

HI84529

Titratable Acidity Mini Titrator and pH Meter

for the Dairy Industry

- **Piston-driven pump with dynamic dosing**
 - For highly accurate, repeatable results
- **CAL Check™**
 - Alerts users to potential problems during calibration such as contaminated buffers or dirty electrodes
- **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 regardless of viscosity of solution
- **GLP features**
 - Date, time, offset, slope and buffers used
- **Application-specific FC260B half-cell pH electrode**
 - This electrode is designed to measure all types of dairy related products
- **HI5315 double junction half-cell reference electrode**
 - Features a plunger design to clear any clogging of the outer junction
- **Help features**
 - Dedicated HELP key for content sensitive help
- **pH/mV meter**
 - Doubles as a benchtop pH meter



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

The HI84529 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 electrode response in order to determine when the titration reaction has reached completion. By simply pressing the START key, the HI84529 automatically performs a pH endpoint titration and displays results immediately in a choice of units.

Acidity Measurement and its Significance in the Dairy Industry

There are two fundamentally different measurements of dairy products: titratable acidity and pH. pH is a measurement of hydrogen ion concentration while titratable

acidity is the neutralizing capacity of a dairy product with NaOH.

An increase in acidity can be caused by bacteria formation. Monitoring acidity is a way of determining the quality and freshness of dairy products. Acidity is determined by a pH endpoint titration using sodium hydroxide (NaOH), and is defined as the consumption 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 endpoint of reaction; with phenolphthalein, a 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 NaOH used during titration.

Titrate acidity can be expressed in several units. Each of these units corresponds to a specific procedure used to titrate dairy products.

% Lactic Acid (% l.a.): is determined by titrating a 20 mL or 20 g sample diluted with twice its volume of deionized or distilled water with 0.1 M sodium hydroxide to a phenolphthalein endpoint.

Degree Soxhlet Henkel (°SH): is determined by titrating a 50 mL sample with 0.1 M sodium hydroxide to a phenolphthalein endpoint.

Degree Dornic (°D): is determined by titrating a 100 mL sample with N/9 sodium hydroxide to a phenolphthalein endpoint.

Degree Thörner: is determined by titrating a 10 mL sample diluted with twice its volume of deionized or distilled water with 0.1 M sodium hydroxide to a phenolphthalein endpoint.

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 HI84529 Mini Titrator eliminates the subjective endpoint 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 endpoint determination using a pre-determined pH value.

The titratable acidity values will vary depending on the method used. Select Low 50 to titrate a non diluted sample, or select low 20/High 20 to titrate 20 mL or 20 g samples that are diluted with twice its volume or deionized or distilled water. The HI84529 uses methods based on AOAC International and Standard Methods for the Examination of Dairy Products. Both of these methods report titratable acidity as % lactic acid, a rough conversion factor can be used to convert the results to the other available units.

The HI84529 can be customized to meet the needs of any dairy analysis lab. Samples can be titrated by weight or volume, diluted or non-diluted (low range only) and titrated to a fixed pH endpoint that can be adjusted by the user.

Specifications	HI84529	
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
	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
	Principle	endpoint titration, adjustable (pH 8.0 - 8.7 in 0.1 increments)
	Pump Speed	10 mL/min
	Stirring Speed	800 (Low Range) / 1000 (High Range)
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; four available buffers (pH 4.01, 6.00, 8.30, 10.01)
	Temperature Compensation	manual or automatic
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; 253.2 to 393.2 K
	Resolution	0.1°C; 0.1°F; 0.1 K
	Accuracy	±0.4°C; ±0.8°F; ±0.4 K
Additional Specifications	Logging Data	up to 400 samples (200 pH/mV, 200 titration)
	Electrodes	FC260B pH electrode with 1 m (3.3') cable (included), HI5315 reference probe with 1 m (3.3') cable (included)
	Temperature Probe	HI7662-T stainless steel temperature probe with 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 power 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	HI84529-01 (115V) and HI84529-02 (230V) are supplied with HI84529-70 Reagent Kit for titratable acidity in dairy products, FC260B pH electrode, HI5315 reference electrode, HI7662-M temperature probe, HI7072 fill solution (30 mL), HI700640 cleaning solution for milk deposits (2 x 20 mL), capillary dropper pipette, 100 mL beakers (2), 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, power adapter, instruction manual and quality certificate.	



