

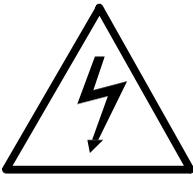
Chapter	Page
1 Introduction	1
1.1 Introduction	1
1.2 Front Panel Description	2
1.3 Rear Panel Description	3
2 Installation and Operation	4
2.1 Mounting Instructions	4
2.2 Power Connections	5
2.3 Input Connections	6
2.4 2-Relay Output Connections	7
2.5 Dual Proportional Relay Connections	8
2.6 Verifying Analog Outputs	9
2.7 Analog Output Connections	10
3 System Configuration	10
3.1 Introduction	10
3.2 Calibration Menu, pH Sensor Inputs	12
3.3 Calibration Menu, Analog Inputs	13
3.4 2-Relay Operation	15
3.5 Dual Proportional Relay Operation	15
3.6 Calibration Menu, Relay Outputs	17
3.7 Calibration Menu, Analog Outputs	19
3.8 View-Only Menus	20
4 Technical Support	21
4.1 Accessing Internal Options	21
4.2 AC Power Configurations	22
4.3 Security Code Function	22
4.4 Installing Input/Output Options	23
4.5 Input Card Introduction Mode	23
4.6 Option Cards and Accessories	28
4.7 Output Card Configurations	29
4.8 Troubleshooting	30
Specifications	31
Warranty Information	33

Table of Contents

Important Safety Information!



CAUTION: Remove AC power to unit prior to wiring input and output connections..



Remove AC power before opening unit. Electrical shock hazard exists

Unpacking and Inspection

Your pH controller package includes the following items:

- PHCN-90 pH Controller
- Two stainless steel mounting brackets
- Mounting Instructions w/self-adhesive template
- Panel gasket
- Instruction manual

Chapter 1

Introduction

1.1 Introduction

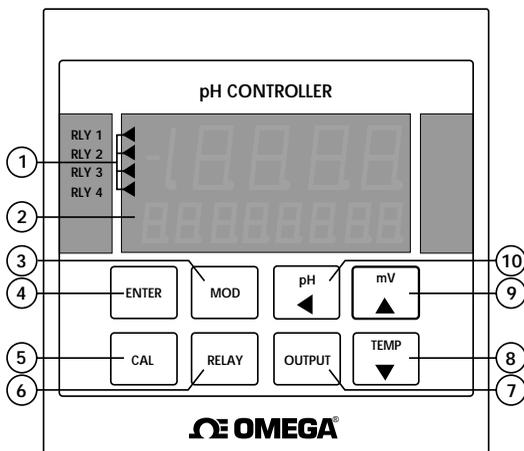
Your new PHCN-90 pH Controller has been specifically designed for pH measurement process control applications. The controller's compact 1/4 DIN enclosure (front) is NEMA 4X/IP65 rated and ideal for installation into instrumentation panels with limited space.

Modular "plug-in" input/output option cards allow you to customize your pH controller to your system's requirements. The controller's unique "slide-out" chassis design makes option installation fast and simple. Smart self-configuring microprocessor based circuitry automatically inventories installed options during power-up, allowing you to upgrade your system in seconds without the need for additional equipment.

The unit's front panel features a highly visible 4.5-digit (seven segment) and 8-digit (alphanumeric) liquid crystal display with adjustable contrast. Active pH, mV, temperature in °C, and alarm relay status information is quickly accessed at a glance. During calibration the user is prompted with clear step-by-step instructions on the unit's front panel display.

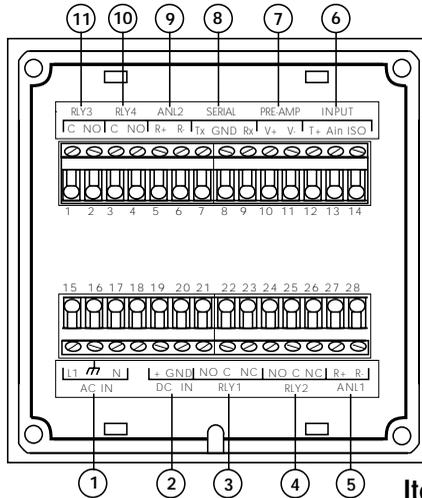
The technical data given in this publication is for general information purposes only. It implies no warranty of any kind.

1.2 Front Panel Description



Item	Function
1. Relay Annunciators:	Indicate activation status of optional output "alarm" relays 1 & 2 and additional relays 3 & 4 (proportional or on/off control)
2. LCD Display:	Shows pH, mV, temperature in °C, and relay activation status information
3. 	A) Accesses one of three calibration menus: CAL, RELAY, OUT B) Enables a calibration parameter for modification C) Restores a calibration parameter to its original value during calibration.
4. 	A) Stores a calibration value into memory after modification B) Used to display available input/output options during normal operation.
5. 	A) Accesses the CAL "view-only" menu B) Used in conjunction with MOD key to access the main CAL menu
6. 	A) Accesses the RELAY "view-only" menu B) Used in conjunction with MOD key to access the RELAY calibration menu
7. 	A) Accesses the OUTPUT "view-only" menu B) Used in conjunction with the "MOD" key to access the OUTPUT calibration menu
8. 	A) Displays temperature in degrees Celsius during normal operation B) Decreases the value of a selected calibration digit
9. 	A) Displays mV during normal operation B) Increases the value of a selected calibration digit
10. 	A) Returns the unit to normal operation mode B) Selects a digit for modification during calibration.

1.3 Rear Panel Description



Note: Rear terminals accept 18 to 22 AWG wire

Function	Item
90 to 132 VAC or 180 to 264 VAC system power connection	1. AC IN
17 to 30 VDC system power connection	2. DC IN
Alarm relay #1 (COM, NO, NC) contact set for external device control (optional)	3. RLY1
Alarm relay #2 (COM, NO, NC) contact set for external device control (optional)	4. RLY2
Analog output #1 from option socket #1 (optional)	5. ANL1
Sensor input connections	6. INPUT
±5 VDC @ 1 mA power output for pH sensor pre-amp circuit	7. PRE-AMP
Serial outputs (future availability)	8. SERIAL
Analog output #2 from option socket #2 (optional)	9. ANL2
Proportional control relay #4 (COM, NO) contact set for external device control (optional)	10. RLY4
Proportional control relay #3 (COM, NO) contact set for external device control (optional)	11. RLY3

Chapter 2

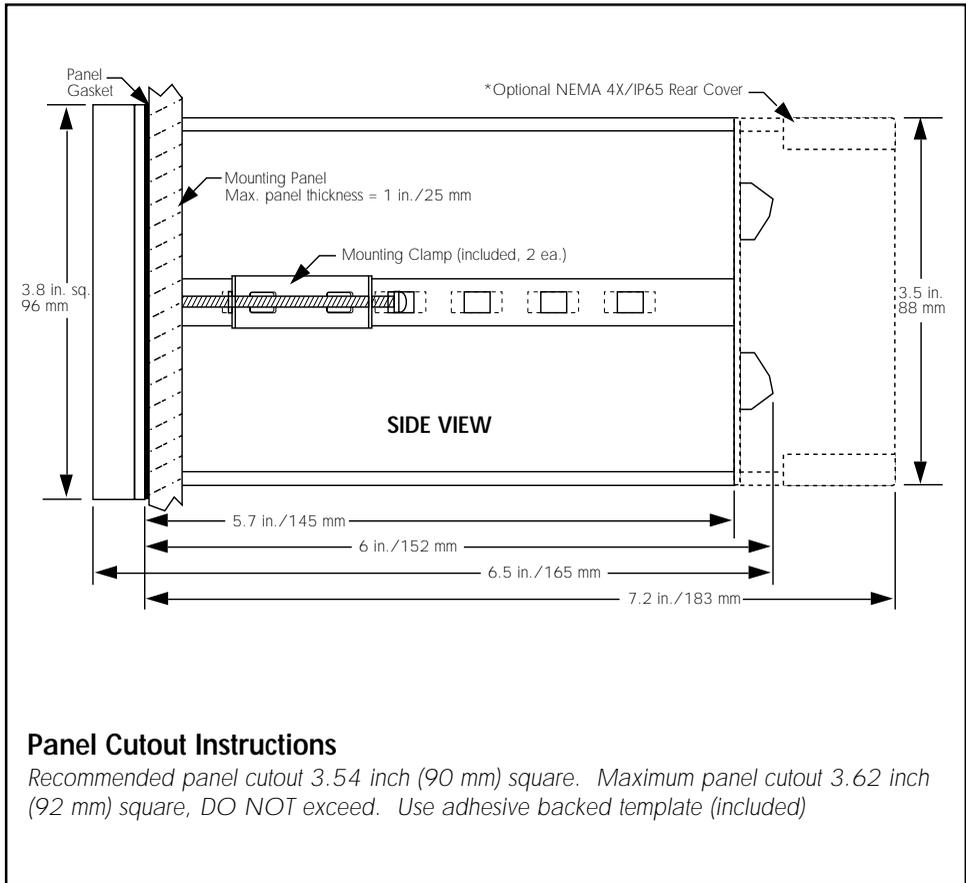
Installation and Operation

2.1 Mounting Instructions

The PHCN-90 pH Controller's 1/4 DIN enclosure is specifically designed for panel mounting. Adjustable mounting brackets allow mounting in panels up to one inch (25 mm) thick. An adhesive template and instructions are included to insure proper installation.

