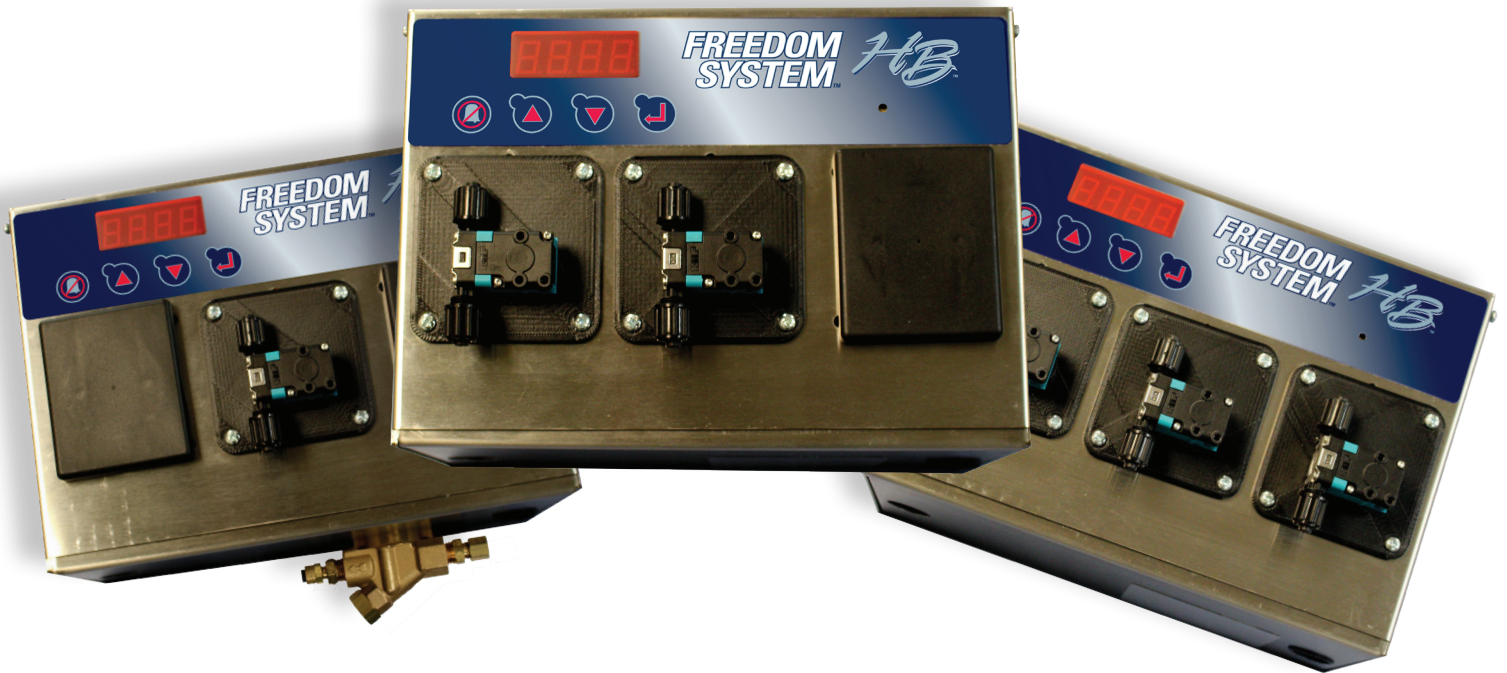




U S Chemical

Providing Exceptional Quality Since 1962



Freedom System HB Warewash Dispenser

Installation Manual - D1229269

Table of Contents

Introduction	4
Freedom System Dispensers.....	5
Installation	6
Mounting the Thermal Sensor Probe	6
Liquid Pump Tubing	7
Electrical Connections.....	8-9
External Mounted Pressure Switch - Install	10
Programming.....	10
Freedom System Introduction	11-17
Normal Operation	17
Error Code Displays - Operator Corrective Actions.....	17
Start-up Screens and Operations	18
Dishmachine Delimiting.....	18
Probeless Operation.....	18
Troubleshooting	19
Parts List	20-21
Concentrations and Use Dilutions.....	22

