WellTender & WellTender II
Operator's Guide

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CONGRATULATIONS!

You have purchased the most reliable, easy to use plunger lift controller on the market! Plus, your new WellTender and WellTender II controller is loaded with exceptional options that will let you optimize your well quickly.

The key to the WellTender and WellTender II controller is its easy scroll through programming. Intermit or plunger lift your well without the complexity of other controllers. There are no modes to select. Just program the functions that you want to use. The remaining options stay in the background until you want to use them.

WellTender controllers recognize signals from all brands of electronic and magnetic plunger sensors to boost production. Where most ON-OFF controllers do not differentiate the gas sales time, the WellTender controller comes with the DELAY time feature to increase your gas sales. To further optimize production, use the WellTender II controller's plunger travel time history, to zero-in on the exact CLOSE and DELAY times that are best for your well.

All WellTender controllers are easy to use. They count down time so that you will know exactly how much time remains in a cycle. Add a simple pressure switch and you can plunger lift your well using pressure for turn-on and shut-in. Use the powerful FALL time feature with the pressure switch to guarantee that your plunger gets to bottom. Connect two pressure switches for differential turn-on or add a tank level switch to protect your location from production spills.

Fine-tune your operations with the WellTender II. The WellTender II controller's second valve option ensures that the liquid load is removed every time. If the plunger doesn't surface, use the BACKUP feature to provide extra time to pressure up the well for the next plunger run.

Reliable, easy to use with powerful options and value priced. WellTender: Lifting your profits!

ELECTRONIC INSTALLATION

This section shows how to connect the battery, solar panel, internal shift valve, and sensor to the controller. If you are using an external shift valve or a pressure switch, this section shows how to connect them, too.

WellTender II

This symbol highlights the special features of the WellTender II controller.

Open the Controller

1 Remove the 4 screws on the controller's faceplate.

See Figure 1.

2 Pull the faceplate forward.

3 Remove the *Quick Start* card, which is inside the controller box.

You can use either the *Quick Start* card or this *Operator's Guide* to install the controller.

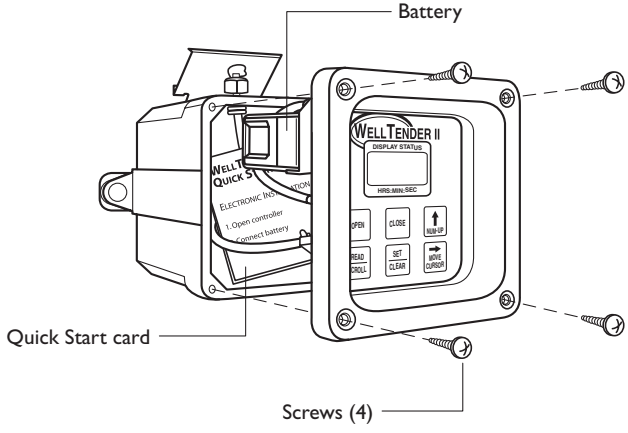


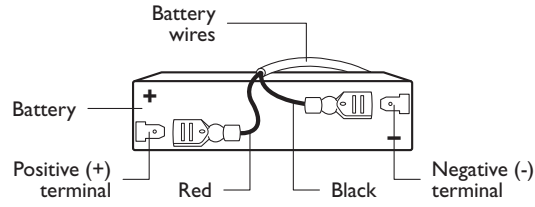
Figure 1: *Opening the controller*

Connect the Battery

The battery bracket is attached to the electronics board. See Figure 1 on page 4.

1 Locate the battery's positive and negative terminals. The positive terminal has an embossed plus (+). The negative terminal has an embossed minus (-).

The figure shows the negative terminal on the right side and the positive terminal on the left side. The terminals on your battery may match the figure, or they may be on the opposite sides.



2 Connect the red battery wire to the positive (+) terminal.

Use the battery clasps that are provided.

☛ **Tip!** You can connect the battery clasps easier if you slide the battery part-way out of its metal bracket.

3 Connect the black battery wire to the negative (-) terminal.

Use the battery clasps that are provided.

Now make sure that the red and black battery wires are connected to the electronics board.

4 Rotate the face of the controller down so you can see the terminal blocks and controller wiring.

The red battery wire should be connected to the +BAT terminal, and the black battery wire should be connected at the GND terminal next to +BAT.

See Figure 2 on page 6.

Check the Solar Panel Connections

The solar panel and battery are connected to the same terminal block.

1 The red wire from the solar panel should be connected to the +SOLAR terminal. See Figure 2.

2 The black wire should be connected to the GND terminal next to +SOLAR.

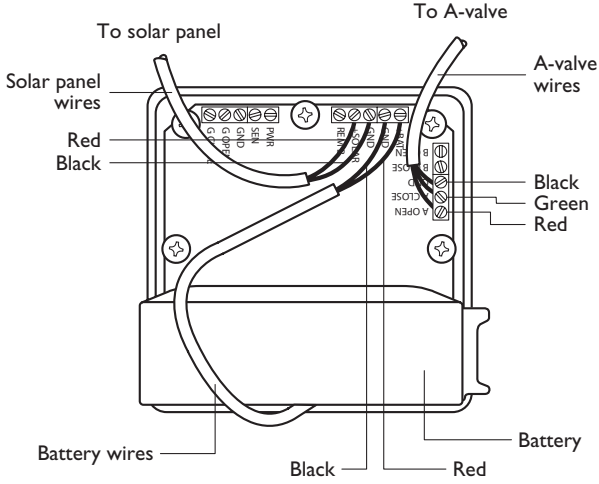


Figure 2: *Check battery, solar panel, and A-valve connections*

Check the Internal Shift Valve (A-Valve) Connections

The internal shift valve (A-valve) should be connected to the terminal block labeled A OPEN and B OPEN at each end. See Figure 2.

1 The red wire from the internal shift valve should be connected to the A OPEN terminal.

2 The green wire should be connected to the A CLOSE terminal.

3 The black wire should be connected to the GND terminal next to the A CLOSE terminal.

Check How the Terminals Work

The controller has "Jaws type" wire connections or terminals. Each terminal block has 5 terminals.