For outdoor and/or stand alone installations the splash-proof NEMA 4X/IP65 back cover kit is recommended (ordered separately).

Figure 1
External dimensions



2.2 Power Connections

AC Power Connections

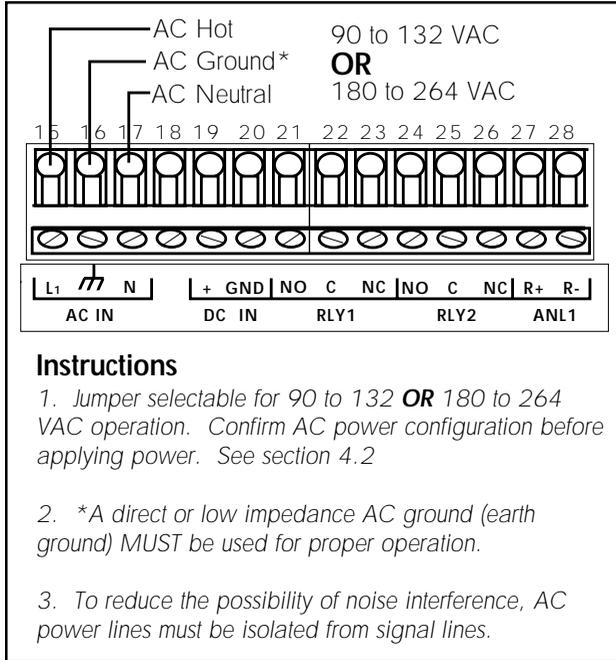


Figure 2

AC power wiring

Note: DC power recommended when ground fault interruption devices (GFI's) are used.

DC Power Connections

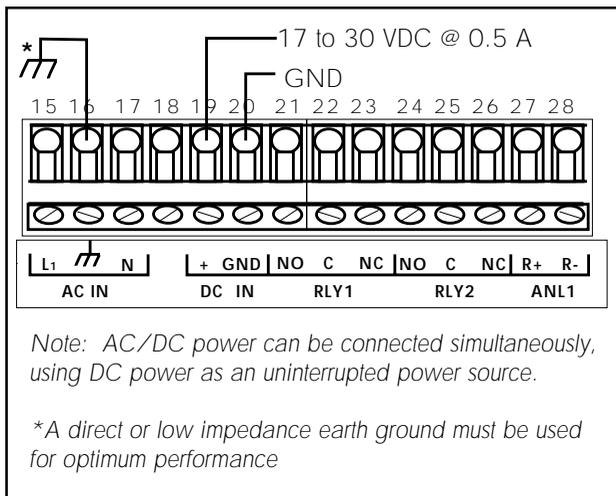


Figure 3

DC power wiring

2.3 Input Connections

Three input options are available, providing a wide range of compatibility for most applications.

Note: See section 4.6 for a listing of available input cards

pH Input Card

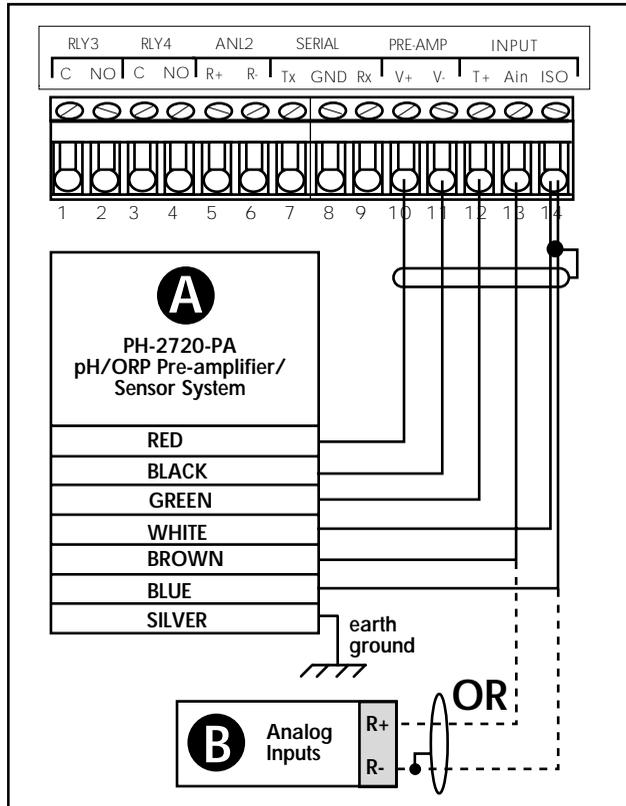
Provides isolated pH sensor input capability, requiring no internal configuration.

Analog Input Cards

Two analog input options available:

- Analog (iso) current, 4 to 20/0 to 20 mA
 - Analog (iso) voltage, 0 to 5/0 to 10 VDC
- Input ranges are software selectable, requiring no internal configuration.

Figure 4A
Input Wiring



To reduce the possibility of noise interference, separate input lines from AC power lines.

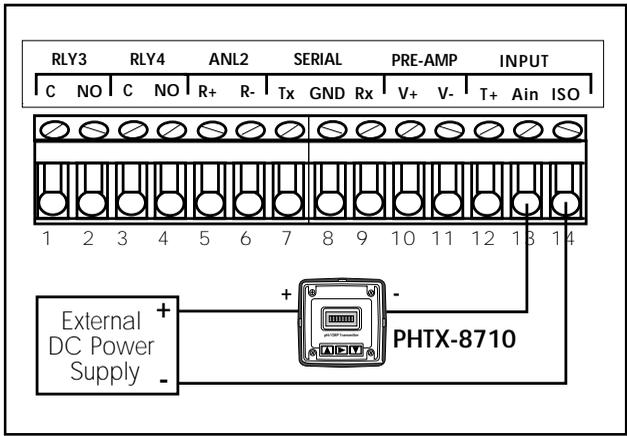


Figure 4B
2-Wire Transmitter Wiring

To reduce the possibility of noise interference, separate input lines from AC power lines.

2.4 2-Relay Output Connections

The 2-Relay option provides two relays for external device control. Each relay's contacts are rated for 5 A maximum. Both NO and NC contacts may be used simultaneously or individually as shown.

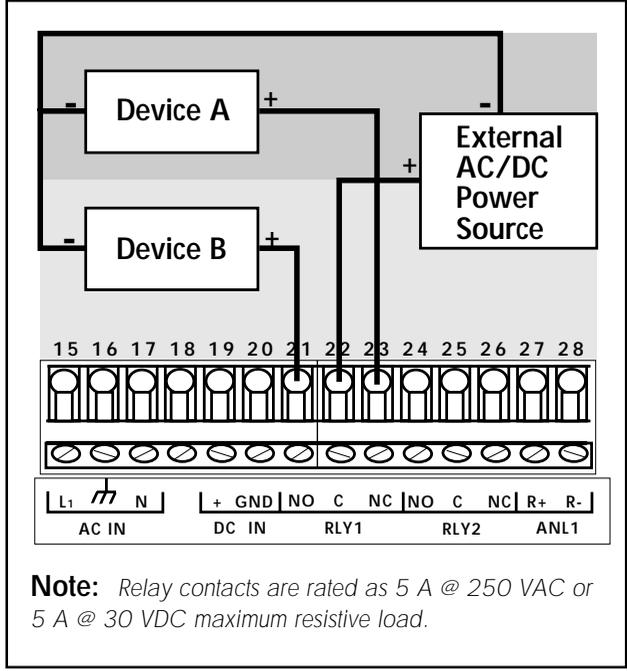


Figure 5
2-Relay wiring

Device A is powered during normal operation. Power is discontinued when relay is energized. Device B is not powered during normal operation. Power is applied after relay is energized.

