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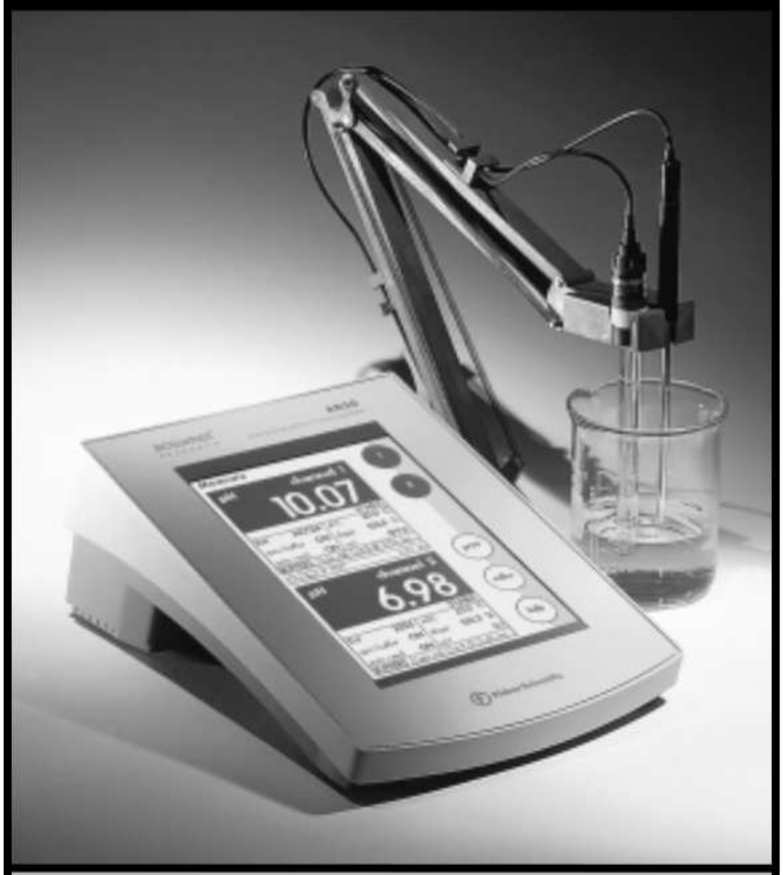
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AR50



USER Manual

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Thank you for selecting a Fisher Scientific accumet pH meter. This manual describes the operation of the accumet AR50 meter. The state-of-the-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 operating manual should answer any questions that might arise in operating your meter; however, do not hesitate to call our Fisher Lab Equipment Technical Support Hotline at 1-800/943-2006 or 412/490-6260, if you need any assistance.

This meter is designed to provide all the information necessary to guide you through the process of measuring pH, mV, ion concentration, or conductivity with a series of prompts on the screen.

The accumet Research AR50 provides microprocessor precision in a compact benchtop design that is easy to use. One touch screen controls all procedures, letting you:

- Measure pH, absolute mV, relative mV, ion concentration or conductivity.
- Select one of three sets of standard buffer groups.
- Implement automatic buffer recognition.
- Standardize with up to five standard or custom buffers.
- Customize your display screen and operating parameters.
- Assign operator and sample identification numbers.
- Specify ion selective electrode type.
- Store 250 data points in the meter's memory or transfer data to a computer or printer.
- Access extensive online help with just a touch of a button.

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

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The following is a listing of what you should have received with your new accumet AR50 pH/mV/Ion/Conductivity meter.

Meter with kit includes
meter
power supply
electrode arm support bracket
electrode arm
electrode (13-620-285)
ATC probe (13-620-19)
manual and literature
* Note that this meter does not include a conductivity cell.

Meter only includes
meter
power supply
electrode arm support bracket
manual and literature

If any of these items are missing, please contact the Fisher Products Group Electrochemistry Operation by dialing 412/490-6267.

Accessory Conductivity Probes and Ion Selective Electrodes are available and can be ordered by calling Fisher Customer Service at 800/766-7000.

