

measure

accumet[™] BASIC

H

AB 15/15+



USER Manual

std

mode

setup

enter

stdby

ar
FFER
ect



2

E

press **mode** to
 press **std** to set
 press **setup** to
 press **enter** to
 press **std** to sto

select
TEMP
UNIT

25.0 °C



Fisher Scientific



ATC

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1 INTRODUCTION

Thank you for selecting the Accumet AB 15/ 15+ bench-top meter. This instruction manual describes the operation of the meter. The state-of-art meter that you have purchased is easy to operate and will guide you through the various functions by displaying easy to understand prompts.

This instruction manual is designed to provide all the information necessary to guide you through the process of measuring pH or mV with a series of prompts on the screen.



You will find this symbol appearing in this manual; it indicates useful tips that ease your meter operation.

The Accumet AB 15/ 15+ meter provides microprocessor precision in a compact benchtop design that is easy to use. This meter allows you:

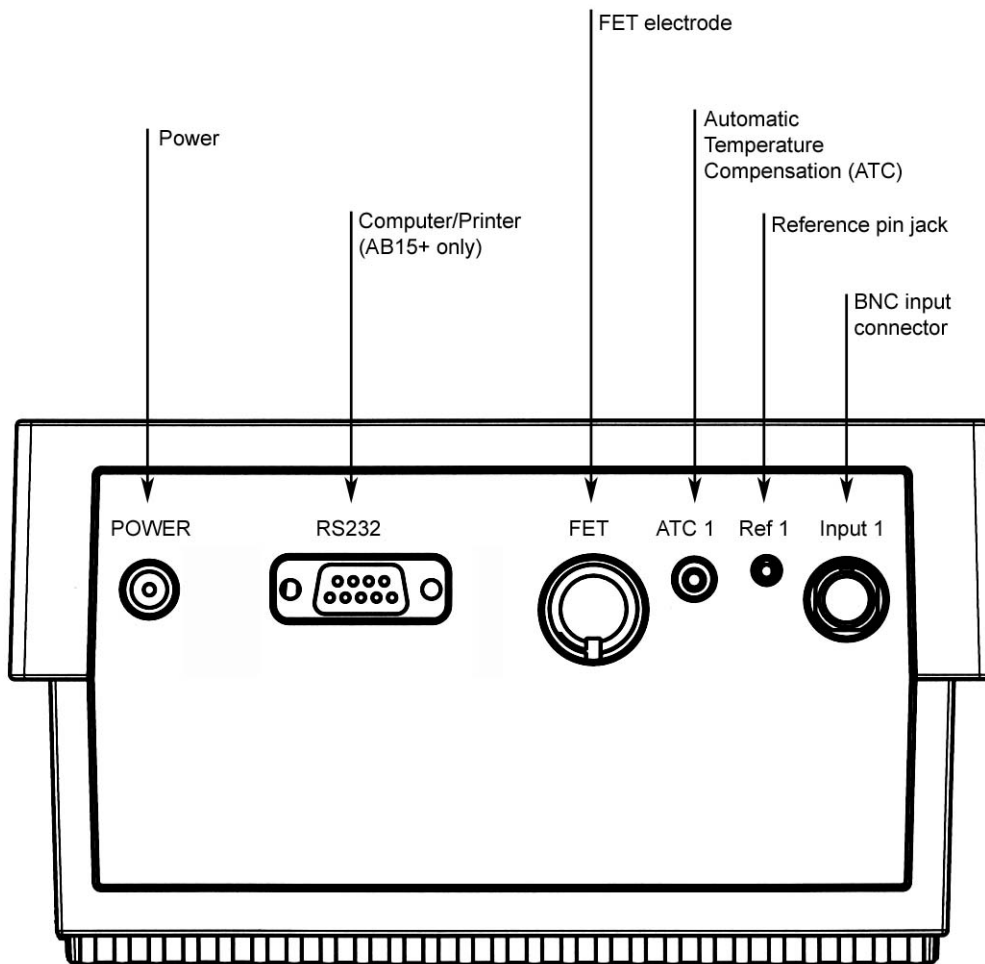
- Measure pH, absolute mV , relative mV or temperature
- Select one of three sets of standard buffer groups
- Standardize with up to five/ six buffers

It all adds up to rapid, completely automatic, intuitive operation.

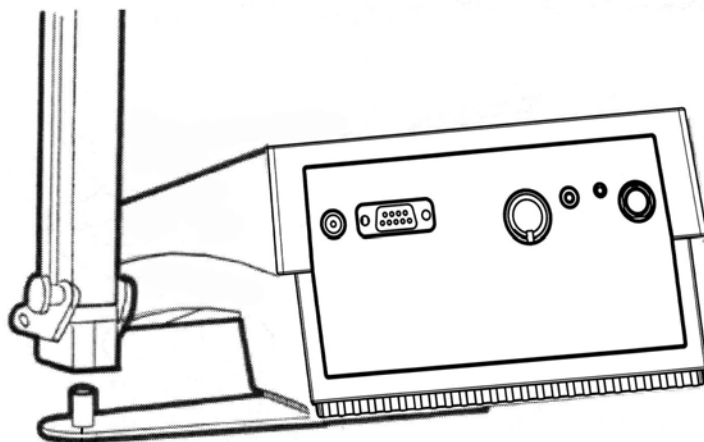
2 GETTING STARTED

2.1 Connectors

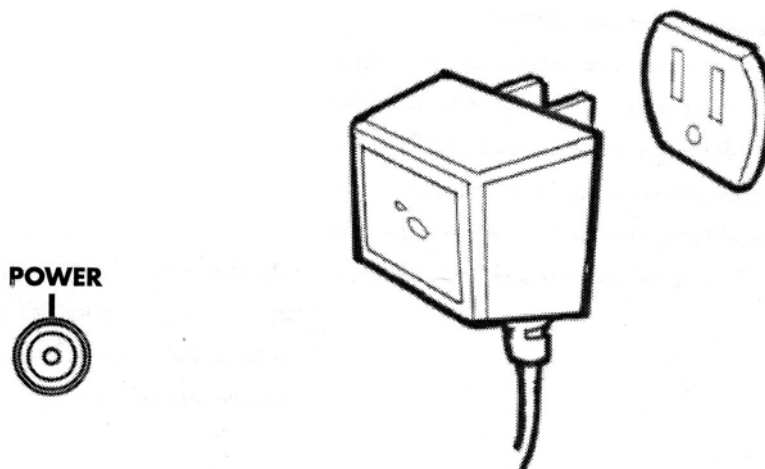
1. Review the layout and arrangement of the rear connector panel.



2. Connect the electrode arm to the base.



3. Connect the power cable to the connector cable to the rear connector panel power jack and to a power source.

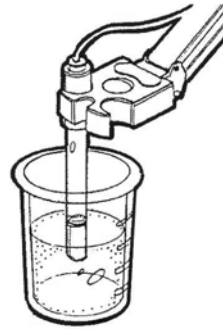


3 USING THE METER

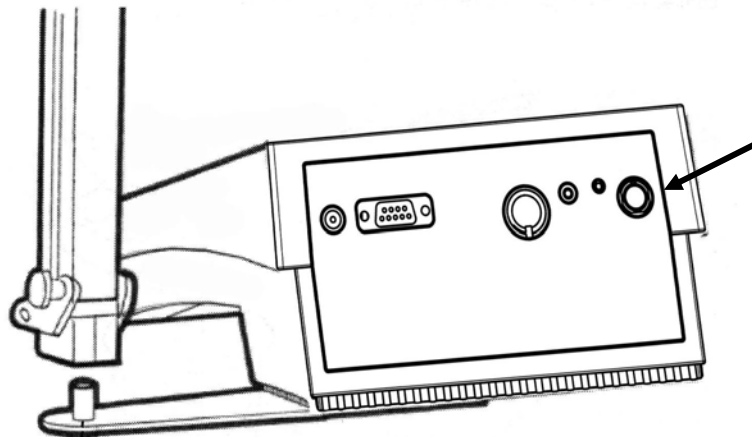
3.1 Electrodes

This meter allows you to use two types of pH electrodes: the conventional glass pH electrode and the field effect transistor (FET) electrode. If both types of electrodes are connected, the meter will read the FET electrode.

1. Carefully remove the protective cover from the end of the electrode. Before first using your glass pH electrode, soak it 2-4 hours in an electrode storage solution, pH 4 buffer, or KCl solution.



2. Remove the shorting cap on BNC connector. Connect the **combination pH electrode** in to the BNC input connector.

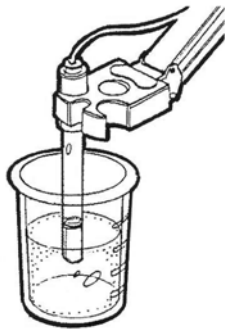
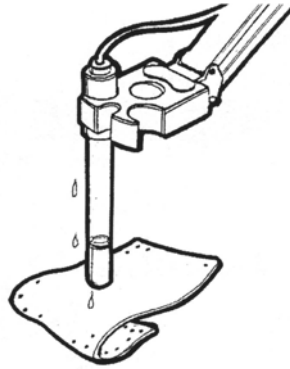


If a combination electrode isn't used, connect the **indicating pH electrode** into the BNC input connector. Plug the **reference electrode** into the reference pin jack. Also, install the **ATC probe** into the ATC jack.

Note: be sure to connect all probes to the appropriate **channel connectors** (for example: Input 1, Ref 1 and ATC1).

Option: Connect the optional **FET electrode** by plugging it into the FET jack on the back meter panel. Allow the FET electrode to warm up five minutes before use.

