SP-1003Plus, series combustible gas alarm controller

Operation and maintenance manual

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Must read before use

Anyone who will use, repair or maintain this product is responsible for reading this manual carefully before using, repairing or maintaining this product

Only by following the manufacturer's instruction manual during use, repair and maintenance can the intended design function be achieved. Users should understand how to set the correct parameters and interpret the results obtained.

warn !

In order to reduce the risk of electric shock, the power supply must be completely disconnected before disassembling or repairing this product. Do not operate the equipment when the machine is in the state of disassembly. This equipment can only be used and repaired in known safe areas.

1. Scope of the specification

The instruction manual describes how to install and configure the controller in detail. It does not contain information about the related transmitters and detection sensors. For information about the transmitters and detection sensors, please refer to the corresponding instruction manual.

warn

This controller shall not be used in areas where there may be explosive hazards or flammable gases. The product's operating environment should be consistent with the product's environmental parameters. For safety reasons, this product must be used and maintained by qualified personnel. Before using and maintaining the product, you must read and understand the product's user manual.

If you encounter any problems during your use, please call the toll-free number 800-810-1336 or 400-815-3366 for consultation.

2. Overview

SP-1003Plus series combustible gas detection and alarm controller (hereinafter referred to as control

The device features a wall-mounted design, offering easy installation and convenient operation. It is suitable for measuring and controlling various standard 4~20mA signals. The controller also includes on-site audio and visual alarms, alarm record storage and retrieval, programmable alarms, and fault switch outputs, allowing flexible control of external alarms, exhaust systems, and other devices. It is ideal for use in industries such as metallurgy, petroleum and petrochemicals, and chemicals for continuous monitoring and alarm control of hazardous gases.

Basic function description:

(1) Alarm: When one of the following situations occurs, the controller will send out sound and light signals. The alarm (total) or fault (total) LED indicator on the controller is on:

A) When the measured gas concentration exceeds the set low alarm value, the buzzer will emit a slightly slow intermittent sound, and the low alarm LED indicator of this channel will be lit, and the status bar of this channel on the LCD display will show "low alarm".

b) When the measured gas concentration exceeds the set high alarm value, the buzzer will emit a rapid intermittent sound, and the high alarm LED indicator of the channel will be lit, and the status bar of the channel on the LCD display screen will show "high alarm".

c) When the detector circuit malfunctions, the detector fails to output a signal or the transmission line is open (i.e., the detector's output current is below 2.5mA), the buzzer will emit continuous beeping sounds. At the same time, the fault LED indicator for this channel will light up, and the

LCD display will show "L" in the channel value column and "Fault" in the status column.

When the detector circuit malfunctions, the detector signal output exceeds the measurement range or a short circuit occurs in the transmission line (i.e., the detector output current exceeds 22mA), the buzzer will emit continuous beeping sounds. At the same time, the fault LED indicator for this channel will light up, and the LCD screen will display 'H' for the value of this channel and 'Fault' for the status bar.

E) When the main power supply (AC 220V) is cut off, the buzzer will emit continuous sound, and the main power status indicator light of the controller will change from green to yellow.

Note: If the local voltage is unstable, it is recommended to add a voltage regulator power supply in front of the controller.

When the connection between the backup power supply and the controller is broken, the buzzer will emit a continuous beeping sound, and the controller's backup power status indicator light will change from green to yellow. If the main power supply is interrupted and the backup power cannot ensure the controller's normal operation, the controller will cut off the power to the detectors. All detectors will display a fault, and the controller will issue a fault alarm signal that persists for over 1 hour.

(2) Self-test: When the controller is turned on, it will automatically check the function of the indicator light, display and buzzer on its panel; and check the preset parameters.

(3) Alarm record: When the gas concentration of a certain channel exceeds the set alarm value, it will automatically record the important information such as the alarm channel number, alarm concentration value and alarm time.

(4) Parameter check and setting: The parameters of the controller can be checked and modified at any time, such as the current date/time, relay delay time, full scale value, secondary (high alarm) alarm value and primary (low alarm) alarm value.

(5) Automatic switching of main and standby power supply: when the main power supply is cut off, it can automatically switch to the standby power supply (can ensure the continuous normal operation of the controller for more than 2h); when the main power supply is restored, it can automatically switch to the main power supply; the working state of the main and standby power supply is controlled

There are indicator lights on the device panel. When the main power supply is working, it charges the backup power supply at the same time. After being fully charged, it automatically switches to trickle charging. The backup battery is usually in float charging state.

(6) Switching Output: The controller features output contacts for controlling external devices (available as normally open or normally closed). This series of controllers includes three common output relays, which are set to the 'OR' logic for all channel signals by default. The remaining relays are programmable and can be configured in the menu. Specifically, the 16-channel model has 8 relays, the 8-channel model has 4 relays, the 4-channel model has 2 relays, and the 2-channel model has 1 relay.

(7) Other functions: display the first report channel number, the total number of alarms, the latest shielding, alarm retention (light and sound alarms) and other functions.

(8) 4-20mA output function (optional).

(9) RS-485 communication function, support Modbus protocol.

(10) The alarm status can be transmitted to the graphic display device.

2.1. Scope of application

SP-1003Plus series controllers are suitable for continuous monitoring of flammable, explosive, toxic and other substances

The concentration of harmful and other gases can be displayed and alarmed, and other external devices connected through the alarm relay can be controlled.

2.2. Main features

Programmable relay output

RS-485 output, support MODBUS

Large character LCD dot matrix liquid crystal display screen, large capacity information

Supports multiple gas Settings and measurement units (including rays)

Chinese operation menu

Synchronous 4-20mA output module (optional)

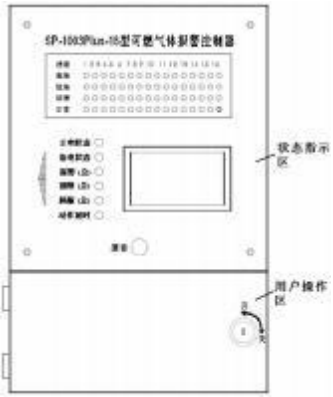
Support alarm record storage and query function

Independent I/O junction box for easy installation

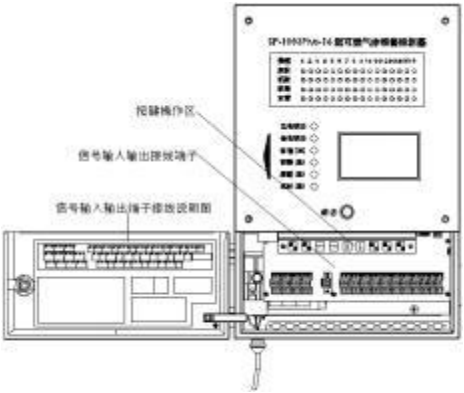
3. Product structure and installation

3.1. Product structure

The SP-1003Plus series controller consists of functional components, and the installation positions of each functional component are shown in the following figure (this figure takes 1003Plus-16/-8 as an example).