With the terminal screw in the up position, the terminal connector is open. As you screw the connector down, it closes upon the wire. **Clamp the connector on the bare wire.** Don't clamp it on the insulating material.

☛ **Tip!** Before you wire the controller, check how the terminals work by opening and closing a screw on a terminal that isn't connected to a wire.

Connect the Electronic Sensor

There are 2 ways to connect the electronic sensor to the controller, depending on sensor type.

2 Lead Wire Sensor

1 Feed the 2 lead cable through the grommet, which is on the bottom of the controller. See Figure 3.

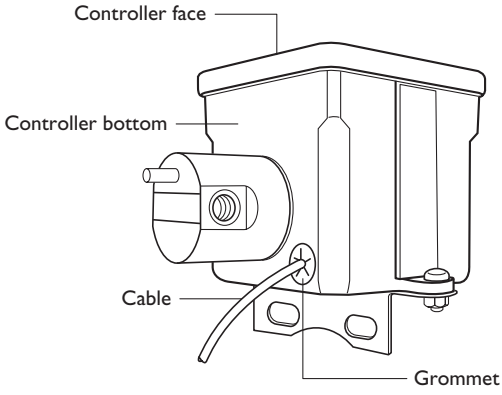


Figure 3: *Feeding the cable through the grommet*

2 Connect the signal wire to the SEN terminal. See Figure 4 on page 8.

3 Connect the ground wire to the GND terminal next to SEN.

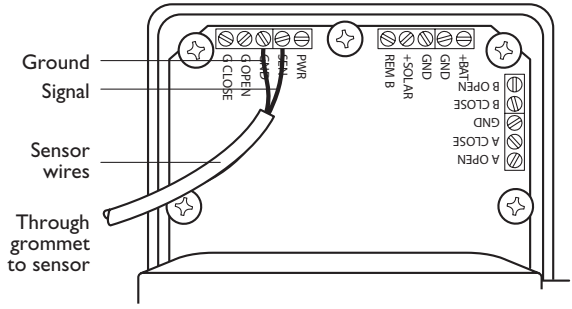


Figure 4: *Connect 2 lead wire sensor*

3 Lead Wire Sensor

1 Feed the 3 lead cable through the grommet. See Figure 3 on page 7.

2 Connect the signal wire to the SEN terminal. See Figure 5.

3 Connect the positive wire to the PWR terminal.

4 Connect the ground wire to the GND terminal next to SEN.

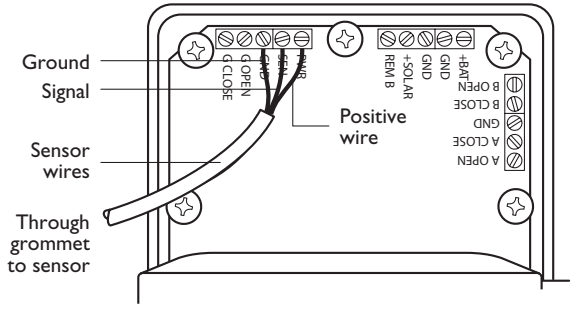


Figure 5: *Connect 3 lead wire sensor*

Optional Dual-Valve Operation: Connect the External Shift Valve (B-valve)

WellTender II

The WellTender II controller supports dual-valve operation. There are 2 ways to connect the external shift valve (B-valve), depending on the type of B-valve.

- The B-Valve Kit (part # WTCXSN0) is for connecting to controllers within 100 feet of the B-valve.
- The B-Valve Booster Kit (part # WTCXSP0) is for connecting to controllers more than 100 feet away.

B-Valve for Connecting to Controller within 100 Feet

These instructions are for the B-Valve Kit, part # WTCXSN0.

1 Feed the 3 lead cable from the external shift valve (B-valve) through the grommet on the bottom of the controller box. See Figure 3 on page 7.

The external shift valve connects to the terminal block labeled A OPEN and B OPEN at each end. See Figure 6.

2 Connect the red wire from the external shift valve to the B OPEN terminal.

3 Connect the green wire to the B CLOSE terminal.

4 Connect the black wire to the GND terminal between the B CLOSE and A CLOSE terminals. This GND terminal should now have 2 black wires connected to it.

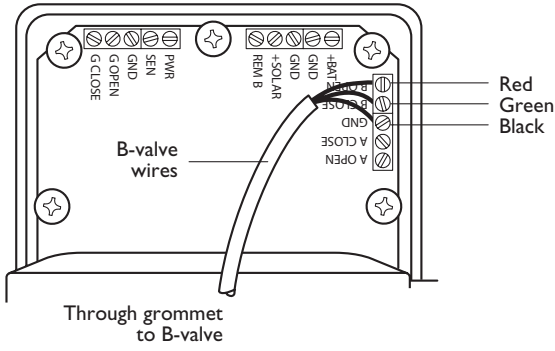


Figure 6: *Connect B-valve (Kit # WTCXSN0) for controller within 100 feet*

B-Valve for Connecting to Controller more than 100 Feet away

These instructions are for the B-Valve Booster Kit, part # WTCXSP0.

1 Feed the 2 lead cable from the external shift valve (B-valve) through the grommet on the bottom of the controller box. See Figure 3 on page 7.

The external shift valve connects to the terminal block labeled REM B and +BAT at each end. See Figure 7.

2 Connect the external shift valve's signal wire to the REM B terminal.

3 Connect the ground wire to either of the GND terminals on the same terminal block. The GND terminal that you selected should now have 2 wires connected to it.

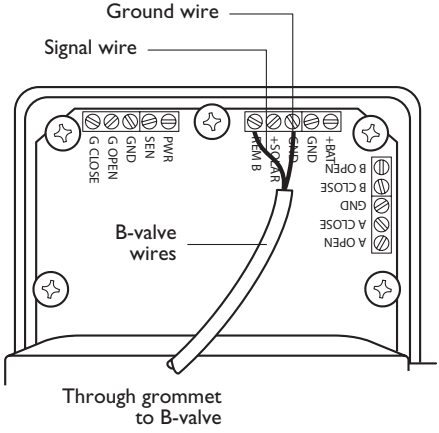


Figure 7: *Connect B-valve (Booster Kit # WTCXSP0) for controller more than 100 feet away*

Optional: Connect an Additional Switch

The controller can operate with the input from additional switches such as a pressure switch.

