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Calibration Experts

**FLUKE**<sup>®</sup>

Calibration

# 6109A / 7109A

Portable Calibration Baths

Four times more  
calibration throughput  
with twice the accuracy  
of Micro-Baths and  
dry-block calibrators



## Portable calibration baths designed for clean process applications

Process manufacturing plants for pharmaceuticals, biotechnology, and food production utilize many sanitary temperature sensors that require regular calibration. Production must stop while the calibrations are taking place. Therefore, more calibration throughput means less plant downtime. And in businesses where even a few tenths of a degree Celsius can cost thousands of dollars in ruined product, temperature accuracy is crucial to maintaining quality.

The Fluke Calibration 6109A and 7109A Portable Calibration Baths let process industry professionals calibrate four times more sanitary sensors per batch in less time and with twice the accuracy of other baths in this class. Up to four tri-clamp sanitary sensors fit easily into these baths for calibration at  $\pm 0.1$  °C temperature display accuracy. Throughput is even higher for sanitary RTDs with small or no flanges.

Two bath models cover a wide temperature range: 35 °C to 250 °C for the 6109A and -25 °C to 140 °C for the 7109A. Each model offers a “-P” version that includes process electronics for connecting an external reference probe.

Professionals working in clean process industries, including facilities managers, production engineers and calibration technicians, prefer these baths for a variety of reasons.

Facilities managers who need to meet U.S. FDA and ISO clean room standards like the baths' stainless steel casing that stands up to harsh cleaning solutions. They depend on the 6109A and 7109A to help maintain the accuracy of the plant's temperature sensors, thus reducing the possibility of an expensive product batch loss.

Production engineers also appreciate the baths' accuracy, which helps them control sensor out-of-tolerance conditions. Moreover, they prefer to use a bath designed specifically for clean room calibration throughput. No more need to make do with equipment designed for some other application.

Calibration technicians who perform calibrations on platforms, in crawl spaces, and other hard-to-reach parts of the plant enjoy the portability and clean room compatibility (i.e. easy to sanitize, don't harbor bacteria) of these baths.

Global Fluke Calibration service and support ensure that your 6109A and 7109A baths will give you years of service that you can trust.



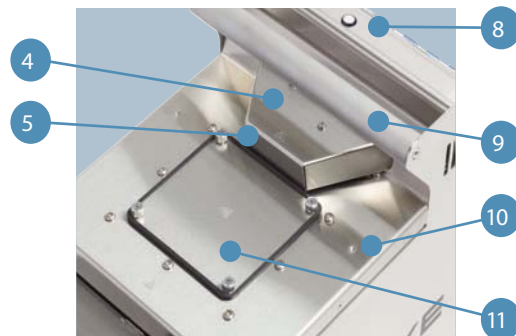
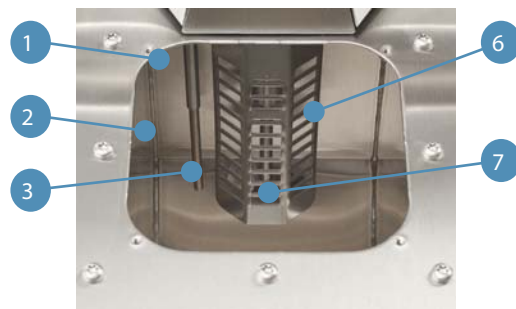
## Key features

- Calibrate up to four tri-clamp sanitary sensors at the same time
- Wide temperature ranges cover most process applications:
  - 6109A: 35 °C to 250 °C
  - 7109A: –25 °C to 140 °C
- Excellent display accuracy of  $\pm 0.1$  °C provides 4:1 test uncertainty ratio (TUR) for critical applications
- Easy to transport up stairs and across catwalks
- Stainless steel casing withstands harsh sterilizing chemicals and is rust proof
- Easy to use and maintain
- Global Fluke support and service



- 1 Tank – The stainless steel tank contains the bath fluid.
- 2 Bath Fluid – Temperature sensors are inserted into the bath fluid for calibration.
- 3 Control Sensor – A precision platinum resistance thermometer (PRT) control sensor measures and controls the temperature of the bath fluid.
- 4 Stir Motor Cover – Protects the stir motor.
- 5 Stir Motor (under the Stir Motor Cover) – Drives the propeller that circulates the fluid to produce a uniform temperature.
- 6 Stir Guard – Separates the working area of the tank from the stir propeller. MIN and MAX marks show the correct fill levels.
- 7 Propeller – Stirs the bath fluid.
- 8 Ready Indicator – Changes from amber to green when the bath fluid temperature has settled at the setpoint. Green indicates the bath is ready to begin measuring.
- 9 Carrying Handle – Use the carrying handle to lift or move the bath. There are also recessed handles on the side of the bath (not shown).

- 10 Threaded Holes – Used to attach accessories to the bath.
- 11 Tank Cover – Isolates the bath fluid from the environment, reduces fumes, prevents objects from falling into the tank, and keeps the fluid temperature stable.



