SPECIFICATION FOR APPROVAL

Product Name : Ultrasonic oxygen sensor

Specification : OCS-3FL-2.1

Customer :

CUST P/N :

Supplies : Winpower Technology Co., Ltd.

Date :

CUSTOMER APPROVAL	CHK	APPD

DWN	CHK	APPD

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

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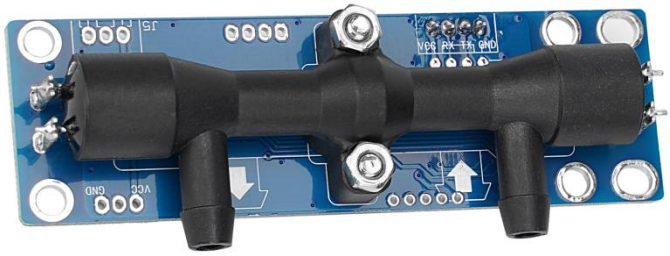
Data manual

OCS-3FL-2.1 Ultrasonic oxygen sensor is a new type of gas sensor developed by Winpower Technology Co., LTD. It uses the ultrasonic principle to detect the oxygen concentration and flow rate in the output gas of the oxygen generator, and sends the detection result by UART digital output.

Features



◆High accuracy

◆Strong anti-interference ability

◆Good long-term stability

◆Without calibration

◆Life espectancy is more than 5 years

◆EMC passed

Application

◆PSA oxygen generator/concentrator

◆HFNC

Prescutions for use

◆Ensure that the detected gas is the gas produced by the oxygen produced mechanism of PSA,water-free,oil-free and dust-free.

◆Usage environment: Plain areas.

◆The sensor shall not be disassembled without the permission of the manufacturer will not guarantee or repair the sensor damage caused by non-measurement

◆This sensor and data manual may be changed due to product technical improvement without prior notice.Please forgive me.

◆The company has the final right to interpret the sensor data manual

◆If there areother special customization requirements,please consult ： 86-0755-82415317 phc@winpower.com.cn

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Specification

Range of Concentration	21% - 96% by default, other concentrations can be customized as (95.6%)
Concentration Resolution	0.1%
Accuracy	±1.5%FS @（5 - 55）℃
Range of Flow	0-20L/min (Default working condition, standard condition needs note order)
Flow resolution	0.1L/min
Accuracy	± 0.2L/min or 5% reading（which is bigger）@ (5-55℃)
Oxygen requirements	Water removal(no condensation);Dust fi ltration(<1um),Humidity is lower than 10%RH
Working temperature and accuracy	5-55℃ Error ± 1.0 ℃
Pressure compensation	300mbar~1200mbar(Absolute pressure, the output atmospheric pressure can be customized)
Detection cycle	500ms
Warm-up time	Sensor works as soon as power on 10s to within specified accuracy.
Digital output	9600bps UART 3.3V（ TTLLevel）
LED output	reserved (Need to be customised)
Direction	Follow the arrow to indicate the direction
Temperature	-5~65℃
Working power supply	DC 5V-12V ， 50mA
Measurement	79mm x 24mm x 22mm (L x W x H) The length of the middle screw can be customised
Weight	25g

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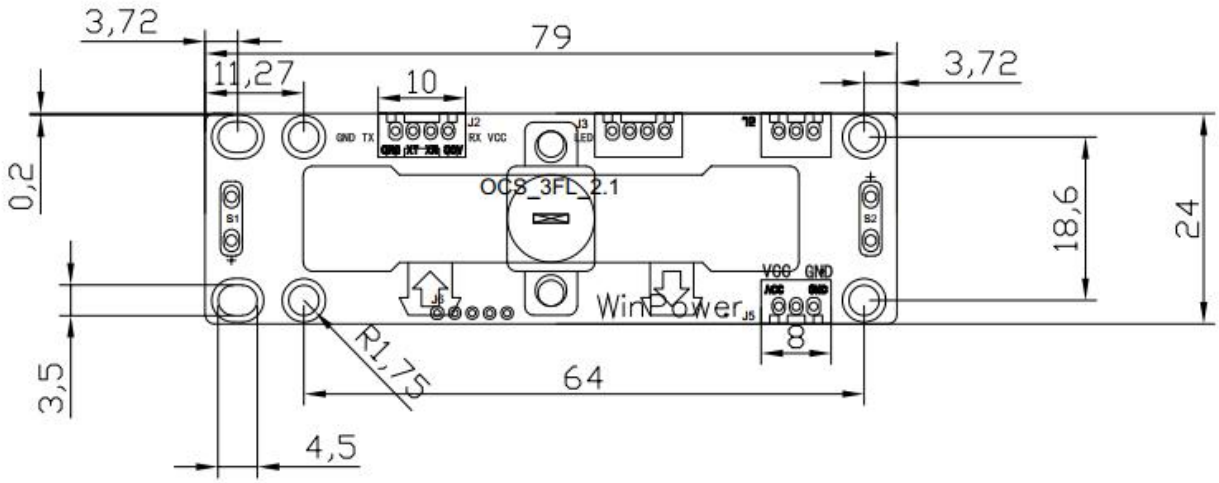
Connectors



