



HI 84532

Titratable Acidity Mini Titrator
for Fruit Juice Analysis



HANNA[®]
instruments



Piston Driven Pump with Dynamic Dosing

The HI 84532 incorporates dynamic dosing to provide precision titrant delivery. Dynamic dosing adjusts the amount of titrant dosed as the end point is approached for increased accuracy in end point detection.

Piston Burette

Piston burettes provide an exceptionally reliable titrant delivery. This highly accurate dosing method is attained by combining a pulse controlled step motor with a 5 mL polypropylene syringe. The rigid and stable body of our syringe allows for less frequent pump calibration. Users no longer have to account for the changing elasticity of tubing associated with peristaltic pumps.

More About Dynamic Dosing

With the integration of our piston burette, our titrator can adjust the volume and frequency of titrant dosed based on relative mV changes in the testing solution. This titrant delivery system is known as dynamic dosing, where titrant is delivered in larger doses at the start of the titration and smaller doses near the end point. These differences in dosing volume and frequency result in a faster titration without sacrificing accuracy. With larger doses in the beginning of the titration, the speed of the titration is increased, where smaller doses near the end point allow for more time for the titrant and analyte to react. Smaller doses also prevent the over titration of a sample and a more accurate determination of titrant volume used.

pH Electrode

The HI 84532 is supplied with the HI 1131B refillable, double junction, combination pH electrode. By design, the HI 1131B has a spherical tip for use in aqueous or liquid solutions. This versatile electrode provides a wide surface of contact with a sample and is ideal for any general acid or base titration in the beverage or agriculture industry.

HI 84532 Mini Titrator for Fruit Juice Applications

- **Piston Driven Pump with Dynamic Dosing**

This piston driven dosing pump incorporates dynamic dosing to provide highly accurate, repeatable results.

- **CAL CHECK™**

CAL CHECK alerts users to potential problems during calibration such as contaminated buffers or dirty/broken electrodes.

- **pH/mV Meter**

In addition to automatic titration, the HI 84532 can also be used as a pH/mV meter.

- **Log-on-Demand**

Log data up to 400 samples (200 for titration; 200 for pH/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 approximately 600 rpm regardless of viscosity of solution.

- **GLP Feature**

The HI 84532 includes a GLP Feature that allows users to view calibration data for the pH electrode and dosing pump.

- **Easy to use interface**

User intuitive design with large keys and easy to navigate screens.

- **pH Electrode**

The HI 84532 is supplied with the HI 1131B electrode. This versatile electrode can measure all types of fruit juice.



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

The HI 84532 digital automatic mini titrator and pH meter is designed for measuring the concentration of titratable hydrogen ions contained in fruit juice samples by neutralization with a strong base solution to a fixed pH as according to the official methods of analysis of AOAC International. 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.

A clear and intuitive user interface allows users to navigate the HI 84532's menus and functions quickly. The HELP key located on the keypad aids in on-screen set-up, calibration status and troubleshooting.

The HI 84532 incorporates a precise piston dosing system, which allows for a highly accurate determination of the amount of titrant used. It is capable of dynamic dosing, making testing both faster and more accurate. Pump calibrations, performed with the provided Hanna standards, help assure the measurement accuracy.

This mini-titrator is also designed to be used as a benchtop pH/mV meter. As a pH meter, it has many features of a professional grade benchtop including automatic calibration up to 3 points with 4 available buffers, a 0.01 pH resolution, accuracy of ± 0.01 pH, automatic temperature compensation and comprehensive GLP Data. The GLP data includes date, time, offset, slope, and buffers used for calibration. Accuracy is always ensured with Hanna's unique Cal-Check feature, which analyzes the response of the electrode during the calibration process. Based on electrode response in the buffers, indicators are displayed on screen to alert the user of potential problems during calibration. These indicators include Buffer Contaminated, Electrode Dirty / Broken, and overall probe condition as a percentage that is based on both the offset and slope characteristic of the electrode.

The Cal-Check function not only ensures an accurate pH reading when the HI 84532 is used as a pH meter but also an accurate titration since the end point is determined by a set pH value.

