

H3000E

WAREWASHING DISPENSER

INSTALLATION AND OPERATION MANUAL



PREFACE

This manual describes how to use the H-3000E warewashing dispenser. Material in this manual is subject to change without notice. Manual revisions will be made on an as needed basis. Special circumstances involving important design, operation or application information will be released via Technical Service Bulletins.

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INTRODUCTION

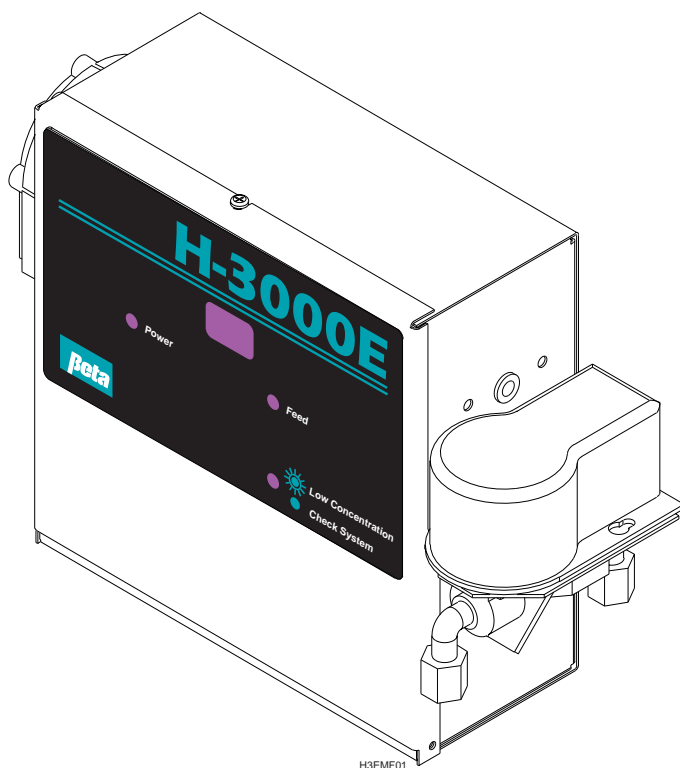


Figure 1. H-3000E Dispenser (Model H-3100RE)

MODEL DESCRIPTIONS

H-3200E Includes a liquid detergent pump and a rinse injector pump.

H-3100RE Includes a unit mounted solenoid assembly for supplying water to a powder detergent reservoir or to a solid product jar hopper, and a rinse injector pump.

H-3200SRE Includes a solenoid assembly, bracket mounted to the bottom of the unit, for supplying water to a powder detergent reservoir or to a solid product jar hopper, a rinse injector pump, and a sanitizer injector pump.

H-3100DE Includes only a liquid detergent pump.
H-3000RE The same as H-3100DE except, instead of a detergent pump, this model includes only a unit mounted solenoid assembly for supplying water to a powder detergent reservoir or to a solid product jar hopper.

SYSTEM FEATURES

Dual Line Power

Installation is easy with the H-3000E series dual-line power feature. Separate power input transformers for the wash and rinse cycles allows complete flexibility when providing power to the dispenser. The dispenser can be powered by circuits in the dishwasher that are energized throughout both the wash and rinse cycles or, energized only during the separate wash or rinse cycle. This eliminates the need for additional relays or timers, which are necessary in order to obtain continuous electrical power from some dishwashers (for example, Hobart AM 14 models).

An optional pressure switch kit is available and allows for rinse/sanitizer pump activation directly off the PCB in the event that there is not enough electrical power available to operate the rinse/sanitizer pump directly off the dishwasher rinse cycle circuitry.

Multiple Voltage Power Inputs

Both the detergent and rinse power inputs can accept either 115, 208, or 230 Volt line power. There is no need to stock H-3000E dispensers dedicated to a specific voltage. This feature has been provided to ensure complete flexibility in most field situations.

Probe Detergent

Wash Tank Concentration

Setpoint is programmed in Beta Units for accurate and repeatable control.

Wash Tank Concentration or Temperature

Either can be displayed real-time on the 3-digit alphanumeric display.

Low Detergent Alarm

When wash tank concentration fails to reach setpoint during the alarm delay time (range 0-180 seconds), an alarm sounds. After an alarm is present, the alarm delay time for future detergent feed cycles is set to 1/2 the programmed alarm delay time and will reset to the programmed alarm delay time only after the setpoint is reached. Power off/on will not reset the alarm delay time.

Overfeed Stop

When a low detergent alarm is present, the detergent feed stops if the setpoint is still not reached during the overfeed stop delay time (range 0-240 seconds). Turning power off, then back on resets the overfeed stop alarm.

Reduced Feed Rate

Detergent feed rate can be programmed (in 10% steps) to operate from 10%-100% of full speed when wash tank concentration is within 5 Beta Units of setpoint. This will help prevent setpoint overshoot when using very concentrated chemicals.

Probeless Detergent

Recharge Dose for Conveyor Machines

Detergent recharge dose time (range 0-60 seconds) is delivered when the cumulative rinse on time (range 0-60 seconds) is reached.

Recharge Dose for Door Machines

Sump type - Detergent recharge dose time (range 0-20 seconds) is delivered each time the rinse cycle power starts.

Fill and dump type - Detergent recharge dose time (range 0-20 seconds) is delivered each time the wash cycle power starts.

Initial Fill Charge for Conveyor Machines

Detergent initial fill charge time (range 0-240 seconds) is delivered when an initial fill is signaled by the initial machine power, a manual switch closed by the operator, or a pressure switch input from the initial fill line.

Initial Fill Charge for Door Machines

Sump type - Detergent initial fill charge time (0-240 seconds) is delivered when rinse power on time exceeds 20 seconds.

Fill and dump type - Initial charge time should be set to zero.

Rinse

Rinse pump delay time after a rinse cycle start can be programmed (range 0-99 seconds). Rinse pump speed (range 0-99%) and rinse pump run time (range 0-99 seconds) are programmed to deliver the desired amount of product.

Sanitizer

Sanitizer pump can run with either the detergent pump (destainer application) or the rinse pump (sanitizer application). Application and pump speed (range 0-99%) are programmed during setup to deliver the correct amount of product.

TERMS

The following terms are used in this manual.

Alphanumeric Display

A display on the PCB used for programming.

Beta Units

A means of indicating the detergent concentration in the wash tank. The probe measures the conductance of the solution. This electrical measurement is converted into and displayed as Beta Units. Each Beta Unit change represents a 5% conductance change. (For example, 23 Beta Units is 95% as great as 24 Beta Units, and 105% of 22 Beta Units.)

LED

A light emitting diode. The LEDs on the H-3000E indicate power, chemical feeding and low concentration.