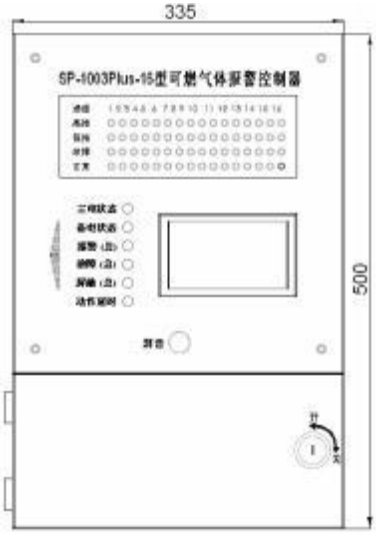
Product appearance and structure diagram



Internal structure diagram of the product

3.2. Product size and installation diagram

3.2.1. The shape and size of the controller are as follows (this figure takes 1003Plus-16/-8 as an example):



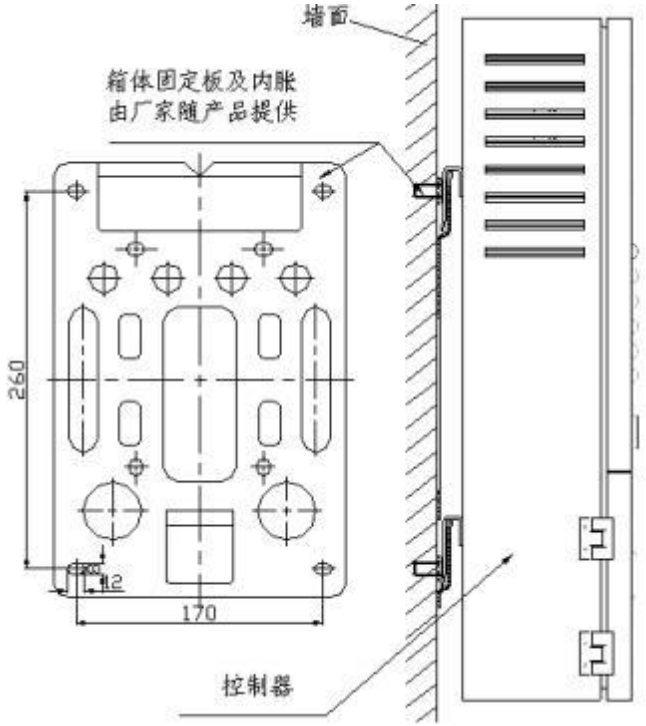
Front view, side view



Front view, side view

3.2.2. Installation of controller:

Use four M8 internal expansion bolts to fix the box fixing plate on the site required safety field, and then hang the controller on the corresponding position of the box fixing plate.
(See figure below)



Note: The unit of size is millimeter

4. Performance indicators

essential parameter	working power supply	220VAC +10%, -15% ; 50Hz ±5Hz
	maximum operating current	1A @ 24VDC
	back up power	24VDC, 7.2Ah
	Output power supply	24VDC, 500mA
	operate mode	routing inspection
	power	Type 16:80W (full load) Type 8: 60W (full load)
	incoming signal	4~20mA (2-wire/3-wire detector)
	output signal	4~20mA per two channels (optional)
Output/alarm	Call logs	Time, concentration, first report channel indication, etc
	Alarm Settings	Exceeding limit alarm (alarm when higher than set value, two levels can be set); Interval alarm (applicable to oxygen)
	Alarm function	Independent LED lights and different frequencies of sound alarms are used to distinguish different alarm levels
	Alarm output	There are three public relays, which are the output of public level 1, public level 2 and public fault alarm relay Type 16:8 programmable relays Type 8: 4 programmable relays
	Contact capacity	220VAC,5A
	Alarm sound pressure level	Settable (65 dB, 95 dB, 115 dB)
	communication interface	RS-485 MODBUS; RS-485 MODBUS (RS-232)
enviromental parameter	ambient temperature	-20℃~+55℃
	ambient humidity	0~99% RH (no condensation)
	ambient pressure	86kPa ~106kPa
show	display mode	240x128 dot matrix LCD with backlight
	resolution ratio	Depending on the range

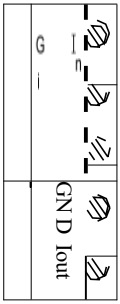
	certainty of measurement	< ± 1%
appearance	outline dimension	Type 16/8: 500mm x 335mm x 125mm (HWD)
	The color of the shell	ash
	weight	15kg

5. Electrical connection

The SP-1003Plus series is powered by an external AC220V power supply and can be connected to both two-wire and three-wire detectors. The system wiring diagram is shown below.

5.1. Terminal diagram

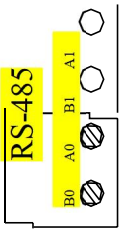
Schematic diagram of analog signal I/O terminals:



Use Iin and V+ when connected to a two-wire detector

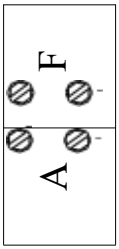
Use Iout and GND (synchronous output 4-20mA analog signal, optional) when connected to the superior control

Schematic diagram of digital signal I/O terminal:



Use A1 and B1 (RS485 Modbus protocol) when connected to the superior control system

Use A0 and B0 (reserved) when connected to a lower detector



Use A, F (reserved) when connected to flame detector

Schematic diagram of relay terminal:

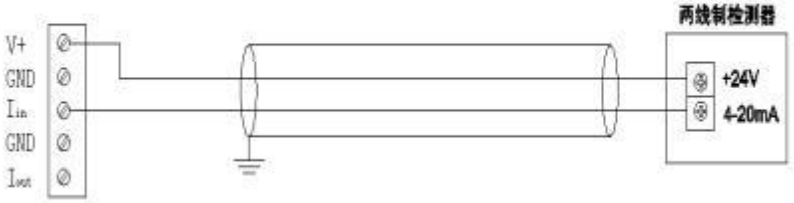


NC: normally closed end of relay

COM: Common terminal of relay

NO: Relay is normally on

5.2. Connect to the two-wire detector

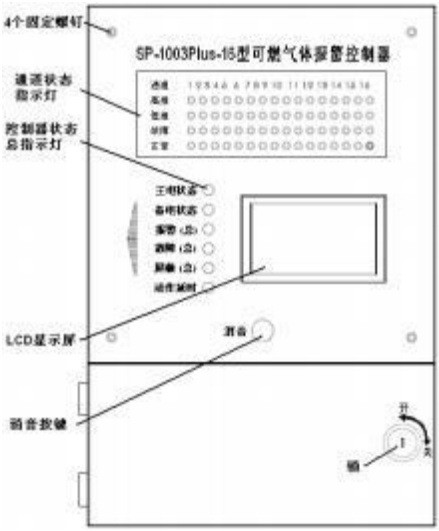


5.3. Connect to the three-wire detector



6. User interface

The user interface of the SP-1003Plus series controllers primarily consists of the display and operation interface, which includes an LCD screen, channel status indicator lights, a controller status indicator light, an alarm buzzer, operation buttons, and a lock. The controller features 9 operation buttons and 1 mute button. See the figure below (this figure uses as an example).



user interface

6.1 Status indicator light

Channel status indicator light information:

LED	information
normal	When a channel is working normally, the corresponding normal green light is on.
hitch	When a channel fails, the yellow light for failure is on.
report to the police	When a channel reaches the high report value, the high report red light is on; When a channel reaches the low report value, the low report red light is on.

Controller status general indicator light information:

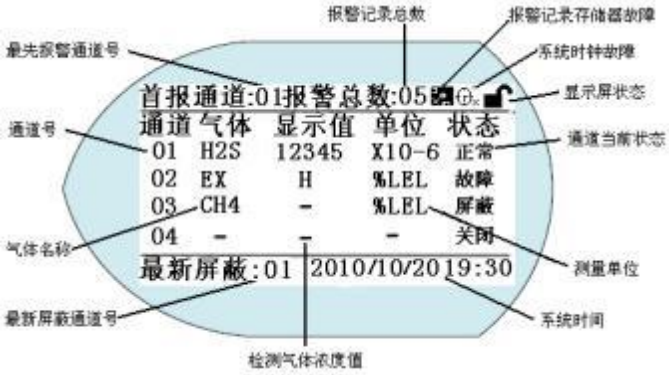
LED	information
Main power status	When the main power is normal, the green light is on; when there is a fault, the yellow light is on
Standby power state	When the backup power is normal, the green light is on; when the fault occurs, the yellow light is on
Alerts (total)	When the system has any alarm signal, the red light is on

Failures (total)	When there is any fault signal in the system, the yellow light is on
Shields (total)	When any channel is blocked, the yellow light is on
Motion delay	When a delay setting is set for any output relay, the red light is on

6.2. Display interface

The controller's LCD display provides visual information including channel readings, status and other information, as well as time, configuration menu and other functions. Real-time measurements are displayed during normal operation

The value is shown in the following figure:



First report channel: "01" -The first alarm channel is the first channel.

Total number of alarms: that is, "total number of alarm locations". "05" - The controller has or has had 5 channels that have been alarmed. For example: -16 type, the maximum value is 16; -8 type, the maximum value is 08; -4 type, the maximum value is 04; -2 type, the maximum value is 02.

: When the system alarm record memory fails, this mark appears and flashes.

: When the system clock fails, the marker appears and flashes.

: Unlock, indicating that the display screen is in the channel inspection display state.

: Lock, indicating that the display is in a locked state.

Latest shielding: "01" -Channel 1 is set to "shield".

Gas: "Ex" -flammable gas; "EC" -other toxic gas; "ETO" -volatile organic gas; "χ, γ" -ray; built-in toxic gas chemical molecular formula.

Display value: "XXXXX" --normal measurement value (X represents a number from 0~9);

"H" -high fault; "L" -low fault; "-" -off or shielded.

unit: "%LEL"; "%v ol"; "x10-6"; "umol/m ol"; "ppm"; "ppb"; uR/h; uSv/h。

Status: "normal", "underreport", "overreport", "fault", "shield", "off".

6.3. Operation keys

The controller adopts 9 key operation mode for parameter configuration and menu guidance operation. See the figure below:



The 9 key functions are as follows:

Mute key: When various alarm signals are generated, press the "mute" key to clear the sound alarm signal, and the light alarm indicator remains.

Locking Key: When in inspection mode, the upper right corner of the display shows a "" symbol. To focus on a specific channel, after inspecting this screen, press the "lock" key. The controller will then display only the values from this screen, and the upper right corner of the screen will show a "" symbol. Pressing the lock key again will return the controller to inspection mode.

"↑" "↓" Key: 1) Change menu item options;

2) The number that changes the cursor position;

3) Parameters to change the cursor position.

"→" "←" Key: Moves the cursor position.

Confirmation key: 1) Confirm that the displayed (or set) parameters are correct;

2) Confirm the input.

Exit key: 1) Go back to the previous level menu;

2) Exit the menu function status and return to the inspection state.

Reset key: Press this key to enter the password "1111" to reset the controller and execute the controller reset program.

6.4. Alarm

Fault alarm

- Level 1 alarm
- Level 2 alarm

Fault alarm: the buzzer rings.

Level 1 alarm: the buzzer is intermittently called at a frequency of 2HZ.

Level 2 alarm: the buzzer is intermittently called at a frequency of 4HZ.

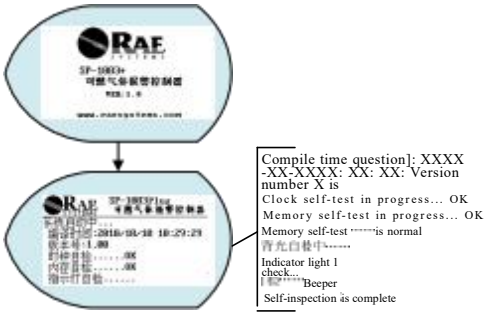
7. Operation instructions

In addition to turning on the power switch, the controller starts up quickly without any manual intervention. Once powered on, the controller performs a self-test.

7.1. Turn on the machine

Connect the controller to an external power supply and turn it on. The screen comes out first

The current logo of Huarui Company is shown below:



After 20 seconds, the system self-test and initialization self-test are completed, and the normal monitoring interface is entered.