1 Feed the 3 lead cable from the switch through the grommet. See Figure 3 on page 7.

2 Connect the 3 wires to the G OPEN terminal, the G CLOSE terminal, and the GND terminal next to G OPEN. See Figure 8.

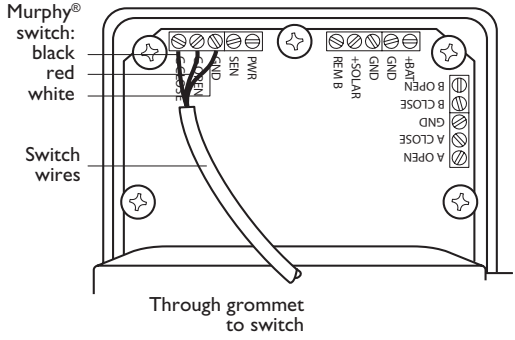


Figure 8: *Connect an additional switch*

Reassemble the Controller

1 Rotate the face of the controller up so that it faces you, and slide the electronics back into the controller box.

2 Push to secure the gasket, which is inside the faceplate, up against the box.

3 Take the 4 screws and screw them into the 4 holes in the faceplate. Tighten the screws hand tight.

SUPPLY GAS AND MOTOR VALVE INSTALLATION

This section shows how to attach the controller to a motor valve, position the solar panel, connect the supply gas line to the controller, and connect the controller gas line to the motor valve.

Attach Controller to Motor Valve

1 Choose a position for the controller so that the faceplate faces a direction from northwest through southeast. This lets you read the LCD screen on sunny days. See Figure 9.

Do not position the LCD screen so that it faces due south.

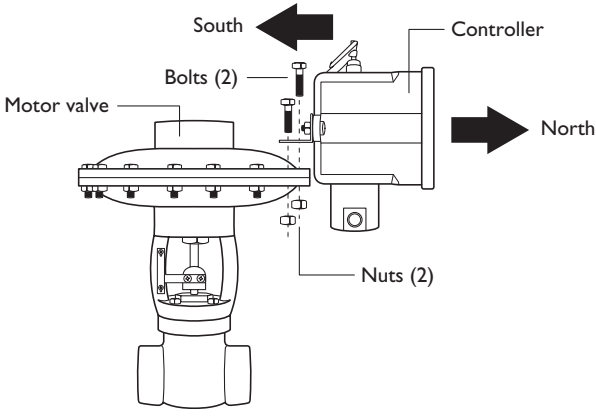


Figure 9: *Attach controller to motor valve*

2 Remove 2 bolts from the motor valve. See Figure 9.

3 Place the metal bracket so that the 2 bolt holes are over the bolt holes on the motor valve.

4 Reattach the 2 bolts and fasten the nuts securely.

Position the Solar Panel

1 Loosen the 2 nuts that fasten the solar panel to the top of the controller.

2 Turn the solar panel so that it faces due south. It should be clear of all barriers or trees that may shade it, especially during winter when the sun is low to the horizon. See Figure 9 on page 12.

If you can't position the solar panel to face due south, turn it to face the direction where it will receive the most direct sunlight each day.

3 Tighten the 2 nuts so that the solar panel is securely fastened.

Connect Supply Gas Line to Controller

1 Connect a drip pot to the gas supply from the casing. Add a regulator and filter to the drip pot. See Figure 10 on page 14.

Note: A drip pot, regulator, and filter are optional but highly recommended.

2 Connect quarter-inch or 3/8th-inch diameter refrigerator-grade copper tubing or stainless steel tubing to the filter.

3 Connect the tubing from the filter to the **<Supply** side of the supply gas manifold, which is the black cylinder sticking out from the bottom of the controller.

Connect Controller Gas Line to Motor Valve

1 Connect quarter-inch or 3/8th-inch diameter refrigerator-grade copper tubing or stainless steel tubing to the **A-Valve>** side of the supply gas manifold, which is the black cylinder sticking out from the bottom of the controller. See Figure 10 on page 14.

