

Previous model number: 900

# CA503-260

## High Sensitivity Large Sample In-Line (Glove Box) Calorimeter

### Introduction

The design of the demountable CA503-260 High Sensitivity In-Line (Glove Box) Calorimeter is based around a sample well that maintains glove box integrity. The thermal element is positioned from below and fixed to the underside of the glove box floor. The sample well becomes part of the calorimeter inner cylinder or measurement chamber.

The design has application to a wide range of measurement requirements including international safeguards measurements, shipper-receiver difference measurements, in-plant accountancy measurements and anomaly resolution in passive neutron coincidence counting or segmented gamma-ray scanning. The instrument also has a role in replacing a portion of Destructive Assay (DA).

In the standard configuration, the calorimeter is capable of measuring plutonium bearing samples that can be contained in a cylindrical canister with internal dimensions 186 mm (7.32 in) in diameter and 240 mm (9.45 in) high. The calorimeter has a variable sample power measurement range from below 0.025 watts to 15 watts and an operating temperature range of 20 to 30 °C.

Variations to the standard design for different requirements and for special sample types or sample packaging can be accommodated. In particular the measurement chamber volume may be reduced or increased in size and measurement precision and measurement time may be optimised for a specific limited sample power range. Smaller sample diameter custom systems achieve significantly better precision and accuracy at lower measurement powers (e.g. <10 mW).

### Features

- True Isothermal 'Air Bath' Absolute Calorimetry Measurements
- Automatic software algorithms for equilibrium sample power prediction and measurement end point determination
- Automatic plutonium and americium decay correction
- Custom designs are available from ANTECH for different size and dimensions of sample containers and measurement sensitivities
- Software selectable redundant measurement sensors and operation modes to optimise either accuracy or measurement time
- Unique design maintains glove box integrity with calorimeter measurement sensors external to the sample well
- Measurements approved for use by IAEA and WIPP



## Benefits

- Avoids the need to “bag out” samples and remove them from the glove box for measurement
- Comprehensive user friendly windows based User Interface Software
- Reduced criticality hazard as water is not used as a heat sink
- Measurement times with equilibrium sample power prediction of between 2-4 hours depending on sample
- Total mass of plutonium determined with error propagation when plutonium isotopic data is provided on a file or ‘on-line’ from ANTECH plutonium gamma-ray Isotopic Measurement System
- Comprehensive and traceable electrical calibration capability reduces dependence on plutonium standards
- Complete heat measurement performed inside glove box containment



Transportable Calorimeter Model CP264-0420

## Specification

<b>Thermal power measurement accuracy</b>	Better than 0.5% over the operating range and better than 0.2% at 1.0 W power
<b>Cylindrical sample chamber</b>	190 mm (7.5 in) diameter, 240 mm (9.45 in) height
<b>Variable measurement chambers operating temperature range</b>	20 - 30 °C
<b>Measurement range</b>	Up to 15 W
<b>Detection level</b>	<5 mW
<b>Power consumption</b>	300 - 600 W 110/230 VAC