7.2. Shutdown

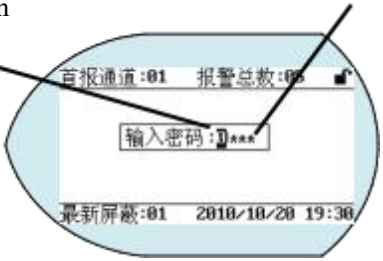
At the same time, cut off the main and standby power switches.

8. User menu operation

When the controller is in normal operation mode, press the 'Confirm' button to enter the user menu by entering a 4-digit password (1111 for basic and 8888 for advanced). Use the 'Up', 'Down', 'Right', and 'Left' keys to adjust the number, then confirm with the 'Confirm' button. If no action is taken within 30 seconds, it will automatically return to the monitoring interface.

3. Adjust the four digits in turn, press the "confirm" key to enter

1. The numbers start from the first digit on the left and are displayed in reverse order (the numbers are surrounded by black boxes)

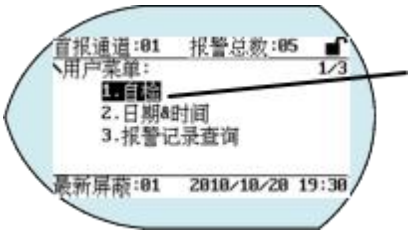


2. Use "up" or "↓" Adjust the anti-display position number, press the "→" key to save and move, move the

cursor to the next position, or

Press the "<-" key to save and move the cursor up one position.

The password is correct and the user menu is entered. When the screen displays the menu, automatically select the controller query or Settings icon (the icon is surrounded by a black box).



Black box surrounds menu selection

Move from one menu to another in the order of "↑" and "↓". Surround each icon in the order of the surrounding box, and display it in reverse. The text below corresponds to the icon:

Enter the basic password "1111" to enter the "user menu":

1. Self-inspection
2. Date & Time
3. Alarm record query

Enter the advanced password "8888" and enter the "Settings menu":

1. Self-inspection
2. Date & Time
3. Alarm record query
4. Channel Settings
5. Relay setting
6. Communication Settings
7. User password Settings
8. Restore factory

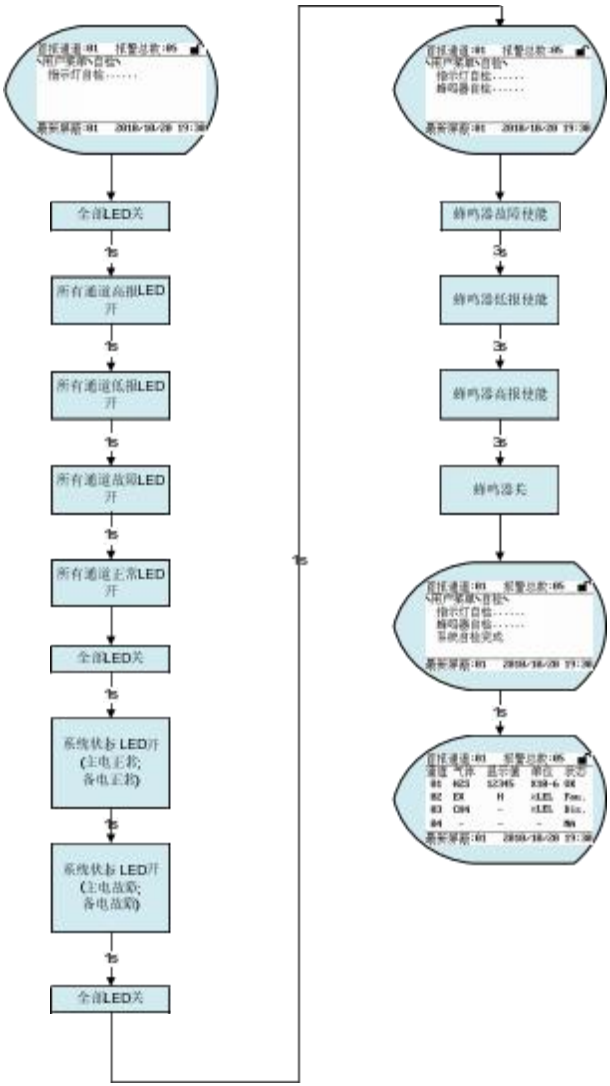
Settings Press the "Exit" key to exit the configuration interface and return to the monitoring interface.

8.1. Self-inspection

When the user enters the controller menu, the default menu is entered.



Start self-test: press the "OK" key.



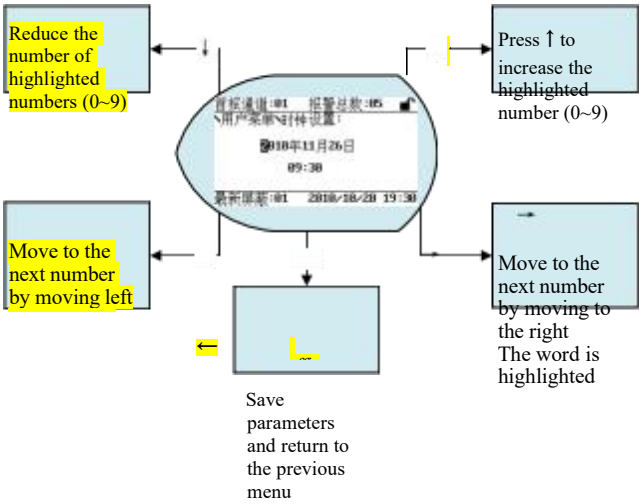
Exit: Press the "Exit" key.

