RS-WZ3/WZ1-N01-1 Temperature vibration transmitter

user 's manual

catalogue

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1. Product introduction

RS-WZ3/WZ1-N01-1 is a high-performance, low-power, anti-interference and composite vibration sensor developed and produced by using high-performance MEMS chips, embedded technology, temperature sensing technology and vibration sensing technology. The products are widely used in the on-line measurement of temperature and vibration of motor, reducer fan, generator, air compressor, centrifuge, water pump and other rotating equipment in coal mine, chemical industry, metallurgy, power generation and other industries.

The shell is made of stainless steel as a whole, and can be installed with threads if conditions permit. The standard threads on the metal shell can be quickly connected with the installation position. The magnetic suction installation method can also be used to eliminate the problem of drilling on site and make the installation more convenient.

2. Product selection

RS-					Company code
	WZ1-				Single shaft temperature vibration transmitter
	WZ3-				Three axis temperature vibration transmitter
		N01-			RS485（Modbus-RTU agreement）
			1-		First generation appearance
				M8	M8 external thread
				M5	M5 external thread
				CX	Magnetic suction installation

3. Functional features

- The product adopts high-performance MEMS chip, with high measurement accuracy and strong anti-interference ability
- The product provides thread installation and magnetic installation。
- It can measure the vibration velocity, vibration displacement and other parameters of single and three shafts。
- It can measure the surface temperature of the motor
- 10-30V DC wide voltage power supply。
- Protection grade IP67。
- Support remote upgrade。

4. Description of technical parameters

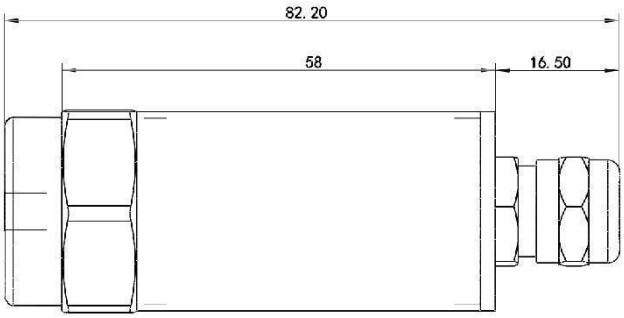
power supply	DC10-30V
power waste	0.1W(DC24V)
Degree of protection	IP67
Frequency range (HZ)	10-1600
Vibration measurement direction	Single or three-axis
Transmitter circuit operating	-40℃~+80℃，0%RH~80%RH

temperature	
Measuring range of vibration speed (mm/s)	0-50
Vibration velocity measurement accuracy (mm/s)	±1.5% FS（@1KHZ，10mm/s）
Vibration speed display resolution (mm/s)	0.1
Measuring range of vibration displacement（ μ m）	0-5000
Vibration displacement display resolution（ μ m）	0.1
Measuring range of surface temperature (℃)	-40~+80
Temperature display resolution (℃)	0.1
signal output	RS-485

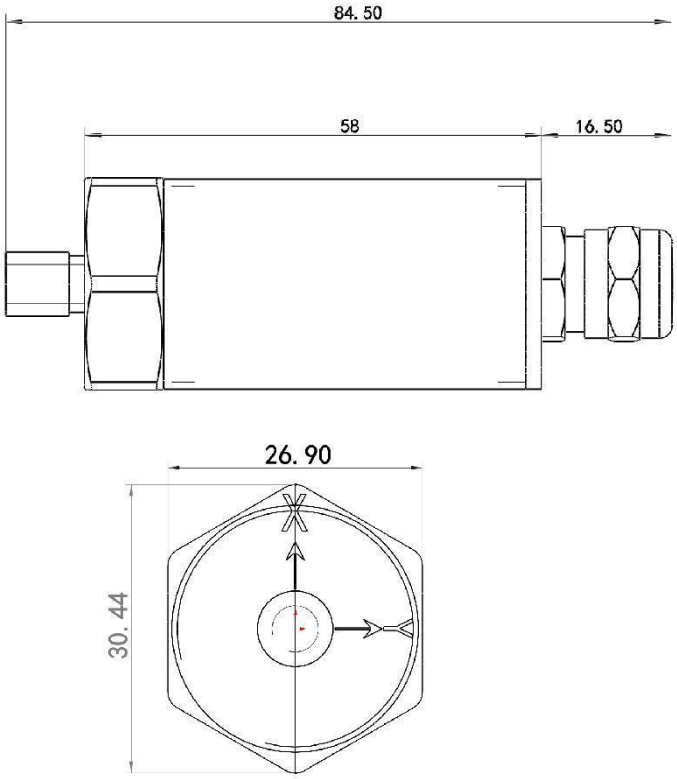
5. Installation Instructions

5.1 External dimensions

Installation dimension of magnetic suction



Thread installation size



Equipment list：

■ 1 main equipment

■ Certificate, warranty card, etc

5.2 Installation and wiring instructions

1) There are certain specification requirements for 485 line field wiring. For details, please refer to the data package 485 Equipment Field Wiring Manual.

