

**WDP Series Dual Input
pH/ORP Controller
Instruction Manual**

Notice

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1.0 Introduction



The Walchem WDP300 Series controllers are dual input wall mount pH/ORP controllers. The type of control output varies depending upon the model ordered. They are available with four on/off control relays (WDP310) with two modulated pulse proportional output and two dry contact relays (WDP320) or four modulated pulse proportional outputs (WDP340). A fifth relay output is used as a diagnostic alarm. One or two optional isolated 4-20 mA outputs that are proportional to either pH or ORP input are available for all models.

The two electrode inputs may be any combination of pH or ORP. The controllers are compatible with any amplified electrode. The choice of pH or ORP operation is selected through the keypad. Use of Antimony pH electrodes is acceptable. Automatic temperature compensation of the pH may be used via a Pt1000 or Pt100 input. The controller will prompt you to calibrate the electrode at the desired frequency. Automatic buffer recognition may be used in the pH calibration routine.

2.0 Specifications



2.1 Measurement Performance

Range:	-2 to 16 pH (± 1500 mV ORP)
Resolution:	.0015 pH units (.01 pH displayed) 92 μ V (1 mV displayed ORP)
Accuracy (Calibrated):	$\pm .01$ pH (± 1 mV ORP)
Temp Comp (optional):	100 or 1000 ohm platinum RTD
Temperature Range:	32-212°F (0-100°C)
Temperature Resolution:	.09°F (.05°C)
Temperature Accuracy:	$\pm .9$ °F ($\pm .5$ °C)

2.2 Electrical: Input/Output

Power

Controller	110-120 VAC 50/60 Hz, 10A 220-240 VAC 50/60 Hz, 5A
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Input Signals (Two of each input type are available)

pH/ORP	± 1500 mV
Temp Comp (optional)	Pt1000 or Pt100
Interlock (optional) (i.e., flow, level, etc.)	Isolated dry contact closure required

Note: A preamplified electrode signal is required. The WEL electrode has preamp built in; the controller also accepts external preamplifiers.

Outputs

WDP310 (ON/OFF Control version)

Control 1-4 and Alarm Internally powered relays
@ 120 VAC, 10A resistive, 1/8 HP
@ 240 VAC, 6A resistive, 1/8 HP

WDP320 (Proportional version)

Control 1-2 Solid state relay
150 mA, 40 VDC max.
 $V_{LOW\ MAX} = .13V @ 18\ mA$

Control 3-4 and Alarm Dry contact relay
@ 120 VAC, 10A resistive, 1/8 HP
@ 240 VAC, 6A resistive, 1/8 HP

WDP340 (Dual Proportional Control version)

Control 1-4 Solid state relay
150 mA, 40 VDC max.
 $V_{LOW\ MAX} = .13V @ 18\ mA$

Alarm Dry contact relay
@ 120 VAC, 10A resistive, 1/8 HP
@ 240 VAC, 6A resistive, 1/8 HP

All Models (4-20 mA, one or two optional)

Fully isolated, internally powered, 600 Ω max. resistive load.
Resolution .001% of span, accuracy
 $\pm 1\%$ of reading.

External preamp power

± 5 VDC, 5mA available (supplied by controller)

Junction Box

If more than 9 devices will be connected (any combination of sensors, flow/level switches, control devices, chart recorders and alarms) a junction box should be ordered (P/N 190851).

Agency Approvals

UL ANSI/UL 61010-1:2004, 2nd Edition*
CAN/CSA C22,2 No.61010-1:2004 2nd Edition*
CE Safety EN 61010-1 2nd Edition (2001)*
CE EMC EN 61326 :1998 Annex A*

Note: For EN61000-4-6,-3 the controller met performance criteria B.

*Class A equipment: Equipment suitable for use in establishments other than domestic, and those directly connected to a low voltage (100-240 VAC) power supply network which supplies buildings used for domestic purposes.

2.3 Mechanical

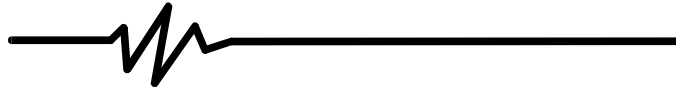
Controller

Enclosure:	Fiberglass
NEMA Rating:	NEMA 4X
Dimensions:	8.5" x 6.5" x 5.5"
Display:	2 x 16 character backlit liquid crystal
Operating Ambient Temp:	32 – 122°F (0 – 50°C)
Storage Temperature:	-20 to 180°F (-29 to 82°C)
Shipping Weight:	7 lbs (3kg) (approximately)

Flow switch manifold assembly

Temperature:	140°F (60°C) max
Pressure:	150 psi max
Process connectors:	¾" NPTF

3.0 Unpacking and Installation



3.1 Unpacking the unit

Inspect the contents of the carton. Please notify the carrier immediately if there are any signs of damage to the controller or its parts. Contact your distributor if any of the parts are missing. The carton should contain a WDP300 controller and instruction manual. Any options or accessories will be incorporated as ordered.

3.2 Mounting the electronic enclosure

The WDP series controller is supplied with mounting holes on the enclosure. It should be wall mounted with the display at eye level, on a vibration-free surface, utilizing all 4 mounting holes for maximum stability. Use M6 (1/4" diameter) fasteners that are appropriate for the substrate material of the wall. The enclosure is NEMA 4X rated. The maximum operating ambient temperature is 122°F (50°C). The enclosure requires the following clearances:

Top:	2"
Left:	8"
Right:	4"
Bottom:	7"

3.3 Installation

Once the enclosure is mounted, the metering pumps may be located at any distance from the controller. The electrode cannot be connected directly to the controller. The electrode signal must first pass through a preamplifier. The preamplifier and controller may be placed up to 1000 feet apart. Shielded cable with twisted pairs is preferable. Always route AC voltage wiring in conduit that is separated by 6 inches from low voltage DC signal lines (such as the electrode signal).

Electrode Installation

The WDP controllers are designed to work with most AMPLIFIED pH, ORP or ISE electrodes. When in doubt, follow the electrode manufacturer's instructions for installation.

If you have ordered the electrode as part of the model code, connect the wiring as described in Figure 4 and install the electrode as described in the electrode instruction manual.

If you have ordered your controller with an external preamplifier pre-wired to the controller, simply attach the electrode to the BNC connector on the preamplifier as shown in Figure 4. If you are using automatic temperature compensation, wire the ATC element to the preamplifier as shown in Figure 4.

If you have ordered the external preamplifier separately, see Figure 4 for wiring instructions.

NOTE: *The cable between the electrode and the preamplifier is carrying an extremely sensitive high impedance voltage signal. Never cut, splice or otherwise destroy the integrity of the cable or unstable readings and susceptibility to electrical noise will result.*

Instructions for physically mounting the electrodes into the process solutions will vary greatly with the type of electrode and circumstances involved in your application. Here are some general guidelines to assist you. Refer to Figures 2 and 3.






The electrode should be installed such that the measuring surfaces will always stay wet. Many electrodes have to be installed vertically, with the measuring surfaces pointing down. Follow the manufacturer's recommendations if this is the case. If the electrode dries out, a slow response and short life will result.

For submersion applications, mount the electrode below the minimum solution level. If the tank will be completely emptied, plan on removing the electrode and storing it in tap water (NOT DI water) or pH 4 buffer solution while the tank is empty. If this is not desirable, a recirculation loop may be installed with the electrode mounted in-line. The WEL electrode cable is not waterproof and must be protected from moisture by connecting a pipe to the top of the electrode housing. The opposite end of the pipe should also be protected from moisture using a cable gland.

For in-line applications, where the electrode is installed in a pipe, the electrode should be placed on the discharge side of the pump (under positive pressure). A "U" trap should be included so that if flow stops, the electrode is still immersed in the solution. If the flow through the pipe can not be shut down for cleaning and calibrating the electrode, install the electrode in a by-pass line with isolation valves to allow for electrode removal. When connecting pipe to the in-line mounting tee of a WEL electrode, use no more than 3 wraps of Teflon tape and only screw in the pipe to FINGER TIGHT. Over-tightening will crack the tee. Do not use pipe dope to seal the threads of the optional flow switch because the clear plastic will crack!

The electrode should be installed in an area where there is good solution movement and where it will respond rapidly to chemical additions. The placement of the electrode relative to the placement of chemical replenishment, along with the quality of the mixing and replenishment flow rate, is critical to accurate control.

3.4 Icon Definitions

Symbol	Publication	Description
	IEC 417, No.5019	Protective Conductor Terminal
	IEC 417, No. 5007	On (Supply)
	IEC 417, No. 5008	Off (Supply)
	ISO 3864, No. B.3.6	Caution, risk of electric shock
	ISO 3864, No. B.3.1	Caution

3.5 Electrical Installation

Based on the model number, the following voltages are required:

WDP3xx-1xx	120 VAC, 50/60 Hz, prewired
WDP3xx-2xx	120 VAC, 50/60 Hz, prewired
WDP3xx-4xx	120 VAC, 50/60 Hz, hardwired
WDP3xx-5xx	240 VAC, 50/60 Hz, hardwired

The various standard wiring options are shown below.

Your WDP series controller will arrive from the factory prewired or ready for hardwiring. Depending on your configuration of controller options, you may be required to hardwire some or all of the output devices. Refer to Figures 5 and 6 for circuit board layout and wiring.

Note: When wiring the optional 4-20 mA outputs or remote flow switches, it is advisable to use stranded, shielded, twisted pair wire between 22-26 AWG. Shield should be terminated at the controller ground stud (see Figure 5).



CAUTION! There are live circuits inside the controller even when the power switch on the front panel is in the OFF position! The front panel must never be opened before power to the controller is REMOVED!

If your controller is prewired, it is supplied with a 8 foot, 18 AWG power cord with USA style plug. A tool (#1 phillips driver) is required to open the front panel.



CAUTION! When mounting the controller, make sure there is clear access to the disconnecting device!



CAUTION! The electrical installation of the controller must be done by trained personnel only and conform to all applicable National, State and Local codes!



CAUTION! Proper grounding of this product is required. Any attempt to bypass the grounding will compromise the safety of persons and property.



CAUTION! Operating this product in a manner not specified by Walchem may impair the protection provided by the equipment.