8.2. Date & Time

Enter the user menu and use the "UP" and "DOWN" keys to move the cursor, as shown in the following figure:



This menu allows users to modify the current year, month, day and hour, and press the "OK" key to enter. See the following operation flow chart for details:

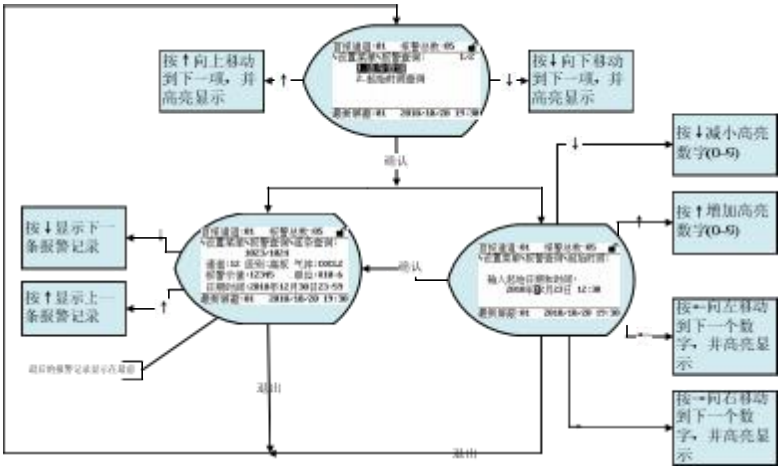


8.3. Alarm record query

Enter the user menu and use the "UP" and "DOWN" keys to move the cursor, as shown in the following figure:


首报通道:01 报警总数:05
设置菜单: 3/8
1.自检
2.日期&时间
3.报警记录查询
4.通道设置
最新屏蔽:01 2010/10/20 19:30

This menu allows users to query the alarm record information of the controller and enter it by pressing the "confirm" key. See the following operation flow chart for details:



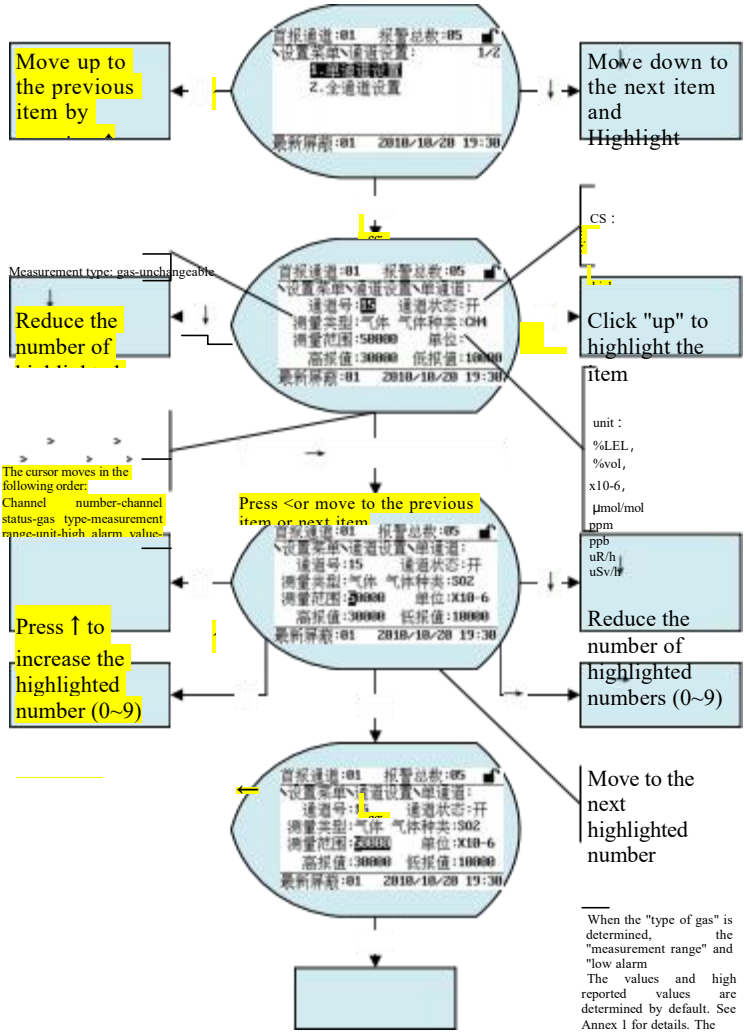
8.4. Channel Settings (see the "Restore Factory Settings" menu item for default Settings)

Enter the user menu and use the "UP" and "DOWN" keys to move the cursor, as shown in the following figure:

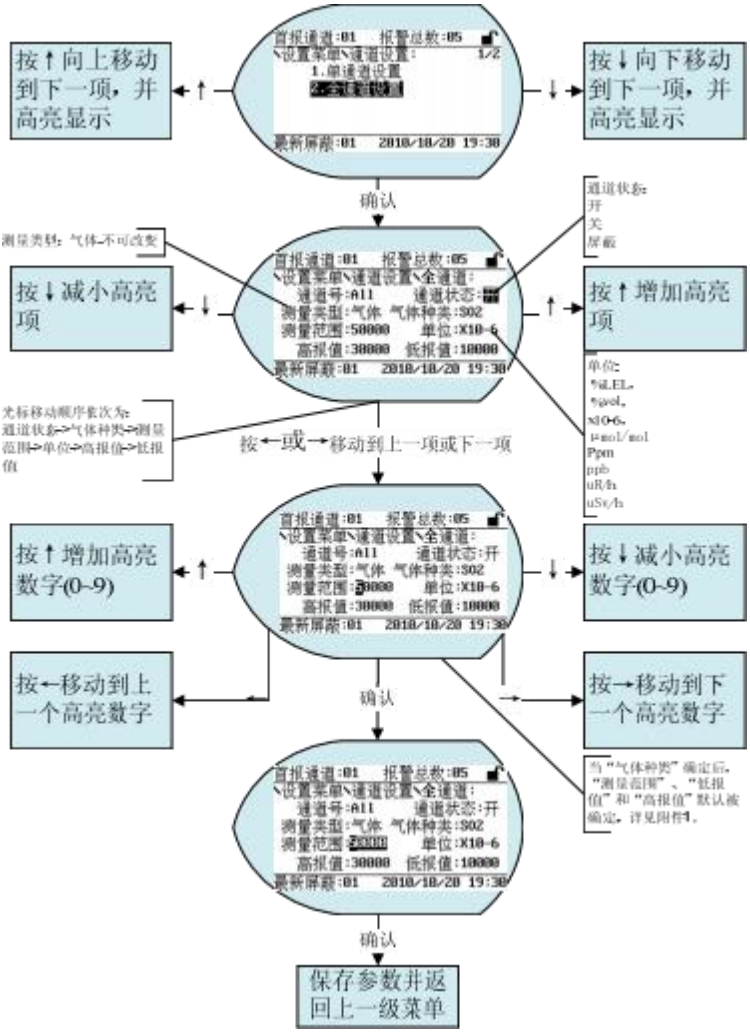


This menu allows users to set channel parameters and press the "OK" key to enter. See the following operation flow chart for details:

Single channel Settings: System parameters for each channel are set separately.



Full channel setting: System parameters of all channels are set uniformly.



