

## Product information

### Cwdz21 split type temperature transmitter



Cwdz21 split temperature transmitter is carefully designed and of excellent quality. It is suitable for measuring equipment surface temperature, liquid temperature and gas temperature. It can be selected with or without display.

Range: - 50 ~ 100 °C

Output: 4 ~ 20mA, RS485, PT100, 0 ~ 10VDC, 0 ~ 5VDC, 1 ~ 5VDC

Power supply: 9 ~ 36VDC, 12 ~ 36VDC

Accuracy: 0.5% FS

In addition, we can provide customized products to meet the application needs of customers in a short time according to their applications.


#### Typical application


▲Applicable to general industry.


## Instructions


The temperature transmitter cwdz21 is applicable to the measurement of equipment surface temperature, liquid temperature and gas temperature. The operator is responsible for checking whether the equipment is suitable for the working conditions of the application. If you have any questions, please contact our sales department to ensure the correct application of the transmitter. The company does not assume any responsibility for the impact caused by improper model selection.


## Icon description

 **Danger!** - A dangerous situation that could result in death or serious injury.

 **Warning!** - A potentially hazardous situation that could result in death or serious injury.

 **! Be careful!** - A potentially hazardous situation that may result in minor injury.

 **Reminder!** - A potentially hazardous situation that may cause personal injury.

 **Tips!** - Tips and information to ensure trouble free operation of the equipment.

User

 **Warning!** This information is applicable to technicians.

## Product features

- a) Wide voltage supply, nonlinear correction and high precision
- b) Small size, light weight and convenient installation
- c) Lightning protection, frequency cut-off interference design and strong anti-interference ability
- d) Reverse protection, current limiting protection

## Product overview

Cwdz21 series temperature transmitters use PT100 (grade 1 / 3b) as the signal measuring element. After computer automatic test, the zero point and sensitivity temperature compensation in a wide temperature range are carried out by laser resistance adjustment process. The amplifying circuit converts the sensor signal into standard output signal, which gives full play to the technical advantages of the sensor and makes the temperature transmitter have excellent performance. It has anti-interference, overload, small temperature drift, high stability and high measurement accuracy. It is an ideal temperature measurement instrument in the field of industrial automation.

## Working principle

The temperature transmitter is a PT100 sensor that produces resistance effect under the influence of temperature. It is converted by a special processing unit to generate a differential voltage signal. This signal is converted into a standard analog or digital signal through a special amplifier.

## Technical parameter

Measuring medium: solid, liquid or gas (compatible with contact material)  
 Measuring range:  $-50 \sim 100 \text{ }^{\circ}\text{C}$   
 Output signal: 4 ~ 20mA, RS485, PT100, 0 ~ 10VDC, 0 ~ 5VDC, 1 ~ 5VDC  
 Measuring element: 1 \* PT100 (Level 1 / 3b)  
 Response time: 18S (in accordance with IEC60751, 0.4m/s wind speed, 10  $^{\circ}\text{C}$  step)  
 Stability:  $\pm 0.1\%$  FS / year  
 On time: 400ms  
 Protection grade: shell IP65, probe IP68 note: the protection grade refers to the degree reached after the electrical connection is complete  
 Overall weight: with display  $\approx 150\text{g}$ , without display  $\approx 130\text{g}$

## Output power supply

output \ power supply	9~36VDC	12~36VDC
4~20mA	√	×
RS485	√	×
0~10VDC	×	√
0~5VDC	√	×
1~5VDC	√	×

## Maximum power

output \ power	$\leq 0.02U_s(\text{W})$	$\leq 0.015U_s(\text{W})$
4~20mA	√	
RS485		√
0~10VDC		√
0~5VDC		√
1~5VDC		√

Note:  $U_s$  = supply voltage.

