

HI84500

# Sulfur Dioxide Mini Titrator

for Wine Analysis

- **Piston driven pump with dynamic dosing**
  - For highly accurate, repeatable results
- **Log-on-demand**
  - Log data up to 400 samples (200 for titration; 200 for ORP/mV)
- **Graphic mode/exportable data**
  - Displays in-depth data on titration, which can then be stored and exported to either a USB drive or PC using the USB connection
- **Automatic stirrer speed control**
  - Maintains stirrer speed at 700 RPM regardless of viscosity of solution
- **GLP features**
  - Date, time, offset, slope and buffers used
- **Easy-to-use interface**
  - User intuitive design with large keys and easy to navigate screens
- **HELP features**
  - Dedicated HELP key for content sensitive help
- **mV meter**



## An Easy-to-Use, Fast and Affordable All-in-one Solution

The HI84500 is an easy to use, fast and affordable automatic mini titrator designed for testing free or total sulfur dioxide (SO<sub>2</sub>) levels in wine. It includes a pre-programmed analysis method and uses a powerful algorithm in order to determine when the titration reaction has reached completion. The HI84500 incorporates a precision dosing pump which allows for a highly accurate determination of the amount of titrant used. Pump calibrations, performed with the provided Hanna standards, help assure the measurement accuracy. The HI84500 also features a new low range measurement and can also be used as a mV meter for direct ORP measurements.

This new generation of mini automatic titrator improves upon the titrant delivery system and measuring ranges for increased accuracy compared to previous models. This meter reflects Hanna's years of experience as a manufacturer of analytical instruments.

## Why Free & Total Sulfur Dioxide is Important

Winemakers add sulfur dioxide to wine in order to inhibit bacteria and wild yeast growth and to serve as an antioxidant to prevent browning. When SO<sub>2</sub> is added to wine, a portion of it becomes immediately bound while a remaining portion is unbound SO<sub>2</sub>. The portion that is unbound is also called free SO<sub>2</sub>; it is responsible for protecting the wine.

The bound and free SO<sub>2</sub> together are referred to as total SO<sub>2</sub>. The relationship between the amount of SO<sub>2</sub> added and the amount of free SO<sub>2</sub> is complex. This relationship is governed by the total amount of SO<sub>2</sub> in the wine and the ability of compounds (e.g. sugars, aldehydes, ketonic acid, quinones, anthocyanin) in the wine to bind SO<sub>2</sub>.

The exact relationship between free and bound SO<sub>2</sub> will vary from wine to wine. The amount of free SO<sub>2</sub> depends on how much is added, how much was present before the addition, and how much was immediately

bound. Free SO<sub>2</sub> exists in two forms: bisulfite (HSO<sub>3</sub><sup>-</sup>) is the predominant form but is relatively ineffective and molecular SO<sub>2</sub> is the minor form and is responsible for protecting the wine. The amount of molecular SO<sub>2</sub> available in wine is depended on the amount of free SO<sub>2</sub> present and the pH. Typically 0.8 ppm of molecular SO<sub>2</sub> provides adequate protection against bacteria growth and oxidation. In order to obtain this value for a wine sample that has a pH of 3.2 you would need 22 ppm of free SO<sub>2</sub>; if the pH was at 3.5 you would need double the amount, 44 ppm of free SO<sub>2</sub>.

Molecular SO<sub>2</sub> can be detected by human senses at about 2.0 ppm. This level is needed for maximum protection of wine. Higher levels are needed for sweet and most notable, botrytised wine. The HI84500 can be used to test for free and total SO<sub>2</sub> in all wines, including red, which are difficult to test using traditional methods associated with a distinctive color change to determine the endpoint.

