DR4422 Temperature and Humidity Transmitter

--Wall mounted

Wall mounted temperature and humidity transmitter is carefully designed with excellent quality. It is suitable for indoor temperature and humidity monitoring in various occasions. The temperature range is adjustable. It can be selected with or without display, and has high cost performance.

Range: temperature - 40 ~ 0 ~ 125 ℃

Humidity 0-100% RH (relative humidity)

Output: RS485, 4-20mA, 0-10vdc

Power supply: 12 ~ 24VDC, 24VDC

Typical application

▲It is suitable for temperature and humidity measurement of various indoor environments

▲Planting and breeding

▲Hospital ward clean room

▲HVAC, etc

Instructions

Temperature and humidity transmitter is applicable to the measurement of indoor ambient temperature and humidity. 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.

Product features

a) Good long-term stability and full range temperature compensation

b) Wide operating temperature range

c) The temperature range can be selected by multiple parameters

d) Easy to install, wall mounted, rail mounted

e) High dust resistance and protection grade

f) LCD liquid crystal display

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.

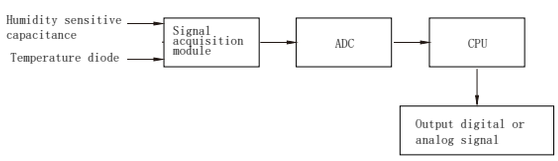
⚠ Tips! - Tips and information to ensure trouble free operation of the equipment.

User

⚠ Warning! This information is applicable to technicians.

Working principle

The sensor adopts high-precision temperature and humidity integrated chip. The temperature is measured by using the diode temperature sensing p-n junction and the characteristics of forward voltage reduction varying with temperature under constant current. Humidity is measured by humidity sensitive capacitance, which changes with the change of humidity and capacitance value. The temperature and humidity are compensated for each other, and then amplified into standard digital or analog signals of relative humidity and temperature through the amplification circuit.



Technical parameter

Measuring medium: gas (compatible with contact material)

Temperature range: - 40 ~ 0 ~ 125 ℃

Humidity range: 0-100% RH (relative humidity)

Overall weight: with display ≈ 160g, without display ≈ 138g

Response frequency: ≤ 2Hz

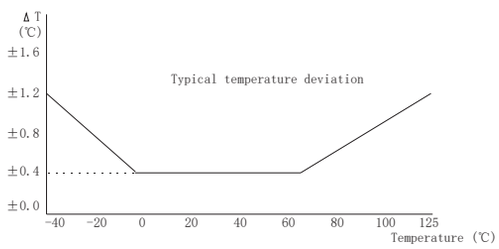
Stability: ± 1% RH FS / year ± 0.2 ℃ / year

Protection grade: IP65

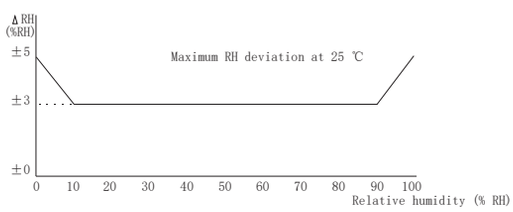
Response speed: the temperature is 10 ℃ per step, the humidity is 10% RH per step, and the gas flow rate is 0.1m/s.

	No filter	With filter
Temperature response time	15s	55s
Humidity response time	15s	35s

Temperature error:



Humidity error:



Output power supply

output \ power supply	12～24VDC	24VDC
4～20mA	√	√
RS485	√	×
0～10VDC	×	√

Maximum power

output \ power	≤0.05Us(W)	≤0.06Us(W)	≤0.015Us(W)	≤0.025Us(W)
4～20mA	No display	There is a display		
RS485			No display	There is a display
0～10VDC			No display	There is a display

Note: US = supply voltage.

Load characteristics

Voltage type: ≥ 100k Ω

Current type: ≤ 200 Ω

Environment condition

Ambient temperature: - 40 ~ 85 ℃

Ambient humidity: 0% ~ 95% RH

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: ≥ 100m Ω, 500VDC

Insulation strength: 500VAC

Output limit

output	Output minimum	Maximum output
4-20mA	4mA	20mA
RS485	0	1650/1000
0～10VDC	0.001VDC	10VDC

整体材质

Main body shell: ABS engineering plastic contact with the measured medium

Filter: Polyethylene (density 50) μ m) Contact with the measured medium

Cable locking head: nylon (lock wire diameter 4 ~ 6mm) contacts the measured medium

Display: LCD with backlight

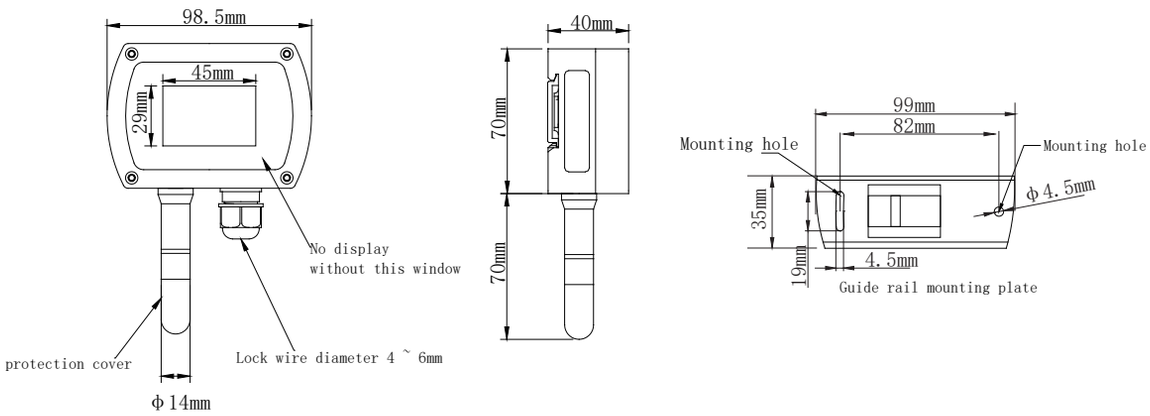
Seal: nitrile rubber in contact with the measured medium

