Control Guard
Instruction Manual
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**CAUTION:** Wear protective clothing and eyewear when dispensing chemicals or other materials. Observe safety handling instructions (MSDS) of chemical mfrs.

**CAUTION:** To avoid severe or fatal shock, always disconnect main power when servicing the unit.

**CAUTION:** When installing any equipment, ensure that all national and local safety, electrical, and plumbing codes are met.
### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Default Setting</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pass Code</td>
<td>0000</td>
<td>0 – 9, A – Z</td>
</tr>
<tr>
<td>Pump Flow Rates</td>
<td>0</td>
<td>0-900.0 Oz, 2000 ml</td>
</tr>
<tr>
<td>System Mode</td>
<td>Signal</td>
<td>Signal, Relay</td>
</tr>
<tr>
<td>Wash Count Pump</td>
<td>2</td>
<td>1 to 8</td>
</tr>
<tr>
<td>Wash Counter</td>
<td>0</td>
<td>0 – 65536</td>
</tr>
<tr>
<td>Units of Measure</td>
<td>US</td>
<td>US, Metric, Imperial</td>
</tr>
<tr>
<td>Pump Delay Units</td>
<td>SEC</td>
<td>SEC, MIN</td>
</tr>
<tr>
<td>System Lockout Time</td>
<td>0</td>
<td>0-100 min</td>
</tr>
<tr>
<td>Washer Signal Qualify Time</td>
<td>1</td>
<td>1-100 sec</td>
</tr>
<tr>
<td>Calibrate Mode</td>
<td>Time</td>
<td>Time, Volume</td>
</tr>
<tr>
<td>Formula Run Times/Volumes</td>
<td>0</td>
<td>0-255 sec, 0-5000 ml, 0-4000 oz</td>
</tr>
<tr>
<td>Formula Delay Times</td>
<td>0</td>
<td>0-255 sec or min</td>
</tr>
</tbody>
</table>

- Pass code does not change when clearing all programmed settings
- The wash counter has its own menu to allow resetting back to zero

### SAFETY SYMBOL EXPLANATIONS

Listed below are explanations of the safety symbols that appear either on the unit, in the instruction manual, or both. Please familiarize yourself with the meaning of each symbol.

- **GENERAL CAUTION**: This symbol indicates a general safety caution.
- **SHOCK HAZARD**: This symbol indicates that hazardous voltages are inside the enclosure.
- **READ MANUAL**: This symbol indicates to read the manual for important instructions and procedures related to safety.
PRE-INSTALLATION

(1) Check all applicable plumbing and electrical codes before installation. This will help to ensure that the system is installed in safe and suitable manner.

(2) Get a wiring schematic of the washmachine (provided by the machine mfr or may be on the machine itself).

(3) Check to make sure that all functions of the washer are operating properly. Including; timer, water solenoids, water level switch, pump motor, and drain valve.

(4) Check the proposed location for a 115, or 230 VAC power source.

(5) Check voltage of all washer chemical signals that will be used. Measure voltage between chemical signal and signal common with a voltmeter. Do not check signal voltage between supply signal and case (earth) ground.

(6) Check mounting location for chemical injection anti-siphon valves. Verify port size with fittings you have for installation.

Before beginning the installation, make sure you have the following tools and materials ready...

- Flat and Phillips screwdrivers. One screwdriver needs to have a long (20 cm) shank to reach the bottom mounting screw on the dispenser.
- Drill and drill bits.
- Suitable wire for main power and signals (check local codes).
- Wire cutters, wire strippers, and pliers.
- Wire terminal connectors and a crimping tool.
- Voltmeter (or multi-meter).
- Dry wall inserts and mounting screws.
- Electrical tape and wire nuts.
- Chemical test kit.
- Dispenser accessory kit.
- Injection check valves.
- Braided vinyl hose for 3/8" ID.

INSTALLATION — MOUNTING

(1) Remove existing dispenser, if any.

(2) Use the mounting bracket to mark where the holes need to be drilled. Drill the three holes.

(3) Press in the dry wall anchors and mount the bracket.

(4) Hang the dispenser and mark where the bottom hole goes. For systems with multiple pumps, mark the locations of all the other mounting holes.