2 Run the tubing to the motor valve and connect the tubing to the bottom side of a normally closed motor valve.

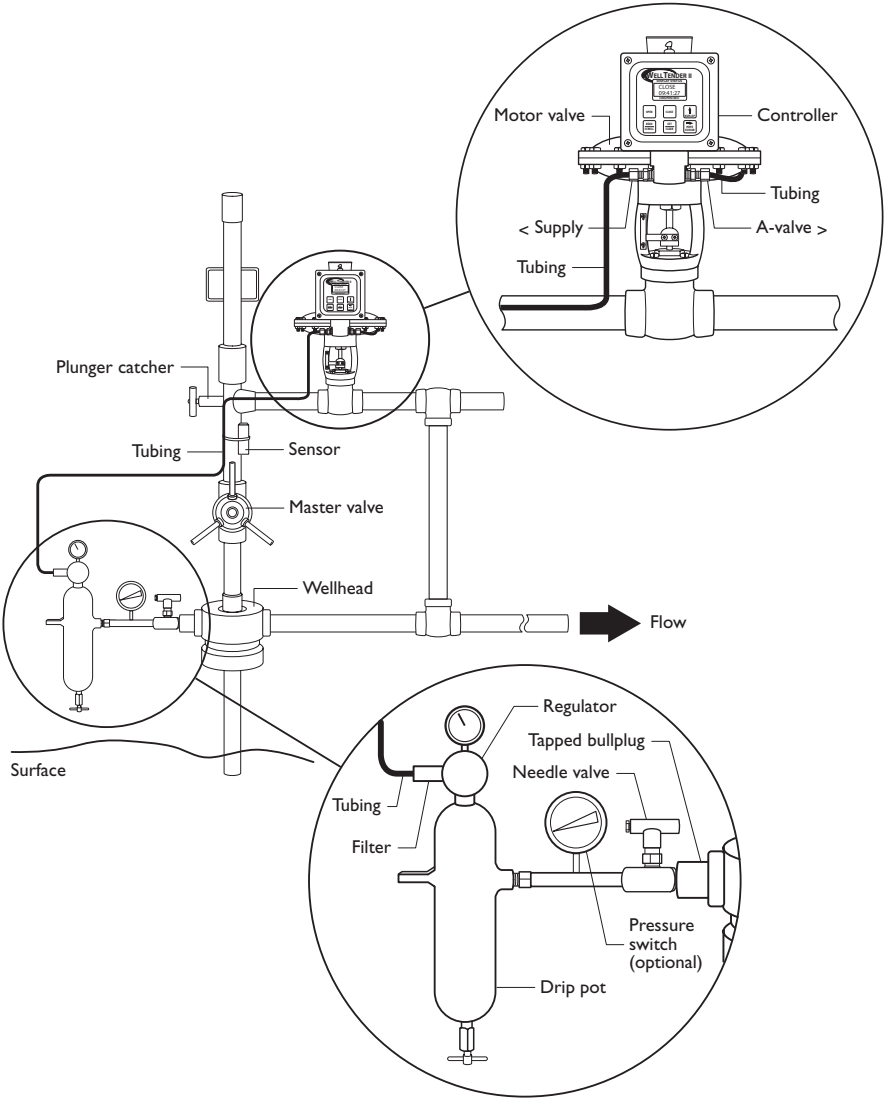


Figure 10: *Connect supply gas line to controller and controller gas line to motor valve*

WAKING UP THE CONTROLLER

The controller goes to sleep after 8 minutes of inactivity to conserve power.

☛ **Tip!** If the DISPLAY STATUS screen is not illuminated, push the NUM-UP button or the MOVE CURSOR button to wake up the controller. See Figure 11 on page 16.

When the controller wakes up, it displays the time remaining in the current cycle, for example:

CLOSE
01:41:27

Once the DISPLAY STATUS screen is on, you can program the controller, read reports, or clear report history values.

Note: We recommend that you wake the controller by pressing the NUM-UP or MOVE CURSOR button, but you can wake the controller by pressing any button lightly. Pressing the button firmly a second time activates the function associated with that button. Pressing any button firmly and holding it wakes the controller and activates the function associated with the button. For example, if you press the CLOSE button firmly when the controller is asleep, the controller wakes up and closes the A-valve or B-valve. (See "CLOSE" on page 17 for an explanation of how the CLOSE button works.)

If the controller does not wake up: Check to see if the battery is connected to the electronics board. See "Connect the Battery" on page 5. If the battery is connected correctly, push the RESET button. The small white dot (*) to the left of the DISPLAY STATUS screen shows the location of the RESET button. See Figure 11 on page 16. After you push the RESET button, the controller starts the plunger cycle in the CLOSE function. For more information about the RESET button, see "RESET" on page 18.

If the controller's display remains on: On very sunny days, the display may remain on. The controller uses the display to consume excess power during the recharging of the battery.

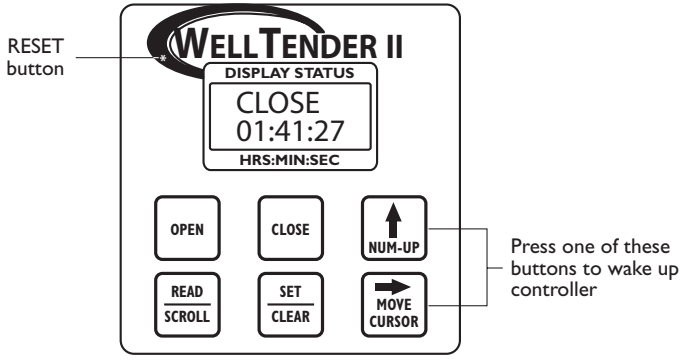


Figure 11: *Controller 's control panel*

Low Power Consumption

The display uses about 2 milliamps of power per hour. When the A-valve shifts in a normal program of values (for example, 1 hour on and 1 hour off), the controller has a full month of power available, even without recharging the battery. Shifting more often than normal sharply reduces the reserve power.

Low Battery Charge

If the battery's charge falls below 5.5 volts, the controller stops the current program. The controller returns to the program when the voltage increases to 5.9 volts. You can increase the voltage by recharging or replacing the battery.

Below 5.5 volts, the controller starts a 99:59:59 shut-in time, and displays a battery error message.

BAT ERR
HH:MM:SS

In place of HH:MM:SS (hours, minutes, seconds), the message shows the time remaining in the 99:59:59 shut-in time count down. When the count down reaches 00:00:00 (that is, 100 hours), it starts over at 99:59:59. There is no way to tell how many times the count down has restarted.

USING THE BUTTONS

The controller has 7 buttons. See Figure 11 on page 16.

OPEN

This button manually opens a valve. Pushing this button overrides the program that is running the controller.

Single Valve Operation: If the controller is in the CLOSE or BACKUP portion of the program, the A-valve will open, and the OPEN A time countdown will start. If the controller is in the OPEN A portion of the program, pushing this button restarts the OPEN A time.

Dual Valve Operation: If the controller is in the CLOSE or BACKUP portion of the program, the A-valve will open, and the OPEN A time countdown will start. If the A-valve is open and the OPEN A time is counting down, the A-valve will close, the B-valve will open and the OPEN B time countdown will start. If the B-valve is open and the OPEN B time is counting down, the B-valve will close, the A-valve will open, and the OPEN A time countdown will start.

CLOSE

This button manually closes the currently open valve. Pushing this button overrides the program that is running the controller. If the controller is in the CLOSE portion of the program, pushing this button restarts the CLOSE time.

READ-SCROLL

This button lets you display a series of up to 14 report screens, depending on the options you are using. You can use the reports on Valve Counts, Plunger Travel Times, Total Close Time, Total Open Time, Voltage, and current program settings to optimize production. For more information, see "Reading the Controller Reports" on page 19.

SET-CLEAR

This button lets you program the controller or clear the values for its reports. For more information, see "Programming the Controller" on page 27 and "Clearing Report Values" on page 31.

NUM-UP

Use this button to program the controller's time settings. Once the cursor is on the correct digit, press the NUM-UP button to scroll through the digits, either 0 to 9 or 0 to 5. Once you have displayed the largest choice for any digit (either 9 or 5), pressing this button rolls the digit over to 0. This is a good button to push to wake up the controller from its sleep. You can also use this button to "jump" from the Plunger Travel Times to the Total Close Time report. For more information, see "Plunger Travel Times Reports" on page 20.