To reduce the possibility of noise interference, separate AC relay lines from input/output lines.

2.5 Dual Proportional Relay Connections

The Dual Proportional Relay Card provides two relays (3 and 4) for external device control. Proportional or alarm operation is selectable during calibration. Both relays MUST be like configured, meaning one relay cannot be selected for proportional operation while the other is selected for alarm operation.

If alarm operation is selected, relays 3 and 4 operate as on/off controls similar to relays 1 and 2. The main distinction is the lack of the normally closed (NC) contact. Refer to Figure 5 pg# 7 for further instructions.

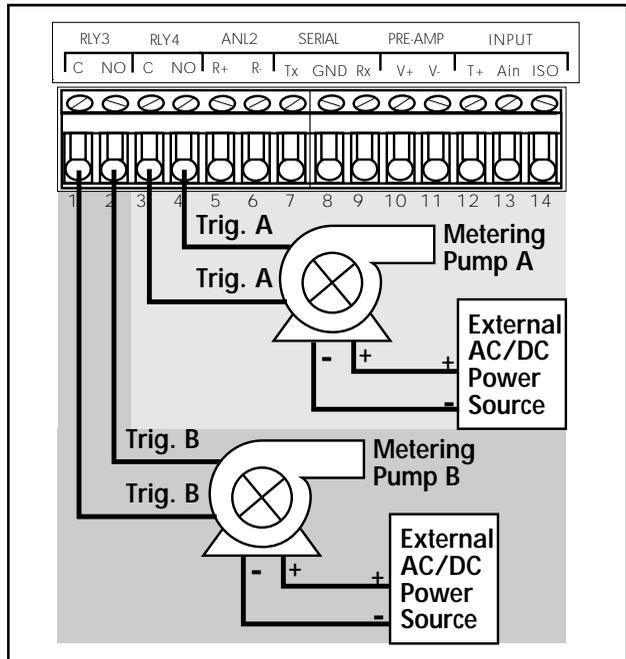
If proportional operation is selected, relays 3 and 4 are configured to provide a varying pulse rate to control metering pumps. Relay 3 is dedicated to low range control and relay 4 to high range control.

Figure 6

Proportional Control Wiring

Note: Relay contacts are rated as 5A @ 250 VAC or 5A @ 30 VDC maximum resistive load.

To reduce the possibility of noise interference, separate AC relay lines from input/output lines.



2.6 Verifying Analog Outputs

Installed output options can be configured to either of the unit's rear analog output terminals: ANL1 or ANL2. Configuration is determined by which sockets the options are installed. Options installed in option socket #1 are configured to the rear ANL1 terminals, options installed in socket #2 are configured to the rear ANL2 terminals, see section 4.4.

Prior to connection, determine which options are configured to terminals ANL1 and ANL2 as follows:

1. Apply power to unit.
2. Press:  Available input/output options are individually prompted on the display.
3. Record option configurations for ANL1 and ANL2 in the spaces provided. This information is necessary for wiring analog outputs in the next section.

<p>ANL1= (i.e. 4 to 20 mA)</p> <hr/>
<p>ANL2= (i.e. N/A)</p> <hr/>

Option Record

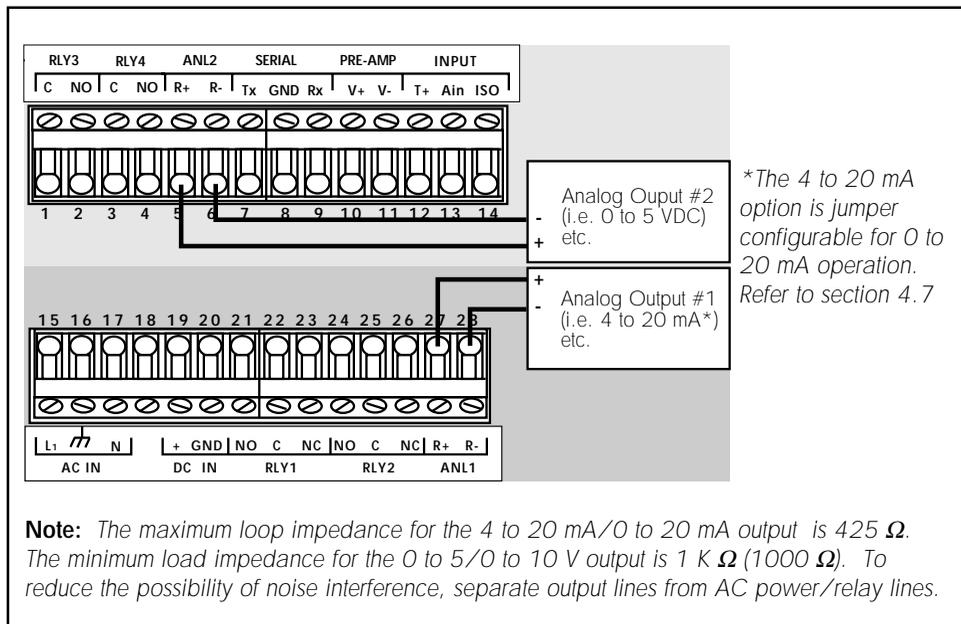
Note: *The unit display's N/A for unavailable options*

2.7 Analog Output Connections

0 to 20/4 to 20 mA isolated or non-isolated output as well as 0 to 5/0 to 10 VDC isolated or non-isolated outputs are available. See section 4.6 for a list of available output cards.

Figure 7

Analog output wiring



Chapter 3

System Configuration

3.1 Introduction

All the functions which can be modified are contained in three menus:

The CAL (calibrate) menu contains those functions which pertain to the input signal and how it is interpreted by the instrument (i.e. pH standard, pH slope). The CAL menu also provides access to the security code and display contrast features.

The RELAY menu contains all the functions necessary to control any output relays, such as relay

setpoint, hysteresis etc.

The Output menu provides access to the functions which define and control all analog output signals, i.e. 4 to 20 mA, 0 to 5 VDC etc.

CAL Menu 	RELAY Menu 	OUTPUT Menu 
<p>(Sensor input)</p> <ul style="list-style-type: none">• pH standard• pH slope• pH temperature °C• Display decimal• Sensor gain• Contrast adjust• Security code <p>(Analog)</p> <ul style="list-style-type: none">• Range select• Minimum pH setpoint• Maximum pH setpoint• Display decimal• Contrast adjust• Security code	<p>(LO/HI)</p> <ul style="list-style-type: none">• Relay 1 LO/HI• Relay 1 setpoint• Relay 1 hysteresis• Relay 2 LO/HI• Relay 2 setpoint• Relay 2 hysteresis <p>(Proportional)</p> <ul style="list-style-type: none">• Relay 3 and 4 Pulse• Relay 3 setpoint• Relay 3 deviation• Relay 4 setpoint• Relay 4 deviation• Relay 4 pulse value	<ul style="list-style-type: none">• Minimum pH value• Maximum pH value• Low output adjust• High output adjust

Note: A security function is provided which allows the user to "lock out" the calibration menus, restricting access to calibration settings. See section 4.3

All menus are loop type menus which repeat until  is pressed.

All menus operate using a standard sequence:

1. Press:  to enable calibration sequence.
2. Enter security code (when active) using:    ; press: 
3. Select menu:    ; press menu key to select item.
4. Press:  to enable modifying item.
5. Alter item using:    ; press:  to save entry.
6. Press corresponding menu key to advance to next menu item.
7. Repeat steps 4-6 for each menu item. Exit menu by pressing: 



STD or SLP system calibration using the same buffer (i.e. STD = 7.00 pH · 0 mV, SLP = 7.00 pH · 0 mV) will cause erratic behavior or pH error.

Always ensure at least 1 pH unit (59 mV) between STD and SLP steps. To recover from pH error, properly perform a two point calibration.