(5) Drill remaining holes and press in final dry wall inserts. Do not install the unit on the wall yet.
RECOMMENDED INSTALLATION LAYOUT

All Chemical Pumps require check valve w/ 5 PSI cracking pressure at injection point to prevent back flow to pumps
3/8" CV Part No. - 7901239
1/2" CV Part No. - 0300300
3/4" CV Part No. - 7864202

AODD Pumps require air operated two way valve to prevent product siphoning

Optional three way ball valve to allow flow to process or calibration line

Optional Low Level Float Switch Inserted in Chemical Drum

No check valves or restrictions

3/8" I.D. Hose

Maximum Suction lift 10 Feet

Calibration lines

All pump injection points should be installed with a three way ball valve
That allows flow to the process on one side and safe, accurate calibration on the other

Chemical suction/discharge/air lines and low supply alarm cable should be routed inside plastic pipe or plastic conduit for a clean, safe and professional looking installation
INSTALLATION — GENERAL

Ensure that all power sources are turned off before proceeding with the following steps.

1. Pull the power wires through the conduit.

2. Remove knockout plug for the conduit by twisting with pliers.

3. Pull wires through the pump case and into the control box. Loosen the end of the conduit so that the male piece can freely rotate. Clearance is tight in the pump case, and you cannot easily rotate the conduit nut. Instead, hold the conduit nut with a wrench and rotate the male piece to tighten.

4. Hang the dispenser on the wall and install the final screw at the bottom of the dispenser. Use a long shank screwdriver to reach it. For Control Guard systems with 500 or 800 series satellite pumps, install the remaining mounting screws.

5. For each pump, cut the suction hose to length and insert one end into the appropriate supply container using PVC pipe as a support. Insert other end of suction tube over the left (input) side of the pump’s barb x barb fitting.

6. For each pump, cut the 3/8” ID hose and push over barb x barb connector. Secure with hose clamp.

**Powering Up**

Upon power up, the display will sequence through all devices that are recognized, such as the satellite pumps, and SIB.

**Display Shown on Power Up**

When the Control Guard dispenser is powered up (for the first time or after adding satellite pumps or low level alarm), the system will automatically check for any of these devices and the display will show all devices recognized.

<table>
<thead>
<tr>
<th>800 PMP Found SubDevice #4</th>
</tr>
</thead>
</table>

This example shows that Control Guard has recognized an 800 Series pump connected to the bus. The #4 indication simply means that this “satellite” pump is set to be pump 4. This message will appear briefly, then the system will automatically advance on to the normal display.

NOTE: The display will sequence through all devices that are recognized. If any new pumps do not appear in the display, check the DIP switch settings and the bus connection for proper engagement.
INSTALLATION — SIGNALS / SIB

The SIB is a signal interface module that receives supply signals from the washer, then communicates with the dispenser to run the pumps. The low voltage cable connects the module to the pump system without requiring conduit.

(1) Mount the SIB bracket using the provided screws, then slide the SIB module into the bracket. The module can be mounted inside the washer's controls, along side the washer's controls, or any other convenient location.

(2) Connect the chemical signals to the SIB per wire colors on the SIB label.

(3) If you have one signal common (typical) connect the common to “COM A” on the SIB. If you have two signal commons, you will need to remove a resistor inside the SIB before connecting the common wires! See the following details.

Splitting signal commons:

(1) Remove the screws from the bottom of the SIB to open the module.

(2) Locate the resistors on the right side of the module (each resistor has a single black band).

(3) Cut and remove the resistor that will “split” the commons between the desired pumps. Be sure to remove only one resistor.

(4) Close the module and replace the screws when finished.

Remote activator usage

If you will be using one or more of the optional remote activator push buttons, then the SIB will need to be connected to the remote activator interface module. See wiring diagram for details.

The remote activators allow the push-buttons to act as trigger signals to the SIB, so its important that the signal qualify time (see page 15) be set to one second. This allows the buttons to activate the pumps immediately.

There are rubber plugs inside the remote activator that seal off the mounting holes in the back of the activator. After mounting the activator, insert the plugs into the mounting hole openings to prevent moisture entry.

<table>
<thead>
<tr>
<th>CUT RESISTOR</th>
<th>TO USE COM A FOR PUMPS</th>
<th>AND COM B FOR PUMPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>R19</td>
<td>1—2</td>
<td>3—5</td>
</tr>
<tr>
<td>R20</td>
<td>1—3</td>
<td>4—5</td>
</tr>
<tr>
<td>R17</td>
<td>1—4</td>
<td>5</td>
</tr>
</tbody>
</table>

Low voltage signal filter

The SIB signal filtering capability can help prevent unwanted injections caused by stray signals or “bleed” voltages. Typically you will have only one signal common, however, if using “split commons”, each common can be independently set to filter signals.

