

# **PR550 Series Portable Liquid Calibration Bath**

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## Overview

The PR550 Series Portable Liquid Calibration Baths while nearly identical in the compact size and weight to conventional dry block calibrators, combine the advantages of liquid thermostatic bath - such as superior uniformity, large heat capacity, and exceptional resistance to environmental interference, with excellent static and dynamic temperature control characteristics. PR552B/PR553B models feature integrated full-function temperature measurement channels and standard instrument measurement channels, supporting editable calibration tasks. This enables fully automated on-site calibration of thermocouples, RTDs, temperature switches, and electrical-output temperature transmitters without external devices.

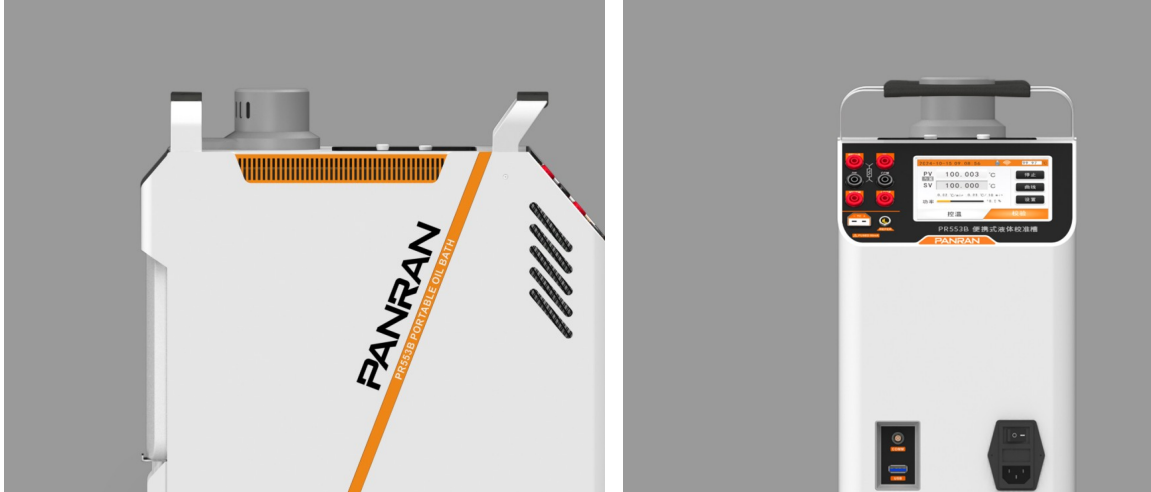
Traditional on-site calibration process usually uses the dry block calibrators as the temperature sources. The dry blocks calibrator biggest advantage is its small size and portability. However, its temperature uniformity is completely dependent on the heat conduction between the metal material and the air. This not only places high demands on the diameter matching between sensors and jacks but also fails to compensate for calibration errors caused by external thermal conduction of sensors with different specifications, often leading to less-than ideal calibration results.

### 1.1 Appearance

- PR550B Series Products Appearance



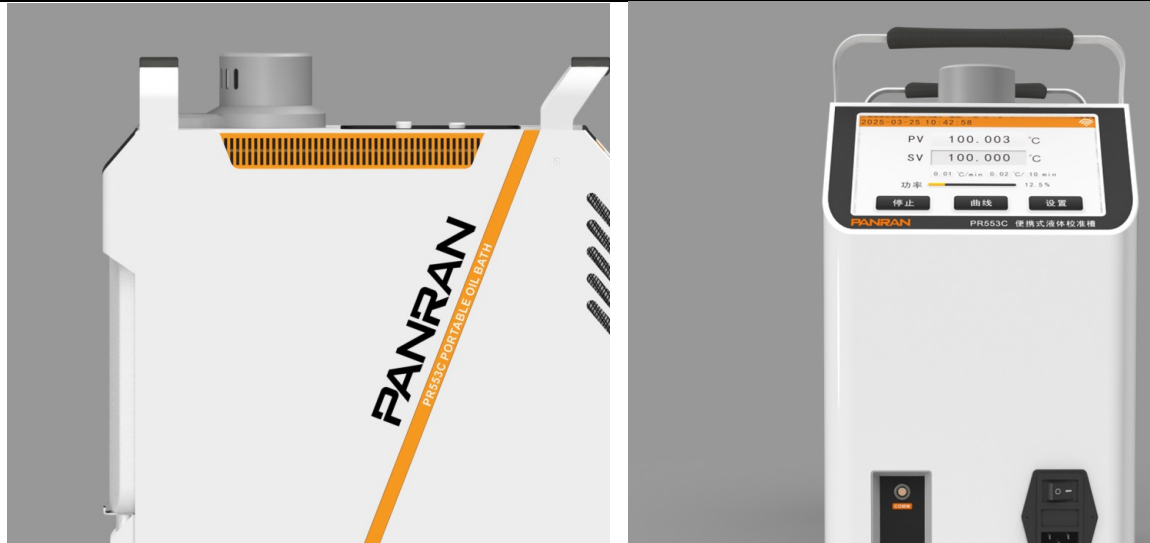
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- PR550C Series Products Appearance