3. Rinse and blot-dry (don't wipe) electrodes between each measurement. Rinse electrodes with distilled or deionized water, or a portion of the next solution to be measured.



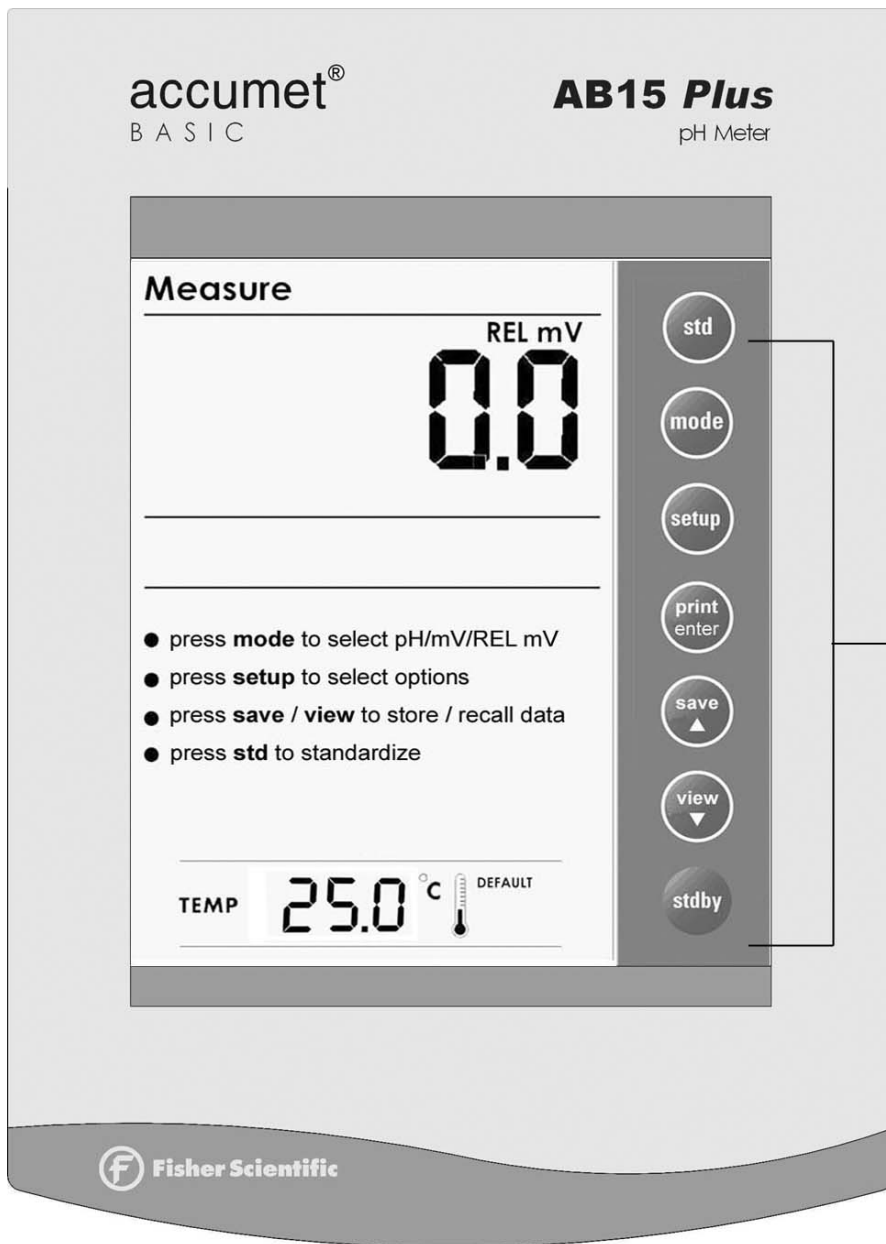
4. Between measurements, store conventional pH electrodes storage solution, pH 4 buffer, or KCl solution. Always leave the filling hole of liquid filled combination electrodes open. Refill when the level of solution gets below the manufacturer's recommended level.



Proper electrode care is fundamental to obtaining reliable pH measurements. Improper care of the electrode may cause the meter reading to drift, respond slowly, or produce erroneous readings. For this reason, the electrode should always be conditioned and used in accordance with manufacturer's instructions.

3.2 Display/ Keys

Overview of the meter screen display and function key layout.



Meter Display: AB15+

Press **std** key to initiate standardization from measure mode. Or press **std** key at the Standardize mode to confirm the standardization and return to Measure mode.

Press **mode** to select pH, mV and Relative mV.

Press **setup** key to access setup for configuration of meter setting.

Press **print** key to print stored data from memory or current reading to a PC or printer (depending on meter setup).

Press **enter** key to confirm selection or change being made.

Press **save/ ▲** key to increment value or scroll up selection.

Press **view/ ▼** key to decrement value or scroll down selection.

Press **save/ ▲** key to store displayed data into memory

Press **view/ ▼** key to recall and select memory location of stored data

Press **stdby** key to start up or put the meter in standby mode.



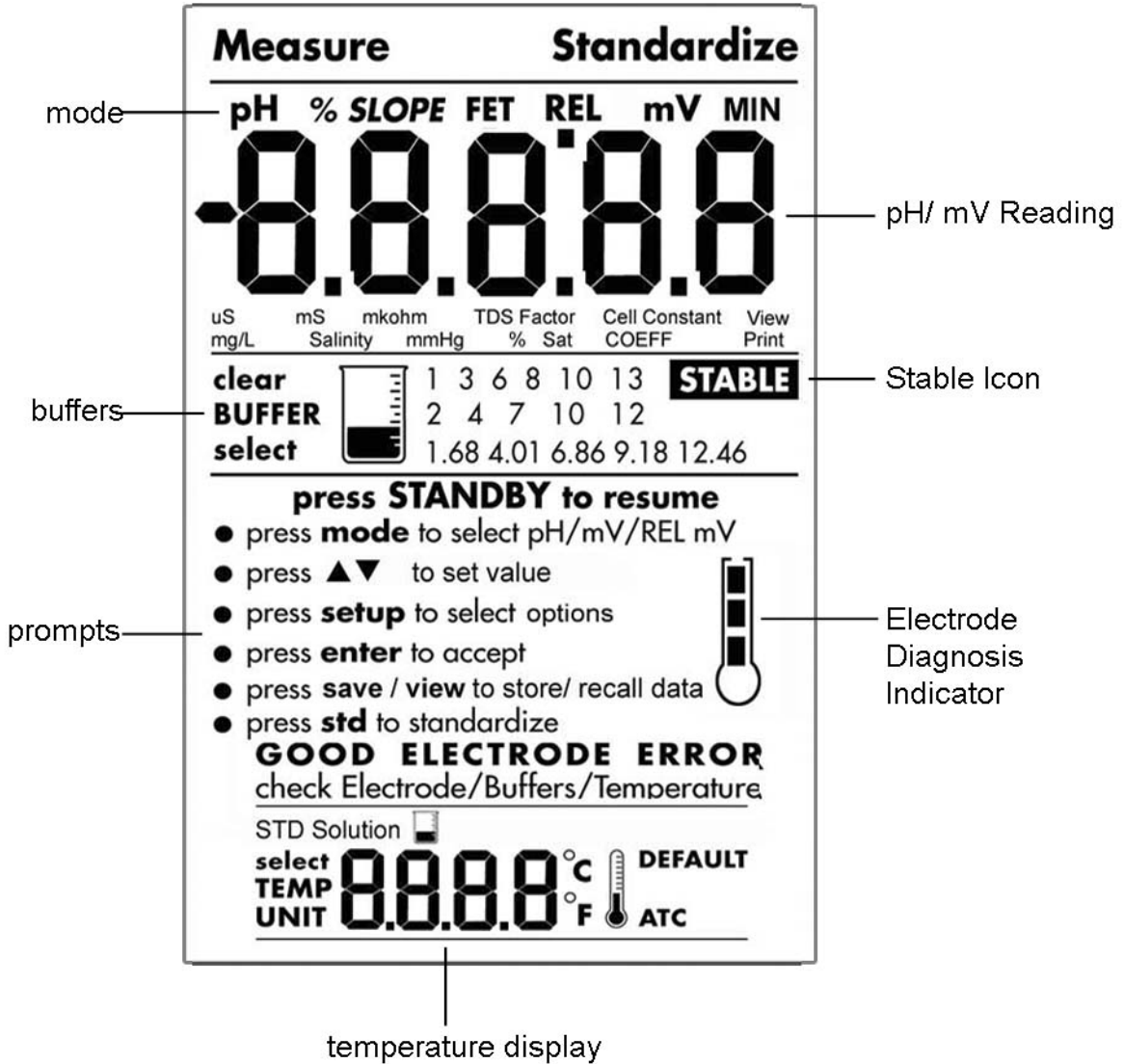
save/ ▲ and **view/ ▼** keys perform different functions whilst in different modes. These keys are only available in Accumet AB15+.



Meter Display: AB15

3.3 Screen Display

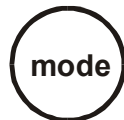
Familiarize yourself with the layout of the digital screen display.



4 pH OPERATION

4.1 Using Setup

The **setup** button is in essence a scroll key which allows you to change several operating parameters. While in the **setup mode** you may:



Press the **mode** key to return to the Measure screen without making a change or selection in the setup mode.



Press the **setup** key to scroll through the remaining selection options available.



Press the **enter** key to accept a change or selection in the displayed parameter. The meter will then return to the measurement mode.



View pH electrode slope

- View the pH electrode slope in % after 2-point standardization is successfully done.



Baud Rate

- To set the baud rate (bits of second) of the communication protocol interface. Select from 4800, 9600, 19200 or 38200.