- 1 Fan – Cools the tank and heating devices (7109A model shown).
- 2 USB hostport – Used to record temperature data to a memory device.
- 3 USB device port – Used to control the bath remotely.
- 4 RS-232 port – Used to control the bath remotely.
- 5 Control panel (see control panel detail).
- 6 Process input module – The optional module includes a Reference PRT Connection and inputs to measure electrical temperature sensors for calibration.



- 1 Display – Shows important information about the bath such as the fluid temperature and setpoint.
- 2 Softkeys – These keys correspond to the display icons directly above each key and perform a variety of useful functions. The functions change with the status of the display.
- 3 Mode keys – The monitor, setpoint, program, and the setup keys access different groups of settings. Some mode keys light up when the mode is active.
- 4 Other keys – The number keys, cursor keys, and a SELECT/ENTER key enable you to make menu choices quickly and easily. Number keys let you enter decimal numbers.
- 5 Hot warning indicator – This indicator lights up if the fluid temperature is greater than or equal to 60 °C. This warns that the bath fluid, tank cover, and area around the tank are hot and should not be touched. If the bath is switched off, the indicator stays on until the bath reaches a safe temperature. It flashes at a slow rate to conserve energy.
- 6 STOP button – Immediately disables heating and cooling and switches off the stir motor.



- 1 Current fuse – Protects the Process Input Module and connected devices from accidental short circuit.
- 2 RTD terminals – A test RTD connects to these terminals. The graphic on the panel shows the circuit diagram for a four-wire RTD.
- 3 Reference PRT connector – A reference probe plugs into this socket. Recommended Fluke Reference PRTs are models 5615-9-A and 5626-12-A. Other Fluke Reference PRTs with Type A INFO-CON termination are also compatible.
- 4 Thermocouple input – A connector for a miniature thermocouple.
- 5 Transmitter terminals – A 4-20 mA transmitter connects to the two transmitter terminals labelled mA LOOP and COM.

The 6109A-P and 7109A-P models come with a Process Input Module that measures various types of temperature sensors.



## Calibrate more sanitary sensors at a time – with confidence

The 6109A and 7109A baths calibrate most temperature sensor applications used in clean process manufacturing, including pharmaceutical bioreactors (-10 °C to 100 °C), chemical reactors (200 °C), steam-in-place process (122 °C to 140 °C), autoclave sterilization (120 °C to 135 °C), food storage freezers (-25 °C), and food processing (0 °C to 220 °C).

A large tank volume (106 mm diameter x 154 mm depth) lets you immerse up to four sanitary sensors at the same time. Calibrate a batch of odd shaped sensors of varying lengths and diameters, and still have room for a reference thermometer. Fast heating and cooling times let you get the job done without spending a lot of time waiting for the bath to come to temperature and stabilize. Increase your sanitary sensor calibration throughput and decrease expensive production downtime.

Excellent system display accuracy of  $\pm 0.1$  °C; accuracy covers all sources of error including calibration uncertainty, stability, uniformity, and repeatability. NVLAP accredited calibration is included standard. Fluke Calibration's high metrological standards and conservative specifications mean you can have confidence in the measurements you make with the 6109A and 7109A Portable Calibration Baths.

Take these portable baths almost anywhere, including the clean room

The 6109A weighs 16 kilograms (35 pounds) and the 7109A weighs 20 kilograms (44 pounds). They each feature a fixed, non-rotating bail handle, enabling most people to carry a bath with one hand. Single-handed carrying comes in handy when the job includes walking up and down stairs, across catwalks, and into other hard-to-reach environments. Two recessed handles on the bottom of each bath also make it easy to move from a shelf to a cart or benchtop. A sealed lid protects against fluid spills while moving the bath.

Stainless steel casing stands up to the harsh chemicals used to sterilize equipment for clean room use. Synthetic materials used for decals, keypads and feet do not harbor bacteria. The keypad is sealed against moisture ingress to protect against damage during cleaning or in non-controlled environments.



### Easy to use and maintain

Each bath features a large color display that indicates date and time, bath fluid temperature, setpoint temperature, control indicator when the fluid is at setpoint, and heating status. A ready indicator changes color from amber to green, giving you 360-degree visual indication when the bath fluid has reached its setpoint temperature and is ready for you to start making measurements.

A hot warning indicator lights up if the fluid temperature reaches above 60 °C, warning the operator that the bath fluid and tank area are hot and should not be touched.

An adjustable probe fixture holds up to four tri-clamp sensors securely inside the tank opening during calibration. An optional single probe clamp kit holds a reference probe.



Fluid spills create mess and potential safety hazards. The 6109A and 7109A include an overflow tube that directs excess bath fluid into an optional overflow container. A drain tube makes it easy to remove bath fluid for replacement or transport.

### I own a Fluke Calibration Micro-Bath. Why do I need a 6109A or 7109A bath?

If you already own a Fluke Calibration Micro-Bath or dry-block calibrator, thank you for being a customer! We hope you are enjoying the portability and stability of these popular products.