MOVE CURSOR

Use this button to program the controller's time settings. The button moves the cursor from left to right. When the cursor is under the right-most digit, pressing this button moves the cursor to the left-most digit. This is a good button to push to wake up the controller from its sleep.

RESET

This unlabeled button starts a new cycle with the current program settings. The small white dot (*) to the left of the DISPLAY STATUS screen shows the location of the RESET button. See Figure 11 on page 16. When you push the RESET button, the controller briefly displays the software version number. Here are examples for WellTender and WellTender II:

WT	WT II
038-01	041-01

After the controller displays the software version number, it starts operating in the program's CLOSE cycle. Use the RESET button if the controller loses its place, for example, after an electrical storm. If the controller loses its place, you may see programming language on the DISPLAY STATUS screen, or the controller may not run the current program properly. The controller may lose its place when you connect the battery. If a screen does not appear after you connect the battery, press the RESET button, and you will be ready to work.

READING THE CONTROLLER REPORTS

To display a list of reports that help you optimize the well, push the READ-SCROLL button.

To clear report values, see "Clearing Report Values" on page 31.

Note: If you don't press any button for 25 seconds or if you press any button other than READ-SCROLL, the controller jumps out of the READ process and displays the current cycle and time remaining. You don't have to wait 25 seconds. You can press the READ-SCROLL button to go to the next screen.

A-Valve and Plunger Counts Report

This report shows the number of times that the A-valve opens, and the number of times that the plunger successfully comes up while the A-valve is open.

The screen looks like this:

AV=0100
PL=0090

In this example, the A-valve opened 100 times, and the plunger came up 90 times while the A-valve was open.

Note for WellTender II: If you're using an optional B-valve, the plunger may come up during OPEN B time instead of during OPEN A time. In the example above, the plunger may have come up a maximum of 10 times during OPEN B time.

To display the next report, press the READ-SCROLL button.

B-Valve and Plunger Counts Report

WellTender II

If you have a WellTender II, this report appears. It shows the number of times that the B-valve opens, and the number of times that the plunger successfully comes up while the B-valve is open. This report appears only if you have programmed an OPEN B time (see "OPEN B Time" on page 24).

The screen looks like this:

BV=0010
PL=0009

In this example, the B-valve opened 10 times, and the plunger came up 9 times while the B-valve was open.

Note: When the plunger doesn't come up while the A-valve is open, the controller's program goes to the B-valve. The maximum number of times that the plunger can come up while the B-valve is open is the number of times it doesn't come up while the A-valve is open. The examples for this report and for the A-Valve and Plunger Counts Report cover 100 program cycles. The plunger came up in 99 of the 100 cycles. It came up 90 times while the A-valve was open, and it came up 9 times while the B-valve was open. The plunger did not come up at all 1 time.

To display the next report, press the READ-SCROLL button.

Plunger Travel Times Reports

WellTender II

These 10 WellTender II reports show the 10 most recent plunger travel times. The most recent plunger run appears under PLT - 00, the second most recent under PLT - 01, and the tenth most recent under PLT - 09.

The screen looks like this:

PLT - 00
00:07:29

In this example, the most recent plunger run was 7 minutes and 29 seconds.

☛ **Tip! How to determine if the plunger came up on OPEN A or OPEN B time.** If the plunger doesn't come up during OPEN A time, then the travel time is a combination of OPEN A time and OPEN B time. For example, OPEN A time has been programmed at 5 minutes, but the plunger does not come up in 5 minutes. If the plunger comes up in 7 minutes and 29 seconds, then the plunger comes up 2 minutes and 29 seconds into the OPEN B time.

If the plunger did not surface on the latest attempt, the screen looks like this:

PLT - 00
NO PLNGR

To display the next most recent plunger travel time report, press the READ-SCROLL button.

To skip from the plunger travel time reports directly to the Total Close Time report, press any button other than the READ-SCROLL button.

Total Close Time Report

This report shows the total amount of time that the controller was closed since the last time you cleared the report. The BACKUP time (if any), FALL time (if any), and CLOSE time are accumulated under TOT CLOS time. The controller reports up to 999 hours and 59 minutes. The screen does not display seconds.

When cleared, the screen looks like this:

TOT CLOS
000:00

To display the next report, press the READ-SCROLL button.

Total Open Time Report

This report shows the total amount of time that the controller was open since the last time you cleared the report. It is useful for determining the gas sales amount for the open period. The DELAY time (if any), OPEN B time (if any), and OPEN A time are accumulated under TOT OPEN time. The controller reports up to 999 hours and 59 minutes. The screen does not display seconds.

When cleared, the screen looks like this:

TOT OPEN
000:00

To display the next report, press the READ-SCROLL button.

Voltage Report

This report shows the battery voltage. The voltage indicates battery capacity and charging ability. Normal voltage is between 6.2 and 6.8 volts. Voltage below 6.2 may be indicating that the battery is not charging. Open the controller and check the battery connections. Charging the battery at a voltage above 6.8 leads to a slight reduction in battery life. The battery should last for approximately 3 years.

The screen looks like this:

VOLTAGE
6.80

To display the next report, press the READ-SCROLL button.

CLOSE and OPEN A Time Reports

The next 2 reports show the CLOSE and OPEN A times programmed into the controller. In these examples, 1 hour has been programmed for each value.

CLOSE
01:00:00

OPEN A
01:00:00

To display the next report, press the READ-SCROLL button.

Optional Time Reports

The WellTender has 2 optional time reports. They show the DELAY and FALL times programmed into the controller.

The WellTender II has 4 optional time reports. They show the OPEN B, DELAY, FALL, and BACKUP times programmed into the controller.

The optional time reports do not appear if no time has been programmed for them.

In these examples, 1 hour has been programmed for each value.

WellTender II

OPEN B
01:00:00

DELAY
01:00:00

FALL
01:00:00

WellTender II

BACKUP
01:00:00

To display the next report, press the READ-SCROLL button.