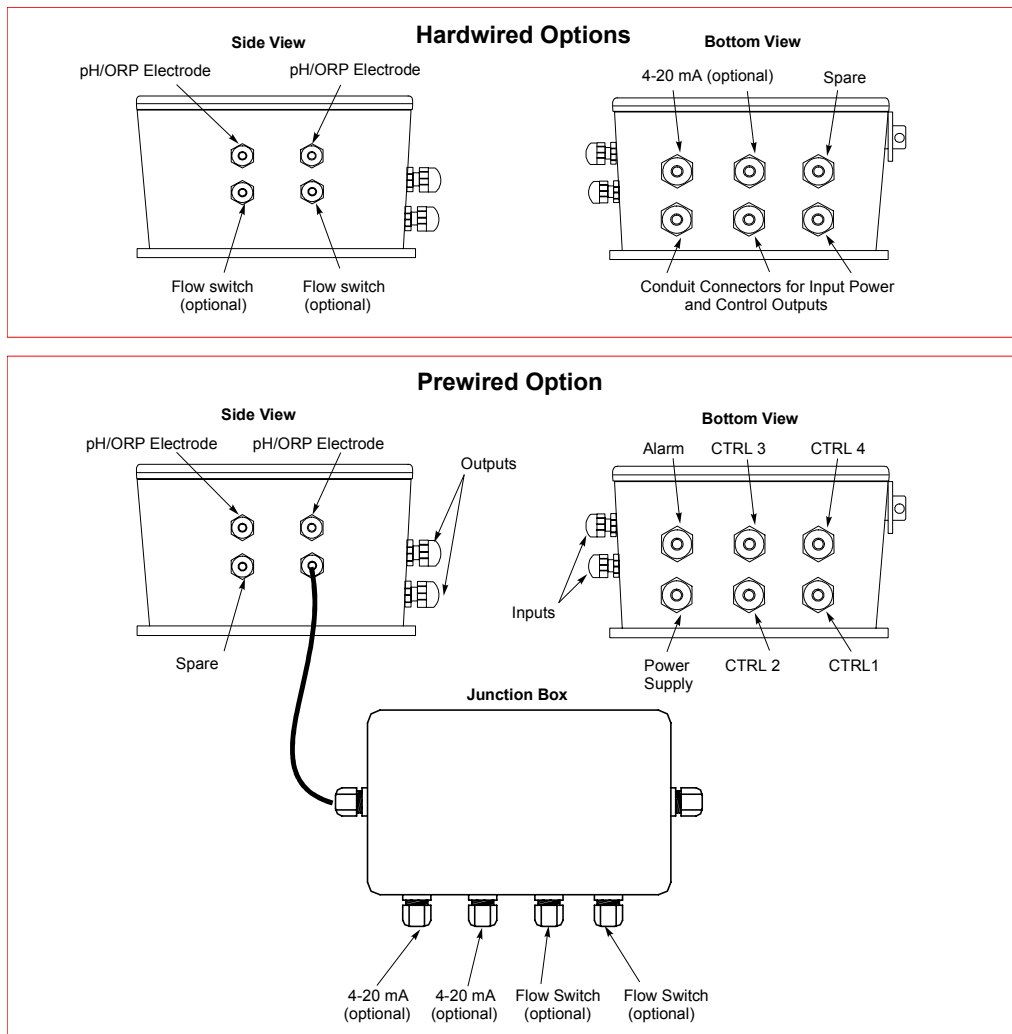


Figure 1 Conduit/Wiring Options

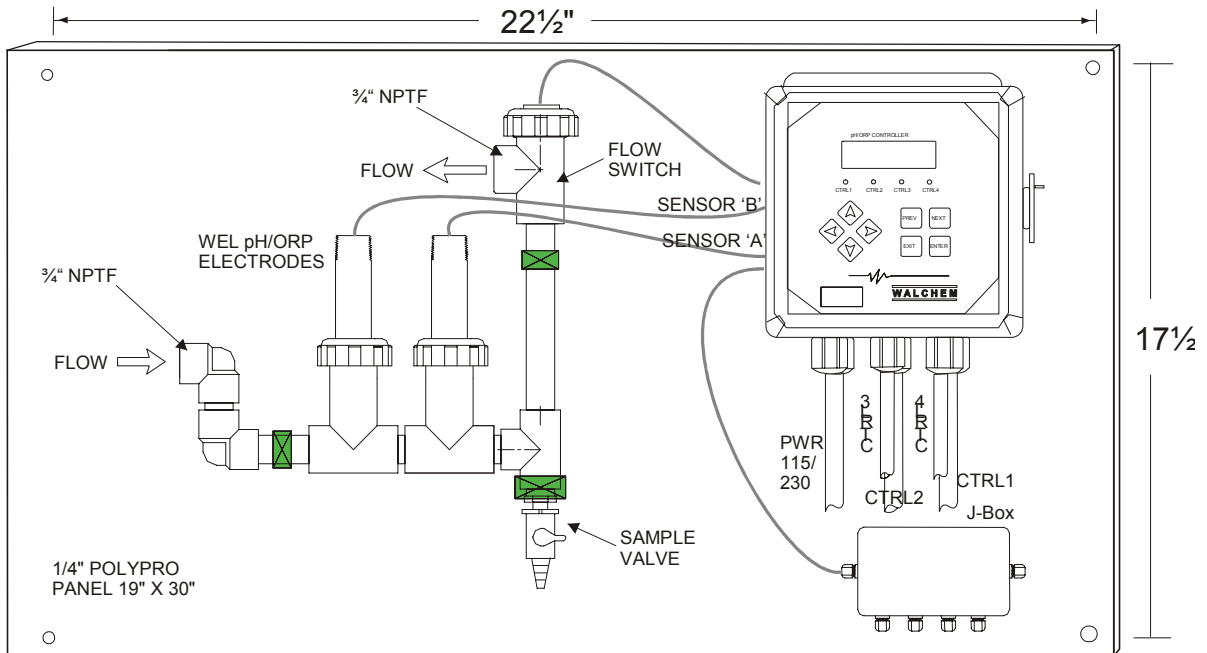
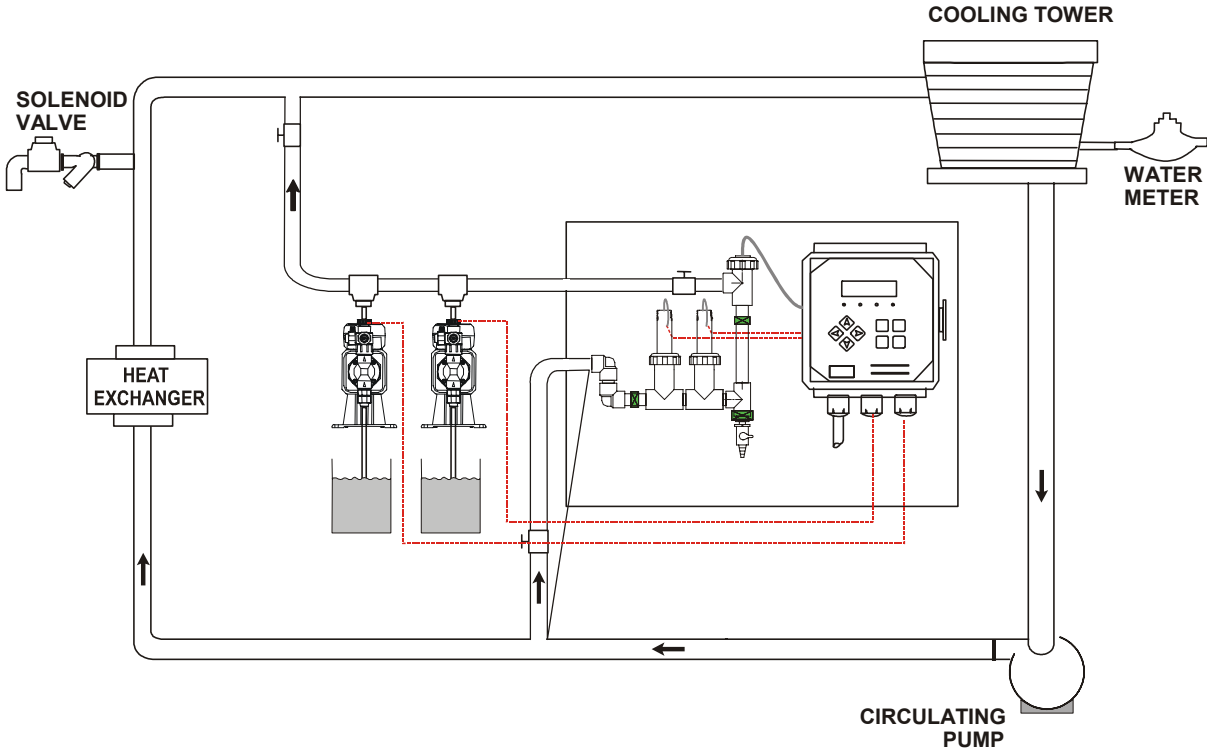


Figure 2 Typical Installation with In-Line Electrodes

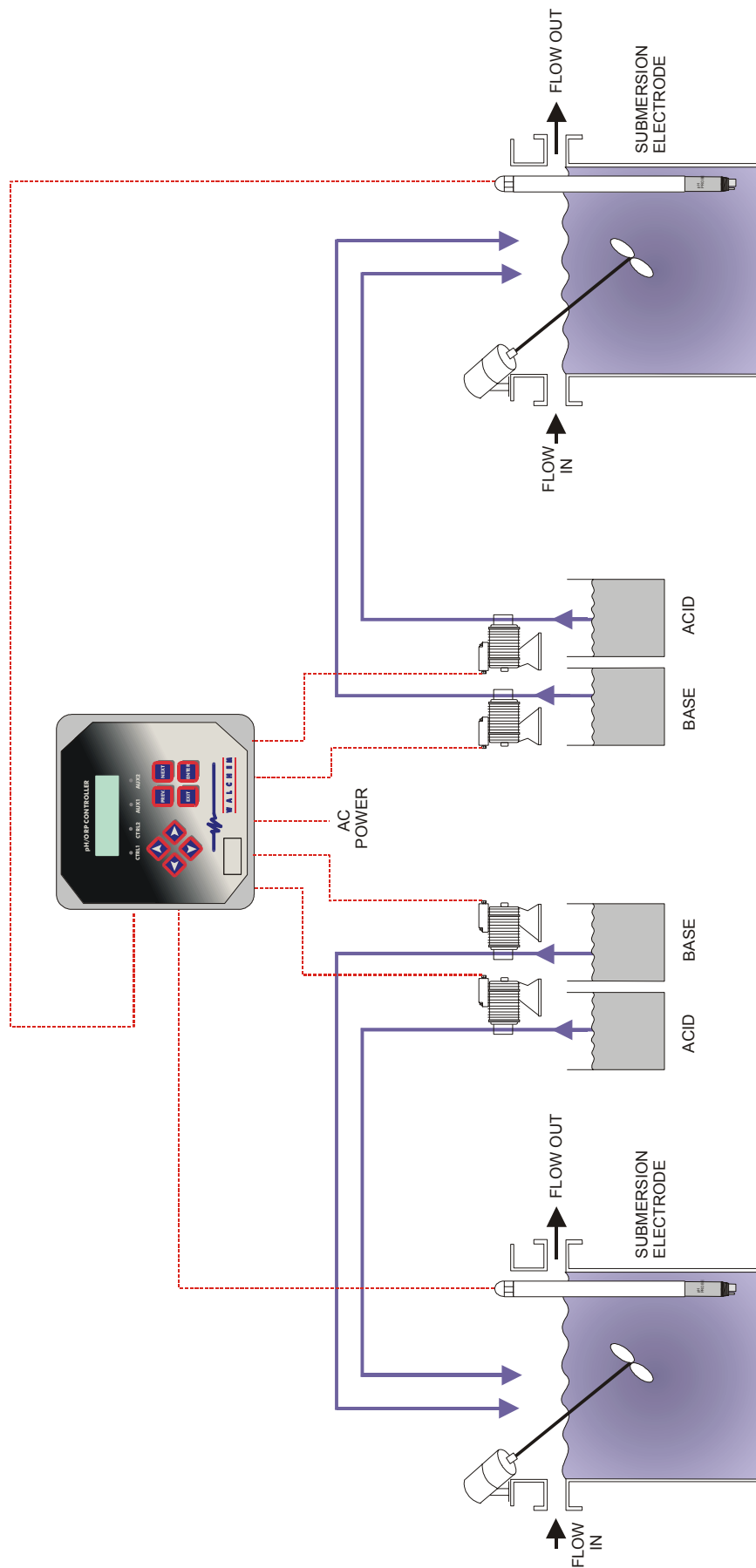


Figure 3 Typical Installation with Submersion Electrodes

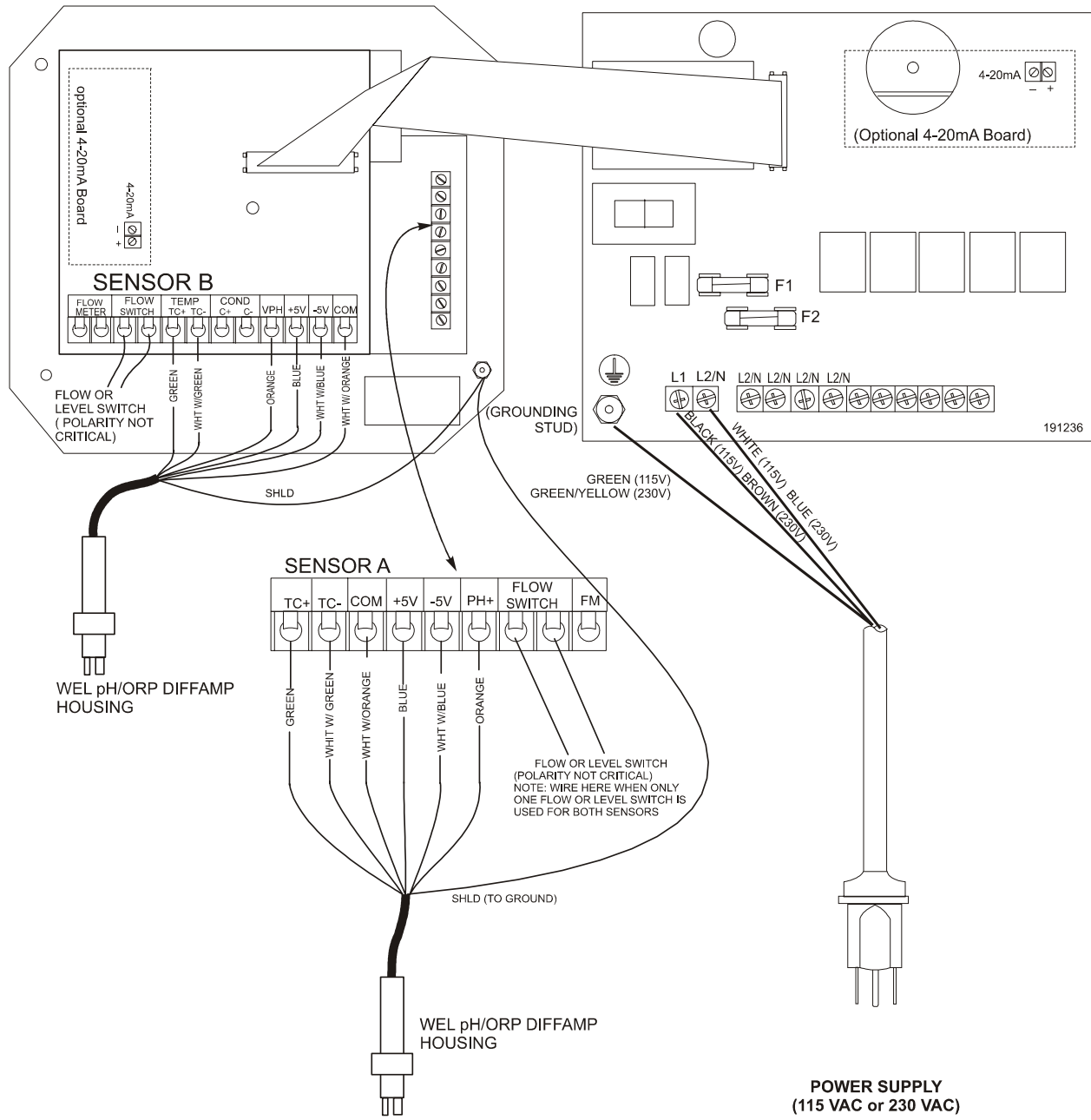


Figure 4 Inputs: Preamplified Electrode Wiring (with power relay board 191236)

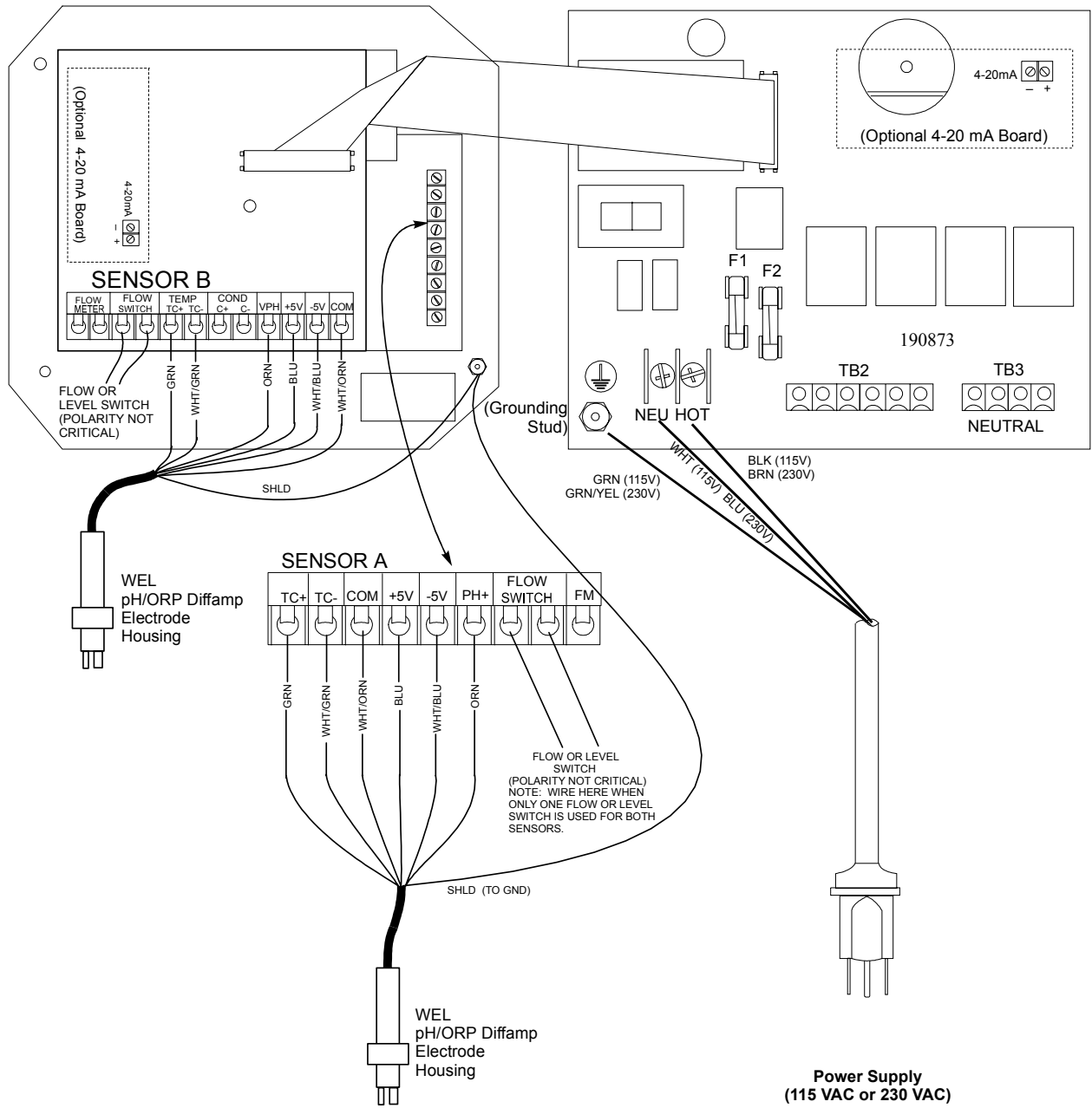


Figure 4a : Preamplified Electrode Wiring (with power relay board 190873)