PCB

Printed circuit board that contains the electronics for the H-3000E

Squeeze Tube

Tubing designed for use in peristaltic pumps.

SPECIFICATIONS

PHYSICAL DIMENSIONS, CONSTRUCTION AND MOUNTING

Size	Height	Width	Depth
H-3200E & H-3100RE	8.75	10.75	3.5 in
H-3200SRE	14	11	3.5 in
H-3000RE & H-3100DE	8.75	10	3.5 in

Weight

H-3200E & H-3100RE	8.5 pounds
H-3200SRE	9.5 pounds
H-3000RE & H-3100DE	8 pounds

Cabinet

Brushed stainless steel.

Mounting

Wall-mounted with one (1) keyhole slot and two (2) lower mounting holes.

OPERATING CONDITIONS

Voltage Requirements

24 Volts AC ($\pm 10\%$), 60 Hz
208 Volts AC ($\pm 10\%$), 60 Hz
230 Volts AC ($\pm 10\%$), 60 Hz



Units equipped with 260 Volt, 50 Hz transformers are available for export.

Current Requirements

Less than 1/2 ampere typical at 115 Volts (all models)
1 ampere maximum at 115 Volts (all models)

COMPONENTS

Fuse

Power transformer inputs are unfused.
PCB is fused with 2 amp fuse, type AGC 250 Volt

Pumps

Peristaltic, dual roller, self-priming and self-checking (no flowback)

Pump Speed

Detergent Pump

60 RPM (fixed speed)

Rinse Pump

2 to 30 RPM (adjustable speed)

Sanitizer Pump (H-3200SRE only)

2 to 30 RPM (adjustable speed)

Pump Displacement

(Based on water displacement.)

Detergent pump

5 oz (145 milliliters) per minute

Rinse Pump

1/15 to 1 oz (2 to 30 milliliters) per minute

Sanitizer Pump (H-3200SRE only)

1/15 to 1 oz (2 to 30 milliliters) per minute

Solenoid Valve Displacement

On H-3100RE, H-3000RE & H-3200SRE models, solenoid valve displacement is totally dependent on user-supplied water flow rates.

Conductivity Probe Input Measurement Ranges

The conductance measurement ranges specified are applicable when using Beta's 0.4 constant (K factor) probe which is provided as standard equipment with the H-3000E series units. Other probes with different constants (K factors) may be used, but the measurement parameters will change. Contact the factory for more information.

Ambient Temperature Operating Range

32° to 132°F (0° to 56°C)

Conductivity Probe Input Measurement Range

660 to 12,800 microsiemens when using 0.4 constant (K factor) probes at 65 degrees C. Readout is in Beta Units.

Low Detergent Alarm (Probe Operation)

An adjustable, audible alarm. The indicator LED on the front panel flashes approximately 2 times per second when the alarm sounds.

INSTALLATION & SETUP

PHYSICAL INSTALLATION



Refer installation and service to qualified personnel only. Installation must comply with all applicable plumbing and electrical codes.

Mounting the Unit

Carefully select a place to mount the dispenser. There must be room around it for access to switches, buttons, wires and tubing, and to swing the top door open for both installation and maintenance. The dispenser is normally mounted against a stable wall with the pumps side-by-side and their tube openings at the bottom. Avoid steam and other sources of moisture, such as from spray or splash. Do not subject dispenser to temperatures outside the range 36 °F to 120 °F (2 °C to 49 °C)

You may accomplish wall mounting using the 2 keyhole slots on the interior back panel, plus the third mounting hole. A mounting bracket kit is available for dishmachine top mounting applications (see **Ordering Information**).

The PCB door is held closed by a captive hold down screw that fits through a slot in the door. The pump door is held closed by the PCB door.

Installing the Conductivity Probe

If suitable for the application, use washer manufacturer's predrilled access hole. Otherwise, punch a 7/8 in (2.2 cm) hole through the wash tank in a location that will provide accurate sampling of the detergent solution. Typically, you would mount the probe about 4 inches (10 centimeters) above the bottom of the tank, away from any heater elements, corners or mechanical components (such as water level floats). Smooth the edges (so gaskets will seal well) and mount the probe.

Installing the Detergent Bulkhead Fitting

Punch a 3/8 inch hole in the wash tank in a suitable location above the water level line. For best results, mount the fitting directly above the point where the probe is located. Bulkhead fitting for a typical installation is included in the installation kit supplied with the H-3000E, or with the powder/solid detergent hopper.

Connecting the Pressure Switch

When using the dispenser with a single transformer, a pressure switch can be used to sense demand for rinse (and sanitizer). In these installations, the pressure switch should be connected to the machine rinse line downstream of the rinse solenoid, either directly or through the rinse injector fitting. Use a 1/4 inch line for this purpose.

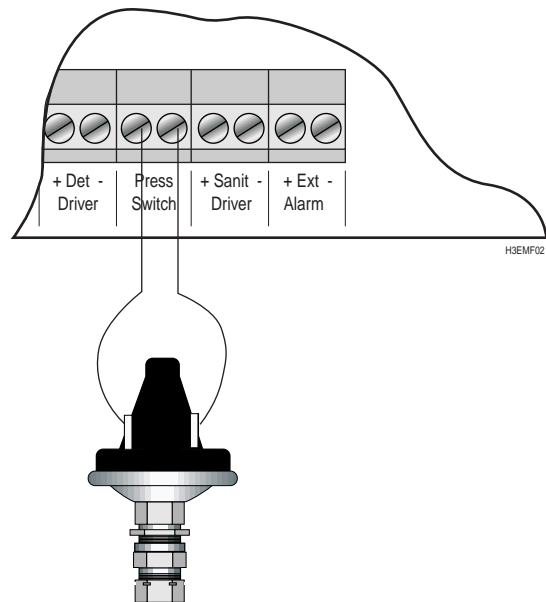


Figure 2. Connecting a Pressure Switch

Rinse Injector/Check Valve Fitting

Drill a 5/16" hole into the rinse line between the rinse line solenoid and the dishwasher itself (the dry side of the solenoid). Thread the hole, using a 1/8" NPT tap. Drill the hole in a location so that once the fitting is screwed in it will not accidentally be damaged by dish racks or other items that are placed on top of the washer. Screw the fitting into the hole. Make sure that the threads are wrapped in Teflon (plumbers) tape to ensure a watertight connection. A plastic sanitizer/injector fitting is supplied in the standard installation kit with the H-3200SRE. Install this the same way as the rinse injector fitting. Many dishwashers include factory equipped access for the above.