3.2 Calibration Menu, pH Sensor Inputs

- If you are installing a new input card, see section 4.5 (input card introduction mode) prior to performing system calibration.
- New pH electrodes require you to "set temp" before setting standard (STD) and slope (SLP). Allow approximately 3-4 minutes for the sensor temperature to stabilize. This adjustment is normally needed only at time of new electrode installation.
- It is recommended to perform two-point calibration routinely to adjust for electrode change. Example: 1. Set STD for 7.00 pH (0 mV). 2. Set SLP for 4.00 pH (+177 mV) or 10.00 pH (-177 mV).

Quick Reference Standard & Slope Procedure

(Security OFF):



Security feature can be disabled via an internal dip switch setting, see section 4.3.

1. Press:

2. Press: once to

SET STD, again to SET SLP, or a third time to SET TEMP (New electrodes: always perform SET TEMP first).

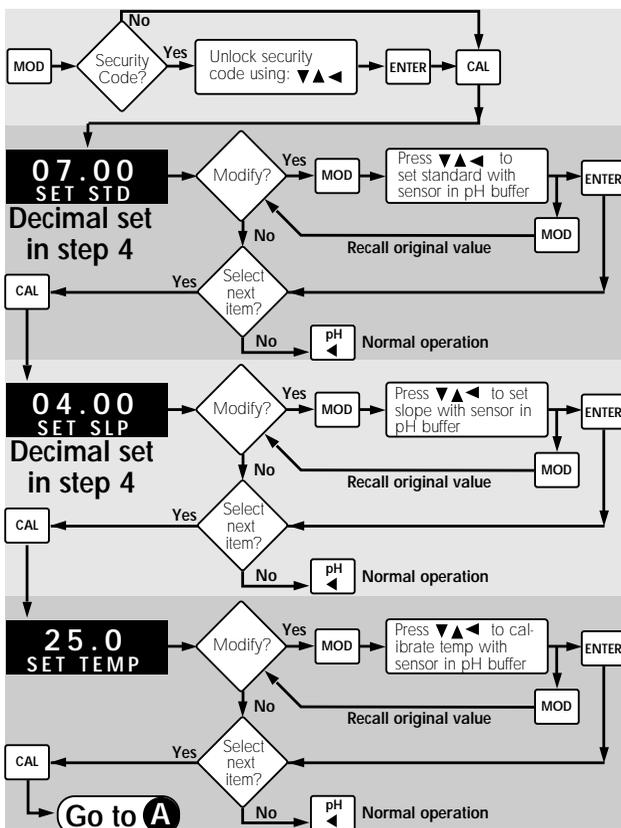
3. Press: then enter buffer or temp. value using:



3. Press: to save.

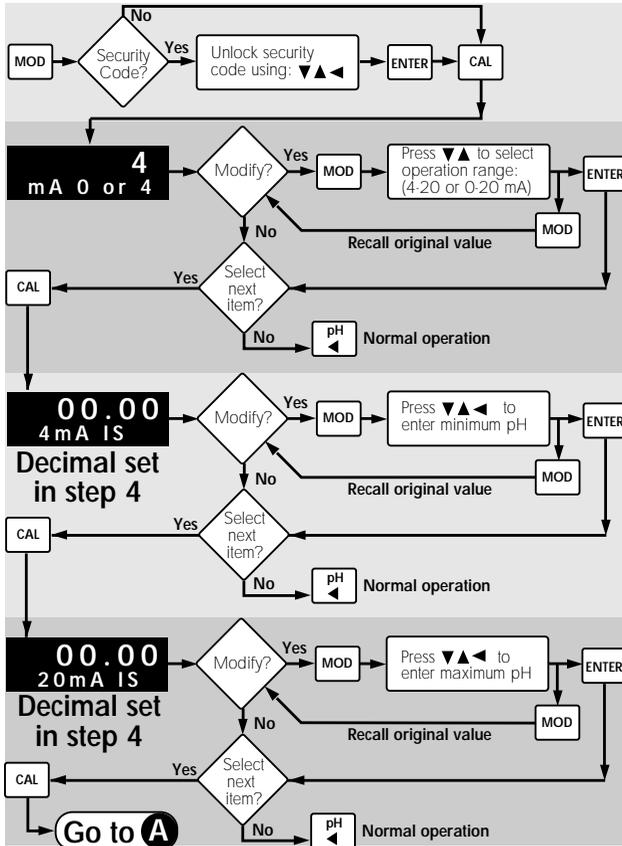
4. Press: to continue

OR to exit for normal operation.

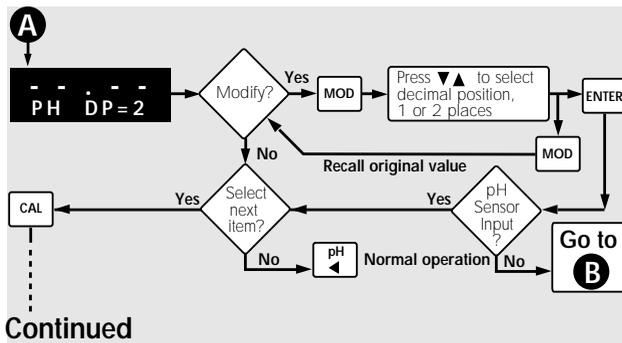


3.3 Calibration Menu, Analog Inputs

4 to 20 mA option illustrated

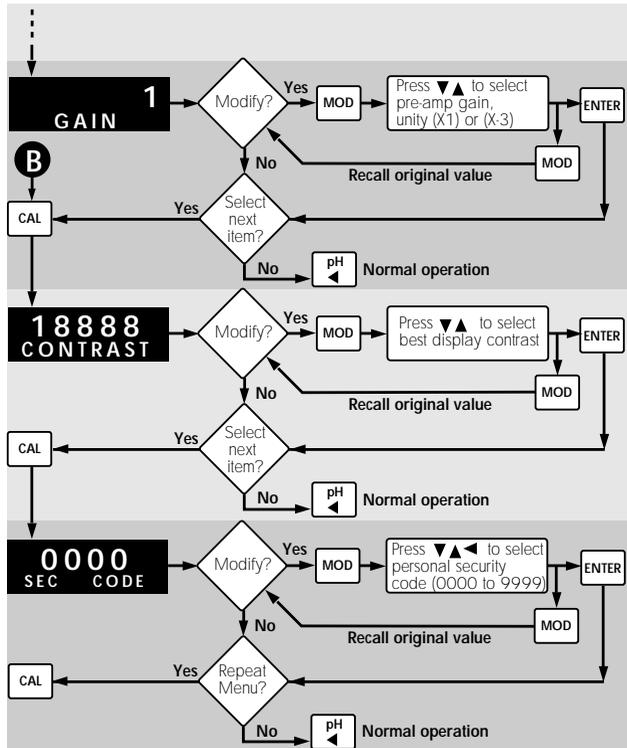


Note: The unit's software recognizes which input card/ configuration is inserted, therefore displaying the corresponding calibration value.



- Use **x 1** gain setting for PH-2720-PA pH/ORP Pre-amplifier/sensor systems.

- **x -3** gain setting used for older preamplifier/sensor systems.



Note: Menu repeats until  is pressed.

3.4 2-Relay Operation

The 2-Relay option allows you to configure individual setpoints, LO or HI operation, and hysteresis values for two independent on/off relays.

- **Relay Setpoints:** Setpoints represent the pH at which each relay is energized.
- **Relay Hysteresis:** Hysteresis values directly effect the LO and HI relay modes, specifying how far the pH will rise above (LO Relay Mode) or fall below (HI Relay Mode) each relay's setpoint prior to de-energizing the relay. The main purpose for hysteresis is to eliminating relay "chatter", caused by a pH hovering around a relay's setpoint. Hysteresis values are programmed in direct pH units and must be less than the corresponding relay setpoint, maximum 4 pH units (a pH setpoint of 3.0 cannot have a hysteresis of 4.0). Hysteresis only applies when exiting an alarm condition.

- **LO Relay Operation:** In LO operation, the relay is energized when the pH drops below the setpoint, and is de-energized when the pH rises above the setpoint plus hysteresis. See Figure 8
- **HI Relay Operation:** In HI operation, the relay is energized when the pH rises above the setpoint and is de-energized when the pH falls below the setpoint plus hysteresis. See Figure 9

3.5 Dual Proportional Relay Operation

The dual proportional relay option allows you to configure relays 3 and 4 to operate as dual proportional control (pulse) relays or as on/off relays which operate identical to the 2-Relay option.

