Winsen
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Refrigerant Detection Module

(ZRT512E-R454B&R32 Series)

Manual

Version: 1.0

Valid date: 2026.01.14

Zhengzhou Winsen Electronics Technology Co., Ltd

Statement

Thanks for purchasing our product. In order to let customers use it better and reduce the faults caused by misuse, please read the manual carefully and operate it correctly in accordance with the instructions. If users disobey the terms or remove, disassemble, change the components inside of the sensor, we shall not be responsible for the loss.

The specific such as color, appearance, sizes &etc., please in kind prevail.

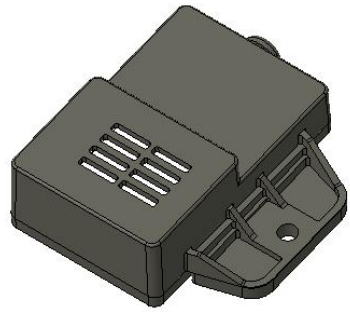
We are devoting ourselves to products development and technical innovation, so we reserve the right to improve the products without notice. Please confirm it is the valid version before using this manual. At the same time, users' comments on optimized using way are welcome.

Please keep the manual properly, in order to get help if you have questions during the usage in the future.

Zhengzhou Winsen Electronics Technology CO., LTD.

ZRT512E-R454B&R32 Series refrigerant detection module

Description



The ZRT512E-R454B&R32 series module is an intelligent infrared based refrigerant detection module (hereinafter referred to as the module), which uses the non dispersive infrared (NDIR) principle to detect refrigerants and has good selectivity without oxygen dependence; This module is a compact and high-performance module that combines mature infrared absorption gas detection sensors with micro machining and sophisticated circuit design.

Easy to use and excellent performance.

Features

- High sensitivity, high resolution, fast response time
- RS485 protocol
- Temperature compensation, excellent linear output, outstanding stability, long service life.
- Anti water vapor interference, no poisoning, can directly replace the catalytic combustion principle module.

Main application

- Heating, Ventilation, and Refrigeration
- Industrial process and safety protection monitoring

Technical indicators

Table1

Model No.	ZRT512E-R454B&R32-4-A-S	ZRT512E-R454B&R32-4-A-L
Target Gas	R454B&R32	
Working Voltage	5±0.5VDC，Ripple < 50mV	
Average current	<150mA(@5V)	
Peak current	<150mA(@5V)	
Cable length	1.5m	3.2m
Interface method	XHS-4Y	XHS-5Y
Protocol	RS485	
Data update	1s	
Preheat time	＞30s	

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Response time①	≤15s
Recover time②	≤300s
Selective testing recovery time③	≥1h
Alarm point	10%LFL(R454B)& 7%LFL(R32)
Working conconditon	-40~95℃，0-95%RH(No condensation)，80-110kPA
Storage condition	-40~70℃，0-95%RH(No condensation)
Dimension	54.0*49.1*17.9mm
Lifespan	＞15 Year
Certification	UL 60335-2-40：2022 & IEC 60335-2-40：2022

① Tested according to UL 60335-2-40: 2022&IEC 60335-2-40: 2022 standards;

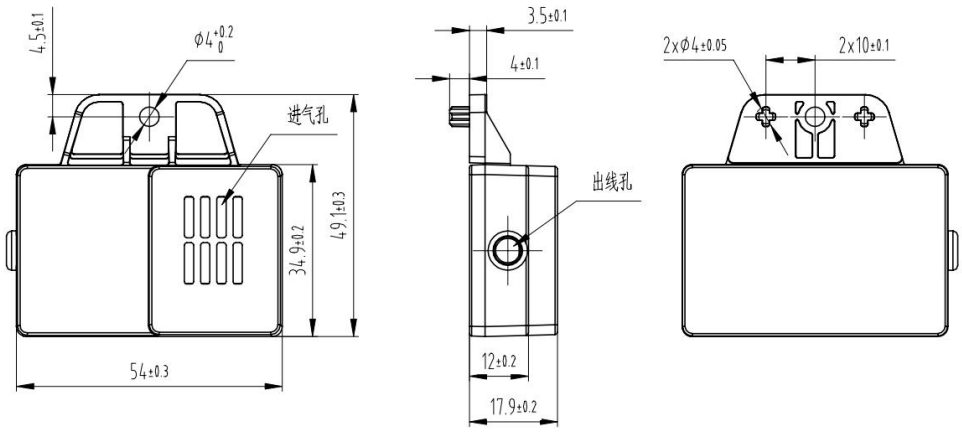
② The time required for the sensor to transfer refrigerant gas with a concentration of 25% LFL to clean air and restore the output value to its initial value (<2.5% LFL) (T10);

