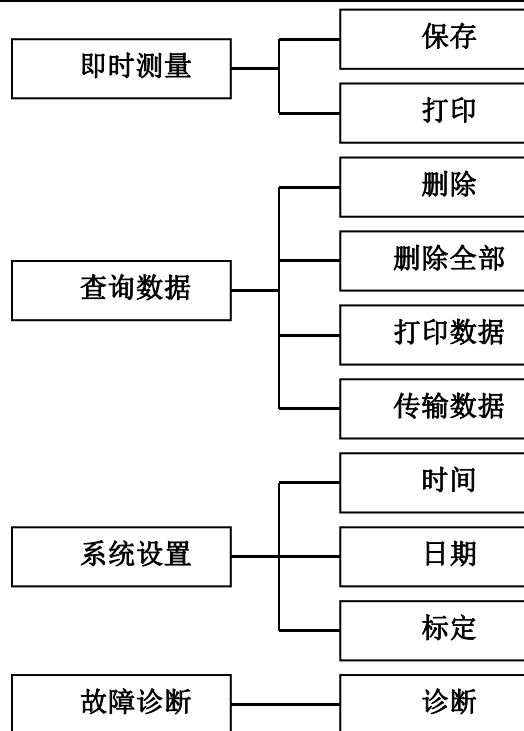


Figure 3 Menu hierarchy

## IV.Operation method

This instrument is highly intelligent. After starting up, the gas under test will be introduced into the instrument, and the appropriate flow rate (0.35l /min) will be adjusted. Select the menu of "Instant Measurement" and press "CONFIRM" to enter the measurement process. The measurement time is about 2-3 minutes. The specific steps are as follows:

### 1. Instant measurement

(1) Insert SF6 gas of the equipment under test into the inlet of the instrument through the quick joint provided with the instrument, open the pipe valve and adjust the flow valve of the instrument to the appropriate flow rate (about 0.35l /min).

(2) After the power is turned on, the system will conduct a 2-minute self-calibration process. After the self-calibration, the main menu is displayed.

(3) On the main menu, use the "▲" and "▼" keys to move the cursor to "Instant Measurement" and press the "OK" key to enter the measurement.

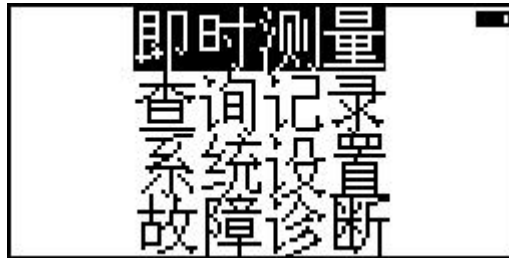


Figure 5 Measurement menu

The measured gas enters into two detectors at the same time. The real-time concentration of SO<sub>2</sub> and H<sub>2</sub>S in the measured gas is displayed every 1 second on the LCD. After the value is stabilized for about 2-3 minutes, the storage operation can be carried out, as shown in Section 7.2.

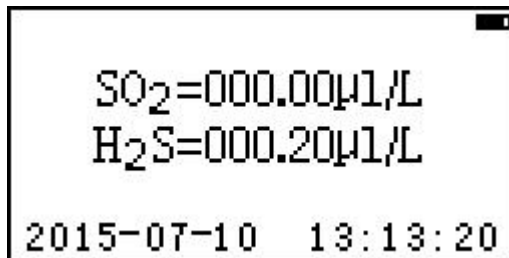


Figure 6 In the measurement

(4) After the measurement of one equipment, close the flow valve and pipeline valve of the instrument, remove the guide pipe and connect with other SF<sub>6</sub>. Do not turn off the power of the instrument at this time when measuring the electrical equipment.

(5) All SF<sub>6</sub>. Turn off the power for electrical equipment inspection, and pack the pipes and accessories.

## 2. Save data

When the measurement results are stable, press "Ok" to display the "save" menu on the keyboard, use "▲" and "▼" to move the cursor to the " Save "menu, and press "OK "to enter the save interface.