Mechanical stability

Seismic performance: 5g (20... 2000Hz) in accordance with iec60068-2-6 standard

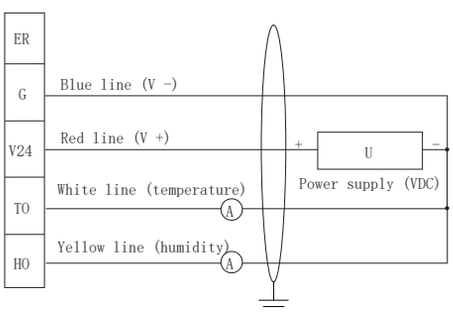
Impact resistance: 500g / lms, conforming to iec60068-2-27 standard

Outline and dimensions

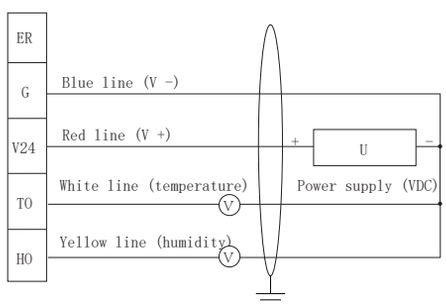


Wiring diagram

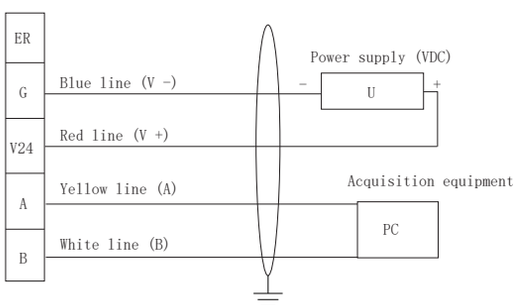
Current output wiring diagram (three wire system)



Voltage output wiring diagram (three wire system)



RS485 (digital signal) output wiring diagram (four 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) Output data: temperature 0-1650 (- 40 ~ 125 ℃) humidity 0-1000 (0 ~ 100% RH)
e) Response frequency: ≤ 2Hz

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

-40~125℃; The communication equipment address of 0-100% RH sensor is set to 01, i.e. [address] = 01; At this time, crc0 = C4, crc1 = 0b. Then, the sending command line is as follows:
Send 01 03 00 02 C4 0b
Return to 01 03 04 02 26 01 77 5B F6
02 26 is the temperature, converted to decimal 550;
01 77 is humidity, converted to decimal 375;
Temperature data output: 0-1650 corresponds to - 40 ~ 125 ℃ (there is no change in the corresponding relationship of range change),
Therefore, the current temperature is t = 165 * 550 / 1650-40 = 15 ℃
Humidity data output: 0-1000 corresponds to 0 ~ 100% RH, so the current humidity is RH = 375 * 100 / 1000 = 37.5% RH

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 to FF 03 02 00 01 50 50
Then: the device address is 01 (hexadecimal)

Detailed description of Modbus RTU write 06 command

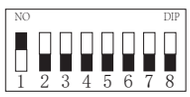
	Device address	Function code	Data address	New address	16crc code (low front high rear)
Host command	Address	06	00 0F	H L	CRC0 CRC1
	Device address	Function code	Data address	New address	16crc code (low front high rear)
Return from machine	Address	06	00 0F	H L	CRC0 CRC1

Modification example

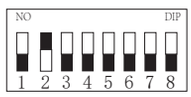
If the 01 address is changed to 09 address:
Send 01 06 00 0f 00 09 79 CF
Return 01 06 00 0f 00 09 79 CF
Then the original address 01 is successfully changed to 09. The modified address can be modified offline or online. After completion, it can work directly without power on again.

Note 1: the digital output temperature range is - 40 ~ 125 ℃, and the corresponding output data is 0-1650.

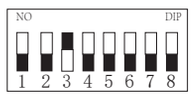
The temperature ranges of current output and voltage output can be changed by dialing the key on the dial switch on the internal circuit board. There are eight ranges to choose from (as shown in the figure below). The factory default temperature range is - 40 ~ 100 ℃.



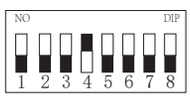
0～50℃



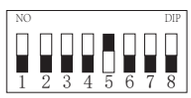
0～100℃



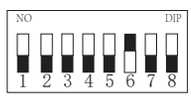
-20～60℃



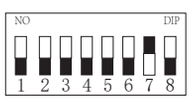
-20～80℃



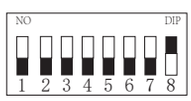
-40～60℃



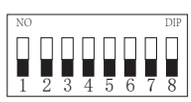
-40～80℃



-40～100℃



-40～125℃



Customization requirements