Connecting Chemical Supply Lines

Detergent, Rinse, and Sanitizer Input Lines

Connect the 1/4 or 1/8 inch line to the nut on the left (inlet side) of the pump squeeze tubes. Tighten the nuts on the fittings. Make sure the connection is airtight. Run the lines to the chemical drums, and secure the end of each supply line into its respective container. Use a snap-in standpipe for liquid detergent lines. The snap-in standpipe is a rigid three-quarter round U-shaped tube section 18 inches long. Cut the line at a 45° angle. Press the feed end of the line into the open part of the U. Leave the bottom of the standpipe slightly lower than the inlet of the line.

Detergent Pump and Sanitizer Output Lines

Connect the 1/4 inch line to the nut on the right (outlet side) of the detergent or sanitizer pump squeeze tubes. Tighten the nut on the fitting. Run the feed line to a bulkhead or injector fitting. Use as short a line as possible and keep the lines away from steam pipes, open flues or other areas where they may be accidentally damaged by machine operators. In this and other output line runs, always try to avoid uphill runs. Secure the line into the fitting.

Rinse Pump Output Line

Connect the 1/4 or 1/8 inch line to the nut on the right (outlet side) of the rinse pump squeeze tube. Tighten the nut on the fitting. Run the feed line to the plastic injector/check valve fitting. Follow the instructions included in the installation kit.



The rinse pump is capable of pumping against 40 psi but it is not advisable to operate at this level. The rinse pump tubing life will be severely shortened. Most dishwasher manufacturers specify no more than 25 psi in the washer rinse line, and the water pressure should always be below this specification to ensure optimum performance and results.

Sanitizer Output Line (H-3200SRE)

Install the same way as the rinse output line. Use the valve/injector fitting (supplied in the standard H-3200SRE installation kit) to inject the sanitizer product. Do not use the nickel coated brass fitting, it is not compatible with bleaches.

Plumbing Connections to Water Solenoid

Solenoids are used to supply water to a powder or solid detergent hopper. The compression fittings on the solenoid inlet and outlet accept either 1/4 inch plastic line or 1/4 inch copper tube. Follow the flow arrows on the solenoid when making connections. Consult the instructions supplied with the detergent hopper. Regulate water pressure to the hopper in the range from 20 to 30 psi (1.4 to 2.1 bar).

LED Display Label

To view LED display, remove label from the inside of the unit door. This label must be removed in order to view LED display from the outside of the unit.

ELECTRICAL CONNECTIONS

Primary Power



Dangerous voltages may be present in the dispenser even when the power switch is set to off. Refer installation and service to qualified personnel only. Installation must comply with all applicable electrical codes.

Locate electrical circuits on the dishwasher that provide power as described in Specifications. Power must be supplied to the dispenser when the dishwasher is in operation (wash and/or rinse cycle) and must be turned off when the dishwasher is off. Connect the 2 legs of each power source to their appropriate terminals inside the dispenser, as detailed on the power wiring label and illustrated in Figure 3.

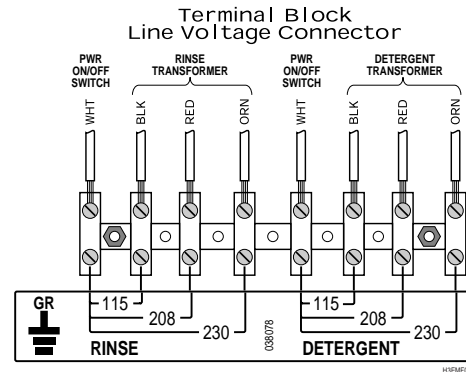


Figure 3. Terminals Inside Dispenser



The terminal block is designed for one or two power sources. When only using one power source, make connections to the right terminals labeled "detergent".

Detergent Power

Locate an electrical circuit in the dishwasher that can provide you with adequately rated 115, 208 or 230 Volt power that will be energized during the wash cycle only, or during both the wash and rinse cycles. Connect the two legs of your detergent power source to the appropriate Detergent Power terminals inside the dispenser. The Power On light on the front panel of the H-3000E unit is on only when there is power applied to the Detergent Power terminals. Some typical power source circuits would be:

1. The wash motor contactors.
2. A wash cycle light
3. A pilot light is on whenever the dishwasher is in a wash or rinse cycle.
4. Manufacturer supplied detergent wash cycle power output terminals, (i.e. DPS 1 and DPS 2 terminals on Hobart AM 12's and 14's).



Do not connect detergent power to a source that is still live when the dishwasher is turned off and the wash tank is drained (for example, L1 and L2 on the dishwasher). If continuous power is provided to the H-3000E, the detergent pump or solenoid will feed (until stopped by the overfeed alarm) every time the wash tank is drained and the probe is not covered with water.

Rinse Power

Locate an electrical circuit on the dishwasher that can provide you with adequately rated 115, 208 or 230 Volt power that will be energized during the rinse cycle only. Connect the two legs of your power source to the appropriate Rinse Power terminals inside the H-3000E. Some typical power source circuits would be:

1. Manufacturer supplied rinse cycle power output terminals (for example, RPS 1 and RPS 2 terminals on Hobart AM 12's and 14's).
2. The two wires that power the rinse line water solenoid.
3. A rinse cycle light.

Probe Connections

You may use a temperature compensated probe or a conductivity only probe. The PCB has 4 connections for the probe installation, as shown in **Figure 4**. With a noncompensated probe, use only the left 2 connectors.

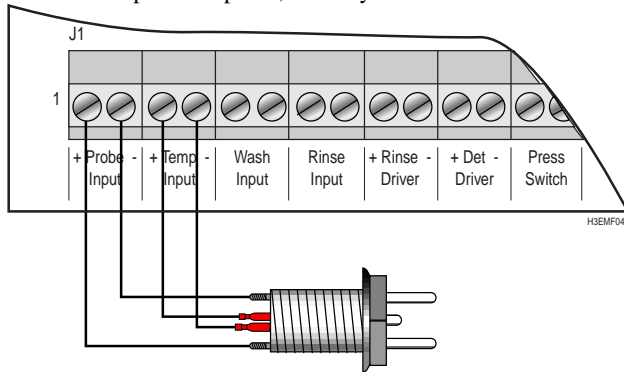


Figure 4. Probe Connectors

1. Bring the probe wires into the dispenser through the bottom access hole.
2. Remove probe connector from PCB and loosen the compression screws.
3. Insert the conductivity wires from the probe into the 2 left positions of the connector and tighten the screws.
4. Insert the temperature probe wires into the two right positions (if temperature compensated probe is used) and tighten the screws.
5. Insert the probe connector into its socket on the PCB.

Optional Rinse Pressure Switch

An optional pressure switch kit is available which will allow rinse/sanitizer pump activation in the event that the dishwasher does not have adequate electrical power available via the rinse cycle circuitry. Connect the pressure switch wires directly to the PCB's marked terminals, as shown in **Figure 2**.