2) When the device is connected to the 485 bus, ensure that the addresses of multiple devices do not duplicate.

3) Installation Instructions

The sensor thread is installed with two specifications: m8 * 1.25 * 10 and m5 * 7.7 external thread. In addition, there is a magnetic installation method.

Power supply and 485 signal

Wide voltage power input can be 10~30V. When wiring 485 signal lines, it should be noted that lines A and B should not be connected reversely, and the addresses of multiple devices on the bus should not conflict.

Specific wiring

	Linear color	explain
Power Supply	brown	V+（10~30V DC）
	Yellow (green)	V-
signal communication	Yellow (green)	485-A
	blue	485-B

5.3Installation and use of configuration software

Software selection

Open the data package, select "Debugging software" - "485 parameter configuration software", and find

Open it。**Note: Only one device can be connected when the configuration software is used to change the address and baud rate.**

Parameter setting

① Select the correct COM port (view the COM port in "My Computer - Properties - Device Manager - Port"). The following figure lists the drive names of several different 485 converters.

② . Connect only one device and power it on. Click the test baud rate of the software, and the software will test the baud rate and address of the current device. The default baud rate is 4800bit/s, and the default address is 0x01.

③ Modify the address and baud rate as required, and query the current function status of the device.

④ If the test is not successful, please recheck the equipment wiring and 485 driver installation.

6. 485communication protocol

6.1 Basic communication parameters

code	8-bit binary
Data bits	8bit
Parity bit	-
Stop bit	1bit
Error check	CRC（Redundant cyclic code）
Baud rate	2400~115200 Can be set

6.2 Data frame format definition

Modbus RTU communication protocol is adopted, and the format is as follows:

Time of initial structure ≥ 4 bytes

Address code=1 byte

Function code=1 byte

Data area=N bytes

Error check=16 bit CRC code

Time to end structure ≥ 4 bytes

Address code: the address of the transmitter, which is unique in the communication network (factory default 0x01).

Data area: The data area is specific communication data. Note that the high byte of 16bits data comes first!

CRC code: two byte check code.

Host interrogation frame structure：

Address code	Function code	Register start address	Register length	Check code low bit	Check code high
1byte	1byte	2byte	2byte	1byte	1byte

Slave response frame structure:

Address code	Function code	Number of valid bytes	Data Zone 1	Second data area	Nth data area	Check code
1byte	1byte	1byte	2byte	2byte	2byte	2byte

6.3 Register address description

RS-WZ1-N01 Register Description

Register address	PLC or configuration address	content	Support function code	explain
0000 H	40001	temperature	0x03/0x04	Real time value of temperature (increased by 10 times)
0001 H	40002	speed	0x03/0x04	Real time value of speed (increased by 10 times)
0002H	40003	displacement	0x03/0x04	Real time value of speed (increased by 10 times)
0050H	40081	Temperature calibration value	0x03/0x04/0x06	Integer (10 times larger)
0068H	40105	Speed calibration value A	0x03/0x04/0x10	Z-axis speed coefficient A (floating point type)
0069H	40106			
006AH	40107	Speed calibration value B	0x03/0x04/0x10	Z-axis speed coefficient B (floating point type)
006BH	40108			
0074H	40117	Displacement calibration value A	0x03/0x04/0x10	Z-axis displacement coefficient A (floating point type)
0075H	40118			
0076H	40119	Displacement	0x03/0x04/0x10	Z-axis displacement coefficient B

0077H	40120	calibration value B		(floating point type)
07D0 H	42001	Device address	0x03/0x04/0x06	1~254 (factory default 1)
07D1 H	42002	Baud rate	0x03/0x04/0x06	0 stands for 2400 1 stands for 4800 2 for 9600 3 for 19200 4 stands for 38400 5 stands for 57600 6 represents 115200 7 for 1200

