

PR204 Series Intelligent Temperature and Humidity Acquisitor

PANRAN

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1. Overview

PR204 Series intelligent temperature and humidity acquisitor uses intelligent connector to connect various thermocouples, thermal resistors and humidity transmitters. The intelligent connector integrates reference end temperature sensor and memory, and can be used as a whole after being combined with the sensor, so as to realize the functions of intelligent identification, classification and editing of sensors, 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.



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2. Features

- Self-locking intelligent connector, using PR2046 intelligent connector to connect with thermocouple, thermal resistor, humidity sensor to form intelligent sensor. The intelligent connector has a self-locking jack, which can quickly and reliably connect the sensor test line. The internal integrated temperature sensor and memory can be used for the measurement of the thermocouple reference end and the storage of sensor number, correction value and other data.



PR2046 intelligent connector

PR2047 transmitter conditioner

- Intelligent sensor recognition: After the intelligent sensor is inserted into any channel of the acquisitor, the acquisitor automatically loads the sensor data and automatically classifies and sorts the channels by type and connection order without the need for additional configuration.
- It has 24 multi-function channels, any channel supports the measurement of 11 types of thermocouples, four-wire Pt100 and 0~1V output humidity or other types of transmitter measurement. The measurement channels can be divided into up to four groups for operation, management and storage, which is convenient for the measure of multiple devices being calibrated simultaneously.
- 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.
- High data reliability, 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. PANRAN instruments are available in South Africa from Intercal (Pty) Ltd

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.



Device screen interface

3. Technical Parameters

3.1 General Technical Parameters

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Weight	1.6kg (without charger)	Working temperature	-5°C~45°C
Dimension	300mm×185mm×50mm	Working humidity	(0~80) %RH, Non-condensing
Battery type	PR2038 7.4V 3000mAh Smart lithium battery pack	Warming-up time	Effective after 10 minutes warm-up
Battery duration	≥12h	Calibration period	1year

3.2 Electrical Technical Parameters

Electrical parameters	Range	Measuring range	Resolution	Accuracy	Max. difference between channels	Acquisition speed
	70mV	-5mV~70 mV	0.1μV	0.01%RD+7μV	4μV	High speed: 0.2 s/channel Medium speed: 0.5 s/channel
	1V	0V~1V	0.1mV	0.2mV	0.1mV	Low speed: 1.0 s/channel
	400Ω	0Ω~400Ω	1mΩ	0.01%RD+7mΩ	2mΩ	High speed: 0.5 s/channel Medium speed: 1.0 s/channel Low speed: 2.0 s/channel

Note 1: The above parameters are tested in an environment of 23±5°C, and the maximum difference between channels is measured in 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

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

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	J	-100.0°C~900.0°C			
	E	-90.0°C~700.0°C			
	T	-150.0°C~400.0°C			
	Pt100	-200.00°C~800.00°C	0.001°C	@ 0°C, 0.05°C @ 300°C, 0.08°C @ 600°C, 0.12°C	Output 1mA excitation current
	Humidity	1.00%RH~99.00%RH	0.01%RH	0.1%RH	Transmitter error is not included

3.4 Regulations and Specifications

No.	Implementation standard/ specification code	Standard/specification name
1	JJF 1101-2019	<i>Calibration specification for environmental testing equipment for temperature and humidity parameters</i>
2	JJF 1376-2012	<i>Calibration specification for box-type resistance furnace</i>
3	JJF 2019-2022	<i>Measurement specification for temperature performance of liquid constant temperature testing equipment</i>
4	JJF 2168-2024	<i>Calibration specification for salt mist testing chambers</i>
5	JJF 1564-2016	<i>Calibration specification for temperature and humidity standard chambers</i>
6	GB/T 9452-2023	<i>Test method for qualified work zone of heat treatment furnace</i>
7	GB/T 5170.1-2016	<i>Inspection methods for environmental testing equipment for electric and electronic products -- part 1: General</i>
8	GB/T 5170.2-2017	<i>Inspection methods for environmental testing equipment -- part 2: Temperature testing equipment</i>
9	GB/T 5170.5-2016	<i>Inspection methods for environmental testing equipment for electric and electronic products -- part 5: Damp heat testing equipment</i>
10	GB/T 5170.8-2017	<i>Inspection methods for environmental testing equipment -- part 8:</i>

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		<i>Salt mist testing equipment</i>
11	HB 5425-2012	<i>Testing method for working zone of heat treatment furnace for aviation</i>
12	HB 6783.3-93	<i>Verification method for climate environment test chamber (room) for military airborne equipment</i>
13	GJB 509B-2008	<i>Quality control for heat treatment process</i>
14	QJ 1428A-2012	<i>Heat treatment furnace temperature control and measurement</i>
15	JB/T 5520-91	<i>Specification for drying oven</i>
16	AMS2750	<i>Aerospace materials pecification(r)pyrometry</i>

4. Model Selection

Function/Model	PR204AS	PR204AC
RS232	•	•
Bluetooth	-	•
WIFI	-	•
Cloud Metrology Function	-	•

5. Packaging Information

	No.	Name & description	Quantity
Standard accessories	1	Intelligent temperature and humidity acquisitor	1 Piece
	2	U Disk	1 Piece
	3	Charger	1 Piece
	4	ABS Carrying case	1 Piece
	5	Operating instructions	1 Piece
	6	Certificate of conformity	1 Piece
	7	Product warranty card	1 Piece

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	No.	Name & description
Optional accessories	1	PR2046 Intelligent connector
	2	PR2047 Transmitter conditioner
	3	Low ripple charger
	4	4-wire Pt100
	5	Thermocouple (S, R, B, K, N, J, E, T)

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