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## 1.2 Technical Features

- Excellent heating/cooling and constant temperature characteristics: Faster heating/cooling rates and shorter stabilization time are crucial for efficient on-site calibrations. The PR550 series portable calibration baths adopt innovative technologies including dual-zone heaters, AC/DC hybrid temperature control, and variable-speed stirring to enhance the dynamic and steady-state control performance of compact liquid constant temperature sources. Taking PR553B/C as an example: it only takes 12 minutes to heat up from ambient temperature to 100°C and reach stability, enabling fully automatic calibration of 3-4 temperature points within 1 hour - significantly improving on-site calibration efficiency.
- Compact and easy to carry, the entire product series incorporates multiple lightweight designs while ensuring structural strength meets requirements. Its compact dimensions and curb weight make it exceptionally easy to deploy at work sites. Taking the PR553B/C as an example, its total weight when filled with medium is merely 12kg, comparable to conventional dry block calibrators.
- Sealed design prevents medium spillage during routine transit. The entire product series is equipped with dedicated flanges and sealing covers for the working cavity, along with a two-stage high-temperature resistant sealed bearing for the stirring motor's rotating shaft at the rear. This effectively prevents medium spillage under all circumstances except when dumping or inversion.
- The PR552B/PR553B has independent dual-channel measurement function. The first channel offers full-function measurement capacity, connecting to calibrated targets such as RTDs,

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thermocouples, temperature transmitters, and temperature switches via the terminal block on the left side of the screen. It also integrates a built-in 24V power supply. The second channel is used to connecting the standard reference temperature sensor, which employs a wire-wound platinum RTD to ensure superior long-term stability and dynamic response characteristics.

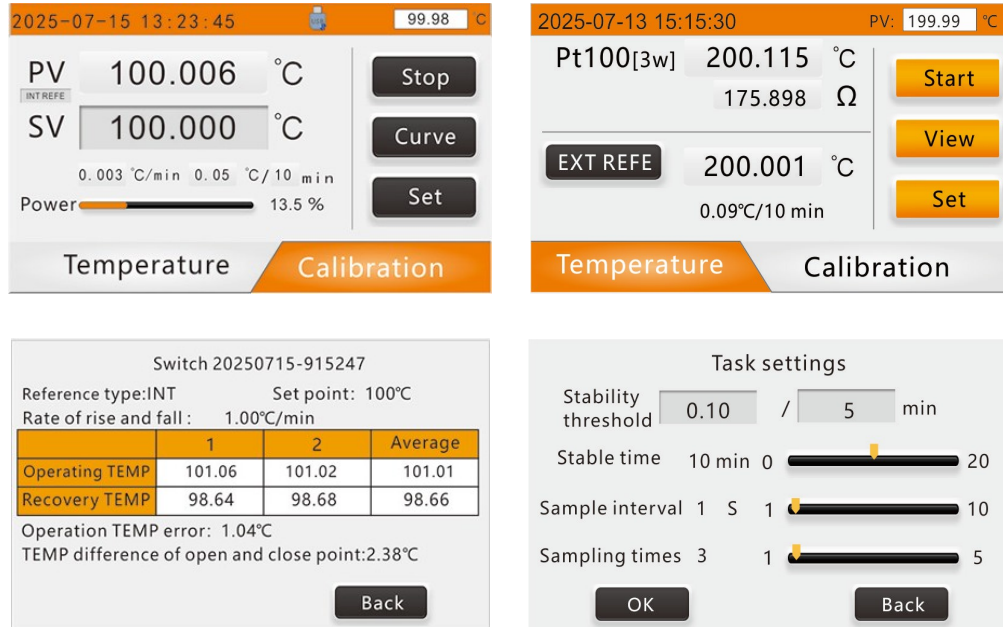
- The PR552B/PR553B has both temperature control mode and task mode, which can be switched with one button. In temperature control mode, users can view all real-time parameters related to temperature control, such as control curves and stability fluctuation. Task mode is designed for fully automatic calibration across multiple temperature points, allowing users to set key process parameters including calibrated target type, calibration temperature points, heating/cooling rates, Ramping directions (up/down), and stability judgment criteria. Real-time data can be monitored during automatic calibration, and calibration results are generated upon task completion. The PR552C/PR553C only support temperature control mode.