2-cell Conductivity Probes:

Cell Constant	Optimal Conductivity Range	Glass Body	Epoxy Body
0.1	0.5 to 200 µS/cm	13-620-156	13-620-161
1.0	0.01 to 2 mS/cm	13-620-155	13-620-160
10.0	1 to 200 mS/cm	13-620-157	13-620-162

4-cell Conductivity Probes:

Cell Constant	Optimal Conductivity Range	Glass Body	Epoxy Body
1.0	0.01 to 20 µS/cm	13-620-163	13-620-165
10.0	1 to 200 mS/cm	13-620-164	13-620-166

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Display	
	640x480 digit LCD
screen size	4 1/2" x 6"
measurement display height	3/4"
temp/etc. display height	1/4"
menu options	extensive
help screens	extensive
configurable display	yes
keypad controls	context specific touchscreen
Memory	
	250 data pts
internal diagnostics	yes
programmable data storage	store on stable, time, manual
programmable data output	output on stable, time, manual
print interval	1 to 9,999 sec
programmable alarm	yes
pH Mode	
range	-2.000 to 20.000
resolution	0.1/0.01/0.001
relative accuracy	± 0.002
automatic buffer recognition	yes
manual buffer recognition	yes
calibration points	5
auto lock	yes
FET	yes
mV Mode	
range	± 1800.0
resolution	0.1
accuracy	± 0.1
Ion Mode	
range	$1x10^{-6}$ to $9.99x10^{10}$
resolution	0.1/0.01/0.001
relative accuracy	± 0.17n%
calibration points	5
incremental methods	KA, KS, AA, AS

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Conductivity Mode

cell constants range	0.1, 1.0, 10
conductivity	0 to $3x10^5$ µS/cm
resistivity	30 ohm·cm to 100 megohm·cm
salinity	2 to 42 ppt
accuracy	0.5%

Temperature Mode

range	-5.0 to +105.0 °C
resolution	0.1 °C
accuracy	± 0.2 °C

General

inputs/outputs	2BNC, 2Pin, 2ATC, 2-pin cond. RS232, DIN (for FET and 4 cell cond.)
electrical requirements	115 V/60 Hz, 230 V/50 Hz
output from PSU	12VDC, 500mA
line voltage tolerance	± 10%
input impedance	$>10^{12}$ ohms
meter size	5.5" x 7.5" x 3.25"
meter weight	1.86 lb.

