



pH / Temperature Meter for Milk

with Application Specific Probe

Application Importance

The measurement of pH in milk is important in testing for impurities, spoilage, and signs of mastitis infection. While there are a number of factors that affect the composition of milk, pH measurements can help producers understand what might be causing certain compositional changes. pH measurements are commonly performed at various points in a milk processing plant.

Fresh milk has a pH value of 6.7. When the pH value of the milk falls below pH 6.7, it typically indicates spoilage by bacterial degradation. Bacteria from the family of Lactobacillaceae are lactic acid bacteria (LAB) responsible for the breakdown of the lactose in milk to form lactic acid. Eventually when the milk reaches an acidic enough pH, coagulation or curdling will occur along with the characteristic smell and taste of "sour" milk.

Milk with pH values higher than pH 6.7 potentially indicate that the milk may have come from cows

infected with mastitis. Mastitis is an ever-present challenge with dairy milking cows. When infected, the cow's immune system releases histamine and other compounds in response to the infection. There is a resulting increase in permeability of endothelial and epithelial cell layers, allowing blood components to pass through a paracellular pathway. Since blood plasma is slightly alkaline, the resulting pH of milk will be higher than normal. Typically milk producers can perform a somatic cell count to detect a mastitis infection, but a pH measurement offers a quick way to screen for infection.

Understanding the pH of raw milk can also help producers optimize their processing techniques. For example, in operations that use Ultra High Temperature (UHT) processing, even small variations from pH 6.7 can affect the time required for pasteurization and the stability of the milk after treatment.



HI99162

pH / Temperature Meter for Milk

with Application Specific Probe

- Waterproof
- Application specific electrode
- Automatic Temperature Compensation
- Automatic one or two-point calibration
- Multi-level LCD display
- On-screen tutorial for calibration and set up
- Stability indicator for accurate data recording
- Battery Error Prevention System
- Battery life displayed on startup
- Supplied as a complete kit

The Hanna Instruments HI99162 is a durable, waterproof, and portable pH and temperature meter designed specifically for milk analysis. Automatic calibration is done at one or two points with two sets of buffers. All calibration and measurement readings are automatically compensated for temperature variations. The split-level LCD displays both pH and temperature readings, along with indicators for reading stability, battery percentage, and calibration instructions.



Calibrate and measure samples right in the case

Our custom carrying case features a beaker holder for calibration on the farm or production floor.



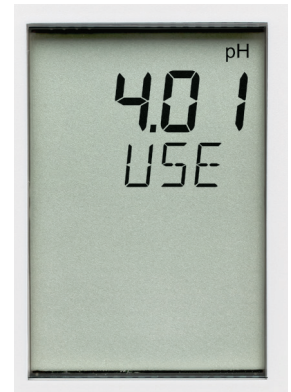
On-screen Features



- **Temperature**
 - °C and °F measurement modes



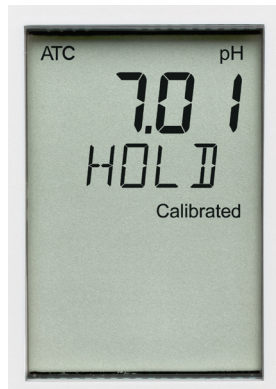
- **Buffer sets**
 - Calibrate to standard (pH 4.01, pH 7.01, pH 10.01) or NIST (pH 4.01, pH 6.86, pH 9.18) buffers



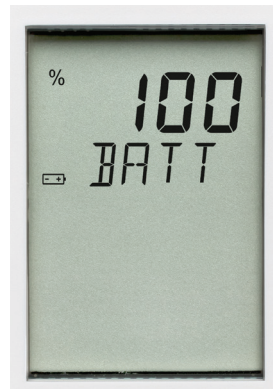
- **Calibration prompts**
 - On-screen prompts during the calibration process



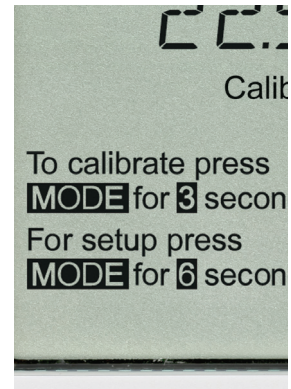
- **Stability indicator**
 - "Not Stable" tag disappears when the reading is stable for accurate data recording



- **Freeze readings**
 - Press the SET/HOLD button to hold readings on the display



- **Battery percentage**
 - Battery percentage is displayed at startup



- **On-screen guides**
 - On-screen quick guides for entering calibration and set up