When prompted to input the device number, the operator can set it regularly according to the number of the tested device. There are 5 digits in total, each digit can display 0-9 digits, A, B,.....26 capital Letters and a, B,...26 lowercase letters.

Press the "▲" and "▼" keys to set each number and letter; Press "◀" and "▶" to set the number of digits.

Press the "OK" key to save the record after the number setting is completed. When the record is saved successfully, "save successfully" will be displayed, and the storage location will be displayed, and then the record will be returned automatically. Press the cancel key to abort the save and return.

### 3.Query records

On the main menu, use the "▲" and "▼" keys to move the cursor to the "Query Record" and press the "OK" key to view the history.

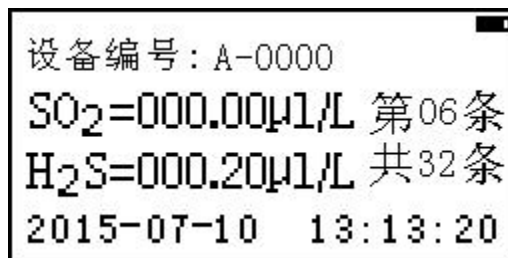


Figure 7 shows the record

As shown in the figure, the record of July 10, 2015 is shown. The device number of this record is A-0000.

The "◀▶" key is used to view the previous record and the next record, respectively.

The Cancel key is used to return the superior color ticket

The "OK" key can be entered into the menu to record data

### 4.Delete records

Press "OK" to delete when viewing the record. Deletion includes deleting one, and deleting all. Use the "▲" and "▼" keys to move the cursor to "Delete" or "Delete all" and press "OK" to delete records; Click Cancel to return to view the record.

## 5. Transfer data

The data is transmitted to the computer through R S232 interface, and the client (computer) USES the super terminal.

## 6. Print data

Printer is optional. It is connected with the microne printer through the RS232 interface of the instrument.

Press "Confirm" when querying records or "Confirm" when measuring to choose print operation.

## 7. Troubleshooting

On the main menu, use the "▲" and "▼" keys to move the cursor to "Fault Diagnosis" and press the "OK" key to view history.

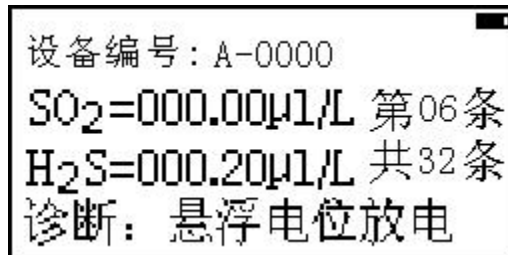


Figure 7 shows the record

As shown in the figure, the record of July 10, 2015 is shown. The device number of this record is A-0000.

The "◀▶" key is used to view the previous record and the next record, respectively.

The Cancel key is used to return the superior color ticket

## 8. Set a time and date

Select the "System Settings" menu and press "Confirm" to enter the setting interface, including "Time", "Date" and "Calibration".

Select "Time" or "Date" to enter the time and date Settings, respectively.

When we enter the time or date setting, use the "◀" and "▶" keys to select the setting time, minute, second or year, month, day; Press "▲" and "▼" to set the value.

Press "OK" to save the Settings after the Settings are completed; The save is abandoned and returned when the Cancel key is pressed.

## 9. Calibration

The instrument has been calibrated before leaving the factory. Normally, no calibration is required for a year. If necessary, please contact the manufacturer or authorized unit for calibration. See Appendix I for details.

### Charge 10.

This instrument USES 4000mAh high-performance lithium battery. The charger has a rated output of 500mA. Connect the charger to the charging seat on the back panel of the instrument. After 220V ac is involved, when the battery voltage is close to the rated, the charging current will automatically decrease. At this time, the charging indicator will change from red to orange, and it can be filled after 12 hours of continuous charging.