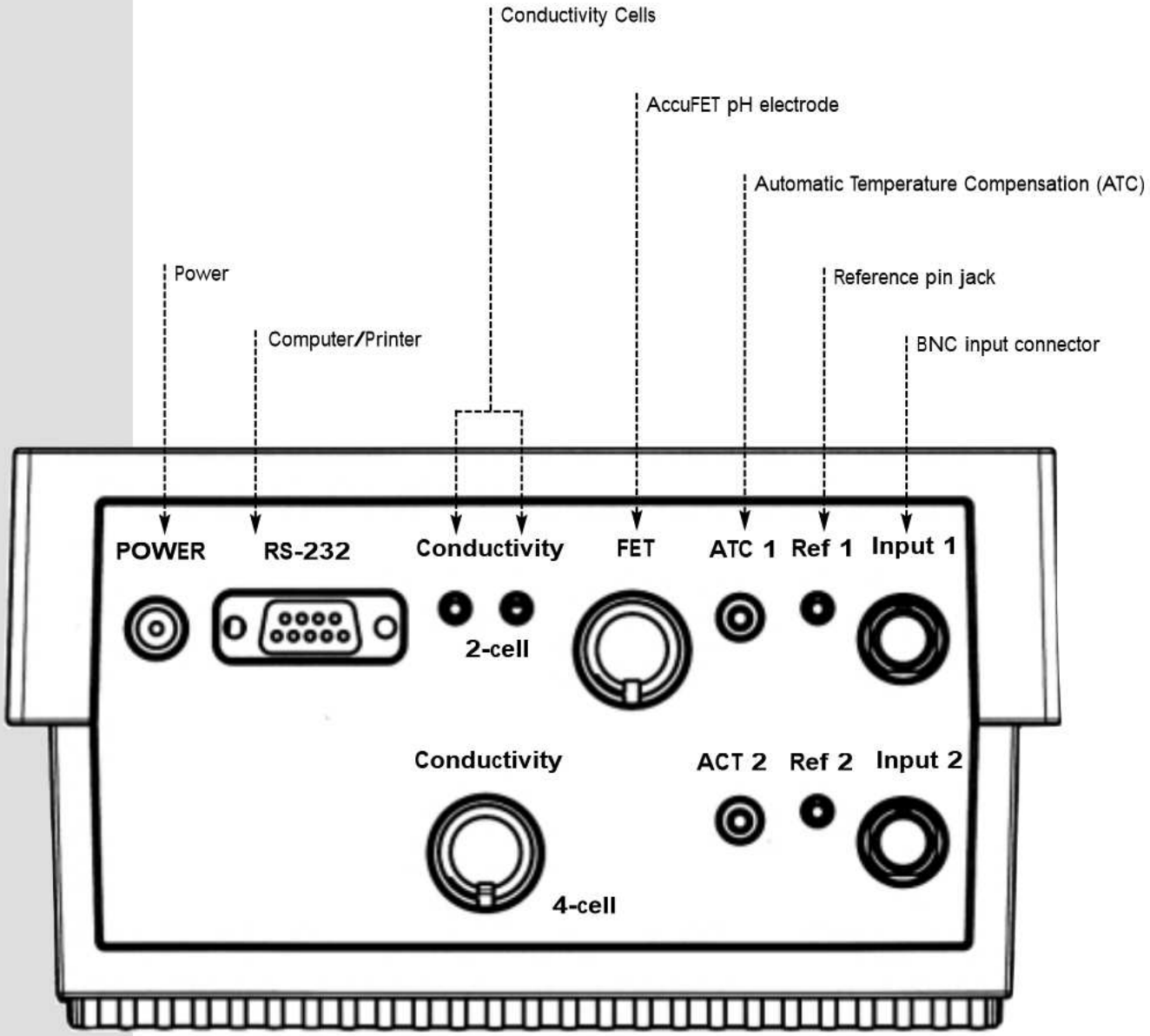
Operating Conditions

operating temperature	5-45 °C
operation humidity	5-80 % noncondensing
maximum operating altitude	2000m
installation category	II
Pollution category degree	2

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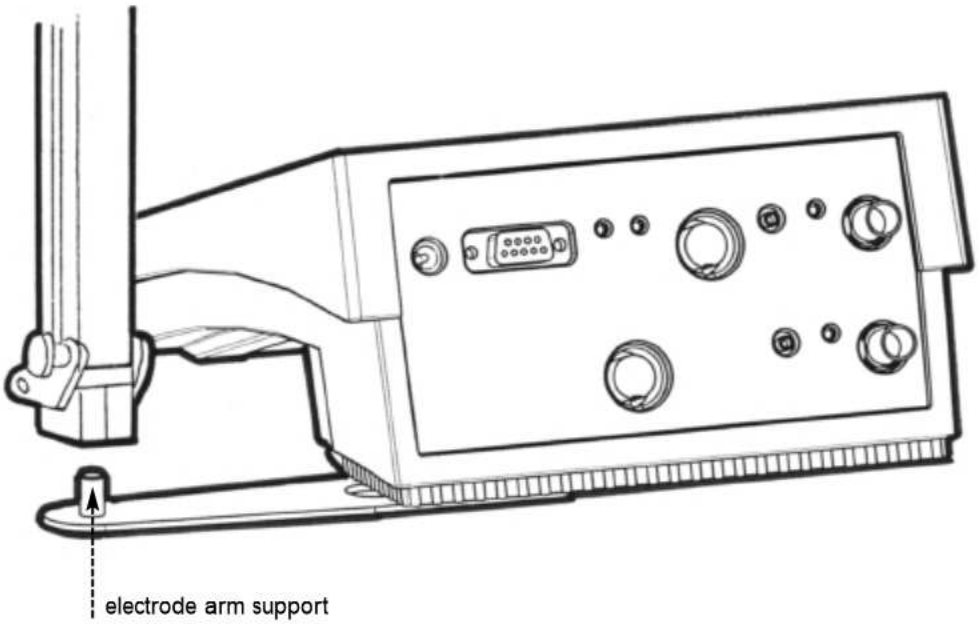
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1 Review the layout and arrangement of the rear connector panel.