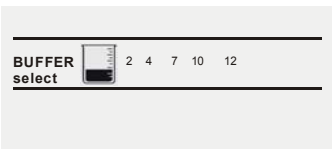
Clear pH standardization

- To clear pH standardized buffers.



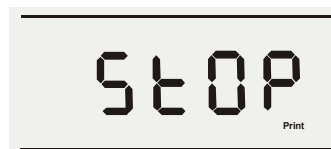
Parity Bit

- Set the parity bit of the communication protocol interface. Select 0(none), 1(odd) or 2(even).



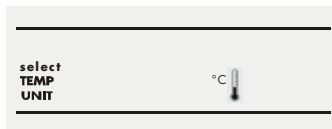
pH buffer group

- Select from 3 different buffer groups, each containing 5-6 buffers, for auto buffer recognition.



Stop Bit

- Set the stop bit of the communication protocol interface. Select 1 or 2.



Temperature Unit

- Select unit of measure for Temperature either in °C or °F.



Print Data

- To print current displayed data or data stored in the meter's memory to a computer or printer via Rs232.



pH resolution

- Select various pH resolution either 88.888, 88.88 or 88.8. (0.001/ 0.01/ 0.1)



Clear Stored Data

- To clear all stored data sets for new data to be stored.



Stability Indicator

-Set the stability indicator to be displayed on the screen. Select On or OFF.

Overview of Setup Menus in AB15+



View pH electrode slope

- View the pH electrode slope in % after 2-point standardization is successfully done.



Clear pH standardization

- To clear pH standardized buffers.



pH buffer group

- Select from 3 different buffer groups, each containing 5-6 buffers, for auto buffer recognition.



Temperature Unit

- Select unit of measure for Temperature either in °C or °F.



pH resolution

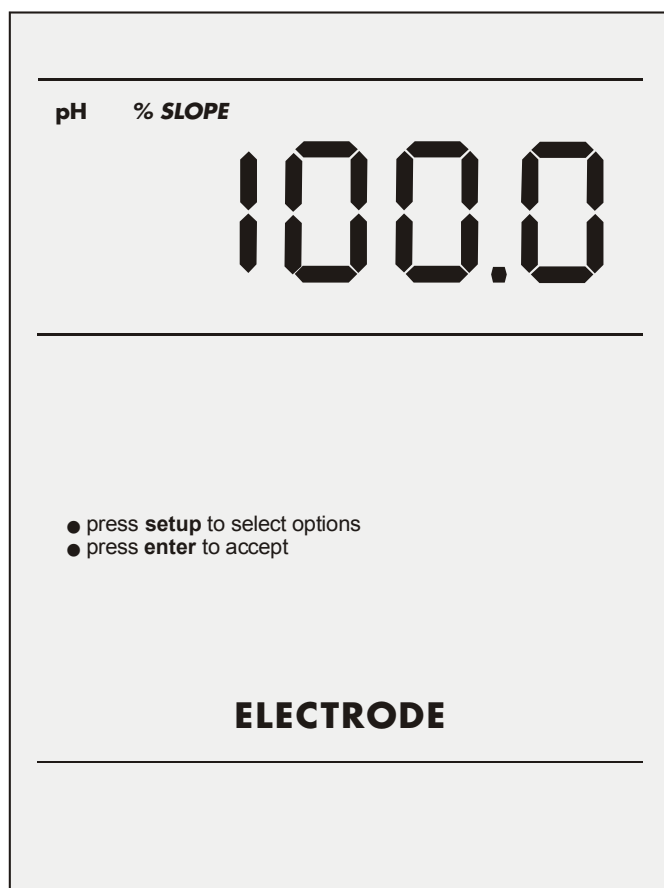
- Select pH resolution either 88.88 or 88.8. (0.01/ 0.1)

Overview of Setup Menus in AB15

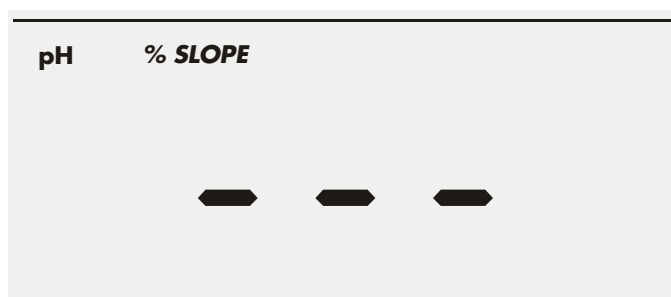
4.1.1 View pH Electrode Slope

This setup menu allows you to view the pH electrode slope in % after 2-point standardization is successfully done.

- 1 Press **setup** to view the pH electrode slope in %.



- 2 If the unit has not been standardized, a series of dashes will appear on the display rather than a number.



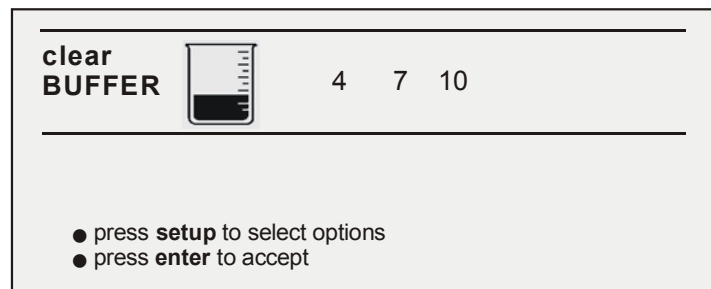
- 3 Press **enter** or **mode** to return to measurement

4.1.2 Clear pH Standardization

The setup option allows you to clear the previous pH standardization.

To clear pH Standardization

1. Access the Clear pH Standardization menu from the pH Measure screen by pressing the **setup** key.
2. Press **setup** again to display the clear BUFFER icon is displayed along with the previously entered buffers.



3. Press **enter** to clear all existing buffers.
4. Press **enter** key to confirm selection OR press **mode** key to exit to measurement OR press **setup** key to access other setup options.

NOTE: If no buffers have been entered, the meter will skip this screen.



You can escape setup mode at any time by pressing mode. Pressing enter will always return the display to the Measure screen after accepting the setup option.

4.1.3 pH Buffer Group

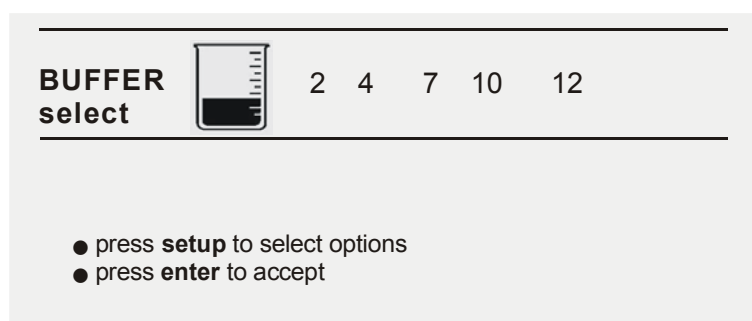
This setup option allows you to select from 3 different buffer groups, for auto buffer recognition.

The 3 buffer groups are:

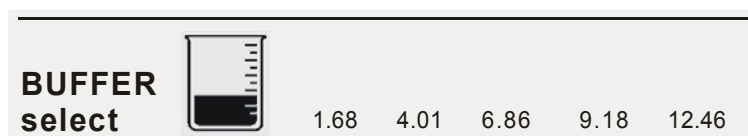
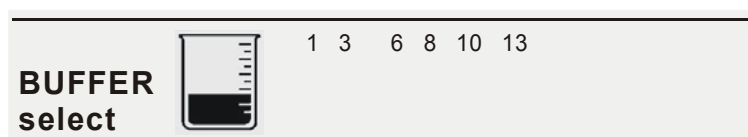
USA buffers: 2, 4, 7, 10 and 12
 European buffers: 1, 3, 6, 8, 10 and 13
 NIST buffers: 1.68, 4.01, 6.86, 9.18 and 12.46

To Select pH Buffer Group

- 1 Access the pH Buffer Group menu from the pH Measure screen by pressing the **setup** key and the screen will display the BUFFER select icon.



- 2 Press **enter** to accept the group and return to the Measure screen, **or**
- 3 Continue to press **setup** until the desired buffer group is displayed.



- 4 Press **enter** to accept the desired buffer group and return to the Measure screen.

4.1.4 Temperature Unit

This setup option allows you to select unit of measure for Temperature either in °C or °F.

To Select Temperature Unit

- 1 Access the Select Temperature Unit menu from the pH Measure screen by pressing the **setup** key.
- 2 Press **setup** to scroll until screen displays as follows. Press **setup** to display the select TEMP UNIT icon.



- 3 Press **enter** to accept the °C temperature unit and return to the Measure screen, **or**
- 4 Press **setup** again to display the °F unit.



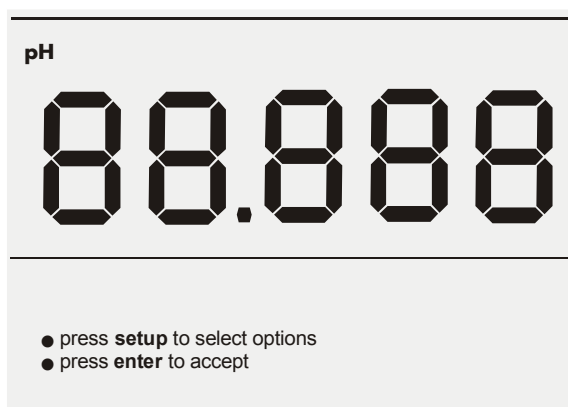
- 5 Press **enter** to accept the °F unit and return to the Measure screen.