## Load characteristics

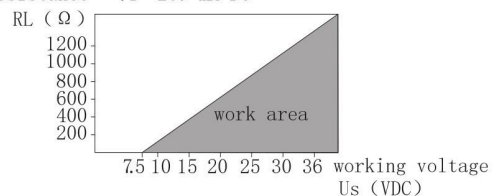
Voltage type:

$\geq 10\text{k}\Omega$

Current type:

$\text{load} \leq \{ (U_s - 7.5) \div 0.02 \} \Omega$  ( $U_s$  = Supply voltage)

Load resistance (4~20) mA DC



## Environment condition

Ambient temperature:  $-40 \sim 85 \text{ }^{\circ}\text{C}$

Ambient humidity: 0% ~ 95% RH (no condensation and condensation)

## Electromagnetic compatibility (EMC)

Serial number	Test items	Basic standards	Test conditions	Performance level
1	Radiated interference (enclosure)	GB/T 9254/CISPR22	30MHz-1000MHz	qualified
2	Conducted interference (DC power port)	GB/T 9254/CISPR22	0.15MHz-30MHz	qualified
3	Electrostatic discharge (ESD)	GB/T 17626.2/IEC61000-4-2	4kV(触点), 8kV(空气)	B(Note 2)
4	Radio frequency electromagnetic field immunity	GB/T 17626.3/IEC61000-4-3	10V/m( 80MHz-1GHz)	A(Note 1)
5	Power frequency magnetic field immunity	GB/T 17626.8/IEC61000-4-8	30A/m	A(Note 1)
6	Electrical fast transient burst immunity	GB/T 17626.4/IEC61000-4-4	2kV(5/50ns, 100kHz)	B(Note 2)
7	Surge immunity	GB/T 17626.5/IEC61000-4-5	500V(Between lines) 1kV(Between ground wires)(1.2us/50us)	B(Note 2)
8	Immunity to conducted interference induced by RF field	GB/T 17626.6/IEC61000-4-6	3V(150kHz-80MHz)	A(Note 1)

Note 1: when the performance grade is a, the performance is normal within the limits of the technical specifications.  
 Note 2: when the performance level is level B, the function or performance is temporarily reduced or lost, but can be recovered by itself, and the actual operation status, storage and data will not change.

## Electrical protection

Short circuit protection: permanent  
 Reverse pole protection: no damage, but does not work  
 Insulation resistance:  $\geq 100\text{m } \Omega$ , 500VDC  
 Insulation strength: 500VAC

## Output limit

	Output minimum	Maximum output
4-20mA	4mA	20mA
RS485	0	1500
0~10VDC	0.001VDC	10VDC
0~5VDC	0.001VDC	5VDC
1~5VDC	0.001VDC	5VDC

## Overall material

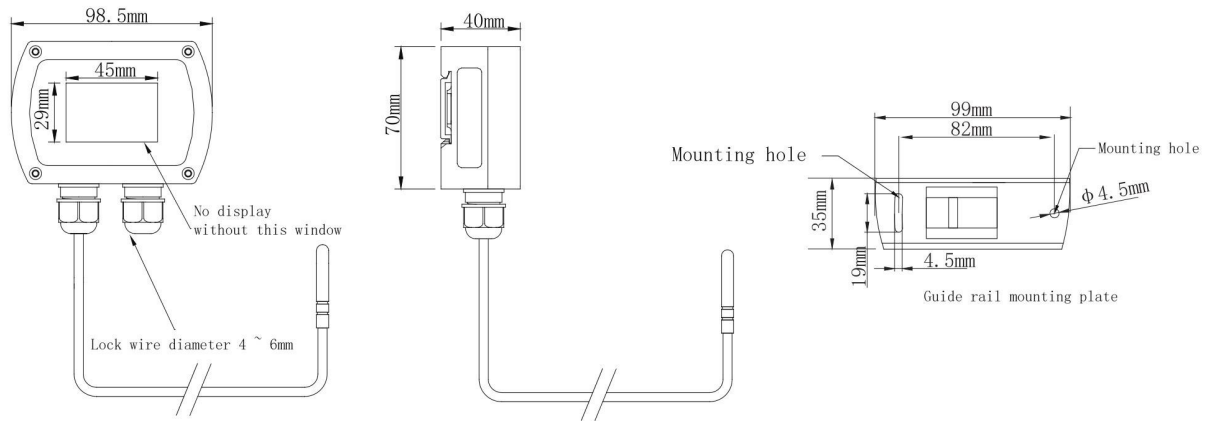
Shell: ABS engineering plastics  
 Cable locking head: nylon (lock wire diameter 4 ~ 6mm)  
 Display: LCD display without backlight  
 Probe material: 304 stainless steel  
 Seal: nitrile rubber  
 Cable: tetrafluoro shielded compensation cable (  $\Phi 4.7\text{mm}$ ) temperature resistance - 50 ~ 200 °C  
 Polyurethane shielded compensation cable ( 4.7mm) temperature resistance - 50 ~ 100 °C