Specifications

pH	Range*	-2.00 to 16.00 pH
	Resolution	0.01 pH
	Accuracy	±0.02 pH
	Calibration	automatic, one or two-point calibration with two sets of standard buffers (standard pH 4.01, 7.01, 10.01 or NIST pH 4.01, 6.86, 9.18)
	Temperature Compensation	automatic from -5.0 to 105.0°C (23 to 221°F)
Temperature	Range*	-5.0 to 105.0°C / 23.0 to 221.0°F
	Resolution	0.1°C/0.1°F
	Accuracy	±0.5°C (up to 60°C); ±1.0°C (outside) / ±1°F (up to 140°F); ±2.0°F (outside)
Additional Specifications	Probe (included)	FC101D pre-amplified pH probe with internal temperature sensor, DIN connector and 1 m (3.3') cable (included)
	Battery Type/Life	1.5V AAA (3) / approximately 1200 hours of continuous use
	Auto-off	auto-off after 8 minutes of non-use
	Environment	0 to 50°C (32 to 122°F); RH max. 100%
	Dimensions / Weight	152 x 58 x 30 mm (6.0 x 2.3 x 1.2") / 205 g (7.2 oz)

* Limits will be reduced to actual sensor limits

FC101D pH / Temperature Probe for Milk

- PVDF body
- Spheric glass tip
- Single ceramic junction
- Double junction
- Built-in temperature sensor

- **PVDF body**
 - The FC101D is composed of food grade PVDF plastic. This material is highly durable and chemically resistant.

- **General purpose glass**
 - The FC101D uses general purpose (GP) glass. The formulation allows for fast response over a wide range of temperatures. The FC101D is suitable to use with samples that measure from 0 to 80°C.



- **Refillable electrolyte**
 - The silver-free electrolyte ensures no precipitate can clog the junction. An easy to use fill cap allows for quick refilling of electrolyte solution to maintain adequate head pressure.
- **Single ceramic junction**
 - A porous ceramic frit allows the silver-free electrolyte to flow slowly into solution, providing accurate readings for aqueous samples.
- **Built-in temperature sensor**
 - A thermistor temperature sensor is in the tip of the indicating pH bulb. A temperature sensor should be as close as possible to the indicating pH electrode in order to compensate for variations in temperature.
- **Spheric tip shape**
 - The shape of the sensing membrane provides a large surface area for contact with milk samples. The highly durable construction provides accurate measurements on the dairy farm as well as the production facility.

Specifications

Description	preamplified pH/temperature probe
Reference	double, Ag/AgCl
Junction	ceramic, single
Electrolyte	KCl 3.5M
Max Pressure	0.1 bar
Range	pH: 0 to 13
Recommended Operating Temperature	0 to 80°C (32 to 176°F) - GP
Tip /Shape	spheric (dia: 7.5 mm)
Temperature Sensor	yes
Amplifier	yes
Body Material	PVDF
Cable	coaxial; 1 m (3.3')
Connection	DIN



HI99162 includes:



FC101D
pre-amplified pH
probe with internal
temperature sensor



100 mL plastic
beaker



HI70004
pH 4.01 buffer
solution sachet



HI70007
pH 7.01 buffer
solution sachet



HI700640
electrode cleaning
solution for milk
deposits sachet (2)



1.5V AAA batteries
(3)



instruction manual
and visual quick
start guide



rugged carrying
case with custom
insert

Accessories

Code	Description
FC101D	FC101D pre-amplified pH probe with internal temperature sensor, DIN connector and 1 m (3.3') cable (included)
HI70004P	pH 4.01 buffer solution, 20 mL sachets (25)
HI7004L	pH 4.01 buffer solution, 500 mL bottle
HI70007P	pH 7.01 buffer solution, 20 mL sachets (25)
HI7007L	pH 7.01 buffer solution, 500 mL bottle
HI700640P	electrode cleaning solution for milk deposits, 20 mL sachets (25)
HI70640L	electrode cleaning solution for milk deposits, 500 mL bottle
HI70300M	electrode storage solution, 230 mL bottle
HI710023	shockproof boot (orange)
HI710024	shockproof boot (blue)
HI98501	Checktemp® digital thermometer



HI98501
Checktemp® digital
thermometer



HI70640L
electrode cleaning
solution for milk deposits,
500 mL bottle



HI710023
shockproof rubber
boot (orange)



HI710024
shockproof rubber
boot (blue)