After all reports have been displayed, the controller displays the current cycle and time remaining.

CREATING A PLUNGER PROGRAM

To control a plunger, you must program 2 time values: CLOSE and OPEN A. You can also program up to 4 optional time values: OPEN B, DELAY, FALL, and BACKUP.

Decide which program times you want to use and select a value for each time. The next section explains how to program these times into the controller. See "Example Programs" on page 33 for some typical ways to control a plunger. The maximum time that you can program is 99 hours, 59 minutes, and 59 seconds.

CLOSE Time

This is the time that the well is shut-in and not flowing. It is the time that when the plunger falls and the well builds pressure for the next cycle. You must have a CLOSE time. Do not program 00:00:00 as the CLOSE time.

☛ **Tip!** In most instances, CLOSE time will be less than 2 hours.

OPEN A Time

This is the time that the well is first opened and gas is flowing through the motor valve (A-valve). It is the time when the plunger starts to surface and when the well is selling its initial head gas. You must have an OPEN A time. Do not program 00:00:00 as the OPEN A time.

☛ **Tip!** In most instances, an OPEN A time will be between 15 and 30 minutes. Plungers should surface at approximately 750 to 1000 feet per minute.

OPEN B Time

WellTender II

This is the time after the well has sold its initial head gas, but the plunger has not arrived. It is additional time to surface the plunger and the liquid load it is carrying. Typically, this gas is vented to the low side of the separator or to a tank.

If you are not using a B-valve, leave the program at 00:00:00. The controller will not use this function, and you will not see this function when you display reports.

☛ **Tip!** In most instances, an OPEN B time will be between 15 and 30 minutes. The reason is that it is probably not good to vent the well to atmosphere for a very long time.

DELAY Time

This is the time of the gas sales through the A-valve after the plunger has arrived.

Note: Some companies refer to DELAY as AFTERFLOW.

If you do not want to sell gas after the plunger arrives, program 00:00:00 for the DELAY time. The controller will not use this function, and you will not see it when you display reports.

If the DELAY time is 00:00:00, the controller returns to the CLOSE time function.

FALL Time

This time is used when a pressure switch is connected to the controller. FALL time guarantees a minimum shut-in time for the plunger to fall to bottom.

If you are not using a pressure switch, program 00:00:00 for FALL time.

Important! When you are using the controller with a pressure switch, CLOSE time is the lowest level of shut-in time. The controller looks for a pressure switch input and prioritizes pressure above a CLOSE time count down. If you program both a CLOSE time and a FALL time, FALL time has the highest priority – above both CLOSE time and input from a pressure switch.

BACKUP Time

WellTender II

This time is used when a plunger does not surface. Usually, after the A-valve and B-valve are opened, but a plunger does not surface, the well requires a longer period of time to rebuild pressure for the next plunger attempt.

If the well does not require additional time to surface the plunger during the next cycle, program either 00:00:00 or the same time value you programmed for the CLOSE time. If you're using BACKUP time, it should always be greater than CLOSE time.

Remember! If the plunger does not surface, BACKUP time **replaces** CLOSE time. BACKUP time **is not in addition to** CLOSE time.

PROGRAMMING THE CONTROLLER

The controller is easy to program. Using just 3 buttons: SET-CLEAR, NUM-UP, and MOVE CURSOR, you can program the controller to operate a plunger in virtually any imaginable way.

1 If the DISPLAY STATUS screen is not on, wake up the controller by pushing the NUM-UP button or MOVE CURSOR button. For more information, see "Waking Up the Controller" on page 15.

Once the screen is on, you can program the controller.

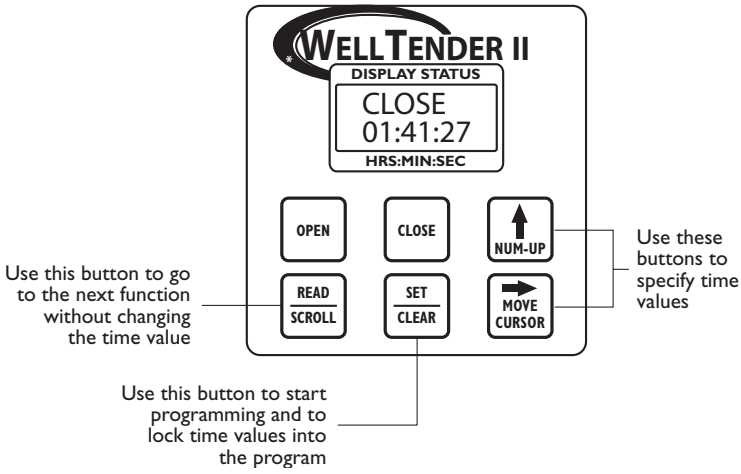


Figure 12: *Buttons used to program the controller*

2 To program the controller, press the SET-CLEAR button.

Note: If you don't press any button for 25 seconds or if you press the OPEN or CLOSE button, the controller jumps out of the SET process. The controller then displays the current cycle (such as CLOSE or OPEN A) and the time remaining. You don't have to wait 25 seconds. You can press the READ-SCROLL button to go to the next screen.

3 The A-Valve Plunger and Counts screen appears. It looks like this:

AV=0000
PL=0000

This screen and the next 3 screens (B-Valve and Plunger Counts, Total Close Time, and Total Open Time) are reports, not program functions. After you have programmed the controller to operate a plunger, you will use these screens most of the time. That is why they are placed first. For more information, see "Clearing Report Values" on page 31.

Note: If you press the SET-CLEAR button at these report screens, you will clear the report values and go to the next screen.

Press the READ-SCROLL button.

WellTender II

4 If you have a WellTender II, the B-Valve and Plunger Counts screen appears. It looks like this:

BV=0000
PL=0000

Press the READ-SCROLL button.

5 The Total Close time screen appears. It looks like this:

TOT CLOSE
00:00:00

Press the READ-SCROLL button.

6 The Total Open time screen appears. It looks like this:

TOT OPEN
00:00:00

Press the READ-SCROLL button.