## Mechanical stability

Seismic performance: 10g (20... 2000Hz) in accordance with IEC60068-2-6 standard  
 Impact resistance: 500g / MS, conforming to IEC60068-2-27 standard

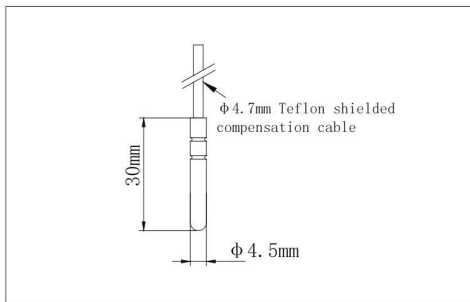
## Outline and dimensions

### Body size

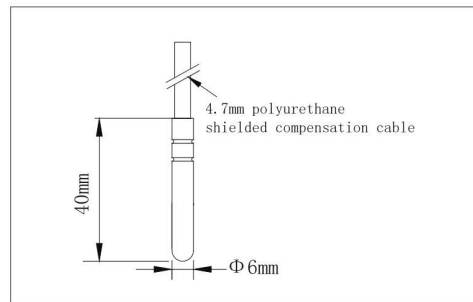


### Probe size

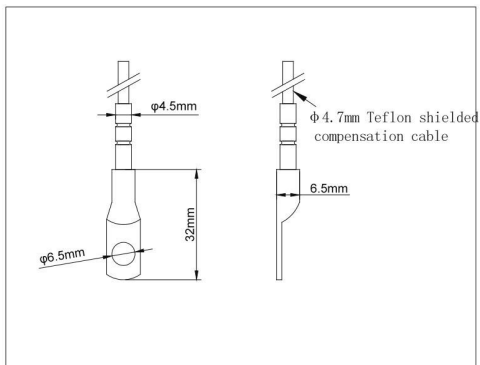
#### Protective tube type (H)



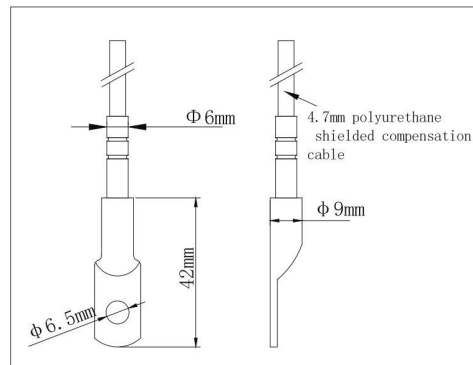
#### Protective tube type (H1)

