JENCO®

VisionPlus

6010M使用说明书

实验室pH计

沪制02270148号

6010M

目录

概述

感谢您选购6010M。6010M是一台测量pH、ORP及温度的精密仪器，内建的微处理器可用来存储、校正和补偿所有有关的pH测量数据，包括pH电极的校正液种类和电极效率。

本仪器拥有防水的外壳，机械式的按键提供高可信任度，高触觉及声响告知等功能，使用单一9V的干电池为电源，校正数据永久储存在EEPROM内存中，下次使用时不需再次校正。

此仪器使用大型的LCD，可同时显示pH/mV，温度及指示目前所在的显示模式，即使在校正或测量程序下，也会提供使用者各种提示。

pH/ORP的测量都具有自动锁定功能（AUTOLOCK），允许仪器自动感测及锁定测量值，也可以使用在不具有自动锁定功能（NON-AUTOLOCK）的模式下操作，自动锁定和使用提示功能会减少许多测量上的人为因素。

6010M具有50组测量数据的记忆功能,可以通过回叫界面轻松的查询所存储的测量数据。存储的数据也可通过清除界面选择全部删除还是单一删除。

其他的特性尚有，电极斜率确认，电极效率百分比显示，内建校正液系数，自动和手动温度补偿，长电池寿命及50/60赫兹交流噪声排除能力，此仪器适用在野外及实验室。

产品检视

小心地打开包装，检视仪器及配件是否有因运输而损坏，如有发现，请立即通知 **JENCO** 的代理。

防水外壳

6010M具有防水外壳但不可在水中使用(因pH电极与仪器连接处不具防水功能）。这个防水特性可避免仪器因为不小心掉入非腐蚀性溶液中而造成的损坏。若仪器不小心掉入溶液中时，请立即做以下步骤处理：

（1） 用蒸馏水小心的清洗仪器，在清洗及晒干后，须将连接器内的污物清理干净，否则会影响电极的连接。

（2） 再重新使用之前须确定仪器及电极已晒干。

（3） 若完成上述步骤仍无法使用，请联络**JENCO**的代理商。（请参考“质量保证”章节）

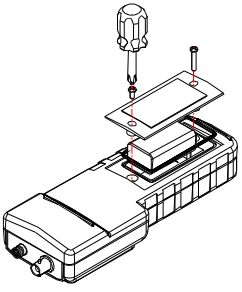
电池的更换

当LCD上的“BAT”闪烁时，表示电力不足，大概可再使用1小时即需更换新电池，更换电池步骤如下：

1. 使用螺丝起子取出两颗螺丝，即可取下电池盖。（请参考图一）

2. 取出9V旧电池并装上新电池，更换时，请注意电池极性放置要正确。

3. 放回防水圈和电池盖，并将刚取出的两个螺丝锁紧即可。

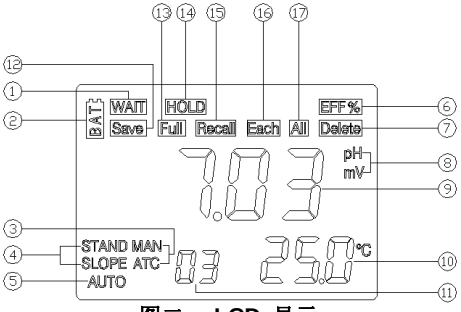


图一：电池安装图

[**注意：**6010M有自动关机功能，30分钟内如果整机没有任何的操作，机器将自动关机。]

显示及按键功能

A. 显示

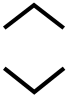


图二： LCD 显示

1. **WAIT-** 表示机器等待锁定。	10. 显示温度及其温度单位。
2. **BAT-** 表示需更换电池。	11. 显示存储数据位置。
3. **ATC/MAN-** ATC 表示机器接了温度探棒。 MAN 表示机器未接温度探棒。	12. **Save-** 表示存储当前的测量值。
4. **STAND/SLOPE-** 闪动表示等待校正信号； 不闪动表示信号已校正。	13. **Full-** 表示存储值已满 50 组，需要删除才能再次存入。
5. **AUTO-** 表示机器在自动锁定模式。	14. **HOLD-** 表示在自动锁定模式，所测数值已自动锁定，不再会随输入的改变而改变。
6. **EFF(%)-** 表示电极效率百分比。当电极效率低于 75%时，请更换新电极。	15. **Recall-** 表示进入回叫模式，可回叫存储的数据记录。
7. **Delete-** 表示进入清除模式，可清除存储的数据记录。	16. **Each-** 表示选择了单个清除功能，存储数据将单个单个的被清除。
8. **pH/mV -** 表示所测数据的模式及单位。	17. **All-** 表示选择了全部清除功能，存储数据将一次性全部清除。
9. 显示 pH、ORP 值及电极效率	

B. 按键

ON OFF	**ON/OFF-** 开关键。按住开关键打开或关闭主机。
MODE	**MODE-** 选择键。 选择仪器的显示模式。连续按此键，显示的顺序为“pH-AUTOLOCK”，“mV-AUTOLOCK”，“pH”，“mV”，