7 The CLOSE time screen appears. It looks like this:

CLOSE
01:00:00

This is the first of several program function screens.
WellTender: CLOSE, OPEN A, DELAY, and FALL.
WellTender II: CLOSE, OPEN A, OPEN B, DELAY, FALL, and BACKUP.

At each program function screen, the cursor appears under the left digit. In the examples, 1 hour has been programmed for each time.

Note: The program function screens scroll automatically. If there is no activity for 25 seconds, the next screen appears. You don't have to wait 25 seconds. You can press the READ-SCROLL button or the SET-CLOSE button to go to the next screen.

8 Specify your CLOSE time value in hours, minutes, and seconds (HH:MM:SS).

Use the MOVE CURSOR button to move the cursor under the digit that you want to program.

Use the NUM-UP button to scroll to the digit you want.

For example, to program a CLOSE time of 2 hours (02:00:00):

- Press the NUM-UP button until the left-most digit is 0.
- Press the MOVE CURSOR button, and then press the NUM-UP button until the next digit is 2.
- Press the MOVE CURSOR button, and then press the NUM-UP button until the next digit is 0.
- Repeat 3 more times.

You must have a CLOSE time. Do not program 00:00:00.

After you have specified the time you want, press the SET-CLEAR button to lock the time displayed on the screen into the program.

Note: To go to the next program function screen without changing the time value, press the READ-SCROLL button.

9 The OPEN A time screen appears. It looks like this:

OPEN A
01:00:00

Specify your OPEN A time value in hours, minutes, and seconds.

You must have an OPEN A time. Do not program 00:00:00.

Press the SET-CLEAR button to lock the time into the program.

WellTender II

10 The OPEN B time screen appears. It looks like this:

OPEN B
01:00:00

If you are using an external shift valve (B-valve), specify your OPEN B time value in hours, minutes, and seconds.

If you are not using a B-valve, specify 00:00:00.

Press the SET-CLEAR button to lock the time into the program.

11 The DELAY time screen appears. It looks like this:

DELAY
01:00:00

Specify your DELAY time value in hours, minutes, and seconds.

If you are not using a DELAY time, specify 00:00:00.

Press the SET-CLEAR button to lock the time into the program.

12 The FALL time screen appears. It looks like this:

FALL
01:00:00

If you are using a pressure switch to operate the well, specify your FALL time value in hours, minutes, and seconds.

If you are not using a pressure switch, specify 00:00:00.

Press the SET-CLEAR button to lock the time into the program.

WellTender II

13 The BACKUP time screen appears. It looks like this:

BACKUP
03:00:00

If the well requires additional time to surface the plunger during the next cycle, specify your BACKUP time value in hours, minutes, and seconds.

If the well does not require additional time to surface the plunger during the next cycle, specify either 00:00:00 or the same time value as the CLOSE

time. **If you're using BACKUP time, it should always be greater than CLOSE time.**

Remember! If the plunger does not surface, BACKUP time is **instead of** CLOSE time – **not in addition to** CLOSE time.

Press the SET-CLEAR button to lock the time into the program.

The controller displays the current cycle and the time remaining.

Your program is now finished, and you are ready to run a plunger cycle.

Neat feature! The controller does not stop the program that is running when you reprogram the controller. The controller finishes the cycle using the old program and then starts a new cycle using the new program. To start a new cycle right away, press the OPEN or CLOSE button to start from that point. Experiment with this nifty feature and see how it can work for you!

CLEARING REPORT VALUES

How often you clear report values depends on how you use the reports. Many operators clear the values for these reports daily, while others clear them at different time intervals.

1 To clear 1 or more of these reports, press the SET-CLEAR button.

2 The A-Valve and Plunger Counts screen appears. It looks like this:

AV=0000
PL=0000

To clear the values and go to the next screen, press the SET-CLEAR button.

To keep the values and go to the next screen, press the READ-SCROLL button.

WellTender II

3 If you have a WellTender II, the B-Valve and Plunger Counts screen appears. It looks like this:

BV=0000
PL=0000

To clear the values and go to the next screen, press the SET-CLEAR button.

To keep the values and go to the next screen, press the READ-SCROLL button.

4 The Total Close time screen appears. It looks like this:

TOT CLOSE
00:00:00

To clear the values and go to the next screen, press the SET-CLEAR button.

To keep the values and go to the next screen, press the READ-SCROLL button.

5 The Total Open time screen appears. It looks like this:

TOT OPEN
00:00:00

To clear the values and go to the CLOSE time program function, press the SET-CLEAR button.

To keep the values and go to the CLOSE time program function, press the READ-SCROLL button.

6 The controller scrolls through the program functions automatically at 25-second intervals and returns to display the currently running program. You can always press the READ-SCROLL button or the SET-CLEAR button to scroll through the program function screens.

Alternatively, you can press the OPEN or CLOSE button to return to the display of the currently running program.

EXAMPLE PROGRAMS

WellTender

This example is for a 7000-foot well that builds casing pressure to 400 psi from 40 psi in 35 minutes. Running a plunger takes 250 psi of casing pressure. Line pressure remains constant at 30 psi, and the plunger always surfaces against sales line pressure. The plunger takes at least 40 minutes to fall to bottom. After the plunger surfaces, the well can sell for up to 2 hours and the plunger will always surface on the next attempt.

CLOSE	00:40:00	Extra time to make sure that the plunger gets to bottom.
OPEN A	00:30:00	
DELAY	02:00:00	

Walk through: This example begins with the well shut-in.

1 The well stays shut-in for 40 minutes (CLOSE time = 00:40:00).

2 The A-valve opens and the controller starts a 30-minute count down.

3 If the plunger arrives in 30 minutes or less, the controller goes to DELAY (step 4) without using the remaining OPEN A time.

If the plunger does not come up in 30 minutes, the controller goes to CLOSE time (step 1) and starts another cycle with a 00:40:00 shut-in.

4 If the plunger comes up during OPEN A time, the controller sells gas for 02:00:00 of DELAY time. Then the controller goes to CLOSE time (step 1) and starts another cycle.