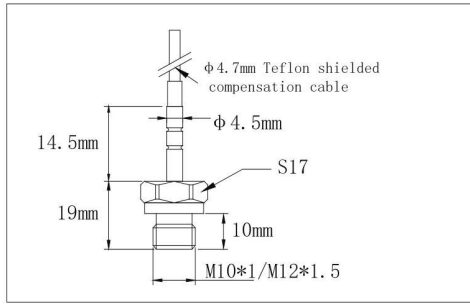
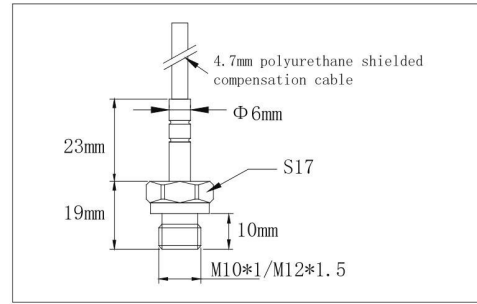
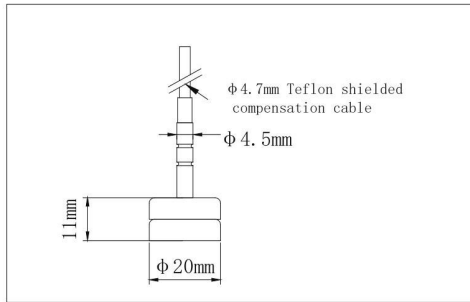


#### Nose pressing (y)

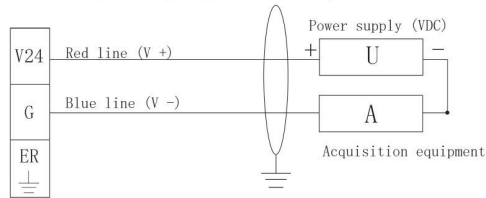
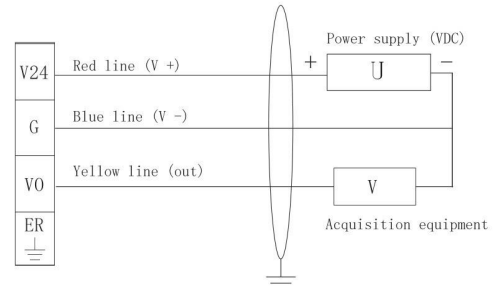
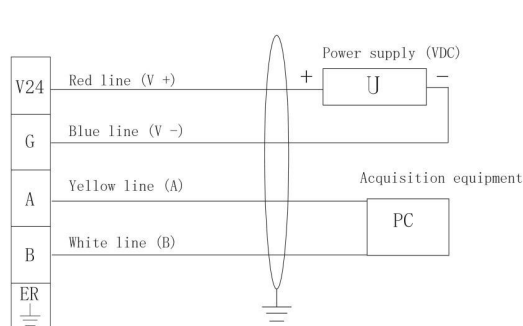
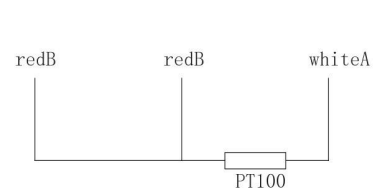



#### Nose pressing (Y1)



**Screw in (x / z)**

**Screw in type (x1 / z1)**

**Magnetic suction (c)**


## Wiring diagram

**Current output wiring diagram (two-wire system)**

**Voltage output wiring diagram (three wire system)**

**RS485 (digital signal) output wiring diagram (four wire system)**

**PT100 resistance signal output wiring diagram (three wire system)**


 Represents shielded wire, and all marked grounding points must be effectively grounded. It is recommended to select shielded twisted pair signal cable for the best effect. In order to avoid grounding loop, the shielding layer adopts single end grounding, insulated floating grounding at the transmitter end and grounding at the control cabinet end.

## Protocol description (limited to RS485 signal output, all product addresses are 01 by default, and the data is hexadecimal)

### Basic technical parameters of transmitter

- This protocol complies with Modbus communication protocol and adopts the centralized RTU mode in Modbus protocol. RS485 half duplex working mode
- a) Output signal: RS485 (distance up to 1000m). 32 channels in total
  - b) Standard: Modbus RTU protocol (03 function reads data, 06 function writes setting data)
  - c) Data format: 9600, N, 8, 1 (9600bps, no verification, 8 data bits, 1 stop bit)
  - d) Measuring range: - 50 ~ 100 °C
  - e) Resolution: 0.1 °C
  - f) Output data: 0... 1500
  - g) Response frequency: ≤ 5Hz
  - h) Response speed: ≥ 10ms