The signal filter is activated by removing a jumper wire inside the SIB. There is one jumper wire for common A and one for common B (if required). The diagram below shows the location of the jumper wires inside the SIB.

- When the jumper wire is removed, the signal input range is 70 – 240 volts.
- With the jumper wire in place (normal) the signal input range is 24 – 240 volts.
- Do not connect any signal wires or common wires to the terminals where the jumper wires go.

Follow the steps below to activate the signal filter. If you later need to setup the SIB for normal signal range, simply replace the jumper wires.

(1) Remove all screws from the bottom of the SIB to open the module.

(2) To filter signals that use common A, remove the jumper wire from the terminals in the upper left corner of the circuit board.

(3) To filter signals that use common B (if required), remove the jumper wire from the terminals in the lower left corner of the circuit board.

(4) Close the module and replace screws when finished.
OPERATION

The Control Guard system has two basic operating modes.

Signal Mode

The system is capable of up to 3 user selectable pre-named formulas with each formula having unique run times and delay times for each pump. Signals from the washer trigger the pumps, then the Control Guard takes control to count down delay times and run times with up to 3 individual “levels” (explained below) for each pump. The machine operator, will select the formula using × or Ø buttons to choose the appropriate wash formula. If the formula change status is set to “disable”, then the system will be locked-in to just one formula. The pumps can also be manually activated with optional remote push-buttons. A remote activator interface module is required to convert the push-button activation into a signal.

Programming "levels" allows a pump to inject different amounts of chemical for multiple signals to the same pump during a formula. For example, pump 1 could inject 8 ounces of chemical on its first signal, then later inject 12 ounces of chemical on its second signal. Up to three levels are available for any pump on any formula, except for the wash count pump. Only 1 level can be programmed for the wash count pump (and any other pump that may be signaled simultaneously with the wash count pump). The level feature can also be used to “skip over” an injection. Simply do not program any volume or delay time for that level.

Note: If using manual pump control, then the level feature will be by-passed and the system will operate the pumps only on level 1. This allows the pumps to be activated back-to-back without having to rely on the activation of the load count pump to reset the system for the next cycle.

One-to-one pump signal activation: When a formula begins the first signal to a pump will activate level 1. The signal has to be present for at least as long as the signal qualify time to be recognized. The second signal to the pump during the formula will activate level 2. The third signal to the pump during the formula will activate level 3. Any further signals will be disregarded once level 3 has been activated. The wash count pump signal must be received to reset levels in preparation for the next formula.

Assigned pump signal activation: Each pump/formula/level combination has a signal assignment for which signal (to the SIB) will trigger the chemical injection. For example, pump 1 input on the SIB becomes “signal 1” and can be assigned to whatever pumps you wish to activate with this signal. Pump 2 input on the SIB becomes “signal 2”, and so on. Incoming signals should be received by the Control Guard in order from lowest number to highest number. This type of operation can be useful with the optional remote push-buttons, as each button can be “assigned” to activate more than one pump.

Relay Mode

This type of operation can be used with PLC based washers where you prefer the chemical pumps be controlled by the PLC. When set to relay mode, the Control Guard system will run its pumps as long as their respective signals are present. To accomplish this, the system “by-passes” its run time and delay time capabilities for the chemical pumps. There is a slight delay of a few seconds before the pump starts and stops running. The on and off delay are about equal, so there is no real need to adjust the signal duration for accurate dosing. Choosing a wash count pump is optional in relay mode — wash counts are tallied as a cumulative number and viewed in the typical manner.

BUTTON FUNCTION REFERENCE

• ENTER: Holding the enter button for 3 seconds (approx.) switches between run and program modes. Enter also advances through programming menus.

• SCROLL: The scroll button moves the position of the cursor in menus where text or number changes are done and toggles between choices in menus that have selectable settings. By pressing repeatedly, the cursor will “wrap around” at the end of a line of characters (advance to the beginning of the line automatically). The scroll button is also used to show wash counts during normal operation. Press the button repeatedly to see wash counts for individual formulas. After individual wash counts have been shown, the display will then show the total cumulative wash count for all formulas combined.