Connecting Earth Ground

Connect a chassis ground wire to the GND terminal.

H-3000E With 2 Internal Transformers			
		Transformer Connection/Machine Power Source	
Machine Type	Product	Probe Mode	Probeless Mode
Recirculating Door	Detergent Initial Charge	Detergent Transformer/Wash Power	Detergent & Rinse Transformers/Rinse Power
	Detergent Recharge	Detergent Transformer/Wash Power	
	Rinse	Rinse Transformer/Rinse Power	
	Sanitizer	Runs during machine rinse cycle.	
	Destainer	Runs during detergent feed.	
Fill and Dump Door	Detergent Initial Charge		Detergent Transformer/Wash Power
	Detergent Recharge		Rinse Transformer/Rinse Power
	Rinse		Runs during machine rinse cycle.
	Sanitizer		Runs during detergent feed.
	Destainer		
Conveyor	Detergent Initial Charge	Detergent Transformer/Wash Power	Detergent Transformer/Initial Fill Power [or] Manual Button or Pressure Switch with Continuous Power
	Detergent Recharge	Detergent Transformer/Wash Power	Rinse Transformer/Rinse Power
	Rinse	Rinse Transformer/Rinse Power	Rinse Transformer/Rinse Power
	Sanitizer	Runs during machine rinse cycle.	
	Destainer	Runs during detergent feed.	
H-3000E With 1 Internal Transformer and a Pressure Switch (not applicable to machines with split wash and rinse power sources)			
Recirculating Door or Conveyor	Detergent Initial Charge	Detergent Transformer/Continuous Power during entire wash and rinse cycles	
	Detergent Recharge		
	Rinse		
	Sanitizer		Runs during machine rinse cycle.
	Destainer		Runs during detergent feed.

Table 1. Internal Transformer Power Connections

SETUP

Controls for the H-3000E are on the PCB located inside the lid, illustrated in Figure 5.

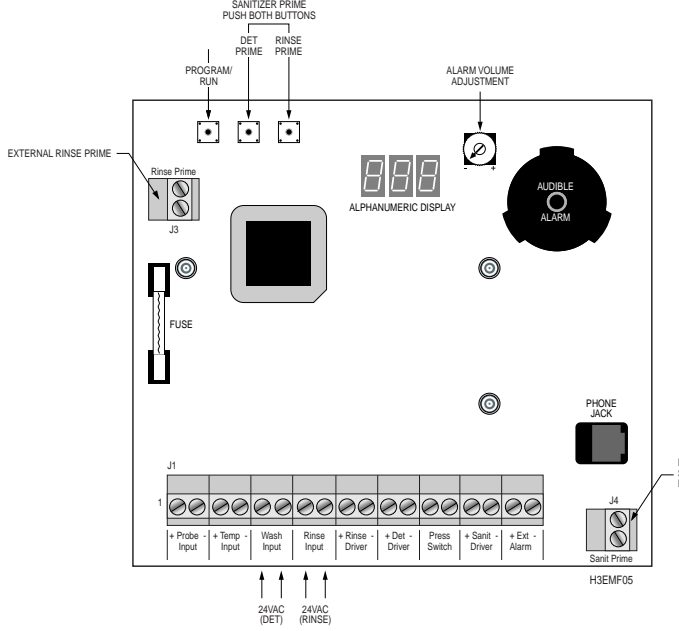
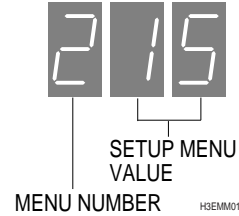


Figure 5. PCB Controls and Probe Connections

The Program/Run button is used to change from the run mode to the programming mode, to scroll through the programming steps and to change the operating information on the display LEDs.

To place the H-3000E in the programming mode, open the top door and hold down the Program/Run button for 5 seconds. The setup information is displayed on the PCB alphanumeric display (see Figure 5). The left digit is the setup menu number and the two right digits are the setup menu value, as illustrated below. See Table 1 for specific menu numbers and probe settings.



If you don't do any programming for 60 seconds, the dispenser will automatically return to the run mode. Use the Program/Run button to change to the next menu and the prime buttons to change the menu values. The detergent prime button increases the value and the rinse prime button decreases the value. Unused menu item numbers are automatically skipped. Each time you press a button while programming, the alarm beeps.

Probe or Probeless Setup

All menu steps are summarized on a drop-in card inside the dispenser. You must apply power to the detergent or rinse input while programming. To quickly change from programming to run mode, turn the dispenser power switch OFF then ON.

Menu No.	Probe Values	Probeless Values
1	Set to 01 for probe	Set to 02 for probeless
2	Low Detergent Alarm Delay Time 0-180 seconds in 10-second steps	Detergent Recharge Dose Trigger 0-60 secs of cumulative rinse on time. Conveyor machines only.
4	Detergent Concentration Setpoint 0-70 Beta units	Detergent Recharge Dose Time for Door Machines: 0-20 secs. Use the detergent prime button to set the desired amount. (see note 1). For Conveyor Machines: 0-6 seconds. Set "00" in menu 8, then return to menu 4 and use the detergent prime button to set desired amount (see note 2).
5	Detergent Overfeed Stop Delay Time 0-240 seconds in 10-second steps after alarm condition	Detergent Initial Fill Charge Time 0-240 seconds in 10-second steps. Use the detergent prime button to set desired amount. (see note 3).
6		Rinse Pump Delay Time 0-99 seconds
7		Rinse Pump Speed 0-99% of maximum speed
8		Rinse Pump Run Time 0-99 seconds Set to 00 for continuous run time for conveyor machines.
D	Reduced Detergent Feed Rate 01 = 1 second ON/9 seconds OFF to 09 = 9 seconds ON/1 second OFF 10 = ON continuously	Detergent Initial Fill Charge Trigger 00 to start feed with machine power on. 01 to start feed with external trigger.
E		Sanitizer Control Set to 00 for feed with rinse or 01 for feed with detergent.
F		Sanitizer Pump Speed 0-99% of maximum speed.