### Modbus RTU read data 03 command description

	Device address	Function code	Data address	Number of read data	16crc code (low front high rear)
Host command	Address	03	00 00	CN	CRC0 CRC1
	Device address	Function code	Data byte	Sensor data	16crc code (low front high rear)
Return from machine	Address	03	02*CN	S_HN , S_LN	CRC0 CRC1

### Communication examples

The address of sensor communication equipment is set to 01, i.e. [address] = 01 (address range 01-254); At this time, crc0 = 84, crc1 = 0A.

Then the sending and returning data are as follows:

Send: 01 03 00 01 84 0A

Return: 01 03 02 AC B9 59

02ac is hexadecimal and converted to decimal 684;

Therefore, the current temperature value is  $t = 684 / 10 - 50 = 18.4$  °C

### Query example

Reading the current device address can only be completed independently by a single offline sensor

Send FF 03 00 0f 00 01 A1 D7 Return FF 03 02 00 01 50 50

Then: the device address is 01 (hexadecimal)

### Detailed description of Modbus RTU write 06 command

	Device address	Function code	Data address	New address	16crc code (low front high rear)
Host command	Address	06	00 0F	H L	CRC0 CRC1
	Device address	Function code	Data address	New address	16crc code (low front high rear)
Return from machine	Address	06	00 0F	H L	CRC0 CRC1

### Modification example

If the 01 address is changed to 09 address:

Send 01 06 00 0f 00 09 79 CF

Return 01 06 00 0f 00 09 79 CF

Then the original address 01 is successfully changed to 09. The modified address can be modified offline or online. After completion, it can work directly without power on again.

**Parameter selection**

CWDZ	Temperature transmitter										
	Code	Transmitter type									
	21	Split type (no electrical connection line by default)									
		Code	Is there a display								
		P	No display								
		X	There is a display								
		Code	Range								
		05	Default range - 50 ~ 100 °C								
		DZ	customized								
			Code	signal output							
			A1	4-20mA two-wire system							
			RS	RS485 communication interface (standard Modbus RTU protocol) four wire system							
			V4	1-5vdc three wire system							
			V5	0-5VDC three wire system							
			V10	0-10VDC three wire system							
			PT	PT100 resistance signal (Level 1 / 3b) three wire system							
			DZ	customized							
			Code	Probe style							
			H	Protective tube type (Teflon cable)							
			HI	Protective tube type (polyurethane cable)							
			C	Magnetic suction							
			Y	Nose pressing type (Teflon cable)							
			YI	Nose pressing type (polyurethane cable)							
			X	Screw in type (thread M10 * 1 Teflon cable)							
			XI	Screw in type (thread M10 * 1 polyurethane cable)							
			Z	Screw in type (thread M12 * 1.5 Teflon cable)							
			ZI	Screw in type (thread M12 * 1.5 polyurethane cable)							
			DZ	customized							
			Code	Connecting line between transmitter and probe							
			L1	1m							
			L2	2m							
			L3	3m							
			L5	5m							
			L10	10m							
			LX	Custom (X: cable length)							
			Code	Supply voltage							
			G	12-36VDC							
			G5	9-36VDC(except 0-10vdc output)							
			No	PT100 signal output without power supply							
			DZ	customized							
			Code	customized							
			D	Other customization requirements							
			No	routine							
CWDZ	21	P	05	A1	HI	L1	G5	Selection example			
For example: cwdz21-p-05-a1-h1-l1-g5 (split temperature transmitter, no display, range - 50 ~ 100 °C, output 4-20mA, protective tube type) Φ 6mm, cable 1m, power supply (9-36vdc)											

## Ordering instructions

⚠ Warning!

When ordering transmitters, users should pay attention to selecting appropriate specifications according to environmental conditions.

Ordering information

Model / output signal / probe style / cable length / power supply voltage / Customization

Please scan the code for more information  
Go to the official website to get