

SPECIFICATION FOR APPROVALProduct Name : Portable Oxygen Generator DetectorSpecification : RP-A01

Customer : _____

CUST P/N: _____

Supplies : Winpower Technology Co.,Ltd.

Date : _____

CUSTOMER APPROVAL	CHK	APPD

DHW	CHK	APPD

■The product specifications are for reference only and shall be signed for confirmation in case of batch supply

User Manual

1. Product Overview

RP-A01 portable oxygen generator detector is developed by Winpower Technology Co., Ltd. on the basis of the company's ultrasonic oxygen sensor. It uses the ultrasonic principle to detect the oxygen concentration in the gas, uses the high-precision flow meter to detect the single discharge volume and continuous flow rate of the portable oxygen generator, and uses the high-precision pressure sensor to detect the pressure of the oxygen outlet. This applies to portable oxygen generators and conventional oxygen generators.

2. Service Environment

2.1 This product is only used to detect the output gas of PSA oxygen generator.

2.2 When in use, please empty the humidification bottle of the oxygen generator, or directly remove the humidification bottle, so as to avoid water entering the detector and damaging the instrument.

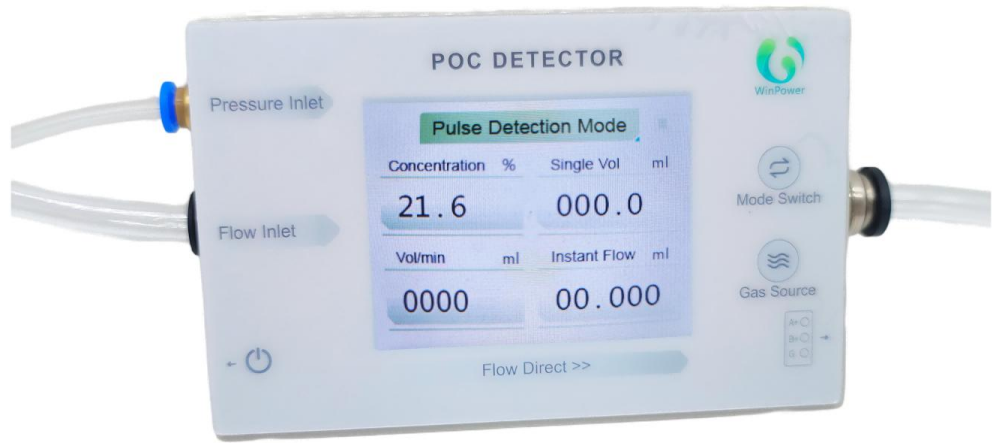
2.3 Dust filtration required.

2.4 Please stay away from the fire.



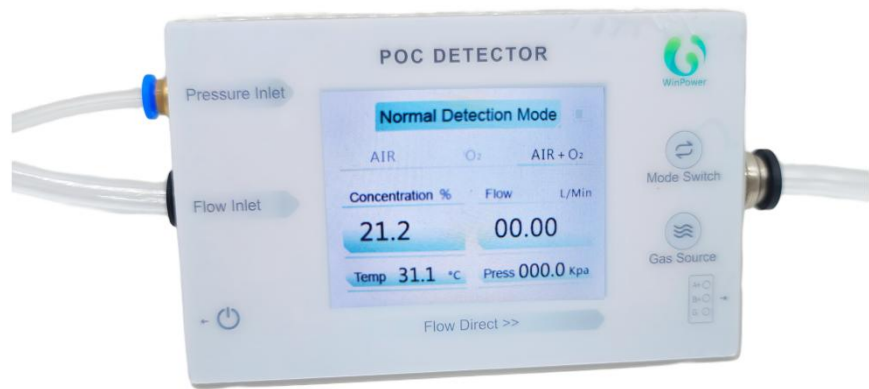
3. Key Marking

3.1 Pulse detection mode



Mode Switch	Click to switch the detection mode	Flow Direct	Air flow from left to right
Concentration	Oxygen purity	Single Vol	Single vent volume
Vol/min	Vent volume per minute	Instant Flow	Maximum instantaneous flow

3.2 Normal detection mode



3.3 Other details



RS-485 communication interface

5V 500mA power supply
/USB Serial port communication port



Flow/concentration detected at air outlet

Pressure detected air outlet

Power switch



Flow/concentration detection import and export

The pipe specification used for the pressure detection intake port: PU pipe, 4 * 2.4

The pipe specification used for the concentration/flow detection intake port: PU pipe, 8*5

4. Communication and Protocol

1. To use the type-c port, you need to turn on the RP-A01 first before the corresponding COM port can be accessed.

2. After powering on, the device will be in an upgrade state for 5 seconds. On the left upper corner interface, "IAP" will be displayed after startup. At this time, the protocol, instructions, and data transmission will not be effective. Once the "IAP" disappears, the device will enter a normal state, and the protocol, instructions, and data transmission can be used normally.

