快速启动指南

Model 5081-P

pH/ORP Transmitter



ROSEMOUNT Analytical

EMERSON Process Management

快速启动指南

用于5081-P分析变送器

1. 安装说明

详见英文操作手册2.0章节。

（1）墙面安装：

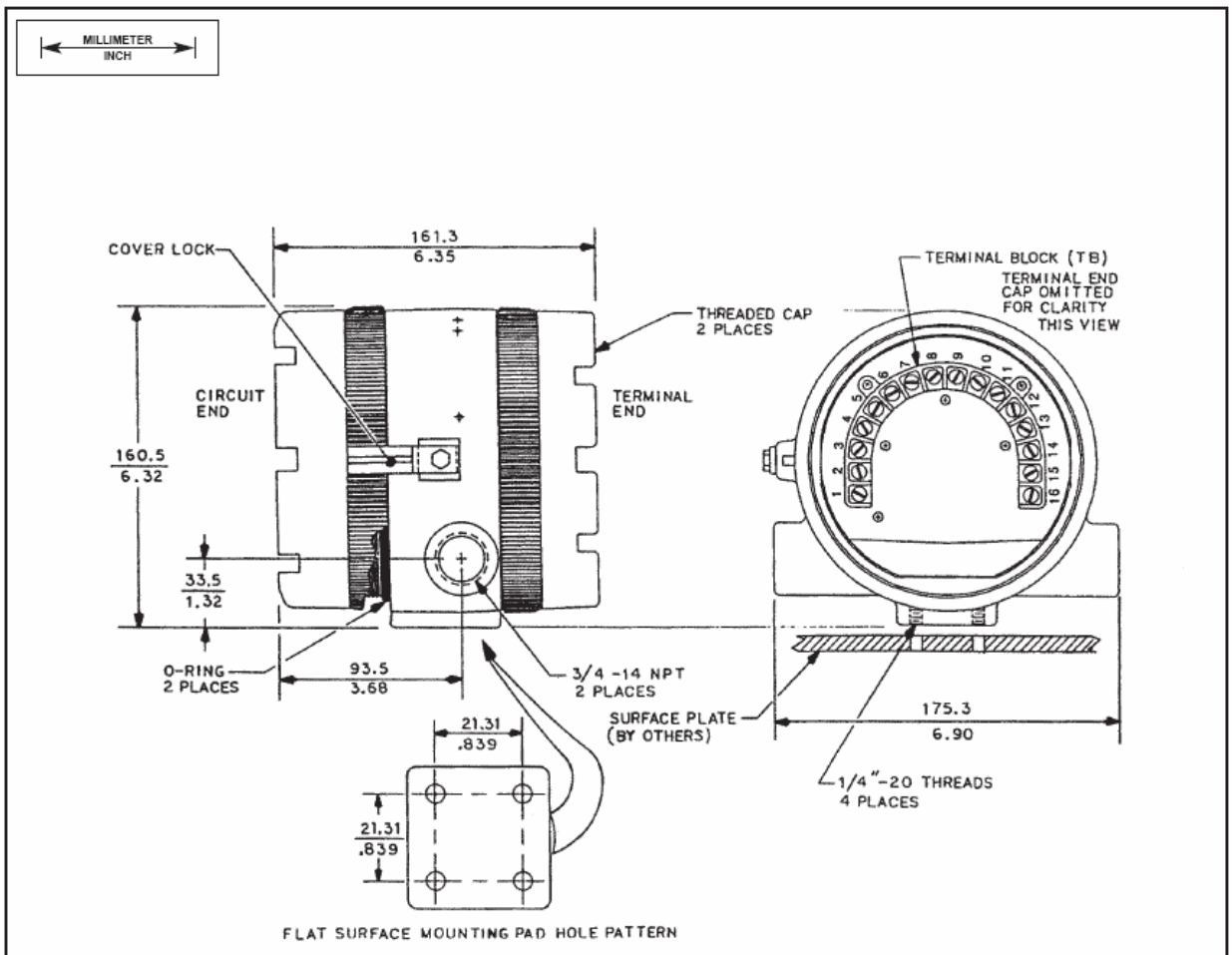


FIGURE 2-1. Mounting the Model 5081-P pH/ORP Transmitter on a Flat Surface

（2）短管安装：需要订购短管安装附件PN 2002577，适用于1-1/2英寸至2英寸的短管。

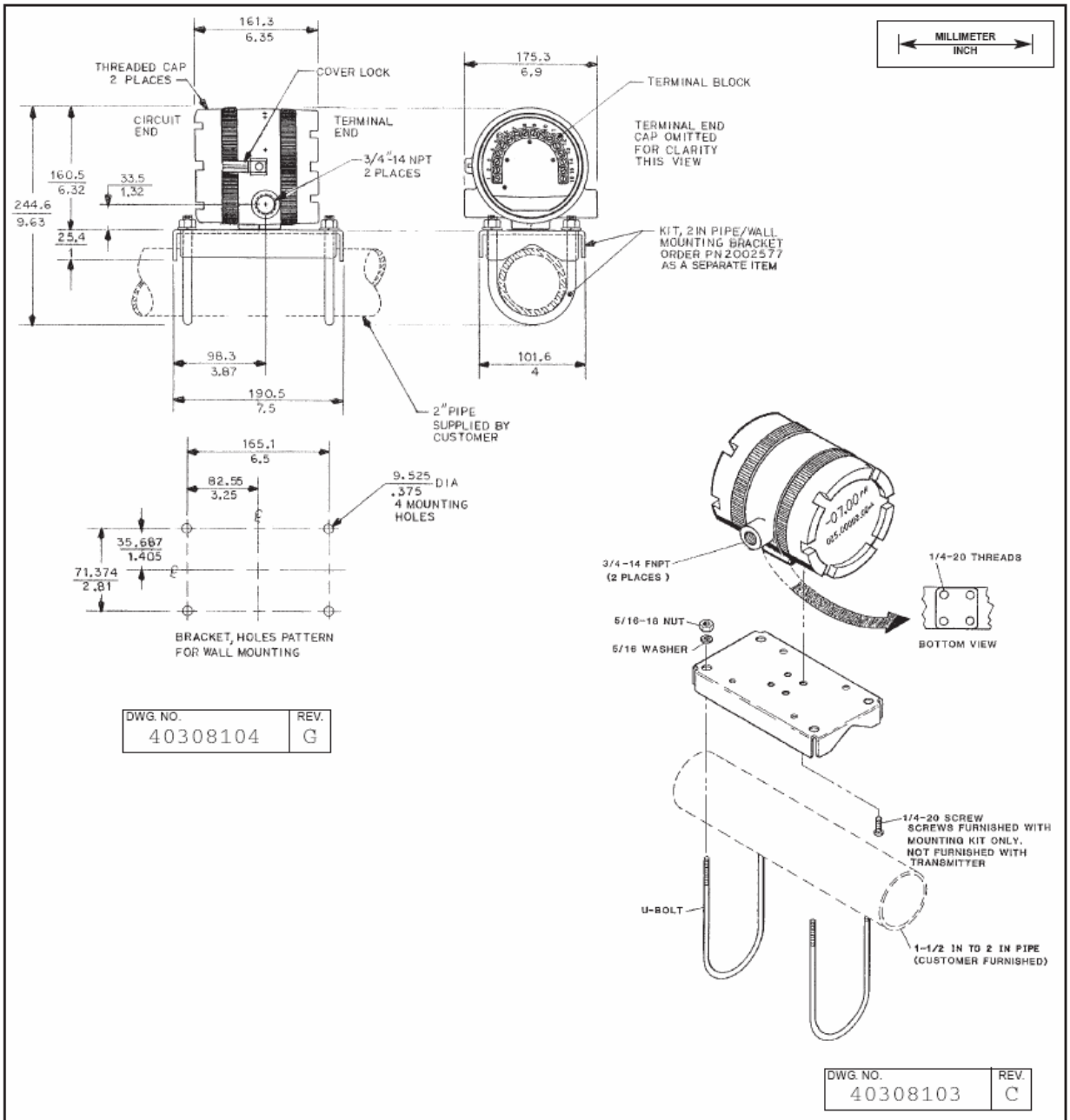


FIGURE 2-2. Using the Pipe Mounting Kit to Attach the Model 5081-P pH/ORP Transmitter to a Pipe

2. 变送器电源详细接线

请注意，传感器接线要与电源接线分开，为了抗无线电干扰（RFI）/电磁干扰（EMI），请使用屏蔽的输出信号电缆，屏蔽线接地。另外，铺设电源电缆和信号电缆时，至少要离强电设备2米远。更详细的内容，请见传感器的操作手册。