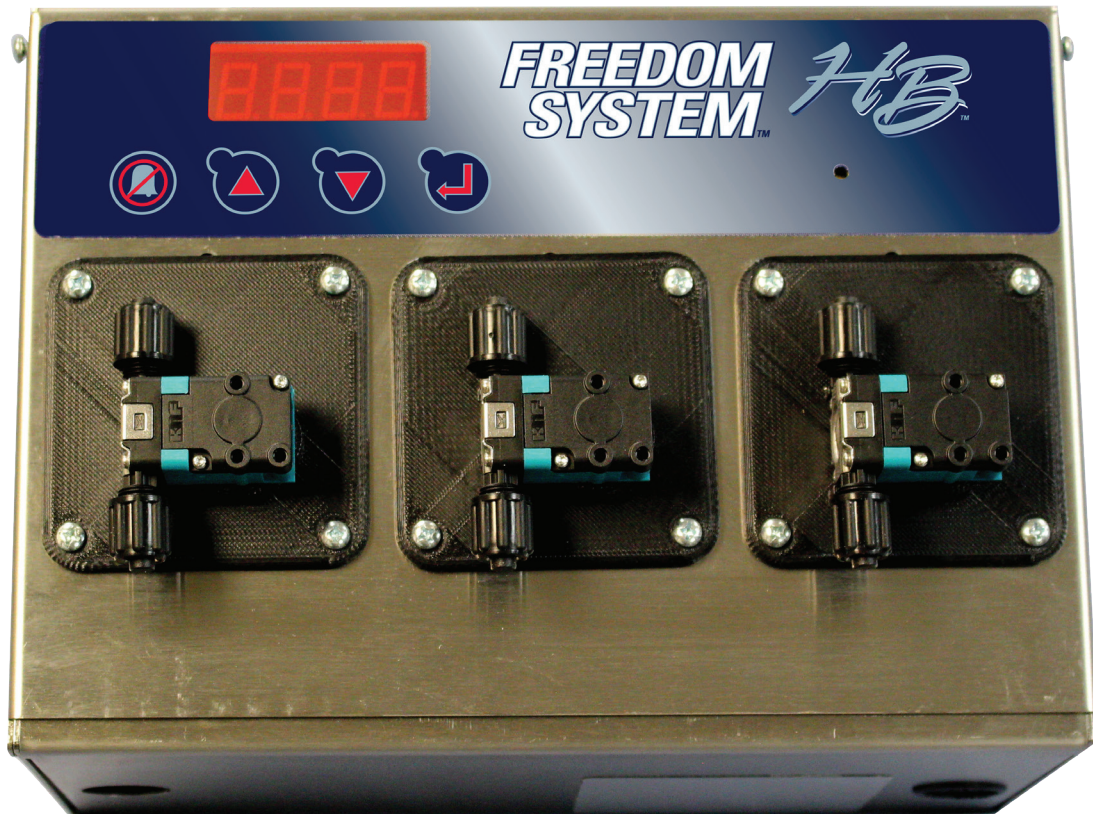
FREEDOM SYSTEM HB INTRODUCTION

Version U01.09

- The Freedom System HB is a warewash dispensing system developed by U S Chemical.
- Features ProbeLogic™ - our patented software program that practically eliminates service calls due to probe related problems.
- Provides a digital readout of what's been happening at an account and how the dishmachine has been running without starting the dishmachine!
- Freedom System HB allows you to program:
 - Detergent concentrations
 - Program the pump speeds
 - Water used during rinse and fill cycles
 - Low wash temperature alarm
 - Low rinse temperature alarm
 - Out of detergent, rinse and/or sanitizer alarms
 - A variety of display options
 - Without starting the dishmachine, the Freedom System HB will report several vital pieces of information about the dishmachine operation.

