THORCAL CALIBRATION SERVICES

Additel
Metrology Made Simple

Additel 835
Portable Calibration Bath

- **Engineered for exceptional portability and performance**
- **Extended temperature range: -30 C to 250 °C**
- **High-precision accuracy: ±0.1 °C**
- **Compatible with a wide range of probe types and sizes**
- **Optional built-in Process Calibrator (PC)**
- **Quick to temperature**
- Delivers outstanding stability and uniformity
- Fast thermal response for efficient operation
- Features advanced dual-zone heating technology
- One touch self-calibration
- Designed with robust electromagnetic interference protection

OVERVIEW

The ADT835 is a portable calibration bath with a compact bath size of 3.54 x 3.54 inches (90 x 90 mm), setting a new benchmark for powerful, space-saving calibration solutions. Unlike typical integrated dry-liquid baths, the ADT835 delivers exceptional versatility—accommodating temperature sensors of virtually any type, size, or shape. Its innovative design supports both batch and field calibrations with ease, while maintaining excellent stability, uniformity, and accuracy. Combining the precision and reliability of a traditional calibration bath with the portability of a dry well, the ADT835 is a dependable choice for demanding calibration environments.

The ADT835 delivers exceptional performance through a smart, user-focused design. Its advanced data logging capabilities simplify documentation and help minimize errors or missed readings. Built-in application tools enhance workflow efficiency, while intelligent remote control functionality allows for multitasking and increased productivity. The 6.5-inch TFT touchscreen provides an intuitive interface, making operation straightforward—even for first-time users.

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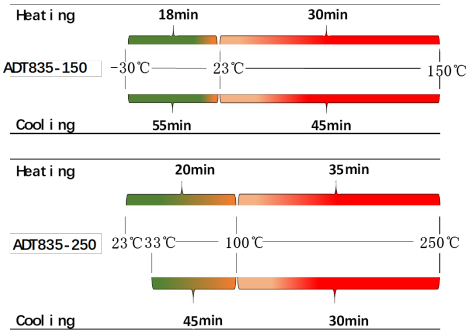
Accelerated Heating and Cooling for Maximum Efficiency

Efficient calibration depends on fast temperature transitions, minimal stabilization times, and sufficient bath capacity. The ADT835 delivers on all fronts with advanced variable-speed prediction and non-overshoot control technology, achieving an accuracy error band of ±0.1°C throughout the heating and cooling process.

Models	ADT835-150 ADT835PC-150	ADT835-250 ADT835PC-250
Heating	To 150°C: 30 minutes	To 250°C: 55 minutes
Cooling	To -25°C: 45 minutes	To 100°C: 30 minutes
	To -30°C: 55 minutes	To 33°C: 45 minutes



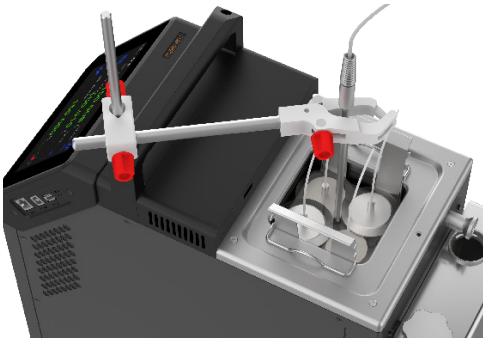
These rapid thermal response times dramatically reduce calibration cycles compared to traditional calibration baths, significantly improving throughput and overall productivity.

Versatile Sensor Calibration with the ADT835

Calibrating a wide range of temperature sensors is a challenge, particularly in industries like pharmaceuticals, biotechnology, and food processing, where specialized or sanitary sensors are common. These sensors often feature large flanges, ferrule nuts, or short probes, making on-site calibration with traditional dry wells difficult and costly. Users may need to invest in custom dry wells, yet still face limitations in achieving accurate results. The ADT835 portable calibration bath addresses these challenges by providing a stable and uniform temperature field, ensuring precise calibration for sensors of various types, sizes, and shapes, without the need for custom solutions.