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2 Connect the electrode arm to the base.

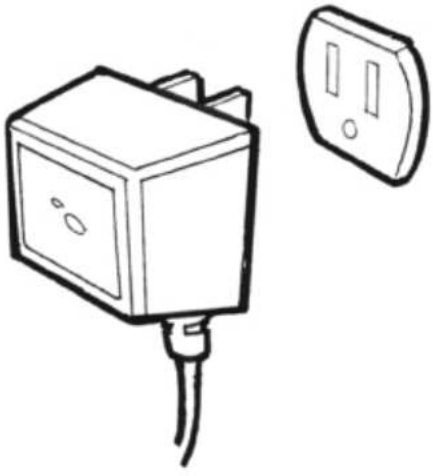




To connect RS-232, see Data Management on page 166.

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





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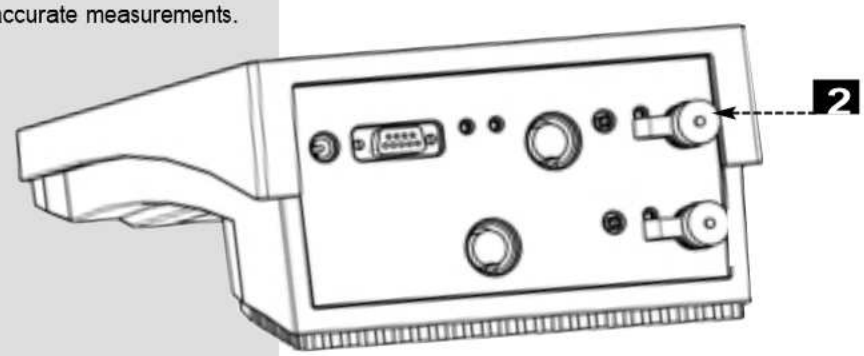
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This meter allows you to use two types of pH electrodes: the conventional glass pH electrode and the AccuFET field effect transistor (FET) pH electrode. If both types of pH electrodes are connected, the meter will read the AccuFET electrode. This meter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

If both a conventional electrode and an AccuFET electrode are connected to the meter, do not put them in a solution together because you will get inaccurate measurements.

1 Carefully remove the protective cover from the end of the electrode. Before first using your glass pH electrode, or whenever the electrode is dry, soak it 2-4 hours in an electrode storage solution, pH 4 Buffer, or KCl solution. Before using your ion specific electrode, consult the manufacturer's instructions for electrode preparation.





Remove the shorting cap on BNC connector. Connect the **combination pH electrode** by plugging it into the BNC input connector (twisting to lock in place).

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 ATC 1).

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

Connect **ion specific electrodes** in the same manner as pH electrodes.

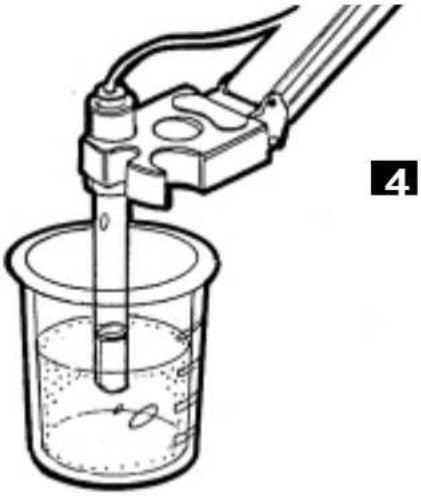
Do not discard the BNC shorting cap.