PROBELOGIC™ SOFTWARE

- ProbeLogic™ solves the #1 cause of all emergency service calls – probe problems.
- In the event that anything causes the probe to malfunction – lime deposits, loose or broken wire, something caught on it, etc. ProbeLogic™ automatically switches the Freedom System HB to operate as a probeless system.
- ProbeLogic™ monitors the probe status, and when the malfunction is corrected it returns the system to probed operation.
- No squeeze tubes to reduce preventive maintenance calls.
- Consistent dosing not found with peristaltic pumps.



FREEDOM SYSTEM HB DISPENSERS

Freedom System HB L1 + P1 (D1229268)

Unit comes with one rinse pump and one solenoid for encapsulated product. This unit is ideal for high temp dishmachines.

Freedom System HB L2 (D1229266)

Unit comes with two pumps intended for detergent and rinse. This unit is ideal for high temperature dishmachines.

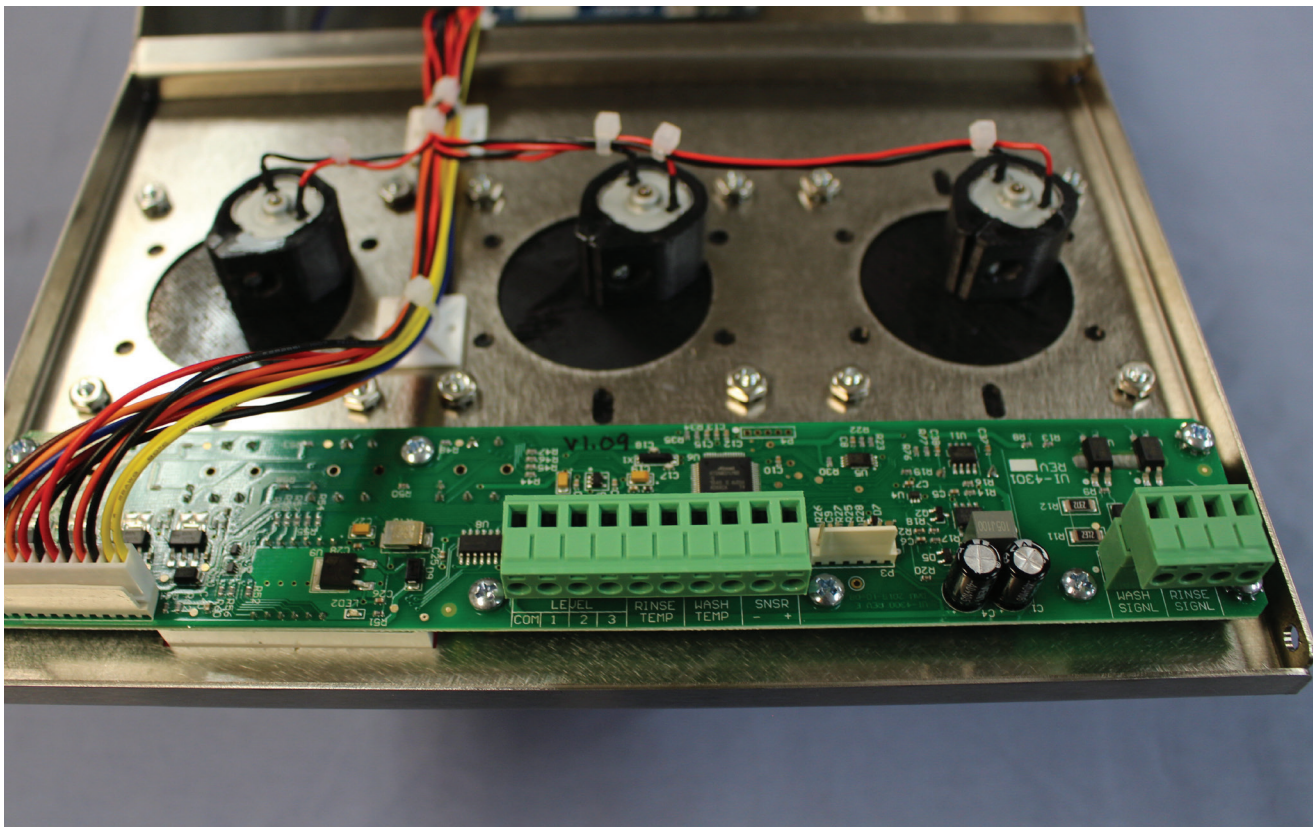
Freedom System HB L3 (D1229267)