Enhanced Efficiency for Batch Calibration

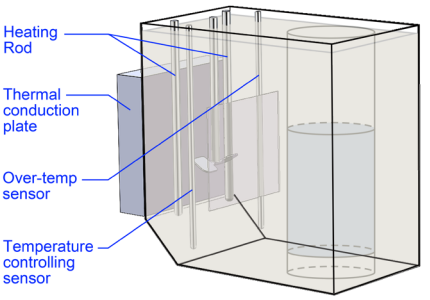
Maximizing calibration efficiency directly reduces factory downtime. To facilitate batch calibration, portable temperature sources must accommodate multiple sensors simultaneously. The ADT835 features a bath size of 90mm x 90mm with a depth of 155mm, enabling the calibration of multiple sensors in one operation. This capacity supports the simultaneous calibration of up to four 50mm diameter sanitary temperature sensors or up to forty 6.35mm diameter rod-type temperature sensors, significantly improving operational efficiency.



Innovative Dual Heating Technology for Enhanced Stability

Field environments often introduce challenges like power fluctuations from heavy equipment, inconsistent airflow from industrial fans, and ambient temperature shifts caused by variable-frequency air conditioning systems. These factors can significantly impact calibration bath performance and compromise temperature control stability.

The ADT835 overcomes environmental challenges with its innovative dual-zone heating technology. An external heating system near the vapor chamber delivers stable, consistent temperature control, while an internal heating element immersed in the fluid provides rapid, dynamic response to disturbances. This advanced design greatly improves resistance to external interferences, ensuring reliable and accurate performance—even in demanding field conditions.



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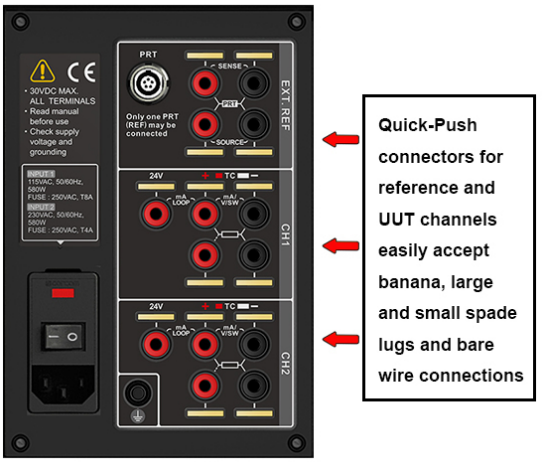
Optional Integrated Three-Channel High-Precision Process Calibrator

The ADT835 offers an optional built-in three-channel high-precision process calibrator, designed to streamline field operations. This feature eliminates the need to carry multiple devices on-site.

The integrated calibrator combines the functions of a thermometer, multimeter, 24V power supply, and HART handheld communicator, enabling the ADT835 to manage a wide range of calibration tasks effectively.

Each channel is equipped with quick push connectors, allowing for tool-free, rapid connections regardless of the connector type. Channel 1 serves as a reference channel, compatible with smart secondary reference PRTs or user-provided reference thermometers. Channels 2 and 3 are designated for device under test (DUT) connections, supporting RTDs, thermocouples (TCs), temperature transmitters, HART temperature transmitters, and temperature switches.



Automated Self-Calibration for Internal Reference Sensor

Periodic calibration is essential for maintaining temperature control accuracy in calibration baths. Traditional methods involve manually recording and calculating errors at each calibration point, a process that can be time-consuming and complex, often taking over an hour.

The ADT835 simplifies this with its automated self-calibration program. This feature eliminates the need for manual data entry and calculations, streamlining the calibration process and ensuring accurate temperature control with minimal user intervention.

Remote Control for Parallel Operation

The ADT835 features advanced remote control capabilities to facilitate parallel operations:

Point-to-Point Mode: Connects to a mobile phone or computer via Bluetooth or WiFi hotspot, allowing direct operation of the bath from these devices.