4.1 Communication Port

1.485 Communication Port	Need a USB to 485 converter device
2. Type-C port	Need a USB to Type-C data cable

4.2 Communication Configuration

Data transmission rate	115200 bps
Data bits	8
Verification	None
Start/Stop Position	1



4.3 Data Content

4.3.1 Pulse Reporting Data Content

16 09 01	00	41 A8 00 00	41 D3 33 33	42 C6 66 66	
Frame header Status	Status byte	Field 1: Concentration	Field 2: Temperature	Field 3: Atmospheric pressure	
00 00 00 00	00 00 00 00	00 00 00 00	00 00 00 00	00 00 00 00	A9
Field 4: Single volume	Field 5: Minute volume	Field 6: Instantaneous flow rate	Reserved	Reserved	And check digit

The data sent in pulse mode is



4.3.2 Data Content for Routine Mode Submission

16 09 01	20	41 A8 00 00	41 DC 00 00	42 C6 66 66	
Frame header Status	Status byte	Field 1: Concentration	Field 2: Temperature	Field 3: Atmospheric pressure	
00 00 00 00	00 00 00 00	00 00 00 00	00 00 00 00	00 00 00 00	E6
Field 4: Single volume	Field 5: Minute volume	Field 6: Instantaneous flow rate	Reserved	Reserved	And check digit

The data submitted under the regular mode is



4.4 Data Parsing

4.4.1 Data Description

The data consists of the frame header + status byte + data field + checksum byte.

The frame header is a fixed content: 0x16, 0x09x, 0x01.

The status byte is composed of one byte. For detailed information about the status, refer to 4.5 Status Byte.

The data field: It is a big-endian floating-point number. One field has 4 bytes and represents a data. The content of the data field can be viewed in 4.3 Data Content.

Concentration: 41 A8 00 00 is a big-endian floating-point number, corresponding to a decimal value of 21.0.

Checksum Byte: The sum of all 16-bit data sent is such that the lower 8 bits are 0.

4.4.2 Data Field Parsing:

```
buffer[0] = 0x41; //MMSB 02
buffer[1] = 0xA8 ; //MLSB 02
buffer[2] = 0x00; //LMSB 02
buffer[3] = 0x00; //LLSB 02
// cast 4 bytes to one unsigned 32 bit integer
tempU32 = ((unsigned int)((((unsigned int)buffer[0]) << 24) |
(((unsigned int)buffer[1]) << 16) |
(((unsigned int)buffer[2]) << 8) |
((unsigned int)buffer[3])));
// cast unsigned 32 bit integer to 32 bit float
o2Concentration = *(float*)&tempU32; // o2Concentration =21.0f
```

The other data follow the same pattern.



4.5 Status Byte

The fourth byte of the submitted data, byte[3], is used as the status + identifier byte.

The definitions of each bit are as follows in the table.

byte[3]		Status Word and number (8bit)			
	bits: <7>: Standard conditions vs. Operating conditions distinction		bits<6:5>: Pulse and normal mode distinction	bits<4>: Reserved	bits<3:0>: Number 0 - 15
	0: represents standard conditions		0: represents a pulse	No function	0 - 15
	1: Representative operating condition		1: Normal, air		
			2: Normal, Oxygen		
			3: Normal, Oxygen-free		



4.6 Instruction Set

Using the corresponding instructions allows you to enter the corresponding mode

Operati on time	Funci on	Instruction code, in hexadecimal system				Instruction response							
After 5 seconds of startup, the normal data reportin g mode is activate d.	Pulse	0X5 A	0X A5	0X 00	0X0 1	Statu s Word and numb er	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	And the verificat ion byte
	Normal air	0X5 A	0X A5	0X 01	0X0 0	Statu s Word and numb er	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	And the verificat ion byte
	Normal oxygen	0X5 A	0X A5	0X 02	0XF F	Statu s Word and numb er	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	And the verificat ion byte
	Normal air-oxy gen mixture	0X5 A	0X A5	0X 03	0XF F	Statu s Word and numb er	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	And the verificat ion byte
	Check the current status	11	05	00	0A	Statu s Word and numb er	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	00 (reserv ed)	And the verificat ion byte



5. Instructions

5.1. Press the switch button, and the LCD will refresh the LOGO of WinPower and display the version number in the upper left corner.