Unit comes with three pumps intended for detergent, rinse and sanitizer on a low temperature non fill and dump machines.

All models are field programmable to accommodate several optional features: (see pages 20 and 21 for SKUs)

- Conductivity Probe – With the addition of a conductivity probe, the Freedom System HB can monitor and control the concentration of detergent in the wash tank and automatically dispense detergent when needed. Without a probe, the Freedom System HB can be used as a probeless system.
- Thermal Sensor Probe – A more sophisticated conductivity probe, with a built in thermistor can be used to monitor and display the wash water temperature. The Freedom System HB can be programmed to alarm when the wash temperature falls outside a high and low limit range.
- Low level float standpipes can be added to the system for liquid detergent, rinse and sanitizer products to enable an alarm to be sounded when the system is out of product.

Wiring instructions are on pages 8 and 9.



INSTALLATION

NOTE: Do not mount the Freedom System HB in the direct path of excessive steam, vapor, heat or where it could be accidentally damaged. The dispensers should be mounted on the “dirty” side of the dishmachine. WHEN OPENING CABINET, DO NOT USE EXCESSIVE PRESSURE ON DOOR.

Survey the dishmachine and its functional environment to determine Freedom System HB equipment mounting locations, wire/conduit routing, plumbing requirements, service accessibility, and non-interference with normal dishmachine operation prior to making installation.

1. Install the control head with the wall mount hardware provided.
2. Product standpipes are supplied with 9' of poly tubing. This is the maximum length of suction tubing recommended.
3. Use Teflon tape or pipe dope and install the 1/4" x 1/8" NPT injection check valve into the dishmachine's rinse line. Connect the discharge tubing into the injection fitting.

OPTIONAL: Use the 1/4" x 1/8" nylon injection check valve for the optional sanitizer pump; connect the 1/4" polyflow discharge tubing to the injection fitting. The optional sanitizer injection fitting should be located downstream from the rinse injection fitting. Most machines will have holes already tapped into the rinse line for these purposes. If no holes are present, select a spot on the rinse line downstream from the vacuum breaker. (Most codes require installation at least 6" below the discharge side of an approved vacuum breaker.) Drill an 1 1/32" hole in the rinse line and tap to 1/8" NPT.

MOUNTING THE THERMAL SENSOR PROBE OR BUTTON PROBE (IF USING A PROBE)

1. Ensure that the dishmachine wash tank is empty of water and electrical power is off, locked and tagged.
2. Examine the tank for any pre-punched holes made by the manufacturer or a previous chemical supplier. If it is in a good location, (approx. 2-3" above the bottom of the tank and not near a corner or obstruction such as the tank heater), go ahead and use it. If there is no hole present, or it's in a poor location, a 3/8" hole must be drilled and enlarged to 7/8" with a round knockout punch.
3. Place a rubber washer onto the probe body. Insert the probe into the machine with the two threaded tips placed towards the “outside” of the machine wall. Place a rubber washer on the outside of the machine, over the button probe body. Place the plastic washer over the rubber washer. Tightly secure the thermal sensor probe to the wash tank with the plastic basin nut.
4. Use the four (4) conductor wire that comes with the thermal sensor probe. Connect the ring terminals on the black and white wires to the threaded posts with SS washers and nuts. Connect the slide terminals on the red and green wires to the thermal sensor connectors.
5. Run the probe wire through the hole on the bottom right side of the enclosure. Connect the black and white wires to the terminals marked “SNSR”. Connect the red and green wires to the terminals marked “WASH TEMP”. The button probe wires are red and black, connect them to the terminals marked “SNSR”.