## V. Instrument maintenance and precautions

### 1. Instrument maintenance

- (1) When the instrument is not in use, it shall be put into the aluminum alloy packing box and placed on the test bench or instrument rack for dust and moisture protection.
- (2) When the instrument is stored and not in use, it is recommended to charge it every three months to extend the battery life.
- (3) The instrument is calibrated once a year with standard gas. It can be sent to manufacturers or authorized units for calibration to ensure accuracy.

### 2. Notes

- (1) When the concentration of SO<sub>2</sub> and H<sub>2</sub>S in the detected gas is high, the remaining gas in the airway should be removed before the next device is tested.

(2) When the concentration of SO<sub>2</sub> or H<sub>2</sub>S in the detection equipment exceeds the normal value, it is recommended to measure twice to confirm the result.

## Appendix a

Press "▲" and "confirm" to enter the calibration mode at the initial state of power on. K value correction and linear value correction are determined according to actual needs.

### 1. Calibrate K value

"Setting" --> "calibration" --> "calibration" --> "k-so<sub>2</sub>" k-value calibration into SO<sub>2</sub>; "Setting" --> "calibration" --> "calibration" --> "k-h<sub>2</sub>s" into the K value calibration of H<sub>2</sub>S.

Set K to 1.

(1) About 80ul/L standard gas.

(2) Measure and record data. In each row, there are two sets of data, the first is revised data, the second is measured data.

(3) K value can be obtained from the measured data of standard gas concentration division.

(4) Input k value. The comparison shows the corrected data.

Two: Linear value correction

"Setting" --> "calibration" --> "calibration" --> "k-so<sub>2</sub>" enter into linear value correction; "Setting" --> "calibration" --> "calibration" --> "k-h<sub>2</sub>s" linear value correction into H<sub>2</sub>S.

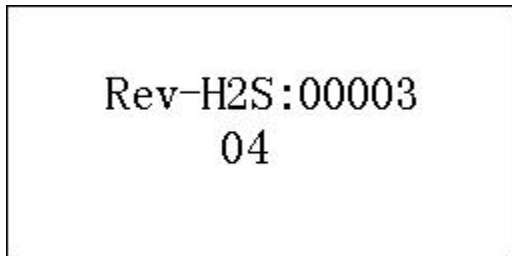
(1) A standard gas of a certain concentration. Record the concentration of the standard gas as Y.

(2) Measure and record data. In each row, there are two sets of data, the first is revised data, the second is measured data. The measured values are recorded as X values, and the first set of data is obtained.

(3) Several sets of data were obtained after the concentration of the variable standard gas for several times, and the instrument supported 16 sets of data at most.

(4) Arrange groups of data according to the size of Y value from small to large.

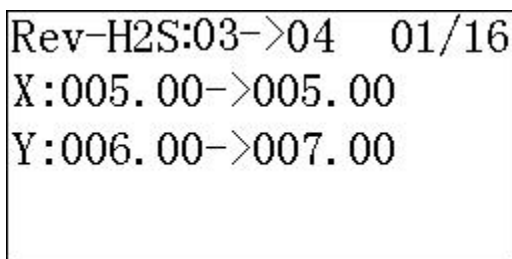
(5) Enter linear value correction, and press "▲" and "▼" to set the value of the number of groups. Press "Ok" to confirm after completion; Abandon calibration and return when the cancel key is pressed.



(Where "Rev-H2S:00003" means that there were 3 sets of data originally, and "04" means that there are 4 sets of calibration now, is)

Then calibrate the specific content

Use "◀" and "▶" keys to select Settings; Press "▲" and "▼" to set the value. Press "Ok" to confirm after completion; Abandon calibration and return when the cancel key is pressed.



(" rev-h2s: 03->04 "means the change from 3 groups to 4 groups," 01/16 "means the change of the first group of 16 groups of data," X: 005.00 -- >0005.00 "means the change of X value from 005.00 to 005.00," X: 005.00 -- >0005.00 "means the change of X value from 005.00 to 005.00,)

When the last set of data has been calibrated, it will prompt you whether to save it or not. Press "Ok" to confirm and save the data and show that it has been saved successfully. Abandon calibration and return when the cancel key is pressed.