

## INSTRUCTION MANUAL

# HI99162

## pH / Temperature Meter for Milk



## Thank You

Thank you for choosing a Hanna Instruments product. Please read this instruction manual carefully before using the instrument.

For more information about Hanna and our products, visit [www.hannainst.com](http://www.hannainst.com) or e-mail us at [sales@hannainst.com](mailto:sales@hannainst.com).

For technical support, contact your local Hanna office or email us at [tech@hannainst.com](mailto:tech@hannainst.com)

Find your local Hanna office on [www.hannainst.com](http://www.hannainst.com)

## Preliminary Examination

Remove the instrument from the packing material and examine it carefully to make sure that no damage has occurred during shipment. If noticeable damage is evident, contact your local Hanna office.

**Note:** Save all packing material until you are sure that the instrument functions correctly. All defective items must be returned in the original packing together with the supplied accessories.

## General Description

The HI99162 is a portable pH and temperature meter designed specifically for pH measurement in milk. The measurement of pH in milk is important in testing for impurities, spoilage, and signs of infection. Fresh milk has a pH value close to pH 6.7. When the pH value of milk falls below pH 6.7, it typically indicates spoilage by bacterial degradation. Milk with pH values higher than pH 6.7 potentially indicate that milk may have come from cows with a mastitis infection.

HI99162 has a waterproof and compact casing, large dual-line display, and automatic pH calibration at one or two points.

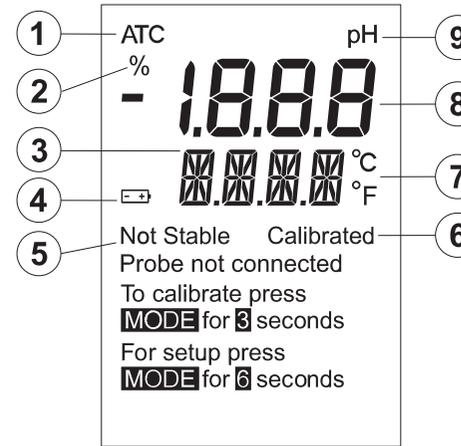
The FC101D pH electrode has a built-in temperature sensor for simultaneous temperature compensated pH and temperature readings, and also contains an integral pH sensor preamplifier to provide measurements impervious to noise and electrical interferences. FC101D electrode is designed to prevent the typical problems of clogging in viscous and proteinaceous liquids ensuring a fast response and stable reading.

Each meter is supplied with:

- FC101D pH/temperature probe with DIN connector and 1 m (3.3') cable
- pH 4.01 & 7.01 Buffer sachets
- HI700640 Electrode cleaning solution for milk deposits (2)
- 100 mL Beaker (1)
- 1.5V AAA Batteries (3)
- Rugged carrying case
- Instruction manual and visual quick start guide

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## LCD Description



1. Automatic Temperature Compensation indicator
2. Battery percentage (visible at power up)
3. Secondary display
4. Low battery indicator
5. Stability indicator
6. Calibration indicator
7. Selectable temperature unit
8. Primary display
9. Measuring unit for primary display

## Maintenance:

- While unpacking, the appearance of salt deposits around the protective cap is normal. The salt deposits will dissolve when rinsed with water.
- After use, rinse the electrode with water and replace the protective cap filled with a few drops of HI70300 storage solution. If HI70300 is not available, use pH buffer.

**DO NOT USE DISTILLED OR DEIONIZED WATER FOR STORAGE PURPOSES.**

## Warranty

The meter is warranted for a period of two years against defects in workmanship and materials when used for their intended purpose and maintained according to instructions. The electrode is warranted for a period of six months. This warranty is limited to repair or replacement free of charge. Damage due to accidents, misuse, tampering or lack of prescribed maintenance is not covered. If service is required, contact your local Hanna office. If under warranty, report the model number, date of purchase, serial number and the nature of the problem. If the repair is not covered by the warranty, you will be notified of the charges incurred. If the instrument is to be returned to Hanna Instruments, first obtain a Returned Goods Authorization (RGA) number from the Technical Service department and then send it with shipping costs prepaid. When shipping any instrument, make sure it is properly packaged for complete protection.

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## Specifications

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

\* The sensor is rated 0 to 13 pH and 0 to 80 °C (32 to 176 °F).

## Accessories

Code	Description
FC101D	Combination preamplified pH electrode with built-in temperature sensor, DIN connector and 1 m (3.3') cable, PVDF body for use in the food industry
HI7004L	pH 4.01 buffer solution, 500 mL
HI7006L	pH 6.86 buffer solution, 500 mL
HI7007L	pH 7.01 buffer solution, 500 mL
HI7009L	pH 9.18 buffer solution, 500 mL
HI7010L	pH 10.01 buffer solution, 500 mL
HI70300L	Electrode storage solution, 500 mL
HI7061L	General purpose cleaning solution, 500 mL
HI70630L	Grease and fats acid cleaning solution, 500 mL
HI70631L	Grease and fats alkaline cleaning solution, 500 mL
HI70640L	Cleaning solution for milk deposits, 500 mL
HI70641L	Cleaning and disinfection solution for dairy products, 500 mL
HI710023	Shockproof rubber boot (orange)
HI710024	Shockproof rubber boot (blue)
HI7209911	Rugged carrying case

## Operational Guide

Before using the instrument for the first time, open the battery compartment and insert batteries, observing the polarity.