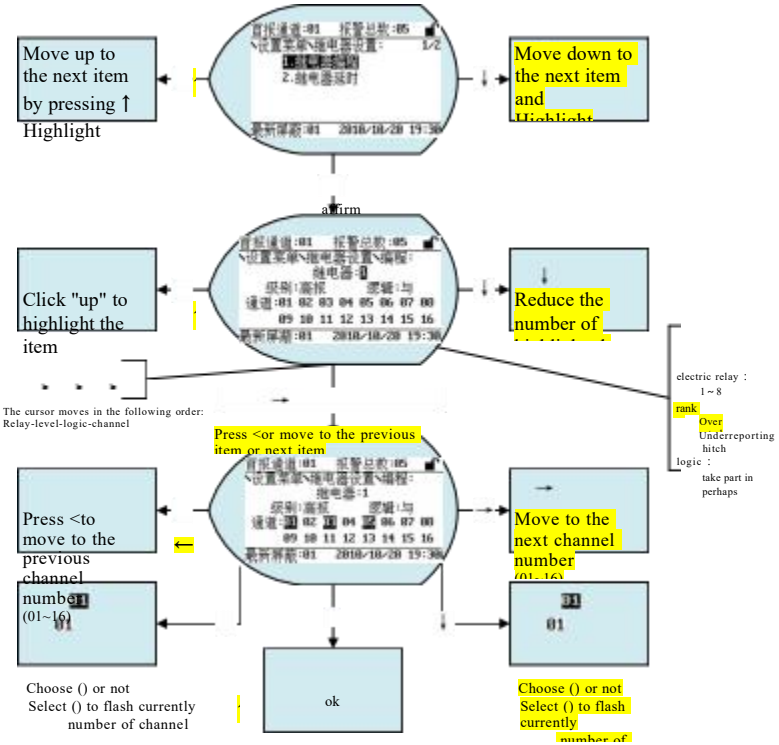
8.5. Relay Settings (see the "Restore factory Settings" menu item for default Settings)

Enter the user menu and use the "↑" and "↓" keys to move the cursor, as shown in the following figure:

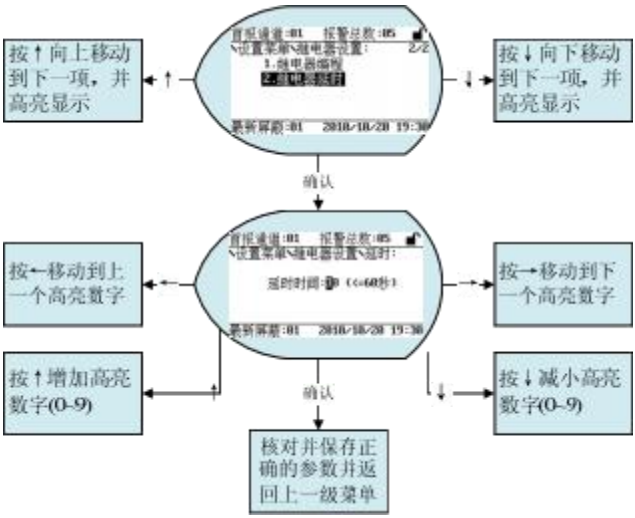


This menu allows users to set the relay parameters and press the "OK" key to enter. See the following operation flow chart for details:

Relay programming: (the following figure takes 1003Plus-16 as an example)



Relay delay:

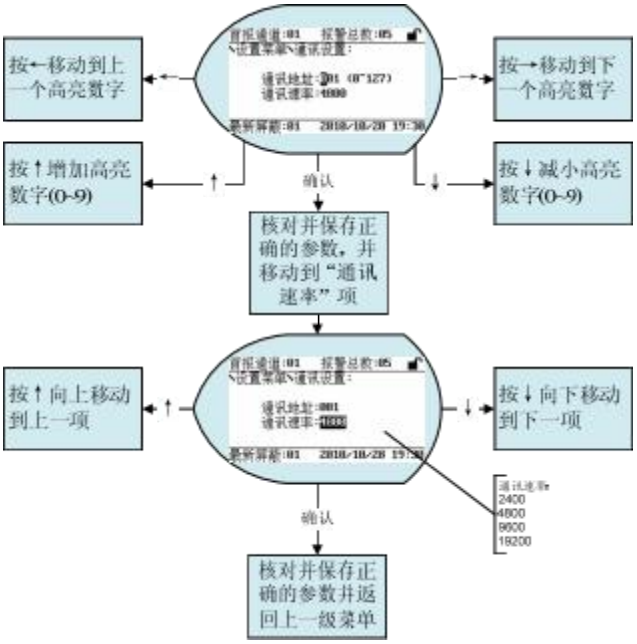


8.6. Communication Settings

Enter the user menu and use the "UP" and "DOWN" keys to move the cursor, as shown in the following figure:



This menu allows users to set the communication parameters with the upper computer. Press the "confirm" key to enter. See the following operation flow chart for details:

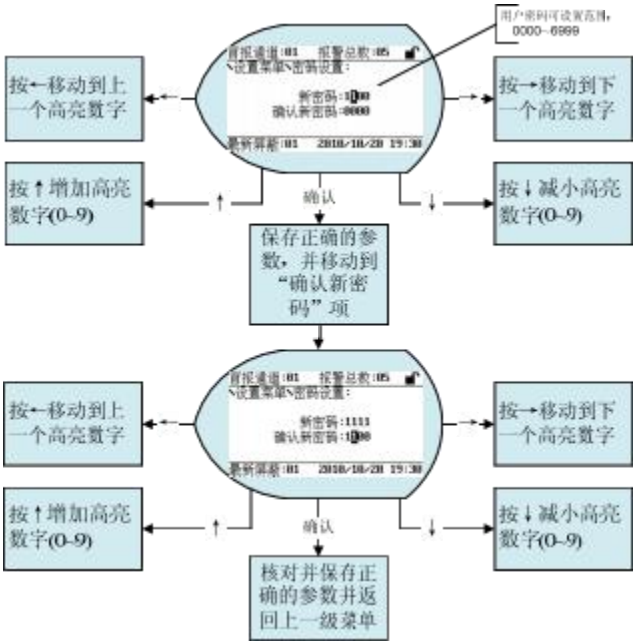


8.7. User password Settings

Enter the user menu and use the "↑" and "↓" keys to move the cursor, as shown in the following figure:



This menu allows users to set the basic password and press the "Confirm" key to enter. See the following operation flow chart for details:

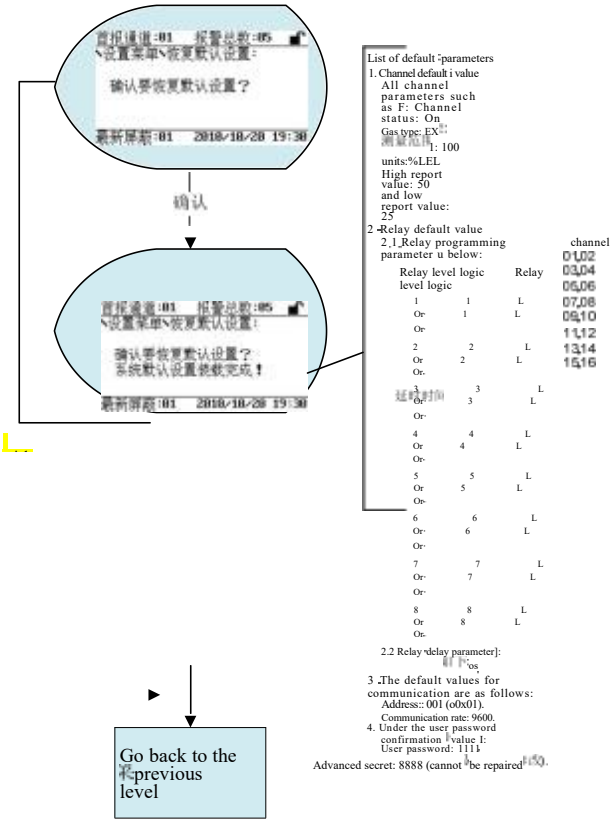


8.8. Restore factory Settings

Enter the user menu and use the "↑" and "↓" keys to move the cursor, as shown in the following figure:



This menu allows users to restore the factory parameter setting value. Press the "OK" key to enter. See the following operation flow chart (this figure takes 1003Plus-16 as an example):



9. Maintenance and complete accessories

9.1. Maintenance

The SP-1003Plus series controllers do not require special maintenance, but should be checked regularly to ensure their normal performance. Detectors should be tested and calibrated regularly according to the cycle specified in the relevant manual.

9.2. Whole machine accessories

Gas detection and alarm controller	1unit
operating instruction	1 book

Insurance fuse 2A/250V	Five
Install attachments	1 set

10. Warranty

The product is guaranteed for one year from the date of sale

If the user uses the correct product and does not open the shell of the product by himself, and the quality problem occurs, we will be responsible for free repair. After the end of the warranty period, we will be responsible for long-term maintenance and charge the cost and other expenses.

11. Technical support

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Appendix A: MODBUS protocol

1. Communications

Communication transmission mode: RTU

Receiver: SP-1003Plus series

From machine address: 1~247 (0x0001~0x00F7)

BPS: 2400,4800,9600,19200

Odd and even parity: None

2. Data

The SP-1003Plus supports only function codes 0x03 and 0x10

0x03: Read-only

register Data format to be sent:

From the machine address	FC	start address (high-order)	start address (low-order)	Number of registers (high-order)	Number of registers (low-order)	CRC a sign or object indicating number (high-order)	CRC a sign or object indicating number (low-order)

Response data format:

From the machine address	FC	Number of bytes	Register data	CRC a sign or object indicating number (high-order)	CRC a sign or object indicating number (low-order)

0x10: writable

register Data format to be sent:

From the machine address	FC	start address (high-order)	start address (low-order)	Number of registers (high-order)	Number of registers (low-order)	Number of words and sentences	Store data	CRC a sign or object indicating number (high-order)	CRC a sign or object indicating number (low-order)

Response data format:

From the machine address	FC	start address (high-order)	start address (low-order)	Number of registers (high)	Number of registers (low)	CRC a sign or object indicating number	CRC a sign or object indicating number

						(high-order)	(low-order)

3. Registers:

(1) 0x03 (read-only register)

The data register address includes the base address and the offset address.
The SP-1003Plus-16 base address range is 0x0000 to 0x00F0;
The SP-1003Plus-8 base address range is 0x0000 to 0x0070;
The base address range for SP-1003Plus-4 is 0x0000 to 0x003; step length: 0x10.

Starting/offset address	length	response data	explanatory note
0x0000	0x0001	byte[0]:0 byte[1]:u8_onOffDis	Channel onOffDis status: 0:CHANNEL_OFF 1: CHANNEL_ON 2: CHANNEL_DIS
0x0001	0x0001	byte[0]:0 byte[1]:u8_Measure Type	Channel Measure Type: 0:GAS(FIXED 0)
0x0002	0x0001	byte[0] = 0 byte[1] = u8_GasTypeID	Channel GasTypeID: 0x00:GT_Ex 0x01:GT_CO 0x02 GT_H2S 0x03 GT_SO2 0x04 GT_O2 0x05 GT_ETO 0x06 GT_CI2 0x07 GT_NH3 0x08 GT_HCN 0x09 GT_PH3 0x0A GT_NO 0x0B GT_NO2 0x0C GT_HCI 0x0D GT_CIO2 0x0E GT_H2 0x0F GT_CO2 0x10 GT_HF 0x11 GT_SiH4 0x12 GT_AsH3 0x13 GT_χ, γ 0x14 GT_EC
0x0003	0x0001	byte[0]=DataFormat B0..B1: Data Length B2..B4: DevideFactor B5..B7: DecimalPoint byte[1]=UnitCode	DataLength: 00 - 1 byte 01 - 2 bytes 10 - 4 bytes 11 - 8 bytes DivideFactor = 10^n: 000 - 1 001 - 10 010 - 100 011 - 1000; 100 - 111: reserved for future use DecimalPoint: 000 - 0 001 - 1 010 - 2 011 - 3 100 - 111: reserved for future use UnitCode: 0x00:LEL 0x01:PPM

			0x02:VOL 0x03:X10_6 0x04:UMOLMOL 0x05:PPB 0x06:uR/h 0x07:uSv/h
0x0004	0x0001	byte[0] = Range higher byte[1] = Range high	Range high word
0x0005	0x0001	byte[0] = Range low byte[1] = Range lower	Range low word
0x0006	0x0001	byte[0] = High Alarm Value higher byte[1] = High Alarm Value high	High Alarm Value high word
0x0007	0x0001	byte[0] = High Alarm Value low byte[1] = High Alarm Value lower	High Alarm Value low word
0x0008	0x0001	byte[0] = Low Alarm Value higher byte[1] = Low Alarm Value high	Low Alarm Value high word
0x0009	0x0001	byte[0] = Low Alarm Value low byte[1] = Low Alarm Value lower	Low Alarm Value low word

Start address of read value storage register: 0x0700
(CH00~CH16:0x0700~0x071F)
SP-1003Plus-16:0x0700 to 0x071E;
SP-1003Plus-8: 0x0700 to 0x070E;
SP-1003Plus-4: 0x0700 to 0x0706;
Step length: 0x02.