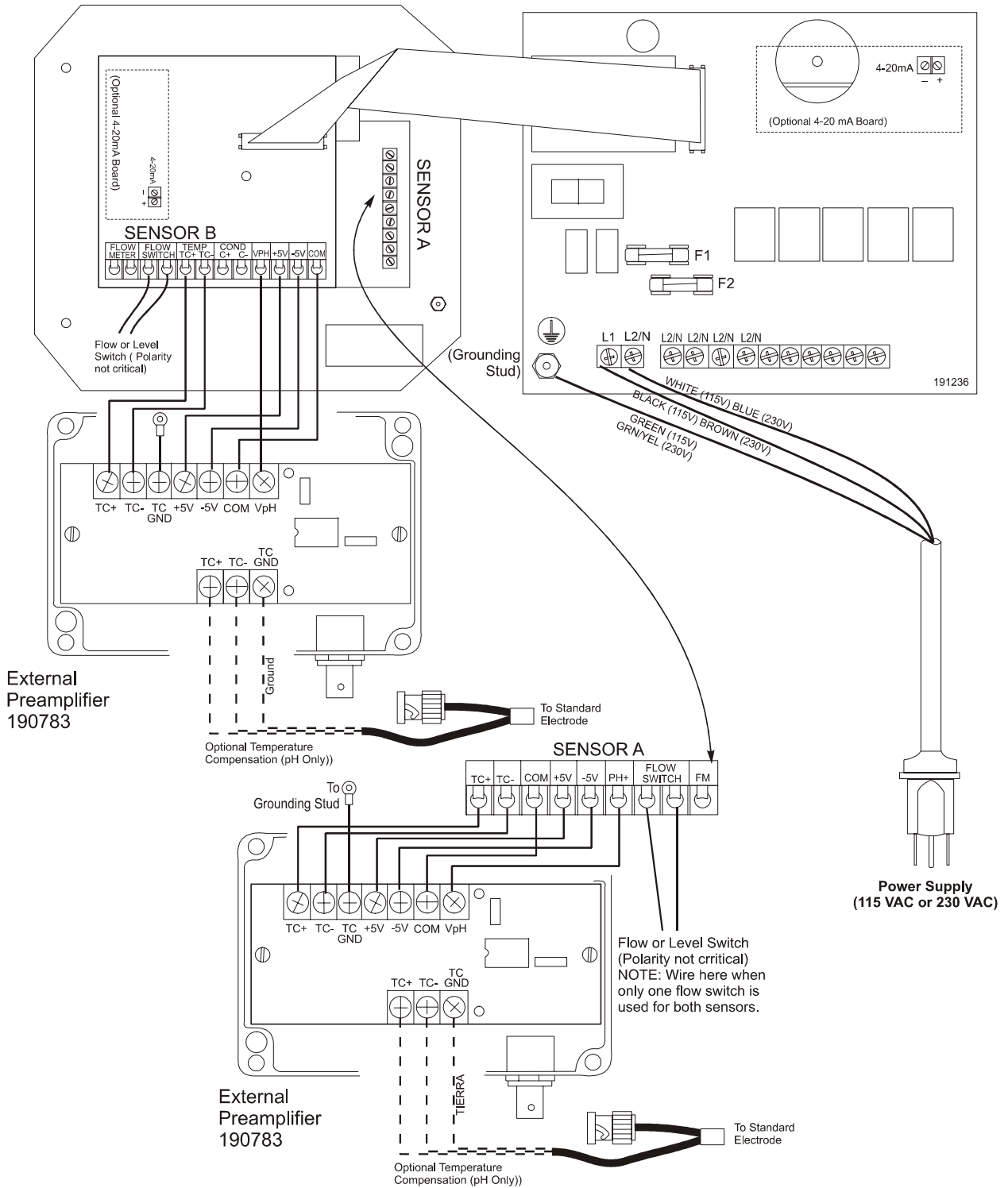


Figure 5 Inputs: Standard Combination Electrode Wiring (with power relay board 191236)

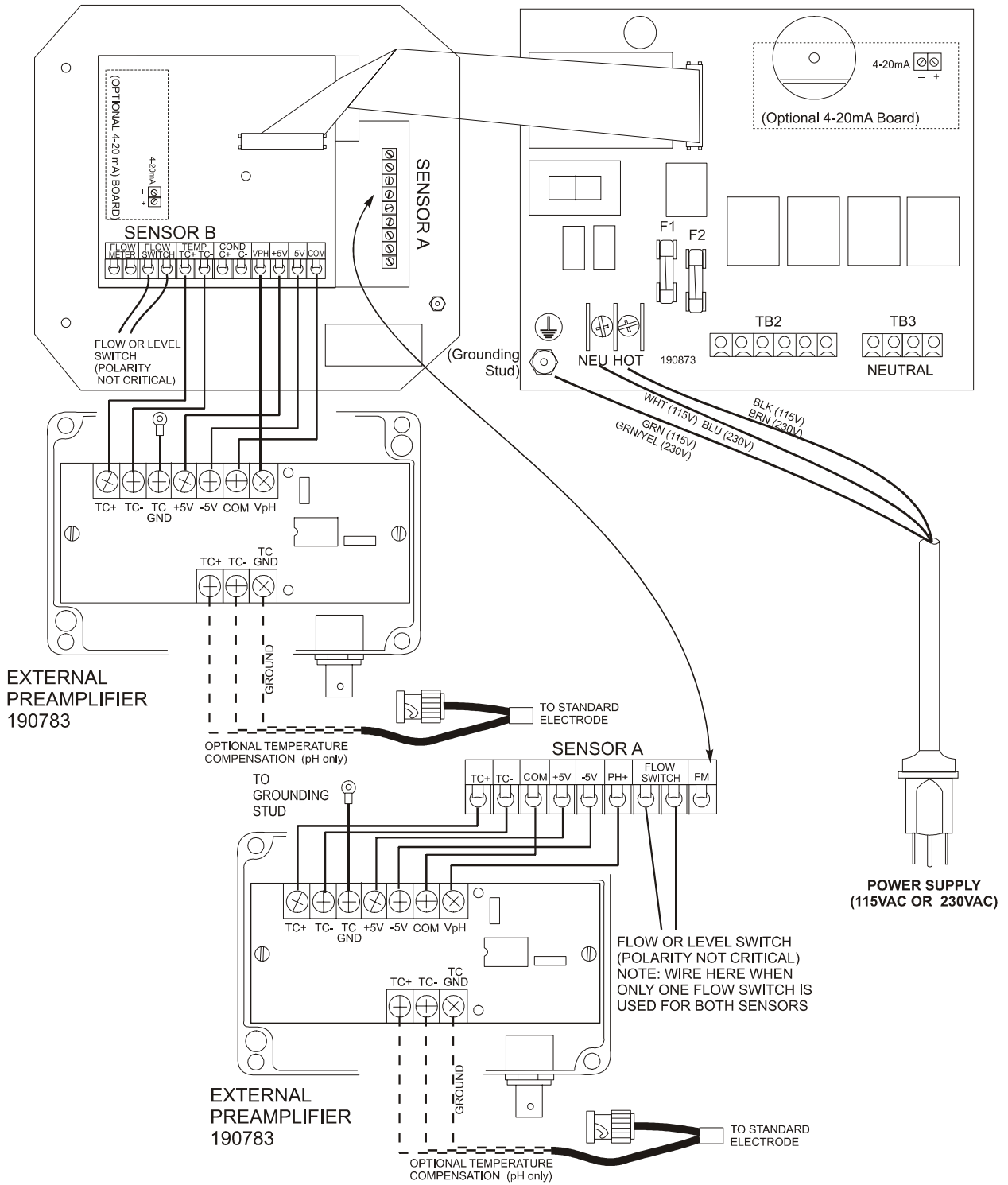


Figure 5a Inputs: Standard Combination Electrode Wiring (with power relay board 190873)

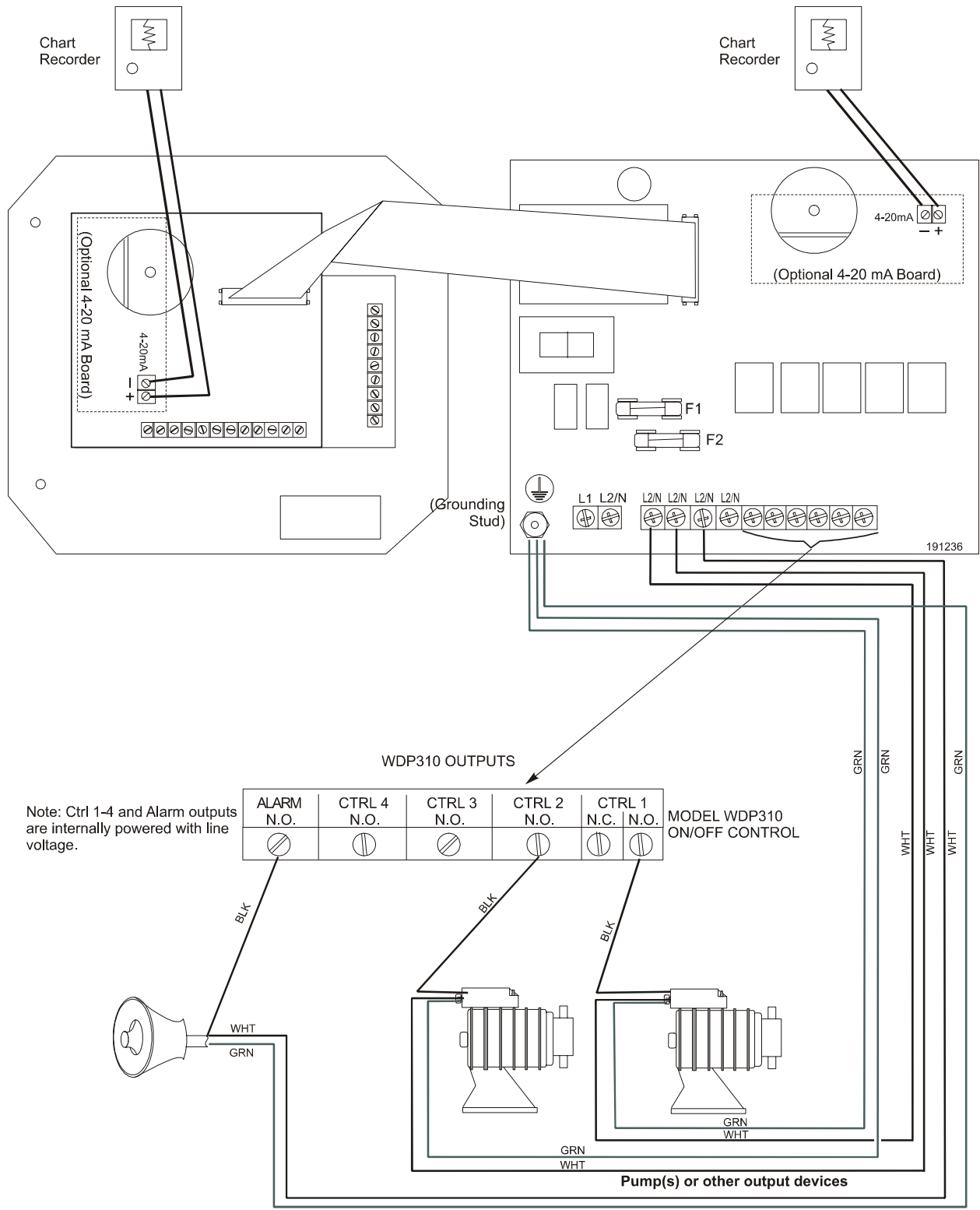


Figure 6 WDP310 Output Wiring (with power relay board 191236)

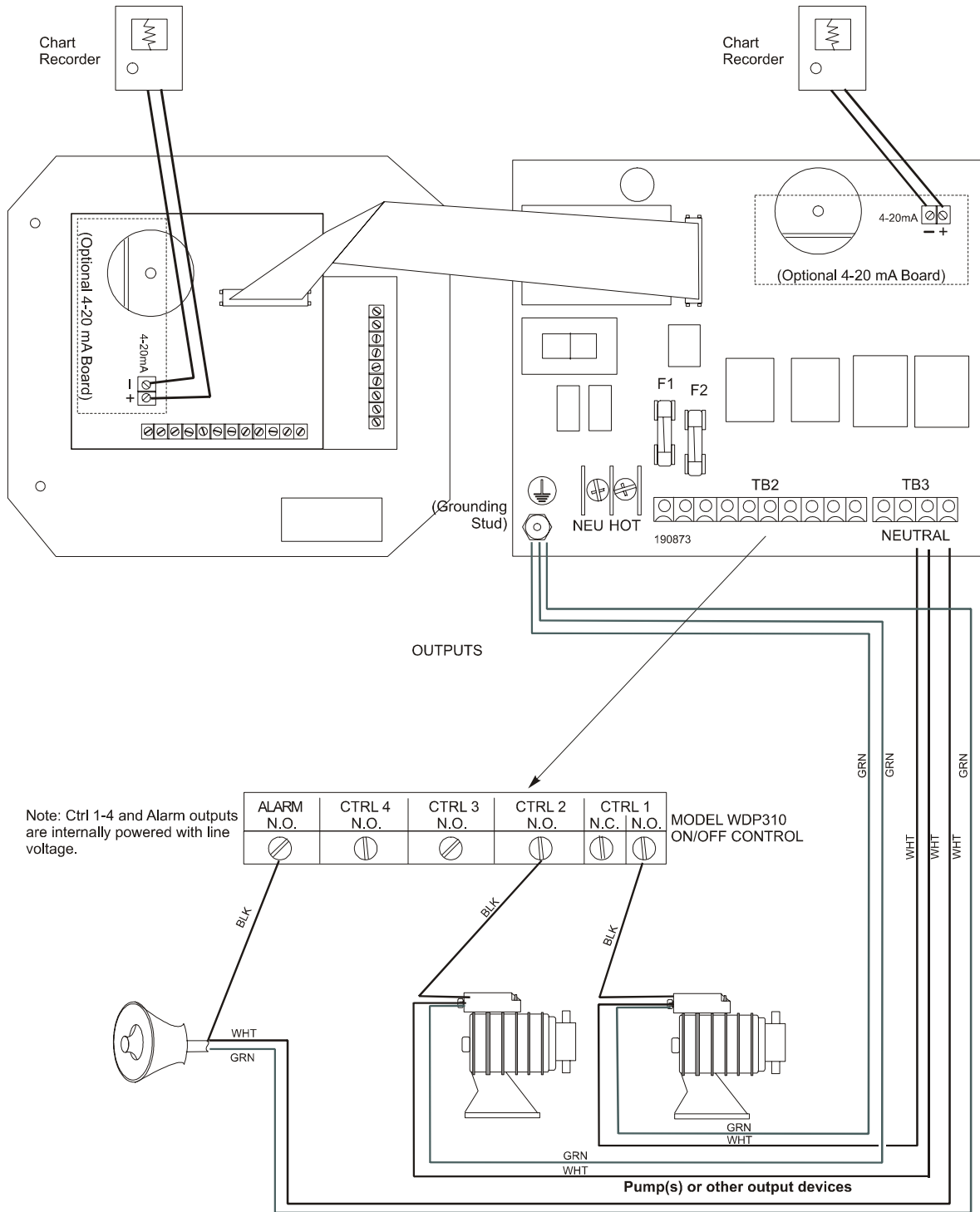


Figure 6a WDP310 Output Wiring (with power relay board 190873)

