

Previous model number: 271

CP271-0442

Calorimeter Pre-heater

Introduction

The ANTECH Model CP271-0442 calorimeter pre-heater uses the temperature control technology developed for the ANTECH CP Series calorimeters. This technology enables up to four canisters to be preheated prior to measurements being made in a calorimeter. Each of the pre-heater cells can be set to a different temperature enabling the CP271-0442 to be used with multiple calorimeters.

During normal measurements a calorimeter is subject to large temperature changes when a new “cold” canister is inserted. The mass of the calorimeter and the canister have to reach thermal equilibrium, which increases the measurement time. Preheating enables this equilibrium to be achieved in the pre-heater rather than in the calorimeter. Measurement time is reduced as the calorimeter measurement chamber does not need to re-establish thermal equilibrium when a new sample canister is introduced.

Sample preheating and sample end point power prediction cannot be employed together. Prediction is most effective when only one sample is available at a time for measurement. The early declaration of a predicted end point sample power in this case enables the measurement time to be reduced.

Sample preheating is the most effective when multiple samples are available for measurement at the same time. Each sample canister reaches the calorimeter equilibrium temperature profile while in the pre-heater. When such a preheated sample canister is rapidly transferred to a calorimeter measurement chamber, the calorimeter reaches thermal equilibrium in a considerably shorter time than would be the case for an un-preheated canister.

Each of the four pre-heater cells offers high stability temperature control. The instrumentation scans each cell and provides the necessary power to maintain temperature stability. If the thermal disturbance during canister transfer is small, calorimeter measurement times as short as 2 hours are possible.

Features

- Preheats between 1 and 4 canisters to calorimeter preset operating temperature value
- Fully automatic temperature control
- Stainless steel construction ensures easy decontamination
- Unit is mounted on a single trolley and connected to an instrument rack by multi-core cables



Benefits

- Easy to use software that requires no operator interaction
- Two stage heat control ensures high accuracy and stability
- Readily transportable (fits through a normal doorway)
- Reduces calorimeter measurement times by 50% or more
- Particularly suitable for measurement of waste residues with poor thermal diffusiveness
- Custom designs are available from ANTECH for different sizes of sample containers and different number of cells

Specification

Preheating cells	Four cells, each independently controlled
Pre-conditioner	Sample canister pre-conditioner compatible with ANTECH P Series and Q Series calorimeters for both Pu and tritium measurements (also available for other calorimeter models)
Weight of complete trolley mounted instrument	375 kg (826.73 lb)
Power consumption	1000 W maximum 110/230 VAC, 50/60 Hz
Temperature stability	Controls canisters with sample powers from 1 to 15 W to $\pm X$ °c