**No longer included with Freedom Systems HB. Special Order DEQ0099926 (Thermal Sensor Probe w/wiring) or D011770 (Button Probe Kit w/wiring)*

MODEL L1+P1 DETERGENT DISPENSER

The Freedom System HB Retro (or “hopper”) is used in conjunction with the Freedom System HB concentration controller and is designed to be used only with disposable canisters containing specially formulated warewashing concentrates. The dispenser is mounted higher than, but within four feet of the dishmachine's detergent injection point. Select a mounting location that does not interfere with normal dishmachine operation, yet allows for easy access to insert and remove the disposable canisters.

1. Use the retro as a mounting template to mark the four holes on the mounting surface. Drill four 1/4" holes and secure the dispenser utilizing the wall anchors and screws provided.
2. If the dishmachine does not already have a detergent injection point, select a location on the dishmachine wash tank for the detergent injection point. Ensure the detergent injection point is ABOVE the wash tank high water level and BELOW the dish rack or conveyor driving mechanism. Drill and punch a 7/8" hole and install the overflow barb fitting. Secure with the rubber and plastic washers and the basin nut.
3. Cut to required length the 5/8" ID x 7/8" ID PVC tubing coming from the bottom of the dispenser and connect to the overflow barb fitting on the dishmachine. Ensure the tubing is routed in a downward direction with no kinks or loops.
4. Remove the white cap from the nozzle arm assembly and screw the vacuum breaker assembly on. DO NOT remove the brass ball from the spray arm. The ball MUST be in place for the safety valve to operate properly. The safety valve stops the flow of water to the dispenser without a concentrate canister being inserted. This valve eliminates any wiring between the dispenser and the board.

SOLENOID VALVE AND VACUUM BREAKER (CONTINUED)

NOTE: Use pipe dope or Teflon tape where needed on plumbing connections.

5. Locate a nearby constant pressure pre-booster heater, domestic hot water source and install a 1/8" NPT x 1/4" copper compression needle valve. A 1/8" female pipe thread is required for this fitting. (Ensure water line is shut off).

NOTE: SOME PLUMBING MODIFICATIONS MAY BE NEEDED. CHECK WITH STATE AND LOCAL CODES ON PLUMBING REQUIREMENTS.

WARNING TO INSTALLER

Water directed to retro unit should not exceed 150°F. Take hot water from a source preceding the booster heater. **DO NOT USE BOOSTER HEATED WATER TO DISPENSE ENCAPSULATED POWDERED PRODUCTS.**

6. Connect and route a length of 1/4" copper tubing from the needle valve to the water solenoid valve inlet connector. Route and connect a length of 1/4" polyflow tubing from the output side of the solenoid valve up to inlet side of the vacuum breaker located on the retro. Run the 1/4" polyflow from the solenoid valve through the strain relief on the mounting screw.
7. The needle valve is used to control the water flow rate into the detergent dispenser. **Optimum results are obtained by adjusting the needle valve to produce a flow of approximately 350 mL (12 oz) of water in 15 seconds.** Use a measuring cup or calibrated bottle to measure the flow rate. Place an empty canister in the retro with power "ON". Then press the up key to activate the solenoid. Measure the output at the bottom of the retro, and adjust as needed to get 350 mL (12 oz) in 15 seconds. **This step is critical to the correct dispensing of encapsulated products.**
8. Remove the pressure sensitive shipping seal from the mouth of the canister and insert the canister into the top of the dispenser. When the system calls for detergent, the water solenoid valve is activated. Water sprays into the dispenser, mixing with the concentrate and flowing from the bottom of the dispenser into the dishmachine wash tank via the 5/8" ID x 7/8" OD PVC tubing.
9. See the programming instructions to calibrate this system.