### 1.3 Main Function List

Software Functions	Hardware Functions
<ul style="list-style-type: none"> <li>■ Optional internal/external reference sensor for temperature control</li> <li>■ Programmable multi-point automatic calibration for thermocouples &amp; RTDs</li> <li>■ Automatic calibration for switching quantities with configurable slope heating/cooling</li> <li>■ Internal calibration data storage</li> <li>■ Self-tuning of multi-point internal/external reference temperature control parameters</li> <li>■ U-disk storage</li> <li>■ Adaptive temperature control parameters</li> <li>■ Real-time display of temperature &amp; power curves</li> <li>■ User-defined temperature stability calculation</li> <li>■ User-defined upper and lower limits of temperature alarm</li> <li>■ Optional units: °C, °F, K</li> </ul>	<ul style="list-style-type: none"> <li>■ mV/mA/V/Ω measurement</li> <li>■ Switching measurement</li> <li>■ Thermocouple measurement function</li> <li>■ 2/3/4-wires RTD measurement</li> <li>■ Built-in reference junction compensation</li> <li>■ DC 24V output (70mA max)</li> <li>■ USB 2.0 port</li> <li>■ Selectable WiFi communication, supporting Panran Cloud Metrology APP</li> <li>■ Speed-adjustable DC stirring motor</li> <li>■ Drain valve (Exclusive to PR553)</li> <li>■ Removable oil tank (Exclusive to PR553)</li> </ul>

Note: Features marked in blue are exclusive to PR552B/PR553B models.

### 1.4 Operational Interfaces (PR552B/PR553B)



## 1. Technical Parameters

### 2.1 General Technical Parameters

Item\Model	PR552B	PR552C	PR553B	PR553C
External Dimensions	420mm(L)×195mm(W)×380mm(H)		400mm(L)×195mm(W)×390mm(H)	
Working Cavity Dimensions	φ60mm×200mm		φ70mm×250mm	
Rated Power	500W		1700W	
Weight	No-load: 13kg; Full-load: 14kg		No-load: 10kg; Full-load: 12kg	
Operating Environment	Operating temperature range: (0~50) °C, non-condensing			
Display Screen	5.0 inches	7.0 inches	5.0 inches	7.0 inches
	Industrial touch screen   resolution: 800 × 480 pixels			
Electrical Measurement Function	●	/	●	/
External Reference Sensor	●	/	●	/
Task Function	●	/	●	/
USB Storage	●	/	●	/
Power Supply	220VAC±10%, 50Hz			
Communication Mode	RS232 (Optional WiFi)			
Calibration Cycle	1 Year			
Note: ● Indicates presence of this function				

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## 2.2 Temperature Technical Parameters

Item\Model	PR552B	PR552C	PR553B	PR553C	Remark
Setting Temperature Range	-30°C~160°C		50°C ~ 300°C		At the ambient temperature of 23°C
Working Medium	Antifreeze [Note 3]		Methyl silicone oil		
Temperature Control Resolution	0.001°C		0.001°C		
Temperature Control Accuracy	0.1°C+0.17%RD		0.1°C+0.17%RD		
Temperature Stability	0.02°C		0.01°C@50°C 0.01°C@100°C 0.02°C@300°C		Temperature Stability/10 minutes
Temperature Uniformity	0.02°C@100°C 0.02°C@0°C 0.03°C@-30°C		0.02°C@50°C 0.02°C@100°C 0.03°C@300°C		[Note 1]
Heating and Cooling Rate	40min@RT~100°C 35min@RT~0°C 45min@0°C~-30°C		30min@RT~300°C 12min@100°C~200°C 15min@200°C~300°C		[Note 2]

All above technical parameters were measured at 23°C ambient temperature using specified working medium.  
 Note 1: Tests conducted with 6mm outer diameter metal-sheathed platinum RTDs. For the PR552B, the effective temperature zone is 20mm~120mm from bottom; for the PR553B, the effective temperature zone is 20mm~160mm from bottom.  
 Note 2: Indicates typical stabilization time required.  
 Note 3: For PR552B operations above 100°C, low-temperature heat transfer oil must be used as working medium.