5.2. The display will show the LOGO for approximately 3 seconds, then automatically switch to the interface for pulse mode. At this time, normal detection can be performed.

5.3. When in IAP upgrade mode, the upper left corner will display the IAP identifier. At this time, the communication protocol and instruction data submission are unavailable. Top right corner

Display the output measurement standards (STD standard condition; ACT operating condition).

5.4. After the IAP ends, the string will report the current version, programme name, and compilation time.

5.5. When detecting concentration, flow rate, and pressure, insert the measured gas into the corresponding connector using a hose.

5.6. Touch the mode switching button to switch to the normal mode. Then touch it again to switch back to the pulse mode.

5.7. In the normal detection mode, touch the gas source selection button to switch to the next gas source type.

5.8. When the battery power is low, the battery power display icon of the detector will keep flashing and make a beeping alarm sound. If not charged in time within 15 seconds, the instrument will automatically shut down and enter a sleep protection state, and will continuously make an alarm sound for 5 minutes to remind the user to charge in time.

5.9. After the instrument is powered off, please plug in the charging cable to charge the equipment promptly, and turn off or reopen the power switch.

5.10. In the normal interface, pure oxygen mode can detect pure oxygen mixed air, with a concentration range of 0-99.9%. Other modes have an oxygen mixed air concentration range of 21%-95.6%.

5.11. Service life is 5 years.

5.12. Factory calibration is provided. Customers do not need to calibrate.



6. Content detected

6.1 Two modes

model	measure	unit
Pulse detection	concentration	%
	Single volume	ml
	Volume per minute	ml
	instantaneous flow rate	l/min
conventional detection	concentration	%
	flow	l/min
	temperature	°C
	pressure	KPa

Note: Measurement of oxygen concentration for different gas types under normal mode:

O2	PSA	AIR
Measure the oxygen concentration in pure oxygen mixed with air. The concentration range is 0 - 99.9%.	Measure the oxygen concentration in the mixed air of the oxygen generator, Concentration range: 21 - 95.6%	Measure the oxygen concentration in the mixed air of the oxygen generator, Concentration range: 21 - 95.6%

6.2 Accuracy range

Flow detection range:	0 - 50.0 slm
Resolution ratio:	1.0 sccm
Precision: (Error is percentage of reading)	0 - 20slm $\pm 2.1\%$
	20 - 30slm $\pm 2.5\%$
	30 - 40slm $\pm 3.1\%$
	40 - 50slm $\pm 3.9\%$
Concentration detection range:	21.0% - 95.6% / 0-99.9% (Pure oxygen up to 99.9%, PSA oxygen generator up to 95.6%)
Resolution ratio:	0.1 %
Precision:	$\pm 1.5\%$
Pressure detection range:	0 - 180KPa
Precision:	$\pm 0.3\text{KPa}$



6.3 Other parameters and functions

Gas type:	O ₂ , Air 、 Air+O ₂
Temperature range	(+5 ~ +50) °C
Power supply	5V 500mA
Battery parameters:	Nominal 3.7V 900mAh Lithium battery; Support charging
Charging time:	2.5-3h
Cruising ability:	8-10h
Communication mode:	RS485; USB serial port
Flow tube connector:	PU pipe; outer diameter*inner diameter*length=8*5*100mm
Pressure tube connector:	PU pipe; outer diameter*inner diameter*length=4*2.4*100mm
Size:	119.3mm*79 mm* 40.7mm
Body weight:	267.5g

7. Maintenance

7.1 In the process of use, it should be handled gently to avoid collision with other objects, so as not to affect the detection accuracy of the instrument.

7.2 When idle, the device should be kept with enough power to store, and regularly charge the device to avoid excessive discharge of the internal battery and reduce the service life of the battery.

Batteries are not guaranteed if not used according to regulations.

7.3 If the instrument fails, it shall not be disassembled or repaired without permission, and it shall contact the manufacturer in time.



8. Other matters

Special announcement:

All information in this material has been carefully checked, if there is any printing errors or errors in the content, the company reserves the right to interpret. Products are subject to improvement without prior notice.

9. Warranty Policy

Customer name		Purchasing date	
Invoice number			
Customer address			

10. Product warranty description

10.1 Product warranty period is one year (from invoicing date)

10.2 During the warranty period, the product quality problems will be provided in accordance with the three-guarantee service policy of the state to provide after-sales service for the products sold.

10.3 Any of the following circumstances are not covered by this warranty:

Damage caused by improper use, storage and maintenance of the user. Caused by failure to operate according to the instructions.

Caused by force majeure.

Unable to provide a bill of sale.

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