However, there are a few reasons why you should consider adding a 6109A or 7109A bath:

- Errors of just a few tenths of a degree Celsius can cause expensive losses in ruined product. The 6109A and 7109A baths are twice as accurate as a Micro-Bath, helping you to reduce this risk.
  - The 6109A and 7109A have four times the calibration throughput of a Micro-Bath, which can only calibrate a single tri-clamp sensor at a time.
  - They're made with materials that don't harbor bacteria. Their stainless steel panels and tank are easy to clean and rust resistant—perfect for clean room use.
- We hope you will continue to use your Fluke Calibration Micro-Bath for many years to come. The 6109A or 7109A baths will also serve you well if you need the throughput, accuracy, and clean room readiness that they provide.

### Backed by global Fluke support and service

The 6109A and 7109A are designed to meet demanding Fluke Calibration metrology specifications, so you can trust that they will perform the way we say they will.

Need assistance? We offer world-class support both before and after the sale, via online chat, email, telephone and through our service organizations. Rest easy knowing the value of your investment will be preserved now and into the future.

## Summary specifications

### General specifications

Size	Height: 382 mm (15 in) Width: 242 mm (9.5 in) Depth: 400 mm (15.7 in)
Weight	6109A: 16 kg (35 lb) 7109A: 20 kg (44 lb)
Fluid volume	2.5 liters (0.66 gallons)
Fluid working area	75 mm x 75 mm (3 in x 3 in)
Maximum fluid depth	154 mm (6.1 in)
Factory calibration	Traceable NVLAP-accredited calibration included

### Temperature specifications

The temperature specifications describe the Absolute Instrumental Uncertainty at 95 % level of confidence (coverage factor k = 2) within one year from calibration. The specifications include environmental temperature effects from 13 °C to 33 °C.

	6109A	7109A
Range (at 25 °C ambient temperature)	35 °C to 250 °C	-25 °C to 140 °C (-15 °C cover off)
Accuracy (maximum permissible error)	0.1 °C	0.1 °C
Display resolution	0.01 °, 0.001 °	0.01 °, 0.001 °
Stability	0.015 °C	0.01 °C
Typical uniformity	0.03 °C up to 200 °C 0.04 °C above 200 °C	0.02 °C
Repeatability	0.04 °C	0.04 °C
Typical heating time	35 °C to 100 °C: 25 minutes 100 °C to 250 °C: 45 minutes	-25 °C to 25 °C: 35 minutes 25 °C to 140 °C: 55 minutes
Typical cooling time	250 °C to 100 °C: 35 minutes 100 °C to 35 °C: 55 minutes	140 °C to 25 °C: 45 minutes 25 °C to -25 °C: 75 minutes
Typical settling time	15 minutes	10 minutes

### Process Input Module specifications (-P models)

The Input Module specifications describe the Absolute Instrumental Uncertainty at 95 % level of confidence (coverage factor k = 2) within one year from calibration. The specifications include calibration uncertainty, linearity, repeatability, resolution, stability, and environmental temperature effects from 13 °C to 33 °C.

Function	Range	Accuracy (Maximum Permissible Error)
Reference input resistance	0 Ω to 42 Ω 42 Ω to 400 Ω	0.0025 Ω 0.006 %
Reference input temperature	-25 °C to 250 °C	0.007 % + 0.015 °C
Resistance sensing current	1 mA	8 %
DUT 4-wire resistance	0 Ω to 31 Ω 31 Ω to 400 Ω	0.0025 Ω 0.008 %
DUT 3-wire resistance accuracy	0 Ω to 400 Ω	0.12 Ω
Thermocouple mV	-10 mV to 100 mV	0.025 % + 0.01 mV
Reference junction temperature	0 °C to 40 °C	0.35 °C
Thermocouple temperature	-25 °C to 250 °C	J: 0.44 °C    K: 0.49 °C    T: 0.53 °C E: 0.44 °C    N: 0.57 °C    M: 0.48 °C L: 0.42 °C    U: 0.48 °C
		R: 1.92 °C    S: 1.88 °C    C: 0.84 °C D: 1.12 °C    G/W: 3.34 °C
mA range	0 mA to 22 mA	0.02 % + 0.002 mA
Loop power	24V dc	± 6 V

## Ordering information

### Models

6109A	Portable Calibration Bath, 35 °C to 250 °C
6109A-P	Portable Calibration with Process Electronics, 35 °C to 250 °C
7109A	Portable Calibration Bath, -25 °C to 140 °C
7109A-P	Portable Calibration Bath with Process Electronics, -25 °C to 140 °C

### Accessories

7109-2013-1	Stainless Steel Transport Cover
7109-2013-2	Stainless Steel Probe Access Cover
7109-2027	Adjustable Probe Holding Fixture
7109-2051	Single Probe Clamp Kit
7109-2080	Fluid Overflow Kit
7109-CASE	Carrying Case
5012	Silicone Oil type 200.10, usable range -30 °C to 209 °C, recommended for 7109A bath
5014	Silicone Oil type 200.50, usable range 30 °C to 278 °C, recommended for 6109A bath



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