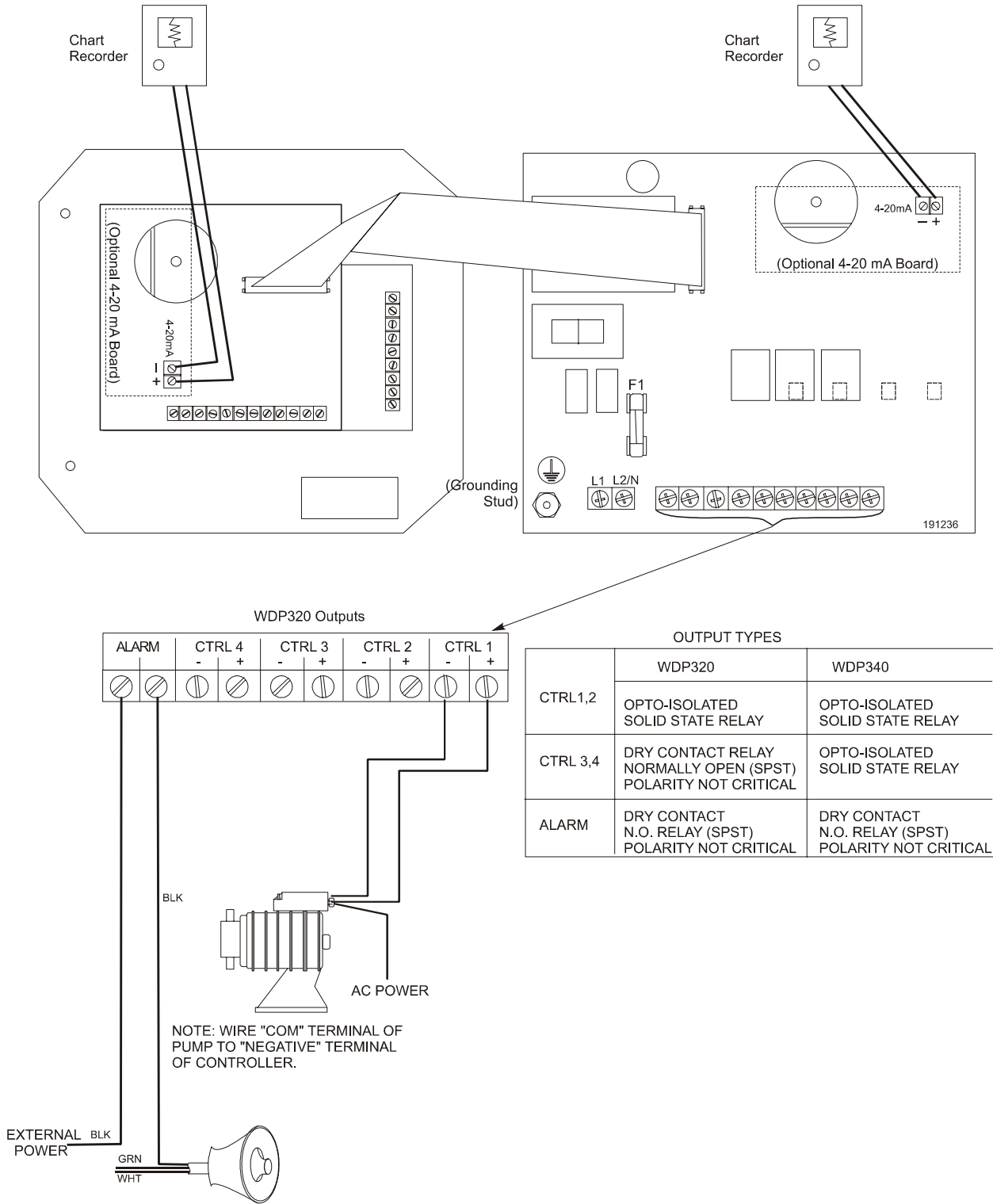


Figure 7 WDP320/340 Output Wiring (with power relay board 191236)

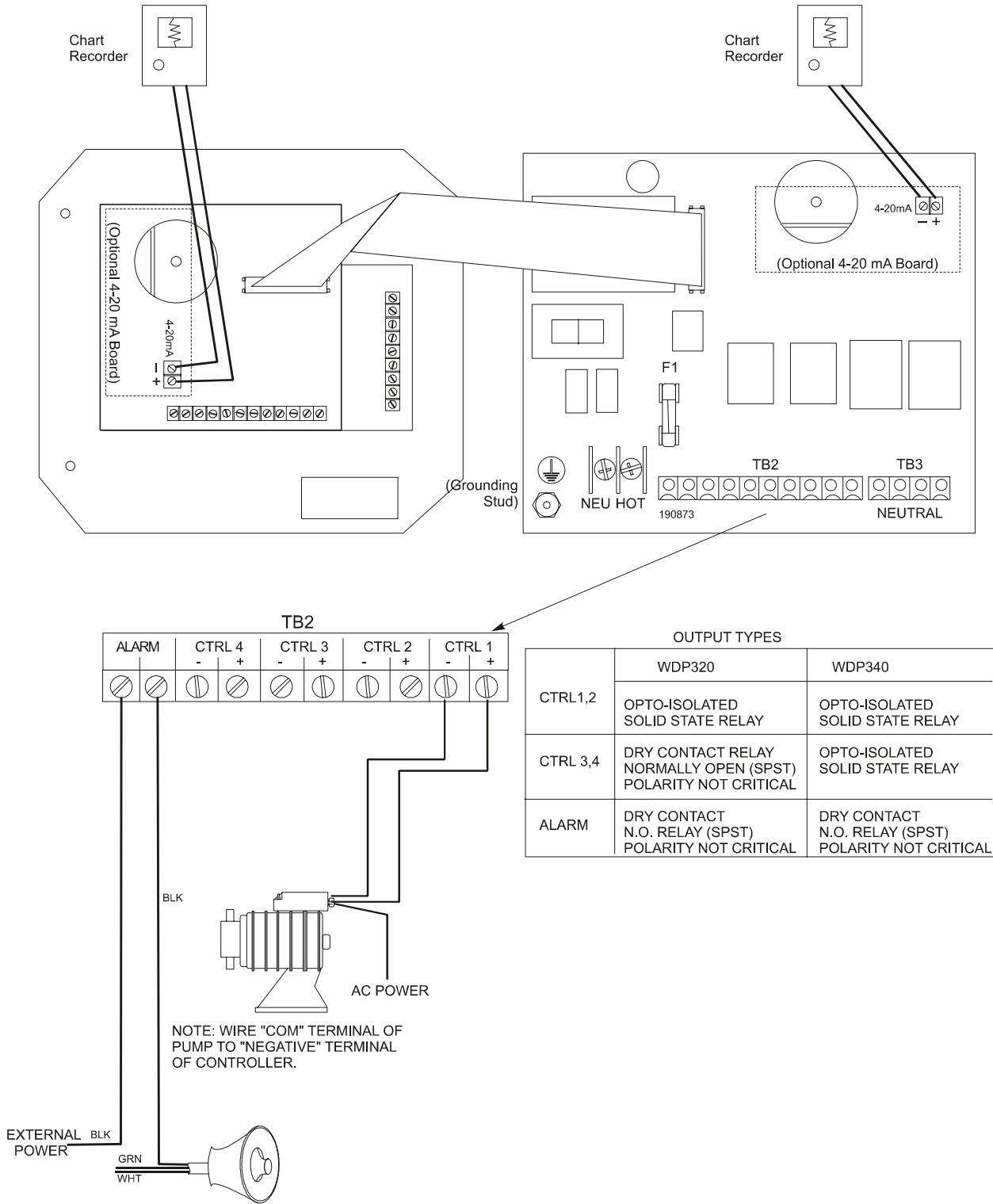
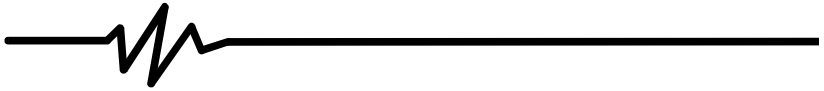
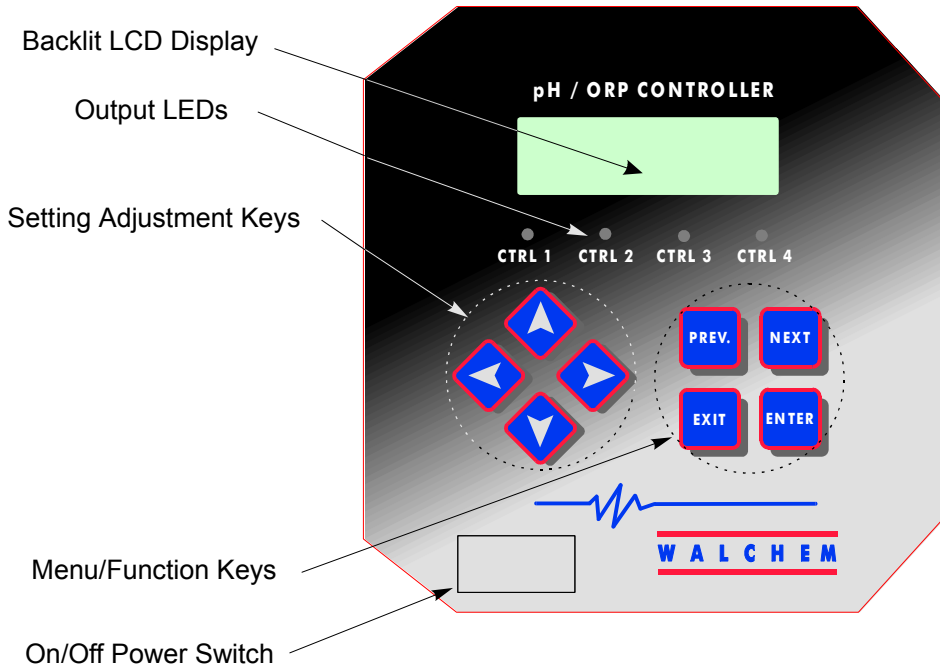


Figure 7a WDP320/340 Output Wiring (with power relay board 190873)

4.0 Function Overview



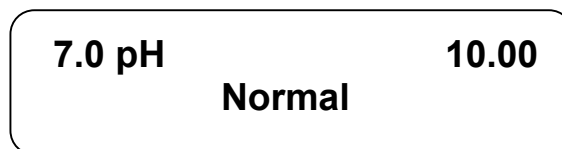
4.1 Front Panel



4.2 Display

A summary screen is displayed while the WDP controller is on. This display shows the pH or ORP of Sensor A on the upper left side, that of Sensor B on the upper right side, and current operating conditions.

The bottom line of the summary screen displays the following potential status messages: Probe A/B Error, TempSensor A/B Error, Probe Wash A/B, Probe Wash Hold A/B, Interlock A/B, Output Timeout, Calibration Time A/B, Range Alarm, In Range Output, High/Low Alarm, Output1 On, Output2 On, Output 3 On, Output 4 On and Normal.



Summary Screen

4.3 Keypad

The keypad consists of 4 directional arrows and 4 function keys. The arrow keys are used to move the adjustment cursor and change settings, while the function keys are used to enter values, and navigate the various menu screens. The function keys are **ENTER**, **EXIT**, **NEXT** and **PREV** (previous). **NEXT** and **PREV** scroll through the various menu choices. **ENTER** is used to enter a submenu and to enter a value. **EXIT** is used to back up one menu level. If you are at the main menu level, **EXIT** will return you to the summary screen.

To change a value in a submenu, the left/right arrow keys move the cursor left and right to each digit or option that can be changed. The up/down arrows will change numeric values up or down, or scroll through option choices. Press **ENTER** only when you have finished making ALL of the changes for that menu screen.

4.4 Access Code

The WDP series controller is shipped with the access code disabled. If you wish to enable it, see Section 5.9 for operation. With the access code enabled, any user can view parameter settings, but not change them. Note that this provides protection only against casual tampering. Use a lock on the cover latch if you need more protection.

4.5 Startup

Initial Startup

After having mounted the enclosure and wired the unit, the controller is ready to be started.

Plug in the controller and turn "ON" the power switch to supply power to the unit. The display will briefly show the WDP model number and then revert to the normal summary screen. Scroll through the menus and calibrate the electrodes, and set the control parameters as detailed in Section 5, Operation.

To return to the summary screen, press the **EXIT** key until you return to this screen. The controller will automatically return to this screen after 10 minutes.

Normal Startup

Startup is a simple process once your set points are in memory. Simply check your supply of chemicals, turn on the controller, calibrate the electrodes if necessary and it will start controlling.

4.6 Shutdown

To shut the WDP controller down, simply turn off the power switch. Programming remains in memory.

The electrodes must be stored with the measuring surfaces wet. If an extended shutdown will result in an electrode dehydrating, it must be removed from its position in the process and stored in pH 4 buffer solution.

5.0 Operation



These units control continuously while power is applied. Programming is accomplished via the local keypad and display.

To view the top level menu, press any key. The menu structure is grouped by inputs and outputs. Each input has its own setup menu for calibration and unit of measure selection as needed. Each output has its own setup menu including set points, timer values, direction of control, etc. as needed. After 10 minutes of inactivity in the menu, the display will return to the summary screen. Keep in mind that even while browsing through the menus, the unit is still controlling.

5.1 Main Menu

The exact configuration of your WDP controller determines which menus are available as you scroll through the settings. Certain menus are only available if you select certain options. All settings are grouped under the following main menu items:

- Sensor A (or B)
- Temperature (A or B, pH only)
- Control 1
- Control 2
- Control 3
- Control 4
- Interlock A
- 4-20 mA (1 or 2, only if option board is installed)
- Time
- Access Code

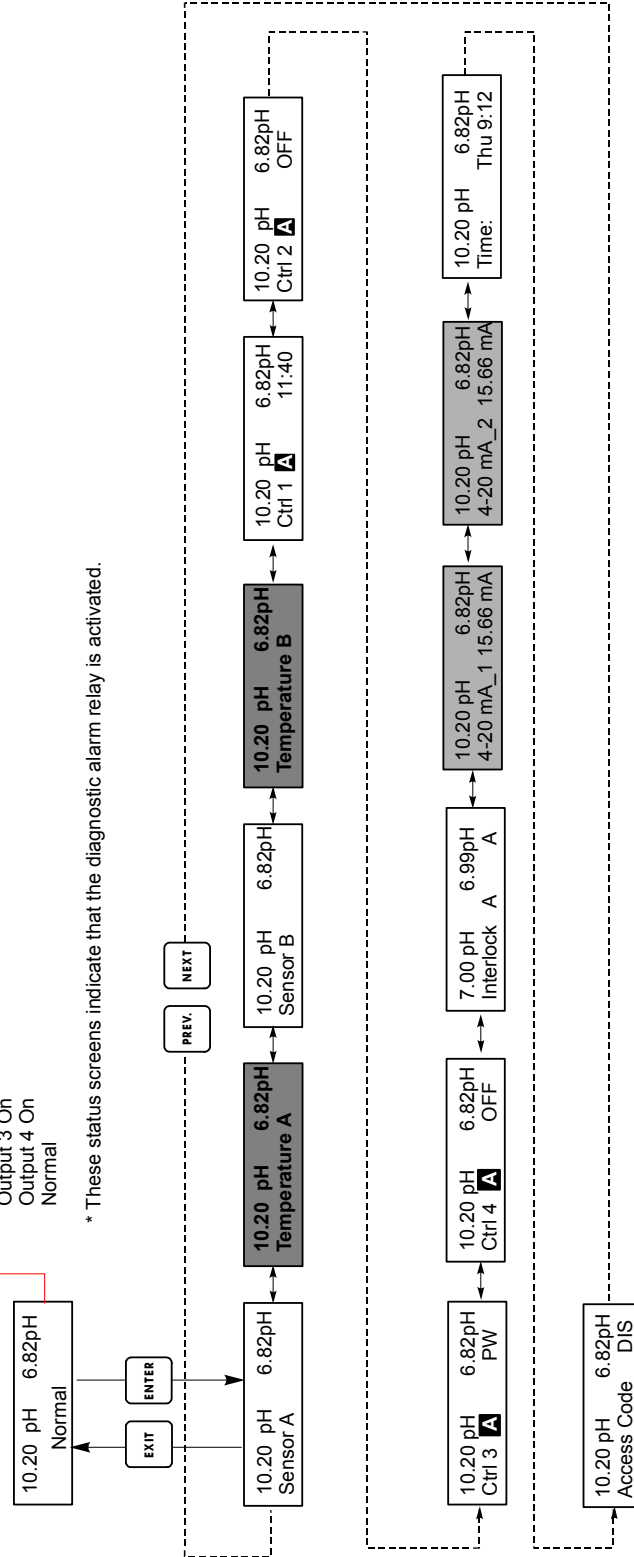
The **NEXT** key travels forward through this list while the **PREV** key travels backwards through the list. Pressing **ENTER** will enter the lower level menu that is currently displayed.