LIQUID PUMP TUBING

1. Insert the 1/4" poly tubing from the standpipe into the inlet (bottom) side of the pump. Secure the threaded compression fitting.
2. Place the appropriate identity tag on the standpipe and place it in the container.
3. Using 1/4" polyflow tubing, secure one end to the outlet side of the pump and the other end to the rinse or sanitizer injection fitting in the dishmachines rinse line.
4. For liquid detergent or destainer injection, follow steps 1-3 above. Locate a 1/4" poly x 7/8" MPT angled plastic fitting about 3" above the water line of the dishmachine. A 7/8" hole is needed for this installation.

ELECTRICAL CONNECTIONS

1. With the dishmachine running, use a voltmeter to determine the power levels for the detergent signal, the rinse signal, and the constant (L1 & L2) power supply. For any voltage over 24 VAC, Seal-Tite® is required.
2. Shut off the dishmachine and the power supply. Lock and tag the power box.
3. The seven (7) conductor wire enclosed with the Freedom System HB is used for the power and signal connections. Wires are both color coded and numbered. A recommended color selection is:

Color	Machine Connection	Freedom Connection	AC Voltage Required
Red	Detergent signal	Wash signal	24, 110, 220
Red/Black	Detergent signal	Wash signal	24, 110, 220
Brown	Rinse signal	Rinse signal	24, 110, 220
Black	Rinse signal	Rinse signal	24, 110, 220
Orange	* L-1	Power supply	110, 220**
Blue	* L-2	Power supply	110, 220**
Yellow	Ground	Ground lug on enclosure by power supply.	

110 – 115 - 120 VAC are equivalent. 208 – 220 – 230 – 240 VAC are also equivalent.

* For 3 phase connections, use L1 + L2.

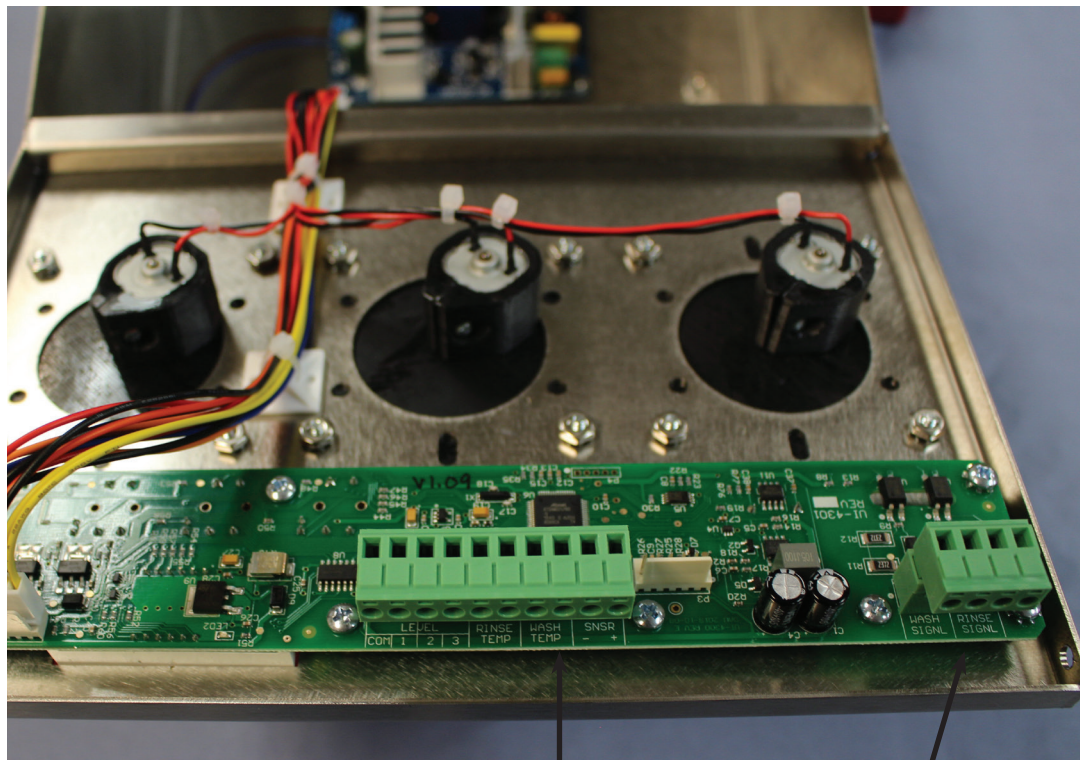
** For 440 – 480 VAC, use a step down transformer.