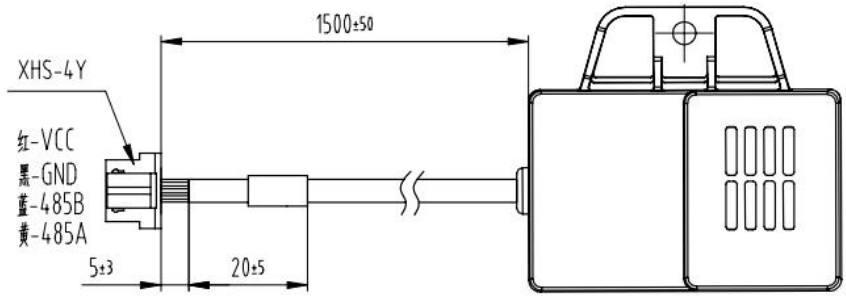
③ The interval between two interfering gases during the selective testing process.

Parameters

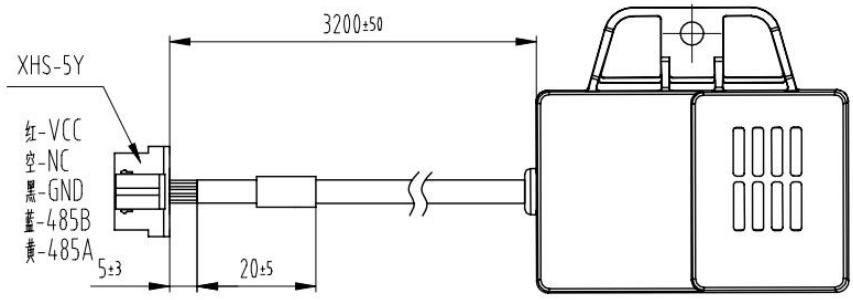
Target Gas	Detection Range	Resolution	Accuracy
Refrigerant R454B&R32	0～100% LFL	0.1% LFL	±2.5%LFL(@0%~25%LFL) ±5%LFL(@25%~ 50%LFL)

Product Dimension





(ZRT512E-R454B&R32-4-A-S)



(ZRT512E-R454B&R32-4-A-L)

Firgue1 Product Dimension Drawing

PIN Definition

Table2 ZRT512E-R454B&R32-4-A-S PIN Definition

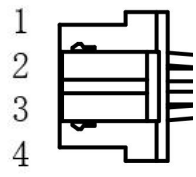
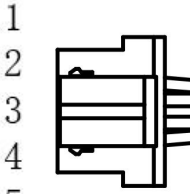
PIN No.	Color	PIN Function	
1	Red	VCC	
2	Black	GND	
3	Blue	RS485-B	
4	Yellow	RS485-A	

Table3 ZRT512E-R454B&R32-4-A-L PIN Definition

PIN No.	Color	PIN Function	
1	Red	VCC	
2	Blank	NC	
3	Black	GND	
4	Blue	RS485-B	
5	Yellow	RS485-A	

Communication Settings

ZRT512E-R454B&R32The series module uses RS485 communication, and the communication parameters are set as follows:

Table4 Communication

Physical layer	RS485
Software protocol type	Modbus RTU
Data byte order	High byte first
CRC byte order	Low byte first
Data frame	Starting position: 1 position Data bits: 8 bits Stop position: 2 positions No verification
Baud rate	2400bps(Default)
Modbus Address	0x01(Default)
Supported Function Codes	0x03(Read multiple hold registers) 0x06(Write a single register)
Supported exception codes	0x01(Illegal function) 0x02(Illegal address) 0x03(Illegal data value) 0x04(Server equipment malfunction)

Precautions

- When using the module, it should be ensured that the voltage is within the set range and the power supply is stable. If the voltage is too high, it may cause damage to the module. If the voltage is too low, the module may not work properly;
- Avoid prolonged exposure of modules to high temperature and humidity environments, strong electromagnetic environments, and excessive dust;
- Vibration and falling may deteriorate the measurement accuracy of the module, and excessive impact or vibration should be avoided;
- Do not install the module in a strong air convection environment for use.

Zhengzhou Winsen Electronics Technology Co., Ltd
Add: No.299, Jinsuo Road, National Hi-Tech Zone, Zhengzhou 450001 China
Tel: +86-371-67169097/67169670
Fax: +86-371-60932988
E-mail: sales@winsensor.com
Website: www.winsen-sensor.com