Main Menu

Possible Status Screens

- * Probe A/B Error
- * TempSensor A/B Error
- Probe Wash A/B
- Probe Wash Hold A/B
- * Interlock A/B, A+B
- * Output Timeout
- * Calibration Time A/B
- Range Alarm A/B
- In Range Output A/B
- High/Low Alarm A/B
- Output 1 On
- Output 2 On
- Output 3 On
- Output 4 On
- Normal

* These status screens indicate that the diagnostic alarm relay is activated.



Operation

Press Enter key to enter menu or submenu.
 Press Exit key to exit menu.
 After 10 minutes of inactivity the controller will automatically return to the summary screen.

Legend

- Only present if 4-20mA option board(s) installed.
- Only present if sensor type is selected as pH.

Figure 8 Main Menu

5.2 Sensor A & B Menus

The sensor menu provides the following settings: Calibration history (informational only), 2 point calibration, 1 point calibration, pH/ORP selection, and other calibration menus. Each is discussed in detail below. Refer to the Sensor Menu chart on the next page.

*Note: If you are programming the unit for the first time, press the **PREV** key once, and set the "Sensor Type" menu first to choose standard pH, antimony pH, or ORP. Then press **PREV** three times to get to the "Use Buffer Rec" menu and choose whether you want to use automatic buffer recognition or not (pH sensors only). Then press **ENTER**.*

Cal'd

Displays the date of the last electrode calibration.

2 Pt Calibration

Press the **ENTER** key to perform a 2 point calibration of the electrode.

Note: 2 point calibration instructions are given in the following order:
pH electrodes, using Auto Buffer Recognition,
pH electrodes, not using Auto Buffer Recognition,
ORP electrodes (Auto Buffer Recognition not available)

2 Pt Calibration for pH electrodes, using Auto Buffer Recognition:

If using manual temperature compensation, the first display will be:

Cal Temp °F/C 68

Use the arrow keys to enter the actual temperature of the buffer solutions. If using automatic temperature compensation, this display will not appear. Press **ENTER** to continue.

Rinse Electrode

Remove the electrode from the process and rinse it off. Press **ENTER** to go to the next step.

First Buffer

This is a prompt to place the electrode in the first buffer. In a few seconds the controller will automatically go to the next step.

1st Buffer 7.00

The top line will show the temperature and the mV output from the electrode.

The bottom line will read "1st Buffer" on the left hand side and either "??.??" or a pH value on the right hand side. If it reads a pH value, that means that it has recognized the buffer solution. Once the buffer value is recognized, it will stop flashing and the mV value will begin flashing. Once this has stabilized, it will stop flashing and go on to the next step.

Sensor A and B Menu

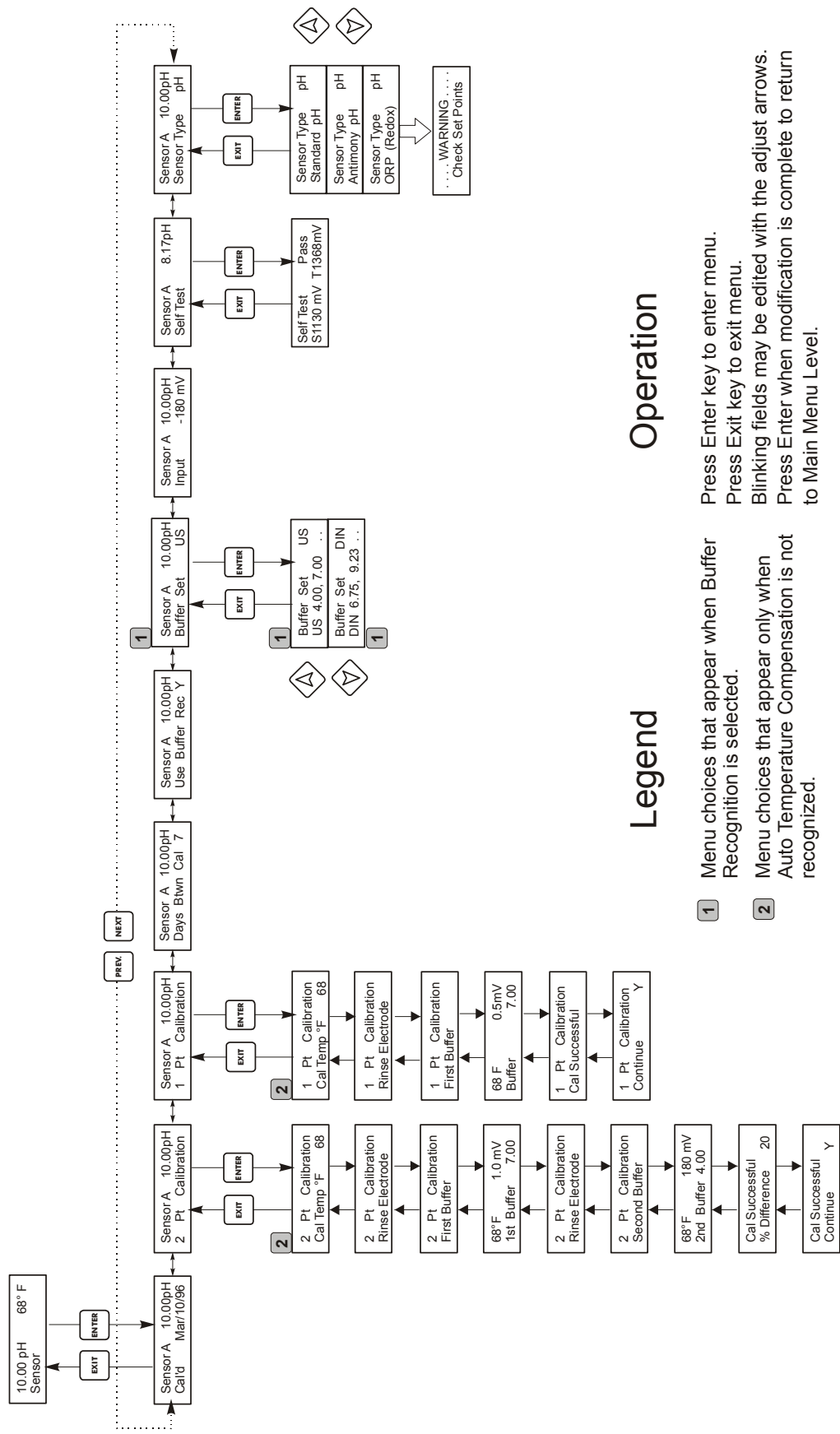


Figure 9 Sensor Menu

Operation

Press Enter key to enter menu.
 Press Exit key to exit menu.
 Blinking fields may be edited with the adjust arrows.
 Press Enter when modification is complete to return to Main Menu Level.

Legend

- 1** Menu choices that appear when Buffer Recognition is selected.
- 2** Menu choices that appear only when Auto Temperature Compensation is not recognized.

If it reads "??.??", that means it hasn't recognized the buffer solution because the mV output of the electrode is too far away from a standard buffer solution's theoretical mV value. If it can't recognize the buffer solution, the controller will beep and display "Unknown Buffer", and then display its best guess. Press **ENTER** to accept that guess, or change the value to the correct one using the arrow keys.

If you press **ENTER** when it reads "??.??", the display will switch to "Buffer Override" and allow you to manually enter the buffer value.

Rinse Electrode

Remove the electrode from the first buffer solution and rinse it off with water. Press **ENTER** to continue.

Second Buffer

Place the electrode in the second buffer solution. The controller automatically advances.

2nd Buffer 4.00

The top line will display the temperature and mV readings, which will blink until they become stable. The bottom line will say "2nd Buffer" on the left hand side, either display the pH of the buffer solution or "??.??" on the right hand side and will go to the next step or display "Unknown Buffer" as in 1st Buffer above.

Cal Successful/Cal Failed

If the electrode response is good, then the display will read "Cal Successful". If the mV output of the electrode did not change enough between the two buffer solutions, it will read "Cal Failed". A failure usually means that the electrode needs to be cleaned, or replaced. It will also display the % difference from the theoretical slope. A failure occurs if the slope is more than 80% different than theoretical. See Troubleshooting Section if calibration failed.

Continue Y

The controller will hold this display until you have replaced the electrode in the process, and press **ENTER**. Control will not begin until **ENTER** is pressed, or 10 minutes go by. If calibration failed, control will begin using old calibration setpoints.

2 Pt Calibration for pH electrodes, not using Auto Buffer Recognition:

If using manual temperature compensation, the first display will be:

Cal Temp °F/C 68

Use the arrow keys to enter the actual temperature of the buffer solutions. If using automatic temperature compensation, this display will not appear. Press **ENTER** to continue.

Rinse Electrode

Remove the electrode from the process and rinse it off. Press **ENTER** to go to the next step.

First Buffer

This is a prompt to place the electrode in the first buffer. In a few seconds the controller will automatically go to the next step.

1st Buffer 7.00

The bottom line will display "1st Buffer" on the left hand side and "7.00" on the right hand side. Use the arrow keys to set the pH value of the 1st buffer, then press **ENTER**. The top line will now show the temperature and the mV input from the electrode. The mV will blink until the

value is stable. The controller will automatically go onto the next step or you may press **ENTER** to go to the next step.

Rinse Electrode

Remove the electrode from the buffer and rinse it off. Press **ENTER** to go to the next step.

Second Buffer

This is a prompt to place the electrode in the second buffer. Again, in a few seconds the controller will automatically go to the next step.

2nd Buffer 4.00

The bottom line will display "2nd Buffer" on the left hand side and "4.00" on the right hand side. Use the arrow keys to set the pH value of the 2nd buffer, then press **ENTER**. The top line will now show the temperature and the mV input from the electrode. The mV will blink until the value is stable. The controller will automatically go onto the next step or you may press **ENTER** to go to the next step.

The controller will go on to the next step once the mV signal is stable.

Cal Successful/Cal Failed

If the electrode response is good, then the display will read "Cal Successful". If the mV output of the electrode did not change enough between the two buffer solutions, it will read "Cal Failed". A failure usually means that the electrode needs to be cleaned, or replaced. It will also display the % difference from theoretical slope. A failure occurs if the slope is more than 80% different than theoretical.

Continue Y

The controller will hold this display until you replace the electrode in the process and press **ENTER**. Control will not begin until **ENTER** is pressed or 10 minutes go by.

2 Pt Calibration for ORP electrodes (no Auto Buffer Recognition available):

Rinse Electrode

Remove the electrode from the process and rinse it off. Press **ENTER** to go to the next step.

First Buffer

This is a prompt to place the electrode in the first buffer. In a few seconds the controller will automatically go to the next step.

Input XX mV

The display will show the mV reading from the electrode. The entire number will blink until the reading is stable, then the display will change to:

Buffer XX

Now you can change the mV value of the buffer, by using the arrow keys and pressing **ENTER**.

Rinse Electrode

Remove the electrode from the buffer and rinse it off. Press **ENTER** to go to the next step.

Second Buffer

This is a prompt to place the electrode in the second buffer. Again, in a few seconds the controller will automatically go to the next step.

Input XXX mV

The display will show the mV reading from the electrode. The entire number will blink until the reading is stable, then the display will change to:

Buffer XXX

Now you can change the mV value of the buffer, by using the arrow keys and pressing **ENTER**.

Cal Successful/Cal Failed

If the electrode response is good, then the display will read "Cal Successful". If the mV output of the electrode did not change enough between the two buffer solutions, it will read "Cal Failed". A failure usually means that the electrode needs to be cleaned, or replaced.

Continue Y

The controller will hold this display until you replace the electrode in the process and press **ENTER**. Control will not begin until **ENTER** is pressed or 10 minutes go by.

1 Pt Calibration

Press **ENTER** to perform a 1 point calibration of the electrode.

Note: 1 point calibration instructions are given in the following order:

- pH electrodes, using Auto Buffer Recognition
- pH electrodes, not using Auto Buffer Recognition
- ORP electrodes (Auto Buffer Recognition not available)

1 Pt Calibration for pH Electrodes, using Auto Buffer Recognition:

If using manual temperature compensation, the first display will be:

Cal Temp °F/C 68

Use the arrow keys to enter the actual temperature of the buffer solutions. If using automatic temperature compensation, this display will not appear.

Rinse Electrode

Remove the electrode from the process and rinse it off. Press **ENTER** to go to the next step.

First Buffer

This is a prompt to place the electrode in the first buffer. In a few seconds the controller will automatically go to the next step.

1st Buffer 4.00

The top line will show the temperature and the mV output from the electrode. These values will blink until they become stable.

The bottom line will read "1st Buffer" on the left hand side and either "??.??" or a pH value on the right hand side. If it reads a pH value, that means that it has recognized the buffer solution. The controller will then go on to the next step.

If it reads "??.??", that means it hasn't recognized the buffer solution because the mV output of the electrode is too far away from a standard buffer solution's theoretical mV value. If it can't recognize the buffer solution, the controller will beep and display "Unknown Buffer", and then display its best guess. Press **ENTER** to accept that guess, or change the value to the correct one using the arrow keys.

If you press **ENTER** when it reads "??.??", the display will switch to "Buffer Override" and allow you to manually enter the buffer value.

Cal Successful/Cal Failed

If the electrode response is good, then the display will read "Cal Successful". If the controller can not calculate an acceptable slope from that mV reading, it will read "Cal Failed". A failure usually means that the electrode needs to be cleaned or replaced.

Continue Y

The controller will hold this display until you replace the electrode in the process and press **ENTER**. Control will not begin until **ENTER** is pressed or 10 minutes go by.

1 Pt Calibration for pH electrodes, not using Auto Buffer Recognition

If using manual temperature compensation, the first display will be:

Cal Temp °F/C 68 Use the arrow keys to enter the actual temperature of the buffer solutions. Press **ENTER** to go on to the next step. If using automatic temperature compensation, this display will not appear.

Rinse Electrode

Remove the electrode from the process and rinse it off. Press **ENTER** to go to the next step.

First Buffer

This is a prompt to place the electrode in the first buffer. In a few seconds the controller will automatically go to the next step.

Buffer 4.00

Use the arrow keys to change the value of the buffer being used, then press **ENTER**.

1st Buffer 4.00

The bottom line will display "1st Buffer" on the left hand side and "4.00" on the right hand side. Use the arrow keys to set the pH value of the 1st buffer, then press **ENTER**. The top line will now show the temperature and the mV input from the electrode. The mV will blink until the value is stable. The controller will automatically go onto the next step or you may press **ENTER** to go to the next step.

Cal Successful/Cal Failed

If the electrode response is good, then the display will read "Cal Successful". If the controller can not calculate an acceptable slope from that mV reading, it will read "Cal Failed". A failure usually means that the electrode needs to be cleaned or replaced.

Continue Y

The controller will hold this display until you replace the electrode in the process and press **ENTER**. Control will not begin until **ENTER** is pressed or 10 minutes go by.

1 Pt Calibration for ORP electrodes (no Auto Buffer Recognition available):

Rinse Electrode

Remove the electrode from the process and rinse it off. Press **ENTER** to go to the next step.

First Buffer

This is a prompt to place the electrode in the first buffer. In a few seconds the controller will automatically go to the next step.

Input 96 mV

The display will show the mV reading from the electrode. The entire number will blink until the reading is stable, then the display will change to:

Buffer 96

Now you can change the mV value displayed to the known value of the buffer, by using the arrow keys and pressing **ENTER**.

Cal Successful/Cal Failed

If the electrode response is good, then the display will read "Cal Successful". If the controller can not calculate an acceptable slope from that mV reading, it will read "Cal Failed". A failure usually means that the electrode needs to be cleaned or replaced.

Continue Y.

The controller will hold this display until you replace the electrode in the process and press **ENTER**. Control will not begin until **ENTER** is pressed or 10 minutes go by.

