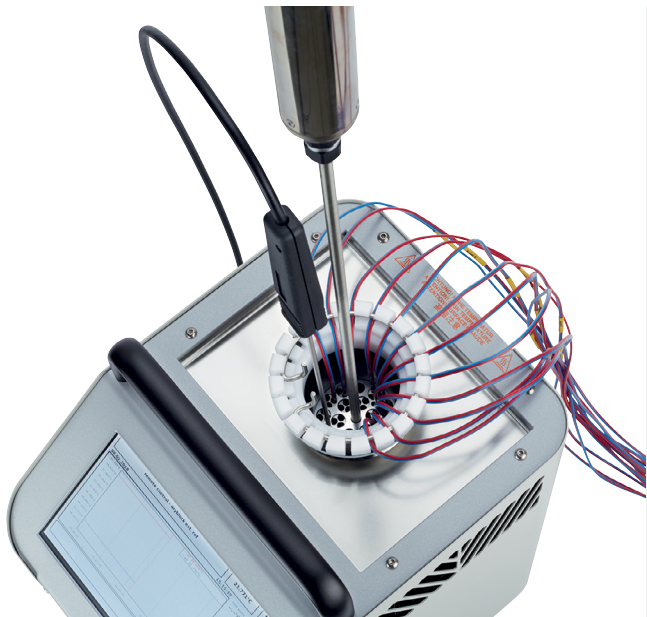


Temperature Calibration Devices

DRY BLOCK, LIQUID BATH, AND TEMPERATURE STANDARDS



Calibrator Overview

Kaye has a full line of calibrators that can fit nearly any application in the pharmaceutical or biotech setting. Our dry block calibrators, liquid baths, and IRTD temperature standards give the most precise accuracy on the market, guaranteeing that you can rely on Kaye's trusted instruments.

For the past 60+ years professionals across the world have trusted Kaye products to deliver the most accurate measurements that are also traceable and secure. So when you need to calibrate your thermocouples, wireless

data loggers, or even verify your IRTD probe, rest assured that we've got the solution for you.

There is rarely a one-size-fits-all solution when it comes to calibrators, so at Kaye we want to ensure that our customers get the calibrator that will fulfill their needs. The tables in this document display specific parameters and specifications for each of our calibrators so you can have a clear understanding of which calibrator would be best for your metrology lab or pharmaceutical thermal validation application.

Temperature Standard IRTD-400

HIGH-ACCURACY TRACEABLE TEMPERATURE STANDARD

-196°C TO 420°C

During sensor calibration / verifications, sensors are compared against the IRTD and offsets are automatically calculated and stored. The broad temperature range from -196 to 420°C, enables it to be used in virtually all temperature validation applications.

FEATURES & BENEFITS

- Accuracy over range $\pm 0.025^{\circ}\text{C}$
- Resolution 0.001°C
- Sensor element 200 Ohm Platinum sensor
- Sheath material Inconel™ 600
- Calibration Traceable to NIST or PTB
- Ambient temperature range 0 to 60°C (32 to 140°F)
- Humidity 0 to 95% non-condensing
- Dimensions Overall length: 603mm (23.75")
Grip: 89mm x 32mm (3.5" x 1.25")
Sensor sheath: 457mm x 6.35mm (18" x 0.25")



IRTD Lab Calibration

Every Kaye IRTD is factory calibrated in our ISO 17025 accredited lab by a team of professionals who ensure the reference device is precise and accurate. The IRTD is tested in multiple baths from -196°C up to 420°C, up to +/- 0.005°C. Data is recorded at various temperature points to guarantee repeatable and traceable results. Regulatory bodies recommend this robust procedure take place annually to prove that your temperature standard has not drifted.

IRTD and Kaye Validation Systems

Use the IRTD as a traceable and highly-accurate standard to verify your qualification studies. The IRTD comes configured to work seamlessly with all Kaye validation products, such as the Validator AVS, ValProbe RT, RF ValProbes, and Kaye baths.

For wired qualifications using a Validator AVS, users must perform a verification to ensure their thermocouples worked properly. The IRTD is used as a temperature standard in combination with a number of Kaye baths, such as the LTR-150 or HTR-420, to verify the accuracy of the thermocouples.

IRTD Stand-Alone Software

EASY AND FLEXIBLE SOFTWARE FOR DIRECT IRTD COMMUNICATION

For independent applications in calibration labs, the IRTD Win Console Software can be used to communicate with up to 2 IRTDs at the same time. It's a convenient interface enabling you to track probe stability, numerically and graphically, log data to a file, compare IRTDs, and much more.

The software flexibility permits use with both standard PCs, as well as on touch screens.




FEATURES & BENEFITS

- State-of-the-art look and feel
- Designed for Win8.1 and Win10
- Accepts up to 2 IRTDs
- Communicates via USB ports
- Easy to use touch screen
- Graph for each IRTD
- Variable log-rate
- Accepts IRTD cable of Validator 2000 and Validator AVS



Dry Block Calibrators

SPECIFICATIONS ▼

	LTR-90	LTR-150	HTR-420
			
Temperature Range	-90°C to 140°C	-30°C to 150°C	30 to 420°C
Temperature Stability	±0.01°C	±0.01°C	±0.01°C
Typical Heat-Up Time	-90°C to 25°C: 15 min 25°C to 140°C: 14 min	20°C to 121°C: 30 min -30°C to 20°C: 20 min	30°C to 100°C: 7 min 30°C to 350°C: 20 min
Typical Cool-Down Time	23°C to -90°C: 80 min 140°C to 20°C: 60 min	20°C to -25°C: 45 min 121°C to 20°C: 30 min	350°C to 125°C: 20 min 350°C to 50°C: 40 min
Access Opening/ Well configuration	Interchangeable Insert Ø 30 mm (Ø 1.18 in) 160 mm depth (6.3 in)	Interchangeable Insert Ø 60 mm (Ø 2.36 in) 170 mm depth (6.7 in)	Interchangeable Insert Ø 60 mm (Ø 2.36 in) 170 mm depth (6.7 in)
Dimensions (H x W x D)	380mm x 205mm x 480mm	380mm x 210mm x 300mm	290mm x 215mm x 345mm
Power	115V 60 Hz 230V 50 Hz Approx. 350 watts	100–240V 50/60Hz Approx. 375 watts	100–240V 50/60Hz Approx. 1,000 watts
Max # of thermocouples	16	48	48
Max # of IRTDs	2	3	3

LTR-150

DRY BLOCK AND LIQUID BATH ALL-IN-ONE TEMPERATURE CALIBRATOR

-30°C TO 150°C

From its ability to calibrate 48 thermocouples at one time to its versatility to function as a dry block, liquid bath or surface calibrator, the LTR-150 saves hours of time and effort when calibrating or verifying validation sensors.

FEATURES & BENEFITS

- Uniformity of up to 0.1°C
- Fast heating and cooling times
- Thermocouple fixture for easy handling of up to 48 TCs
- Dry block inserts are designed to accommodate thermocouples, IRTD, ValProbe (RT) flexible/bendable as well as RF ValProbe probes
- Software interface for all existing Kaye products (IRTD, Validator 2000, Validator AVS, ValProbe (RT) and RF ValProbe) and features automatic/manual calibrations

- Liquid micro bath tub with sensor cage and magnetic stirrer can be used for thermocouples, special process probes as well as ValProbe RT rigid loggers



HTR-420

DRY BLOCK TEMPERATURE CALIBRATOR | 30° TO 420°C

The Kaye HTR-420 is the most advanced high temperature calibrator and is compatible with the Validator 2000, Validator AVS, ValProbe (RT) or RF ValProbe software for automatic sensor calibration.

FEATURES & BENEFITS

- Uniformity of up to 0.1°C
- Fast heating and cooling times
- Software interface for all existing Kaye products (IRTD, Validator 2000, Validator AVS, ValProbe (RT) and RF ValProbe) and features automatic/manual calibrations
- Additional inserts available for calibrating specialty or process probes

LTR-90

ULTRA-COOL DRY BLOCK CALIBRATOR -90°C TO 140°C


The Kaye LTR-90 is an ultra-cool dry well calibrator designed for portability, and ease of operation. Operating from -90°C to +140°C it delivers fast response, high stability and automated sensor calibration for ultra-low temperature applications.