4.1.5 Set pH Resolution

This setup option allows you to select various pH resolution either 0.1, 0.01 or 0.001 (only available in AB15+).

To Select pH Resolution

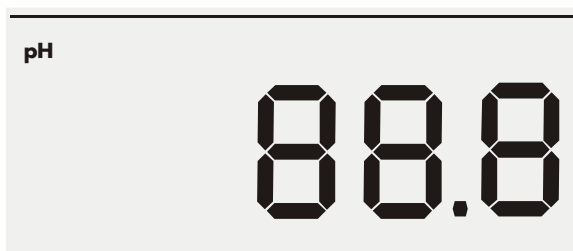
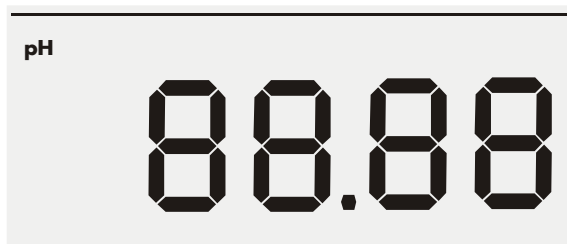
- 1 Access the Select pH Resolution menu from the pH Measure screen by pressing the **setup** key.
- 2 Press **setup** to scroll until screen displays as follows. Press **setup** to view the three decimal point resolution selection.
(Three decimal resolution only available in Accumet AB15+)



- 3 Press **enter** to accept this resolution and return to the Measure screen,

OR

- 4 Press **setup** again to display two/ one resolution setup options.



- 5 Press **enter** to accept this resolution and return to the measure screen.

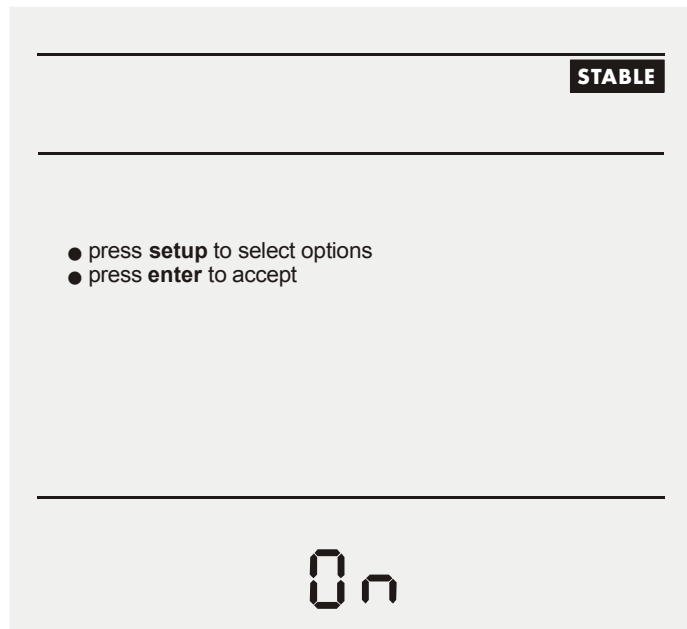
- 6 Press **enter** key to confirm selection OR press **mode** key to exit to measurement OR press **setup** key to access other setup options.

4.1.6 Stability Indicator (Only available in AB15+)

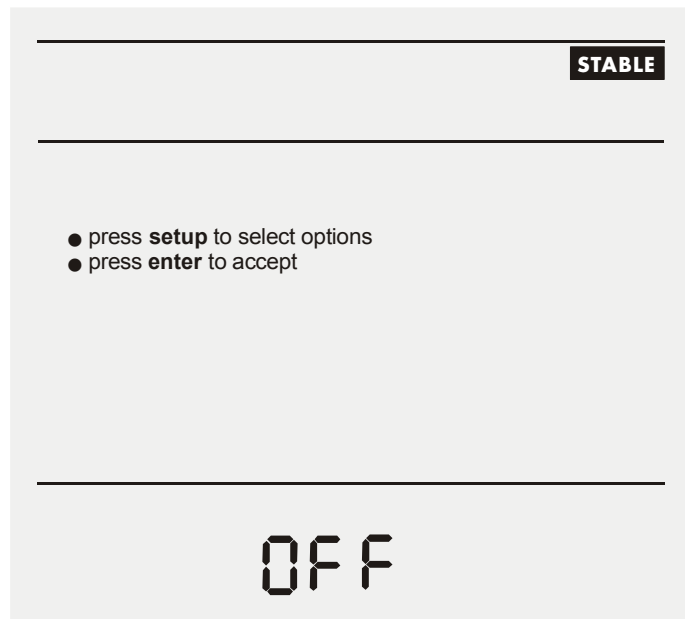
This setup option allows you to set the stability indicator to be displayed on the screen whenever reading has stabilized, thus minimizes guesswork.

To Set Stability Indicator

1. Access the Set Stability Indicator menu from any Measure screen by pressing the **setup** key.
2. Use the **setup** key to scroll until the screen displays the **stable** icon is shown.



3. Press **enter** to enable the "STABLE" OR press **setup** again to select to disable the STABLE option.



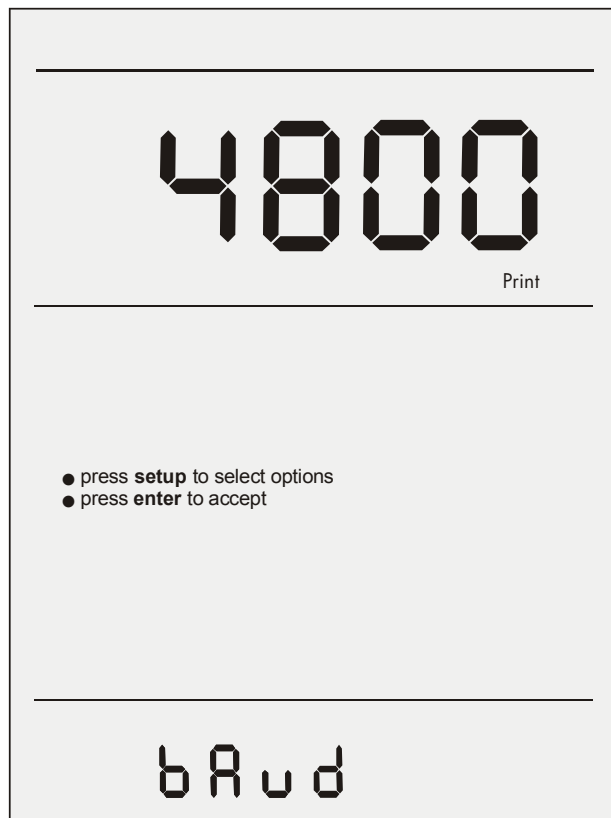
- 5 Press **enter** key to confirm selection OR press **mode** key to exit to measurement OR press **setup** key to access other setup options.

4.1.7 Baud Rate (Only available in AB15+)

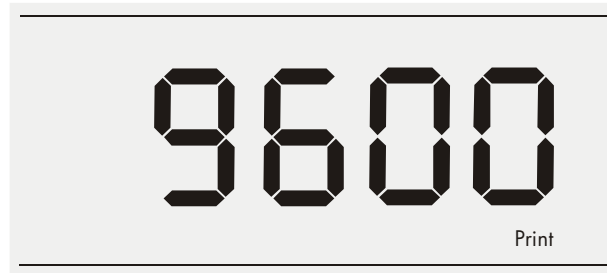
This setup option allows you to set the baud rate (bits per second) of the communication protocol interface.

To Set Baud Rate

1. Access the Set Baud Rate menu from any Measure screen by pressing the **setup** key.
2. Use the **setup** key to scroll until the screen display as shown.



3. Press **enter** key to make selection and exit to measurement OR use the **setup** key to go to other baud rate selection. (4800, 9600, 19200 and 38400).



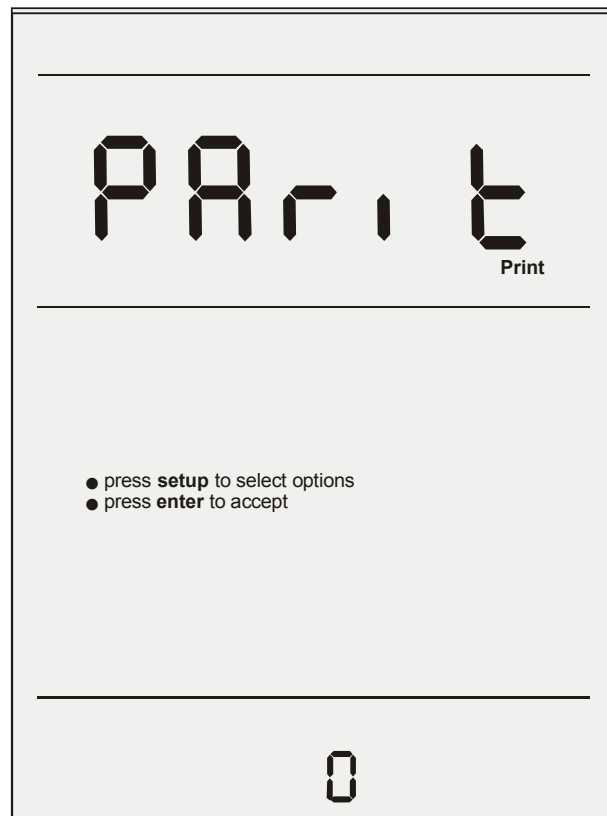
4. Press **enter** key to confirm selection OR press **mode** to exit from this page, and return to measure screen.