	“Recall(回叫)”和“Delete（清除）”六个模式。更换测量模式并不影响校正值。 在“Recall”和“Delete”模式，按此键可以退出此两个模式。
	**UP/DOWN-** 上键和下键仅在手动温度补偿模式下用来增加、减少手动温度值，在自动温度补偿模式不起作用。 在“Recall”模式，按上键和下键可以翻看存储的数据记录。 在“Delete”模式，按上键和下键可选择删除的方式“Delete Each”或者“Delete All”；在“Delete Each”删除方式中，按此两键可以选择需删除的存储的数据记录。
STAND SLOPE	**STAND/SLOPE-** STAND 和 SLOPE 键用于双点校正。 按住STAND键同时再按开关键，可以改变机器的标准溶液组别。
MEA. EFF.	**MEA. / EFF.-** 测量键/效率键。 在“pH-AUTOLOCK”和 “mV-AUTOLOCK” 模式，按此键可解开锁住的显示。 长按此键 5 秒，可显示电极效率。
CLEAR ENTER	**CLEAR/ENTER-** 清除键/存储键。 当机器显示出错时，按此键，机器即可清除记忆体中的标准溶液校正值。 在“pH-AUTOLOCK”，“mV-AUTOLOCK”，“pH”，“mV”模式下，长按此键 5 秒，机器会删除所有标准溶液的校正值并重新进入校正模式。 在“pH-AUTOLOCK”，“mV-AUTOLOCK”，“pH”，“mV”模式下，按此键一次，机器将存储此时界面的显示值并记录相对应的位置号。6010M可存储 50 组数据。 在“回叫”模式，按此键一次，机器将显示最后一个存储的数据。 在“清除”模式，按此键一次，机器将进入清除方式：“Delete All”和“Delete Each”选择，按上键下键进行选择。在“Delete All”界面，再按此键一次，机器将删除所有存储的数据。在“Delete Each”界面，再按此键一次，机器将进入删除单个存储数据的界面，此时，可以按上键和下键，选择需要删除的数据，按此键确认，机器将删除此位置号的存储数据，同时，由后一存储数据代替此位置号的存储数据。

操作步骤

A. 标准溶液组别的选择

本机提供两组校正液：7.00, 4.01, 10.01pH 和 6.86, 4.00, 9.18pH 以供不同国家选择使用。你只要按住“STAND”键再按开关键开机，你即可选择另一组校正液使用。

B. pH 校正

6010M需做双点校正，第一点校正必须是6.86/7.00。

a. 在pH自动锁定模式下，具有自动温度补偿的校正：

1. 打开主机，按住“CLEAR”键5秒，液晶显示将全显，机器将删除所有上次储存的校正值。

2. 将pH电极的输入接头与主机的BNC头连接，温度输入接头与主机的温度接口连接：“ATC” 显示将亮起，“pH”和“AUTO”显示也将亮起，标准溶液显示将闪烁。

3. 将电极用蒸馏水洗净并擦干，放入第一杯校正溶液中（7.00或6.86），当温度读值稳定后，请按住“STAND”键2秒，机器进入校正模式，此时“WAIT” 显示将闪烁。当数值稳定，机器将存储此稳定值作为第一点的校正值，“WAIT” 显示消失，机器完成第一点校正，此时“4.00，9.18或4.01，10.01” 显示将间接闪烁，表示机器已准备第二点的校正。

4. 将电极用蒸馏水洗净并擦干，放入第二杯校正溶液中（4.00/4.01或9.18/10.01），当温度读值稳定后，请按“SLOPE”键，机器开始做第二点校正，此时“WAIT” 显示将闪烁。当数值稳定，机器将存储此稳定值作为第二点的校正值，“WAIT” 显示消失，机器完成第二点校正，并自动退出校正模式。两点校正功能完成。

5. 主机具有计算和补偿电极斜率偏差的功能，在完成两点校正后，长按“MEA./EFF.”键5秒，机器可显示新电极的电极效率。

b. 在pH自动锁定模式下，具有手动温度补偿的校正：

1. 打开主机，按住“CLEAR”键5秒，液晶显示将全显，机器将删除所有上次储存的校正值。

2. 将pH电极的输入接头与主机的BNC头连接，“MAN” 显示将亮起，“pH”和“AUTO”显示也将亮起，标准溶液显示将闪烁。

3. 将电极用蒸馏水洗净并擦干，放入第一杯校正溶液中（7.00或6.86），把手动温度通过按上键和下键调到第一杯标准溶液的温度（0 ~ 60.0℃），温度调准后请按住“STAND”键2秒，机器进入校正模式，此时“WAIT” 显示将闪烁。当数值稳定，机器将存储此稳定值作为第一点的校正值，“WAIT” 显示消失，机器完成第一点校正，此时“4.00/4.01或9.18/10.01”显示将交替闪烁，表示机器已准备第二点的校正。

4. 请重复操作“在pH自动锁定模式下，具有自动温度补偿的校正”中的第4~第5步骤。

c. 在pH非自动锁定模式下，具有自动温度补偿的校正：

1. 打开主机，按住“CLEAR”键5秒，液晶显示将全显，机器将删除所有上次储存的校正值。

2. 将pH电极的输入接头与主机的BNC头连接，温度输入接头与主机的温度接口连接：“ATC” 显示将亮起，“pH”显示也将亮起，标准溶液显示将闪烁。

3. 将电极用蒸馏水洗净并擦干，放入第一杯校正溶液中（7.00或6.86），当温度读值稳定后，请按住“STAND”键2秒，机器立即存储此稳定值作为第一点的校正值，完成第一点校正，此时“4.00，9.18或4.01，10.01”显示将交替闪烁，表示机器已准备第二点的校正。

4. 将电极用蒸馏水洗净并擦干,放入第二杯校正溶液中(4.00/4.01或9.18/10.01），当温度读值稳定后，请按“SLOPE”键，机器立即存储此稳定值作为第二点的校正值，完成第二点校正，并自动退出校正模式。两点校正功能完成。

5. 主机具有计算和补偿电极斜率偏差的功能，在完成两点校正后，长按“MEA./EFF.”键5秒，机器可显示新电极的电极效率。

d. 在pH非自动锁定模式下，具有手动温度补偿的校正：

1. 打开主机，按住“CLEAR”键5秒，液晶显示将全显，机器将删除所有上次储存的校正值。

2. 将pH电极的输入接头与主机的BNC头连接，“MAN” 显示将亮起，“pH”显示也将亮起，标准溶液显示将闪烁。

3. 将电极用蒸馏水洗净并擦干，放入第一杯校正溶液中（7.00或6.86），把手动温度通过按上键和下键调到第一杯标准溶液的温

度（0 ~ 60.0℃），温度调准后请按住“STAND”键5秒，机器立即存储此稳定值作为第一点的校正值，完成第一点校正，此时“4.00/4.01或9.18/10.01”显示将间接闪烁，表示机器已准备第二点的校正。