RS-WZ3-N01 Register Description

Register address	PLC or configuration address	content	Support function code	explain
0000 H	40001	temperature	0x03/0x04	Real time value of temperature (increased by 10 times)
0001 H	40002	X-axis speed	0x03/0x04	Real time value of X-axis speed (increased by 10 times)
0002H	40003	Y-axis speed	0x03/0x04	Real time value of Y-axis speed (increased by 10 times)
0003H	40004	Z-axis speed	0x03/0x04	Real time value of Z-axis speed (increased by 10 times)
0004H	40005	X-axis displacement	0x03/0x04	Real time value of X-axis displacement (increased by 10 times)
0005H	40006	Y-axis displacement	0x03/0x04	Real time value of Y-axis displacement (increased by 10 times)
0006H	40007	Z-axis displacement	0x03/0x04	Real time value of Z-axis displacement (increased by 10 times)
0050H	40081	Temperature	0x03/0x04/0x06	Integer (10 times larger)

		calibration value		
0060H	40097	X axis speed calibration value A	0x03/0x04/0x10	X-axis speed coefficient A (floating point type)
0061H	40098			
0062H	40099	X axis speed calibration value B	0x03/0x04/0x10	X-axis speed coefficient B (floating point type)
0063H	40100			
0064H	40101	Y-axis speed calibration value A	0x03/0x04/0x10	Y-axis speed coefficient A (floating point type)
0065H	40102			
0066H	40103	Y-axis speed calibration value B	0x03/0x04/0x10	Y-axis speed coefficient B (floating point type)
0067H	40104			
0068H	40105	Z-axis speed calibration value A	0x03/0x04/0x10	Z-axis speed coefficient A (floating point type)
0069H	40106			
006AH	40107	Z-axis speed calibration value B	0x03/0x04/0x10	Z-axis speed coefficient B (floating point type)
006BH	40108			
006CH	40109	X axis displacement calibration value A	0x03/0x04/0x10	X axis displacement coefficient A (floating point type)
006DH	40110			
006EH	40111	X axis displacement calibration value B	0x03/0x04/0x10	X axis displacement coefficient B (floating point type)
006FH	40112			
0070H	40113	Y axis displacement calibration value A	0x03/0x04/0x10	Y-axis displacement coefficient A (floating point type)
0071H	40114			
0072H	40115	Y axis displacement	0x03/0x04/0x10	Y-axis displacement coefficient B (floating point type)
0073H	40116			

		calibration value B		
0074H 0075H	40117 40118	Z-axis displacement calibration value A	0x03/0x04/0x10	Z-axis displacement coefficient A (floating point type)
0076H 0077H	40119 40120	Z-axis displacement calibration value B	0x03/0x04/0x10	Z-axis displacement coefficient B (floating point type)
07D0 H	42001	Device address	0x03/0x04/0x06	1~254 (factory default 1)
07D1 H	42002	Baud rate	0x03/0x04/0x06	0 representative 2400 1 representative 4800 2 representative 9600 3 representative 19200 4 representative 38400 5 representative 57600 6 representative 115200 7 representative 1200

6.4 Example and explanation of communication protocol

Example 1: Read the temperature value of device 1

Interrogation frame：

Address code	Function code	Start Address	Data length	Check code low bit	Check code high
0x01	0x03	0x00 0x00	0x00 0x01	0x84	0x0A

Response frame: (for example, device 1 is the temperature, and the real-time value is 8.6 ℃)

Address code	Function code	Return the number of valid bytes	Device 1 real-time data	Check code low bit	Check code high
0x01	0x03	0x02	0x00 0x50	0xB8	0x78

Temperature calculation:

Temperature: 0050H (hexadecimal)=80 (decimal)=>Temperature=8.0 ℃ (the upload value of our transmitter is ten times of the actual value)

6.5 Common problems and solutions

Device cannot be connected to PLC or computer
Possible causes:
1) The computer has multiple COM ports, and the selected port is incorrect
2) The device address is incorrect, or there are devices with duplicate addresses (factory default is all 1)
3) Baud rate, check mode, data bit, stop bit error
4) 485 bus is disconnected, or A and B lines are connected reversely
5) If the number of equipment is too large or the wiring is too long, power shall be supplied nearby, 485 intensifiers shall be added, and 120 Ω terminal resistance shall be added at the same time.
6) USB to 485 drive not installed or damaged
7) Equipment damage.

7. contact information

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8. Document History

V1.0 Document Creation

Appendix 1

ISO2372 equipment vibration standard is applicable to all kinds of motors, fans, pumps, machine tools, etc.

This product can detect the three-axis vibration speed within the range of 0-50mm/s and 0-5000 μ M range of triaxial vibration displacement, applicable to vibration test and fault reduction.

Vibration range	ISO2372 Equipment Vibration Standard			
	Equipment category			
unit（mm/s）	Class I	Class II	Class III	Class IV
0.71	A	A	A	A
1.12	B	A	A	A
1.8	B	B	A	A
2.8	C	B	B	A
4.5	C	C	B	B
7.1	D	C	C	B
11.2	D	D	C	C
18	D	D	D	C
28	D	D	D	D

Class I	Small equipment below 15KW	A:	good
Class II	15-75KW medium equipment	B:	Acceptable
Class III	Large equipment installed on hard foundation	C:	be careful
Class IV	High speed equipment with rotating speed higher than natural frequency	D:	not allow