# ChemiSorb HTP

## High Thoughput Chemisorption Analyzer

- *High throughput with six analysis stations*
- *Up to six chemisorption analyses can begin simultaneously*
- *Independent furnaces for each analysis station features a user defined temperature range from 10 ºC above ambient to 700 ºC.*
- *Quartz sample reactor with flow-through design, available for various size pellets, core and powders*
- *Fully automated analysis*
- *Long unattended analysis times for high resolution adsorption isotherms*
- *Analysis ports operate concurrently or in parallel*
- *Up to 12 different gases can be attached simultaneously*
- *Windows® driven software*

Optimum design and efficient utilization of catalysts require a thorough understanding of the surface structure and surface chemistry of the catalytic material. Chemical adsorption analyses can provide much of the information needed to evaluate catalyst materials in the design and production phases, as well as after a period of use.

The ChemiSorb HTP is a fully-automated high-throughput chemisorption analyzer that determines the percent metal dispersion, active metal surface area, size of active particles, and surface acidity of catalyst materials. A major advantage of this instrument is its six analysis stations. Multiple analyses can be run simultaneously or in parallel on one instrument not only saving time for busy catalyst operations, but providing economy of lab space.

The ChemiSorb HTP features a vacuum system and manifold with constantly monitored pressure transducers on each of its six analysis stations. Each port is also equipped with a furnace enabling independent control of sample temperature and ramping from 10 ºC above ambient to 700 ºC. The temperature is recorded with each equilibrium pressure to provide the highest quality isotherms possible. An equilibration option allows the user to specify different equilibration times. A mass flow controller is installed in each port to ensure accurate and reproducible flow through the sample. Up to twelve different gases can be attached to the ChemiSorb HTP simultaneously.

Degas/sample preparation is done in-situ prior to analysis. Samples may be added or removed from each station without disturbing the treatment of other samples undergoing preparation or analysis. The instrument features long unattended analysis times and a high-throughput mode that allows the user to start multiple parallel analyses.

The ChemiSorb HTP analysis program operates in a Windows® environment. This makes operation of the analyzer easier and allows the user to run other applications while an automatic operation is in progress. The report system provided in the analysis program allows the user to manipulate and customize reports in a variety of ways. Zoom in on portions of the graphs or shift the axes to examine fine details. Graphs and data can be copied to the clipboard and pasted into other applications. Reports can be customized with a choice of fonts and a company logo added to the report header.

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*The Science and Technology of Small Particles™*

**www.micromeritics.com**

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Customer Orders: 770.662.3636, FAX: 770.662.3696

# Specifications

## Analysis

Capacity: 6 sample stations

## Manifold Temperature

Type: Seven platinum resistance detector (RTD)
Accuracy: ± 0.02 °C by keyboard entry
Stability: ± 0.1 °C per month

## Gas Flow Control

Type: Six Mass Flow Controller, One per port
Range: 0 to 200 sccm (nitrogen equivalent flow rate)
Accuracy: ≥ 5% full scale

## Gas Dosing

Accuracy 0.05 $cm^3$ STP, normal doses
0.01 $cm^3$ STP, low-pressure doses

## Pressure Measurement

Analysis Manifold Transducers:

- Range: 0 to 950 mmHg
- Resolution: 0.001 mmHg, 1000-mmHg transducer
  0.00001 mmHg, 10-mmHg transducer
- Accuracy: Within 0.15% of reading, 1000- and 10-mmHg transducers (Includes nonlinearity, hysteresis and non-repeatability; transducer manufacturer's specifications.)

Sample Port Transducers:

- Range: 0 to 1000 mmHg
- Resolution: 0.001 mmHg, 1000-mmHg transducer
  0.00001 mmHg, 10-mmHg transducer
- Accuracy: Within 0.5% of reading, 1000- and 10-mmHg transducers (Includes non linearity, hysteresis and non repeatability; transducer manufacturer's specifications.)

Vacuum Gauge:

- Type: Pirani thermal vacuum gauge
- Range: 0.000375 mmHg to ≥1 mmHg
- Resolution on screen:
  0.0001 mmHg (0.1 microns)

## Vacuum System

Diaphragm pump: Two-stage, ultimate vacuum less than 3 mmHg
High-vacuum pump: Less than 3.8 x $10^{-9}$ mmHg, measured by pump manufacturer according to Pneurop Standard 5608

## Furnace System

The ChemiSorb HTP has six independent furnaces, one for each sample port.

Temperature Range: 10 ºC above ambient to 700 ºC
Accuracy: ± 1.0 ºC
Stability: ± 0.5 ºC up to 50 ºC;
± 1.0 ºC from 50 to 700 ºC;
Ramp Range: 1 to 20 ºC/min up to 500 ºC
1 to 10 ºC from 500 to 700 ºC
Cool down: From 700 to 10 ºC above ambient in less than 60 minutes
Temperature increment: 1 ºC

## Electrical

Voltage: 100/115/230 VAC
Frequency: 50 or 60 Hz
Power: 1500 VA, maximum
(exclusive of vacuum fore pump which is powered separately)

## Environment

Temperature: 10 to 35 ºC (50 to 95 ºF), operating;
-10 to 55 ºC (14 to 131 ºF), storing or shipping
Humidity: Up to 90% non-condensing (for instrument)
20 to 80% (for computer system)

## Physical

| | | |
|---|---|---|
| Width: | 159 cm | (63 in.) |
| Depth: | 51 cm | (20.2 in.) |
| Height: | 159 cm | (62.5 in.) |
| Weight: | 215 kg | (475 lb) |

## Computer

Minimum requirements: Computer capable of running Windows® 7, Windows® XP Professional or Windows Vista® Business or Ultimate operating system
CD-ROM drive
512 megabytes of main memory
20-gigabyte hard drive
SVGA monitor (1024 x 768 minimum resolution)
Ethernet port, capable of communicating with a 10 base-T ethernet card

*In keeping with a policy of ongoing product improvement, specifications are subject to change without notice*

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QUALITY MANAGEMENT SYSTEM
CERTIFIED BY DNV
ISO 9001:2008

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