4. 请重复操作“在pH非自动锁定模式下，具有自动温度补偿的校正”中的第4~第5步骤。

[注意：如需精确测量，建议每周或更换新电极之后，对整套仪表重新做一次校正。**]**

C. pH 测量

在pH测量模式，标准溶液指示必须显示，表示机器已完成双点校正为测量数值做好了准备。如果，标准溶液显示闪烁，表示机器未曾校正，请在使用测量模式之前进行校正。

a. 在pH自动锁定模式下，具有自动温度补偿的测量：

1. 将pH电极的输入接头与主机的BNC头连接，温度输入接头与主机的温度接口连接，“ATC”显示将亮起。

2. 按“MODE”键直到“pH”和“AUTO”显示也亮起。

3. 将电极用蒸馏水洗净并擦干，放入被测溶液中，稍作搅动，赶走空气泡，让电极与被测溶液充分接触。

4. 按“MEA.”键，“WAIT”显示将闪烁，当数值稳定，“WAIT”显示停止闪烁，机器将显示“HOLD”并将此稳定值锁定为此被测溶液的测量值，此时机器的读值不随被测溶液的变动而变动。

[注意：对于不稳定的被测溶液，建议使用“pH NON- AUTOLOCK”非自动锁定模式。**]**

b. 在pH自动锁定模式下，具有手动温度补偿的测量：

1. 将pH电极的输入接头与主机的BNC头连接。不接温度探棒，“MAN”显示将亮起，按上、下键调节温度值到被测溶液的温度(-10.0 to 120.0℃)。

2. 请重复操作“**在pH自动锁定模式下，具有自动温度补偿的测量”**中的第2~第4步骤。

[**注意：**对于不稳定的被测溶液，建议使用“pH NON- AUTOLOCK”非自动锁定模式。]

c. 在pH非自动锁定模式下，具有自动温度补偿的测量：

1. 将pH电极的输入接头与主机的BNC头连接，温度输入接头与主机的温度接口连接，“ATC”显示将亮起。

2. 按“MODE”键直到“pH”显示也亮起。

3. 将电极用蒸馏水洗净并擦干，放入被测溶液中，稍作搅动，赶走空气泡，让电极与被测溶液充分接触。

4. 等待片刻，使被测溶液读值稳定，此稳定值就是被测溶液的测量值。

d. 在pH非自动锁定模式下，具有手动温度补偿的测量：

1. 将pH电极的输入接头与主机的BNC头连接。不接温度探棒，“MAN”显示将亮起，按上、下键调节温度值到被测溶液的温度(-10.0 to 120.0℃)。

2. 请重复操作“**在pH非自动锁定模式下，具有自动温度补偿的测量”**中的第2~第4步骤。

D. 温度测量

6010M在没有pH电极，有温度探棒的情况下，也可作为测量温度的仪表。接上温度探棒，机器就可测量温度。

E. mV 测量

a. 在自动锁定模式下的mV值的测量。

1. 将ORP电极的输入接头与主机的BNC头连接。

2. 按“MODE”键直到“mV”和“AUTO”显示亮起。

3. 将电极用蒸馏水洗净并擦干，放入被测溶液中，稍作搅动，赶走空气泡，让电极与被测溶液充分接触。

4. 按“MEA.”键，“WAIT”显示将闪烁，当数值稳定，“WAIT”显示停止闪烁，机器将显示“HOLD”并将此稳定值锁定为此被测溶液的测量值，此时机器的读值不随被测溶液的变动而变动。

   [[注意：对于不稳定的被测溶液，建议使用“mV NON- AUTOLOCK”非自动锁定模式。]

b. 在非自动锁定模式下的mV值的测量。

1. 将ORP电极的输入接头与主机的BNC头连接。

2. 按“MODE”键直到“mV”显示亮起。

3. 将电极用蒸馏水洗净并擦干，放入被测溶液中，稍作搅动，赶走空气泡，让电极与被测溶液充分接触。

4. 等待片刻，使被测溶液读值稳定，此稳定值就是被测溶液的测量值。

F. 存储、回叫和清除数据

a. 存储数据。

1. 在“pH-AUTOLOCK”，“mV-AUTOLOCK”，“pH”和“mV”模式，按“CLEAR/ENTER”键一次，机器将存储当前数据值。此时“Save”显示将显示一次，并且有一位置号也同时显示，表示当前界面值已被存储并做了此位置号的记录。

2. 如果界面上显示“Full”，则代表机器的50组数据已存储满了，不能再存储其他数据。使用者只能删除或删除部分数据才能存储新的数据。

b. 回叫存储数据。

1. 按“MODE”键进入回叫模式，按“CLEAR/ENTER”键，机器将显示最后一组存储数据。

2. 此时按上键或下键选择位置号,找到自己需要读取的存储数据。.

3. 读取完存储数据后可按“MODE”键退出回叫模式。

c. 清除存储数据。

1. 按“MODE”键进入清除模式，按“CLEAR/ENTER”键，机器将进入清除方式的选择，可按上键或下键在“Delete All”和“Delete Each”之间选择。

2. 在“Delete All”界面，按此键一次，机器将删除所有存储的数据，并显示None，表示没有存储数据。

3. 在“Delete Each”界面，按此键一次，机器将进入删除单个存储数据的界面,此时,可以按上键和下键选择需要删除的位置号,

按此键确认，机器将删除此位置号的存储数据，同时，此位置号的存储数据将由下一个位置号的存储数据所代替。

例如：01,7.00pH,25℃;
02,6.86pH,23.8℃;
03,4.00pH,15.6℃;
…
如果清除了02位置号的存储数据，则机器存储数据变为：
01,7.00pH,25℃;
02,4.00pH,15.6℃;
…