(continued)

Figure 8

LO relay operation mode

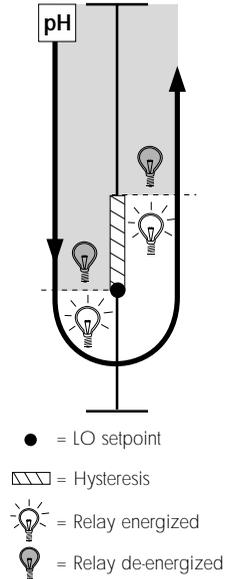
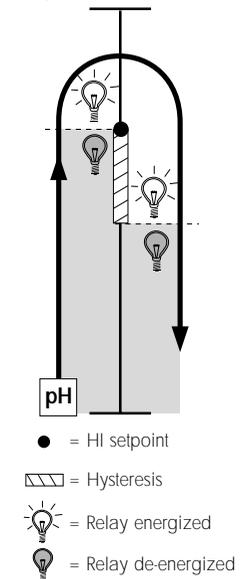


Figure 9

HI relay operation mode

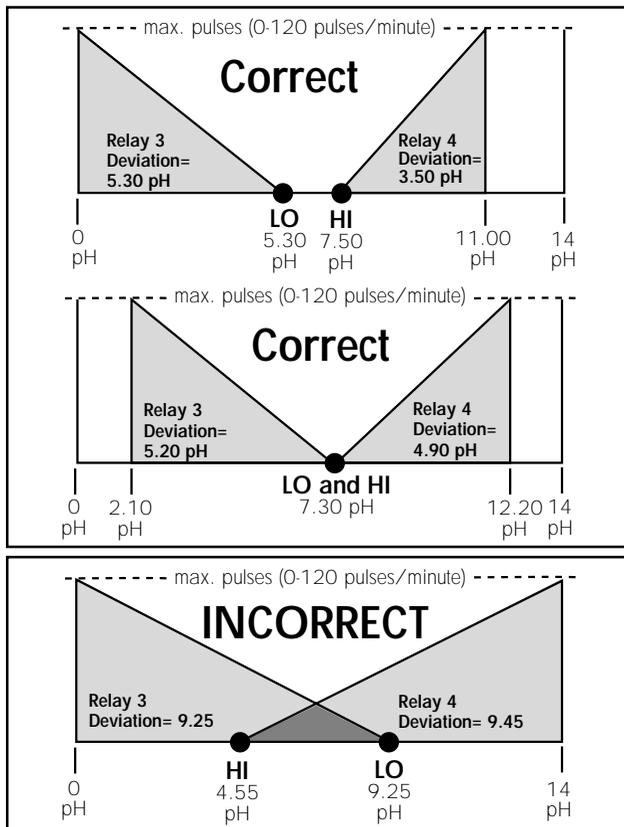


The dual proportional relay configuration is primarily designed to control external metering pumps. Setpoints, deviation ranges, and maximum pulse rates are selected via the relay menu.

- Setpoint: pH value at which relay pulsing begins. Relay 3 setpoint must be less than or equal to relay 4 setpoint.
- Deviation: Number of pH units from setpoint to maximum pulse rate. Deviation values cannot extend beyond the 0 to 14 pH scale.
- Pulse Rate: Pulse rate selected from 0 to 120 pulses per minute maximum.

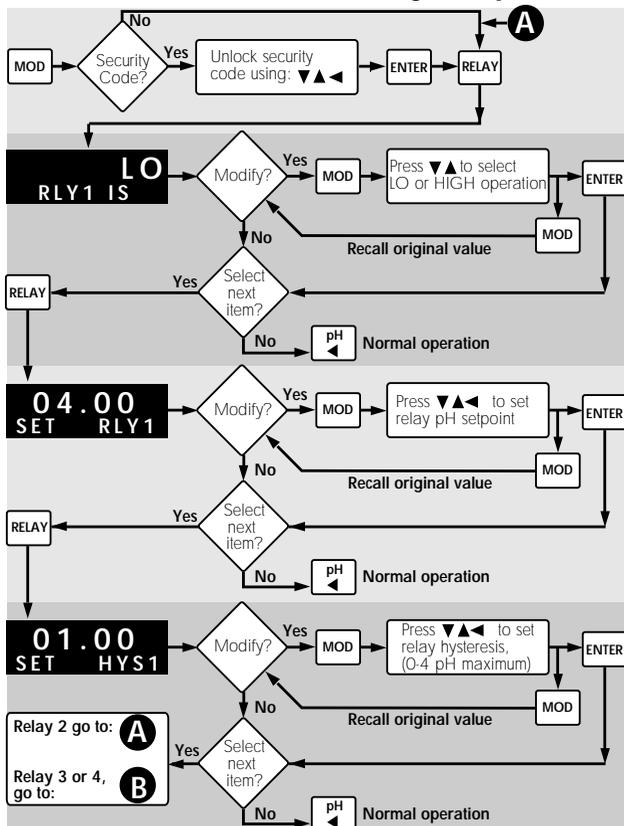
Figure 10

Dual Proportional relay examples

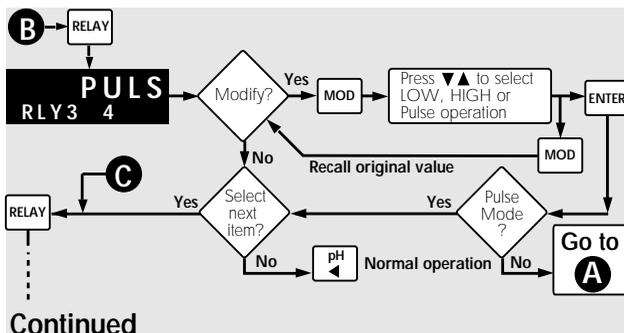


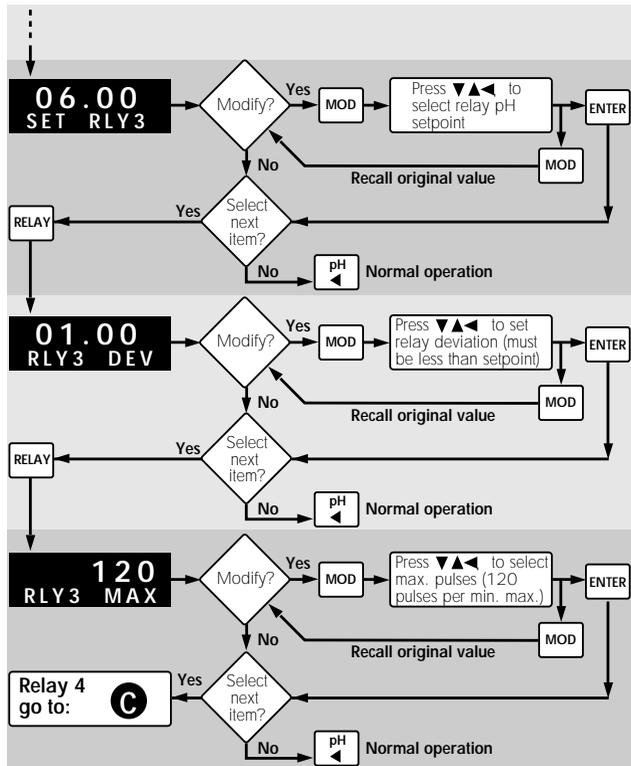
Note: *Relay 3 setpoint cannot exceed relay 4 setpoint*