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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 in electrode 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. Store ion specific electrodes according to electrode manufacturer's recommendations.

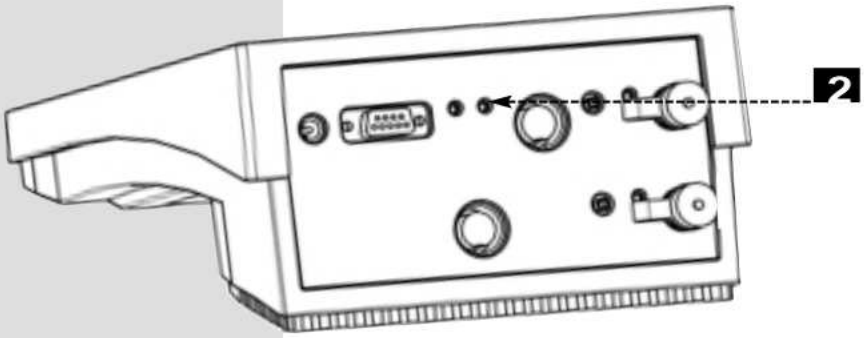
Proper electrode care is fundamental to obtaining reliable pH measurements. Improper care of the electrode may cause the meter reading to drift, respond slowly, or produce erroneous readings. For this reason, the electrode should always be conditioned and used in accordance with manufacturer's instructions.

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This meter also allows you to use two types of conductivity cells: the 2-cell conductivity cell with dual pin connector and the 4-cell conductivity cell with DIN connector. The 2-cell conductivity probe works in channel 1 and the 4-cell conductivity cell works in channel 2.

1 Carefully remove the protective cover from the end of the conductivity cell. Before using your conductivity cell, soak it for 5 to 10 minutes in distilled or deionized water.





Connect the **2-cell conductivity cell** to the 2-cell jack. Install the ATC probe in the ATC-1 jack.

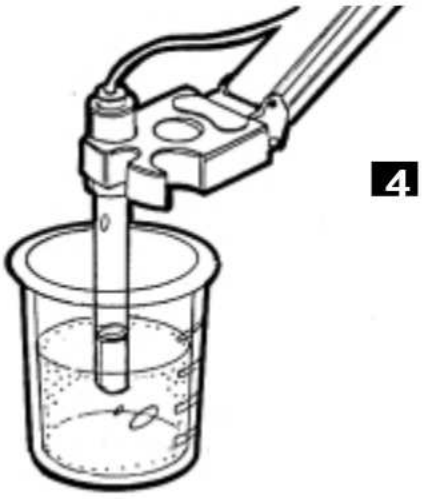
OR

Connect the **4-cell conductivity cell** to the 4-cell jack. The 4-cell accumet conductivity cells have built in ATC probes. Therefore, there is no need to install a separate ATC probe.