Starting/offset address	length	response data	explanatory note
0x0000	0x0001	byte[0] = Reading higher byte[1] = Reading high	Reading high word
0x0001	0x0001	byte[0] = Reading low byte[1] = Reading lower	Reading low word

From the machine address and baud rate (Client ID & Baud Rate) register addresses

start address	length	response data	remarks
0x0800	0x0001	byte[0] = Client_ID high byte[1] = Client_ID low	Client ID From the machine address
0x0801	0x0001	byte[0] = Baud rate high byte[1] = Baud rate low	Baud rate baud rate

(2) 0x10 (writeable register)

The data register address includes the base address and the offset address.
The SP-1003Plus-16 base address range is 0x0000 to 0x00F0;
The SP-1003Plus-8 base address range is 0x0000 to 0x0070;
The SP-1003Plus-4 base address range is 0x0000 to 0x003;

Step length: 0x10.

start address	length	response data	remarks
0x0000	0x0001	byte[0] = 0 byte[1] = u8_OnOffDis	Channel onOffDis status: 0:CHANNEL_OFF 1: CHANNEL_ON 2: CHANNEL_DIS
0x0001	0x0001	byte[0] = 0 byte[1] = u8_Measure Type	Channel Measure Type: 0:GAS(FIXED 0)
0x0002	0x0001	byte[0] = 0 byte[1] = u8_GasTypeID	Channel GasTypeID: 0x00:GT_Ex 0x01:GT_CO 0x02 GT_H2S 0x03 GT_SO2 0x04 GT_O2 0x05 GT_ETO 0x06 GT_CI2 0x07 GT_NH3 0x08 GT_HCN 0x09 GT_PH3 0x0A GT_NO 0x0B GT_NO2 0x0C GT_HCI 0x0D GT_CIO2 0x0E GT_H2 0x0F GT_CO2 0x10 GT_HF 0x11 GT_SiH4 0x12 GT_AsH3 0x13 GT_χ,γ 0x14 GT_EC
0x0003	0x0001	byte[0]=DataFormat B0..B1: Data Length B2..B4: DevideFactor B5..B7: DecimalPoint byte[1]=UnitCode	DataLength: 00 - 1 byte 01 - 2 bytes 10 - 4 bytes 11 - 8 bytes DivideFactor = 10^n: 000 - 1 001 - 10 010 - 100 011 - 1000; 100 - 111: reserved for future use DecimalPoint: 000 - 0 001 - 1 010 - 2 011 - 3 100 - 111: reserved for future use UnitCode: 0x00:LEL 0x01:PPM 0x02:VOL 0x03:X10_6 0x04:UMOLMOL 0x05:PPB 0x06:uR/h 0x07:uSv/h
0x0004	0x0001	byte[0] = Range higher byte[1] = Range high	Range high word
0x0005	0x0001	byte[0] = Range low byte[1] = Range lower	Range low word
0x0006	0x0001	byte[0] = High Alarm Value higher	High Alarm Value high word

		byte[1] = High Alarm Value high	
0x0007	0x0001	byte[0] = High Alarm Value low byte[1] = High Alarm Value lower	High Alarm Value low word
0x0008	0x0001	byte[0] = Low Alarm Value higher byte[1] = Low Alarm Value high	Low Alarm Value high word
0x0009	0x0001	byte[0] = Low Alarm Value low byte[1] = Low Alarm Value lower	Low Alarm Value low word

From the machine address and baud rate (Client ID & Baud Rate) register addresses

start address	length	response data	remarks
0x0800	0x0001	byte[0] = Client_ID high byte[1] = Client_ID low	Client ID From the machine address
0x0801	0x0001	byte[0] = Baud rate high byte[1] = Baud rate low	Baud rate baud rate

Appendix B: Communication protocol with graphic display device

The controller is the master station, using 485 communication, baud rate 9600, and data is transmitted in ASCII code mode.

type	Frame data			
	start symbol	denoter	Event information	tailed
Fire alarm information	@	FIR/FRI	Loop number (3 characters) Address number (3 characters) Year, month, day and hour (2 characters) CRCH CRCL Except #, all are checked.	#
fault message	@	FAU/FAI	Loop number, address number, year and month At 10:00 CRCH and CRCL	
Block information	@	ISI/ISO	Loop number, address number Year month day hour minute CRCH CRCL	
The screen is off	@	ISR	Loop number, address number Year month day hour minute CRCH CRCL	

recovery from failure	@	FAR	Loop number, address number Year month day hour minute CRCH CRCL	

Appendix C: Factory Settings

Sensor type	Zero-Span	Unit	Decimal Point	1st Alarm	2nd Alarm
Name of gas	range	unit	decimal place	Level 1 alarm value	Level 2 alarm value
Ex	0 – 100	%LEL	2	25	50
CO	0 – 1000	ppm	1	35	200
H2S	0 – 200	ppm	1	10	20
SO_2	0 - 100	ppm	2	5	10
O_2	0 – 30	%VOL	2	18.5	23.5
ETO	0 – 200	ppm	1	10	20
Cl_2	0 – 30	ppm	2	1	3
NH_3	0 – 200	ppm	1	25	50
HCN	0 – 30	ppm	2	5	10
PH_3	0 – 20	ppm	2	2	4
NO	0 – 1000	ppm	1	25	50
NO_2	0 – 50	ppm	2	3	5
HCl	0 – 30	ppm	2	10	20
ClO_2	0 – 1	ppm	3	0.2	0.5
H2	0 – 1000	ppm	1	200	400
CO_2	0 – 50000	ppm	0	500	2000
HF	0 – 10	ppm	3	3	6
SiH_4	0 – 50	ppm	2	0.5	1.5
AsH_3	0 – 1	ppm	3	0.05	0.15
χ,γ	0 – 20000	μR/h	0	20	2000
EC	0 – 100	ppm	2	10	20



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