

HANNA® instruments

HI-98164
Yogurt pH Meter

Food quality pH & temperature measurement

The right electrode for yogurt pH measurement

The conic shape tip of the Hanna yogurt electrode makes it easy to introduce into yogurt samples, including semi-solid types of yogurt. One of the problems encountered when measuring pH of food is that conventional pH electrodes easily become clogged and the speed of response and accuracy of pH readings both suffer as a result.

The Hanna FC2133 pH electrode for yogurt overcomes the potential issues with an open junction design consisting of a solid gel interface between the sample being measured and the internal reference. This interface makes it impermeable to clogging after repeated measurements have been taken, ensuring a fast response and stable readings as well as offering longer electrode life than conventional electrodes.



Glass body

The glass body of the FC2133 allows standards and samples to quickly reach thermal equilibrium while also providing chemical resistance.

Low temperature glass

The FC2133 electrode uses Low Temperature (LT) glass for the sensing bulb. The LT glass tip is a lower resistance glass formulation. As the temperature of the sensing glass decreases, the resistance of the LT glass will increase approaching that of standard glass at ambient temperatures. The FC2133 is suitable to use with samples that measure from 0 to 50°C.

Viscolene electrolyte

The viscolene electrolyte offers a hard gel interface between the inner electrode components and the sample being measured. The electrolyte is silver-free for use in yogurt products and is maintenance-free.

Open junction reference

Clogging of the reference junction is a common challenge faced by yogurt producers as the milk solids and proteins can easily build up on the electrode. The open junction design of the FC2133 resists clogging and continues to provide accurate, stable readings.

Conic tip shape

This design allows for penetration into solids, semi-solids, and emulsions for the direct measurement of pH in yogurt products.

Built-in temperature sensor

A thermistor temperature sensor is in the tip of the indicating pH electrode. A temperature sensor should be as close as possible to the indicating pH bulb in order to compensate for variations in temperature.

The importance of pH in yogurt production

Monitoring pH is crucial in producing consistent, quality yogurt. Yogurt is made by the fermentation of milk with live bacterial cultures. Following pasteurisation and compositional adjustment, milk is homogenised for a consistent texture, heated to the desired thickness, and cooled before inoculation. Most yogurt is inoculated with a starter culture consisting of *Lactobacillus bulgaricus* and *Streptococcus thermophilus*. Once the live culture is added, the mixture of milk and bacteria is incubated, allowing for fermentation of lactose to lactic acid. As lactic acid is produced, there is a correlating drop in pH. Due to the more acidic mixture, the casein protein in milk coagulates and precipitates out, thickening the milk into a yogurt-like texture.

Yogurt producers cease incubation once a specific pH level is reached. Most producers have a set point between pH 4.0 and 4.6 in which fermentation is stopped by rapid cooling. The amount of lactic acid present at this pH level is ideal for yogurt, giving it the characteristic tartness, aiding in thickening, and acting as a preservative against undesirable strains of bacteria.

By verifying that fermentation continues to a predetermined pH endpoint, yogurt producers can ensure their products remain consistent in terms of flavour, aroma, and texture. A deviation from the predetermined pH can lead to a reduced shelf life of yogurt or create a product that is too bitter or tart. Syneresis is the separation of liquid, in this case whey, from the milk solids; this can occur if fermentation is stopped too early or too late, resulting in yogurt that is respectively too alkaline or too acidic. Consumers expect yogurt to remain texturally consistent, so ensuring fermentation is stopped at the appropriate pH is vital to consumer perception.

HI-98164

pH / Temperature Meter for Yogurt



HI-98164 is a professional portable pH and temperature meter with a probe designed specifically for pH measurement in yogurt.

- Waterproof
  - IP67 rated waterproof, rugged enclosure
- CAL Check™
  - Alerts users to problems during calibration including dirty/broken electrode, contaminated buffer and overall probe condition
- Automatic or manual temperature compensation
  - pH sensors incorporate a built-in temperature sensor
- Calibration
  - Up to a five-point calibration with seven standard buffers and five custom buffers
- Approximately 200 hour battery life
  - Powered by (4) 1.5V AA batteries
- Clear display
  - Dot matrix display with multi-functional virtual keys
- Auto hold
  - Alerts when calibration is due at a specified interval
- Calibration timeout
  - Alerts when calibration is due at a specified interval
- Connectivity
  - PC connectivity via opto-isolated micro-USB with HI-92000 software
- GLP
  - GLP data provides data from previous calibration to ensure Good Laboratory Practices are met
- Intuitive keypad
  - Important and often used functions such as GLP information, help, range, calibration and backlight have a dedicated button
- Supplied complete
  - Each meter is supplied complete with sensor, calibration and cleaning solutions, beakers, PC software and connection cable, instruction manual, quick start guide and batteries in a rugged, customised carrying case

Specifications		HI-98164
pH*	Range	-2.0 to 20.0 pH; -2.00 to 20.00 pH; -2.000 to 20.000 pH
	Resolution	0.1 pH; 0.01 pH; 0.001 pH
	Accuracy (@25°C)	±0.1 pH; ±0.01 pH; ±0.002 pH
	Calibration	up to five-point calibration, seven standard buffers available (1.68, 4.01, 6.86, 7.01, 9.18, 10.01, 12.45) and five custom buffers
	Temperature Compensation	automatic or manual from -20.0 to 120.0°C
mV	Range	±2000 mV
	Resolution	0.1 mV
	Accuracy	±0.2 mV
	Relative mV Offset Range	±2000 mV
Temperature*	Range	-20.0 to 120.0 °C
	Resolution	0.1°C
	Accuracy (@25°C)	±0.4°C (excluding probe error)
Additional Specifications	pH Probe	FC1013 PVDF body, pH electrode with internal temperature sensor quick DIN connector and 1 m cable
	Slope Calibration	from 80 to 110%
	Log-on-demand	Up to 200 samples (100 pH, 100 mV)
	PC Connection	opto-isolated USB with HI-92000 software and micro USB cable
	Input Impedance	10^{12} Ω
	Battery Type / Life	1.5V AA batteries (4) approximately 200 hours of continuous use without backlight (50 hours with backlight)
	Auto-off	user selectable: 5, 10, 30, 60 min, disabled
	Environment	0 to 50°C; RH 100% IP67
	Dimensions / Weight	185 x 93 x 35.2 mm / 400 g

Ordering Information	
	HI-98164 is supplied with FC2133 pH electrode, HI-7004M pH 4.01 buffer solution (230 mL), HI-7007M pH 7.01 buffer solution (230 mL), HI-700643 electrode cleaning and disinfection solution sachet for yogurt products (2), 100 mL plastic beaker (2), HI-92000 PC software, HI-920015 micro USB cable, 1.5V AA batteries (4), quick start guide, quality certificate and instruction manual in a rugged carrying case with custom insert.

* Limits will be reduced to actual probe/sensor limits.

Also available from Hanna Instruments

Food Refractometers
portable digital meters for testing salts and sugars in liquids such as beer, wine, fruit juice

Food Thermometers
from pocket to waterproof hand-held meters, our food probes are used throughout the food chain and offer unrivalled accuracy

Food Titrators
replace manual titration with one of our fully automatic and competitively priced food titrators

Hanna Instruments Ltd
Eden Way
Pages Industrial Park
Leighton Buzzard
Bedfordshire LU7 4AD

Tel 01525 850855
Fax 01525 853668
Email sales@hannainstruments.co.uk
Web www.hannainstruments.co.uk

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