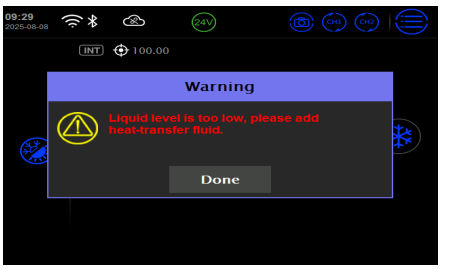
Cloud Mode: Connects to the network through WiFi or LAN port, enabling remote management of multiple calibration baths via mobile phones or computers in point-to-point mode.

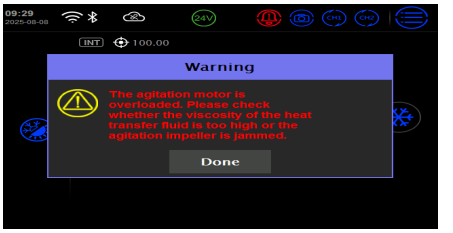
These smart remote control options enhance operational flexibility and efficiency.

Advanced Fluid Protection Design for Ease of Use and Maintenance

The ADT835 incorporates a professional fluid protection design to ensure safe and convenient operation. It features an integrated overflow tank and drain port to manage fluid efficiently and facilitate easy transport, mitigating environmental contamination and safety risks. The bath and tank body are constructed from rust-resistant stainless steel, which is easy to clean and durable, even in the presence of irritating or corrosive contaminants.

The ADT835 also includes a sealed top cover with a hand-tight screw to effectively prevent fluid spill during transport and calibration. Additionally, a protective power switch design minimizes the risk of oil mist accumulation on power switch contacts, enhancing reliability and reducing failure likelihood. For user safety, a temperature warning icon appears on the display when the liquid temperature exceeds 50°C, alerting users to prevent accidental burns. These features collectively enhance the safety, usability, and maintenance of the ADT835 calibration bath.





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SPECIFICATIONS

General Specifications

Models	835-150	835-250
Range at 23°C	-30 ~ 150 °C	33 ~ 250 °C
Display accuracy	± 0.1 °C	± 0.1 °C
EXT REF accuracy [1]	± 0.05 °C	± 0.05 °C
Stability [2][3] (10 mins)	± 0.01 °C	± 0.015 °C
Uniformity [2][3]	± 0.02 °C	± 0.03 °C (≤200 °C) ± 0.04 °C (> 200 °C)
Repeatability	0.04 °C (internal reference) 0.01 °C (external reference)	0.04 °C (internal reference) 0.01 °C (external reference)
Heating time	18 min (-30 ~ 23 °C) 30 min (23 ~ 150 °C)	20 min (23 ~ 100 °C) 35 min (100 ~ 250 °C)
Cooling time	45 min (150 ~ 23 °C) 45 min (23 ~ -25 °C) 55 min (23 ~ -30 °C)	30 min (250°C ~ 100°C) 45 min (100°C ~ 33°C)
Typical time to stability	10 min	
Working area	ϕ 75mm circular zone of bath center, 15mm above bath bottom & 65mm below the fluid level	
	Maximum media depth: 155 mm	
Opening size	90 x 90 mm	
Media Recommendation	10cSt DOW CORNING XIAMETER PMX-200	50cSt DOW CORNING XIAMETER PMX-200
Volume	Max: 2.5 L	
Temperature Units	°C, °F, K	
Resolution	Adjustable, up to 0.001 °C	
Display	6.5 in (165 mm) color touch screen, 640*480 pixels, dark or bright theme switchable	
	Refresh rate: 4 times/s	
Warm-up time	15 min	
Environment	Operating temperature: 0 ~ 40°C Guaranteed accuracy: 13 ~ 33°C Storage temperature: -20 ~ 60°C	
	Humidity: 5%RH~95%RH, non-condensing	
	Altitude: < 2000 m	
Mechanical testing	Vibration: 2g	
	Impact: 5g	
	Package drop test: 1 m	
Size	7.5 × 16.2 × 15.2 in (191 W × 412 H × 387 D mm)	
	7.5 × 18.1 × 16.77 in (191 W × 460 H × 426 D mm) with handle, overflow tube	
Weight	35.27 lbs (16 kg) for non-PC unit 35.94 lbs (16.3 kg) for PC unit	30.86 lbs (14 kg) for non-PC unit 31.53 lbs (14.3kg) for PC unit
Power requirements	-110V: 100~120V, 50/60 Hz, fuse: 8A 250V -220V: 200~230V, 50/60 Hz, fuse: 4A 250V Maximum power consumption: 800W	
IP rating	IP20, indoor use only	
Communication	USB-A, USB-B, LAN, WIFI, BLE	
Languages	English, Chinese, Japanese, Russian, German, French, Italian, and Spanish	
Warranty	1 year	