Why Titratable Acidity is So Important

Titrateable acidity is an important parameter in determining fruit maturity and sour taste in citrus fruits. The maturity of fruit is one of the most important factors to determine how well fruit will store and how it will taste. For some fruits, governmental quality standards (based on titrateable acidity or the ratio of total soluble solids ($^{\circ}$ Brix) to titrateable acidity) are in place to protect consumers. Immature fruit will normally have a low sugar to acid ratio as compared to mature fruit that will have a high sugar to acid ratio.

The HI 84532 measures the concentration of titrateable hydrogen ions contained in fruit juice samples by neutralization with a strong base solution to a fixed pH. This value includes all the substances of an acidic nature in the fruit juice including: free hydrogen ions, organic acids and acid salts. Titrateable acidity is expressed as g/100 mL of the predominant acid. The predominant acids in fruit depend on the type of fruit being tested and include citric acid, tartaric acid, and malic acid.



Fruits, juices	Titrateable acidity (g/100 mL)	Predominant acid
Apple, pear	0.36-0.80	Malic acid
Cranberry	1.6-3.6	Citric acid
Grapefruit	1.2-2.0	Citric acid
Lemon	4-6.2	Citric acid
Mango	0.34-0.84	Citric acid
Orange	0.8-1.4	Citric acid
Peach, nectarine, sweet cherry	0.24-0.94	Citric acid
Pineapple	0.7-1.6	Citric acid
Plum/Sour cherry	0.94-1.64	Malic acid
Strawberry	0.6-1.1	Citric acid
Table grape	0.4-0.9	Tartaric acid
Tomato	0.34-1.00	Citric acid

All-in-One

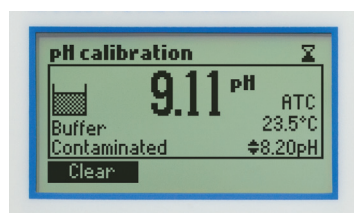
Fruit Juice Titrator, pH Meter, Electrode and Magnetic Stirrer in one package

Features



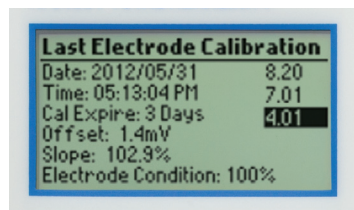
Setup Screens

The LCD features an easy to use setup screen that allows the user to change measuring range, time, date, language and more.



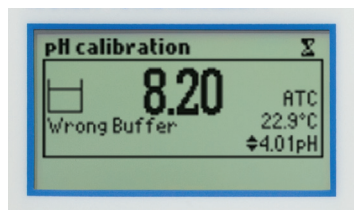
CAL CHECK™

CAL CHECK is a Hanna exclusive process for checking the condition of electrodes which helps keep measurements accurate.



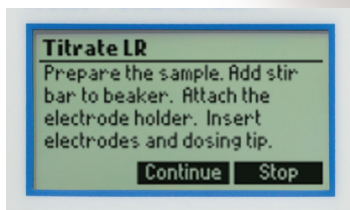
GLP

The GLP feature records electrode and pump calibration data to help keep measurements accurate and reliable.



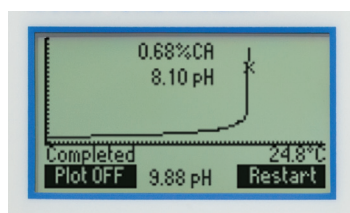
Procedure Warnings

Users are warned if there is an error in procedures such as the use of a wrong buffer.



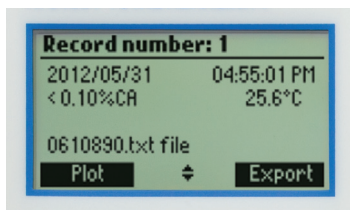
Tutorial and HELP Screens

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



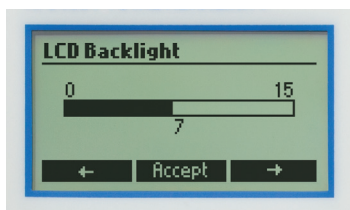
Titration Curve Displayed On Screen

The HI 84532 offers real time graphing of the titration curve on the LCD.



Log and Recall data

The HI 84532 can log up to 400 samples (200 for titration results; 200 for pH/mV) and recall or export data to a USB drive or PC.