HI84531 Titratable Alkalinity Mini Titrator and pH Meter Reagents and Accessories

Reagent Code	Description
HI84531-50	titrant solution for low range, 120 mL
HI84531-51	titrant solution for high range, 120 mL
HI84531-55	pump calibration standard, 230 mL
HI7004M	pH 4.01 buffer, 230 mL
HI7007M	pH 7.01 buffer, 230 mL
HI70083M	pH 8.30 buffer, 230 mL
HI7010M	pH 10.01 buffer, 230 mL
HI70300M	storage solution, 230 mL
HI7082	pH electrode filling solution, 3.5M KCl, 30 mL (4)
HI7061M	general purpose electrode cleaning solution, 230 mL

Accessory Code	Description
HI740236	5 mL syringe for mini titrator
HI70500	tube set with cap for titrant bottle, tip and valve
HI731319	stir bar, 25 x 7 mm (10)
HI740036P	100 mL beaker (10)
HI920013	PC connection cable
HI1131B	replacement pH electrode
HI7662-T	replacement temperature probe



HI84529 Titratable Acidity Mini Titrator and pH Meter Reagents and Accessories

Reagent Code	Description
HI84529-50	titrant solution for low range 20, 120 mL
HI84529-51	titrant solution for high range 20, 120 mL
HI84529-52	titrant solution for low range 50, 120 mL
HI84529-55	pump calibration standard, 230 mL
HI7004M	pH 4.01 buffer, 230 mL
HI70060M	pH 6.00 buffer, 230 mL
HI70083M	pH 8.30 buffer, 230 mL
HI7010M	pH 10.01 buffer, 230 mL
HI70300M	storage solution, 230 mL
HI70640M	cleaning solution for milk deposits, 230 mL
HI70641M	cleaning and disinfection solution for dairy products, 230 mL
HI7072	reference half-cell filling solution, 1M KNO ₃ , 30 mL (4)

Accessory Code	Description
HI70500	tube set with cap for titrant bottle, tip and valve
HI731319	stir bar, 25 x 7 mm (10)
HI740036P	100 mL beaker (10)
HI740037P	20 mL beaker (10)
HI740236	5 mL syringe for mini titrator
HI920013	PC connection cable
FC260B	replacement pH half-cell electrode for dairy
HI5315	replacement reference half-cell electrode
HI7662-T	replacement temperature probe



HI84532 Titratable Acidity Mini Titrator and pH Meter Reagents and Accessories

Reagent Code	Description
HI84532-50	titrant solution for low range, 120 mL
HI84532-51	titrant solution for high range, 120 mL
HI84532-55	pump calibration standard, 230 mL
HI7004M	pH 4.01 buffer, 230 mL
HI7007M	pH 7.01 buffer, 230 mL
HI70082M	pH 8.20 buffer, 230 mL
HI7010M	pH 10.01 buffer, 230 mL
HI70300M	storage solution, 230 mL
HI7061M	general purpose cleaning solution, 230 mL
HI7082	pH electrode filling solution, 3.5M KCl, 30 mL (4)

Accessory Code	Description
HI731342	automatic pipette (2000 µL)
HI731352	tips for 2000 µL automatic pipette (4)
HI70500	tube set with cap for titrant bottle, tip and valve
HI731319	stir bar, 25 x 7 mm (10)
HI740036P	100 mL beaker (10)
HI740037P	20 mL beaker (10)
HI740236	5 mL syringe for mini titrator
HI920013	PC connection cable
HI1131B	replacement pH electrode
HI7662-T	replacement temperature probe