The connector positions and pin arrangements of the OCS-3FL2.1 sensor are shown in the above figure. The specific functions of each connector are listed in the following table:

Connection number	Funcition
J2	Power supply and digital signal output connecter(UART)
J3	LED (customized required)
J5	

UART communication parameters

Baud rate: 9600bps

Character length: 1 start bit, 8 data bits, 1 stop bit, no parity check

Communication instructions:

1. The data in this protocol are all in hexadecimal format. For example, "46" is the decimal equivalent of [70].

2. Protocol verification must include 0x16, 0x09, 0x01 and the CS bit. Only the verified data is correct and can be used normally.

3. Automatic reporting mode: The sensor reports data every 500ms.

4. Response mode: The mainboard sends a query command, and the sensor responds immediately.

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5. If the sensor does not receive the query command within 4 seconds, it automatically enters the automatic reporting mode. If the sensor receives the mainboard's query command every 4 seconds, it operates in the response mode.

6. Sensor flow detection is divided into working condition and standard condition. The default is to ship in the working condition, and the standard condition can be customized.

7. Note: The sensor supports switching between flow working condition and standard condition. The instructions are as follows.

Sensor report：

Byte0、Byte1	Byte2	Byte3、Byte4	Byte5、Byte6	Byte7、Byte8	Byte9	Byte10	Byte11
0x16、0x09	0x01/0x02	0x00、0xD2	0x00、0x1E	0x00、0xD2	0x64	0x64	0xCS
Data header	Flow standard	Concentration	Flow	Temperature	Pipeline pressure	Atmospheric pressure	Accumulation and verification

Data Parsing:

Data Header: Must include for data verification.

Flow Standard: The default standard is 0x01. After the user changes the standard, it becomes 0x02. Note: After the default working condition is changed, it becomes standard condition, and the default is that after the standard condition is changed, it becomes working condition. The specific working condition and standard condition depend on the customer's requirements. If there is no requirement, it defaults to the working condition program.

Concentration, Flow, Temperature, Pipeline Pressure, Atmospheric Pressure Calculation Reference Sample Program.

Accumulation and Verification: Unsigned data. Calculation method: 0xCS = 0 - sum[0:10]. Refer to the sample program's method for verification.

Mainboard instructions：

Byte0	Byte1	Byte2	Byte3
0x11	0x01	0x01/0x02	0xED/0xEC
Data header		Flow standard	Accumulation and verification

The flow standard description is as follows. The customer does not specify the default factory condition.

Sample program：

(The motherboard receives the sensor and submits data for data analysis)

```
temp_u8=0;      //It must be 8-bit unsigned data, and the operation of resetting to zero should be performed first. Assume that the serial port 2 on the motherboard is used to receive sensor data.

for(i=0;i<12;i++) temp_u8 += USART2_RXbuffer[i];
```


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```
if((temp_u8==0)&&(USART2_RXbuffer[0]==0x16)&&(USART2_RXbuffer[1]==0x09)&&((USART2_RXbuffer[2]==0x01)||(
USART2_RXbuffer[2]==0x02)))
{//The data packet headers are all correct and the cumulative sum is 0.
    o2_concent    = USART2_RXbuffer[3]*256 + USART2_RXbuffer[4]; //Oxygen concentration（o2_concent/10）%
    o2_flow       = USART2_RXbuffer[5]*256 + USART2_RXbuffer[6];  //Oxygen flow rate（o2_flow/10）L/min
    o2_temp       = USART2_RXbuffer[7]*256 + USART2_RXbuffer[8];  //Oxygen temperature（o2_temp/10）℃
    o2in_press    = USART2_RXbuffer[9];          //Absolute pressure within the pipeline o2in_press      Kpa
    o2out_press   = USART2_RXbuffer[10];         //Atmospheric pressure      o2_press          Kpa
}
```

(The motherboardsends query instructions to the sensor)

```
USART2_TXbuffer[0] = 0x11;          //
USART2_TXbuffer[1] = 0x01;          //
USART2_TXbuffer[2] = 0x01/0x02;     //The flow standard requires that the response from the sensor byte should be consistent.
USART2_TXbuffer[3] = 0xED/0xEC;     //
```

Package

Small box: Packing capacity 30PCS / layer * 5 layers = 150PCS Length, width and height: 42*30*24cm	Logistics box: length, width and height: 50*32*44cm Two small boxes inside: 150*2=300PCS	Net weight:5KG Gross weight: 7.2KG
		

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