## 2.3 Electrical Measurement Technical Parameters

Type	Range	Signal Range	Accuracy	Resolution	Remarks
Voltage Measurement	15mV	0mV ~ 15mV	±0.015%RD+2μV	0.1μV	Input impedance ≥50 MΩ
	50mV	0mV ~ 50mV	±0.015%RD+5μV	0.1μV	Input impedance ≥50 MΩ
	50V	0V ~ 50V	±0.015%RD+0.005%FS	0.1mV	Input impedance ≥1 MΩ
Resistance Measurement	500Ω	0Ω ~ 500Ω	±0.015%RD+0.005%FS	1mΩ	4-wires, outputting 1 mA current
	5kΩ	0kΩ ~ 5kΩ	±0.015%RD+0.005%FS	10mΩ	4-wires, outputting 0.1 mA current
Current Measurement	50mA	0mA ~ 50mA	±0.015%RD+0.005%FS	1μA	Internal resistance: 10 Ω
Temperature Coefficient	2ppm/°C@(Ω, KΩ)    5ppm /°C@(mV, V)    5ppm /°C@(mA)				
24V Output	Maximum Voltage Error: 0.3 V; Maximum Load Current: 70 mA				

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Note: Connect via front-panel terminals.

## 2.4 Thermocouple Measurement Parameters

Type	Signal Range	Accuracy	Resolution	Remark
S, R	0°C ~ 1760°C	±0.8°C@600°C ±1.0°C@1000°C	0.01°C	Including reference junction compensation error
N, K	-80°C ~ 1300°C	±0.6°C@(≤600°C) ±0.1%RD@(> 600°C)		
WRE325, WRE526	0°C ~ 2300°C			
B	300°C ~ 1800°C			
T	-200°C ~ 400°C			
E	-90°C ~ 800°C			
J	-100°C ~ 1090°C			
EA2	-30°C ~ 760°C			

Note: Connect using the reference junction socket on the front panel.

## 2.5 RTDs Measurement Parameters

Type	Signal Range	Accuracy	Resolution	Remark	
Pt10	-200°C ~ 800°C	±0.7°C	0.001°C	Employs 4-wires measurement method	
Pt100(385/392), Pt1000		±0.08°C@100°C ±0.18°C@700°C			
Pt200		±0.25°C@100°C ±0.45°C@700°C			
Pt500		±0.19°C@100°C ±0.37°C@700°C			
Cu50		-50°C ~ 150°C			±0.17°C@100°C
Cu100					±0.11°C@100°C
External Reference RTD	0°C ~ 700°C	±0.05°C@100°C ±0.07°C@300°C ±0.10°C@600°C			

Note: Connect the RTD under calibration to the front-panel terminals, while the external reference RTD must be connected to the dedicated REFER port.

## 2. Packaging Information

### 3.1 Packaging List

No.	Item Description	Qty	Unit	Remark
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PR550 Series Portable Liquid Calibration Bath

1	PR550 Series Portable Liquid Calibration Bath	1	Set	
2	Dedicated Flange	1	pc	
3	Dedicated Sealing Cover	1	pc	
4	High-Accuracy Reference Sensor	1	pc	Exclusive to PR552B/PR553B
5	Red/Black Test Leads	3	Sets	Exclusive to PR552B/PR553B; 1.2m length, each set includes 1 red and 1 black lead with single alligator clip
6	Spare Fuse	1	pc	220V 3A (PR552) 220V 8A (PR553)
7	3L Liquid Storage Bucket	1	pc	
8	Overflow Canister	2	pcs	PR553 only
9	200ml Syringe	1	pc	PR552 only
10	USB	1	pc	PR552B/PR553B only
11	Power Cord	1	pc	
12	User Manuals	1	copy	

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