4. 清除完数据后可按“MODE”键退出清除模式。

pH 标准溶液

pH 4.00、4.01、6.86、7.00、9.18和10.01这六种标准溶液的温度系数被存储在机器内部。使用校正液时，必须显示对应温度的pH值（如下表）：

℃	4.00	6.86	9.18	4.01	7.00	10.01
0	4.01	6.98	9.46	4.01	7.11	10.32
5	4.00	6.95	9.39	4.01	7.08	10.25
10	4.00	6.92	9.33	4.00	7.06	10.18
15	4.00	6.90	9.28	4.00	7.03	10.12
20	4.00	6.88	9.23	4.00	7.01	10.06
25	4.00	6.86	9.18	4.01	7.00	10.01
30	4.01	6.85	9.14	4.01	6.98	9.97
35	4.02	6.84	9.10	4.02	6.98	9.93
40	4.03	6.84	9.07	4.03	6.97	9.89
45	4.04	6.83	9.04	4.04	6.97	9.86
50	4.06	6.83	9.02	4.06	6.97	9.83
55	4.07	6.83	8.99	4.08	6.97	9.80
60	4.09	6.84	8.97	4.10	6.98	9.78

[**注意：**机器的读值与表中的值会有±0.01pH的误差。]

错误显示及原因

主显示	可能发生原因	纠正措施
“Er1”	1. 按“STAND”键的时候，零位的标准溶液的数值超出+/-1.5 pH。	1. 按“CLEAR/ENTER”键，然后稍等片刻,等电极采样数值稳定，再按“STAND”键。
	2. pH电极OFFSET大于/小于+/-1.5 pH.	2. 更换标准溶液或pH电极。然后按“CLEAR/ENTER”键重新进行校正。
	3. pH电极损坏。	3. 更换电极。
“Er2”	1. 按“Slope 键的时候，斜率的标准溶液的数值超出30%。	1. 稍等片刻,等电极采样数值稳定，再按“SLOPE”键。
	2. 4.00, 4.01, 9.18 和 10.01 标准溶液用的不对。	2. 确认所用标准溶液是否正确。
	3. pH电极斜率已超出30%。	3. 更换标准溶液或pH电极。然后按“CLEAR”键重新进行校正。
“Er3”	1. 温度超出0.0~60.0° C的范围。	1. 降低标准溶液的温度,使之在此温度范围之内。
“over” / “undr”	1. 测量的pH值超出-2.00~16.00 pH的范围。	1. 使被测液的pH值在此范围内。
	2. 测量的mV值超出 - 1999.9 ~ 1999.9 mV的范围。	2. 使被测液的mV值在此范围内。
	3. 测量的温度值超出-10.0 ~ 120.0° C的范围。	3. 使被测液的温度值在此范围内。

[**注意：**如果机器仍然不能正常工作，请联系Jenco的服务部门。]

规格

显示	测量范围	分辨率	精确度
pH	-2.00 to 16.00 pH	0.01 pH	±0.02 pH
mV	-1999.9 to 1999.9 mV	1mV	±0.1%
温度	-10.0 to 120.0 ° C	0.1 ° C	±0.5° C

pH 校正液认知	pH 7.00, 4.01, 10.01 或 pH 6.86, 4.00, 9.18
pH 温度补偿	手动/自动 -10.0° C to 120.0 ° C
pH 校正液温度范围	0° C ~ 60.0° C
pH 电极零点校正范围	±90 mV在pH 7.00或pH6.86。
pH 电极斜率校正范围	±30%在pH 4.00, 4.01, 9.18 和10.01
输入阻抗	$>10^{12}\ \Omega$
温度探棒	热敏电阻, 10 kΩ。
电源	1节9VDC电池
校正存储	EEPROM
测量数据存储	50组
音效回馈	所有按键
自动关机功能	未做任何操作，30分钟后自动关机。
终点锁定	有
显示 (pH /mV : 温度)	12mm : 8mm 字高 LCD
环境温度	0 ~ 50 ° C
相对湿度	90%以下
外壳	IP65
尺寸 (长 x 宽 x 高)	70mm x 198mm x 37mm
重量	260g (包含电池)

质量保证

仪器保修一年（以购买日为准）。在保修期内如有质量问题，本公司将无偿代为修复；如有人为因素造成故障或损坏，本公司竭诚代为修复，但需酬收工本费（配件如电极头、标准液等消耗品不在保证范围内）。在将本机退回本公司时，请用包装材料妥为包好，以避免运输途中碰伤。无论何种情况，在退回本机前，请先与本公司联系，并得到本公司认可，方可退回本机。

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CONTENTS

GENERAL INTRODUCTION

Thank you for selecting the 6010M meter. The 6010M is a precision tool that measure pH, ORP and temperature. A built-in microprocessor stores, calculates and compensates for all parameters related to pH determinations including pH electrode temperature characteristics, electrode slope deviations and buffer solutions.

This unit has a waterproof IP65 case. The touch mode keys are highly reliable with tactile and audio feedback. This meter can operate with one 9V battery, typical battery life is 1000 hours. Re-calibration is not required when power is turned on again.

The front of the meter has a large LCD that displays pH or ORP and temperature simultaneously along with user prompts and mode indicators. The unit prompts the user through calibration and measurement procedures.

An AUTOLOCK feature for both pH and ORP measurements enables the unit to automatically sense the end point and " HOLD " the display to indicate the end point value of a measurement. AUTOLOCK and user prompts help to eliminate most errors in determining pH and mV values, resulting in precise, repeatable and error-free measurements. The 6010M can also be used in non-AUTOLOCK mode.

The unit is also equipped with a non-volatile memory allowing the user to store 50 different sets of readings. This unit will assign a site number for each set of reading so the user can review the data easily.

The model 6010M is available with pH, ORP and ATC (Automatic Temperature Compensation) probes. Other features include electrode offset recognition, electrode slope recognition, electrode efficiency display, built-in buffer coefficients, automatic or manual temperature compensation, long battery life and 50/60Hz AC noise rejection. This meter is user-friendly for field, industrial and laboratory applications.

INITIAL INSPECTION

Carefully unpack the unit and accessories. Inspect for damages made in shipment. If any damage is found, notify your **Jenco** representative immediately. All packing materials should be saved until satisfactory operation is confirmed.

WATER PROOF

Though the 6010M meter is housed in a watertight case, **DO NOT** use it underwater. The watertight case prevents permanent damage to the unit if accidentally dropped into non-corrosive solutions.

Follow these steps immediately if the unit is immersed in any solution:

1. Rinse unit carefully with distilled water. After rinsing and drying, inspect and clean connectors to remove all contaminants that may affect probe connections.

2. Wait for the unit and probe to dry completely before resuming operation.

3. If the unit does not function correctly after steps1 and 2, call JENCO for possible repair or replacement (see Warranty).

INSTALLING THE BATTERIES

The 6010M meter is packaged with one 9V battery required for operation. To insert the batteries into the meter, follow the procedure outlined below.

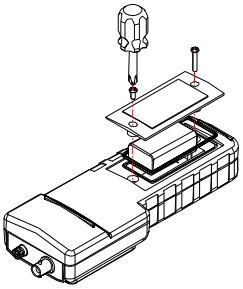

Figure 1: Battery compartment

1. Use a screw driver to remove the two screws and battery cover to expose the battery compartment. (Figure 1.)

2. Replace the 9V battery.

3. Replace the battery cover and make sure to secure the two screws for the water-tight feature.

[**Note:** Press the “ON/OFF” key to turn the unit on. If the unit is running then you can press the “ ON/OFF ” key to turn the unit off. The unit will automatically turn off after 30 minutes of no key activity.]

DISPLAY & KEYS FUNCTIONS

B. Display

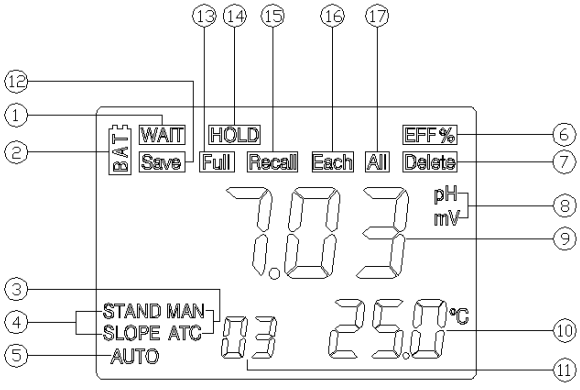

Figure 2: Active LCD screen

1. **WAIT-** This will be displayed when the unit is still waiting for a stable reading or end point sensing.	4. **STAND/SLOPE-** This indicator will flash if the STAND or SLOPE is not yet calibrated. This indicator will remain lit-up if the STAND and SLOPE have been calibrated.
2. **BAT-** Low battery indicator.	5. **AUTO-** AUTOLOCK mode indicator.
3. **ATC/MAN-** ATC indicator will be displayed if a temperature probe is connected otherwise the MAN indicator will be displayed.	6. **EFF(%)-** This will be displayed if the user is viewing the efficiency of the electrode.

7. **Delete-** To delete stored data.	13. **Full-** This will indicate that all 50 data storage sites are used up.
8. **pH/mV-** Unit and mode indicators.	14. **HOLD-** This will indicate that the reading is frozen during AUTOLOCK mode.
9. Main display for pH, mV and probe efficiency values	15. **Recall-** To recall data from the data storage.
10. Temperature and unit display	16. **Each-** To delete a single set of data from the data storage.
11. Data storage site number.	17. **All-** To delete all the data in the data storage.
12. **Save-** To save a reading into the data storage.	

B. Keys

ON/OFF	**ON/OFF-** Powers on and shuts off the meter.
MODE	**MODE-** Selects display mode. Pressing this key changes the display sequentially to display pH-AUTOLOCK, mV-AUTOLOCK, pH, mV, Recall and Delete interface. In “Recall” and “Delete” modes, press this key to exit “Recall” and “Delete” modes respectively.
^ v	**UP/DOWN-** The two keys are used to manually enter the temperature values. They have no effect on the unit when operating in ATC mode. In “Recall” mode, view saved data and data storage site number by pressing these keys. In “Delete” mode, press these keys to select between the “Delete Each” and “Delete All” mode. In “Delete Each” mode, view to be deleted data and data site numbers by pressing these keys.

STAND SLOPE	**STAND/SLOPE-** The “STAND” and “SLOPE” keys are used for dual point pH calibration of the unit. Pressing and holding the “STAND” key while turning on the power, will change the buffer set to the other available buffer set.
MEA. EFF.	**MEA. / EFF.-** The key is used to bring the unit out of the AUTOLOCK condition when operating in the pH-AUTOLOCK or mV-AUTOLOCK mode. Press and hold this key for 5 seconds, the LCD will display the efficiency of the electrode.
CLEAR ENTER	**CLEAR/ENTER-** It is used to clear the unit when error signal appears. It clears all calibration values stored in the internal memory. In the pH-AUTOLOCK, mV-AUTOLOCK, pH and mV modes, press and hold this key for 5 seconds to enter the stand/slope calibration mode. In the pH-AUTOLOCK, mV-AUTOLOCK, pH and mV mode, press this key to save reading into the next available data storage site. At the Recall interface, press this key to display the last set of saved data. At the Delete interface, press this key to go into “Delete” mode. In the “Delete All” mode, press this key to delete all saved data. In the “Delete Each” mode, press this key to delete a single set of data.

OPERATIONAL PROCEDURES

A. Buffer Set Selection

The 6010M meter has two buffer sets: 7.00, 4.01, 10.01pH and 6.86, 4.00, 9.18pH. The meter is factory pre-set at 7.00, 4.01 and 10.01pH.
To change the buffer set, turn off the unit, then press and hold the "STAND" key while turning on the unit again.

[Note: There is no need to repeat this procedure every time the unit is power up unless one decides to change the buffer settings.]

B. pH Calibration

The 6010M uses 2-point calibration. The first point must be 6.86/7.00, and the second point can either be 4.00/4.01 or 9.18 / 10.01.

[**Note:** For accurate measurements, it is recommended that pH calibration is preformed once a week and after replacing the electrode.

a. Calibration with an ATC/Temp probe in the pH-AUTOLOCK mode.

1. Turn the unit on. Press "CLEAR/ENTER" key for 5 seconds, all LCD elements will lit up. The meter clears all calibration values stored in the internal memory.

2. Connect the pH electrode to the BNC connector and the ATC/Temp probe to the ATC/Temp connector of the unit: "ATC" icon will lit up. "pH" icon and "AUTO" icon will lit up. The "STAND" icon will flash.

3. Rinse the pH and ATC/Temp probes in distilled water and immerse them in the first buffer solution (either 7.00 or 6.86). Allow temperature reading to stabilize, then press and hold "STAND" key for 2 seconds to calibrate. The "WAIT" icon will flash until the unit detects a stable reading. Once the unit calibrates the first point, the "SLOPE" icon will flash. The unit is ready to be sloped at the second buffer.

4. Rinse the pH and ATC/Temp probe in distilled water and immerse them in the second buffer solution (either 4.00/4.01 or 9.18/10.01). Allow temperature reading to stabilize, then press "SLOPE" key to calibrate. The "WAIT" icon will flash until the unit detects a stable reading. Once the unit calibrates the second point and the unit will automatically

exit the calibration mode. Dual point calibration is complete.

5. The unit calculates and compensates for the pH electrode SLOPE deviation corresponding to the values of the two calibration buffers. After calibration, press and hold "MEA./EFF." key for 5 seconds to display the new electrode efficiency.

[**Note:** It is recommended to use a new electrode when the efficiency value is over than 75%.]

b. Calibration with manual temperature compensation in the pH-AUTOLOCK mode.

1. Turn the unit on. Press "CLEAR/ENTER" key for 5 seconds, all LCD elements will lit up. The meter clears all calibration values stored in the internal memory.

2. Connect the pH electrode to the BNC connector of the unit, "MAN" icon will lit up. "pH" icon and "AUTO" icon will lit up. The "STAND" icon will flash.

3. Rinse the pH probes in distilled water and immerse it in the first buffer solution (either 7.00 or 6.86). Adjust the temperature reading to that of the first buffer using the "UP" or "DOWN" keys (0.0 to 60.0℃) before pressing "STAND" key. Then press and hold "STAND" key for 2 seconds to calibrate. The "WAIT" icon will flash until the unit detects a stable reading. Once the unit calibrates the first point, the "SLOPE" icon will flash. The unit is ready to be sloped at the second buffer.

4. Rinse the pH probe in distilled water and immerse it in the second buffer solution (either 4.00/4.01 or 9.18/10.01), then press "SLOPE" key to calibrate. The "WAIT" icon will flash until the unit detects a stable reading. Once the unit calibrates the second point and the unit will automatically exit the calibration mode. Dual point calibration is complete.

5. The unit calculates and compensates for the pH electrode SLOPE deviation corresponding to the values of the two calibration buffers. After calibration, press and hold "MEA. /EFF." key for 5 seconds to display the new electrode efficiency.

[**Note:** It is recommended to use a new electrode when the efficiency value is over than 75%.]

c. Calibration with an ATC/Temp probe in the pH NON-AUTOLOCK mode.

1. Turn the unit on. Press “CLEAR/ENTER” key for 5 seconds, all LCD elements will lit up. The meter clears all calibration values stored in the internal memory.

2. Connect the pH electrode to the BNC connector and the ATC/Temp probe to the ATC/Temp connector of the unit: “ATC” icon will lit up. “pH” icon is on. The “STAND” icon will flash.

3. Rinse the pH and ATC/Temp probes in distilled water and immerse them in the first buffer solution (either 7.00 or 6.86). Allow temperature reading to stabilize, then press and hold “STAND” key for 2 seconds to calibrate. Once the unit calibrates the first point, the “SLOPE” icon will flash. The unit is ready to be sloped at the second buffer.

4. Rinse the pH and ATC/Temp probe in distilled water and immerse them in the second buffer solution (either 4.00/4.01 or 9.18/10.01). Allow temperature reading to stabilize, then press “SLOPE” key to calibrate. Once the unit calibrates the second point and the unit will automatically exit the calibration mode. Dual point calibration is complete.

5. The unit calculates and compensates for the pH electrode SLOPE deviation corresponding to the values of the two calibration buffers. After calibration, press and hold “MEA. /EFF.” key for 5 seconds to display the new electrode efficiency.

   [**Note:** It is recommended to use a new electrode when the efficiency value is over than 75%.]

d. Calibration with manual temperature compensation in the pH NON-AUTOLOCK mode.

1. Turn the unit on. Press “CLEAR/ENTER” key for 5 seconds, all LCD elements will lit up. The meter clears all calibration values stored in the internal memory.

2. Connect the pH electrode to the BNC connector of the unit, “MAN” icon will lit up. Press “Mode” key until “pH” icon is on. The “STAND” icon will flash.

3. Rinse the pH probes in distilled water and immerse it in the first buffer solution (either 7.00 or 6.86). Adjust the temperature reading to that of the first buffer using the “UP” or “DOWN” keys (0.0 to 60.0℃) before pressing “STAND” key. Then press and hold “STAND” key for 2 seconds to calibrate. Once the unit calibrates the first point, the “SLOPE” icon will flash. The unit

is ready to be sloped at the second buffer.