4.1.8 Parity Bit (Only available in AB15+)

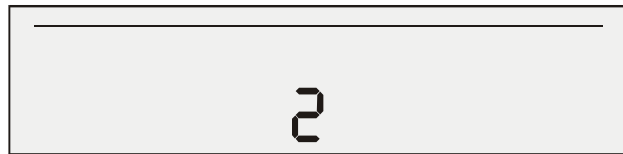
This setup option allows you to set the parity bit of the communication protocol interface.

To Set Parity Bit

1. Access the Set Parity Bit menu from any Measure screen by pressing the **setup** key.
2. Use the **setup** key to scroll until the screen display as shown.



3. Press **enter** key to make selection and return to measurement OR use the **setup** key to go to other parity setting. [0 (none), 1 (odd) or 2 (even)]. *Default: 2(even)*



4. Press **enter** key to confirm selection OR press **mode** to exit from this page.

4.1.9 Stop Bit (Only available in AB15+)

This setup option allows you to set the stop bit of the communication protocol interface.

To Set Stop Bit

1. Access the Set Stop Bit menu from any Measure screen by pressing the **setup** key.
2. Use the **setup** key to scroll until the screen display as shown.



3. Press **enter** key to make selection and return to measurement

OR

use the **setup** key to go to Stop Bit = 2 option.



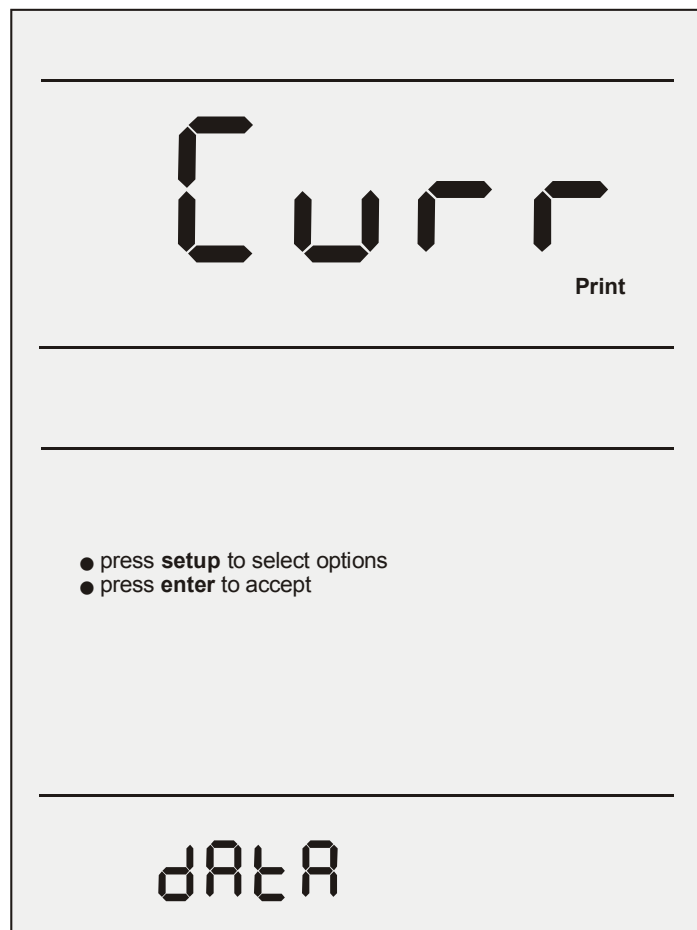
4. Press **enter** key to confirm selection OR press **mode** to exit from this page.

4.1.10 Print Current & Stored Data/ Clear Stored Data (Only available in AB15+)

This setup option allows you to print current displayed data or data stored in the meter's memory to a computer or printer via its RS232 interface port. Note all the communication protocol for both the meter and computer/printer must match before successful printing can be performed.

To Select Print Data Option (Current / Memory)

1. Access the Select Print Data Option menu from any Measure screen by pressing the **setup** key.
2. Use the **setup** key to scroll until the screen display as shown.



3. Press **enter** key to make selection and return to measurement
- OR
4. Press **setup** key again to print stored data option.



4.1.11 Clear Stored Data (Only available in AB15+)

This setup option allows you to clear all stored data sets (from previous measurements) in the meter's memory for new data to be stored. Note old data sets will be overwritten by any new data sets in the event when the stored locations have exceeded.

To Clear Stored Data

1. Access the Clear Stored Data menu from any Measure screen by pressing the **setup** key.
2. Use the **setup** key to scroll until the screen displays as shown.



3. Press **enter** key to clear the memory.

OR

Press **mode/ setup** to exit to measurement.



When enter key is pressed, meter displays the blinking “clear” icon.

Once the clearing process is over, meter returns to measure screen.

5 STANDARDIZATION

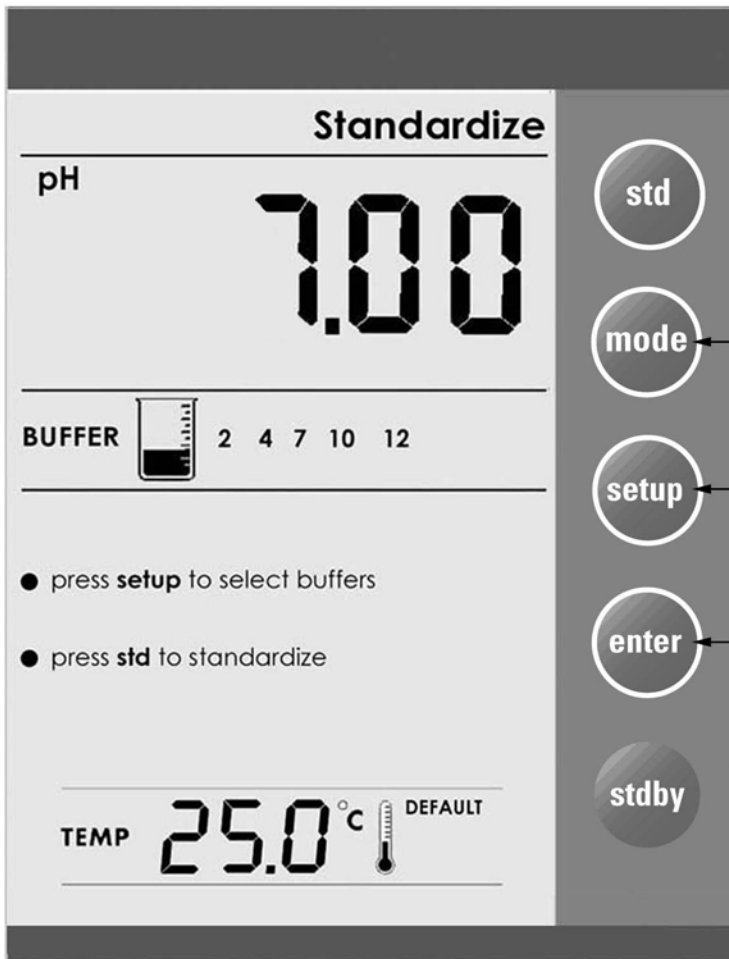
5.1 Standardization Procedure

Because electrodes vary in their response, you must standardize or calibrate your pH meter and electrode to compensate for electrode variation. The more frequently you standardize or calibrate, the more accurate your measurements. Standardize at least daily, or more often, for accurate results. The Accumet AB 15/ 15+ meter has auto buffer recognition for up to 5/6 buffer values from choice of either 1 of the 3 buffer groups available or 6 custom pH buffer values selected from any of these 3 buffer groups (Depending on buffer selection).

The diagram shows the Accumet AB15+ screen and display keys. The screen displays 'Standardize' mode with a pH reading of 7.001, a buffer selection of 7, and a temperature of 25.0°C. The keys shown are std, mode, setup, print enter, save, view, and stdby. Arrows point from the mode, setup, and print enter keys to the numbered instructions on the right.

1. Press and release the mode key until your digital display indicates pH mode. This key toggles between pH, mV and Rel mV modes.
2. Press the setup key twice and then press **enter** key to clear an existing standardization. (See USING SETUP on Pg 9 if the calibration done)

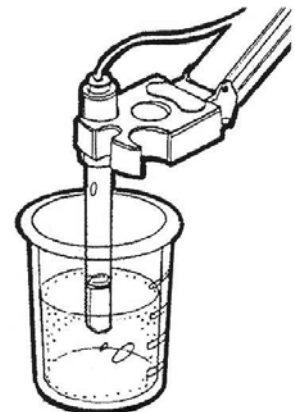
AB15+ screen & display keys



1. Press and release the mode key until your digital display indicates pH mode. This key toggles between pH, mV and Rel mV modes.
2. Press the **setup** key twice and then press **enter** key to clear an existing standardization. (See USING SETUP on Pg 9 if the calibration done)

AB15 screen & display keys

3. Immerse the rinsed electrode(s) into a buffer from the selected group. Stir, moderately,

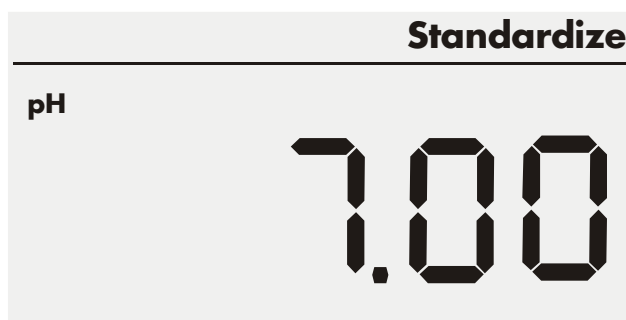


4. Press **std** to access the Standardize mode.

The selected buffer group is displayed briefly.



5. Do wait for reading to stabilize.
6. Press **std** again to initiate standardization. The meter will automatically recognize the buffer.



and then meter returns to the Measure screen.



