

# AMI-400TPx

#### Cost-Effective, Automated Chemisorption Analysis

## **INTRODUCTION**

"Complete Chemisorption & Reactor Solutions—Precision Without the Premium"



Figure 1. AMI-400TPx chemisorption analyzer

The **AMI-400TPx** sets a new benchmark in fully automated chemisorption analysis, combining advanced capabilities with outstanding economic efficiency. Designed with unattended operation at its core, it addresses the high standards and evolving needs of catalyst researchers while minimizing operating costs and maximizing laboratory productivity.

This space-saving system is equipped with robust control components and advanced data processing software, enabling the delivery of accurate kinetic parameters critical for catalyst characterization. Its compact, cost-effective design makes it an ideal choice for labs with limited space or budget, without compromising analytical performance.

The **AMI-400TPx** comes standard with temperature-programmed desorption (TPD), temperature-programmed reduction and oxidation (TPR/O), and temperature-programmed surface reaction (TPSR) capabilities. For laboratories with more advanced requirements, optional features include pulse chemisorption, a sub-ambient temperature module, a mass spectrometer for evolved gas analysis, and a gas chromatograph for detailed component separation and quantification. This flexibility allows users to tailor the system to their specific research goals while maintaining a practical, affordable approach to catalyst evaluation.



#### SOFTWARE

One of the key advantages of the **AMI-400TPx** is its ability to operate without constant operator supervision, making it an ideal solution for busy research environments. Once the experiment is set up and running, the system performs fully automated sequences, freeing up valuable time for researchers to focus on data analysis, planning, or other laboratory activities.

The instrument is designed to run on a standard Windows-based computer, providing a familiar and user-friendly interface. It also supports Internet connectivity, enabling remote monitoring and control when needed. This flexibility ensures that the **AMI-400TPx** can be easily integrated into the existing digital infrastructure of any laboratory.

Moreover, the same computer used to control the instrument can be utilized to manage additional laboratory tasks, streamlining operations and reducing the need for multiple workstations. This combination of automation, connectivity, and multitasking capability makes the **AMI-400TPx** a powerful and practical tool for modern catalyst research laboratories.



Figure 2. AMI-400TPx operation interface

The **AMI-400TPx** features a user-friendly interface and intuitive layout that simplifies experimental design. Users need only to input the changeable process variables, while the system automatically handles the rest—making setup quick and error-free. Flexible selection or customization of methods such as TPD, TPO, TPR, TPSR, and pulse calibration is supported, with the ability to configure up to 99 fully automated programs. A complete experiment can be set up in just a few minutes, streamlining workflows and boosting lab productivity.



Step1	Pretreatment	Step2	TPR/O	Step3	Calibration	Step list	1- Treatment 2- TPR/O
TPI	R/O	RI	un				3- Pulse Calibration
Initialize	Camier Gas F C6: 10%H2/Ar 🗸	How Rate(sccm)	Initial Temp(°C)	Bypass Trap	Hold Time(hm:s) 00:02:00		
Detector	Yes	TCD Current(mA) 1 75	Delay for AutoBaseline No	TCD Gain Sec 5	onds/Point 0.1 🗸		
Ramp &Hold	Temp SP(*c) Ramp 100	Rate(*c/min) Hold 1 10 00	Time(h:m:s) 0:00:10				
Ending Condition	Post Flush No	Flow Rate(score 30	n) Hold Time(ham:s) 00:02:00	Max Time (min) Inf	1		
	Step1	Step1 Pretreatment   TPR/O   Initialize Carrier Gas   C6: 10%H2/Ar C   Detector TCD Enable   Yes Yes   Ramp &Hold Temp SP(c)   Ending Condition Post Flash	Step1 Pretreatment Step2   TPR/O Image: Comparison of the state of	Step1 Pretreatment Step2 TPR/O   TPR/O Image: Constraint of the state of the st	Step1 Pretreatment Step2 TPR/O Step3   TPR/O Image: Carrier Gas Flow Rate(sccm) Initial Temp(vc) Image: Condition of the step of the st	Step1   Pretreatment   Step2   TPR/O   Step3   Calibration     TPR/O   Image: Carrier Gas   Flow Rate(sccm)   Initial Temp(%)   Image: Carrier Gas   Flow Rate(sccm)   Image: Colspan="2">Bypass Trap   Hold Time(hmuts)     Initial Temp(%)   Image: Colspan="2">Image: Carrier Gas   Flow Rate(sccm)   Initial Temp(%)   Image: Colspan="2">No   Step3   Calibration     Initialize   Carrier Gas   Flow Rate(sccm)   Initial Temp(%)   Image: No   Step3   Calibration     Detector   CG: 10%H2/Ar   30   40   Image: No   Cols200   Image: No   Cols200     Detector   ICD Enable   ICD Current(mA)   Delay for AutoBaseline   TCD Gain   Seconds/Point     Yes   ICD Current(mA)   Delay for AutoBaseline   TCD Gain   Seconds/Point     Temp SP(C)   Ramp Rate(*C/min)   Hold Time(hums)   Image: No   Image: No   Image: No     Binding   No   Image: No   Image: No   Image: No   Image: No   Image: No     Binding   No   Image: No   Image: No   Image: No   Image: No   Image: No   Image: N	Step1   Pretreatment   Step2   TPR/O   Step3   Calibration   Step list     TPR/O   Image: Calibration   <

Figure 3. AMI-400TPx experiment setting interface

The **AMI-400TPx** is equipped with a multi-layered safety system that combines hardware, firmware, and software safeguards to ensure reliable and secure operation. On the hardware side, a temperature safety switch provides immediate protection against furnace overheating. Built-in firmware-level factory-set alarms offer an additional layer of control to prevent unsafe operating conditions. At the software level, an intuitive interface allows users to configure a wide range of safety protection programs, including automated alarms, manual valve control, and real-time input of gas flow and temperature settings. Together, these features deliver robust, comprehensive protection throughout every stage of operation.

	_	Alar	m Matri	x	_	
Shutdown Alarms	Alarms	Limit(°C)	State	Reset All SP	Other Action	
	TCD Oven	310	•		Drop Main Contactor	$\square$
	Valve Oven	175			Drop Main Contactor	$\checkmark$
	Furnace limit	1200	•		Drop Main Contactor	$\checkmark$
	Bed limit	1200	•		Drop Main Contactor	$\checkmark$
Adjustable Alarms	Alarms	Limit(°C)	State	Reset All SP	Other Action	
	TCD oven overshoot	1111	•		SP to 25 degrees	
	Valve oven overshoot	1111	•		SP to 25 degrees	
	Bed not heating	1200	•		SP to 25 degrees	
MFC Flow Toleranc	e					
	Carrier Tolerance	102				
						OK

Figure 4. AMI-400TPx alarms setting interface



## **TECHNICAL PARAMETERS**

	AMI-400TPx			
Number of Stations	1			
Temperature range	-100 °C (optional) -1200 °C			
Mass flow controller	1			
Temperature ramp rates	0.1 - 50 °C/min			
Gas inlets	6 analysis ports, 4 pulse ports			
Operating Pressure	Atmospheric pressure			
Gas flow rate	2-100 sccm			
Sample tube	Quartz U-shaped tube, bubble tube			
TCD detector	Tungsten-rhenium filament			
Process Tubing	316L Stainless Steel, 1/16 inch			
Seals	Viton, Buna-N, Kalrez, etc			
Dimensions	L 17.0 in (43 cm) × W 25.2 in (64 cm) × H 24.5 in (62 cm)			