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

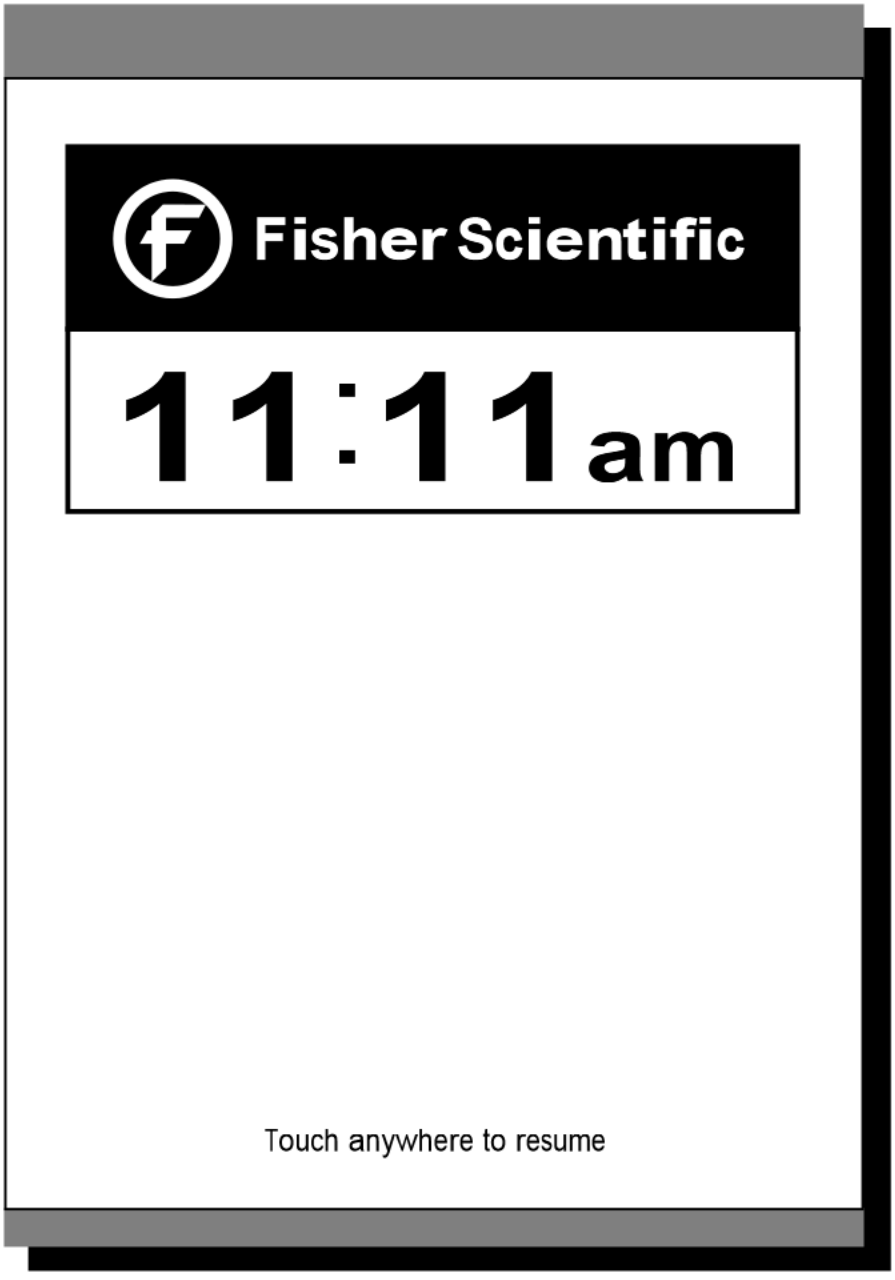




4 Between measurements, store conductivity probes dry.

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Standby screen



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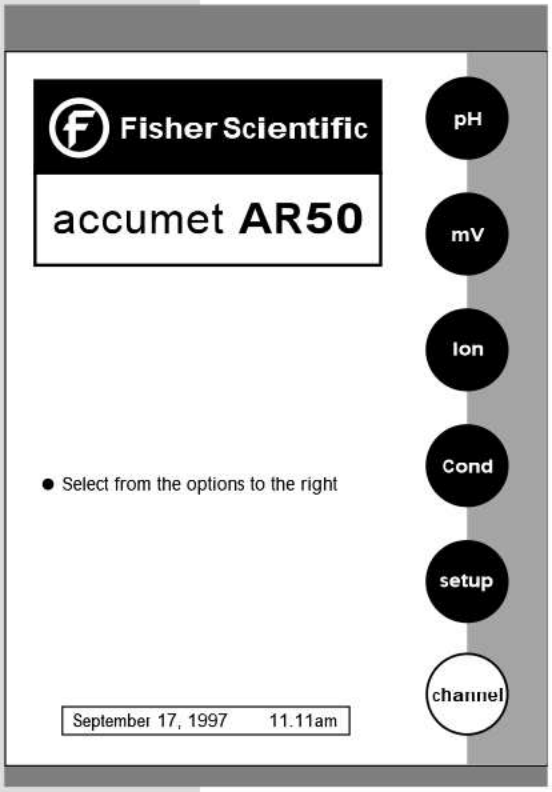
The new accumet Research benchtop pH meters operate with a state-of-the-art touch screen. The touch screen makes this the easiest meter on the market to operate and care for. When the meter is first plugged in, the STANDBY screen will appear. Touch anywhere on this screen to access the functions of the meter.