Press **mode** key while in the standardization mode to return to measurement without accepting calibration.

7. Repeat steps 3-6 with a second and subsequent buffers.



When the ATC probe is connected, the meter will continually adjust for temperature. Therefore the buffer values may vary slightly from the nominal values because of temperature variations.



It is good to standardize your meter using at least 2 buffers.

When the meter accepts the second buffer, it will briefly display the percent slope associated with the electrode's performance prior to returning to the Measure mode.



If the electrode is within the range of 90-102%, the GOOD ELECTRODE message will appear.

GOOD ELECTRODE

If the electrode is outside this range, the meter will display the ELECTRODE ERROR message, and will not return to the Measure screen until the user presses **enter**.

ELECTRODE ERROR



The meter will permit the user to use an electrode outside the recommended range, but the ERROR message will persist.

5.2 pH Electrode Diagnosis Indicator

There is an electrode diagnosis icon that indicates the condition of pH electrode being used.

The STABLE icon will appear once the reading is stabilised. If the meter is calibrated with 2 or more points, then meter displays the electrode characteristic indicator bar with appropriate segments.

All	3 segments lighted:	102% > Slope > 90%
	2 segments lighted:	90% > Slope > 80%
	1 segment lighted:	80% > Slope > 70%
	None lighted:	Slope < 70%/ or >102%



STABLE icon will only appear provided that it has been set yo 'On' mode in setup. See Section 4.1.6: Stability Indicator (Only available in AB15+), Pg 17.

5.3 Standardizing with buffers from different buffer sets

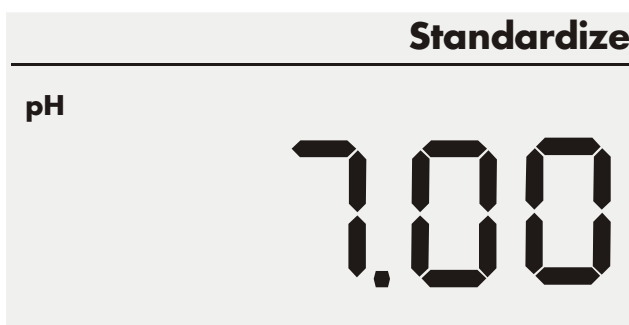
You can standardize the meter or buffer values from different selected buffer groups.

To standardize with buffers from different buffer sets

1. Press **setup** to select a buffer group that includes the desired buffer. See page 14.

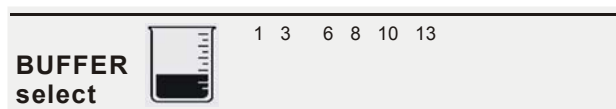


2. Press **std** to standardize the meter with the selected buffer(s)/ see pages 29- 32.



3. After the standardization meter returns to measurement mode.

4. Press **setup** to return to setup and select the next buffer group that contains the desired buffer(s). See page 14.



5. Press **std** key to standardize the meter with the selected buffer(s). see pages 29- 32.



6. Repeat steps 1-2 until standardization with all desired buffers is completed.



It is better if the selected buffers will be at least 2 pH units apart.

6 MEASUREMENT

6.1 Measurement Procedure

1. Immerse the electrode (along with temperature probe if available for the measurement of pH) into the sample solution. Stir moderately.

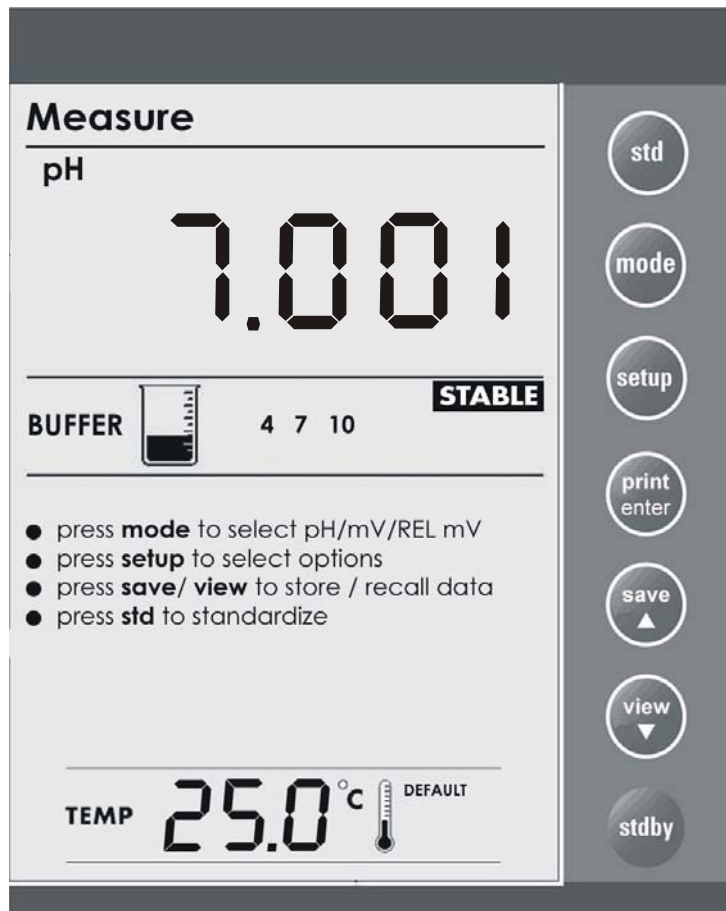


Make sure that the meter is in the Measure mode.

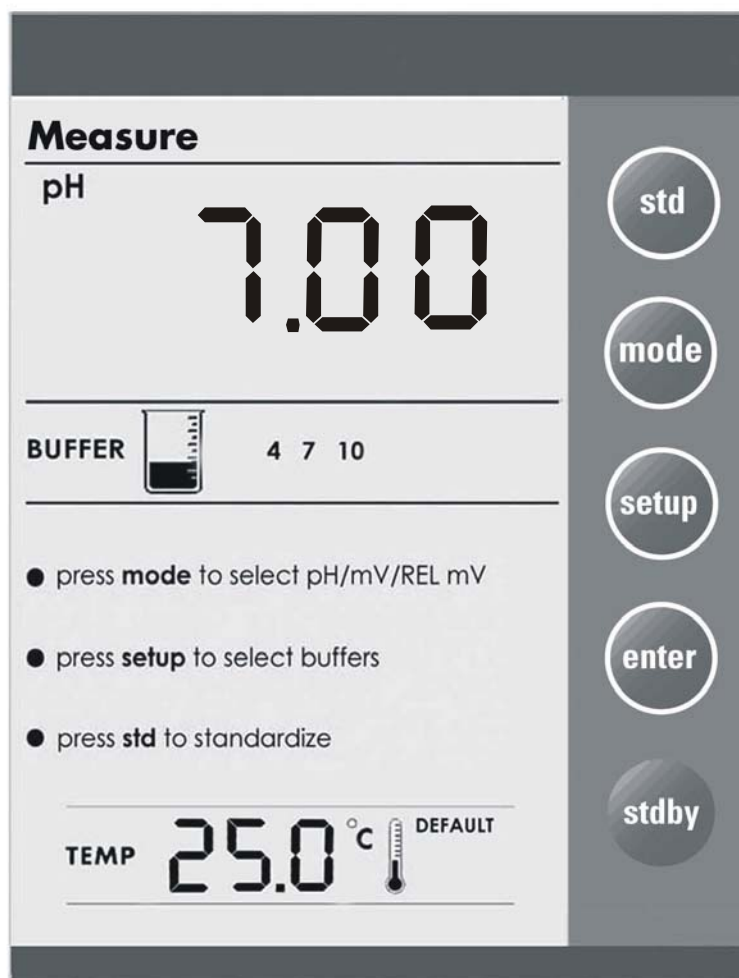
2. When the meter senses that the reading has stabilized, the stable icon will appear under the reading. The reading may be recorded at this time.



STABLE icon will only appear provided that it has been set to 'On' mode in setup. See Section 4.1.6: Stability Indicator (Only available in AB15+), Pg 17.



AB15+ screen & display keys



AB15 screen & display keys



Stirring with a magnetic stir bar and stirrer provides faster electrode response.

3. The reading may be recorded at this time by saving into meter's memory using save key.

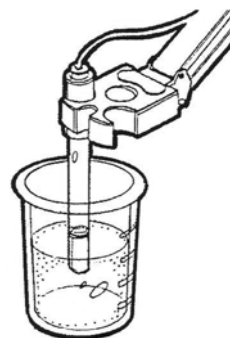
7 mV OR RELATIVE mV OPERATION

7.1 Absolute mV

Millivolts (mV) measurement is used primarily for measuring redox potential (also known as ORP, oxidation reduction potential). You will normally use a platinum ORP electrode, combined with a reference electrode, to measure redox potential (ORP) of a test sample. ORP measurements indicate the oxidizing or reducing capability of a solution. You can also use ORP values to monitor or control solutions requiring a set amount of oxidants or reductants. Calibration of ORP is not necessary. However it is essential to cross-reference using known Quinhydrone or Pre-treatment ORP solutions to ensure good working condition and response of ORP electrode being used from time to time.

1. Access the mV mode by pressing mode key until your meter displays screen shown below.
2. Immerse the electrode in a sample solution.
3. The stable icon appears when reading stabilizes. The reading may be recorded at this time by storing into meter's memory using **save/ ▲** key.

