PR201 Series Intelligent Temperature and Humidity Acquisitor

PANRAN

1. Overview

The PR201 series intelligent temperature and humidity acquisitor is the first of its kind to use an smart junction box to connect various thermocouples, thermal resistors and humidity transmitters. The smart junction box integrates a reference end temperature sensor and memory. After the first combination with the sensor and simple data editing, it can be used as a whole for a long time. When using it, you only need to insert the junction box into the slot of the acquisitor, and the acquisitor can automatically identify and load data such as the sensor number and correction value, which greatly improves the intelligence level of the acquisitor.

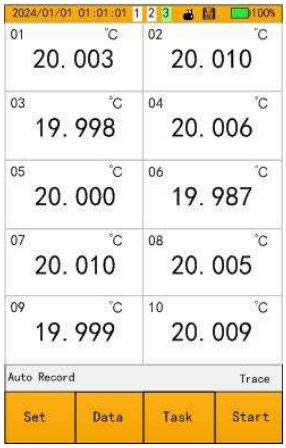
In addition, the acquisitor uses an embedded operating system, which can realize inspection configuration, data viewing, sensor correction, data statistics, curve display and other operations without other peripherals. After using the cloud metrology function, the temperature control deviation, temperature field, humidity field, uniformity, volatility and other parameters of heat treatment furnaces and temperature (humidity) environment experimental equipment can be automatically tested and analyzed online.

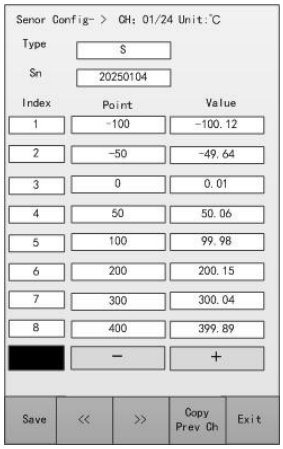
2. Features

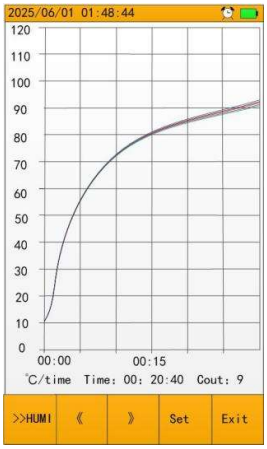
- Smart Junction Box - Intelligent. It can quickly and batch connect thermocouples, thermal resistors, humidity sensors through internal self-locking connectors to form a set of temperature and humidity measurement units. The junction box integrates a temperature sensor for reference end compensation and a memory for storing sensor parameters. It can be quickly connected to the acquisitor host in a plug-and-play manner, thereby realizing automatic recognition of sensors and automatic loading of related parameters.
- Smart Junction Box - Usability. The channels of the PR201 series acquisitor have excellent electrical measurement consistency. When the sensor correction value can be automatically loaded, the users do not need to pay attention to the correspondence between each sensor and the physical channel of the acquisitor. They only need to focus on the correspondence between the sensor number and the actual layout diagram, making the sensor location logic simpler.

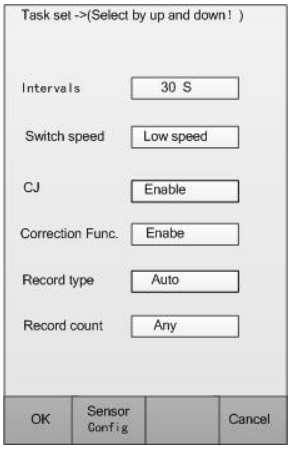
- Smart Junction Box - Reliability. Special wire ducts are designed on both sides of the junction box, and necessary positions are reserved for the sequential arrangement of each sensor lead. The wire duct adopts an S-shaped structure, which can effectively disperse the stress of the sensor lead and avoid lead breakage caused by pulling force.
- Smart Junction Box - Compatibility. The junction box is compatible with sensors of various specifications, including 11 types of thermocouples, four-wire Pt100 and 0~1V output humidity or other types of transmitter measurement. At the same time, multiple sets of 3.3V power supplies with overcurrent protection function are provided internally to power the transmitter.
- The channel switching uses a mechanical relay array, which does not cause additional electrical measurement errors due to leakage current, thereby achieving excellent channel consistency. Another advantage of the relay structure is that the signal loop can withstand 250V AC voltage accidentally entering and can effectively suppress surge voltage impacts under harsh working conditions.
- The sampling data is highly reliable, and the built-in industrial-grade FLASH memory is used to save the original data of each inspection operation, The data can be viewed and copied, but cannot be changed. During the inspection operation, the data can also be saved in an external U disk at the same time, and the security and reliability of the data are improved through double backup.
- The closed structure design adopts aluminum alloy shell, and the safety protection level reaches IP64, which can be used for a long time in harsh environments such as dust and vibration.
- It uses a detachable intelligent lithium battery pack, which can run continuously for more than 12 hours when fully charged. The built-in battery management system can accurately estimate the remaining usage time based on the real-time power consumption, and can provide diagnostic information including battery cycle number, charge and discharge status, etc.
- The Internet of Things Function. It has the built-in Bluetooth and WiFi modules, and can be used in conjunction with the PANRAN Smart Metrology Mobile APP to realize remote real-time monitoring, recording, data output, alarm and other functions of networked devices; historical data is stored in the cloud for easy query and data processing; the software has rich permission configuration modules, and the user units can independently manage the account of

the unit, support the simultaneous online access of multiple users and the configuration of different user permission levels.