The buttons on the right side of the screen control all of the functions of the meter. A light touch on the screen is all that you need to access the various functions. Once you touch a button you will get an audible tone; **the screen will not change until you lift your finger**. This design prevents rapid uncontrolled scrolling through the various function screens. Function buttons and options change from screen to screen. Easy to understand prompts guide you through the operation of the meter in the selected mode. If you are ever in doubt about what to do, just touch **help** on the bottom right corner of the screen for detailed information about that screen.

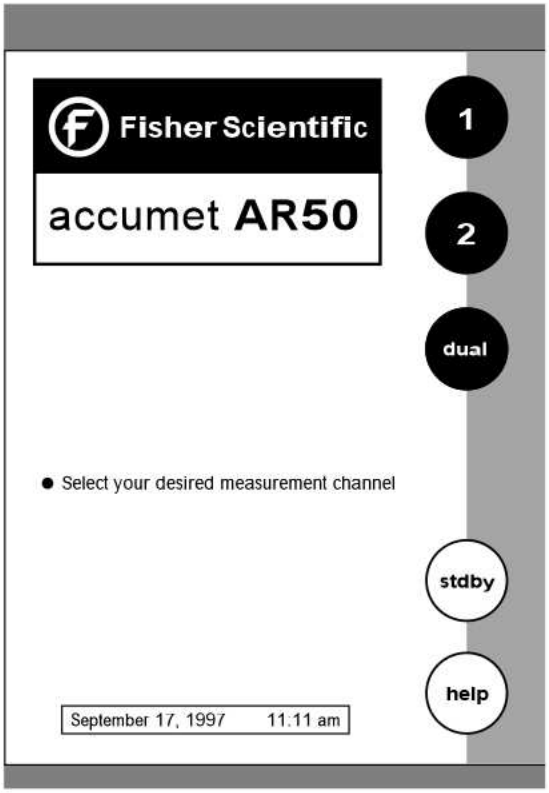
The touch screen is made of a durable polyester material that is chemically resistant. Maintenance is simple with this meter. To clean the screen you just need to wipe it with a damp cloth and dry it with a clean dry towel. For additional information, see cleaning and troubleshooting sections of the manual (pages 160-161).

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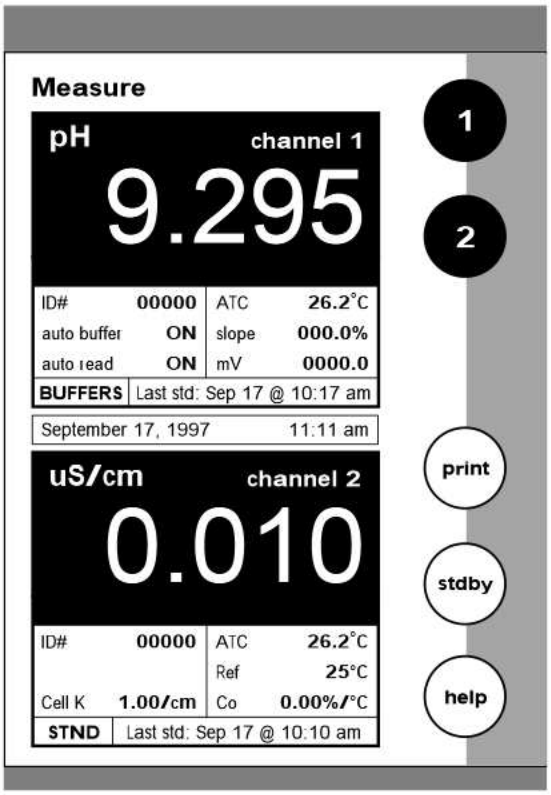
Main screen



Channel screen



Dual screen



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The accumet Research AR50 is a Multi-channel pH meter. With this meter you can switch from channel 1 to channel 2. You can also view both channels at the same time by accessing the dual channel mode. If you set the meter to view both channels, you cannot change the parameters without choosing the screen that you want to modify. The setup parameters for each screen are setup independently of one another.