• UP (×): Increases numeric values or advances upward through available characters. Hold the button down to rapidly advance. The UP button also chooses the formula during normal operation.

• DOWN (Ø): Decreases numeric values or advances downward through available characters. Hold the button down to rapidly advance. The DOWN button also chooses the formula during normal operation.
PROGRAMMING

You may find it helpful to read through the programming instructions before getting started. This will better familiarize you with the operation of the Control Guard, and will make the actual programming go much quicker.

• Be sure to clear all settings before programming.
• If you wish to return to normal operating mode at any point during programming, hold down the ENTER button for 3 seconds to exit the programming mode.
• While programming, if no buttons are pressed for approximately 2 minutes, the Control Guard system will automatically return to normal operating mode.

When you’re ready to get started, hold down the ENTER button for about 3 seconds to go into the programming mode. Release the button when you see the access code prompt below...

ENTER ACCESS
0000 CODE:

All new systems are shipped from the factory with the access code set at 0000. If the system is new, press ENTER to continue.

If the access code has been changed from the default of 0000 (explained later in this manual) use ÷/♫ and SCROLL to type in your code, then press ENTER to continue.

SELECT LANGUAGE:
ENGLISH

If you wish to change the menu language, press SCROLL to advance through the available choices until your desired language name is shown on the display. Press ENTER to continue.

PRIME PUMP 2
SCROLL = START

Use ÷/♫ to choose the pump number that you wish to prime, then use SCROLL to turn the pump on or off. Repeat as needed for other pumps. When finished, press ENTER to continue.

CHANGE FORMULAS?
NO—SCROLL FOR YES

If you wish to change formula settings, press SCROLL to choose YES then ENTER (for signal mode only - does not apply to relay mode). This is a quick shortcut to the formula programming menu. If you do not wish to change formulas (reply of NO) you will advance normally to the next menu prompt.

PIPELINE LV1 P1
RTIM 0S DL 0

Use SCROLL and ÷/♫ to choose the desired formula/level/pump on the top line. Then use SCROLL and ÷/♫ to set the pump run time and delay time (if required) on the bottom line. Repeat for all pumps and formulas that you wish to program. Press ENTER to continue.

NOTE: If using “assigned” signal mode there will also be a signal number (indicated as “SI”) on the top line. Choose the signal number that the pump should be activated by.

• If pumps are calibrated in volume mode, the display will show “VOL” instead of “RTIM”.
• Run time range: 0 - 255 seconds
• Delay time range is 0 - 255 seconds (or minutes)
This menu item allows you to change the “main” pass code. Use ÷/ø to change the selected character (the one that is underlined) and SCROLL to advance to the next character. When finished, press ENTER to continue.

NOTE: The “main” pass code allows entry into the system for all programming functions.

NEW MAIN CODE IS 0000

If you changed the pass code in the previous menu, the system will show the new code to confirm it has been changed. Press ENTER to continue.

CHANGE USER PASS
0000 CODE?

This menu item allows you to change the “user” pass code. Use ÷/ø to change the selected character (the one that is underlined) and SCROLL to advance to the next character. When finished, press ENTER to continue.

NOTE: The “user” pass code allows entry into the system only for priming pumps and prevents unauthorized changes to any programmed settings.

NEW USER PASSCODE 0000

If you changed the pass code in the previous menu, the system will show the new code to confirm it has been changed. Press ENTER to continue.

SCROLL & DOWN TO RESET EVERYTHING

You will be prompted if you wish to reset the system. This function is recommended for new installations and allows you to clear all memory and set the unit back to default parameters. If you wish to perform this function to clear the memory, press the SCROLL and DOWN buttons simultaneously and you will then see the following display.

ARE YOU SURE?
SCRLL & DWN AGAIN

The system will prompt if you are sure you want to clear memory. If you’re sure, press SCROLL and DOWN again. You will see the message “RESETTING EVERYTHING” for a few seconds, then the memory will be cleared and the display to the left will return. Press ENTER to continue.