[1] With AM1730-12-ADT.
[2] 1.25 times when the bath operates without bath cover
[3] 1.25 times when the environment temperature is outside 13~33°C

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Input Specifications (Process Calibrator [PC] Option)

Electrical Measurement Specification [1]			
Reference RTD channel (EXT.REF)	RTD measurement	Probe type	Pt25, Pt100
		Measurement Capability	4-wire
		Range	0~400 Ω
		Accuracy	± 1.25 mΩ @ (0~50)Ω ± 0.0025%RD @ (50~400)Ω
		Resolution	0.1 mΩ
		Temperature coefficient	± 1 ppm FS/°C @ (0~13)°C and (33~50)°C
		Excitation current	0.75 mA, current reversal
		Measurement rate	1 reading/sec
		Standard	ITS-90, CVD, IEC-751
		Connection	Lemo connector, quick push connectors, and ϕ4mm banana jacks
DUT channels (CH1, CH2)	Current measurement	Range	-30~30 mA
		Accuracy	± (0.01% RD + 2 μA)
		Resolution	0.1μA
		Temperature coefficient	± 5 ppm FS/°C @ (0~13)°C and (33~50)°C
		Input impedance	< 10 Ω
	Voltage measurement	Range	-12~12 V & -30~30 V
		Accuracy	± (0.01% RD+0.6 mV)
		Resolution	0.1mV
		Temperature coefficient	± 5 ppm FS/°C @ (0~13)°C and (33~50)°C
		Input impedance	> 1 MΩ
	RTD measurement	Probe Type	Pt10, Pt25, Pt50, Pt100, Pt200, Pt500, Pt1000, Cu10, Cu50, Cu100, Ni100, Ni120
		Measurement Capability	2/3/4-wire
		Resistance Range	0~400 Ω and 0~4000 Ω, auto switch
		Accuracy (4-wire)	± 2.0 mΩ @ (0~25)Ω ± 0.004%RD @ (25~400)Ω ± 0.005%RD @ (400~4000)Ω
		Resolution	0.1 mΩ
		Temperature coefficient	± 2 ppm FS/°C @ (0~13)°C and (33~50)°C
		Excitation current	0.25mA, current reversal
		Measurement rate	1 reading/sec
	TC measurement	Probe type	S, R, B, K, N, E, J, T, C, D, G, L, U
		mV range	-75~75 mV
		Accuracy	± (0.01%RD + 5 μV)
		Temperature coefficient	± 5 ppm FS/°C @ (0~13)°C and (33~50)°C
		Cold junction range	0 ~ 50 °C
		Cold junction accuracy	± 0.2 °C
	Loop power	With load accuacy	24 V ± 10%
		Without load accuacy	24 V ± 1%
		Max 60mA	
	HART	Only available on CH1 channel	
	Switch measurement	Mechanical or electrical switch	
	Connection	Quick push connectors, and ϕ4mm banana jacks	

