HI 84529

Titratable Acidity Mini Titrator for Dairy Analysis

HANNA® instruments

Piston Driven Pump with Dynamic Dosing

The HI 84529 incorporates dynamic dosing to provide precison titrant delivery. Dynamic dosing adjusts the amount of titrant dosed as the end point is approached for increased accuracy in endpoint 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 and Reference Electrodes

Standard combination electrodes typically combine the pH and reference half cells into one electrode. In most configurations, the reference half cell's ceramic junction can be easily clogged by milk and dairy solids while the general purpose glass of the pH half cell will be out of range for most dairy applications. Both of these issues can result in erratic readings.

To solve these problems, the HI 84529 utilizes two separate half cell electrodes–the HI 5314 reference electrode and FC 260B pH electrode. The HI 5315 allows users to renew the junction by pressing it's plunger to dispense electrolyte from the electrode, effectively clearing any clogs.For optimum performance, the FC 260B pH electrode uses low temperature (LT) glass since most simple measurements will be lower than room temperature.

HI 84529 **Mini Titrator for Dairy 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 M eter

  In addition to automatic titration, the HI 84529 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 800 rpm (Low Range) & 1000 rpm (High Range) regardless of viscosity of solution.

- GLP Feature

  The HI 84529 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.

- Application Specific (electrode)

  The HI 84529 is supplied with the FC 260B pH electrode. This versatile electrode can measure all types of dairy related products.

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

The HI 84529 is an easy to use, fast and affordable mini automatic titrator and pH meter designed for testing acidity levels in dairy products. 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.

This mini titrator includes a pre-programmed analysis method designed for acidity measurements for dairy analysis. It uses a powerful algorithm which analyzes the shape of the electrode response in order to determine when the titration reaction has reached completion. By simply pressing the START key, the HI 84529 automatically performs an end point titration and displays results immediately in a choice of units.

Why Titratable Acidity is So Important

There are two fundamentally different conventions for expressing acidity in dairy products: titratable acidity and pH. The pH is a measurement of hydrogen ion concentration while titratable acidity is the neutralizing capacity by a base.

An increase in acidity can be the result of bacteria formation. Monitoring acidity is a way of detereming in the quality and freshness of dairy products. Acidity is determined by an end point titration using sodium hydroxide (a base), and is defined as the consumption of base necessary to shift the pH value from 6.6 (corresponding to fresh milk) to a pre-determined pH value. While pH 7.0 is the actual point of neutralization, phenolphthalein is commonly employed as a color indicator to determine the end point of reaction and with it, color change occurs at pH 8.3. Titratable acidity is expressed in a variety of units based on the one which reflects the titration method and strength of base used during titration.

°SH – Soxlet Henkel degrees: obtained by titrating 100 mL of milk with 0.25N NaOH, using phenolphthalein as the indicator. This method is common in Central Europe.

°Th – Thorner degrees: obtained by titrating 100 mL of milk thinned with 2 parts distilled water, with 0.1 N NaOH, using phenolphthalein as an indicator. Method is used mostly in Sweden and the CIS.

°D – Dornic degrees: obtained by titrating 100 mL of milk thinned with two parts distilled water, with 0.9N NaOH, using phenolphthalein as an indicator. Used mostly in the Netherlands and France.

% l.a. – percent lactic acid: obtained as °D divided by 100. Frequently used in the UK, USA, Canada, Australia and New Zealand.

Note: Taking into account the concentration of sodium hydroxide, the results expressed in one value can be easily converted into any other unit value by consulting the chart below.

From:	To:	Divide By:
%l.a.	°SH	0.0225
%l.a.	°D	0.0100
%l.a.	°TH	0.0090

Eliminate Subjectivity and Increase Efficiency.

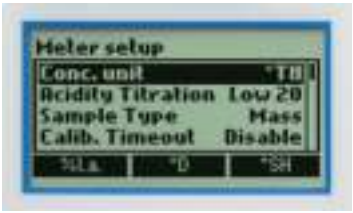
The HI 84529 Mini Titrator eliminates the subjective end point color change detection determined by the human eye, and instead employs the sensitivity and accuracy of a pH sensor. The titration method is a potentiometric end point determination using a pre-determined pH value.

Acidity of dairy products can be expressed in any of the units described earlier by simply selecting the desired unit. After performing a pump calibration with the supplied standard, you can then perform titrations, expressed in the desired unit, using the same titrant. This eliminates the inconvenience of purging the titrant and being sure that you have the right titrant concentration - saving time and titrant. The quantity of sample needed is much smaller in comparison to a traditional method. 50 mL is used in the low range and 10 mL is used in the high range as compared to 100 mL used in the traditional method.

All-in-One

Dairy Titrator, pH Meter, Electrode and Magnetic Stirrer in one package

Features



Setup Screens

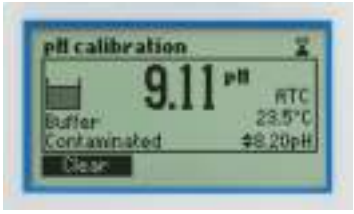
The LCD features an easy to use setup screen that allows the user to change measuring range, time, date, language and more.