OPERATE MODE IS: SIGNAL

This display shows what operating mode the Control Guard is running. Use the SCROLL button to choose signal, or relay operating modes (explained on page 12) then press ENTER to continue.
SIG QUALIFY TIME 005 SEC

Not available in relay mode. This selection sets the time required for a supply signal from the machine to be recognized. This feature is used to "filter" out stray signals (or ghost signals) that can erroneously trigger a pump. It is recommended to set the signal qualify time to be at least 5 seconds shorter than the supply signal duration. Use SCROLL and ø/Ø to set the signal qualify time (range is 1 - 255 seconds). Press ENTER to continue.

NOTE: For manual start operation, set signal qualifying time to one second.

MAIN CONTR PUMPS LFT/RIGHT = 0/0

This menu item sets the pump numbers for the main control. The system will automatically recognize any "satellite" pumps that are attached so only the main control pumps need to be set. There are four possible configurations:

0/0 = No pumps connected as pumps 1 or 2, no air solenoid.
1/0 = One EDP pump connected as pump 1, no air solenoid.
0/2 = No pump connected as pump 1, air solenoid installed on right side.
1/2 = One EDP pump connected as pump 1, air solenoid or EDP as pump 2.

Use ø/Ø and SCROLL to choose the pump assignments then press ENTER.
This menu item sets which pump will be used to count wash cycles. Always choose the last pump that will receive a signal. As the wash cycle finishes, activation of the wash count pump tells the system that the cycle has ended and prepares it for the next wash cycle. Use $\frac{a}{b}$ to set the wash count pump, then press ENTER to continue.

**NOTE:** The wash count pump must be signaled at the end of every wash cycle for the system to function properly on the next cycle. If a chemical injection is not required, signal the wash count pump anyway and program a zero run time volume.

<table>
<thead>
<tr>
<th>WASH COUNT PMP = 2</th>
<th>This menu item sets which pump will be used to count wash cycles. Always choose the last pump that will receive a signal. As the wash cycle finishes, activation of the wash count pump tells the system that the cycle has ended and prepares it for the next wash cycle. Use $\frac{a}{b}$ to set the wash count pump, then press ENTER to continue. <strong>NOTE:</strong> The wash count pump must be signaled at the end of every wash cycle for the system to function properly on the next cycle. If a chemical injection is not required, signal the wash count pump anyway and program a zero run time volume.</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘DOWN’ TO RESET ALL WASH COUNTS</td>
<td>Press 6 once to reset the wash counter. The display will briefly flash to show that the wash count was reset (to zero). Press ENTER to continue.</td>
</tr>
<tr>
<td>VOLUME UNITS = US</td>
<td>This selection allows you to choose US, Metric, or Imperial units of measure. Use SCROLL to choose the unit of measure, then press ENTER to continue.</td>
</tr>
<tr>
<td>PMP DELAY UNITS = SEC</td>
<td>Some injections only need to be delayed for a few seconds while others need much longer times (range is 0 - 255 for seconds or minutes). Choose the setting best suited for your particular installation. Use SCROLL to choose between seconds or minutes delay time units. Press ENTER to continue.</td>
</tr>
<tr>
<td>SYS LOCKOUT TIME 0 MINUTES</td>
<td>This selection sets the time (in minutes) that the system will be “locked-out” to all incoming supply signals. The lock-out time is started by a signal to the wash count pump. Use $\frac{a}{b}$ and SCROLL to set the system lockout time (range is 0 - 99 minutes). Press ENTER to continue.</td>
</tr>
<tr>
<td>EDIT CUSTOM MSSG KNIGHT LLC</td>
<td>This menu item allows you to change the custom message (that appears on the display). Press the SCROLL button once and you will see a screen with the current display name showing. Use $\frac{a}{b}$ to change the selected character (the one that is underlined) and SCROLL to advance to the next character. When finished, press ENTER to continue.</td>
</tr>
</tbody>
</table>

*Continue on next page*
This menu selection will not appear if using relay mode (only applies to signal mode or drain mode). Use SCROLL to choose time or volume programming mode, then press ENTER to continue.

**VOLUME:** Pump flow rates are set by actually running the pump and dispensing product. This allows the system to calculate true flow rates. Use a large container with volume markings, such as a beaker or graduated cylinder, for the calibration steps below.

**TIME:** Setting pump flow rates is not necessary. Pumps simply run for a specific time as programmed in each formula.

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**CALIBRATE MODE = TIME**

You will see this display only if volume mode was chosen in the previous step. Ensure that the pump is primed, then position your container below the pump output.