Table 2. Menu Numbers and Probe Settings

- To set the recharge dose for a door machine while in menu 4, pump the desired dose amount into a graduated container by pressing the Detergent prime button to start the pump and pressing it again to stop the pump when the desired amount is reached. The display will show the run time (range 0 to 20 seconds). In the run mode, the measured dose will be delivered.
- To set the recharge dose for a conveyor machine while in menu 4, pump ten (10) times the desired dose amount into a graduated container by pressing the Detergent prime button to start the pump and pressing it again to stop the pump when the desired amount is reached. By pumping 10 times the desired amount, high accuracy can be assured even for very small doses. The display will show the run time (range 0 to 60 seconds). In the run mode, 1/10 of that amount will be delivered.
- To set the initial fill charge dose (for a door or conveyor machine) while in menu 5, pump the desired amount into a graduated container by pressing the Detergent prime button to start the pump and pressing it again to stop the pump when the desired amount is reached. Since the initial fill charge time range is 0 to 240 seconds and only two digits of the display are available for this value, the display will only show the approximate run time. For example, a 02 indicates a range between 20 and 29 seconds. A 15 indicates a range between 150 and 159 seconds. In the run mode, the measured dose will be delivered.

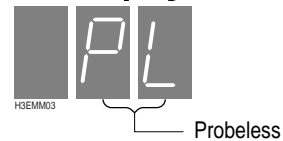
Probe Mode Display



While operating in probe run mode, the display shows actual tank concentration in Beta Units or temperature in degrees C. Note that the first tank concentration display character is blank. To toggle between displaying tank concentration and temperature, briefly press the program/run button. Use the following chart to convert temperature from Centigrade to Fahrenheit.

°C	°F
0	32
10	50
20	68
25	77
30	86
35	95
40	104
45	113
50	122
55	131
60	140
65	149
70	158
80	176
90	194
100	212

Probeless Mode Display



While operating in probeless run mode, the display shows a PL to indicate probeless mode.



If the alarm goes into the overfeed mode (a high-pitched solid tone), you must reset it. To reset the alarm, turn off power to the Detergent Power terminals, wait a few seconds and turn the power back on.

Prime Rinse Pump

There is a pushbutton switch located above and to the right side of the rinse pump. While power is applied to the Rinse Power input, press and hold this switch to prime the chemical feed lines from a new pail.

Setup Sanitizer Pump (H-3200SRE)

Prime and adjust the same as the rinse pump.



Although the rinse and sanitizer pumps are capable of pumping against 40 pounds of pressure per square inch (PSI), it is not advisable to attempt doing so. The rinse pump tubing life will be much shorter. Dishwasher manufacturers specify no more than 20 to 25 PSI in the washer rinse line because if the pressure is higher than 25 PSI chances are that you are only misting, not spraying the ware and your results will not be very good.

OPERATOR CONTROLS AND EXTERNAL INDICATORS

The H-3000E models include a power on/off switch under the dispenser; sanitizer prime button, rinse prime button, program/run button and an alarm adjustment dial on the PCB inside the dispenser; and indicator lights on the front panel as illustrated in Figure 6.

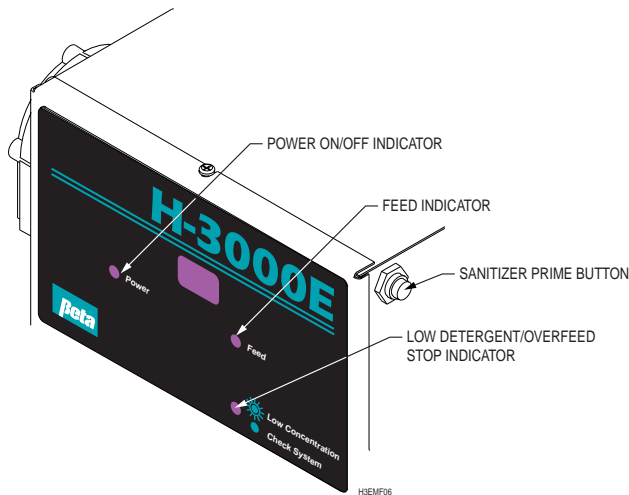


Figure 6. H-3000E Indicators and External Prime Button

Power ON/OFF Switch

This double-pole, single-throw switch, mounted on the bottom of the unit, provides control over the incoming power to the dispenser. It accommodates 1 or 2 transformers or the 24 Volt supply for the 24 Volt units.

INTERNAL CONTROLS AND INDICATORS

Detergent Prime Button

There must be power to either detergent or rinse inputs for this button to work. The detergent pump/solenoid runs as long as the button on the PC board is pressed.

Rinse Prime Button

There must be power to either detergent or rinse inputs for this button to work. The rinse pump runs as long as this button on the PC board is pressed.

Sanitizer Priming

When an auxiliary sanitizer pump is used, priming can be done by pressing the detergent and rinse prime buttons on the PC board simultaneously.

Alarm Adjustment Dial

The alarm volume adjustment dial (located in the upper right corner of the PCB) adjusts the volume of the audible alarm. The volume range is 0 to 93 dB.

Alarm & LED

The internal audible alarm and the LED on the front panel together provide the following operating status information:

Input power to detergent or rinse terminals
Indicator is on continuously

Detergent or rinse feeding
Indicator is flashing slowly

Detergent low
Indicator is flashing rapidly and alarm is pulsing (probe operation only)

Overfeed stop
Indicator and alarm are on continuously (probe operation only)

MAINTENANCE & TROUBLESHOOTING

PERIODIC MAINTENANCE

General Cleaning

Keep the unit wiped clean of any residual chemical buildup that might corrode the stainless steel cabinet.

Caring For The Roller Assembly

Whenever you change a squeeze tube, use a standard 3/32 inch hex driver to make sure that the roller is tight on the motor shaft. Use a few drops of 3 in 1 oil to lubricate the roller sleeves and the roller pins. Remove the roller assembly before lubricating and wipe off any excess oil because it may attack the tubing and cause premature wear.

Cleaning The Probe

The conductivity probe tips (electrodes) MUST be cleaned on a regular basis to ensure optimum performance. The inherent water conditions (for example, water hardness) will be the primary factor in determining how often the electrodes need to be cleaned. To clean, simply wipe off any scale buildup.

Pump & Squeeze Tube Replacement Schedule

Since every installation is different (chemicals, tube runs, operating frequency, and so on), an exact tube replacement schedule cannot be specified. With use, the tube slowly evolves from round to oval and the amount of chemical pumped decreases. By regularly checking the amount of chemical pumped, you can determine general tube life. It is recommended that you closely monitor the time it takes the original tube to reach the end of its flex life, and then establish a replacement schedule. Replacing tubes at regularly scheduled intervals ensures more accurate product use and reduces service calls. In general, short feed lines of a large diameter will improve pump tube life.



It is very important not to let the tubes become worn to the point where they tear and allow chemicals to saturate the pump housing.

TROUBLESHOOTING

Refer to the assembly drawings and the complete unit wiring diagram in the **Appendix**, and the PCB illustration in **Figure 5**. To order replacement spares, see **Ordering Information**.

No Power

Is the On/Off switch on?



The following procedure is to be performed only by qualified personnel.

Units Connected to Line Voltage

- Is proper line power Voltage connected to the power input terminals in the unit? Check both transformers. Is a PCB fuse blown?
- With the power wiring harness unplugged from the PCB, is 24 VAC measured across the transformer secondary wires when power is supplied from the washer? If not, replace the transformer. If yes, replace the PCB.

Units Powered With 24 Volts

- Is 24 Volts connected to the input terminal block? Is the PCB fuse blown?
- If the above is verified, replace the printed PCB.

Properly Rated Fuse Blows Repeatedly

1. Is there a mechanical problem with a motor or solenoid (for example, jammed tubing or frozen gears in the gearbox)?
2. Do motor and/or solenoid resistance measurements fall in the approximate range from 4 to 100 ohms? If yes, go on to the next step. If no, replace suspect part(s) since a shorted motor or solenoid will cause the fuse to blow.



Measure resistance only when the power is turned off. A short will typically measure less than 0.2 ohms; an open will typically measure more than 2000 ohms.

3. Are proper Voltages measured across the appropriate output terminals (detergent drive and rinse drive) when power is applied? If not, replace the PCB. Maximum Voltage is 33 to 34 VDC (without load). Rinse Voltages may be lower depending on the speed setting.

Detergent Feeds Too Often/Too Much

Detergent Used

With Probe

1. Ensure that this installation is a probe setup, not probeless.
2. Check to see if the prime button is operating properly. If the PCB is not installed correctly, the prime button may be depressed continuously.
3. Use the PCB display to check if the concentration setting is correct, or that the actual concentration value is close enough to the setpoint to keep the alarm from sounding. Are the probe electrodes clean?
4. Is a dishwasher problem the cause? This could include fill valve on, too much rinse tank overflow into wash tank, leaking or open drain valve, or wash motor not running to agitate the solution.

5. While the detergent is feeding, short the two probe wires together (down at the probe). Does the detergent feed stop? If so, see **Detergent Does Not Feed at All** and **Checking the Detergent System Functions**. If not, go on to the next step.
6. Are the probe wires loose or disconnected? If not, short across the two probe wire terminals on the PCB (instead of at the probe). This should stop the detergent feed.
7. Replace the PCB if either of these tests does not stop the detergent feeding.

Probeless

1. Check to see if the prime button is operating properly. If the PCB is not installed correctly, the prime button may be depressed continuously.
2. Check the detergent control setup. (Refer to the original setup records.) If wrong, correct. If OK, replace the PCB.

Detergent Does Not Feed at All

With Probe

1. Ensure that this installation is a probe setup, not probeless.
2. Are the two probe wires shorted together? If so, the unit will never feed until this is corrected.
3. Disconnect one of the wires at the probe to cause an open circuit. The indicator should flash slowly, indicating feeding, and the pump or solenoid should function. If so, see **Checking the Detergent System Functions**. If not, go on to the next step.
4. Disconnect one of the probe wires from the PCB. If the detergent does not feed (or there is no Voltage output from detergent drive), replace PCB.
5. Before replacing the PCB, measure the Voltage from the transformer secondary wires to ground. Approximately 14 VAC should be present. A transformer short to ground could cause the pump motor to run erratically.
6. Replace the PCB if either of these tests (steps 5 and 6) does not start the detergent feeding.

Probeless

Check the detergent control setup. (Refer to the original setup records.) If wrong, correct. If OK, replace the PCB.

Checking the Detergent System Functions



You may use this test to verify proper functioning of all of the detergent system—probe input circuitry, detergent drive circuitry and the low detergent and overfeed alarm.

With Probe

1. Place the H-3000E in the Program Mode and select Probe in Menu 1.
2. Connect a forty-seven (47) ohm 1/4 or 1/2 watt resistor across the two PCB probe terminals, or at the end of the probe wires.
3. Move the program to Menu 4 and set the Beta Units below 40.
4. Cycle detergent power to the unit and observe that detergent pump or solenoid is not feeding.

- Place H-3000E in the Program Mode and select probe in Menu 1.
- Move the program to Menu 4 and set the Beta Units to 70.
- Cycle power to the unit. After a 7 second delay, the feed cycle will start.
- If the test did not perform as described, replace the PCB.

Standard Probeless

- Place H-3000E in the Program Mode and select Probeless in Menu 1.
- Set Menu 8 to a number greater than 0, Menu d to 00 and the detergent recharge time in Menu 4 to 8 seconds.
- Cycle power to the unit and observe that the detergent pump runs or solenoid clicks on, feeds for 8 seconds and stops.
- If this test does not perform as described, replace the PCB.

Rinse Pump will Prime but Not Feed

- Is the PCB receiving power?
- Adjust the feed rate setting in Menu 7 to a rate near mid-range, and check if there is adequate run time in Menu 8.
- Check to see if the Rinse prime button is operating properly. If the PCB is not installed correctly, the prime button may be depressed continuously.
- When using a pressure switch, short across the contacts. The pump should run at the programmed speed. If not, replace the PCB. If wired directly to the rinse solenoid, confirm that the rinse power is on from dishmachine.
- Is dishmachine rinse line solenoid opening?

Rinse Pump will Feed but not Prime

- Is the PCB too far back? If so, reinstall.
- Replace the PCB.

Rinse Pump will Neither Prime nor Feed

- Washer must be in wash/rinse cycle to prime pump.
- Check for a loose wire connection to the pump.
- When you push the Rinse Prime button, 33 to 34 VDC should be measured across the motor terminals. When shorting the pressure switch contacts, 0 to 34 Volts DC should be measured, depending on what pump speed setting has been selected. This Voltage will change as you increase or decrease the pump speed setting.
- If Voltage in the proper range is present and the pump will still not run, remove the pump cartridge and observe the drive spline while you push the Rinse Prime button. If the drive spline does not turn, replace the motor assembly.
- Replace the PCB if either of these tests (steps 3 and 4) does not fix rinse pump.

Rinse Pump Feeds Continuously

Check to make sure rinse prime switch is working properly. Check the preset run time of the pump and the operation of the Rinse prime button. If the pump continues to run beyond that run time, replace the PCB.

Pump Will Not Pull the Chemical Out of the Drum

- Too much vacuum created. The supply line in the chemical drum may be up against either the side or bottom, the supply lines may be too long for a viscous product, or there may be a crimp in the intake supply line, thus exceeding the pump's vacuum specifications.
- There may be an air leak somewhere in the input supply line. Most often this is caused by inadequate sealing of the supply line into the line nuts.
- Squeeze tube is worn and rollers can't squeeze the tube properly. Correct by changing the pump cartridge with the correct size squeeze tube and line nuts for the chemical being pumped.