## Application-specific ORP Electrode

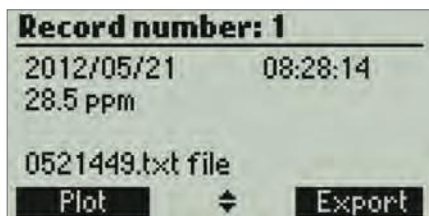
The HI84500 is supplied with the HI3148B ORP electrode featuring CPS™ technology to prevent the clogging of the reference junction. Conventional electrodes may clog quickly in biological samples such as wine. By design, the HI3148B ORP electrode utilizes a ground glass/PTFE sleeve junction which controls a steady, predictable flow of electrolyte solution, keeping the junction open. The hydrophobic properties of PTFE repels wetness and coatings.

## On-screen Features



### Titration curve displayed on screen

The HI84500 offers real time graphing of the titration curve on the LCD.



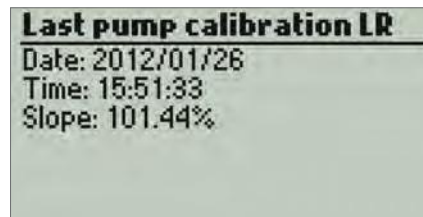
### Log and recall data

Log up to 400 samples (200 for titration results; 200 for ORP/mV) and recall or export data to a USB stick or PC.



### ORP

During ORP measurements, the stirrer icon will be displayed when the stirrer is on



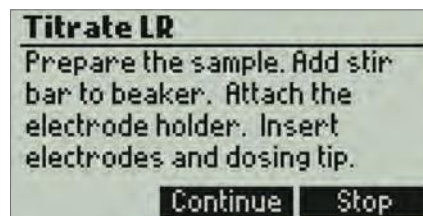
### GLP

Records pump calibration data to ensure measurements are accurate and reliable.



### Procedure warnings

Users are warned if there is an error in procedures such as the titration exceeded the maximum volume of titrant.



### Tutorial and help screens

Accessing the tutorial menu provides helpful information during calibration and titration.

## Specifications

Specifications		HI84500
Titrator	Range	Low Range: 1.0 to 40.0 ppm of SO <sub>2</sub> High Range: 30 to 400 ppm of SO <sub>2</sub>
	Resolution	Low Range: 0.1 ppm High Range: 1 ppm
	Accuracy (@25°C/77°F)	Low Range: ±0.5 ppm or 3% of reading, whichever is greater High Range: ±1 ppm or 3% of reading, whichever is greater
	Sample Volume	50 mL
	Method	Ripper method
	Principle	equivalence point redox titration
	Pump speed	10 mL/min
	Stirring Speed	700 rpm
ORP Meter	Range	-2000.0 to 2000.0 mV
	Resolution	0.1 mV
	Accuracy (@25°C/77°F)	±1 mV
Additional Specifications	Logging Data	up to 400 samples (200 ORP/mV, 200 titration)
	Electrode	HI3148B glass body ORP electrode with BNC connector and 1 m (3.3') cable (included)
	Connectivity	(1) Type-B USB for PC interface, (1) Type-A USB for storage
	Environment	0 to 50°C (32 to 122°F); RH max 95% non-condensing
	Power Supply	12 VDC adapter (included)
	Dimensions	235 x 200 x 150 mm (9.2 x 7.9 x 5.9")
Weight	1.9 kg (67.0 oz.)	
Ordering Information	<b>HI84500-01</b> (115V) and <b>HI84500-02</b> (230V) are supplied with HI3148B ORP electrode, HI7082 electrode fill solution (30 mL), HI84500-70 reagent kit for SO <sub>2</sub> determination (consisting of: 1 bottle HI84500-50 (230 mL) low range titrant, 1 bottle HI84500-51 high range titrant (230mL), 1 bottle HI84500-55 pump calibration standard (120 mL), 1 bottle HI84500-60 acid reagent (230 mL), 1 bottle HI84500-61 alkaline reagent (120 mL) and HI84500-62 stabilizer packets (100 packets)), 100 mL beakers (2), 20 mL beakers (2), scissors, dosing pump valve, 5 mL syringe, 1 mL plastic pipette, tube set (aspiration tube with titrant bottle cap and dispensing tube with tip), stir bar, electrode cleaning solution sachets for wine deposits (2), electrode cleaning solution sachets for wine stains (2), power adapter, instruction manual and quality certificate.	