- To calibrate a pump, use \(\uparrow/\downarrow\) to choose the pump number, then press SCROLL twice to start the pump. Allow the pump to run for about a minute (does not have to be exact) then press SCROLL again and the pump will stop. You will automatically advance to the next step.

- To advance without calibrating, press ENTER to continue on directly to pump flow rates.

---

**CALIBRATE PUMP #1**

**SCROLL = START/STOP**

Use \(\uparrow/\downarrow\) to enter the volume of chemical that was dispensed in the previous step, then press ENTER.

**TIP:** Hold down on the button you are pushing to rapidly advance the number.

---

**VOLUME DISPENSED**

1.0 OZ

This is an example of a pump calibration. The volume per minute is displayed in the unit of measure you selected.

- If you were performing calibration steps, the system automatically calculates this flow rate based on how long the pump actually ran, and the exact volume that was dispensed. Press ENTER to continue. The new data will be saved and you will return to the calibration menu.

- If you had advanced to this menu without calibrating, then you can change the flow rates manually. Use \(\uparrow/\downarrow\) to choose the pump number, then use SCROLL to move the cursor to the right. Use \(\uparrow/\downarrow\) to change the flow rate then press ENTER. Repeat as needed for other pumps.

**TIP:** Hold down on the button you are pushing to rapidly advance the number.

---

**FLOW RATES / MIN.**

PMP 1 = 10.7 OZ

On to formula programming menu
ADDING SATELLITE PUMP MODULE(S) OR LOW LEVEL ALARM MODULE

Adding a satellite pump module or low level alarm module to an existing system requires just a few simple steps. The pumps or alarm can only be mounted on the right side of the Control Guard dispenser.

1. Turn the unit over and lie it down, preferably on a smooth surface that won’t scratch the display.

2. Remove the cover on the right side of the unit by gently prying it up with a flat screwdriver tip. For low level alarm, remove the cover on the last satellite pump to the right (if so equipped).

3. Line up the pump module or alarm module with the open slot. Ensure the 4-pin (bus) connectors are aligned and slide the module into place.

4. Insert screws and tighten.

5. Set the DIP switches (on the back of the pump) for what the new pump number will be. This step is not required for a low level alarm module.

6. Repeat these steps for any other modules to be added. Below is an example of a low level alarm module attached to a satellite pump module. Various configurations are possible based on your particular application requirements.

9. Process complete! Now ready to be powered up.
INSTALLING SATELLITE BOARD(S) FOR CLEAN GUARD PUMPS

(1) Ensure that power to the unit is off.
(2) Loosen the two screws and pull the cover open.

(3) Disconnect the wiring harness from the pump control board that is mounted inside the unit.
(4) Remove the screw from the pump control board.
(5) Carefully pull the pump control board away from the unit to expose the back side of the board. There will be 3 expansion sockets on the back of the board.

(1) Set the DIP switch on the satellite board for the corresponding pump number and carefully insert the satellite board into the appropriate socket.
- Socket J11 is for pump #3 — set DIP switch 3 ON
- Socket J12 is for pump #4 — set DIP switch 4 ON
- Socket J13 is for pump #5 — set DIP switch 5 ON

(7) Insert the pump control board back into the unit and secure with the screw. Ensure that the satellite pump board(s) is not bent. Re-connect the wiring harness that was disconnected in step 3.

(8) Carefully tuck all wires in while closing the cover. Tighten the cover screws.

(9) Process complete! Now ready to be powered up.

EXAMPLE OF DIP SWITCH SETTING FOR PUMP 3 AND BOARD PLUGS INTO SOCKET J11

INSTALLING SATELLITE BOARD(S) FOR CLEAN GUARD PUMPS
CHANGING MAIN CONTROL BOARD

(1) Ensure that power to the unit is off.

(2) Loosen the two screws and pull the cover open.

(3) Disconnect the wiring harness from the pump control board that is mounted inside the unit.

(4) Gently push up on the two upper mounting tabs while pulling the circuit board away from the cover. Once the top is loose, the bottom will pull away freely from the lower tabs.

(5) Replace with new circuit board and carefully line up the buttons and LED's with the holes on the cover. Snap the board into place on the upper and lower mounting tabs. Set the jumpers per table below.

(6) Re-connect the wiring harness that was disconnected in step 3.