Choosing a Channel

1. Touch anywhere on the Standby screen.

   OR

   Touch **channel** on the main screen.

   THEN

2. Touch **1**, **2** or **dual** to access the channel that you want to view.



If you are in any measure mode, touch mode until you access the main screen.

To access System Setup from the Standby screen

1. Touch anywhere on the Standby screen.
2. Touch **1** or **2** on the channel screen to access either channel.
3. Touch **setup**.
4. Touch **system** on the Setup screen.

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The touch screen of your accumet Research pH meter has "buttons" along the right side of the screen that are common to many of the screens. The following indicates the function of these common buttons.



This is the **standby** button and it allows you to access the standby mode. When in standby, the meter will not take measurements. It is in a state of rest. When you touch stdby the meter will return to the standby screen which says "Fisher Scientific" and displays the time.



This button allows you to access the channel screen to choose what channel you want to view. This button appears only on multichannel meters such as the accumet AR25 and AR50. This button also allows you to move from the main mode screen to the channel screen to access the standby mode.



The **mode** button allows you to switch between the various operations of the meter. These operations, depending upon which meter you have, include four measuring modes (pH, mV, ion, conductivity) as well as a setup mode.



The **enter** button allows you to accept any changes that you have made on setup screens or accept values that you have input with keypads. When touched, enter will save the changes and return you to the previous screen.



The **save** button allows you to save multiple changes you have made on one screen as a group. It functions like the enter button does for individual changes.



The **exit** button allows you to leave the screen you are currently viewing and return to the previous screen without making any changes.



The **help** button allows you to access helpful information on any screen. When you touch the help button, information about the current screen appears. This information will include step-by-step instructions for operating the meter from the current screen and possible applications information for that screen.



The **close** key appears on the bottom of all help screens and allows you to exit the help screen and return to the previous screen.



The **more** button appears on the help screens and allows you to advance to the next help screen for additional information.



The **back** button appears on the help screens and allows you to move back to a previous help screen.

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This button accesses the standardization screen from the various measure modes and initiates standardization of the meter once the standardization screen is accessed.



This button is the measure button and directs the meter to measure your sample when in the Auto Read function of the pH or Ion modes.



This button will access the setup screens for the measuring mode that you are currently using. It can also be used to access the system setup screen that allows you to set parameters that are not related to measurements such as the time and the date.



The **print** button will send information to the output device that you have connected to your accumet meter. The output device can be a printer, data logger or a computer. In addition to this, touching the print button will also send data to the data storage center of the meter if a sample ID# has been assigned to your sample.



The **arrow** keys on the screen move the cursor up and down in order to highlight parameters that you would like to review or edit.



The **edit** button appears on the setup screens. After you have highlighted a parameter that you would like to change, the edit button allows you to access the available options for that parameter.



The **clear** button allows you to remove a setup parameter or standard buffer value from the meter's memory that may have been entered at a previous time or by a previous user that is no longer of value to you. Touching the clear button erases the value so you may enter a new one. It can also erase a parameter that you may have entered erroneously.



The **BS** button is a backspace button. It appears on keypad screens and it allows you to back up and delete a character entered in error.



The **delete** button appears on the "View Stored Data" screens. This button allows you to erase the data from the memory of the meter.



The **prev** button appears on the Data Screens when the data stored in the meter's memory has been accessed. It allows you to scroll through data points sorted and stored prior to the current data point displayed.



The **next** button appears on the Data Screens when the data stored in the meter's memory has been accessed. It allows you to scroll through data points sorted and stored after the current data point displayed.

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