WellTender II

This example is for a 7000-foot well that builds casing pressure to 400 psi from 200 psi in 35 minutes. The operator wants to run the well using pressure information, not time. Running a plunger takes 400 psi, and the well has a pressure switch. Line pressure fluctuates between 200 psi and 220 psi. At the higher line pressure, the plunger usually surfaces, but slower than at the lower line pressure. The plunger takes 40 minutes to fall to bottom. After the plunger surfaces, the longest the well can sell is for 11 minutes or the plunger will not

surface against sales line pressure on the next attempt. The plunger always surfaces after a 3-hour shut-in.

CLOSE	00:35:00	Or 00:00:00. The controller uses FALL time instead of CLOSE time with a pressure switch.
OPEN A	00:30:00	
OPEN B	00:20:00	
DELAY	00:10:30	
FALL	00:40:00	
BACKUP	03:00:00	

FALL time is 00:40:00 because even though the pressure is high enough (400 psi in 00:35:00) to surface a plunger, the plunger may not yet be on bottom at the bumper spring. DELAY is set for a little less time than the amount where the well will get in trouble on succeeding runs.

Walk through: This example begins with the well shut-in.

1 The well stays shut-in for at least 40 minutes (FALL time = 00:40:00) while the pressure switch waits for the pressure to reach 400 psi.

2 Once the pressure reaches 400 psi **and** the well has been shut-in for **at least** 00:40:00, the A-valve opens and the controller starts a 30-minute count down.

3 If the plunger arrives in 30 minutes or less, the controller goes to DELAY (step 5) without using the remaining OPEN A time.

   If the plunger does not come up in 30 minutes, the controller goes to OPEN B (step 4) and starts a 20-minute count down.

4 If the plunger comes up in 20 minutes or less, the controller goes to DELAY (step 5) without using the remaining OPEN B time.

   If the plunger does not come up after 20 minutes of OPEN B time, the controller goes to BACKUP time and starts another cycle with a 03:00:00 shut-in. Once the pressure reaches 400 psi **and** the well has been shut-in for **at least** 03:00:00, the A-valve opens (step 2).

5 If the plunger comes up during OPEN A or OPEN B time, the controller sells gas for 00:10:30 of DELAY time. Then the controller goes to FALL time (step 1) and starts another cycle.

CONTROLLER PART ASSEMBLIES

Figure 13 shows the component part assemblies that make up the controller. If you need a replacement part, you can purchase any part assembly.

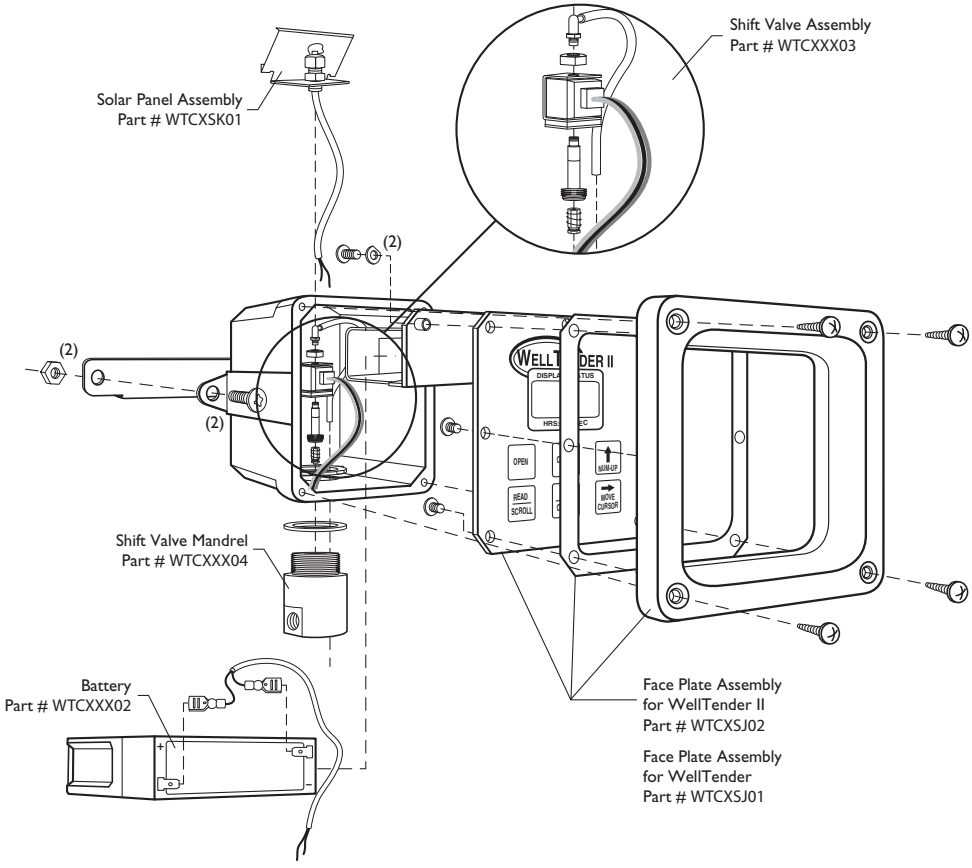


Figure 13: *Controller part assemblies*

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WellTender & WellTender II Specifications

Battery:	6V	1.3 AH
Solar panel:	7.2V	25mA
Power consumption:	3mA	active display
	13μA	no display
Protection:		
Deep discharge of battery.	5.5V shutdown	
	5.9V re-activation	
Short circuit and reverse polarity.		

Environmental: Operates in sub-zero to tropical extremes

Temperature:	-20° F to 150° F
Humidity:	0-95% non-condensing

Water resistant: Molded case with rubber gasket seal, NEMA 4

Keypad: Stainless steel dome switches mounted directly on PCB.

Dimensions with extensions:	6" x 7 3/4" x 5 3/4"
Weight:	3 lbs., 7 oz.

Gas supply connections:	1/4" NPT
	brass or stainless steel

Warranty: Well Tender, Inc. warrants all WellTender manufactured equipment to be free of defects in material and workmanship for ONE YEAR from date of purchase by original buyer only. Warranty is completely void if abuse, neglect, misuse, or misapplication is the cause of the malfunction. Determination of abuse or damage is to be made solely by Well Tender, Inc.

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Brighton, Colorado 80601

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You can get more information about the WellTender plunger lift line on the Internet. Go to: **www.WellTender.com**