[1]: One year specifications, based on a confidence level of K=2

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Temperature Sensor Measurement Accuracy (°C) [1]								
Channel	Probe Type \ Temperature	-30	0	50	100	150	200	250
Reference RTD channel (EXT.REF)	PT25	±0.013	±0.013	±0.013	±0.013	±0.013	±0.014	±0.014
	PT100	±0.006	±0.006	±0.008	±0.009	±0.011	±0.012	±0.013
DUT channels (CH1, CH2) [2]	PT100	±0.009	±0.010	±0.012	±0.015	±0.017	±0.019	±0.021
	K-TC	±0.14	±0.13	±0.13	±0.13	±0.14	±0.15	±0.15
	N-TC	±0.20	±0.19	±0.19	±0.18	±0.17	±0.17	±0.17
	E-TC	±0.09	±0.09	±0.08	±0.08	±0.08	±0.09	±0.09
	J-TC	±0.11	±0.10	±0.10	±0.10	±0.11	±0.11	±0.11
	T-TC	±0.14	±0.13	±0.12	±0.12	±0.11	±0.11	±0.11
	L (XK)	±0.09	±0.08	±0.08	±0.08	±0.08	±0.08	±0.08
	A-1	N/A	±0.42	±0.38	±0.35	±0.34	±0.33	±0.33
	A-2	N/A	±0.43	±0.38	±0.35	±0.33	±0.32	±0.32
	A-3	N/A	±0.43	±0.38	±0.36	±0.34	±0.33	±0.33
	M (MK)	±0.13	±0.12	±0.11	±0.11	N/A	N/A	N/A

[1]: The measurement accuracy specification does not include the accuracy of the probe itself;
[2]: Thermocouple measurement accuracy is calculated based on the cold junction temperature of 0°C and does not include the error of the CJC sensor.

ADT835 Selection Guide

Models	ADT835PC-150	ADT835-150	ADT835PC-250	ADT835-250
Range	-30°C~150°C	-30°C~150°C	33°C~250°C	33°C~250°C
mA/mV/V	●		●	
measure	●		●	
Switch measure	●		●	
24V loop power	●		●	
HART communicator	●		●	
Quick push wiring	●		●	
INT reference	●	●	●	●
EXT reference	●		●	
Self-calibration	●		●	
Documenting task	●		●	
Step test	●	●	●	●
Thermal calculator	●	●	●	●
Sensor library	●	●	●	●
Snapshot	●	●	●	●
Remote control	●	●	●	●
Smart diagnosis	●	●	●	●
USB stick update	●	●	●	●

ADT835 PC Version

ADT835 non-PC Version

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Ordering Information

Model Number

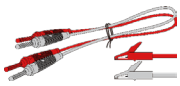
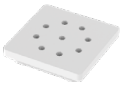
ADT835 — 150 — 110 V

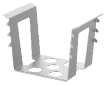
Model:
ADT835
ADT835PC

Temperature Range
(at 23°C):
150: -30°C to 150°C
250: 33°C to 250°C

Power Option:
110 V
220 V

Accessories

Standard Accessories		
Model	***Quantity***	***Picture***
AC power cable	1 pc.	
USB cable	1 pc.	
Test leads, 1 red 1 black (only ADT835PC-L-150/ ADT835PC-H-250)	2 set	
Top sealing cover	1 pc.	
Multiple hole Teflon cover	1 pc.	
Protection basket	1 pc	
Fluid overflow box	1 pc.	
ISO 17025 accredited calibration	1 pc.	

Optional Accessories		
Model	***Description***	***Picture***
9921	Carrying case with wheels	
9090	Clamp bracket (see next page for details)	
9091	Circular bracket (see next page for details)	
9092	Sanitary fitting fixture (see next page for details)	
AM17XX-12-ADT	Straight Secondary reference PRT (see Additel catalog)	
AM17XX-BEND-ADT	Bend Secondary reference PRT (see Additel catalog)	
9070	Smart connector for reference PRT (for modifying user's own reference sensor)	
9071	Connector Adapter from smart connector to 4-wire with gold-plated spades (for calibrating smart connector reference sensor)	
9072	Smart connector with clamps for reference PRT (for connecting to user's own reference sensor)	
9203-4L	Silicon Oil, 4L (10 cSt for -150)	
9204-4L	Silicon Oil, 4L (50 cSt for -250)	
9094	Blank Teflon Access Cover (holes machined by user)	
9093	High volume probe fixture	
9080	Compensation cable kit (S, R, K, J, T, E, N)	