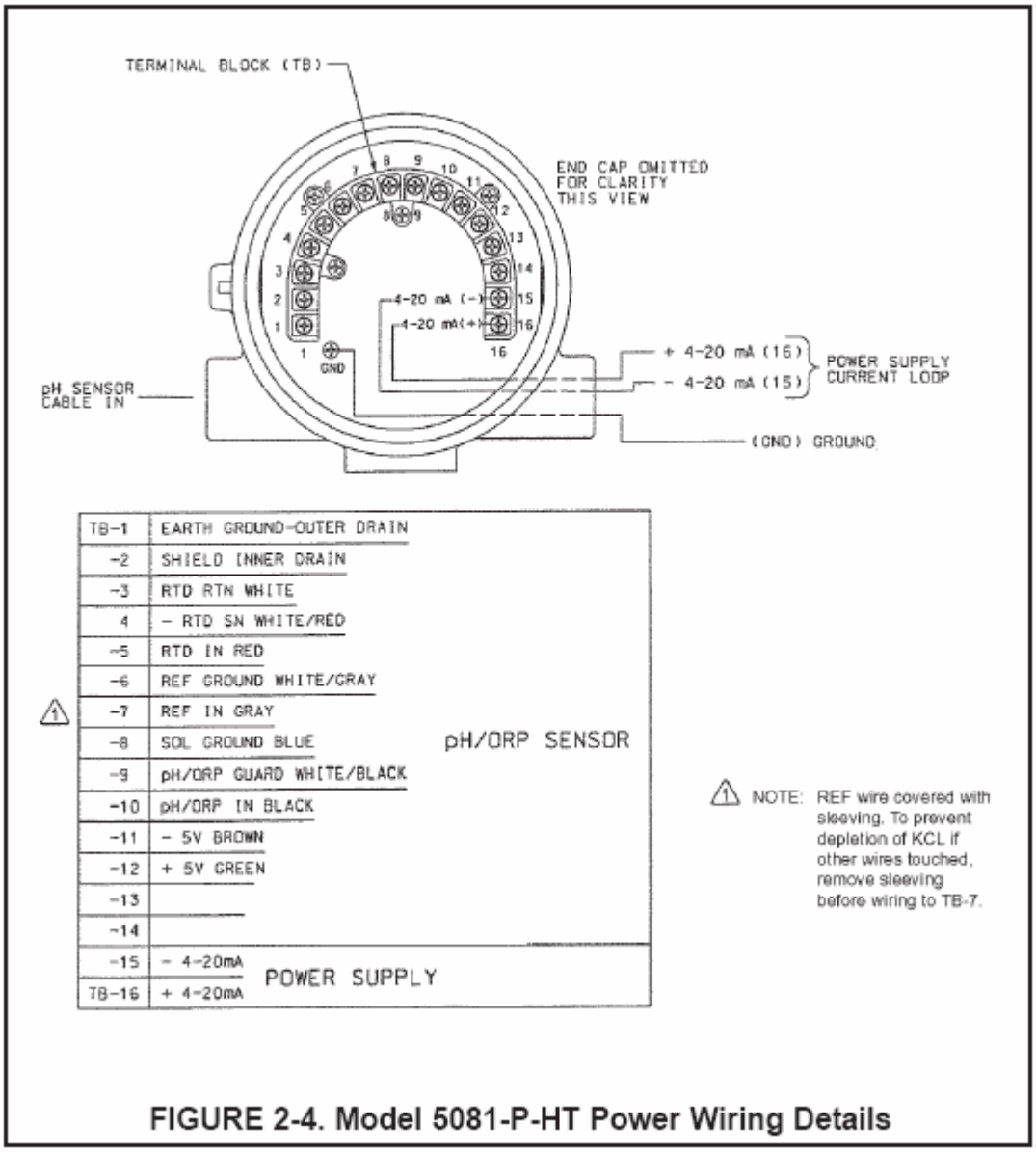
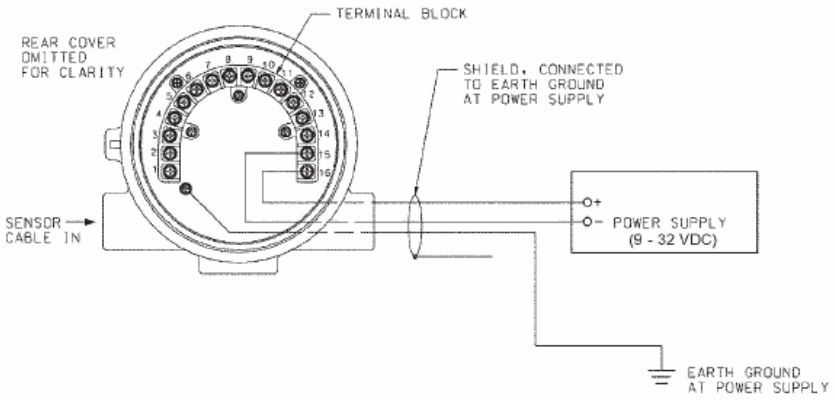


FIGURE 2-4. Model 5081-P-HT Power Wiring Details

TB-1 接地极
TB-2 屏蔽线
TB-3 RTD热电阻补偿线，白色
TB-4 RTD热电阻连接线，红白相间色
TB-5 RTD热电阻信号线，红色
TB-6 参比电极地线，灰白相间色
TB-7 参比电极信号线，灰色
TB-8 液接地电极，蓝色
TB-9 pH/ORP测量电极地线，黑白相间色
TB-10 pH/ORP测量电极信号线，黑色
TB-11 -5V，棕色
TB-12 +5V，绿色
TB-13
TB-14
TB-15 4-20mA输出/回路电源（-）
TB-16 4-20mA输出/回路电源（+）

注：参比电极线带保护套管，其目的是防止该线在与其它线接触时，造成KCL电解液损耗，接线前，请将保护套管取下。



TB-1	EARTH GROUND-OUTER DRAIN	
-2	SHIELD INNER DRAIN	
-3	RTD RTN WHITE	
4	- RTD SN WHITE/RED	
-5	RTD IN RED	
-6	REF GROUND WHITE/GRAY	
⚠1 -7	REF IN GRAY	
-8	SOL GROUND BLUE	pH/ORP SENSOR
-9	pH/ORP GUARD WHITE/BLACK	
-10	pH/ORP IN BLACK	
-11	- 5V BROWN	
-12	+ 5V GREEN	
-13		
-14		
-15	-	POWER SUPPLY
TB-16	+	

⚠1 NOTE: REF wire covered with sleeving. To prevent depletion of KCL if other wires touched, remove sleeving before wiring to TB-7.

FIGURE 2-6. Model 5081-P-FF Power Wiring Details

TB-1　接地极
TB-2　屏蔽线
TB-3　RTD热电阻补偿线，白色
TB-4　RTD热电阻连接线，红白相间色
TB-5　RTD热电阻信号线，红色
TB-6　参比电极地线，灰白相间色
TB-7　参比电极信号线，灰色
TB-8　液接地电极，蓝色
TB-9　pH/ORP测量电极地线，黑白相间色
TB-10　pH/ORP测量电极信号线，黑色
TB-11　-5V，棕色
TB-12　+5V，绿色
TB-13
TB-14
TB-15　FF信号/回路电源（-）
TB-16　FF信号/回路电源（+）

注：参比电极线带保护套管，其目的是防止该线在与其它线接触时，造成KCL电解液损耗，接线前，请将保护套管取下。

3. 变送器与不同传感器的接线

见英文操作手册3.0章节。

（1）pH/ORP传感器与5081P pH/ORP变送器的连结总体上有三种途经：

- 直接接变送器；
- 通过传感器顶部接线盒接变送器；
- 通过远方接线盒接变送器。

安装组合形式如下：

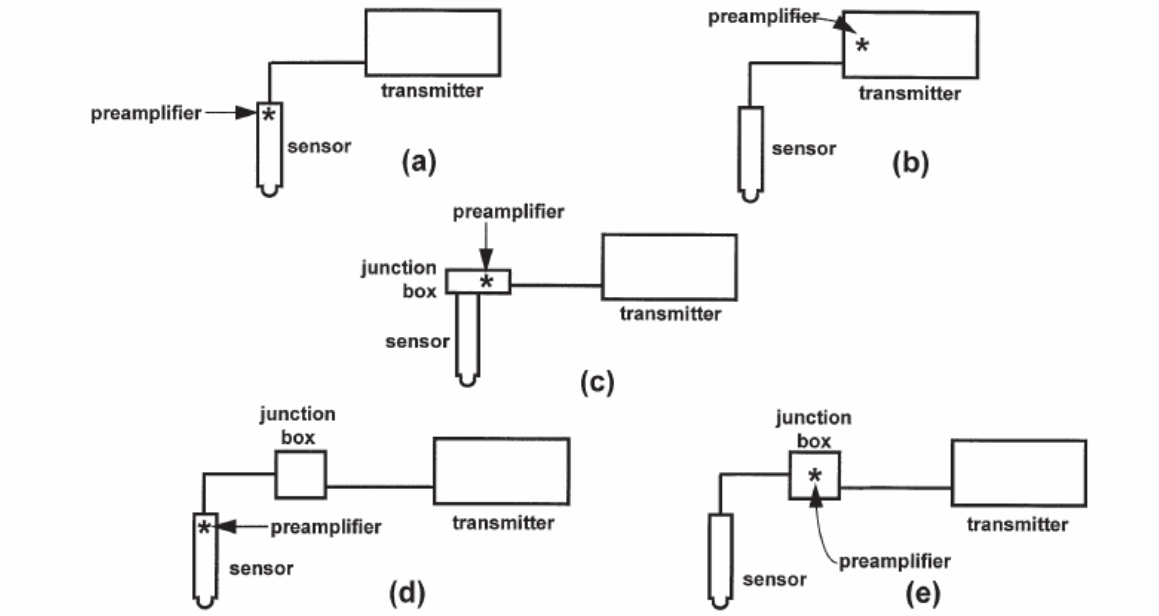


FIGURE 3-1. Wiring and Preamplifier Configurations for pH and ORP Sensors.

（2）常用的pH/ORP传感器与5081P pH/ORP变送器的接线：

有关各传感器的详细内容，请见传感器的操作手册。

Table 3-1. Wiring Diagrams for Model 399 sensors

Sensor	Junction Box	Preamplifier	RTD	Wire Function	Wiring Diagram
399-09*	none	in transmitter	Pt 100	Figure 3-2	Figure 3-4
399-09*	remote	in remote junction box	Pt 100	Figure 3-2	Figure 3-5
399-09-62	none	in transmitter	Pt 100	Figure 3-3	Figure 3-4
399-09-62	remote	in remote junction box	Pt 100	Figure 3-3	Figure 3-5
399-33 (ORP only)	none	in transmitter	Pt 100	Figure 3-19	Figure 3-20

Table 3-3 Wiring Diagrams for Model 396R Sensors

Sensor	Junction Box	Preamplifier	RTD	Wire Function	Wiring Diagram
396R-54	none	in transmitter	Pt 100	Figure 3-10	Figure 3-11
396R-54	remote	in remote junction box	Pt 100	Figure 3-10	Figure 3-12
396R-54-60	sensor-mounted	in sensor-mounted junction box	Pt 100	Figure 3-7	Figure 3-9
396R-54-61	sensor-mounted	in sensor-mounted junction box	Pt 100	Figure 3-10	Figure 3-12

Table 3-4 Wiring Diagrams for Model 396P Sensors

Sensor	Junction Box	Preamplifier	RTD	Wire Function	Wiring Diagram
396P-01-55	none	in sensor	Pt 100	Figure 3-13	Figure 3-14
396P-01-55	remote	in sensor	Pt 100	Figure 3-13	Figure 3-14
396P-02-54	none	in transmitter	Pt 100	Figure 3-10	Figure 3-11
396P-02-54	remote	in remote junction box	Pt 100	Figure 3-10	Figure 3-12
396P-02-55	none	in transmitter	Pt 100	Figure 3-10	Figure 3-11
396P-02-55	remote	in remote junction box	Pt 100	Figure 3-10	Figure 3-12

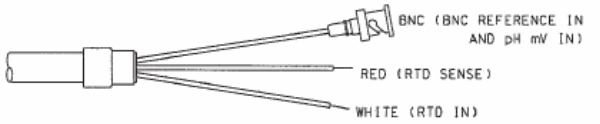
Table 3-5 Wiring Diagrams for Model 396 Sensor

Sensor	Junction Box	Preamplifier	RTD	Wire Function	Wiring Diagram
396-54*	none	in transmitter	Pt 100	Figure 3-6	Figure 3-8
396-54*	remote	in remote junction box	Pt 100	Figure 3-6	Figure 3-9
396-54-62	none	in transmitter	Pt 100	Figure 3-7	Figure 3-8
396-54-62	remote	in remote junction box	Pt 100	Figure 3-7	Figure 3-9

* 传感器带BNC接头，5081P变送器没有配置该接头插座，故此时应剪掉BNC接头，按照图3-20配置同轴电缆，否则，5081P变送器要配置BNC接头（PN 9120531）。

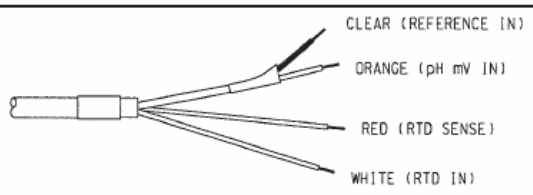
Table 3-11 Wiring Diagrams for Model 320HP Sensor

Sensor	Junction Box	Preamplifier	RTD	Wiring Diagram
320HP-10-55	on mounting plate	in transmitter	Pt 100	Figure 3-18
320HP-10-58	on mounting plate	in junction box attached to mounting plate	Pt 100	Figure 3-19



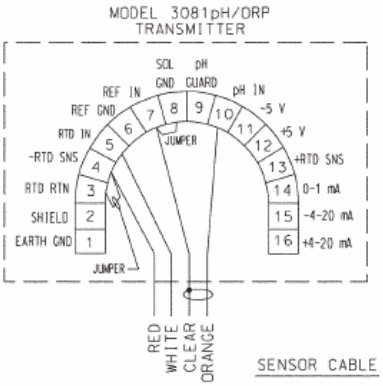
REMOVE BNC AND TERMINATE COAXIAL CABLE BEFORE WIRING SENSOR TO TRANSMITTER. SEE FIGURE 3-23. ALTERNATIVELY, USE A BNC ADAPTER (PN 9120531) OR ORDER MODEL OPTION -62 (SENSOR WITH BNC REMOVED AND TERMINATIONS COMPATIBLE WITH 5081 pH/ORP). IF USING A BNC ADAPTER, THE RED WIRE IS MV OR pH IN AND THE BLACK WIRE IS REFERENCE IN. TO PREVENT SHORT CIRCUITS TO THE TRANSMITTER HOUSING, INSULATE THE BNC WITH BY WRAPPING IT WITH ELECTRICAL TAPE.

