

# Temperature References

## *Stable Uniform Heat Sources*

GE 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 GE Kaye's Validator® 2000 and traceable IRTD temperature standard.

### F E A T U R E S

#### **HTR & LTR Series Dry Wells**

- Rapid response time with no oils or fluids
- Stability of  $\pm 0.02^{\circ}\text{C}$  ( $\pm 0.05^{\circ}\text{C}$  for temperatures exceeding  $300^{\circ}\text{C}$ )
- Lightweight yet rugged design for portability
- Operates on standard line voltage
- Dry well inserts minimize thermocouple tip cooling

#### **CTR -80 Cryo Temperature Bath**

- 120 minute cool-down from ambient to  $-80^{\circ}\text{C}$
- Stability of  $\pm 0.01^{\circ}\text{C}$
- Very low noise
- Operates on standard line voltage
- Mounted on casters for portability
- Positions for two IRTD standards

## *HTR & LTR Series Dry Wells*

The HTR & 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 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  $-80$  to  $30^{\circ}\text{C}$ , 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 system (R507 and R508B). The CTR -80 is the ideal unit for calibrating temperature sensors used in freeze dryer, freezer, and cryo unit validation.



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# Temperature References

Specifications	HTR 400	LTR -25/140	LTR -40/140	Specifications	CTR -80
<b>Temperature Range:</b>	25°C above ambient to 400°C	-25 to 140°C	-40 to 140°C	<b>Temperature Range:</b>	-80 to 30°C
<b>Ambient Operating Range:</b>	5 to 50°C (40 to 120°F)	5 to 50°C (40 to 120°F)	5 to 50°C (40 to 120°F)	<b>Ambient Operating Range:</b>	15 to 25°C (59 to 77°F)
<b>Set-Point Accuracy:</b>	0.2 to 300°C 0.3 to 400°C	0.2°C	0.2°C	<b>Set-Point Accuracy:</b>	0.5°C
<b>Temperature Stability:</b>	0.02 to 300°C 0.05 to 400°C	0.02°C	0.02°C	<b>Temperature Stability:</b>	± 0.01°C
<b>Transfer Cal. Accuracy<sup>1</sup> (IRTD Standard to Thermocouples):</b>	50 to 150°C: 0.1°C 150 to 250°C: 0.2°C 250 to 350°C: 0.3°C 350 to 400°C: 0.4°C	-25 to 80°C: 0.1°C 80 to 130°C: 0.15°C 130 to 140°C: 0.18°C	-40 to -25°C: 0.15°C -25 to 80°C: 0.1°C 80 to 130°C: 0.15°C 130 to 140°C: 0.18°C	<b>Temperature Uniformity:</b>	± 0.012°C
<b>Typical Heat-up Time:</b>	Ambient to 90°C: 5 min 90 to 125°C: 3 min Ambient to 350°C: 25 min	Ambient to 80°C: 6 min Ambient to 140°C: 14 min	Ambient to 80°C: 6 min Ambient to 140°C: 14 min	<b>Typical Cool-Down Time:</b>	25 to -80°C 120 min
<b>Well Configuration:</b>	Reference wells (2): 6.7mm (0.265") dia. x 127mm (5") deep Calibration wells (8): 9mm (0.354") dia. x 155mm (6.1") deep	Reference wells (2): 6.7mm (0.265") dia. x 155mm (6.1") deep Calibration wells (6): 9mm (0.354") dia. x 155mm (6.1") deep	Reference wells (2): 6.7mm (0.265") dia. x 155mm (6.1") deep Calibration wells (6): 9mm (0.354") dia. x 155mm (6.1") deep	<b>Access Opening:</b>	86mm x 114mm (3.25" x 4.5") w/positions for (2) IRTDs and (3) 11mm (7/16") dia. x 203mm (8") deep calibration wells
<b>Display:</b>	LED w/0.01 (°C or °F) resolution	LED w/0.01 (°C or °F) resolution	LED w/0.01 (°C or °F) resolution	<b>Display:</b>	LED w/0.01 (°C or °F) resolution
<b>Computer Interface:</b>	RS-232	RS-232	RS-232	<b>Computer Interface:</b>	RS-232
<b>Dimensions:</b>	343 x 198 x 317.5mm (13.5"H x 7.8"W x 12.5"D)	343 x 198 x 317.5mm (13.5"H x 7.8"W x 12.5"D)	343 x 198 x 317.5mm (13.5"H x 7.8"W x 12.5"D)	<b>Dimensions:</b>	762 x 305 x 610mm (30"H x 12"W x 24"D)
<b>Weight:</b>	8.2kg (18 lbs)	13.6kg (30 lbs)	13.6kg (30 lbs)	<b>Weight:</b>	57kg (125 lbs)
<b>Power:</b>	115VAC 60Hz, 6A or 230VAC 50Hz, 3A 700 Watts	115VAC 60Hz, 3A or 230VAC 50Hz, 1.5A 350 Watts	115VAC 60Hz, 3A or 230VAC 50Hz, 1.5A 350 Watts	<b>Power:</b>	115VAC 60Hz, 16A or 230VAC 50Hz, 8A 1700 Watts
<b>Fault Protection:</b>	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	<b>Fault Protection:</b>	Over temp limits (user settable), low voltage cutout, automatic refrigeration turn off, electrical fuse

<sup>1</sup>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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