Replacing the PCB

Follow the procedure below to replace the H-3000E PCB when necessary:

- Ensure power to the dispenser is off and open the dispenser cover.
- Disconnect all connectors.
- Remove the four screws holding the PCB to the cover, and lift it away from the cover.
- Install the new PCB to the cover and secure it with the four mounting screws.
- Reconnect all connectors to PCB.
- Double-check all connections before turning power on to the dispenser. Refer to the wiring drawing in the **Appendix**.
- Turn power on to the dispenser and test operation.
- Set concentration and delay time as described in **Installation and Setup**.

Display Diagnostics

During operation in probe mode, the display on the PCB may indicate one of the following error conditions.

When working in probeless mode, these error condition messages may appear by default, but operation is unaffected.

- Bad temperature sensor (thermistor) or open wiring. Check connections or replace temperature sensor.



- Bad temperature sensor (thermistor) or shorted wiring. Check connections or replace temperature sensor.



- Failed PCB. Replace the PCB.



ORDERING INFORMATION

To order items in the lists below, please use the item number.

Seq #	Description	Item N°
Dispenser and Power Components		
1	PCB Assembly	096883
2	Motors, Rinse & Sanitizer 24VDC, 17 RPM	039370
3	Motor, Detergent, 24VDC, 100 RPM	018056
4	Pump Housing (front half)	059967
5	Pump Housing (rear half)	038850
6	Detergent Solenoid Assembly (w/24VDC coil)	017616
7	Solenoid Valve Repair Kit	035646
8	Fuse (AGC 250 Volt 2 Amp)	042882
9	Detergent and Rinse Power Transformers	094786
10	Rinse Line Injector/Checkvalve Fitting	035876
11	Standard Conductivity Probe Kit	018079
12	Optional Pressure Switch Assembly	042552
13	Optional On/Off Power Switch Kit	018003
	Mounting Kit	018224
14	Detergent Tubes	
	Silicone	026913
	Molded Nordel	041849
	C-FLEX	035929
	Beta Tube	022028
	Nordel (straight)	035919
15	Rinse Tubes	
	Silicone	026881
	C-FLEX	035933
	Beta Tube	017431
	Nordel (straight)	035926
16	Sanitizer Tubes	
	Silicone	026883

TECHNICAL ASSISTANCE

If you require technical assistance or additional product technical information, contact Technical Support.

RETURNS

To return equipment for repair, obtain a Return Authorization (RA) number from Beta Technology Customer Service. Equipment returned under warranty will be received freight prepaid by customer and returned freight prepaid by Beta. Freight charges for out of warranty repairs will be the responsibility of the customer both to and from Beta. Returns for credit must be authorized within 30 days after invoice date and shall be subject to a 20% restocking charge plus prepaid freight.

WARRANTY

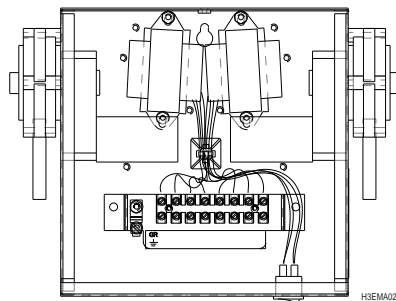
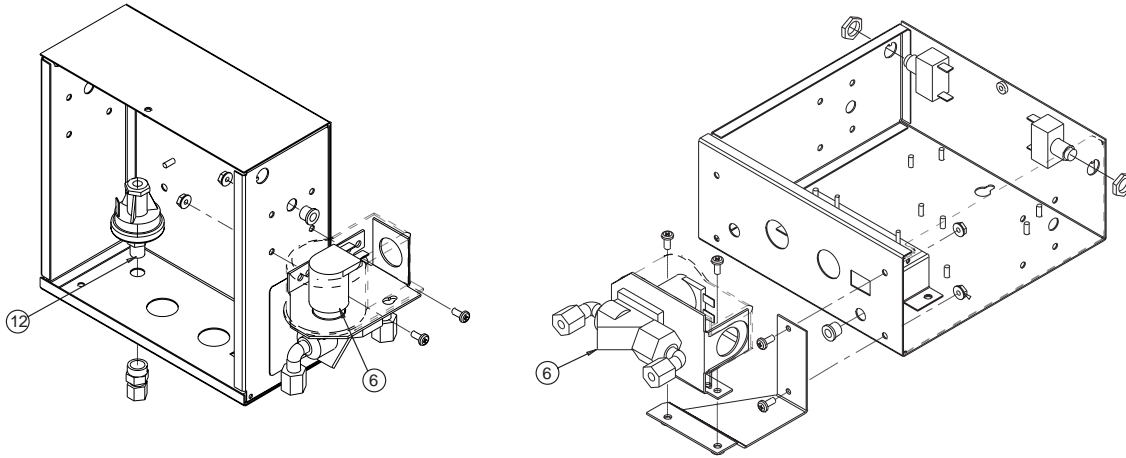
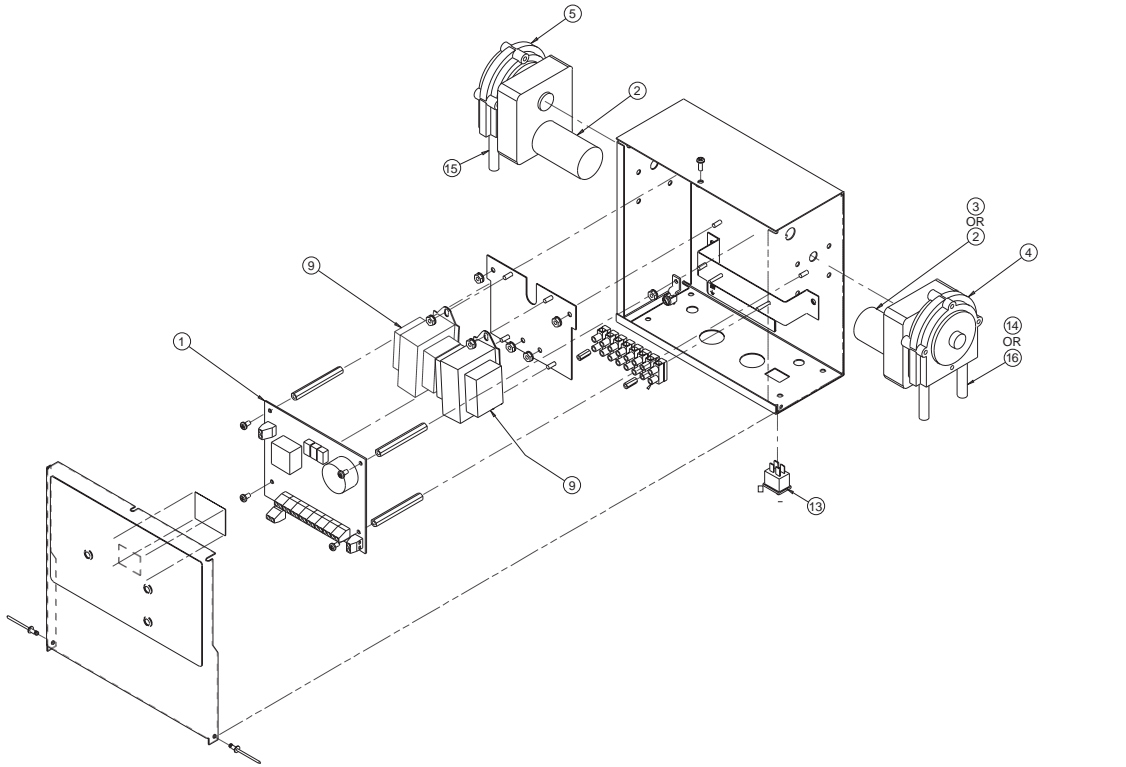
Beta Technology, Inc. (Beta) warrants each new item of unit equipment manufactured by Beta to be free from defects in materials and workmanship under normal use and operation in accordance with Beta's instructions and use directions for a period of twenty-four (24) months from the date of delivery to the original purchaser. Exception: pH probes are only guaranteed to be operational at the time of delivery. All probe claims must be submitted in writing within 30 days from the date of shipment from Beta.