(SAVING function only available in AB15+)



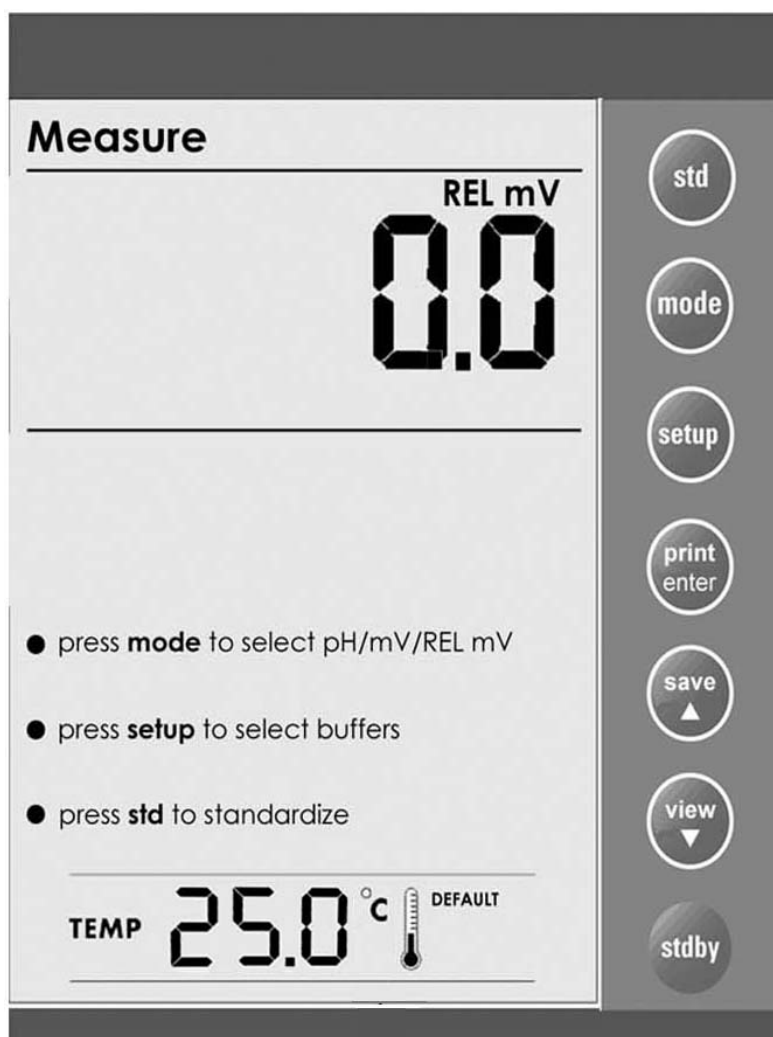
STABLE icon will only appear provided that it has been set to 'On' mode in setup. See Section 4.1.6: Stability Indicator (Only available in AB15+), Pg 17.

7.2 Relative mV

The Relative mV mode helps you to standardize certain analytical and monitoring activities such as filtrations.

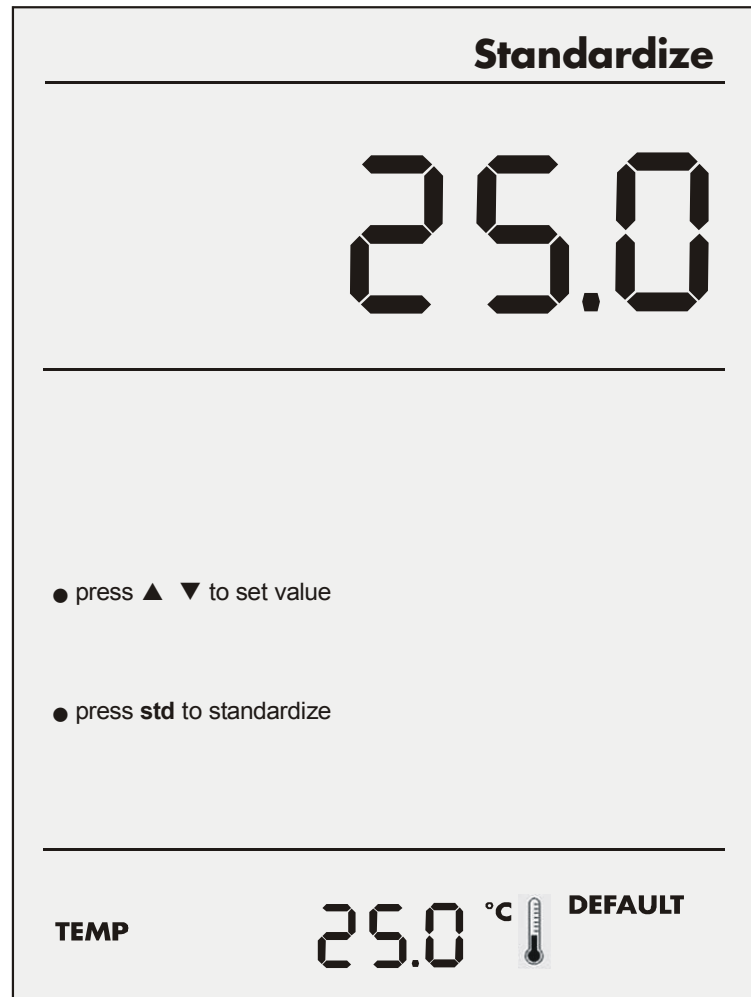
1. Access the Relative mV mode by pressing **mode** until your meter displays screen shown below.
2. Immerse the electrode in a sample solution.
3. If you press **std** and mV on the screen will change to 0.0 mV reading . Subsequent mV readings will be displayed relative to this 0.0 mV setting.
4. Reading may be recorded by storing into meters measuring using **save/ ▲** key.

(SAVING function only available in AB15+)



7.3 Temperature Calibration

1. Access the temperature calibration mode by pressing **mode** key to go to the absolute mV measure screen
2. Press **std**. This will take you to the temperature calibration (MTC or ATC)
3. Press **save/ ▲** or **view/ ▼** to adjust the temperature.



4. Press **std** to confirm the reading.

Maximum adjustable temperature offset is

For ATC: ±5°C/ 9°F

For MTC: - 5 to 105 °C/ 23°F -221°F

8 MEMORY (Only available in AB15+)

8.1 Store Value Into Memory

In any Measure mode, press **save/ ▲** key to store the displayed reading into the meter's non-volatile memory. A memory location is shown momentarily and the meter returns to the Measure mode.

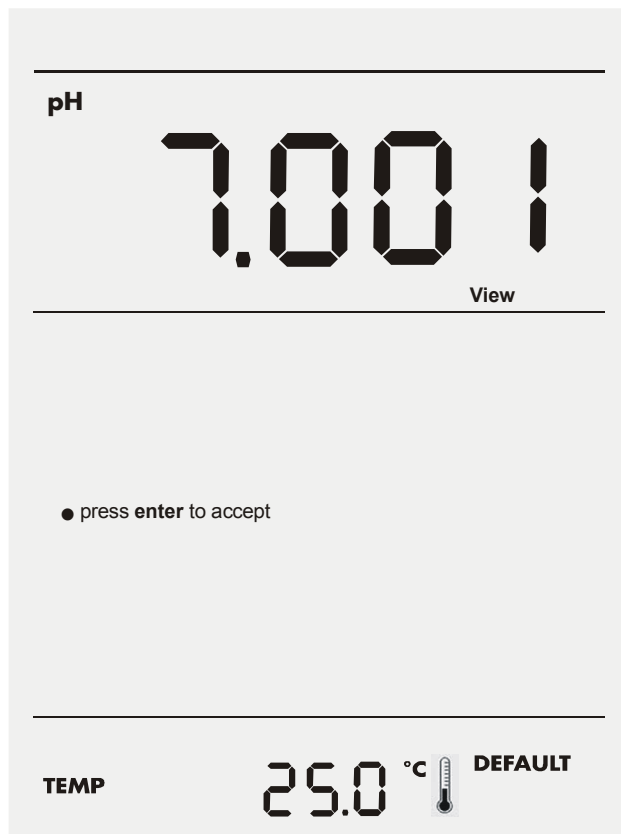


8.2 Recall Value From Memory

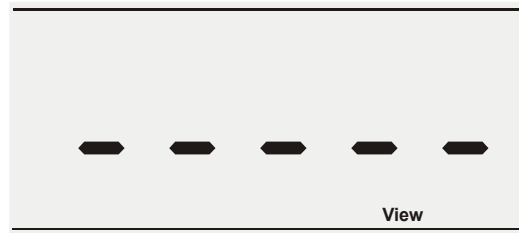
In any Measure mode, pressing **view/ ▼** key retrieves data from the meter's memory on the Last-In-First-Out (LIFO) basis. The screen displays the last stored memory location. To view stored data in that particular memory location, press **enter** key. If you wish to view data at specific memory location, use **save/ ▲** or **view/ ▼** key to scroll and select.



1. Press **enter** key to view data contents.



2. Pressing **enter** key repeatedly allows you to view data contents until a series of dashes appear on the display which indicates an empty data location.



Pressing **mode** key allows you to return to the Measure mode in any sequence of memory recall.

9 PRINT DATA (Only available in AB15+)

9.1 Printing Data

Depending on the print option in the meter setup, pressing **print** key allows you to print either current displayed reading or stored data from meter to a PC or printing device via a RS232 communication cable. Ensure that both meter and peripheral have the same configuration in terms of baud rate, parity bit and stop bit. Please check with the printer's or peripheral's manufacturers for details of any specific settings of the device in use.

If there is an error message during operation, the screen displays **Err1**. This indicates a communication error due to incorrect baud rate, parity or stop bit being selected.