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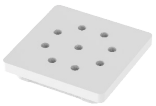
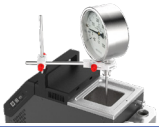
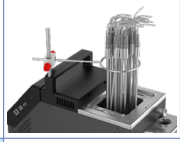
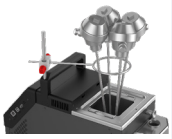
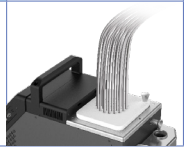
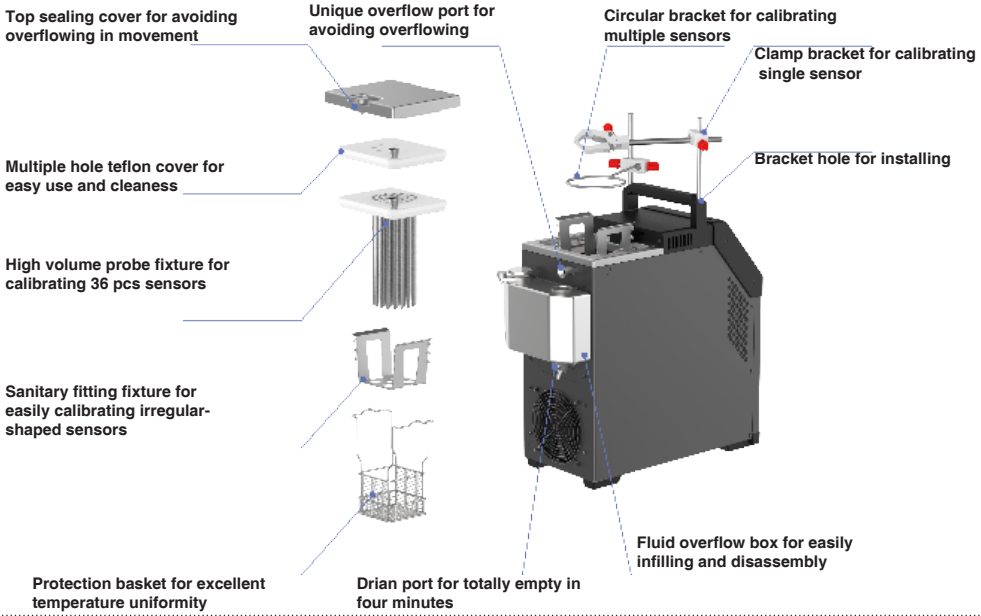
ADT835 Special jigs			
No.	***Item***	***Function***	***Picture***
1	9090 Clamp bracket	Quick connect to the M4 thread hole on the bath handle for clamping single DUT	
2	9091 Circular bracket	Quick connect to the M4 thread hole on the bath handle Constrains multiple DUTs for batch calibration	
3	Protection basket	The mesh thermal protection basket is quickly installed in the tank. The sides and bottom of the basket have excellent temperature uniformity, and the DUTs can contact it at any place	
4	Sanitary fitting fixture	Allows the flange, nut and stem of special-shaped DUTs to be immersed in the liquid at the appropriate position, and the height can be easily adjusted. Suitable for calibration of multiple sanitary temperature sensors	
5	Multiple hole Teflon cover	The PTFE cover provides heat insulation. The default is 9 * ϕ 8mm holes, and the quantity and diameter of holes can be customized. Suitable for calibration of precision temperature sensors	
6	High volume probe fixture	Almost 36 pcs temperature sensors to be calibrated is placed in a uniform temperature tube, with no risk of liquid contamination to the sensor, and remains clean.	

Typical Application of ADT835 Special jigs			
No.	***Application***	***Jigs***	***Picture***
1	Open single calibration for 1 large dial bimetallic thermometer	9090 Clamp bracket	
2	Open batch calibration for 40 rod type sensors	9091 Circular bracket + Protection basket	
3	Open batch calibration for 4 temperature transmitters or more	9091 Circular bracket + Protection basket	
4	Open batch calibration for 4 sanitary sensors of 50 mm diameter	Adjustable multiple hole jig	
5	Closed precision calibration for 9 precision sensors	Multiple hole Teflon cover + Protection basket	
6	Non-open precision calibration (for calibrating 36 flexible temperature sensors)	High volume probe fixture	

Note:

Open calibration is intended for batch calibration of low-precision temperature sensors, large dial low-precision sensors, or temperature transmitters.

Closed calibration is designed for precision temperature sensors or transmitters, featuring insulation to minimize heat loss.



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