(7) Carefully tuck all wires in while closing the cover. Tighten the cover screws.

(8) Process complete! Now ready to be powered up.

Jumper Settings

The circuit board has shunt jumpers that must be set for the Control Guard to operate correctly (diagram to the right shows jumper locations). This is particularly important when changing circuit boards.

For the Control Guard system, **always** set the jumpers according to the table below.

<table>
<thead>
<tr>
<th>JP1</th>
<th>JP2</th>
<th>JP3</th>
<th>JP4</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
</tr>
</tbody>
</table>
## REPLACEMENT PARTS (GENERAL)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7140563</td>
<td>Main Control Circuit Board Assy, Control Guard</td>
</tr>
<tr>
<td>7140762</td>
<td>Pump Circuit Board Assy, Control Guard, AC Pump Output (Standard USA Fuse)</td>
</tr>
<tr>
<td>7140762-02</td>
<td>Pump Circuit Board Assy, Control Guard, AC Pump Output w/5 x 20 MM Fuse</td>
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<td>(Europe Version)</td>
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<tr>
<td>7140761</td>
<td>Satellite Pump Circuit Board Assy, AC Pump Output (Standard USA Fuse)</td>
</tr>
<tr>
<td>7140761-02</td>
<td>Satellite Pump Circuit Board Assy, AC Pump Output 240V w/5 x 20 MM Fuse</td>
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<td>(Europe Version)</td>
</tr>
<tr>
<td>1200520</td>
<td>Front Label / Keypad</td>
</tr>
<tr>
<td>7164201</td>
<td>Front Cover, Main Control Unit, Blue</td>
</tr>
<tr>
<td>7164262</td>
<td>Front Cover, Main Control Unit, Green</td>
</tr>
<tr>
<td>7655146</td>
<td>SIB Signal Interface Module</td>
</tr>
<tr>
<td>7655147</td>
<td>SIB Signal Interface Module, Westfalia</td>
</tr>
<tr>
<td>7165100</td>
<td>Remote Activator Interface</td>
</tr>
<tr>
<td>7640616-25</td>
<td>Remote Push-Button Activator w/25’ Cable</td>
</tr>
<tr>
<td>7164205</td>
<td>Faceplate, Main Control Unit, Blue</td>
</tr>
<tr>
<td>7164265</td>
<td>Faceplate, Main Control Unit, Green</td>
</tr>
<tr>
<td>7164257</td>
<td>Transformer Assy w/Plug</td>
</tr>
<tr>
<td>7164042</td>
<td>Air Solenoid Assy for Base Unit (right side only)</td>
</tr>
<tr>
<td>7164268</td>
<td>Bracket, for Base Unit, Dual Strain Relief (right side only)</td>
</tr>
<tr>
<td>1900874</td>
<td>Screws for Air Solenoid or Strain Relief Bracket (4 required)</td>
</tr>
<tr>
<td>7020144</td>
<td>Hose Clamp, Worm Gear Type (for hose connection to squeeze tube)</td>
</tr>
<tr>
<td>7164213</td>
<td>Interface Wedge Panel (for attaching satellites together or to base unit)</td>
</tr>
<tr>
<td>7164210</td>
<td>Blank Panel (for satellite pump or base unit)</td>
</tr>
<tr>
<td>1900873</td>
<td>Screws for Interface Wedge Panel (4 required)</td>
</tr>
<tr>
<td>7034225</td>
<td>Accessory Kit, Mounting Bracket &amp; Hardware</td>
</tr>
<tr>
<td>7901234</td>
<td>Checkvalve, Viton w/ PTFE Ball (Injection Fitting)</td>
</tr>
<tr>
<td>7013022</td>
<td>Fuse Holder</td>
</tr>
<tr>
<td>7012028</td>
<td>Fuse, 1 AMP (USA)</td>
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## REPLACEMENT PARTS (PUMPS)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>- 500 Series -</strong></td>
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<tr>
<td>7164039</td>
<td>Complete Satellite Pump Module, 500 Series</td>
</tr>
<tr>
<td>7010211</td>
<td>Gearmotor Assy 100 RPM, 500 Series</td>
</tr>
<tr>
<td>7164209</td>
<td>Pump Body, UniTech 500 Series</td>
</tr>
<tr>
<td>1900455</td>
<td>Pump Body Mounting Screws, 500 Series (4 required)</td>
</tr>
<tr>
<td>7503450</td>
<td>Pump Roller Block Assy, 500 Series</td>
</tr>
<tr>
<td>7018051</td>
<td>Pump Squeeze Tube, T-50-E, 500 Series</td>
</tr>
<tr>
<td>7164204</td>
<td>Pump Faceplate, UniTech 500 Series, Blue</td>
</tr>
<tr>
<td>7164274</td>
<td>Pump Faceplate, UniTech 500 Series, Green</td>
</tr>
<tr>
<td>1900457</td>
<td>Pump Faceplate Screw, 500 Series</td>
</tr>
<tr>
<td>1600715</td>
<td>Fitting, 1/4” Barb x 3/8” Barb, Kynar (for hose connection to T-50 squeeze tube)</td>
</tr>
<tr>
<td><strong>- 800 Series -</strong></td>
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<tr>
<td>7164036</td>
<td>Complete Satellite Pump Module, 800 Series</td>
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<tr>
<td>7010116</td>
<td>Gearmotor Assy 110 RPM, 800 Series</td>
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<tr>
<td>7164215</td>
<td>Pump Body, UniTech 800 Series</td>
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<tr>
<td>0200284</td>
<td>Pump Body Mounting Screws, 800 Series (4 required)</td>
</tr>
<tr>
<td>7633330</td>
<td>Pump Roller Block Assy, 800 Series</td>
</tr>
<tr>
<td>7018068</td>
<td>Pump Squeeze Tube, T-66-E, 800 Series</td>
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<tr>
<td>7164216</td>
<td>Pump Faceplate, UniTech 800 Series, Blue</td>
</tr>
<tr>
<td>7164266</td>
<td>Pump Faceplate, UniTech 800 Series, Green</td>
</tr>
<tr>
<td>1900456</td>
<td>Pump Faceplate Screw, 800 Series</td>
</tr>
<tr>
<td>1600713</td>
<td>Fitting, 3/8” Barb x 3/8” Barb, Kynar (for hose connection to T-66 squeeze tube)</td>
</tr>
</tbody>
</table>
EC – DECLARATION OF CONFORMITY