Tutorial and HELP Screens

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

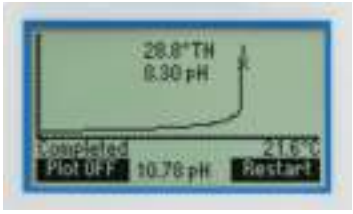
Rear USB Outputs

For PC connection and to export data to a USB drive



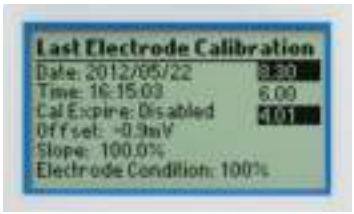
CAL CHECK™

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



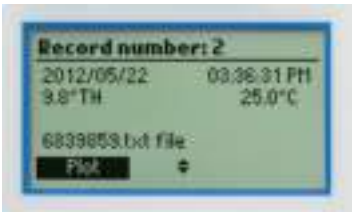
Titration Curve Displayed On Screen

The HI 84529 offers real time graphing of the titration curve on the LCD.



GLP

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



Log and Recall data

The HI 84529 can log up to 400 samples (200 for titration results; 200 for mV/pH) and recall or export data to a USB stick or PC.

Procedure Warnings

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

Adjustable Backlit LCD

The HI 84529 offers a backlit LCD with adjustable brightness levels. This ensures that the LCD is always easy to read.

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 status icons

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 84529 - Titratable Acidity

Titrator

Range	(Low Range): %l.a.: 0.01 to 0.20; °SH: 0.4 to 8.9; °D: 1.0 to 20.0; °TH: 1.1 to 22.2 (High Range): %l.a.: 0.1 to 2.0; °SH: 4.4 to 88.9; °D: 10 to 200; °TH: 11.1 to 222.2
Resolution	(Low Range): %l.a.: 0.01; °SH: 0.1; °D: 0.1; °TH: 0.1 (High Range): %l.a.: 0.1; °SH: 0.1; °D: 1; °TH: 0.1
Accuracy (@25°C/77°F)	(Low Range): ± 0.01 %l.a. (High Range): ± 0.1 %l.a.
Method	Acid-base titration
Principle	End point titration 8.30 pH (adjustable pH 8.1 - 8.4)
Sample Size LR 20	20 mL or 20 g
Sample Size LR 50	50 mL or 50 g
Sample Size HR 20	20 mL or 20 g
Pump speed	10 mL/min
Stirring Speed	800 (Low Range) / 1000 (High Range)
Logging Data	up to 200 samples (pH or mV)

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	one, two or three-point calibration (pH 4.01, 6.00, 8.30, 10.01)
Temperature Compensation	manual or automatic from -20 to 120°C (-4 to 248°F)
Logging Data	up to 50 samples

mV Meter

Range	-2000.0 to 2000.0 mV
Resolution	0.1 mV
Accuracy	± 1.0 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	FC 260B pH electrode with 1 m (3.3') cable (included),
Reference Electrode	HI 5315 refillable reference probe with 1 m (3.3') cable (included)
Temperature Probe	HI 7662-M 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 84529-50	Titrant solution for Low Range 20 (120 ml)
HI 84529-51	Titrant solution for High Range 20 (120 ml)
HI 84529-52	Titrant solution for Low Range 50 (120 ml)
HI 84529-55	Pump Calibration Standard (230 mL)

pH Calibration Solutions

HI 7004M	Buffer solution pH 4.01 (230 mL)
HI 70060M	Buffer solution pH 6.00 (230 mL)
HI 70083M	Buffer solution pH 8.30 (230 mL)
HI 7010M	Buffer solution pH 10.01 (230 mL)

Electrode Fill and Storage Solutions

HI 7072	Reference electrode fill solution (4 x 30 mL)
HI 70300L	Electrode storage solution (500 mL)

Cleaning Solution

HI 70640L	Cleaning solution for remaining milk deposits (500 mL)
HI 70641L	Cleaning and disinfecting for dairy products (500 mL)
HI 70642L	Cleaning solution for remaining cheese deposits (500 mL)
HI 7077L	Electrode cleaning solution for oils (500 mL)

Electrodes

FC 260B	pH electrode
HI 5315	Reference electrode
HI 7662-M	Temperature probe

Other Accessories

HI 70500	Tube set with cap for titrant 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 minititrator
HI 920013	PC Connection Cable

Ordering Information

HI 84529-01 (115V) and **HI 84529-02** (230V) are supplied with:

HI 84529-70 Reagent Kit for titratable acidity in dairy products
FC 260B pH electrode
HI 5315 Reference electrode
HI 7662-M temperature probe
HI 7072 fill solution (30 mL)
Cleaning solution for milk deposits (2 x 20 mL)
One capillary dropper pipette
HI 740036P Two 100 mL beakers
HI 70500 Tube set (aspiration tube with titrant bottle cap and dispensing tube with tip),
Dosing Pump Valve
HI 740236 5 mL Syringe
1 mL plastic pipette
HI 731319 stir bar
HI 920013 power adapter
Instuction manual and quality certificate

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