# Kaye ValProbe® Series

## Temperature Calibration and Reference

### Features

- Operates on standard line voltage
- Positions for two IRTD standards

### Fluid Baths

- Wide operating range covers most common application requirements
- CTR-40 stability to ±0.005°C or CTR-80 stability to ±0.01°C
- Rapid cool down from ambient to –40°C
- Very low noise
- Modest footprint with floor cart available for portability
- Quick drain spout simplifies fluid change
- 120 minute cool-down from ambient to –80°C
- Mounted on casters for portability



### Dry Wells

- HTR and LTR Series dry wells
- Rapid response time with no oils or fluids
- Stability of ±0.02°C to ±0.05°C for temperatures exceeding 300°C
- Lightweight yet rugged design for portability

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# Temperature Calibration

## CTR–40

The CTR–40 is a portable temperature bath designed to meet the calibration and validation needs of the ValProbe system. Combined with the Intelligent RTD (IRTD) and ValProbe software, the CTR–40 provides pre-study and post-study verifications, as well as ValProbe temperature sensor calibration.

The advanced design combines excellent temperature stability and uniformity with a broad temperature range –40°C to 150°C to address most ValProbe applications. The generous nine liter tank and specially designed ValProbe immersion basket accommodate up to eight ValProbe loggers, making calibration or verification a quick and easy process.

The portable tabletop design easily fits onto a benchtop without consuming precious space. An optional floor cart, with locking casters, raises the unit to a convenient operating height and allows easy transport within your facility.

## Intelligent RTD Standard

The IRTD Temperature Standard (IRTD 400) is a National Industry of Standards and Technology (NIST) traceable instrument calibrated from –195°C to 420°C with 0.025°C accuracy over the entire range. This completely self-contained measurement system serves as the secondary standard providing traceability for ValProbe calibration or verification. By interfacing with the ValProbe software, the IRTD 400 eliminates the potential for human error, ensuring accurate and traceable measurements.



ValProbe immersion basket shown with IRTD Standard (not included).

# Temperature Calibration

## Stable Uniform Heat Sources

Kaye temperature references are designed for easy operation while delivering the highest level of temperature stability possible. These stable uniform heat sources combine rapid heat-up and cool-down with large sensor capacity to minimize overall calibration time. Multiple calibration set points are programmed via the easy-to-use operator panel and displayed (set point or well temperature) to 0.01 degree accuracy. These references provide fully automated sensor calibration when used with Kaye's Validator® 2000 and traceable IRTD temperature standard.

## HTR and LTR Series Dry Wells

The HTR and LTR Series dry wells are specifically designed for calibrating sensors used for process validation. These are the most advanced reference units on the market, featuring fast heat-up and cool-down, large well capacity to accommodate 18 to 24 thermocouples, and they use no messy oils or fluids.

The HTR 400 is ideal for high-temperature applications such as autoclaves, dry heat ovens and sterilizer tunnels. The LTR models offer low-temperature performance for applications including freezers, cold rooms, incubators and autoclaves. The LTR model selection should be based on the application's low-temperature point.

## CTR–80 Cryo Temperature Bath

Operating from –80°C to 30°C, the CTR delivers fast response, high stability, and automated sensor calibration for the most severe cold-temperature applications. A generous 3.7 liter tank is heated and cooled quickly and quietly by a two-stage refrigeration system (R507 and R508B). The CTR–80 is the ideal unit for calibrating temperature sensors used in freeze dryer, freezer, and cryo unit validation.



LTR Series

# ValProbe Series Specifications

## CTR-40

### Temperature Range
-40°C to 150°C

### Ambient Operating Range
15°C to 25°

### Set-Point Accuracy
0.5°C

### Temperature Stability
- ±0.005°C at -40°C
- ±0.005°C at -25°C
- ±0.005°C at -150°C

### Temperature Uniformity
±0.01°C

### Typical Cool-Down Time
25°C to -40°C, 110 minutes

### Access Opening
94 mm x 172 mm with positions for IRTD and up to eight ValProbe data loggers with immersion basket

### Display
LED with 0.01°C resolution

### Computer Interface
RS232

### Off Cart Dimensions (h x w x d)
584 mm x 305 mm x 622 mm

### On Cart Dimensions (h x w x d)
819 mm x 305 mm x 622 mm

### Volume
9 liters

### Recommended Bath Fluids
- -40°C to 130°C, Silicone oil type 200 (five centistoke viscosity)
- -30°C to 150°C, Silicone oil type 200 (10 centistoke viscosity)

### Weight
32 kg

### Power
115 VAC 60 Hz, 16 A or 230 VAC 50 Hz, 8 A 1700 W

### Fault Protection
- Oven temperature limits (user can set)
- Low voltage cutout
- Automatic refrigeration turn off
- Electrical fuse

## CTR-80

### Temperature Range
-80°C to 100°C

### Ambient Operating Range
15°C to 25°

### Set-Point Accuracy
0.5°C

### Temperature Stability
±0.01°C

### Temperature Uniformity
±0.012°C

### Typical Cool-Down Time
25°C to -80°C, 20 minutes

### Access Opening
86 mm x 114 mm with positions for (two) IRTDs and (three) 11 mm diameter x 203 mm deep calibration wells

### Display
LED with 0.01°C resolution

### Computer Interface
RS232

### Dimensions (h x w x d)
762 mm x 305 mm x 610 mm

### Weight
57 kg

### Power
115 VAC 60 Hz, 16 A or 230 VAC 50 Hz, 8 A 1700 W

### Fault Protection
- Oven temperature limits (user can set)
- Low voltage cutout
- Automatic refrigeration turn off
- Electrical fuse

# ValProbe Series Specifications

## IRTD-400

### Temperature Range
-195°C to 420°C

### Accuracy Over Range
0.025°C
*Accurate for one year, 0°C to 60°C ambient. Includes calibration certificate with traceability to NIST.*

### Resolution
0.001°C

### Sensor Element
200 Ω platinum RTD sensor

### Sheath Material
Inconel 600

### Immersion Depth (Minimum)
101.6 mm

### Calibration
±0.01°C
*Kaye provides a re-certification service for calibrating the temperature standard.*

### Power Probe
- Unregulated DC, 10 to 25 V
- 850 mW at 15 V for first probe
- 550 mW for each additional probe

### Power Supply
115 VAC US-style adaptor or 230 VAC VDE-approved adaptor
*Power supply is not required for use with the ValProbe system.*

### Measurement Rate
One reading per second

### Environmental
- Ambient temperature range 0°C to 60°C
- Humidity 0 to 95% non-condensing

### Overall Dimension Length
603 mm

### Grip
89 mm x 32 mm

### Sensor Sheath
457 mm x 6.35 mm

| | HTR 400 | LTR –25/140 | LTR –40/140 |
|---|---|---|---|
| Temperature Range | 25°C above ambient to 400°C | –25°C to 140°C | –40°C to 140°C |
| Ambient Operating Range | 5°C to 50°C | 5°C to 50°C | 5°C to 50°C |
| Set-Point Accuracy | 0.2°C to 300°C | 0.2°C | 0.2°C |
| | 0.3°C to 400°C | | |
| Temperature Stability | 0.02°C to 300°C | 0.02°C | 0.02°C |
| | 0.05°C to 400°C | | |
| Transfer Calibration Accuracy* | 50°C to 150°C: ±0.1°C | –25°C to 80°C: ±0.1°C | –40°C to –25°C: ±0.15°C |
| IRTD Standard to Thermocouples | 50°C to 250°C: ±0.2°C | 80°C to 130°C: ±0.15°C | –25°C to 80°C: ±0.1°C |
| | 250°C to 350°C: ±0.3°C | 130°C to 140°C: ±0.18°C | 80°C to 130°C: ±0.15°C |
| | 350°C to 400°C: ±0.4°C | | 130°C to 140°C: ±0.18°C |
| Typical Heat-Up Time | Ambient to 90°C: 5 minutes | Ambient to 80°C: 6 minutes | Ambient to 80°C: 6 minutes |
| | 90°C to 125°C: 3 minutes | Ambient to 140°C: 14 minutes | Ambient to 140°C: 14 minutes |
| | 350°C: 25 minutes | | |
| Well Configuration | Reference wells (2): 6.7 mm diameter x 127 mm deep | Reference wells (2): 6.7 mm diameter x 155 mm deep | Reference wells (2): 6.7 mm diameter x 155 mm deep |
| | Calibration wells (8): 9 mm diameter x 155 mm) deep | Calibration wells (6): 9 mm diameter x 155 mm) deep | Calibration wells (6): 9 mm diameter x 155 mm) deep |
| Display | LED w/0.01°C resolution | LED w/0.01°C resolution | LED w/0.01°C resolution |
| Computer Interface | RS232 | RS232 | RS232 |
| Dimensions | 343 mm x 198 mm x 317.5 mm | 343 mm x 198 mm x 317.5 mm | 343 mm x 198 mm x 317.5 mm |
| Weight | 8.2 kg | 13.6 kg | 13.6 kg |
| Power | 115 VAC 60 Hz, 6 A or 230 VAC 50 Hz, 3 A 700 watts | 115 VAC 60 Hz, 3 A or 230 VAC 50 Hz, 1.5 A 350 watts | 115 VAC 60 Hz, 3 A or 230 VAC 50 Hz, 1.5 A 350 watts |
| Fault Protection | Sensor burnout protection, over temperature thermal cutout, electrical fuse | Sensor burnout protection, over temperature thermal cutout, electrical fuse | Sensor burnout protection, over temperature thermal cutout, electrical fuse |

* Transfer calibration accuracy is the difference between the thermocouple tip and the sensor of the IRTD temperature standard. This accuracy includes well to well uniformity.

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