4. Rinse the pH probe in distilled water and immerse it in the second buffer solution (either 4.00/4.01 or 9.18/10.01), then press “SLOPE” key to calibrate. Once the unit calibrates the second point and the unit will automatically exit the calibration mode. Dual point calibration is complete.

5. The unit calculates and compensates for the pH electrode SLOPE deviation corresponding to the values of the two calibration buffers. After calibration, press and hold “MEA. /EFF.” key for 5 seconds to display the new electrode efficiency.

[**Note:** It is recommended to use a new electrode when the efficiency value is over than 75%.]

C. pH Measurements

To take pH measurements, “STAND” and “SLOPE” icon must be on, indicating the unit is dual-point calibrated and ready for measurements. If “STAND” and “SLOPE” icons flash, perform a pH calibration before taking measurements.

a. Measurement with an ATC/Temp probe in the pH-AUTOLOCK mode.

1. Connect the pH electrode to the BNC connector and the ATC/Temp probe to the ATC/Temp connector of the unit. The “ATC” icon will lit up.

2. Press “MODE” key until “pH” icon and “AUTO” icon lit up.

3. Rinse the pH electrode and ATC/temp probe with distilled water and immerse them in the sample to be measured. Remove any air bubbles trapped around the probe by shaking or stirring the probe.

4. Press the “MEA./EFF.” key. The “WAIT” icon will start flashing. The unit is waiting for a stable reading. The meter will track the pH value as sensed by the pH electrode and the ATC/Temp probe.

5. When the “WAIT” icon disappears and the “HOLD” icon is displayed, the reading is then locked and will not respond to further changes from the sample. The pH value shown is the pH value of the sample at the displayed sample temperature.

[**Note:** For samples that are inherently unstable, the unit will

not AUTOLOCK. In this case, use the pH NON- AUTOLOCK mode for measurements.]

b. Measurement with manual temperature compensation in the pH-AUTOLOCK mode.

1. Connect the pH electrode to the BNC connector of the unit. The “MAN” icon will lit up. Set unit to display the sample temperature by pressing the “UP” and “DOWN” keys (-10.0 to 120.0℃).

2. Press “MODE” key until “pH” icon and “AUTO” icon lit up.

3. Rinse the pH electrode probe with distilled water and immerse it in the sample to be measured. Remove any air bubbles trapped around the probe by shaking or stirring the probe.

4. Press the “MEA./EFF.” key. The “WAIT” icon will start flashing. The unit is waiting for a stable reading. The meter will track the pH value as sensed by the pH electrode probe.

5. When the “WAIT” icon disappears and the “HOLD” icon is displayed, the reading is then locked and will not respond to further changes from sample. The pH value shown is the pH value of the sample at the set sample temperature.

   [**Note:** For samples that are inherently unstable, the unit will not AUTOLOCK. In this case, use the pH NON- AUTOLOCK mode for measurements.]

c. Measurement with an ATC/Temp probe in the pH NON-AUTOLOCK mode.

1. Connect the pH electrode to the BNC connector and the ATC/Temp probe to the ATC/Temp connector of the unit. The “ATC” icon will lit up.

2. Press “MODE” key until the “pH” icon lit up.

3. Rinse the pH electrode and ATC/temp probe with distilled water and immerse them in the sample to be measured.

4. Allow sufficient time for the display to stabilize. The instrument will display the pH value of the sample at the displayed sample temperature.

d. Measurement with manual temperature compensation in the pH NON-AUTOLOCK mode.

1. Connect the pH electrode to the BNC connector of the unit.

The “MAN” icon will lit up. Set unit to display the sample temperature by pressing the “UP” and “DOWN” keys (-10.0 to 120.0℃).

2. Press “MODE” key until the “pH” icon lit up.

3. Rinse the pH electrode probe with distilled water and immerse it in the sample to be measured.

4. Allow sufficient time for the display to stabilize. The instrument will display the pH value of the sample at the set sample temperature.

D. Temperature Measurements

The 6010M can measure temperature independently with the ATC/temp probe without using the pH electrode. Place the ATC/temp probe in the sample. The unit will display the measured temperature.

E. mV Measurements

a. Measurement in the mV-AUTOLOCK mode.

1. Connect the combination ORP electrode to the BNC connector of the unit.

2. Press “MODE” key until the “mV” icon and “AUTO” icon lit up.

3. Rinse electrode with distilled water and immerse it in sample to be measured.

4. Press the “MEA./EFF.” key. The “WAIT” icon will start flashing. The unit is waiting for a stable reading. The meter will track the mV value as sensed by the ORP electrode

5. When the “WAIT” icon disappears and the “HOLD” icon is displayed, the reading is then locked and will not respond to further changes from the sample. The mV value is the sample reading.

[**Note:** For samples that are inherently unstable, the unit will not AUTOLOCK. In this case, use the mV NON- AUTOLOCK mode for measurements.]

b. Measurement in the mV NON-AUTOLOCK mode.

1. Connect the combination ORP electrode to the BNC connector of the unit.
2. Press “MODE” key until the “mV” icon lit up.

3. Rinse electrode with distilled water and immerse it in sample to be measured.

4. Allow sufficient time for the display to stabilize. The instrument will display the mV value of the sample.

F. Save, Recall and Delete Data

a. Saving readings to memory.

1. In pH-AUTOLOCK, mV-AUTOLOCK, pH and mV modes, press the “CLEAR/ENTER” key to save data. The “Save” icon with the corresponding site number will lit up for a brief moment to indicate a successful data save. Saving is now complete.

2. If the “Full” icon is displayed, this means that all 50 data saving sites are used up. No new data can be saved until existing saved data are deleted.

b. Recalling readings from memory.

1. To recall saved data, press “CLEAR/ENTER” key at the Recall interface to go into “Recall” mode.

2. Press the “UP” or “DOWN” keys to select the storage site number.

3. Press “MODE” key to exit “Recall” mode.

c. Deleting data.