### To connect the probe

With the meter turned off, connect the FC101D probe to the DIN socket on the bottom of the meter by aligning the pins and pushing in the plug. Tighten the nut to ensure a good connection. Remove the protective cap from the probe before taking any measurements.

### To turn the meter ON and check the battery status

Press the ON/OFF/MODE button to turn the meter on. At start-up, all the LCD segments are displayed for 1 second, then the percent indication of the remaining battery life is displayed for another second. The meter then enters the normal measuring mode.

**Note:** Holding the ON button while turning the meter on will display all LCD segments as long as the button is pressed.

### To freeze the display

While in measurement mode, press and hold the SET/HOLD button until "HOLD" appears on the secondary display and the reading will be frozen on the LCD. Press any button to return to normal mode.

### To turn the meter OFF

While in normal measurement mode, press the ON/OFF/MODE button. "OFF" will appear on the secondary display.

**Note:** When the meter detects the absence of probe at its input, the message "Probe not connected" appears on LCD and "----" blinks on LCD lines. When a probe is connected, the "Probe not connected" tag is turned off, and the readings are displayed on the LCD.

### To enter calibration mode

Press and hold down the ON/OFF/MODE button until "OFF" is replaced by "CAL." Release the button.

### To enter setup mode

Press and hold ON/OFF/MODE button until "CAL" is replaced by "TEMP" on the secondary display. Release the button.

## Meter Setup

While in measurement mode, press and hold the ON/OFF/MODE button until "TEMP" appears on the secondary display. Pressing the ON/OFF/MODE button will now cycle through the various units and features below which can then be modified with the SET/HOLD button.

### To select the temperature unit (°C/°F)

Press ON/OFF/MODE button until "TEMP" and the selected temperature unit "°C" or "°F" is displayed. Press SET/HOLD button to select temperature unit.

### To select standard or NIST buffers for calibration

Press ON/OFF/MODE button until "TEMP" is displayed. Press ON/OFF/MODE once more to view the current buffer set. To change the buffer set press SET/HOLD. Choose "pH 7.01 BUFF" (for standard buffer set: 4.01/7.01/10.01) or "pH 6.86 BUFF" (for NIST buffer set: 4.01/6.86/9.18).

### To return to measurement mode

Press ON/OFF/MODE button.

## pH Measurement and Calibration†

- Make sure the meter has been calibrated before use.
- If the probe is dry, soak it in HI70300 storage solution for 30 minutes to reactivate it.
- Submerge the probe in the sample to be tested while stirring it gently. Wait until the "Not Stable" tag on the LCD disappears.
- The LCD displays the pH value (automatically compensated for temperature) on the primary LCD, while the secondary LCD displays the sample temperature.
- If measurements are taken in different samples successively, rinse the probe tip thoroughly† to eliminate cross-contamination. After cleaning, rinse the probe tip with some deionized water and some of the sample to be measured.

For better accuracy, frequent calibration of the pH sensor with the meter is recommended. In addition, the meter must be recalibrated whenever:

- a) The pH electrode is replaced.
- b) After testing aggressive chemicals.
- c) Where high accuracy is required.
- d) At least once a month.

### pH calibration

- Enter calibration mode while in pH measurement mode.
- Place the sensor into the first calibration buffer. If performing a two-point calibration, use pH 7.01 (pH 6.86 for NIST) buffer first.
- The meter will enter the calibration mode, displaying "pH 7.01 USE" (or "pH 6.86 USE" for NIST).

Follow directions for single and two-point calibration below:

### Single-point calibration

1. Place the probe in any buffer from the selected buffer set. The meter will automatically recognize the buffer value.
  2. If the buffer is not recognized or the calibration offset is out of the accepted range "---- WRNG" is displayed.
  3. If the buffer is recognized "REC" is displayed until the reading is stable and the calibration is accepted.
- If using pH 7.01, after acceptance of the buffer press any key to exit. "OK1" message is displayed and meter returns to pH measurement mode.
  - If using 4.01 or 10.01/9.18 buffer the "OK1" message is displayed and meter returns to pH measurement mode.

### Two-point calibration

Proceed with steps 1 through 3 under single-point calibration using 7.01 (pH 6.86 for NIST) pH buffer first. Then follow steps below:

- The "pH 4.01 USE" message is then displayed.
- Place the probe in the second calibration buffer (pH 4.01 or 10.01/9.18). When the second buffer is accepted, the LCD will display "OK2" for 1 second and the meter will return to the normal measurement mode.

- If the buffer is not recognized or the slope is out of accepted range "---- WRNG" is displayed. Change the buffer, clean the electrode or press any key to exit calibration.

**Note:** When the calibration procedure is completed, the "Calibrated" tag is turned on.

It is always recommended to carry out a two-point calibration for better accuracy.

## Battery Replacement

The meter is supplied with batteries.

The meter displays the remaining battery percentage when turned on. When the level is below 5%, the  symbol on the LCD blinks to indicate a low battery condition. If the battery level is low enough to cause erroneous readings, the Battery Error Prevention System (BEPS) turns the meter off. It is recommended to replace the batteries as soon as the display flashes the battery symbol. To replace the batteries:

- Open the battery compartment cap (on the bottom of the instrument).
- Remove old batteries.
- Replace new batteries, observing the polarity on the rear of the instrument.
- Close the battery compartment cap.

† The probe tip should be rinsed with purified water (reverse osmosis, distilled, or deionized) before and after placing in any solution (buffer, storage, or sample).