10 pH THEORY

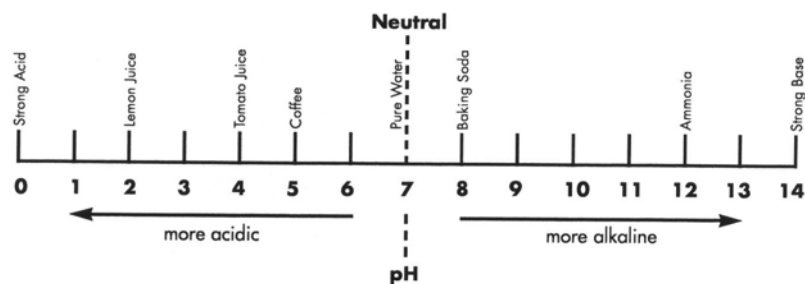
The measurement of pH plays an important role in quantifying and controlling acidity and alkalinity levels for industry and research. pH is a measure of the acidity or alkalinity of a solution and can be represented by this equation:

$$\text{pH} = -\log [\text{H}^+]$$

With $[\text{H}^+]$ representing the concentration of hydrogen ions in the solution. pH is sometimes referred to as power of the hydrogen ion in a solution.

By using a pH meter, you can most precisely determine exact pH levels of solutions. For example, rather than saying that lemon juice is quite acidic, you can say that lemon juice has a pH of 2.4. an exact pH value is often required to control or optimise acidity levels for manufacturing processes or for basic research.

pH values generally range from 0 to 14, with a pH value of 7 being the neutral point, or the value of pure water. The pH values above the neutral point represent increasing alkalinity, whereas pH values below the neutral point represent increasing acidity.



10.1 Measuring pH

To measure pH, the meter receives a millivolts signal from a glass bulb electrode that is sensitive to hydrogen ions. Therefore the potential developed at the glass bulb is directly related to the pH of the solution.

The glass bulb electrode is paired with a reference electrode which completes the electrical measuring circuit and provides a stable reference point. These two electrodes can be separated or they can be joined to create a combination electrode. The combination glass electrode makes a single connection to the pH meter which converts the electrodes millivolts output to pH unit, and displays the result.

This meter can also use a field effect transistor (FET) electrode for measuring pH. This type of electrode employs an ion-sensitive solid state membrane as part of a transistor to measure the hydrogen ion concentration of a solution. The FET is paired with a reference electrode and counter electrode that maintain a constant potential while the FET responds to the sample.

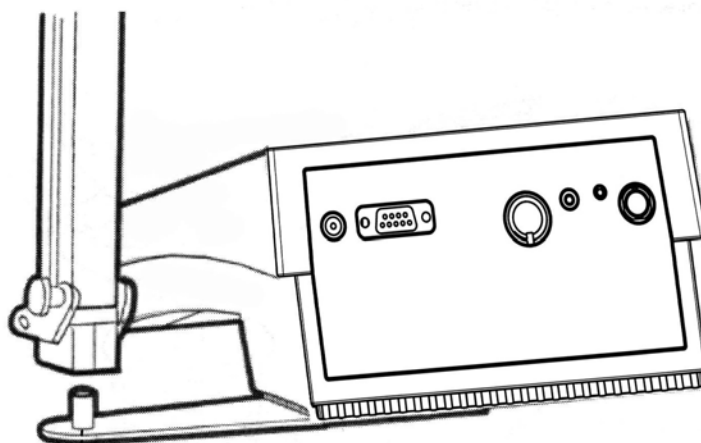
11 CLEANING

This meter requires no regular maintenance, but it is recommended to occasionally wipe down the front with a damp cloth from time to time.

12 TROUBLE-SHOOTING

Most troubles arise out of a problem with the electrode, not the meter. However, a meter check can be performed, and is simple to do.

1. To test the meter for correct operation, install the BNC (input) shorting cap. Press the mode key to access the mV mode, and note the mV reading. If the meter reads 0+/-1 mV, it is measuring correctly.



2. The meter will display Electrode Error when it detects an error in electrode response. During standardization, the message indicates that the electrode has a slope of less than 90% or more than 102%. The Electrode Error message can indicate a bad electrode(s), bad buffer(s) or a bad standard sequence technique.

ELECTRODE ERROR

13 METER SPECIFICATIONS

Description	AB15	AB15+
<u>Display</u>	Custom LCD	
Screen Size	3" X 4.25"	
Measurement Display Height	¾" H	
Temp./ others display height	5/16"	
Keypad controls	5 keys	7 keys
<u>Memory</u>	~	100 Memory Locations
	Internal Diagnostics	
<u>pH Mode</u>		
Range	-1.99 to 19.99	-1.999 to 19.999
Resolution	0.1/ 0.01	0.1/ 0.01/ 0.001
Relative Accuracy	±0.01	±0.002
Automatic Buffer Recognition	Yes	
Calibration Points	5/6	
FET	Yes	
<u>mV Mode</u>		
Range	-1800.0 to 1800.0	
Resolution	1	0.1
Accuracy	±1	±0.2
<u>Temperature Mode</u>		
Range	-5 to 105°C (23°F or 221°F)	
Resolution	0.1°	
Accuracy	±0.5°C	
<u>General</u>		
Inputs/ outputs	BNC, Pin, ATC, DIN (For FET)	
Electrical Requirements	12 VDC (centre negative)	
Impedance	>10 ¹² ohms	
Meter Size	5.5" X 7.5" X3.25"	
Meter Weight	7.86lb	
RS232 output	~	Yes

14 WARRANTY

The Fisher Scientific Company ("Fisher") warrants to the direct purchaser that the Accumet meters and Accumet, AccuTupH, AccuFet, AccupHast, and Microprobe electrodes will be free from defects in material or workmanship for a specified warranty period. During that period, Fisher will repair or replace the product or provide credit, at its sole option, upon prompt notification and compliance with its instructions. For Accumet meter, that specified period is 24 months from delivery date. For electrodes, that specified period is 12 months- except for models 13-620-532, 13-620-533, 13-620-534, 13-620-535, 13-620-536, 13-620-537, 13-620-538, 13-620-539- which are warranted for six months.

Unless otherwise agreed, the warranty is limited to the country in which the product is sold.

No Fisher employee, agent or representative has the authority to bind Fisher to any oral representation or warranty concerning any product sold. Any oral representation or warranty made prior to purchase of any product and not set forth in writing and signed by a duly authorized officer of Fisher shall not be enforceable by the purchaser.

FISHER EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE..

Fisher's sole responsibility and the purchaser's exclusive remedy for any claim arising out of the purchase or any product listed above is repair, replacement or credit as described above, where applicable. In no event: 1) shall the cost of the exclusive remedy exceed the purchase price: 2) shall Fisher be liable for any special, indirect, incidental, consequential, or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Each article that Fisher furnishes will conform to the written specifications given in this manual, or those of a further improved model. Changes are made often to the information in the manual and will be incorporated into future editions.

15 NOTICE OF COMPLIANCE

Warning

This meter generates, uses, and can radiate radio frequency energy. If not installed and used properly, that is in strict accordance with the manufacturer's instructions, it may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

This product is to be used only as described in the manual. This product is for indoor use only, and must be used in a well ventilated area.

Warning!

To meet or exceed FCC regulations and comply with CE requirements, the Fisher Scientific supplied power supply must be used. Use of a power supply that is not approved by Fisher Scientific may cause safety hazards and/or cause unit to exceed EMC limits and/or damage unit. When using his meter with a computer or printer, a shielded RS232 cable must be used to meet or exceed FCC regulations, and comply with CE Mark requirements.

16 REPLACEMENT PARTS

16.1 Replacement parts

Description	Fisher Catalog Number
Accumet 3 – in – 1 pH/ATC combination electrode, single junction, Ag/AgCl reference, polymer body, BNC connector	13-620-530
AccuFlex electrode support arm	13-637-671
Electrode support bracket	13-637-671A
Power Supplies: 115V, US plug	13-636-100
230V, UK plug	13-636-101
230V, Europe plug	13-636-102
Operator's Manual	13-636-AB15M
BNC Shorting cap	13-636-99

16.2 Accessories

pH Electrodes	Fisher Catalog Number
Accumet 3 – in – 1 pH/ATC combination electrode, single junction, Calomel reference, glass body, BNC connector	13-620-531
Accumet pH combination electrode, single junction, calomel reference, glass body, BNC connector	13-620-286
AccupHast pH combination electrode, double junction, glass body, BNC connector	13-620-296
AccupHast pH combination electrode, double junction, epoxy body, BNC connector	13-620-298
AccuFet solid state pH/ ATC combination electrode, Ag/ AgCl gel reference	13-620-755
ATC probe	13-620-19

16.3 pH Buffers and Solutions

pH	Colour	Ingredients	Size	Fisher Catalog Number
4.00	Red	Potassium Biphthalate	500 ml	SB101-500
7.00	Yellow	Potassium Phosphate Monobasic & Sodium Hydroxide	500 ml	SB107-500
10.00	Blue	Potassium Carbonate, Potassium Borate & Potassium Hydroxide	500 ml	SB115-500
Fisher Buffer- Pac		(500 ml ea. Of colour coded pH 4, 7, and 10 buffers)	3 X 500 ml	SB105
4.00	Red	Individual Tear open pH Packets	20/ box	SB4
7.00	Yellow	Individual Tear open pH Packets	20/ box	SB7
10.00	Blue	Individual Tear open pH Packets	20/ box	SB10
	Gray	Electrode Rinse Individual Tear open pH Packets	20/ box	SB15
		Electrode Storage Solution	1 L	SE40-1

To place an order, call 1-888-358-4706

For technical Support, call 1-888-358-4706

Electrochemical Questions?
Call our Technical Specialists at

1-888-358-4706

Email: accumet@fishersci.com

MODEL NUMBER _____

SERIAL NUMBER _____

PURCHASE DATE _____