3. Technical Parameters

3.1 General Technical Parameters

Model	PR201AS	PR201AC	PR201BS	PR201BC
RS232	●	●	●	●
Bluetooth	-	●	-	●
WIFI	-	●	-	●
Number of TC channels	30		20	
Number of RTD channels	30		20	
Number of humidity channels	90		60	
Weight	1.7kg（without charger）		1.5kg（without charger）	
Dimension	310mm×165mm×50mm		290mm×165mm×50mm	
Working temperature	-5℃～45℃			
Working humidity	（0～80）%RH, Non-condensing			
Battery type	PR2038 7.4V 3000mAh Smart lithium battery pack			
Battery duration	≥14h	≥12h	≥14h	≥12h
Warming-up time	Effective after 10 minutes warm-up			
Calibration period	1 year			

3.2 Electrical Technical Parameters

Range	Measuring range	Resolution	Accuracy	Max difference between channels	Acquisition speed
70mV	-5mV～70mV	0.1μV	0.01%RD+7μV	4μV	High speed：0.2 s/channel Medium speed：0.5 s/channel Low speed：1.0 s/channel
400Ω	0Ω～400Ω	1mΩ	0.01%RD+20mΩ	5mΩ	High speed：0.5 s/channel Medium speed：1.0 s/channel Low speed：2.0 s/channel
1V	0V～1V	0.1mV	0.5mV	0.2mV	High speed：0.2 s/channel Medium speed：0.5 s/channel Low speed：1.0 s/channel
Note 1: The above parameters are tested in an environment of 23±5℃, and the maximum difference between channels is measured in the inspection state. Note 2: The input impedance of the voltage-related range is ≥50MΩ, and the output excitation current of the resistance measurement is ≤1mA.					

3.3 Temperature Technical Parameters

Range	Measuring range	Accuracy	Resolution	Remarks
S	0℃～1760.0℃	@ 600℃，0.9℃ @ 1000℃，0.9℃	0.01℃	Conforms to ITS-90 temperature scale Including reference end compensation error
R				
B	300.0℃～1800.0℃	@ 1300℃，1.0℃		
K	-100.0℃～1300.0℃	≤600℃，0.6℃ ＞600℃，0.1%RD		
N	-200.0℃～1300.0℃			
J	-100.0℃～900.0℃			

E	-90.0℃～700.0℃			
T	-150.0℃～400.0℃			
Pt100	-200.00℃～800.00℃	@ 0℃，0.08℃ @ 300℃，0.11℃ @ 600℃，0.16℃	0.001℃	Output 1mA excitation current
Humidity	1.00%RH～99.00%RH	0.1%RH	0.01%RH	Transmitter error is not included

3.4 Regulations and Specifications

No.	Implementation standard/ specification code	Standard/specification name
1	JJF 1101-2019	*Calibration specification for environmental testing equipment for temperature and humidity parameters*
2	JJF 1376-2012	*Calibration specification for box-type resistance furnace*
3	JJF 2019-2022	*Measurement specification for temperature performance of liquid constant temperature testing equipment*
4	JJF 2168-2024	*Calibration specification for salt mist testing chambers*
5	JJF 1564-2016	*Calibration specification for temperature and humidity standard chambers*
6	GB/T 9452-2023	*Test method for qualified work zone of heat treatment furnace*
7	GB/T 5170.1-2016	*Inspection methods for environmental testing equipment for electric and electronic products -- part 1: General*
8	GB/T 5170.2-2017	*Inspection methods for environmental testing equipment -- part 2: Temperature testing equipment*
9	GB/T 5170.5-2016	*Inspection methods for environmental testing equipment for electric and electronic products -- part 5: Damp heat testing equipment*
10	GB/T 5170.8-2017	*Inspection methods for environmental testing equipment -- part 8: Salt mist testing equipment*
11	HB 5425-2012	*Testing method for working zone of heat treatment furnace for aviation*
12	HB 6783.3-93	*Verification method for climate environment test chamber (room) for*

		military airborne equipment
13	GJB 509B-2008	*Quality control for heat treatment process*
14	QJ 1428A-2012	*Heat treatment furnace temperature control and measurement*
15	JB/T 5520-91	*Specification for drying oven*
16	AMS2750	*Aerospace materials pecification(r)pyrometry*

	No.	Name & description	Quantity
Standard accessories	1	Intelligent temperature and humidity acquisitor	1 piece
	2	PR2016 Smart junction box	Type A*3 Type B*2
	3	Charger	1 piece
	4	Carrying case	1 piece
	5	U disk	1 piece
	6	Fuse（1.25A）	1 piece
	7	Operating instructions/product warranty card/certificate of conformity/test report	1 piece each

4. Packaging Information

	No.	Name & description
Optional accessories	1	Low ripple charger
	2	PR2016 Smart junction box
	3	4-wire Pt100
	4	Thermocouple(S、R、B、K、N、 J、 E、T)