3.6 Calibration Menu, Relay Outputs



Note: Displayed decimal position set in CAL menu

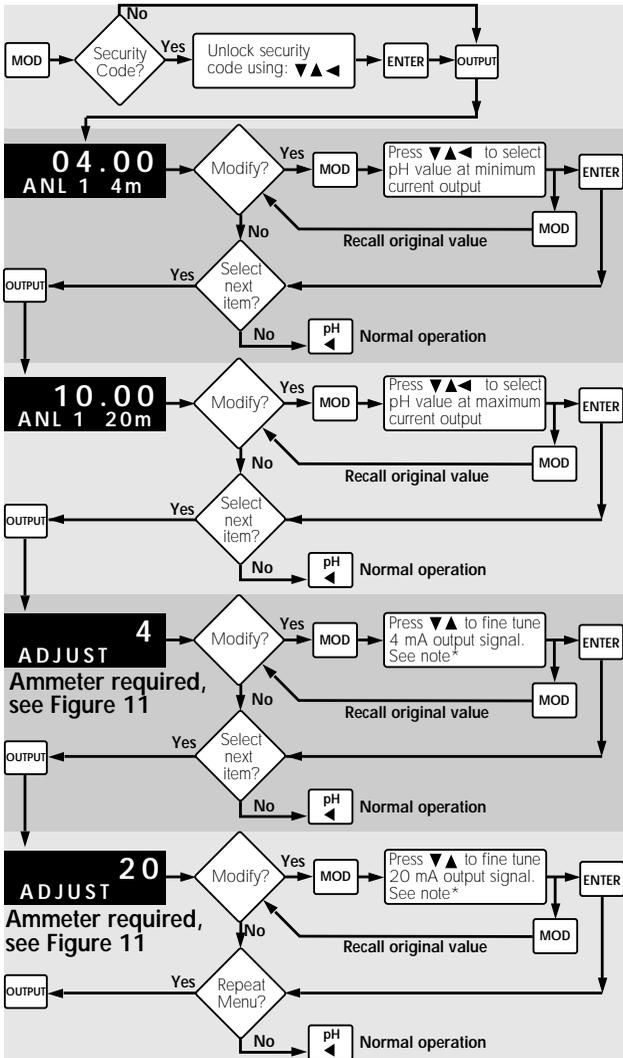




Note: Menu repeats until

 is pressed.

3.7 Calibration Menu, Analog Outputs



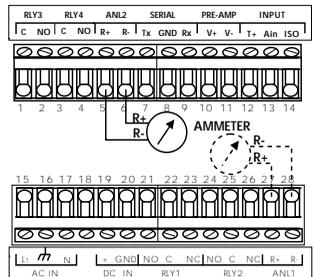
4 to 20/0 to 20 mA
(iso/non-iso) option illustrated

***Note:** Press:  to quickly access the minimum or maximum current output signal
Press:   to fine tune the current output signal.

Exiting menu: Menu repeats until  is pressed.

Figure 11

The min. and max. current adjustment steps require an external ammeter for monitoring the current output.



3.8 View-Only Menus

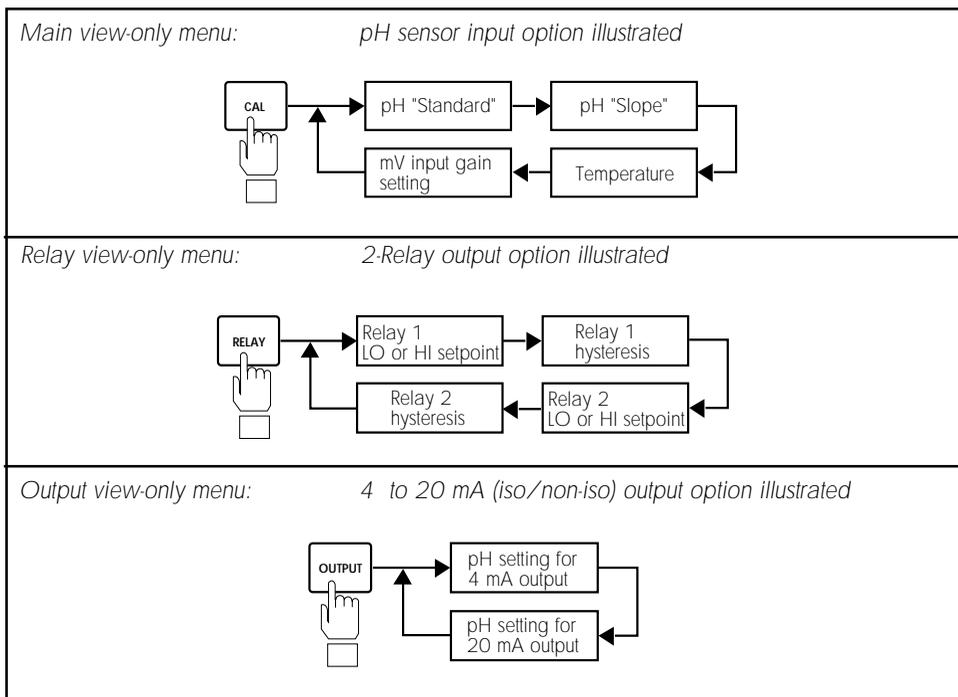
Note: The view-only menus are designed for viewing only and DO NOT permit access for calibration of any kind. Menus will vary depending upon installed options.

Three "view-only" menus (CAL, RELAY, and OUTPUT) are available during normal operation. Each view only menu provides the operator a means of browsing through calibration settings without disturbing system calibration and/or the pH measurement process. When used in conjunction with the security feature, the view only menus allow an operator to view most calibration information on the front display, excluding the ability to change system parameters without the supervisors approval and personal security code.

Access each of the three view only menus by pressing it's corresponding menu key. After entering each of the three view only menus, each calibration parameter is sequentially displayed on the main and lower displays by successively pressing it's corresponding menu key as follows:

Exiting Menus: Exit view only menus at any time by

pressing: 



4.1 Accessing Internal Options

1. Remove bezel (1) by placing a coin in the notch (2), twist coin to remove the bezel from the instrument casing. See Figure 12
2. **Loosen the four front bracket screws (3)**, then loosen the center "jack-screw" (4). See Figure 13
3. Slide the electronics assembly (5) from the instrument casing. See Figure 14
4. Lift upper retainer with adhesive gasket to install/remove plug-in cards. Be sure plug-in cards are properly seated in slots before reassembling instrument. See Figure 14

Figure 12

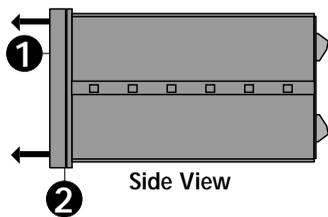


Figure 13

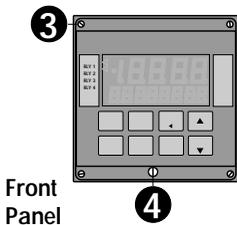
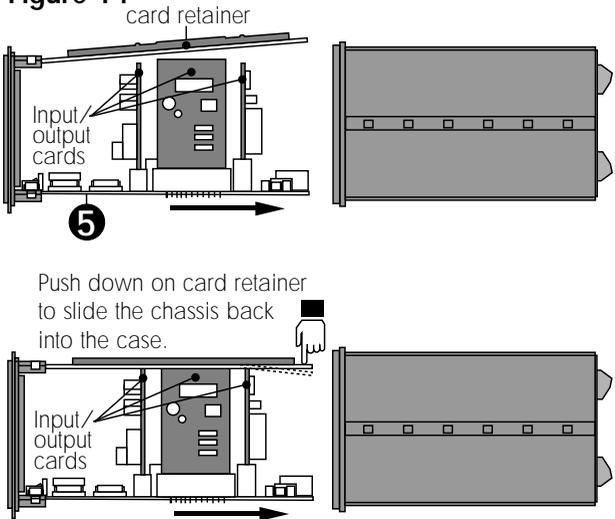


Figure 14



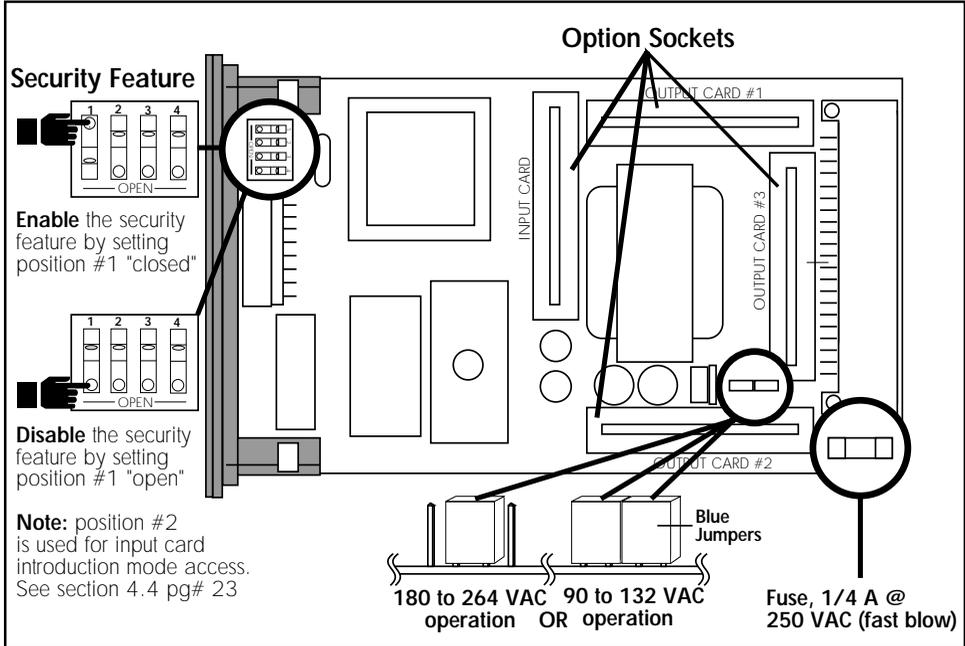
Warning: Check AC configuration before applying power.

4.2 AC Power Configurations

Two AC power options are possible; 90 to 132 VAC, or 180 to 264 VAC. Each power option is selectable via internal jumpers on the main pc board.

Figure 15

Main PC Board



4.3 Security Code Function

The security function prompts the operator for a 4-digit code during setup menu access, when enabled. This function prohibits unauthorized entry and/or alterations to system parameters.

The security function can be completely disabled by changing an internal dip switch setting as illustrated in Figure 15. The security function is no longer prompted during setup menu access, when disabled.

4.4 Installing Input/Output Options

Input/output option cards are "keyed" for proper insertion four sockets. Sockets are located on the unit's main pc board and are clearly marked. See Figure 15 and table below:

Socket Labeled	Compatible Options
Input Card	Dedicated for input option cards
Output Card #1	Accepts all analog option cards, except the Dual Proportional Relay card.
Output Card #2	Accepts all analog option cards and Dual Proportional Relay Card
Output Card #3	Dedicated for the 2-Relay option card.

4.5 Input Card Introduction Mode



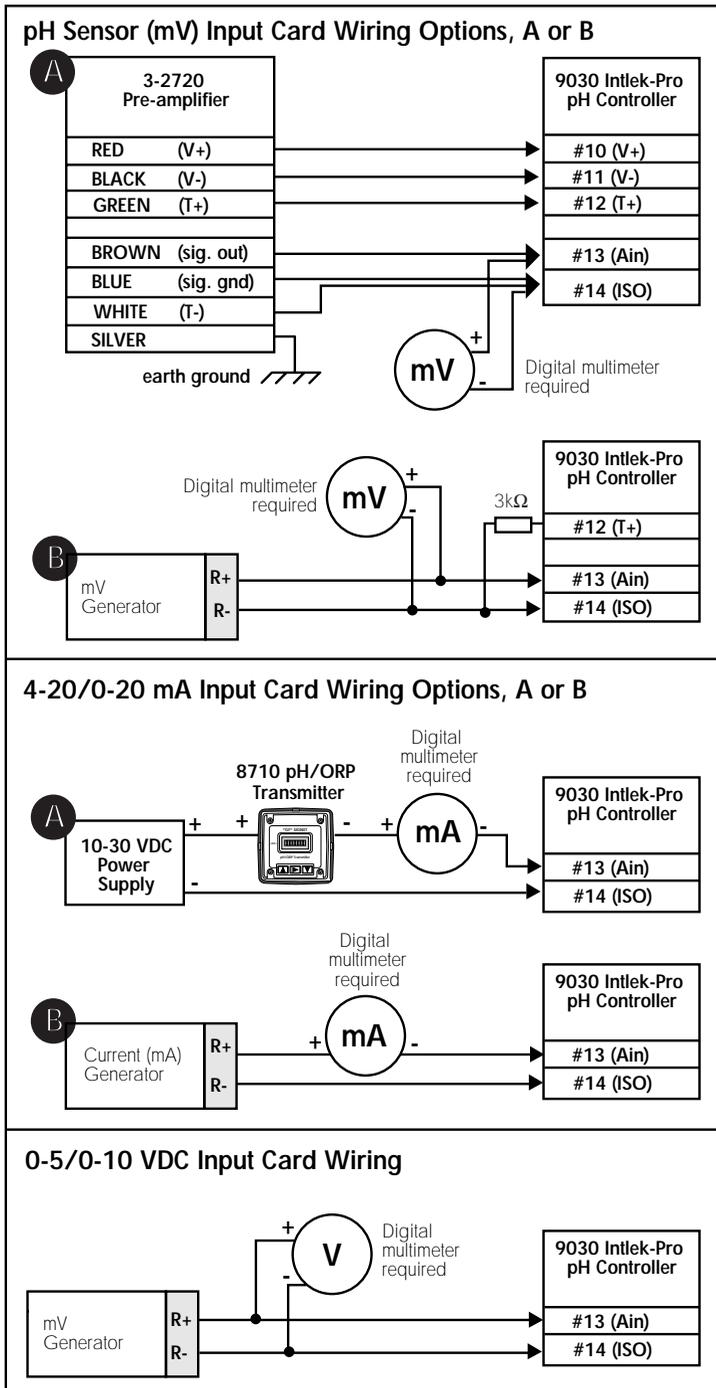
Factory installed input cards are preconfigured and DO NOT require this procedure. This procedure is recommended for input card replacement only.

The input card introduction mode is accessed by setting an internal dip switch on the main pc board. When accessed, this procedure adds two steps to the CAL menu. First, you must input a pH simulation signal of 4.0 pH and enter the exact simulation value. Second, you must input a pH simulation signal of 10.0 pH and enter the exact simulation value. Simulation signals vary depending on installed input card type.

Simulation signal inputs can be provided by pH sensor/preamplifier and common pH buffers, pH transmitter, or by external test equipment. See Figure 16 for input simulation options.

A pH 4.0, 7.0, 10.0 buffer capsule kit is offered for pH sensor/preamplifier inputs PHA-4710 (sec. 4.6)

Figure 16
Input simulation options



Introduction Procedure

1. Access main pc board and **close** dip switch position 2 to enable introduction mode (sec. 4.1). **Open** dip switch 1 to disable the security feature.
2. Wire simulation inputs and external digital multimeter as illustrated in Figure 16.

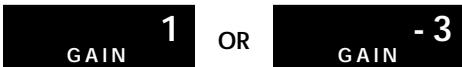
3. Access the calibrate menu as follows:

Step 3 assumes the security feature is disabled (sec. 4.2).

- Analog input cards, skip to step 4.
- pH Input Cards:

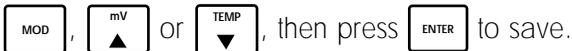
A. Press: then for CAL menu access.

B. Scroll through the menu by pressing until the lower display reads:

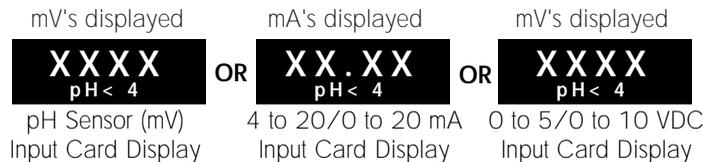


X1 GAIN required for PH-2720-PA Preamplifiers. Older model preamplifiers use X-3 GAIN.

C. Set the GAIN display to X1. To change, press:



4. Scroll the CAL menu until the PHCN-90 reads:



5. Apply the proper simulation signal to simulate 4 pH for your input card type (Table 1).

Table 1

INPUT CARD:	INPUT TYPE: (see Figure 16)	4.0 pH SIMULATION: (step 5):	10.0 pH SIMULATION: (step 8):
pH Sensor (mV) Input Card (PHCN-9PH)	A PH-2720-PA pH/ORP Pre-amplifier/Sensor Record values:	Place pH sensor in pH 4.0 buffer	Place pH sensor in pH 10.0 buffer
	B mV Generator	Apply 177 mV	Apply -177 mV
4-20/0-20 mA Input Card (PHCN-9MA) Jumper configurable range, sec. 4.7	A PHTX-8710 pH/ORP Transmitter (unit must be calibrated first, see transmitter manual)	Place sensor in pH 4.0 buffer	Place sensor in pH 10.0 buffer
	B mA Generator	4-20 mA range: apply 8.6 mA 0-20 mA range: apply 5.7 mA	4-20 mA range: apply 15.5 mA 0-20 mA range: apply 14.3 mA
0-5/0-10 VDC Input Card (PHCN-9V) Programmable range sec. 3.2	mV Generator	0-5 VDC range: apply 1400 mV (1.4 VDC)	0-5 VDC range: apply 3600 mV (3.6 VDC)
		0-10 VDC range: apply 2300 mV (2.3 VDC)	0-10 VDC range: apply 7200 mV (7.2 VDC)

**Simulation signal polarity MUST be observed. To enable the negative polarity indicator (-), shift the selected display digit to the far left. To disable (remove) the negative polarity indicator, shift the selected digit to the far left a second time.*

*Voltage Input cards:
All voltage inputs MUST be entered into memory as mV's (i.e. 1.0 VDC = 1000 mV).*

6. Enter the simulation signal value exactly as displayed on the external digital multimeter (DMM) as follows:

A. Press: to enable PHCN-90 display (display will begin to flash)

B. Press: keys to enter the

exact* simulation value. Press to confirm entry.