Days Btwn Cal

Use the arrow keys to set the number of days that you would like to go by before recalibrating the electrode. The controller will prompt you to recalibrate when that time has expired. Setting the number of days to zero will disable this feature.

Use Buffer Rec

Use the Up and Down arrows to toggle between Y (yes) and N (no). If you choose to use automatic buffer recognition, then the controller will recognize which buffer solution the electrode has been placed in. If you choose not to, then you will have to enter the information manually during the 1 or 2 point calibration procedures. Press **ENTER** to accept the choice displayed.

Buffer Set

This menu will only appear if you have decided to use automatic buffer recognition. Press **ENTER** to change the type of buffers that will be used. Use the Up and Down arrows to toggle between US buffers (pH 4, 7 and 10) or DIN standard buffers (pH 6.75, 9.23, etc.) then press **ENTER** to make your selection.

Input

This menu displays the uncalibrated mV from the electrode. It is useful for troubleshooting.

Self Test

Press **ENTER** to perform a self-test. If it says "FAIL" in the upper right hand corner, disconnect the electrode wiring from the terminal strip inside the controller and repeat the self test. If it still says "FAIL," this indicates a problem with the controller which should be returned for repair. If it passes, and you have a problem calibrating, it is an electrode or preamp problem.

Sensor Type

Press **ENTER** to set up the controller to match the type of electrode to be used. Use the Up and Down arrows to toggle between standard pH, antimony pH, and ORP, then press **ENTER** to make your selection. The controller will warn you to check your set points, since all set point values will stay the same even though the units of measure may have changed.

Press any key to clear the warning messages.

5.3 Temperature A & B Menus

(THIS MENU DOES NOT APPEAR IF AN ORP SENSOR HAS BEEN SELECTED)

The temperature menu contains the following settings: Calibrate and Units (if the Pt100 or Pt1000 sensor is detected when the unit is powered on) or Manual Temp and Units (if no temperature sensor is detected at power-up). Refer to the Temperature Menu chart below.

Calibrate

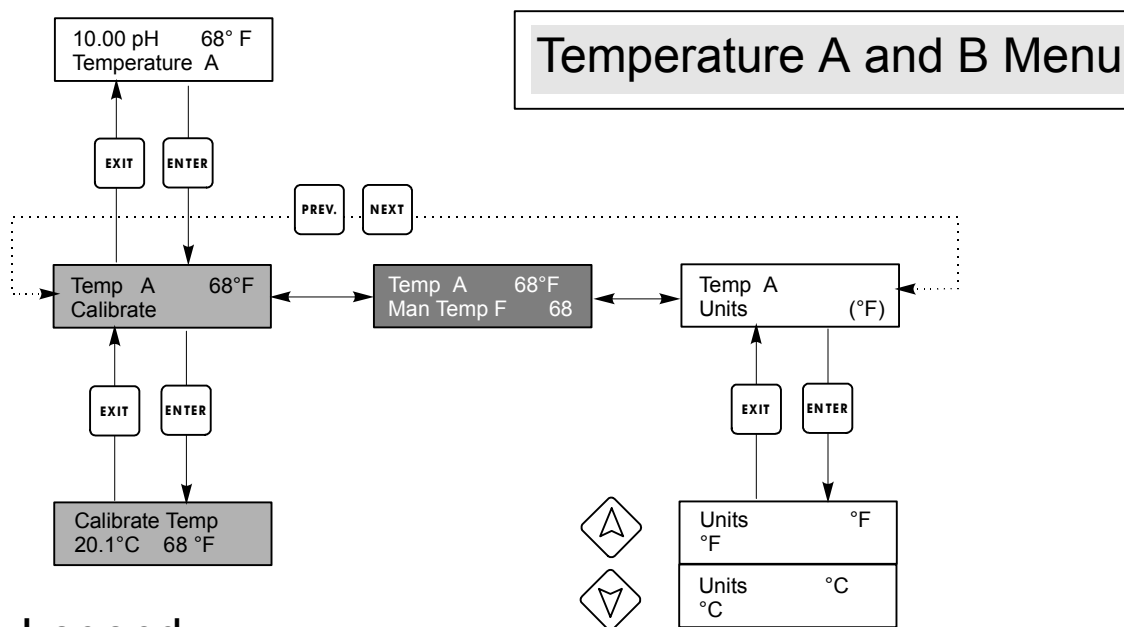
Only appears if a temperature sensor is connected. Press **ENTER** to calibrate the temperature display to match a thermometer. Use the Up or Down keys to adjust the reading, and press **ENTER** to accept the change. Press **EXIT** to exit the calibration.

Man Temp

Only appears if no temperature sensor is connected. Use the Up or Down arrows to set the temperature to match that of the process solution to be controlled.

Units

Press **ENTER** to change the units of measure. Use the Up and Down arrows to toggle between degrees F and C, then press **ENTER** to accept the change.



Legend

- Menu wording that appears when Automatic Temperature Compensation is selected.
- Menu wording that appears when Manual Temperature Compensation is selected.

Figure 10 Temperature Menu

5.4 Control 1-4 Menus for Relay Outputs

The description of the menus for relay outputs will apply to Control 1, 2, 3, and 4 for WDP310 models, to control 3 and 4 for WDP320 models and does not apply at all to WDP340 models.

Control menus are separate from each other but operate in exactly the same way. Each menu provides the following independent settings: Set Point, Dead Band, Time Limit, Interlock, Output Mode, Assign Input, HOA, Set Point, Dead Band, and Time Limit. Certain menus only appear if certain output modes have been selected.

The top level menu status line may display the following messages: Off, Intrlck, Timeout, or a time. "Off" indicates that the output is off. "Intrlck" indicates that a signal from a flow switch or level switch is stopping control and has disabled the control outputs. "Timeout" indicates that the output has been on for longer than the maximum time programmed by the user. The time shows that the output is on, and has been for that amount of time. Refer to the Control menus on the following pages.

NOTE: When programming the unit for the first time, go to the "Assign Input" menu to select which electrode signal will control the output, then go to the "Mode" menu to select how that output will operate. Making these assignments first will bring up the correct menus for the Mode you are using.

Assign Input

Press the **ENTER** key to change the sensor signal which will be used to control the output. Use the arrow keys to toggle between "Sensor A" and "Sensor B". Press **ENTER** to accept the change.

Mode

Press the **ENTER** key to change the mode in which the output will operate. The relays may be a low set point, a high set point, a low alarm, a high alarm, an out-of-range alarm, an in-range output, or a probe wash. Use the arrow keys to scroll through the choices.

Low Set Point

Press **ENTER** when this is displayed to select a low set point. The relay will close when the process value goes below the set point value. The summary screen will display that the output is on. A time limit menu will be available, to prevent runaway control. An Interlock menu will be available to allow you to stop control if flow past the sensor stops.

High Set Point

Press **ENTER** when this is displayed to select a high set point. The relay will close when the process value goes above the set point value. The summary screen will display that the output is on. A time limit menu will be available, to prevent runaway control. An Interlock menu will be available to allow you to stop control if flow past the sensor stops.

Low Alarm

Press **ENTER** when this is displayed to select a low alarm. The relay will close when the process value goes below the set point value. The summary screen will display "Low Alarm". No time limit or interlock features will be available.

High Alarm

Press **ENTER** when this is displayed to select a high alarm. The relay will close when the process value goes above the set point value. The summary screen will display "High Alarm". No time limit or interlock features will be available.

Out Range Alarm

Press **ENTER** when this is displayed to select an out-of-range alarm. The relay will close when the process value is either above or below the two set point values. The summary screen will display "Range Alarm". No time limit or interlock features will be available.

In Range Output

Press **ENTER** when this is displayed to select an in-range output. The relay will close when the process value is between the two set point values. The summary screen will display "In Range Output". No time limit or interlock features will be available.

Probe Wash

Press **ENTER** when this is displayed if you want to use the relay to interrupt control and activate a pump or valve to wash down the electrode. The summary screen will display "Probe Wash".

Time Limit

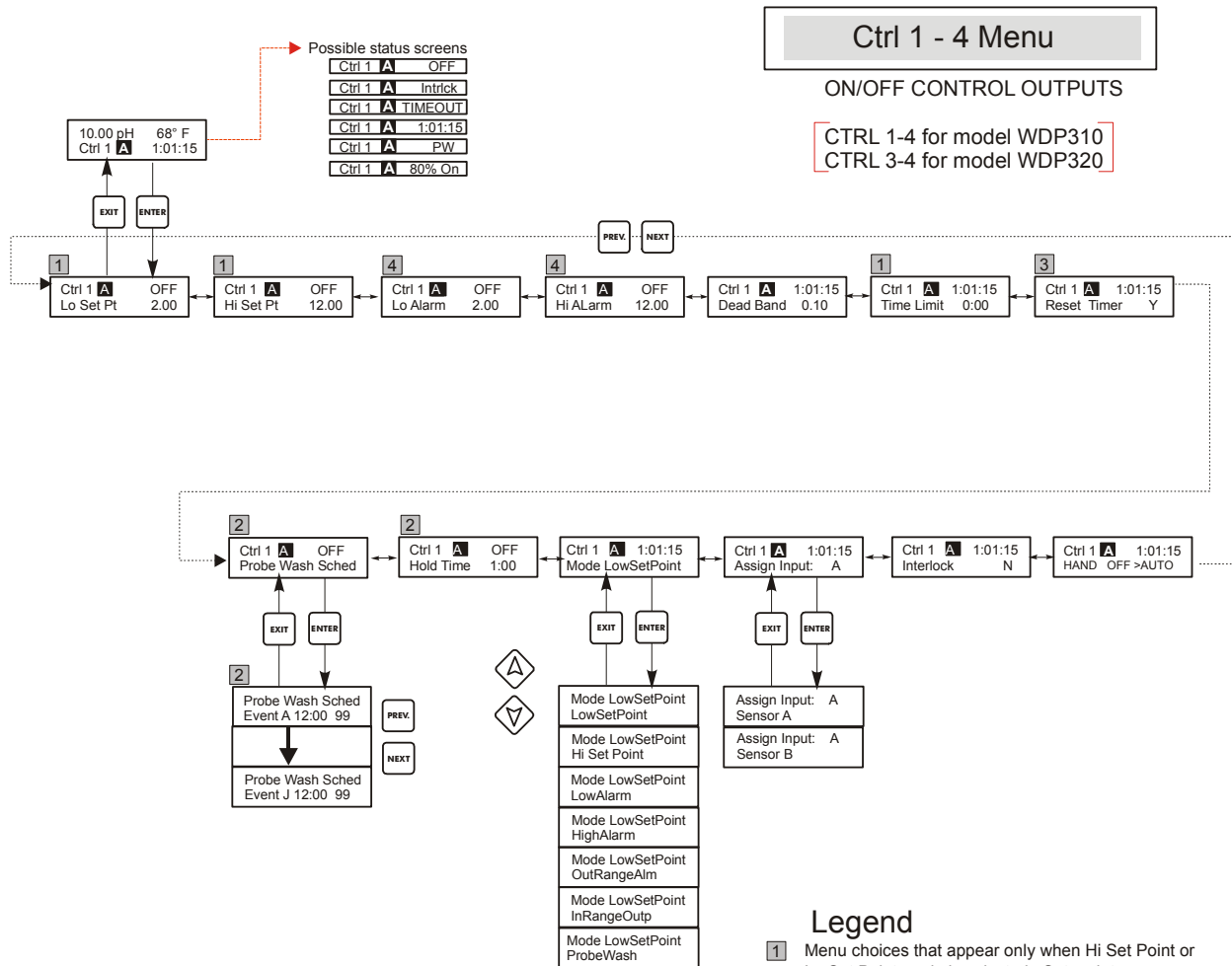
Use the arrow keys to set the time limit (min:sec) for the output to be active, then press **ENTER**. If it is set for "0:00", no limit will be imposed, and the output could stay on forever.

Reset Timer

This menu only appears if the output mode has been selected as a Low Set Point, or a High Set Point and the time limit has expired. Determine the reason that the output stayed on too long, and once the problem has been solved, press **ENTER** to reset the timer.

Interlock

Use the Up and Down arrows to toggle between Y(Yes) and N(No). Choosing Y means that the output will deactivate if the device attached to the controller is open. For example, if the electrode is installed in a recirculating pipe line, a flow switch that is closed if flow is sufficient and open if flow is insufficient may be installed in the line, so that if flow past the electrode stops, the controller will not pump in chemicals based on a stagnant sample. Similarly, a level switch may be attached to prevent control of an empty batch tank.



Operation

Press Enter key to enter menu.
Press Exit key to exit menu.
Blinking fields may be edited with the adjust arrows.
Press Enter when modification is complete to return to Main Menu Level.

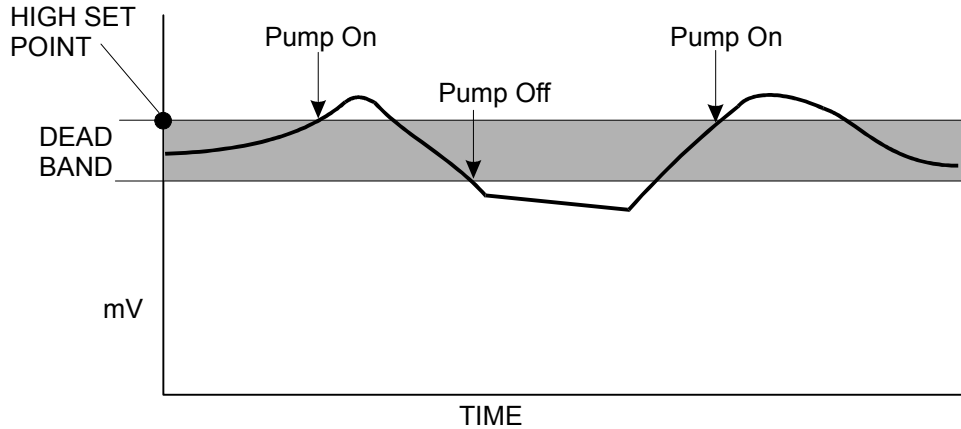
Legend

- 1 Menu choices that appear only when Hi Set Point or Lo Set Point mode is selected. Set points appear as needed depending on output mode (i.e. the Low Set Point does not appear if Hi Set Point mode is selected). Neither set point appears if the Probe Wash mode is selected.
- 2 Menu choices that appear when Probe Wash mode is selected.
- 3 Appears only if limit timer has expired.
- 4 Menus appear only if Hi or Lo Alarm mode or Out of Range or In Range Output is selected. If Hi Alarm mode is selected, only Hi Alarm appears, etc. Both appear if In Range output or Out of Range Alarm is selected.

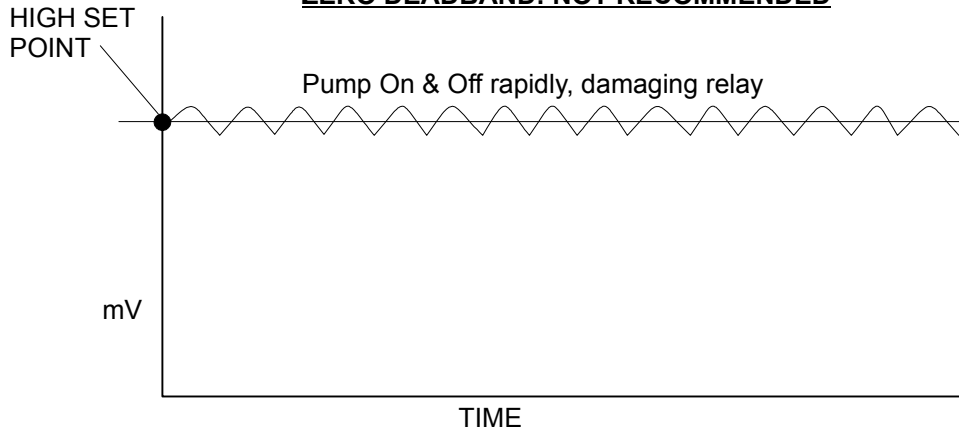
Figure 11 Control 1-4 (ON/OFF) Menu

Dead Band

Use the arrow keys to set the desired dead band, then press **ENTER**. If the set point is pH 7.00, and the dead band is 0.05 pH units, then the relay will close at pH 7.00 and open 0.05 pH units away from 7.00.



ZERO DEADBAND: NOT RECOMMENDED



Probe Wash Sched

This menu only appears if the output mode has been selected as a Probe Wash.

Press **ENTER** to program the probe wash schedule. The display will be "Event A 00:00 00". The first numbers are the time of day, in military time, when the probe wash will take place. The last two numbers are the time, in seconds, that the relay will be closed and the pump or valve attached to the relay will clean the probe. Use the arrow keys to change the time of day and the duration of the cleaning. When both values are set, press **ENTER**.

If the electrode needs to be washed more than once a day, additional events may be accessed by pressing the NEXT key. Once all events are programmed, press **EXIT** to return to the top level menus.

Hold Time

This menu only appears if the output mode has been selected as a Probe Wash.

Use the arrow keys to select the time delay in seconds between the probe wash ending and control beginning again. The hold time can be a maximum of 99 seconds. During the hold time, the summary display will indicate “Probe Wash Hold”.

HOA

Use the Left and Right arrows to move between Hand, Off and Auto. In Hand (Manual) mode, the output will be turned on immediately for a maximum of 10 minutes. In the Off mode, the output will be turned off indefinitely. In the Auto mode, the output turns on and off in response to changes in the process value relative to the set point. The letter inside the block on the status screen indicates which mode the output is in.

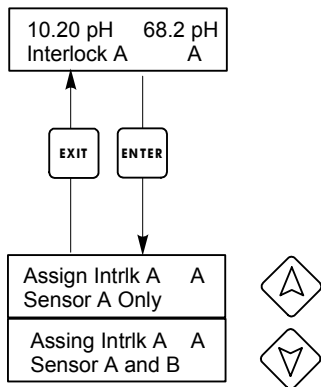
Low Set Point

Press **ENTER** if you want the Control relay to close if the process goes below a certain value. The status screen message will be Output ON. This denotes a normal correction of the process value. If you want the status message to be Low Alarm, indicating a problem, choose an Output Mode of Low Alarm as described below.

High Set Point

Press **ENTER** if you want the Control relay to close if the process above a certain value. The status screen message will be Output ON. This denotes a normal correction of the process value. If you want the status message to be High Alarm, indicating a problem, choose an Output Mode of High Alarm as described below.

Interlock A Menu



Operation

- Press Enter key to enter menu.
- Press Exit key to exit menu.
- Blinking fields may be edited with the adjust arrows.
- Press Enter when modification is complete to return to Main Menu Level.

Figure 12 Interlock A Menu

5.5 Interlock A Menu

The Interlock A menu is used to assign an interlock device to the appropriate sensor. An interlock device is an external monitoring sensor like a flow or level switch that serves to deactivate control outputs when activated. For example, this could be used to prevent the controller from pumping chemicals based on a stagnant sample.

The WDP controller can support up to two interlock devices. Refer to Figure 4 or 5 for a wiring illustration. A typical setup would use one flow switch for sensor A and one for sensor B and they would function independently. This is the default setting and describes operation when **Sensor A Only** is selected in this menu.

However, in some applications it is desirable to have one interlock device assigned to both sensor A and B. For example, if you have both sensors mounted in the same sample stream, then a flow switch input could be used to disable control for both sensors. This describes the operation when **Sensor A and B** is selected in this menu. *Note: If this type of operation is desirable, the single interlock device must be connected to the Sensor A input as illustrated in Figures 4 or 5.*

To make a selection, press **ENTER** at the Interlock A menu. Use the UP or Down keys to toggle between **Sensor A Only** and **Sensor A + B**. Press **ENTER** again when the desired choice is displayed to change the selection. Press **EXIT** to return to the higher level menu.

5.6 Control 1-4 Menu for Pulse Proportional Outputs

The description of the menus for pulse proportional outputs applies to Control 1-4 in WDP340 models, Control 1 and 2 for WDP320 models and does not apply to WDP310 models.

The Control menus are separate from each other but operate in exactly the same way. Each menu provides the following independent settings: Set Point, Prop Band, Control Direction, Min SPM Rate, Max SPM Rate, Time Limit, Interlock and HOA.

The top level menu status line may display the following messages: Off, Intrlck, Timeout or SPM. "Off" indicates that the output is off. "Intrlck" indicates that the output would be on but is not because of a signal from a flow switch or level switch is stopping control. "Timeout" indicates that the output has been on for longer than the maximum time programmed by the user. The SPM display shows the stroke rate of the pump. Refer to the Control menu on the previous pages.

Note: When programming the unit for the first time, go to the Assign Inputs Menu to select which electrode signal will control the output.

Assign Input

Press the **ENTER** key to change the sensor signal which will be used to control the output. Use the arrow keys to toggle between Sensor A and Sensor B. Press **ENTER** to accept the change

Set Point

Use the arrow keys to adjust the display to read the desired set point value. Press **ENTER** to accept the change.

Prop Band

Use the arrow keys to adjust how far away from the set point the process value must get before the pump is stroking at the maximum rate. For example, if the set point is 6.00 pH, and the proportional band is 0.5, then the pump will stroke at its maximum rate when the pH is 0.5 units away from the set point (see Figure on the next page).

Control Dir

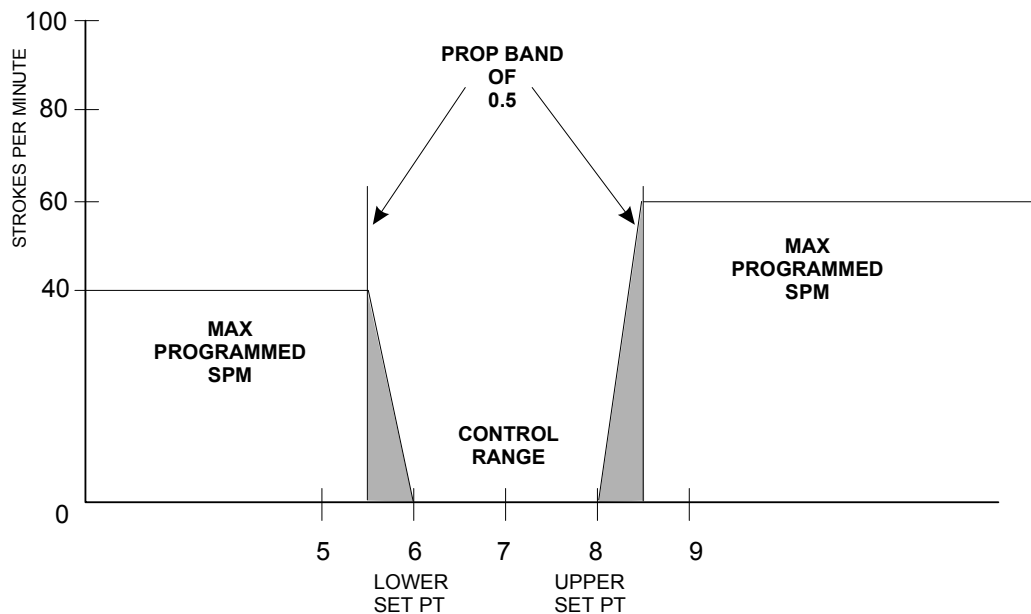
Press **ENTER** to change the direction of control, then use the Up and Down arrows to toggle between High Set Point and Low Set Point, and press **ENTER** to make your choice. A high set point will turn on the relay when the process value goes over the set point value (to add an acid, or reducing agent, or as a high alarm). A low set point will turn on the relay when the process value goes below the set point value (to add an alkali, or oxidizer, or as a low alarm). The further away from the set point the process value gets, the faster the pump will stroke.

Min SPM Rate

Use the arrow keys to set the minimum stroke rate of the pump. If you want to stop when the set point has been reached, enter 0. If you need the pump to run at a certain rate regardless of the set point, enter that stroke rate. This may be useful in once-through control schemes.

Max SPM Rate

Use the arrow keys to enter the maximum stroke rate of the pump. This may be the maximum that the pump is capable of, or it may be less if the pump is oversized for your application, but it can NOT be higher than the pump is capable of, or the pump will not stroke at all.



Time Limit

Use the arrow keys to set the time limit (min:sec) for the output to be active, then press **ENTER**. If it is set for "0:00", no limit will be imposed, and the output could stay on forever.

Reset Timer

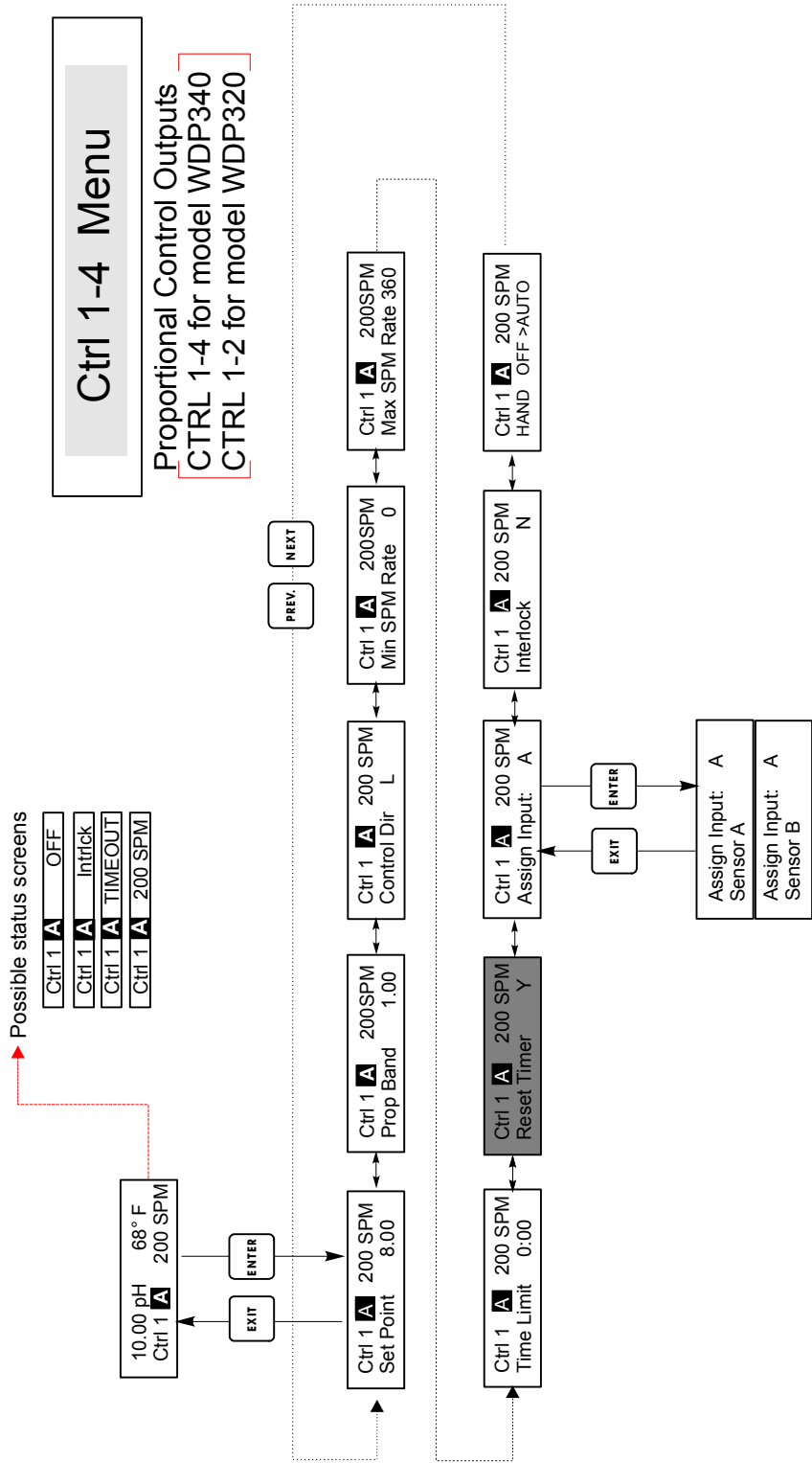
This menu only appears if the output mode has been selected as a Low Set point or a High Set Point and the time limit has expired. Determine the reason that the output stayed on too long, and once the problem has been solved, Press **ENTER** to reset the timer.

Interlock

Use the Up and Down arrows to toggle between Y(Yes) and N(No). Choosing Y means that the output will deactivate if the device attached to the controller is open. For example, if the electrode is installed in a recirculating pipe line, a flow switch that is closed if flow is sufficient and open if flow is insufficient may be installed in the line, so that if flow past the electrode stops, the controller will not pump in chemicals based on a stagnant sample. Similarly, a level switch may be attached to prevent control of an empty batch tank.

HOA

Use the Left and Right arrows to move between Hand, Off and Auto. In Hand (Manual) mode, the output will be turned on immediately at the maximum programmed rate for a maximum of 10 minutes. In the Off mode, the output will be turned off indefinitely. In the Auto mode, the output turns on and off in response to changes in the process value relative to the set point. The letter inside the block on the status screen indicates which mode the output is in.



Operation

- Press Enter key to enter menu.
- Press Exit key to exit menu.
- Blinking fields may be edited with the adjust arrows.
- Press Enter when modification is complete to return to Main Menu Level.

Legend


 Appears only if limit timer has expired.

Figure 13 Control 1-4 (Proportional Menu)

5.7 4-20 mA 1 and 2 Menus (Optional)

These menus will only appear if one or more optional 4-20 mA output boards are installed. They are used to set the scale of the 4-20 mA output. They contain the following menu selections: 4 mA Point, 20 mA Point, and Calibrate.

Note: When programming the controller for the first time, first go to the Assign Inputs Menu, then program the other menus.

Assign Inputs

Press **ENTER** to assign the 4-20 mA output to a sensor input. The input could be either the pH/ORP signal, or for the pH controllers, the temperature signal. Use the arrow keys to scroll through the choices. Press **ENTER** when the desired choice is displayed.

4 mA Pt

Use the arrow keys to enter the process value (in either pH units, temperature units, or mV if ORP) that you want to correspond to a 4 mA output from the controller.

20 mA Pt

Use the arrow keys to enter the process value (in either pH units, temperature units, or mV if ORP) that you want to correspond to a 20 mA output from the controller.

Calibrate

This menu is used to calibrate instruments connected to the mA output. The 4-20 mA output is extremely accurate and stable and therefore will never need calibration. This feature allows other devices to be calibrated at the 4 and 20 mA points. Press **ENTER** to start the calibration.

Fixed 4 mA Out

The controller will output 4.00 mA. Adjust the chart recorder or data logger per its instruction so that the process value displayed is what is expected for a 4.00 mA input.

Fixed 20 mA Out

As above, except that the controller will output 20.00 mA.

The design of the 4-20 mA output is such that it should never need calibration. If the mA signal is not what it should be, call the factory for service.