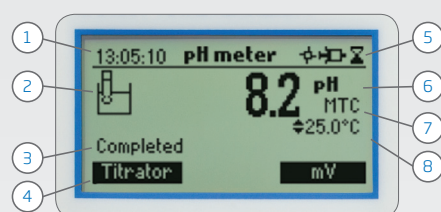
Adjustable Backlit LCD

The HI 84532 offers a backlit LCD with adjustable brightness levels. This ensures that the LCD is always easy to read.



Rear USB Outputs

For PC connection and to export data to a USB drive



Display

- 1) Current time and instrument mode information (pH meter or Titrator)
- 2) Procedural indicators
- 3) Instrument status
- 4) Virtual option keys
- 5) Stirrer and icon status

During the instrument's operation a set of information are displayed on the LCD. Displayed icons:



Stirrer on



Pump running



Wait for stable reading



Stirrer is not working properly



Parameter can be modified

- 6) Main reading information
- 7) pH temperature compensation mode (Manual or Automatic)
- 8) Temperature reading

Specifications

HI 84532 -Titratable Acidity

Titratr

Range	Citric acid g/100 mL	Low Range (5mL sample):	High Range (5mL sample):
	Tartaric acid g/100 mL	0.10 - 2.00 %CA	1.00 - 10.00 %CA
	Malic acid g/100 mL	0.11 - 2.35 %TA	1.17 - 11.72 %TA
		0.10 - 2.09 %MA	1.05 - 10.47 %MA
Resolution	0.01%		
Accuracy (@25°C/77°F)	3% of reading or ± 0.02 %CA, whichever is greater		
Method	Acid-base titration, method based on the Official Methods of Analysis of AOAC International.		
Principle	End point titration: 8.1 pH		
Pump speed	10 mL/min		
Stirring Speed	600 rpm		
Logging Data	up to 200 samples		

pH Meter

Range	-2.0 to 16.0 pH / -2.00 to 16.00 pH
Resolution	0.1 pH / 0.01 pH
Accuracy (@25°C/77°F)	±0.01 pH
Calibration	1, 2, or 3 calibration points; 4 available buffers (4.01; 7.01; 8.20; 10.01)
Temperature Compensation	manual or automatic from -20 to 120°C (-4 to 248°F)
Logging Data	Up to 200 samples (pH or mV)

mV Meter

Range	-2000.0 to 2000.0 mV
Resolution	0.1 mV
Accuracy	± 1.0 mV
Logged Data	Up to 200 samples (pH or mV)

Temperature

Range	-20.0 to 120.0°C (-4.0 to 248.0°F)
Resolution	0.1°C
Accuracy	±0.4°C without probe error

Additional Specifications

pH Electrode	HI 1131B glass body, refillable, with BNC connector and 1 m (3.3') cable (included)
Temperature Probe	HI 7662-T stainless steel temperature probe with 1 m (3.3') cable (included)
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.)

Accessories

Reagents

HI 84532-50	Titratr solution for Low Range (100 mL)
HI 84532-51	Titratr solution for High Range (100 mL)
HI 84532-55	Calibration Standard (100 mL)

pH Calibration Solutions

HI 7004M	Buffer solution pH 4.01 (230 mL)
HI 7007M	Buffer solution pH 7.01 (230 mL)
HI 70082M	Buffer solution pH 8.20 (230 mL)
HI 7010M	Buffer solution pH 10.01 (230 mL)

Electrode Fill and Storage Solutions

HI 7082	Electrode fill solution (4 x 30 mL)
HI 70300L	Electrode storage solution (500 mL)

Electrode Cleaning Solution

HI 7061M	Electrode Cleaning Solution (230 mL)
----------	--------------------------------------

Electrodes

HI 1131B	pH Electrode
HI 7662-T	Temperature probe

Other Accessories

HI 70500	Tube set with cap for titratr bottle, tip and valve
HI 71005/8	115 Vac to 12 Vdc, 800 mA
HI 71006/8	230 Vac to 12 Vdc, 800 mA
HI 731319	Stir bar, 25 x 7 mm (10 pcs.)
HI 740036P	100 mL Beaker (10 pcs.)
HI 740037P	20 mL Beaker (10 pcs.)
HI 740236	5 mL Syringe for minitratr
HI 920013	PC Connection Cable

Ordering Information

HI 84532-01 (115V) and HI 84532-02 (230V) are supplied with:

