Temperature Standards

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 and traceable IRTD temperature standard.

Features

HTR and LTR Series Dry Wells

- Rapid response time with no oils or fluids
- Stability of ±0.02°C (±0.05°C for temperatures exceeding 300°C)
- Lightweight yet rugged design for portability
- Operates on standard line voltage
- Dry well inserts minimize thermocouple tip cooling
- Temperature range -95° to +140°C

CTR -80 Cryo Temperature Bath

- 120 minute cool-down from ambient to =80°C
- Stability of ±0.01°C
- Very low noise
- Operates on standard line voltage
- Mounted on casters for portability
- Positions for two IRTD standards

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Advanced Sensors

CTR-80 Cryo Temperature Bath

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

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 wr thermocouples, and 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 ultra low-temperature performance to -95°C for applications including freezers, cold rooms, incubators and autoclaves. The LTR model selection should be based on the application's low-temperature point.

Specifications	CTR-40	CTR-80	HTR 400	LTR -25/140	LTR-40/140	LTR-90
Temperature Range	–40°C to 150°C	-80 to 100°C (–112°F to 212°F)	25°C above ambient to 400°C	–25°C to 140°C	–40°C to 140°C	–95°C to 140°C
Ambient Operating Range	5–40°C (41–104°F)	15 to 25°C (59 to 77°F)	5°C to 50°C	5°C to 50°C	5°C to 50°C	5°C to 50°C
Set-Point Accuracy	±0.5°C	±0.006°C at –80°C (ethanol) ±0.010°C at 0°C (ethanol) ±0.010°C at 100°C (oil)	0.2°C to 300°C 0.3°C to 400°C	0.2°C	0.2°C	0.2°C
Temperature Stability	±0.005°C at –40°C (ethanol) ±0.005°C at 25°C (water) ±0.007°C at 150°C (5012 oil)	±0.006°C at –80°C (ethanol) ±0.010°C at 0°C (ethanol) ±0.010°C at 100°C (oil)	0.02°C to 300°C 0.05°C to 400°C	0.02°C	0.02°C	0.02°C
Temperature Uniformity	±0.006°C at –40°C (ethanol) ±0.005°C at 25°C (water) ±0.010°C at 150°C (5012 oil)	±0.008°C at –80°C (ethanol) ±0.012°C at 0°C (ethanol) ±0.012°C at 100°C (oil)				
Transfer Calibration Accuracy* IRTD Standard to Thermocouples			50°C to 150°C: ±0.1°C 150°C to 250°C: ±0.2°C 250°C to 350°C: ±0.3°C 350°C to 400°C: ±0.4°C	–25°C to 80°C: ±0.1°C 80°C to 130°C: ±0.15°C 130°C to 140°C: ±0.18°C	–40°C to –25°C: ±0.15°C –25°C to 80°C: ±0.1°C 80°C to 130°C: ±0.15°C 130°C to 140°C: ±0.18°C	–40°C to –25°C: ±0.15°C –25°C to 80°C: ±0.1°C 80°C to 130°C: ±0.15°C
Typical Heat-Up Time	60 minutes, from 25°C to 150°C (5012 oil@115V)		Ambient to 90°C: 5 minutes 90°C to 125°C: 3 minutes 350°C: 25 minutes	Ambient to 80°C: 6 minutes Ambient to 140°C: 14 minutes	Ambient to 80°C: 6 minutes Ambient to 140°C: 14 minutes	Ambient to 80°C: 6 minutes Ambient to 140°C: 14 minutes
Typical Cool-Down Time	110 minutes, from 25°C to –40°C (ethanol)	25 to -80°C 120 min				
Access Opening	172mm x 94mm (6.8" x 3.7")	86 mm x 114 mm (3.25" x 4.5") w/positions for (2) IRTDs and (3) 11 mm (7/16") dia. x 203 mm (8") deep calibration wells				
Well Configuration			Reference wells (2): 6.7 mm diameter x 127 mm deep Calibration wells (8): 9 mm diameter x 155 mm) deep	Reference wells (2): 6.7 mm diameter x 155 mm deep Calibration wells (6): 9 mm diameter x 155 mm) deep	Reference wells (2): 6.7 mm diameter x 155 mm deep Calibration wells (6): 9 mm diameter x 155 mm) deep	Reference wells (2): 6.7 mm diameter x 155 mm deep Calibration wells (6): 9 mm diameter x 155 mm) deep
Display	Digital with push-button entry	LED w/0.01 (°C or °F resolution)	LED w/0.01°C resolution	LED w/0.01°C resolution	LED w/0.01°C resolution	LED w/0.01°C resolution
Computer Interface	RS-232	RS232	RS232	RS232	RS232	RS232
Dimensions	305 mm x 622 mm x 584 mm (12" x 24.5" x 23")	762 x 305 x 610 mm (30" H x 12"W x 24" D)	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	343 mm x 198 mm x 317.5 mm
Weight	35.4 kg (78 lb)	57 kg (125 lbs)	8.2 kg	13.6 kg	13.6 kg	13.6 kg
Power	115 VAC (±10%), 60 Hz, 15 amps [230 VAC (±10%), 50 Hz, 8 amps optional]	115 VAC 60 Hz, 16A or 230 VAC 50 Hz, 8A 1700 Watts	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	115 VAC 60 Hz, 3 A or 230 VAC 50 Hz, 1.5 A 350 watts
Fault Protection		Over temp limits(user settable), low voltage cutout, automatic refrigeration turn off, electrical fuse	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	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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