FEATURES & BENEFITS

- Stirling cooler technology: reaches -90°C in 80 min
- Temperature stability of $\pm 0.01^\circ\text{C}$
- Axial uniformity 0.05°C full range
- Software interface with Kaye Validator for automatic sensor calibration utility
- Custom block design to accommodate 2 reference probes (IRTD) and four inserts with three thermocouples per insert
- Rubber insulator cap to prevent frost buildup

Liquid Calibration Baths

SPECIFICATIONS ▼

	CTR-25	CTR-40	CTR-80
			
Temperature Range	-25°C to 140°C	-40°C to 150°C	-80°C to 30°C (100°C)
Temperature Stability	0.01°C	±0.005°C at -40°C (oil)	±0.006°C at -80°C (halocarbon)
Typical Heat-Up Time	25°C to 140°C: 55 min	25°C to 150°C: 60 min	-80°C to 25°C: 60 min
Typical Cool-Down Time	140°C to 25°C: 45 min	25°C to -40°C: 110 min	25°C to -80°C: 120 min
Access Opening / Well configuration	111mm x 111mm (4.4" x 4.4") Tank 2.5l	172mm x 94mm (6.8" x 3.7") Tank 9.2l	86mm x 114mm (3.25" x 4.5") Tank 3.8l
Dimensions (H x W x D)	382mm x 242mm x 400mm	584 mm x 305 mm x 622 mm	762 x 305 x 610mm
Power	115V 50 Hz or 60 Hz 230V 50 Hz or 60 Hz Approx. 1,150 watts	115V 60 Hz 230V 50 Hz Approx. 1,400 watts	115V 60 Hz 230V 50 Hz Approx. 1,700 watts
Max number of rigid ValProbe loggers	10	16	3

Additional fixtures available for:

- CTR-40 – can hold up to 20 freeze dryer loggers
- CTR-80 – can hold up to 12 freeze dryer loggers

CTR-25

PORTABLE LIQUID CALIBRATION BATH | -25°C TO 140°C

The CTR-25 was designed to address portability, capacity, speed and accuracy requirements not normally found in competitive liquid baths. The CTR-25 is ideally suited for verifications of up to 10 Kaye ValProbe or ValProbe RT Loggers as well as various sized process sensors.

FEATURES & BENEFITS

- Uniformity of up to 0.02°C
- Firmware supports automatic/manual verifications of ValProbe loggers
- Compressor free unit – operates with modern Peltier technology
- Stainless steel casing withstands harsh sterilizing chemicals
- Large front panel display with intuitive controls
- Large 2.5l tank with up to 6" (15.24cm) depth can accommodate wide range of sensor types



CTR-40

LIQUID CALIBRATION BATH

-40°C TO 150°C

The advanced design of the CTR-40 combines excellent temperature stability and uniformity with a temperature range of -40 to 150°C to address ValProbe applications. The generous 9.2-liter tank and specially designed ValProbe immersion basket accommodate up to 16 ValProbe loggers, making calibration or verification a quick and easy process.

FEATURES & BENEFITS

- Large capacity for multiple and different size sensors
- Indicates temperature to 0.01°C resolution
- Automates calibration when used with all Kaye Products
- Quiet operation

CTR-80

ULTRA-LOW TEMPERATURE BATH

-80°C TO 30°C

The CTR-80 bath is the ideal unit for calibrating temperature sensors used in freeze dryers, freezers, and ultra-low cryo units. Operating from -80 to 30°C, the CTR-80 brings fast response and high stability to your cold temperature applications.

FEATURES & BENEFITS

- Large capacity for multiple and different size sensors
- Uniformity of up to $\pm 0.008^\circ\text{C}$
- Indicates temperature to 0.01°C resolution
- Automates calibration when used with the Validator 2000
- Quiet operation

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