1. Press the “CLEAR/ENTER” key at the Delete interface to go into “Delete” mode.

2. Select “Delete All” or “Delete Each” mode by pressing the “UP” or “DOWN” key.

3. In the “Delete all” mode, press “CLEAR/ENTER” key to clear all stored data. Deletion is now complete.

4. In the “Delete Each” mode, use “UP” and “DOWN” key to select data to be deleted. Then press “CLEAR/ENTER” key to delete. Deletion is now complete. The next set of saved data will automatically move up a slot in the storage site.

5. Press “MODE” key to exit “Delete” mode.

pH BUFFERS

The temperature coefficient of pH calibration buffers 4.01, 6.86, 7.00, 9.18 and 10.01 are stored inside the instrument. The buffers used to calibrate the instrument must exhibit the same temperature characteristics as the stored values.

Temperature coefficient of the pH buffers

℃	4.00	6.86	9.18	4.01	7.00	10.01
0	4.01	6.98	9.46	4.01	7.11	10.32
5	4.00	6.95	9.39	4.01	7.08	10.25
10	4.00	6.92	9.33	4.00	7.06	10.18
15	4.00	6.90	9.28	4.00	7.03	10.12
20	4.00	6.88	9.23	4.00	7.01	10.06
25	4.00	6.86	9.18	4.01	7.00	10.01
30	4.01	6.85	9.14	4.01	6.98	9.97
35	4.02	6.84	9.10	4.02	6.98	9.93
40	4.03	6.84	9.07	4.03	6.97	9.89
45	4.04	6.83	9.04	4.04	6.97	9.86
50	4.06	6.83	9.02	4.06	6.97	9.83
55	4.07	6.83	8.99	4.08	6.97	9.80
60	4.09	6.84	8.97	4.10	6.98	9.78

[Note: The actual reading of the instrument can differ from the values shown by ±0.01pH.**]**

ERROR DISPLAYS AND TROUBLESHOOTING

Main Display	Possible Cause(s)	Corrective Action(s)
"Er1"	1. "STAND" was pressed before the electrode and ATC/Temp probe settled to within +/-1.5 pH of the buffer value.	1. Press "CLEAR/ENTER" key, allow sufficient time for the electrode and ATC/Temp probe to stabilize, re-press "STAND" key to start the calibration procedure.
	2. pH electrode offset is greater / less than +/-1.5 pH.	2. Replace the buffer and /or the pH electrode. Press "CLEAR/ENTER" key to recalibrate meter.
	3. pH electrode is faulty.	3. Replace electrode.
"Er2"	1. "SLOPE" was pressed before the electrode and ATC/Temp probe settled to within 30% of the buffer value.	1. Allow sufficient time for the electrode and ATC/Temp probe to stabilize, re-press "SLOPE" key to continue the calibration procedure.
	2. Buffer 4.00, 4.01, 9.18 and 10.01 is not correct.	2. Check if the correct buffer is used.
	3. pH electrode SLOPE is off by more than 30% of ideal SLOPE.	3. Replace the buffer and /or the pH electrode. Press "CLEAR/ENTER" key to recalibrate meter.
"Er3"	1. Temperature is out of the 0.0 to 60.0°C range.	1. Bring the buffer temperature within range.
"over" / "undr"	1. Measured pH is out of the –2.00 to 16.00 pH range.	1. Bring sample pH into the correct measuring range.
	2. Measured mV is out of the –1999 to 1999 mV range.	2. Bring sample ORP into the correct measuring range.
	3. Measured temperature is out of the –10.0 to 120.0°C range.	3. Bring sample temperature into the correct measuring range.

[Note: If the meter still does not perform normally after the above measures are taken, call **Jenco** Service Department.**]**

SPECIFICATIONS

Display	Range	Resolution	Accuracy
pH	-2.00 to 16.00 pH	0.01 pH	±0.02
mV	-1999 to 1999 mV	1 mV	±0.1%
Temperature	-10.0 to 120.0 °C	0.1 °C	±0.5°C

pH buffer recognition	pH 7.00, 4.01, 10.01 or pH 6.86, 4.00, 9.18
pH Temperature compensation	AUTO/MAN –10.0°C to 120.0 °C
pH Buffer Temperature range	0°C to 60.0°C
pH Electrode Offset recognition	±90 mV at pH 7.00 or 6.86
pH Electrode SLOPE recognition	±30% at pH 4.00, 4.01, 9.18 and 10.01
Input impedance	$>10^{12}\Omega$
Temperature sensor	Thermistor, 10 kΩ at 25°C
Power	9Volt battery
Calibration Back-up	EEPROM
Datalogging capabilities	50 data sets
Automatic shut off function	30 minutes of non-use
Audio Feedback	All Touch Keys
End Point Sensing & Hold	Yes
Display (pH / mV : Temp)	12mm : 8mm high LCD
Ambient Temperature Range	0 to 50 °C
Relative Humidity	At 90% RH
Case	IP65 waterproof
Dimensions (W x D x H)	70mm x 198mm x 37mm
Weight	260 grams (Batteries included)

WARRANTY

Jenco warrants this product to be free from significant deviations in material and workmanship for a period of 1 year from date of purchase. If repair or adjustment is necessary and has not been the result of abuse or misuse, within the year period, please return-freight-prepaid and the correction of the defect will be made free of charge. If you purchased the item from our **Jenco** distributors and it is under warranty, please contact them to notify us of the situation. **Jenco** Service Department alone will determine if the product problem is due to deviations or customer misuse.

Out-of-warranty products will be repaired on a charge basis.

RETURN OF ITEMS

Authorization must be obtained from one of our representatives before returning items for any reason. When applying for authorization, have the model and serial number handy, including data regarding the reason for return. For your protection, items must be carefully packed to prevent damage in shipment and insured against possible damage or loss. **Jenco** will not be responsible for damage resulting from careless or insufficient packing. A fee will be charged on all authorized returns.

NOTE: Jenco reserves the right to make improvements in design, construction and appearance of our products without notice.

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