Equipment Description: Chemical Dispensing Equipment

Type/Model Number: UNITECH

The signing legal authorities state that the above mentioned equipment meets the requirements for emission, immunity and safety according to

GUIDELINE OF COUNSEL DIRECTIVE 89/336 EEC
(Adaptation of the regulations of the member countries regarding the electromagnetic compatibility (EMC))

AND

GUIDELINE OF COUNSEL DIRECTIVE 73/23 EEC AS AMENDED BY COUNCIL DIRECTIVES 92/59 EEC AND 93/68 EEC
(Adaptation of the regulations of the member countries regarding the low voltage directive (LVD))

and there it is allowed to carry the CE – PROTECTION LABEL.

The evaluation procedure of conformity was assured according to the following standards:

EN 55014
EN 61010

The EC –DECLARATION OF CONFORMITY is based on tests carried out at CSA International, Irvine CA and DNB Engineering, Riverside, CA.

Name: M.T. Whiting
Signature: [Signature]
Position: Vice President, Engineering
Date: June 1st 2004
DISCLAIMER

Knight LLC does not accept responsibility for the mishandling, misuse, or non-performance of the described items when used for purposes other than those specified in the instructions. For hazardous materials information consult label, MSDS, or Knight LLC. Knight products are not for use in potentially explosive environments. Any use of our equipment in such an environment is at the risk of the user, Knight does not accept any liability in such circumstances.

WARRANTY

All Knight controls and pump systems are warranted against defects in material and workmanship for a period of ONE year. All electronic control boards have a TWO year warranty. Warranty applies only to the replacement or repair of such parts when returned to factory with a Knight Return Authorization (KRA) number, freight prepaid, and found to be defective upon factory authorized inspection. Bearings and pump seals or rubber and synthetic rubber parts such as “O” rings, diaphragms, squeeze tubing, and gaskets are considered expendable and are not covered under warranty. Warranty does not cover liability resulting from performance of this equipment nor the labor to replace this equipment. Product abuse or misuse voids warranty.

FOOTNOTE

The information and specifications included in this publication were in effect at the time of approval for printing. Knight, LLC reserves the right, however, to discontinue or change specifications or design at any time without notice and without incurring any obligation whatsoever.