Beta's obligation under this warranty is limited to the repair or replacement of any such item of equipment (or part thereof) shown to be defective or, at Beta's option, to refunding the purchase price of any such defective item of equipment less a reasonable allowance for prior use. Replacement parts furnished by Beta shall be warranted as stated above for the unexpired portion of the original equipment's twenty-four (24) month warranty. This does not extend to any item or part subjected to misuse, accident, improper installation, maintenance or application, improper packing by purchaser in return shipment to Beta, or any item or part repaired or altered outside of Beta's factory without expressed prior authorization of Beta.

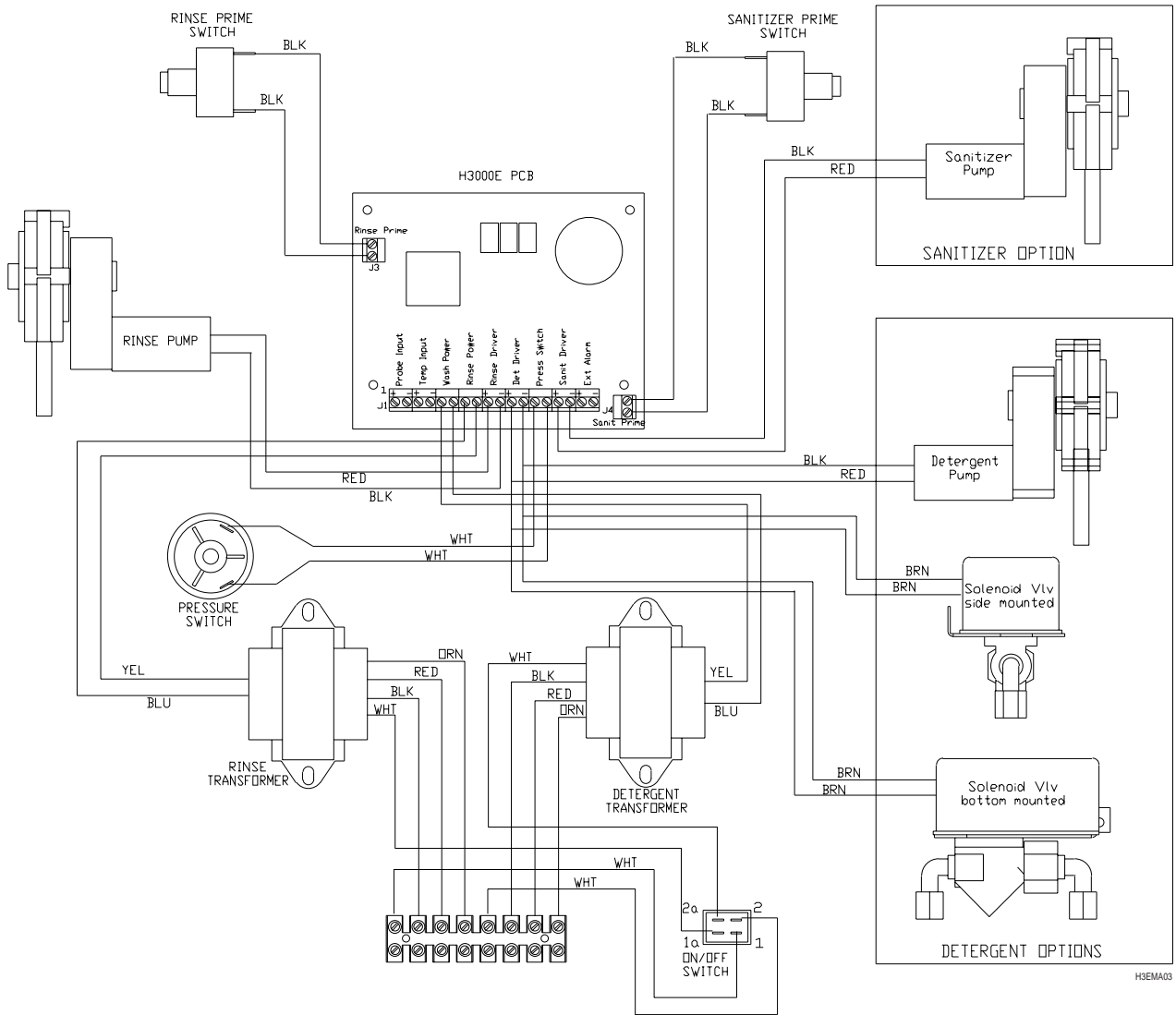
"Goods Sold as Purchased" item warranty will be passed on as furnished by the vendor.

The foregoing warranty is in lieu of any other warranty, expressed or implied, in fact or in law, including without limitation the warranty of merchantability or the warranty of fitness for a particular purpose. It is expressly understood that purchaser's sole and exclusive remedy is limited to enforcement of Beta's obligation as set forth above and Beta shall not be liable to purchaser or others for loss of use of the equipment or for other direct, special, indirect, incidental or consequential damages.

APPENDIX



FRONT PARTIAL VIEW
 PRIMARY TRANSFORMER WIRING TO TERMINAL BLOCK
 (MODEL H3200E SHOWN - REF)



H3EMA03



This Manual is desktop published in Microsoft Word. If you want to make a local translation, contact your Beta Technology customer service representative. The electronic file on a zip disk is approximately 5M.



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