FIGURE 3-2. Wire functions for Models 399-02, 399-09, 381pH-30-41, and 381pHE-31-41 before removing BNC and terminating cable.



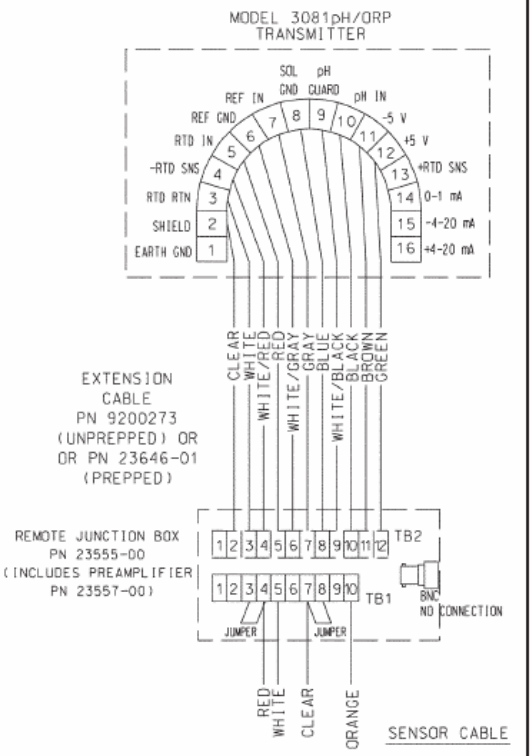
IF USING A BNC ADAPTER, THE RED WIRE IS MV OR pH IN AND THE BLACK WIRE IS REFERENCE IN. TO PREVENT SHORT CIRCUITS TO THE TRANSMITTER HOUSING, INSULATE THE BNC WITH BY WRAPPING IT WITH ELECTRICAL TAPE.

FIGURE 3-3. Wire functions for Models 399-02, 399-09, 381pH-30-41, and 381pHE-31-41 after removing BNC and terminating cable. Wire functions for Models 399-09-10-62, 381pH-30-42 and 381pHE-31-42 as received.



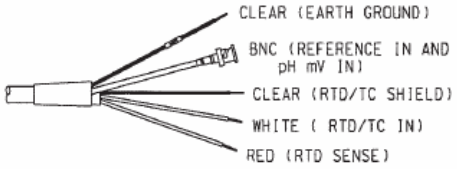
NOTES:
1. PLACE PREAMPLIFIER SELECTION SWITCH S1 IN "TRANSMITTER" POSITION (SEE SECTION 2.2).
2. IF SENSOR HAS 3K BALCO RTD, SET JUMPER (SECTION 2.2) AND PROGRAM TRANSMITTER TO RECOGNIZE RTD (SECTION 8.5-pH OR 10.5-ORP)
3. JUMPERS SUPPLIED BY CUSTOMER.

FIGURE 3-4. Wiring diagram for Models 399-09, 381pHE-30-41, and 381pHE-31-41 after removing BNC and terminating cable. Wiring Diagram for Models 399-09-62, 381pHE-30-42, and 381pHE-31-42 as received. Wiring directly to the transmitter.



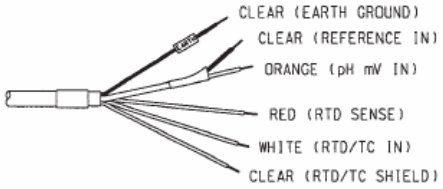
NOTES:
1. PLACE PREAMPLIFIER SELECTION SWITCH S1 IN "SENSOR/JUNCTION BOX" POSITION (SEE SECTION 2.2).
2. IF SENSOR HAS 3K BALCO RTD, SET JUMPER (SECTION 2.2) AND PROGRAM TRANSMITTER TO RECOGNIZE RTD (SECTION 8.5-pH OR 10.5-ORP)
3. SEE FIGURE 3-24 FOR TERMINATION OF RAW INTERCONNECTING CABLE (PN 9200273).
4. JUMPERS SUPPLIED BY CUSTOMER.

FIGURE 3-5. Wiring diagram for Models 399-02, 399-09, 381pH-30-41, and 381pHE-31-41 after removing BNC and terminating cable. Wiring Diagram for 399-09-62, 381pH-30-42, and 381pH-31-42 as received. Wiring through a remote junction box to the transmitter.



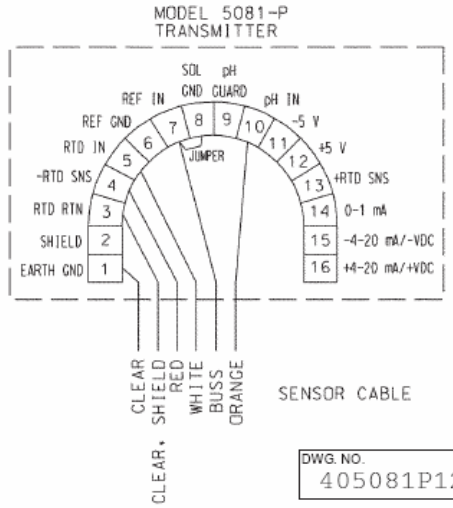
REMOVE BNC AND TERMINATE COAXIAL CABLE BEFORE WIRING SENSOR TO TRANSMITTER. SEE FIGURE 3-23. ALTERNATIVELY, USE A BNC ADAPTER (PN 9120531) OR ORDER MODEL OPTION -62 (SENSOR WITH BNC REMOVED AND TERMINATIONS COMPATIBLE WITH 5081 pH/ORP). IF USING A BNC ADAPTER, THE RED WIRE IS MV OR pH IN AND THE BLACK WIRE IS REFERENCE IN. TO PREVENT SHORT CIRCUITS TO THE TRANSMITTER HOUSING, INSULATE THE BNC WITH BY WRAPPING IT WITH ELECTRICAL TAPE.

FIGURE 3-6. Wire functions for Models 397-50, 397-54, 396-50, 396-54, 396R-50-60, 396R-54-60, 389-02-50, and 389-02-54 before removing BNC and terminating cable.



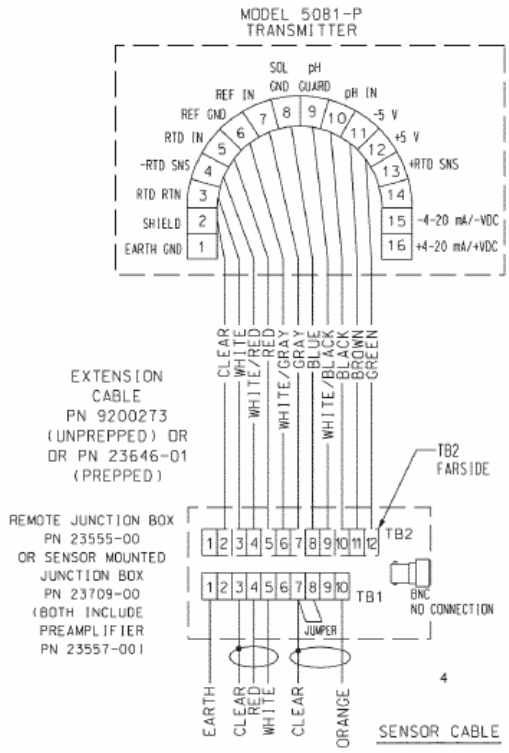
IF USING A BNC ADAPTER, THE RED WIRE IS MV OR pH IN AND THE BLACK WIRE IS REFERENCE IN. TO PREVENT SHORT CIRCUITS TO THE TRANSMITTER HOUSING, INSULATE THE BNC WITH BY WRAPPING IT WITH ELECTRICAL TAPE.

FIGURE 3-7. Wire functions for Models 397-50, 397-54, 396-50, 396-54, 396R-50-60, 396R-54-60, 389-02-50, and 389-02-54 after removing BNC and terminating cable. Wire functions for Models 397-54-62, 396-54-62, and 389-02-54-62 as received.



DWG. NO.	REV.
405081P12	A

FIGURE 3-8. Wiring diagram for Models 397-50, 397-54, 396-50, 396-54, 389-02-50, and 389-02-54 after removing BNC and terminating cable. Wiring diagram for Models 397-54-62, 396-54-62, and 389-02-54-62 as received. Wiring directly to the transmitter.



NOTES:
1. SEE FIGURE [21] FOR PREPARATION INSTRUCTIONS FOR CABLE PN 9200273.
2. ADDITIONAL CABLE PREP REQUIRED FOR MODELS 389 -02, 396 -54, 397 -02-10-54 AND 398R -54 SEE SENSOR INSTRUCTION MANUAL.
3. FIGURE ALSO APPLIES TO MODEL 396R -60 AND 398R -60

DWG. NO.	REV.
405081P19	A

FIGURE 3-9. Wiring diagram for Models 397-50, 397-54, 396-50, 396R-50-60, 396R-54-60, 396-54, 389-02-50, and 389-02-54 after removing BNC and terminating cable. Wiring diagram for Models 397-54-62, 396-54-62, and 389-02-54-62 as received. Wiring through a remote junction box to the transmitter.

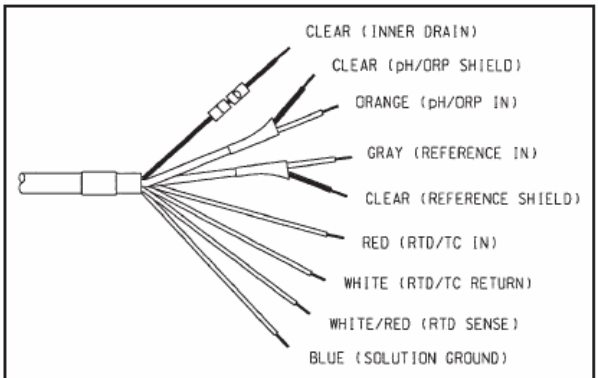
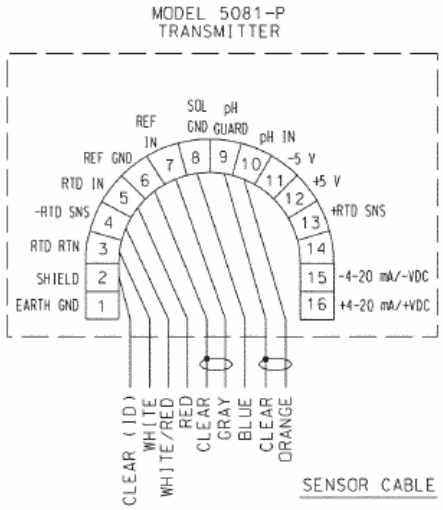


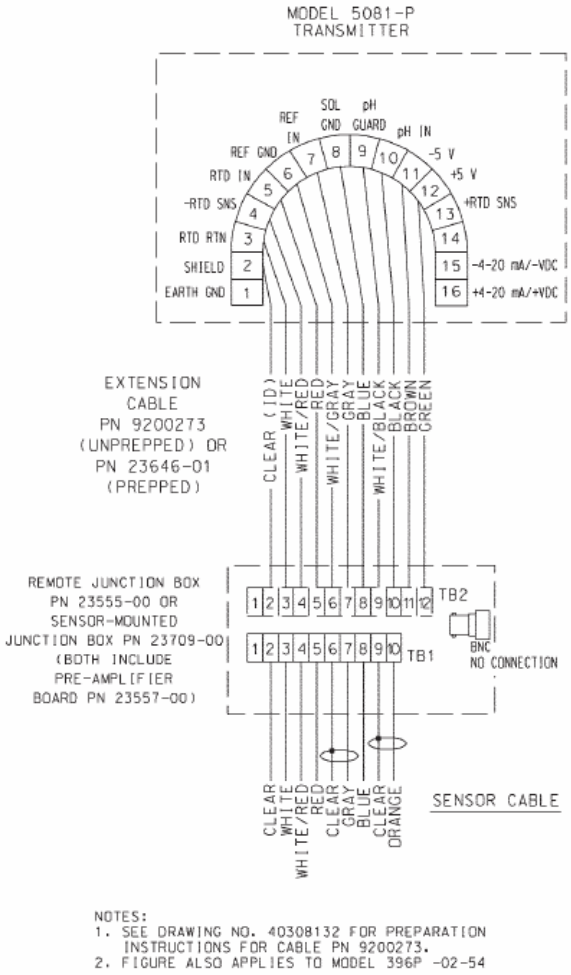
FIGURE 3-10. Wire functions for Models 396R-50, 396R-54, 396R-54-61, 396P-02-50, 396P-02-54, 396P-02-55, 385+ -04, and 385+ -41-52.



NOTES:
1. FIGURE ALSO APPLIES TO MODEL 396P-02-54.

DWG. NO.	REV.
405081P18	A

FIGURE 3-11. Wiring diagram for Models 396R-50, 396R-54, 396R-54-61, 396P-02-50, 396P-02-54, 396P-02-55, 385+ -04, and 385+ -41-52. Wiring directly to the transmitter.



NOTES:
1. SEE DRAWING NO. 40308132 FOR PREPARATION INSTRUCTIONS FOR CABLE PN 9200273.
2. FIGURE ALSO APPLIES TO MODEL 396P -02-54

DWG. NO.	REV.
405081P24	A

FIGURE 3-12. Wiring diagram for Models 396R-50, 396R-54, 396R-54-61, 396P-02-50, 396P-02-54, 396P-02-55, 385+ -04, and 385+ -41-52. Wiring through a sensor-mounted junction box to the transmitter.

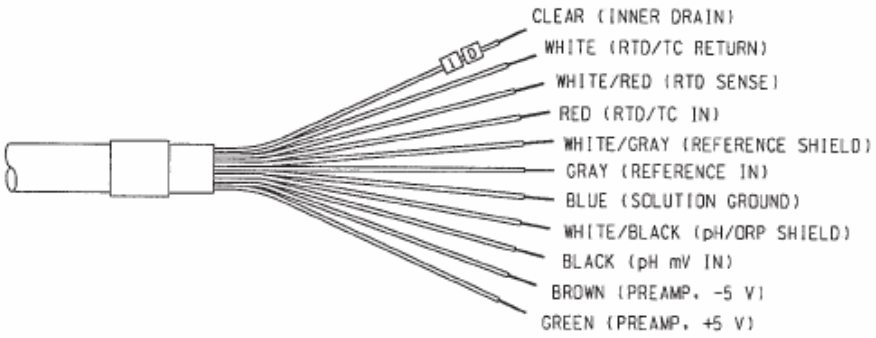


FIGURE 3-13. Wire functions for Models 396P-01-55, 385+ -03, 381+ -40-55, and 381+ -43-55.

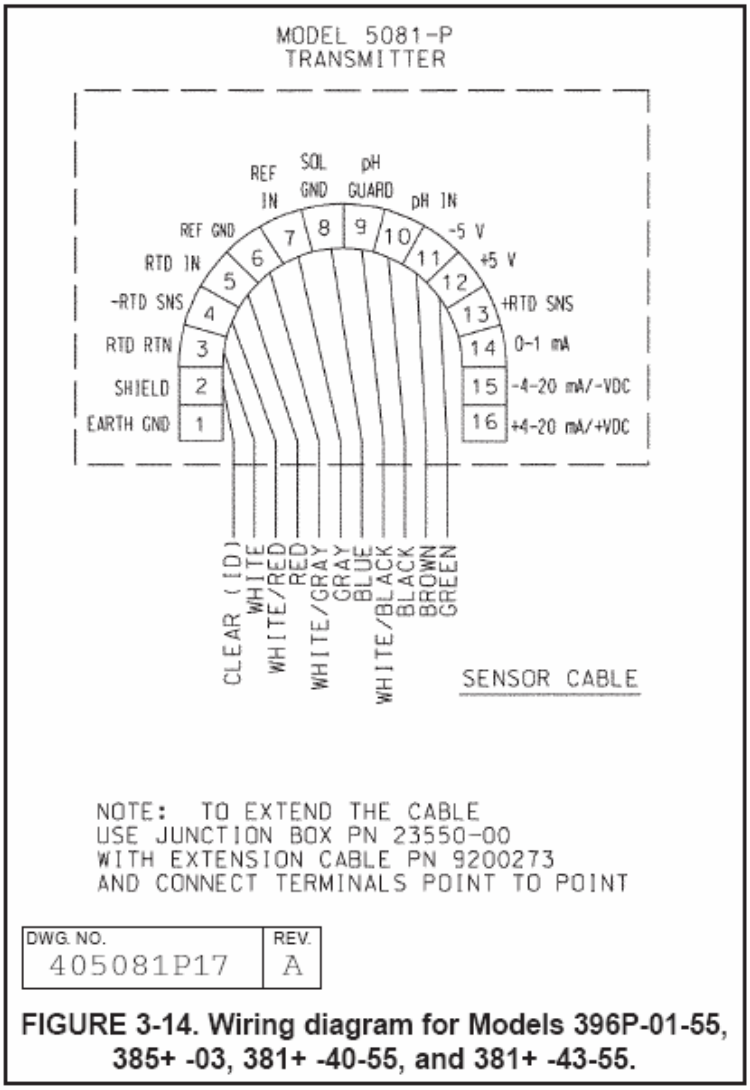


FIGURE 3-14. Wiring diagram for Models 396P-01-55, 385+ -03, 381+ -40-55, and 381+ -43-55.

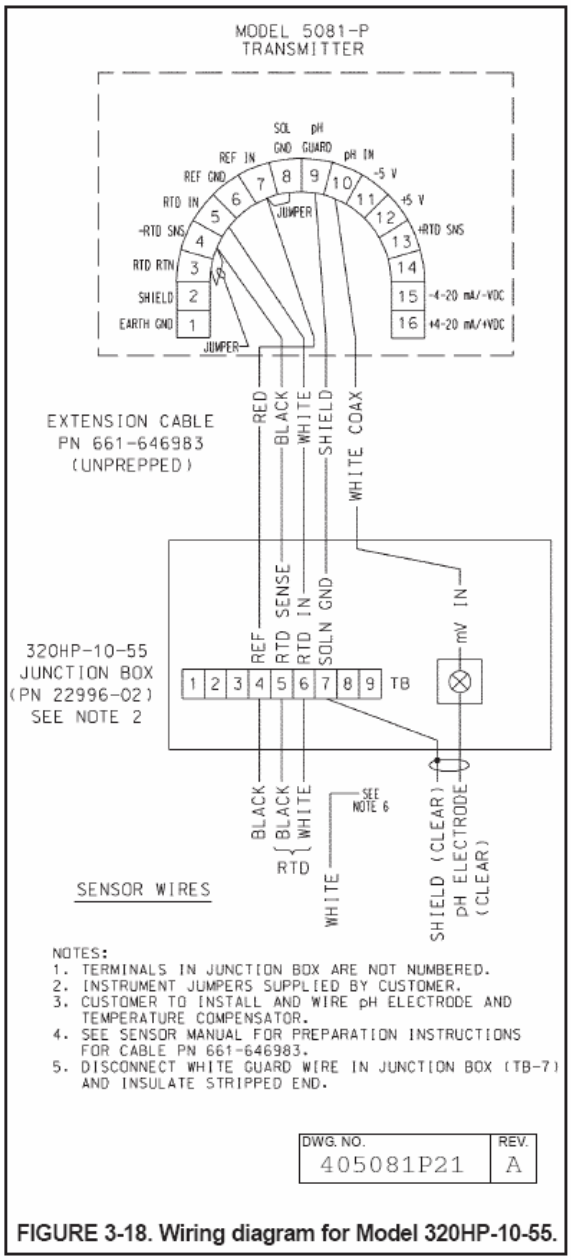


FIGURE 3-18. Wiring diagram for Model 320HP-10-55.

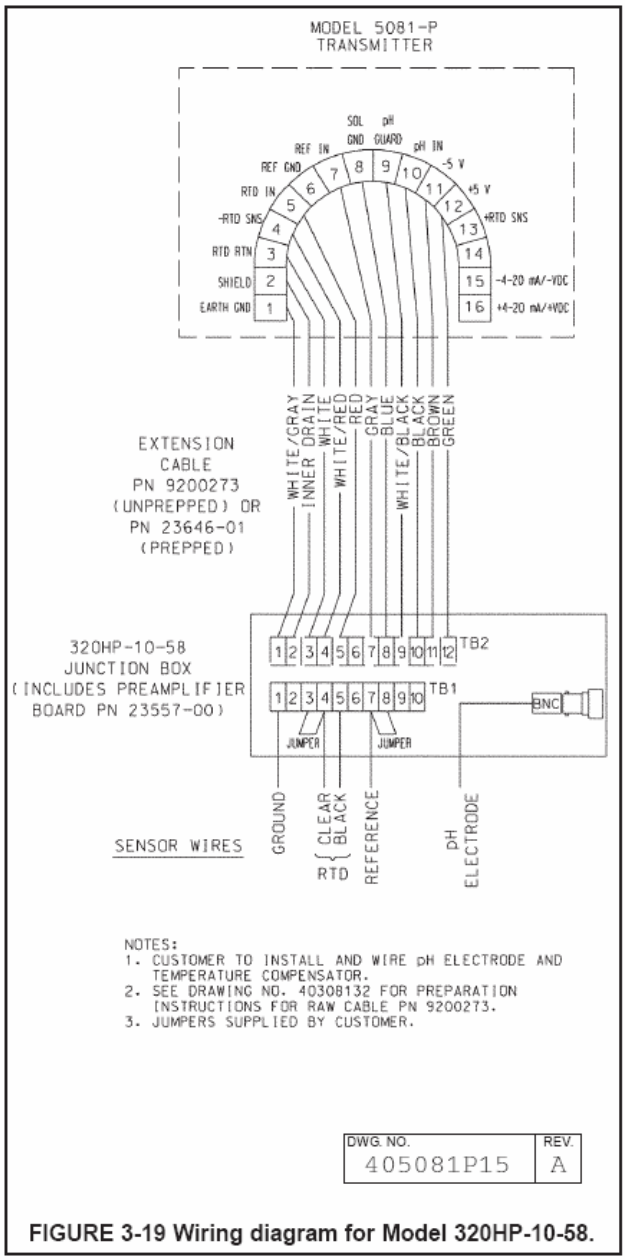


FIGURE 3-19 Wiring diagram for Model 320HP-10-58.

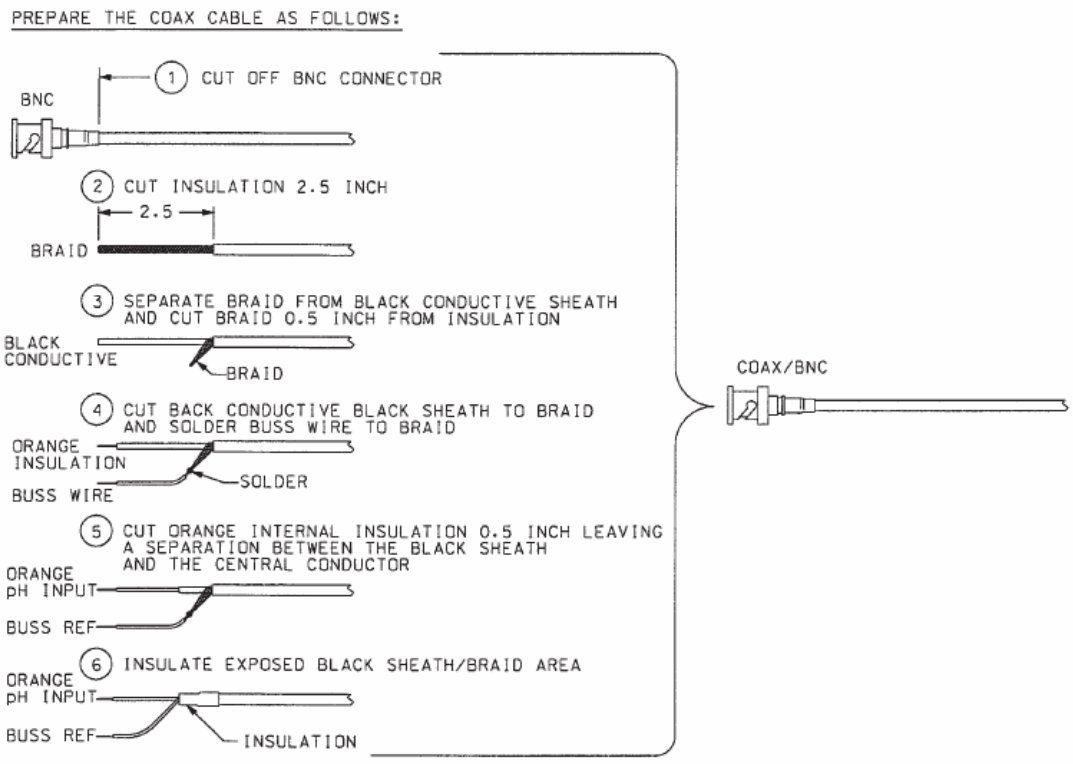


FIGURE 3-20. Procedure for Removing BNC Connector and Preparing Coaxial Cable

4. 用红外遥控器调整5081P变送器

（1）变送器显示

正常工作时显示画面见图5-2，编程组态时显示画面见图5-3：

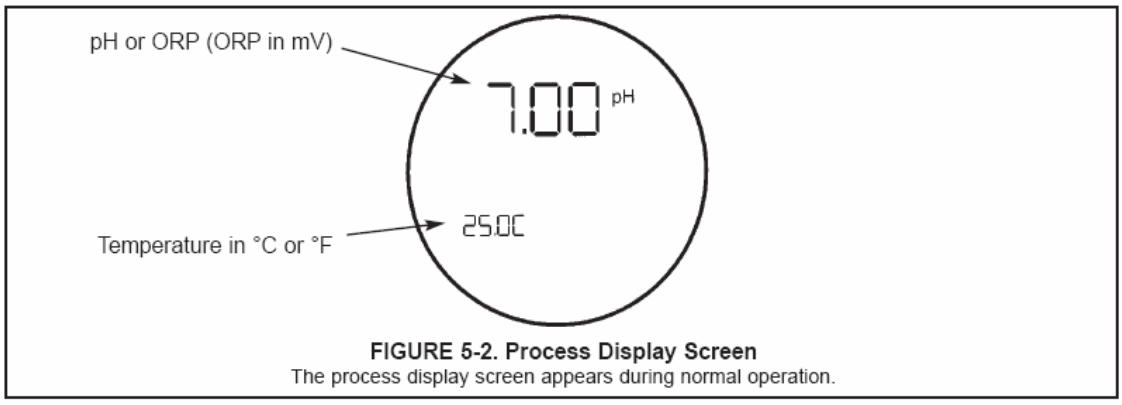


FIGURE 5-2. Process Display Screen
The process display screen appears during normal operation.

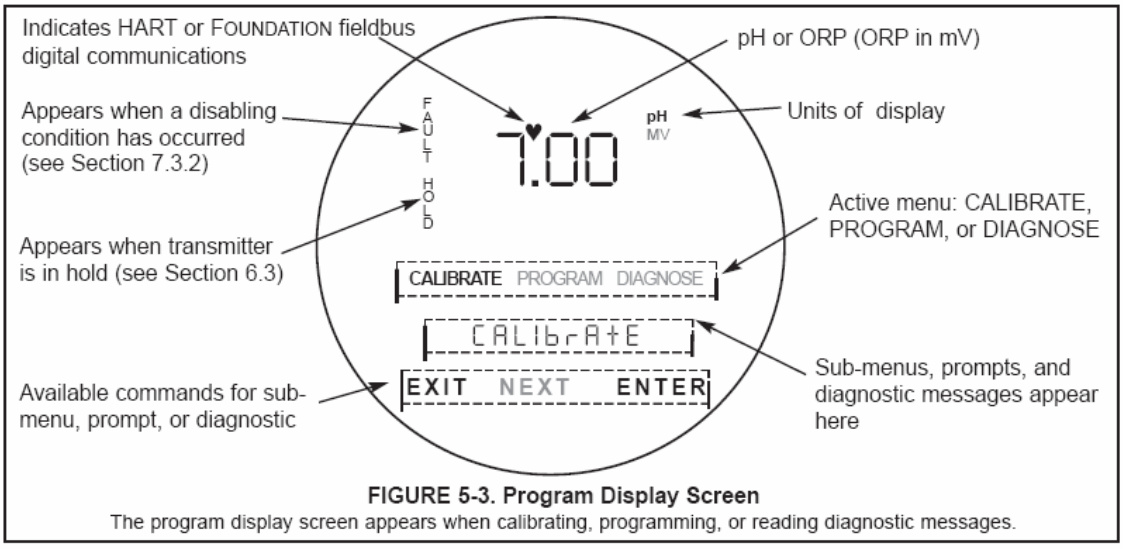


FIGURE 5-3. Program Display Screen
The program display screen appears when calibrating, programming, or reading diagnostic messages.

Indicates HART or Foundation Fieldbus digital communication: 表明是HART或FF数字通讯。

Appears when a disabling condition has occurred: 在有故障的情况下出现。

Appears when transmitter is in hold: 当变送器处于保持工作状态时出现。

Available commands for submenu, prompt, or diagnostic: 在进入子菜单、提示信息和故障诊断时，作为有效命令。

Active menu: CALIBRATE, PROGRAM, or DIAGNOSE:

正在运行的工作状态：标定、编程或诊断。

Sub-menus, prompts, and diagnostic messages appear here: 显示子菜单、提示信息和故障诊断。



(2) 红外遥控器

1．按“ RESET ”键，变送器退出当前操作，返回主菜单。

2．使用箭头编辑键，浏览允许设置的内容，或改变设置的数据。

3．通过菜单按键“ CAL、PROG、DIAG ”，可以选取标定、组态或诊断菜单。

4．按“HOLD”键，变送器处于保持状态，输出电流为预先设定的数值。

5．按“Enter”键，存数据或组态信息。

6．按“NEXT”键，从当前的子菜单退出，进入下一个子菜单。

7．按“EXIT”键，不存数据退出。

红外遥控器的有效工作范围6英尺以内，且遥控器与变送器显示屏的水平夹角小于15º。

（3）pH测量树形菜单结构图

5081-P pH变送器有三个菜单：CALIBRATE标定、PROGRAM编程和DAIGNOSE诊断。在标定和编程菜单下有若干个子菜单，例如在标定菜单下有：CALIbrAtE、Std（标准的）和tEMP AdJ（温度调整）。在每个子菜单下有相应的提示，例如在Std下，有提示Std xx.xx和Slope xx.xx。诊断菜单则为用户提供诊断信息。图5-5给出5081-P-HT的树形菜单结构图，图5-6给出5081-P-FF的树形菜单结构图。

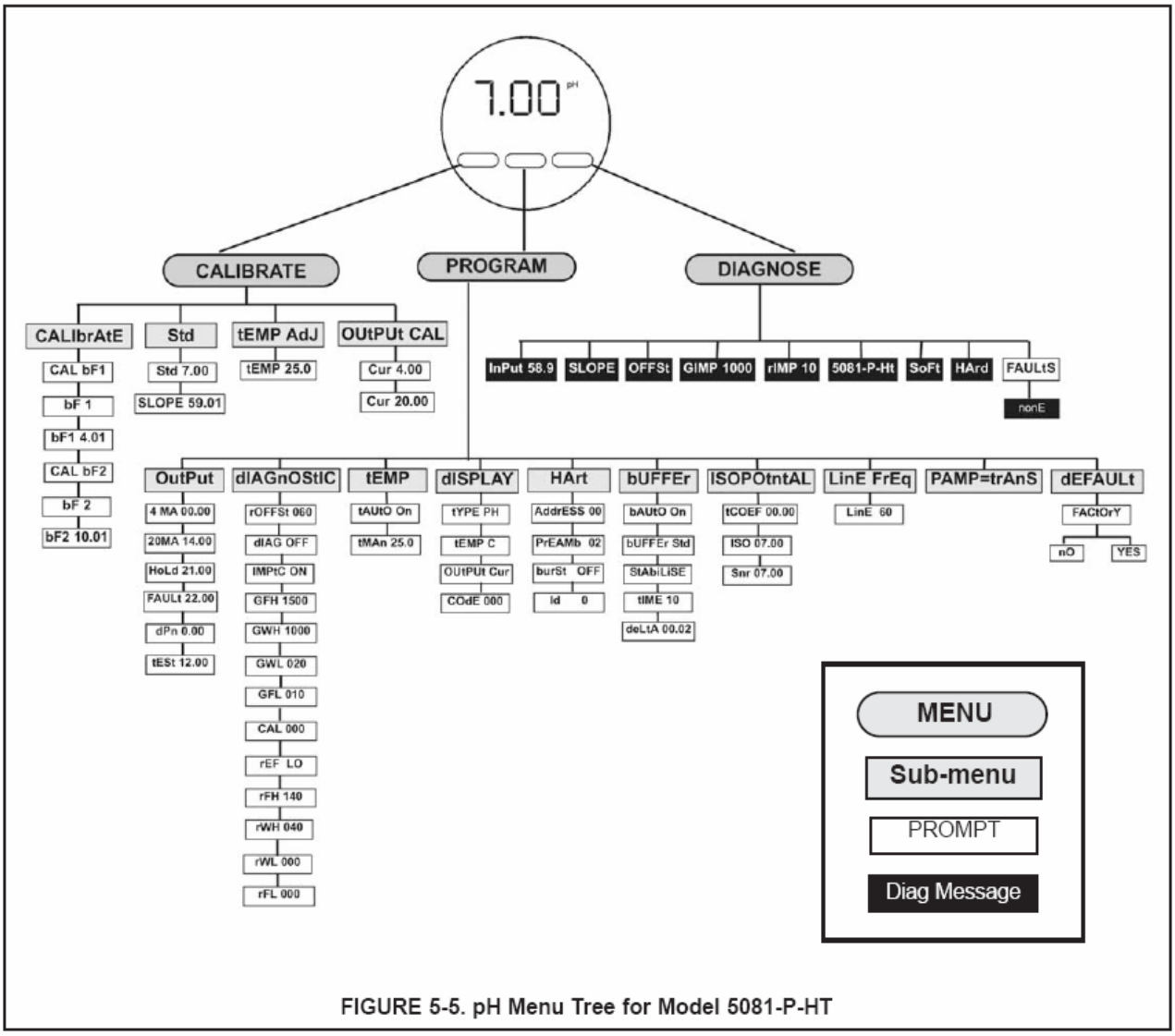


FIGURE 5-5. pH Menu Tree for Model 5081-P-HT

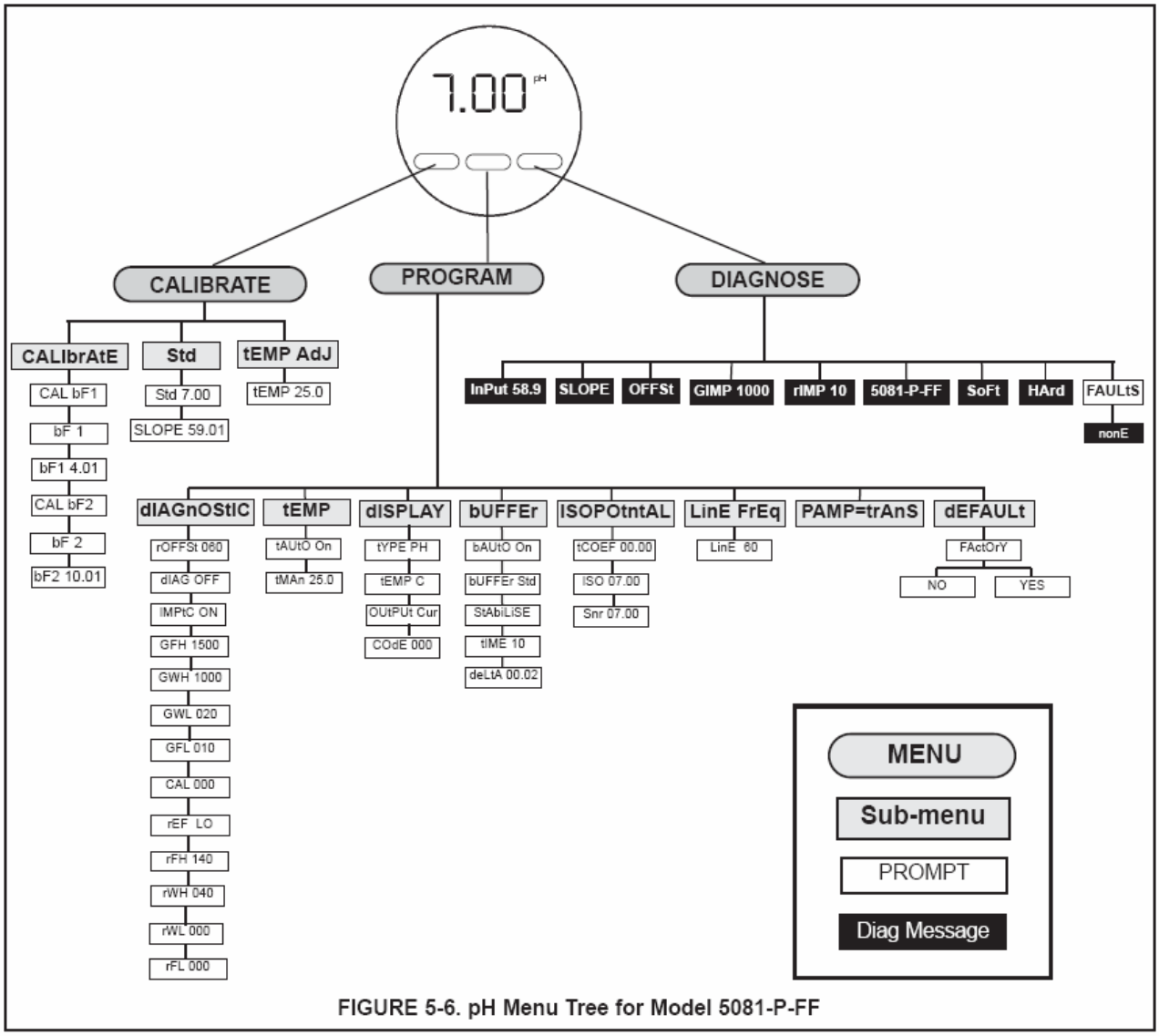


FIGURE 5-6. pH Menu Tree for Model 5081-P-FF

（4）密码

变送器的组态和标定设置可以通过密码进行加密保护。



输入密码：

1．按红外遥控器上的PROG或CAL，出现左图所示的Id屏幕。

2．用编辑键输入密码，按ENTER键。

3．如果密码正确，第一个子菜单出现，如果密码不正确，则重新显示过程参数。

恢复遗忘的密码：

1．如果忘记了密码，在Id屏幕输入555，按ENTER键，此时，变送器显示当前的数码。

2．按EXIT键，变送器显示过程参数。

3．按PROG或CAL键，Id屏幕再次出现。

4．用编辑键输入刚才显示的数码，然后，按ENTER键。

5．在选择的菜单下出现第一子菜单。

5. 用375 HART手操器调整5081P变送器

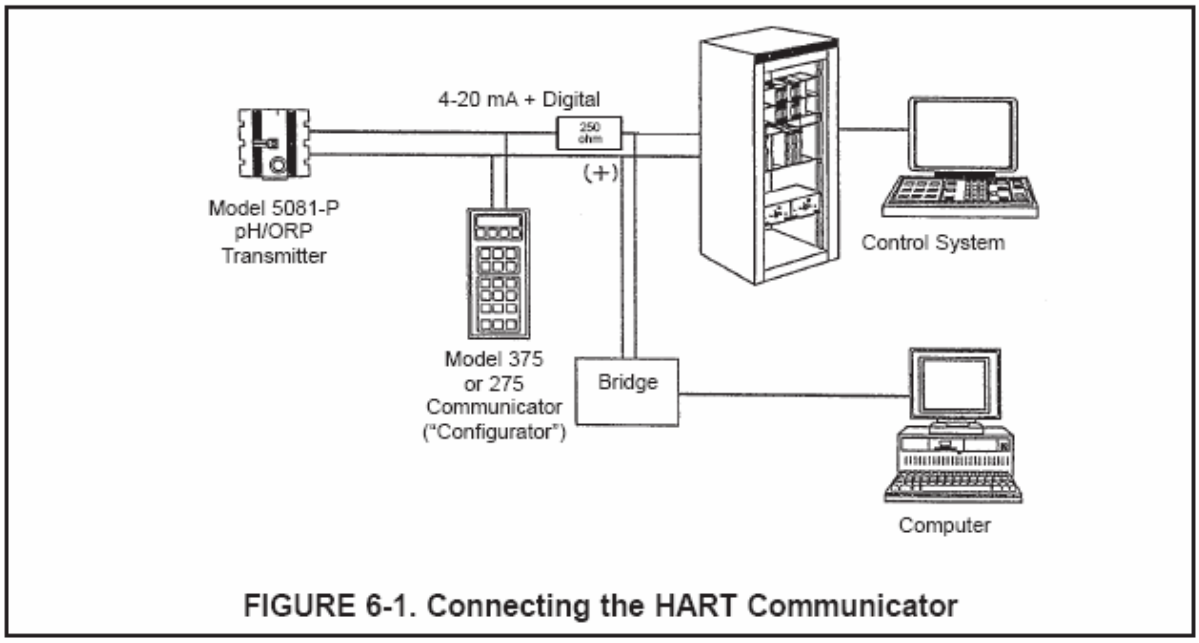


FIGURE 6-1. Connecting the HART Communicator

（1）离线操作和在线操作

375手操器可以离线操作，也可以在线操作。在线操作意味着手操器按照常规连接到变送器的测量回路中，此时，操作人员可以通过手操器，观察到变送器的测量数据，改变变送器的组态，并读取诊断信息。离线操作意味着手操器不连接到变送器的测量回路中，操作人员对手操器进行编程，以后，适时将手操器连接到变送器的测量回路中，将程序下装到变送器中。离线操作在对多台变送器进行常规组态时，具有很强的优越性。

（2）通过键盘，作有关HART的设置

Calibrate Hold **Program** Display	按MUNE，主菜单出现，选择Program。
Output Temp Measurement >>	选择>>
Security **HART** >>	选择HART
DevID PollAddrs Burst Preamble	选择DevID，显示装置的ID码；选择PollAddrs，显示登记地址；选择Burst，显示字符组的状态设置；选择Preamble，显示预兆性事件的计数。

（3）树形操作菜单

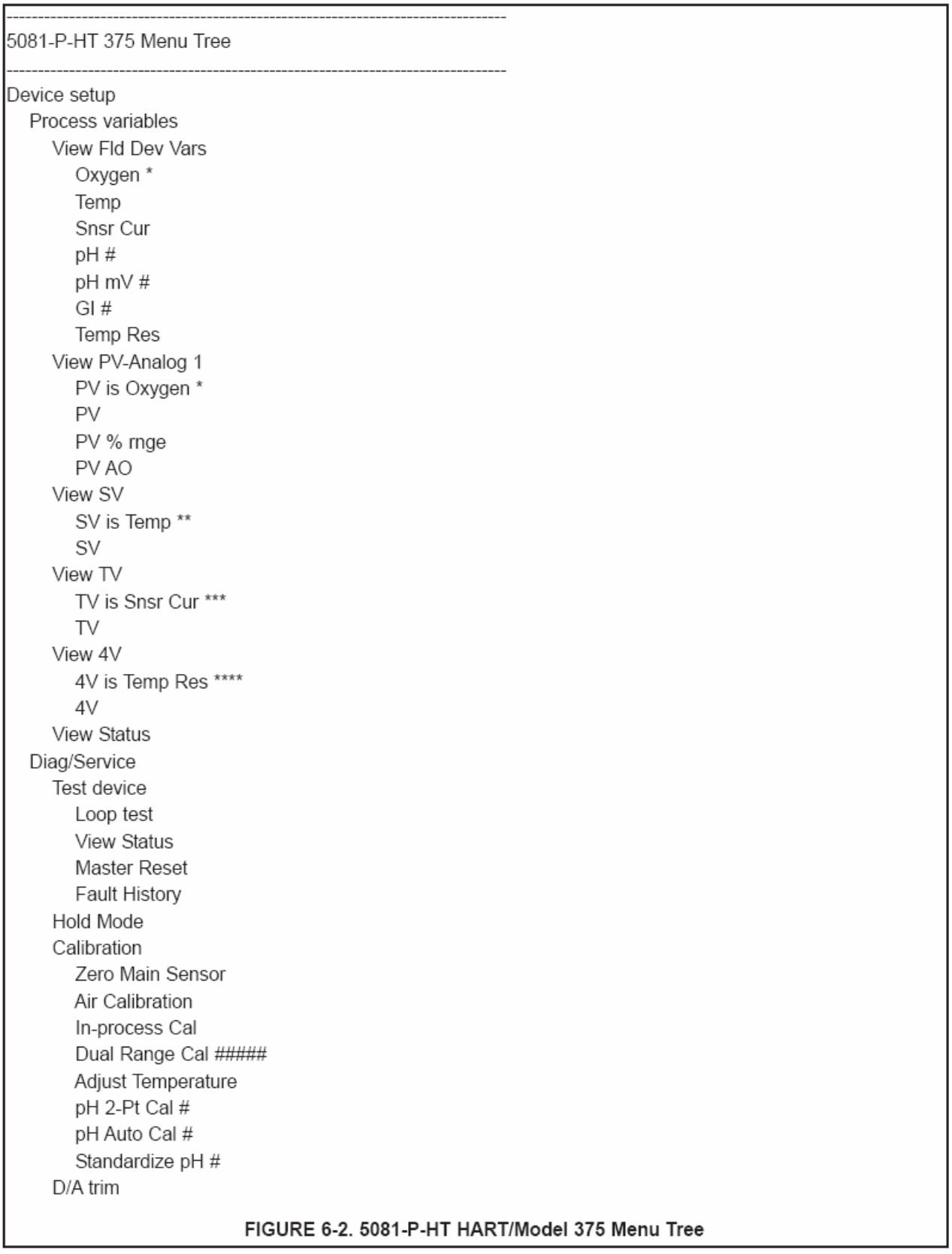


FIGURE 6-2. 5081-P-HT HART/Model 375 Menu Tree

- Diagnostic Vars
  - Oxygen
  - Snsr Cur
  - Sensitivity
  - Zero Current
  - pH Value #
  - pH mV #
  - pH Slope #
  - pH Zero Offset #
  - GI #
  - Temp
  - Temp Res
  - Noise rejection
- Basic setup
  - Tag
  - PV Range Values
    - PV LRV
    - PV URV
    - PV
    - PV % rnge
  - Device information
    - Distributor
    - Model
    - Dev id
    - Tag
    - Date
    - Write protect
    - Snsr text
    - Descriptor
    - Message
    - Revision #'s
      - Universal rev
      - Fld dev rev
      - Software rev
    - Hardware rev
- Detailed setup
  - Sensors
    - Oxygen *
      - Oxygen Unit [ppm, ppb, %sat, mmHg, inHg, atm, kPa, mbar, bar] *, *****
      - Oxygen Sensor [ADO, TRDO, SSDO1, SSDO2] ##
      - Salinity ###
      - Pressure Unit [mmHg, inHg, atm, kPa, mbar, bar] ##
      - Use process pressure for %saturation? [No, Yes] ###
      - Process pressure (Note: Valid only when process pressure is enabled)
      - Air cal pressure ## (read only)
      - Input filter
      - Sensor SST
      - Sensor SSS
      - Dual Range Cal [Disable, Enable] ####

FIGURE 6-2. 5081-P-HT HART/Model 375 Menu Tree

- pH #
  - pH Value
  - pH Comp [Auto, Manual]
  - Manual pH
  - Preamp loc [Sensor, Xmtr]
  - Autocal [Manual, Standard, DIN 19267, Ingold, Merck]
  - pH Slope
  - pH SST
  - pH SSS
  - pH Zero Offset Limit
  - pH Diagnostics
    - Diagnostics [Off, On]
    - GFH
    - GFL
    - Imped Comp [Off, On]
- Temperature
  - Temp Comp [Auto, Manual]
  - Man. Temp
  - Temp unit [ºC, ºF]
  - Temp Snsr
- Signal condition
  - LRV
  - URV
  - AO Damp
  - % rnge
  - Xfer fnctn
  - AO lo end point
  - AO hi end pt
- Output condition
  - Analog output
    - AO
    - AO Alrm typ
    - Fixed
    - Fault mode [Fixed, Live]
    - Fault
    - Loop test
    - D/A trim
  - HART output
    - PV is Oxygen *
    - SV is Temp **
    - TV is Snsr Cur ***
    - 4V is pH ****
    - Poll addr
    - Burst option [PV, %range/current, Process vars/crnt]
    - Burst mode [Off, On]
    - Num req preams
    - Num resp preams

FIGURE 6-2. 5081-P-HT HART/Model 375 Menu Tree

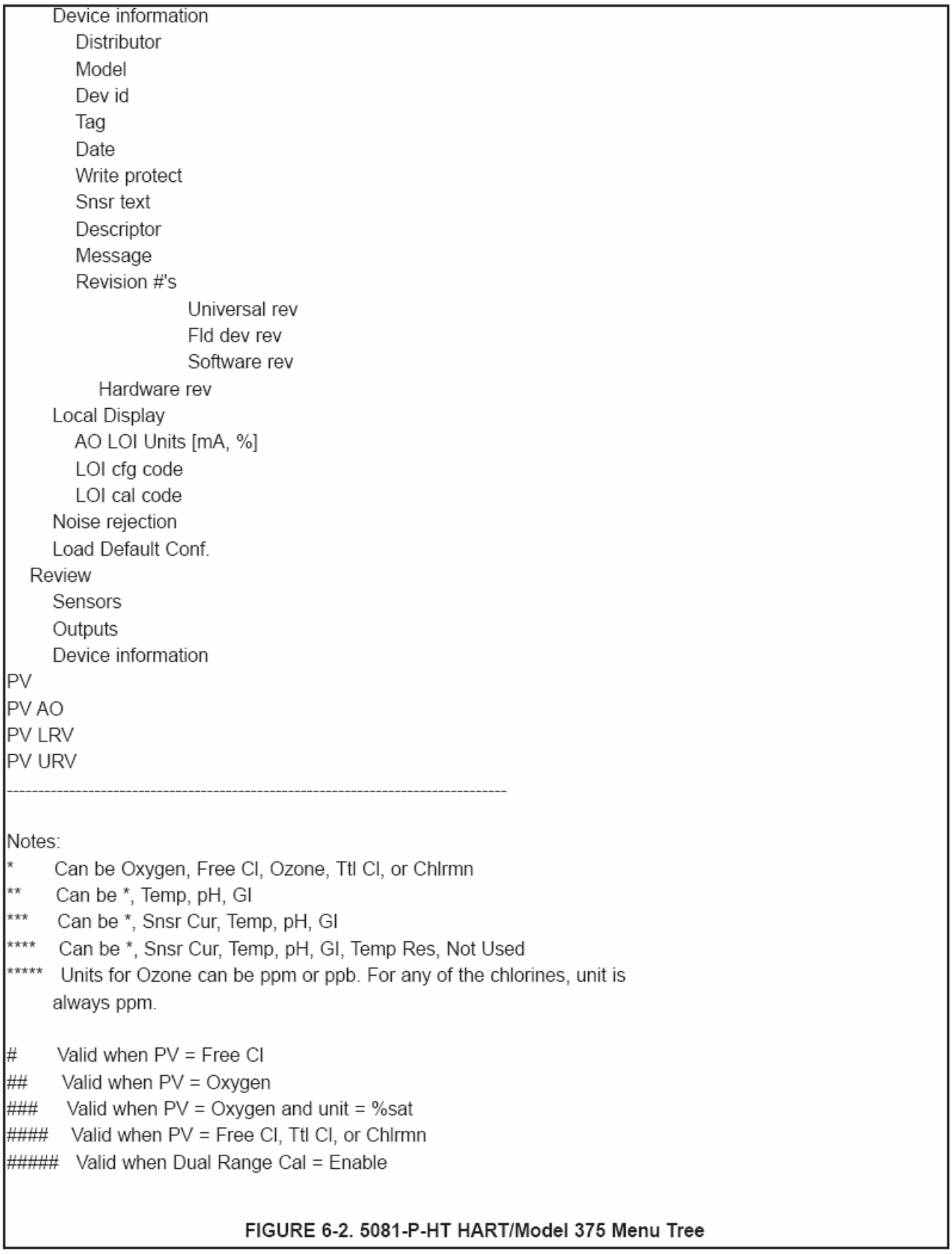


FIGURE 6-2. 5081-P-HT HART/Model 375 Menu Tree

6. 温度标定

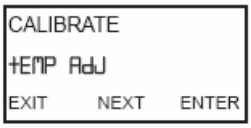
由于温度波动对pH测量有很大影响，所以，如果pH传感器和变送器测量回路的温度测量精度应为±1ºC。

由于多台变送器可以共用1台红外遥控器，为了避免误操作，请改变被调变送器附近变送器的操作密码。

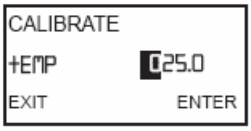
标定程序



- 在环境温度下，将pH传感器和比对标定的温度计放入盛有水溶液的容器中，确保传感器的温度电极完全浸没在溶液中，注意不要让传感器的重量集中在玻璃球膜上，即传感器要离容器的底部至少3英寸。连续搅拌溶液，等待10分钟，让温度恒定。
- 用红外遥控器，按CAL键，进入CALIbrAtE子菜单。如左画面。
- 在CALIbrAtE子菜单屏幕，按2次NEXT键，tEMP AdJ子菜单屏幕出现。



- 按ENTER键，进入温度编辑屏幕。



- 比较变送器显示的温度和温度计测量的温度，如果有差异，用箭头编辑键改变温度值，使其等于温度计的测量值。注意，该读数的改变不能超过15ºC。
- 按ENTER键，存温度标定值，显示画面将返回至tEMP AdJ子菜单屏幕。
- 按EXIT键，退出CALIBRATE菜单。
- 用比上面使用的水溶液冷10-15ºC或热10-15ºC的水溶液再次进行标定，则可以检查温度传感器的测量线性度。由于温度恒定需要时间，所以，在进行这一标定步骤时，最好使用绝热效果比较好的容器，或使用恒温容器。

7. pH测量自动标定（所谓自动标定，是标定液自动识别）

（1）标定液

- 标定液的选择一定要含盖测量值，如测量值在8-9pH，则标定液要选7pH和10pH。
- 传感器标定时，若标定液温度与被测过程温度相差10ºC以上，则传感器至少要放在标定液中20分钟后，才能开始正式标定。
- 标定液有一定的使用期限，如果过期，不能使用。标定液在室温下保存。
- 碱性标定液若长期暴露于空气中，则空气中的二氧化碳会被标定液吸收，导致标定液的pH值下降。
- 传感器在标定前要用去离子水清洗，然后用干净的棉纱吸掉附在传感器上离子水，不能擦抹，否则将产生静电，导致噪音信号。

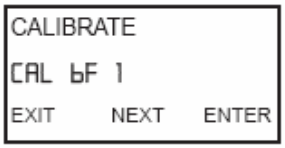
（2）标定程序



注意1：标定开始前，用红外遥控器将变送器置于HOLD保持工作状态。

注意2：由于多台变送器可以共用1台红外遥控器，为了避免误操作，请改变被调变送器附近变送器的操作密码。

- 激活自动标定。确认所使用标定液的pH值。
- 用红外遥控器，按CAL键，进入CALIbrAtE子菜单
- 在CALIbrAtE子菜单，按ENTER键，出现CAL bF1屏幕。



- 将清洗干净的传感器放进盛有第一种标定液的容器中，检测元件要完全浸没在标定液中，注意不要让传感器的重量集中在玻璃球膜上，标定液中不要有汽泡。此时变送器显示前一次标定的pH值。



- 按ENTER键，bF1闪烁，直至测量的pH值等于所使用标定液的pH值，这段时间小于20分钟。一旦读数稳定，显示如左图，闪烁的数字是第一种标定液在25ºC时的pH值。如果闪烁的数字不对，按↑键和↓键，使其等于第一种标定液的pH值。按ENTER键，保存第一个标定液的数值。



- 重复上面的步骤，作第二点标定。
- 两点标定完成，在按ENTER键后，变送器保持在CALIbrAtE子菜单状态约2分钟。



- 将传感器放回工艺过程，如果变送器在标定过程中是处于HOLD保持工作状态，则等变送器读数稳定后，将变送器退出保持工作状态。
- 变送器用标定完的数据计算新的斜率。如果计算的斜率不被变送器接受，则标定的数据也不被变送器接受，且变送器显示SLOPE Err HI或SLOPE Err LO出错信息，详细内容请参见英文手册的诊断信息表。
- 按EXIT键，退出标定子菜单。
- 电极斜率指标有助于对传感器进行故障诊断。要了解电极斜率，用红外遥控器，按CAL键，出现CALIbrAtE子屏幕；按EXIT键，出现Std子菜单；按ENTER键，出现SLOPE xx.xx，其中4位数字即为电极斜率。斜率值在50-60范围，说明电极（传感器）是好的。

8. pH测量手动标定（如果标定液是非标准的，采用手动标定）

（1）标定液

- 标定液的选择一定要含盖测量值，如测量值在8-9pH，则标定液要选7pH和10pH。
- 传感器标定时，若标定液温度与被测过程温度相差10ºC以上，则传感器至少要放在标定液中20分钟后，才能开始正式标定。
- 标定液有一定的使用期限，如果过期，不能使用。标定液在室温下保存。
- 碱性标定液若长期暴露于空气中，则空气中的二氧化碳会被标定液吸收，导致标定液的pH值下降。
- 传感器在标定前要用去离子水清洗，然后用干净的棉纱吸掉附在传感器上离子水，不能擦抹，否则将产生静电，导致噪音信号。

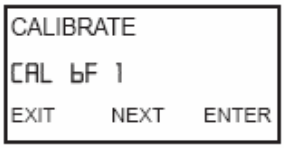
（2）标定程序



注意1：标定开始前，用红外遥控器将变送器置于HOLD保持工作状态。

注意2：由于多台变送器可以共用1台红外遥控器，为了避免误操作，请改变被调变送器附近变送器的操作密码。

- 撤销自动标定。
- 用红外遥控器，按CAL键，进入CALIbrAtE子菜单



- 在CALIbrAtE子菜单，按ENTER键，出现CAL bF1屏幕。
- 将清洗干净的传感器放进盛有第一种标定液的容器中，检测元件要完全浸没在标定液中，注意不要让传感器的重量集中在玻璃球膜上，标定液中不要有汽泡。此时变送器显示前一次标定的pH值。



- 一旦pH值和温度读数稳定，按ENTER键，显示如左图，用编辑键（↑键和↓键）改变闪烁的数字，使其等于该标定液的pH值。按ENTER键，保存第一个标定液的数值。变送器在CAL bF1屏幕出现后20分钟内，接受输入的读数。如果不按ENTER键，变送器将脱离标定菜单，返回测量工作模式。



- 重复上面的步骤，作第二点标定。
- 两点标定完成，在按ENTER键后，变送器保持在CALIbrAtE子菜单状态约2分钟。



- 将传感器放回工艺过程，如果变送器在标定过程中是处于HOLD保持工作状态，则等变送器读数稳定后，将变送器退出保持工作状态。
- 变送器用标定完的数据计算新的斜率。如果计算的斜率不被变送器接受，则标定的数据也不被变送器接受，且变送器显示SLOPE Err HI或SLOPE Err LO出错信息，详细内容请参见英文手册的诊断信息表。
- 按EXIT键，退出标定子菜单。
- 电极斜率指标有助于对传感器进行故障诊断。要了解电极斜率，用红外遥控器，按CAL键，出现CALIbrAtE子屏幕；按EXIT键，出现Std子菜单；按ENTER键，出现SLOPE xx.xx，其中4位数字即为电极斜率。斜率值在50-60范围，说明电极（传感器）是好的。

pH测量的出厂设置参数表

ITEM	MNEMONIC	DISPLAY LIMITS	FACTORY SETTINGS	USER SETTINGS
PROGRAM LEVEL (Sections 8.0 - 8.9).				
A. Output Range (Section 8.3) (for 5081-P-HT only)	OutPut			
1. 4 mA Output		0 - 14 pH	0.00 pH	_____
2. 20 mA Output:		0 - 14 pH	14.00 pH	_____
3. Hold	HOLd	3.80 to 22.00 mA	21.00mA	_____
4. Dampening	dPn	0 to 255 seconds	0 seconds	_____
5. Fault Current Output Setting	FAULt	3.80 to 22.00 mA	22.00mA	_____
B. Diagnostic (Section 8.4)	dIAgnOStIC			
1. Reference Cell Offset (Standardize error)	rOFFSt	0 to 1000 mV	60 mV (pH on glass electrode)	_____
2. Diagnostics Function	dIAg	On/Off	Off	_____
3. Glass Impedance Temperature Correction	IMPtC	On/Off	On	_____
4. Glass Electrode High Impedance Fault	GFH	0 to 2000 megohms	1500 megohms	_____
5. Glass Electrode High Impedance Warning	GWH	0 to 2000 megohms	1000 megohms	_____
6. Glass Electrode Low Impedance Warning	GWL	0 to 900 megohms	20 megohms	_____
7. Glass Electrode Low Impedance Fault	GFL	0 to 900 megohms	10 megohms	_____
8. Glass Impedance Calibration Warning	CAL	0 to 500 %	0 % (not Active)	_____
9. Reference Cell Impedance Type	rEF	LO/HI	LO	_____
10. Reference Cell High Impedance Fault	rFH	0 to 2000 megohms (HI) 0 to 2000 kilohms (LO)	1500 megohms 140 kilohms	_____
11. Reference Cell High Impedance Warning	rWH	0 to 2000 megohms (HI) 0 to 2000 kilohms (LO)	1000 megohms 40 kilohms	_____
12. Reference Cell Low Impedance Warning	rWL	0 to 900 megohms (HI) Does not apply for low impedance reference cell	20 megohms	_____
13. Reference Cell Low Impedance Fault	rFL	0 to 900 megohms (HI) Does not apply for low impedance reference cell	10 megohms	_____
C. Temperature (Section 8.5)	tEMP			
1. Auto Temperature Compensation	tAUtO	On/Off	On	_____
2. Manual Temperature	tMAn	-15 to 130 ºC 5 to 266 ºF	25 ºC	_____
3. Temperature Sensor Type	tC	100-3; 100-4; 1000-3; 1000-4: 3000	100-3	_____
D. Display (Section 8.6)	dISPLAY			
1. Measurement type	tYPE	pH/ORP	pH	_____
2. Temperature Units	tEMP	°C/°F	°C	_____
3. Output Units (for 5081-P-HT only)	OUtPUt	mA/% of full scale	mA	_____
4. Code	COdE	0 to 999	000	_____
E. Buffer (Section 8.7)	bUFFEr			
1. Auto Calibration Function	b AUtO	ON/OFF	ON	_____
2. Buffers Selection List	bUFFEr	See Tables 8-2 and 8-3	Standard	_____
3. Auto Buffer Stabilization Time	tIME	0 to 30 seconds	10 seconds	_____
4. Auto Stabilization pH Change	PH	.002 to .5pH	.02 pH	_____
F. Isopotential (Section 8.8)	ISOPOtntAL			
1. Temperature Coefficient	tCOEF	-0.044 to 0.028 pH/ ºC	0.000 pH/ ºC	_____
2. Solution Isopotential pH	ISO	-1.35 to 20.12 pH	7.00 pH	_____
3. Sensor Isopotential pH	Snr	0.00 to 14.00 pH	7.00 pH	_____
G. Output Simulation (Section 8.9) (for 5081-P-HT only)	SIMOUtPUt			
Test	tESt	3.80 to 22 mA	12.00 mA	_____

其它详细内容，请见英文操作手册。