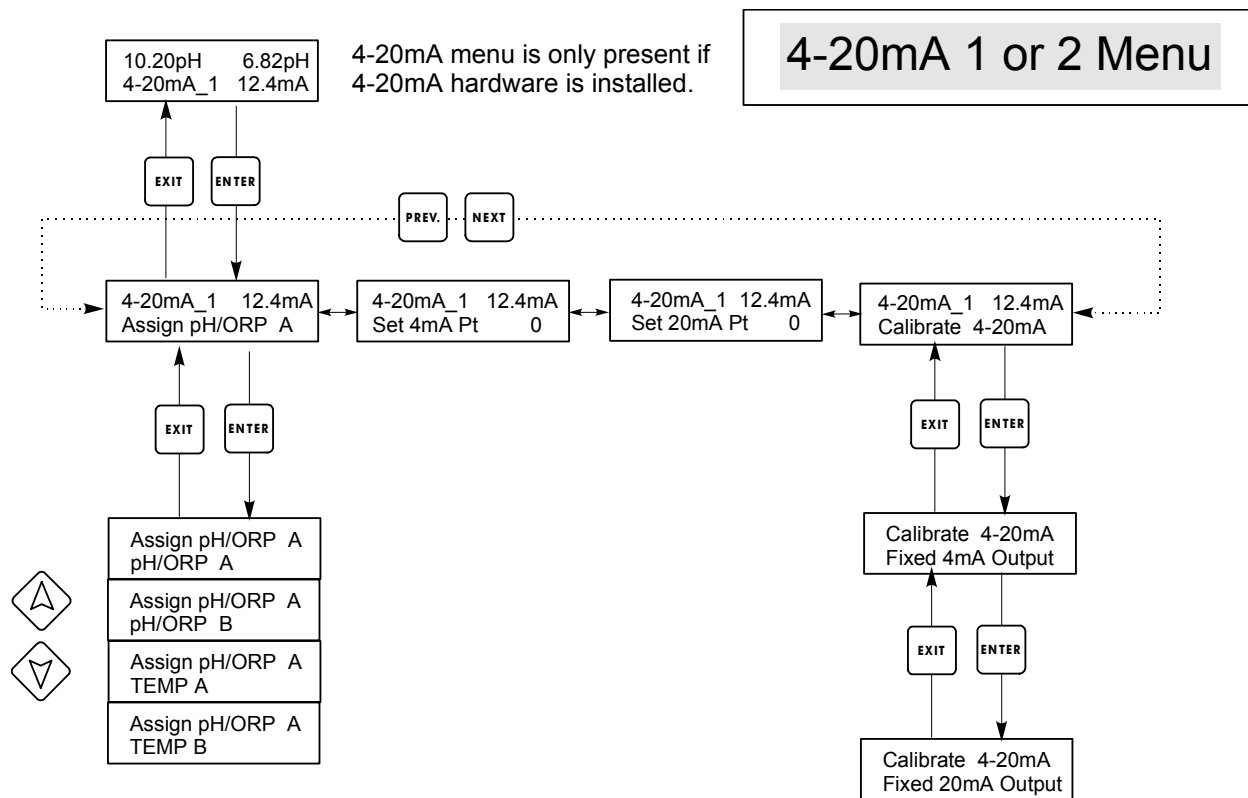


Figure 14 4-20 mA 1 & 2 Menus

5.8 Clock Menu

The clock menu is used to set the date and time that the controller uses to schedule probe washing and calibration prompts. There is only one menu selection: Set Clock.

Set Clock

Press **ENTER** to set the clock. Use the arrow keys to change the year, date, and month, then press **ENTER**. Use the arrow keys again to set the day of the week and the time. Use military time (for example, 1:00 PM is 13:00). Press **ENTER** to return to the top level clock menu.

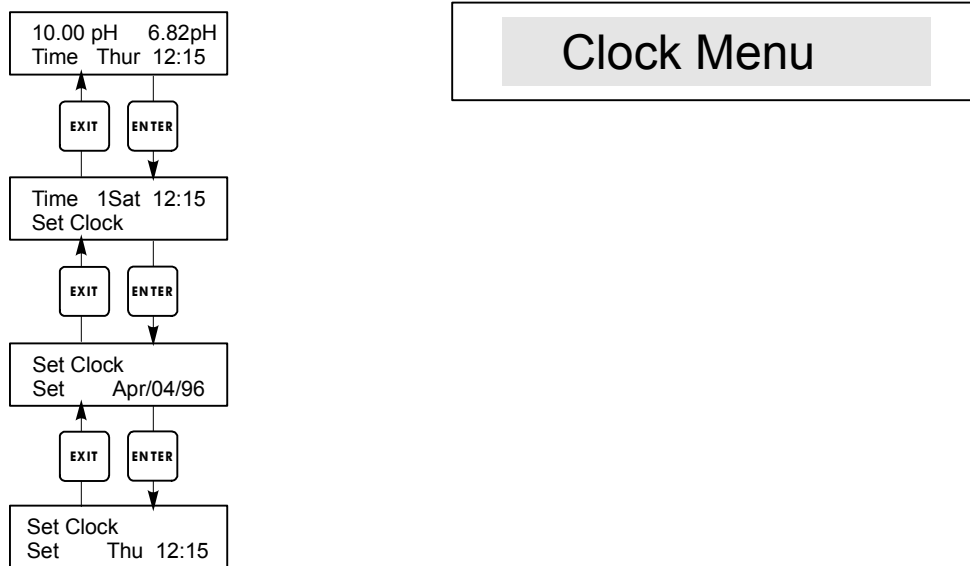


Figure 15 Clock Menu

5.9 Access Code Menu

This menu determines whether the access code feature of the controller is enabled or disabled and allows you to customize the access code to your own value. The access code controls whether or not you are allowed to change the parameters in the controller. With the access code disabled, any user may change any parameter. With the access code enabled, any user can view any parameter, but cannot change them.

Once an attempt is made to change a parameter, the display will prompt the user to enter the access code. If the correct code is entered, the parameter can be changed. (If the cursor is blinking, a change will be allowed; if the number or words are not blinking, they can't be changed). Once the correct access code has been entered, it will remain valid until there is a period of 10 minutes without a key being pressed.

Possible status screens are: Access Code REQ, Access Code OK, and Access Code DIS.

The first indicates that the access code is required to alter settings. The second indicates that the access code is required and has been entered correctly, and the last indicates that the access code has been disabled.

Enable Y/N

Use the arrow keys to select Y(Yes) or N(No) and press **ENTER** to enable or disable the access code. If the code was enabled, you must enter the access code in order to disable it.

New Access Code

Press **ENTER** to display the current access code value and use the arrow keys to change it to any value between 0 and 9999. If the access code has been enabled, you will be prompted to enter the current access code before being allowed to change it.

The factory default access code is 1995.

If you change the access code and can't remember it, follow this procedure:

1. Turn off the power to the controller.
2. Wait 10 seconds.
3. Press and hold the Up and Down arrow keys while turning on the power.
4. Read the access code on the display.
5. Release the arrow keys and the code will disappear.

Access Code Menu

Any Top Display
Access Code 0000

The Access Code prompt may appear at any screen in the entire menu structure if the current access code has not been entered by the user. Access code entries will be valid for 10 minutes from the most recent key press.

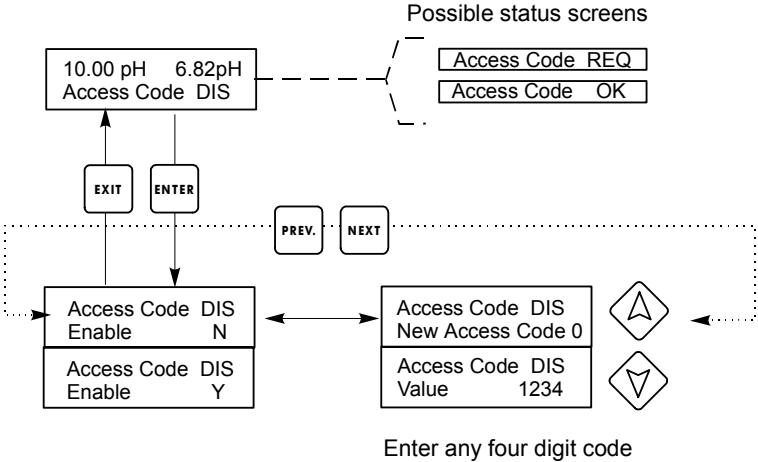


Figure 16 Access Code Menu

6.0 Maintenance



The WDP control module itself needs very little maintenance. Clean the outside of the controller enclosure with a damp cloth. Do not spray down the controller unless the enclosure door is closed and latched. "Pigtails" should be protected from spray or washdown. Check the cords and cables for damage.

6.1 Electrode Maintenance

The pH or ORP electrodes require periodic cleaning and calibration. These electrodes are like batteries and their voltage outputs will change with time even if they are not being used. After installation, the rate of change increases, and factors such as temperature, extremes of pH, abrasion and chemical attack will increase the required frequency of calibration. If the process solution contains oils, scale or other solids, the electrode surfaces will tend to coat, its response time will slow down and cleaning will be required.

The frequency of cleaning and calibrating will vary greatly depending upon the application, the factors listed above, as well as the accuracy of control you require. The best way to determine the optimum number of days between calibrations is to remove the electrode from the process periodically (weekly in clean water applications, daily in dirty or hot applications) and check its accuracy in a buffer solution. If using manual temperature compensation, remember to change the temperature from that of the process to that of the buffer. If the accuracy of the reading is within your required tolerances, and the speed of response is good, replace the electrode in the process. If not, clean the electrode and perform a two point calibration.

The method of cleaning the electrode will depend upon the coating, as well as the materials of construction of the electrode. Do not use a solvent that will attack the electrode! Care must be taken to avoid scratching the pH electrode's glass, as this will shorten its life. An ORP electrode's platinum surface may be cleaned with 600 grit silicon carbide paper, jewelers rouge or very fine steel wool.

Oily coatings should be removed with a mild detergent or isopropyl alcohol. Hard scales such as calcium carbonate can usually be removed with a dilute hydrochloric acid solution. Soft coatings can be removed using a soft cloth or soft toothbrush.

A two point calibration should always be performed after cleaning the electrode.

Because the electrode signal is so sensitive, the condition of the cable and connectors between the electrode, preamplifier and controller is critical. Make sure that all electrical connections stay clean and dry. Never splice the cable prior to preamplification. Replace the cable if there is any sign of damage.

6.2 Replacing the Fuses

CAUTION: Disconnect power to the controller before opening front panel!

Locate the fuses on the circuit board at the back of the controller enclosure. (See figure 3.) Gently remove the old fuse from its retaining clip and discard. Press the new fuse into the clip, secure the front panel of the controller and return power to the unit.

Warning: Use of non-approved fuses can affect product safety approvals. Fuse ratings depend on controller power rating. Specifications are shown below. To insure product safety certifications are maintained, it is recommended that a Walchem fuse is used.

Controller Rating	F1	Walchem PN	F2	Walchem PN
120 VAC	5 x 20 mm,0.125A,250V	102369	5 x 20 mm,10A,125V	102432
240 VAC	5 x 20 mm,0.063A,250V	103363	5 x 20 mm, 5A, 250V	102370

7.0 Troubleshooting



CAUTION: Disconnect power to the controller before opening front panel!

Troubleshooting and repair of a malfunctioning controller should only be attempted by qualified personnel using caution to ensure safety and limit unnecessary further damage. Contact the factory.

7.1 Error Messages

Calibration Time

This message appears to prompt you to perform the routine maintenance of cleaning and calibrating the electrode. It does not appear based upon any analysis of the condition of the electrode. The frequency of calibration is set by the user in the "Days Between Cal" menu found in the "Sensor" menu. If you do not want to be prompted to perform a calibration, set this menu to "0".

Output Timeout

This error message appears if one of the control outputs has been on longer than the maximum amount of time programmed in the "Time Limit" menu found in the "Control" menus. It is reset by answering "Yes" to the "Reset Timer" prompt that will appear. There are a number of possible reasons that the output could go on for longer than normal:

Possible Cause

1. The process went further out of control than normal.
2. The chemical supply has run out.
3. The pump or valve or supply line is faulty.

Corrective Action

1. Increase time limit or reset timer.
2. Replenish the chemical supply.
3. Repair or replace the control device.

- | | |
|--|--|
| 4. Wrong chemical is being controlled. | Replace with correct chemical. |
| 5. The electrode is not responding to changes. | Replace electrode, cable or preamplifier.
Evaluate mixing or recirculation. |

High Alarm

This error message appears if the pH/ORP reading exceeds the set point for one of the Control outputs that has been configured as a high alarm output. There are a number of possible causes for this condition:

Possible Cause	Corrective Action
1. The process went further out of control than normal.	May have to increase chemical flow rate.
2. The chemical supply has run out.	Replenish the chemical supply.
3. The pump or valve or supply line is faulty.	Repair or replace the control device.
4. Wrong chemical is being controlled.	Replace with correct chemical.
5. The electrode is not responding to changes.	Replace electrode, cable or preamplifier. Evaluate mixing or recirculation.
6. The pump is siphoning, valve leaking.	Repair or replace the control device or re-route tubing.
7. Control output has been left in "HAND" mode.	Switch back to "AUTO".
8. It may be a normal part of the process.	None required.

Low Alarm

As above for "High Alarm", except that the pH/ORP reading is below the set point of one of the Control outputs that has been set up as a low alarm output. Refer to the possible causes and corrective actions listed above for the "High Alarm" error message.

Out Range Alarm

This error message appears if the pH/ORP reading is outside of the range selected for one of the Control outputs that has been programmed as an "Out of Range Alarm". Refer to the possible causes and corrective actions listed above for the "High Alarm" error message.

In Range Output

This error message appears if the pH/ORP reading is inside of the range selected for one of the Control outputs that has been programmed as an "In Range Alarm". Refer to the possible causes and corrective actions listed above for the "High Alarm" error message.

Temp Error

This error message appears if the signal from the automatic temperature compensation element disappears during operation. It is usually caused by a failure of the platinum RTD, or by a problem with the cabling or connections of the cable.

The Pt1000 RTD should read 1000 ohms at 0°C and 3.85 ohms/degree C above zero. At 25°C it should read 1096.25 ohms ±1%. A higher reading or open circuit (infinite resistance) may indicate a bad connection. A lower reading may indicate a shorted cable.

Measure the resistance at each connection between the sensor and the controller to determine if the sensor, cabling or connections are faulty.

Probe Error

This error message appears if the pH/ORP input signal is outside of the normal range. This usually indicates that the electrode has been disconnected or is faulty. It could appear under normal conditions if the pH is outside of the operating range of -2 to 16pH, or if the ORP is outside of the normal range of ±1450 mV.

Possible Cause

1. Controller is faulty; fails self test (see section 5.2)
2. Preamplifier has no power to it.
3. Preamplifier is faulty.
4. Electrode is faulty

Corrective Action

- Return for repair.
- If battery powered preamp, replace battery. If preamp is powered by our controller, check +5V, -5V terminals vs COM terminal. Should read +5VDC ±5% and -4.6 VDC ± -5%.
- Indicated if ±5VDC power out of spec w/preamp attached, but in spec without preamp attached. Repair or replace preamp.
- Replace electrode.

Interlock

This error message indicates that control has been stopped because the closed contact signal from a flow switch or level switch is now open and one or more control outputs have been programmed to interlock.

Possible Cause

1. Flow has stopped, level too low.
2. Flow, level switch disconnected.
3. Flow, level switch faulty.
4. Controller faulty.

Corrective Action

- May be a normal condition, otherwise restore flow or level.
- Reconnect.
- Verify that switch closes using an ohmmeter. If not, repair or replace.
- Verify that error message disappears if controller flow switch input is shorted. If not, repair controller.

Check Set Points

This is a normal display if you have changed the choice of sensor from pH to ORP or vice versa. The default set points for each choice is different, and will not match what you need for your application. Always select the sensor type before setting the control or auxiliary output set points.

8.0 Service Policy



The WDP Series pH/ORP Controller has a 2-year warranty on electronic components and a 1-year warranty on mechanical parts (keypad, terminal strip and relays).

We stock circuit boards for immediate exchange after we have isolated the cause of the problem.

Factory authorized repairs that are received by next-day-air will be returned within 24 hours. Normal priority for returns is two weeks.

Out of warranty repairs or circuit board exchanges are done on a flat fee basis after the warranty is expired.