7. Press: CAL (once). The PHCN-90 reads:

mV's displayed	mA's displayed	mV's displayed		
0000 pH>10	OR	00.00 pH>10	OR	0000 pH>10
pH Sensor (mV) Input Card Display		4 to 20/0 to 20 mA Input Card Display		0 to 5/0 to 10 VDC Input Card Display

8. Apply the recommended simulation signal to simulate 10 pH for your input card type (Table 1). Repeat step 6 to enter and save the second simulation value into memory.
9. Access main pc board and **open** dip switch position 2 to disable the introduction mode (sec. 4.1). This completes the introduction mode procedure.

Optional: To enable the security feature, **close** dip switch 1.

You must now recalibrate your pH system. See sections 3.2 - 3.3 for details.

4.6 Option Cards and Accessories

Part Number	Input Cards
PHCN-9PH	pH sensor (mV) input card (isolated)
PHCN-9MA	4 to 20/0 to 20 mA input (isolated)
PHCN-9V	0 to 5/0 to 10 VDC input (isolated)
Part Number	Output Cards
PHOR-90-MA-N (Requires See section 4.7)	4 to 20/0 to 20 mA (non-isolated) configuration)
PHOR-90-5V-N	0 to 5 VDC (non-isolated)
PHOR-90-10V-N	0 to 10 VDC (non-isolated)
PHOR-90-MA-I (Requires configuration) See section 4.7	4 to 20/0 to 20 mA (isolated)
PHOR-90-5V-I	0 to 5 VDC (isolated)
PHOR-90-10V-I	0 to 10 VDC (isolated)
PHOR-90-R2	2-Relay card
PHOR-90-PC	Dual Proportional Relay Card
Part Number	Accessories
PHOR-9AP	Mounting adapter plate
PHOR-9RC	NEMA 4X/IP65 back cover kit
PHA-4710	pH buffer kit, pH 4.0, 7.0, 10.0 (2 capsules each)

Part Number	Spare Parts
3-9000.525-1	Front bezel
3-9000.575	Panel mounting gasket
3-9000.560	Mounting Clamp
2400-0404	Front cover screws (4 each)
3-9000.570	Front cover gasket
PHOR-9FUZE	Fuse, 1/4 A @ 250 VAC (fast blow)

4.7 Output Card Configurations

Each 4 to 20/0 to 20 mA (iso or non-iso) output card contains jumper selections for its operation range. See instructions below and Figure 19

- Placing the blue jumper in the "A" position configures the card for 4 to 20 mA operation.
- Placing the blue jumper in the "B" position configures the card for 0 to 20 mA operation.

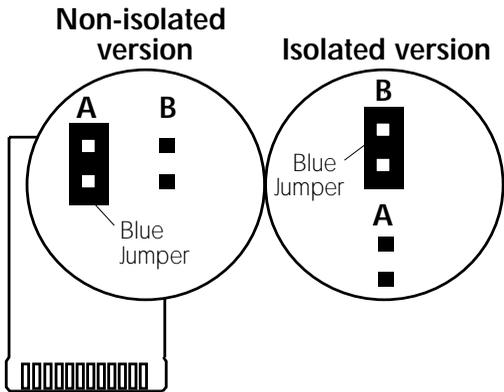


Figure 19
4 to 20/0 to 20 mA output cards

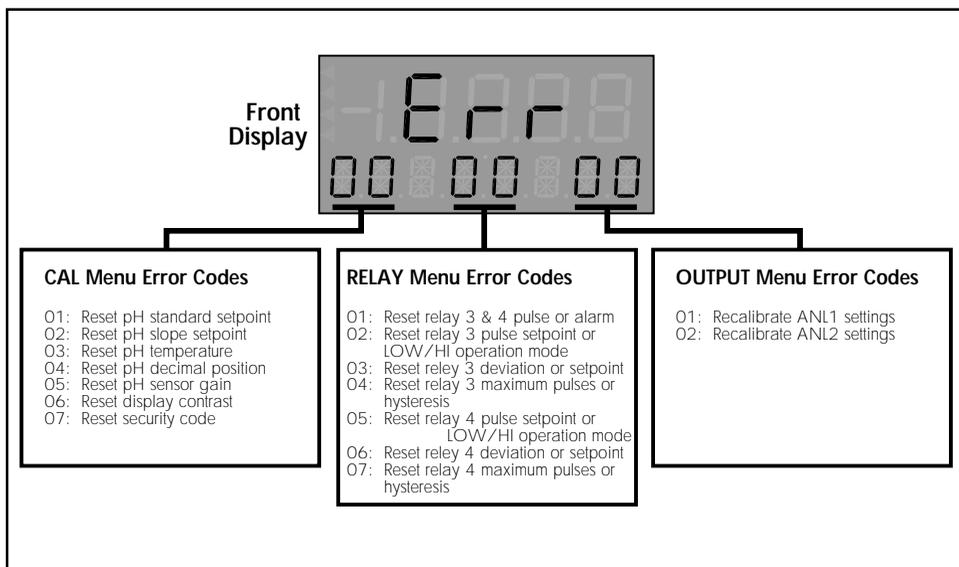
4.8 Troubleshooting

Error codes will be shown on the display after an abnormal occurrence, such as large amounts of electromagnetic interference or a large voltage transient on the AC power line occur.

Displayed error codes represent corrupted setup data in the internal memory which must be re-entered by the operator. See Figure 20

Figure 20

Displayed error codes



Specifications

Power Requirements

17 to 30 VDC @ 0.5 A max., and/or
90 to 132 VAC @ 50 to 60 Hz, or
180 to 264 VAC @ 50 to 60 Hz (jumper
selectable)

Operating Temperature

32 to 130 °F/0 to 55 °C

Relative Humidity

95% R.H. maximum, non-condensing

Enclosure

Materials: ABS plastic

NEMA 4X/IP65 front, **optional** NEMA 4X/IP65
rear cover

Dimensions: 3.5 x 3.5 x 6.5 in /
88 x 88 x 165 mm

Memory Backup

Non-volatile RAM

Liquid Crystal Display

4.5 digits - 0.5 inch high (upper)

8 digits - 0.3 inch high (lower)

Range: pH 0.00 to 14.0

Temperature 4 to 230 °F/-10 to 110 °C

Noise Immunity

Meets IEC 801-3

Compatible Pre-amplifier/Sensor System

PH-2720-PA Pre-amplifier

PHE-3271 Flat Surface pH Sensor

PHE-2716 General purpose bulb pH Sensor

ORE-2715 Flat Surface ORP Sensor

ORE-2717 General purpose bulb ORP Sensor

(continued)

pH Input (isolated)

pH range: 0 to 14 pH

Isolation: 500 VDC to earth ground

Current and Voltage Input (isolated)

Input range: 4 to 20 mA or 0 to 20 mA

0 to 5 VDC or 0 to 10 VDC

Isolation: 500 VDC to earth ground

2-Relay Output Card

2 SPDT contact outputs 5 A @ 250 VAC or
5A @ 30 VDC maximum

Dual Proportional Output Card

2 SPST contact outputs 5 A @ 250 VAC or
5 A @ 30 VDC maximum

4 to 20 or 0 to 20 mA Output Card

Response time: 2.5 s max. for 100% change

Max. loop resistance: 425 Ω

Isolation: 500 VDC to earth ground (iso. version)

0 to 5 or 0 to 10 VDC Output Card

Response time: 2.5 s max. for 100% change

Min. load resistance: 1 k Ω

Isolation: 500 VDC to earth ground (iso. version)

Accuracy

Display: pH ± 0.02

Analog output: $\pm 0.5\%$ of full scale