There are three places for wiring connection:

1. Constant power is on power supply inside back of enclosure. (fig. 2)

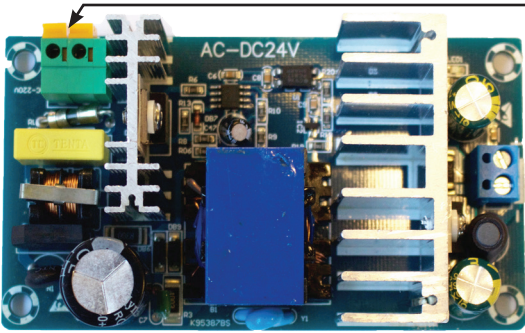
2. Signal connections

* See specific wiring connection in Fig. 3 (page 9)



3. Probe ("SNSR") and other sensors

(fig. 1)



The power supply to the Freedom System HB must be a constant power supply. Connections should be made to the line voltage (L1-L2) on the dishmachine.

Check the voltage with your voltmeter, then connect two wires to the dishmachine and run the wires through conduit to the powersupply in the dispenser.

- Constant power is on and terminals accept 110, 115 & 220 AC volts.

A ground wire should be connected to the grounding lug on the enclosure.

** A stepdown transformer (440-110 VAC) is needed for 440 VAC.*

(fig. 2)

Signal connections for DETERGENT (WASH SIGNAL) and RINSE (RINSE SIGNAL) are labeled as shown. Voltage of these signals may be 24, 115, or 230 VAC.

The amount of wiring will depend on the features utilized in the installation. A 20' piece of 16 gauge, 7 strand wire will be included in the installation kit for the constant power, wash and rinse signals, and ground.

The other wires for connections will be provided with the optional sensor.



LEVEL COMMON

LOW LEVEL 1

LOW LEVEL 2

LOW LEVEL 3

RINSE TEMP

WASH TEMP

PROBE SENSOR

WASH SIGNAL

RINSE SIGNAL

(NOTE: The Freedom System HB has the ability to provide alarms for "out of product" and low wash and rinse temps.)

(fig. 3)

EXTERNAL MOUNTED PRESSURE SWITCH – INSTALLATION

Special Order Installation Kit Includes:

SKU NUMBER	ITEM	QUANTITY
D011771	Remote Pressure Switch assembly	1

Provide a 1/8" tapped NPT hole on the final rinse line. Most codes require installation at least 6" below the discharge side of an approved vacuum breaker. Use pipe dope or Teflon tape on the threads of the brass street tee and install the remote pressure switch assembly in the rinse line.

Connect the 1/4" x 1/8" NPT brass fittings on the 90° part of the brass street tee. Insert the cap of the fitting over the 1/4" polyflow tubing. Slide the 1/4" polyflow tubing down through the fitting and into the brass tee. Tighten the cap. Route the 1/4" polyflow tubing up to the rinse pump discharge side and insert it into the pump.

Route the two conductor wire up to the yellow wires from the harness attached to the board.

When installation is complete, proceed to programming.

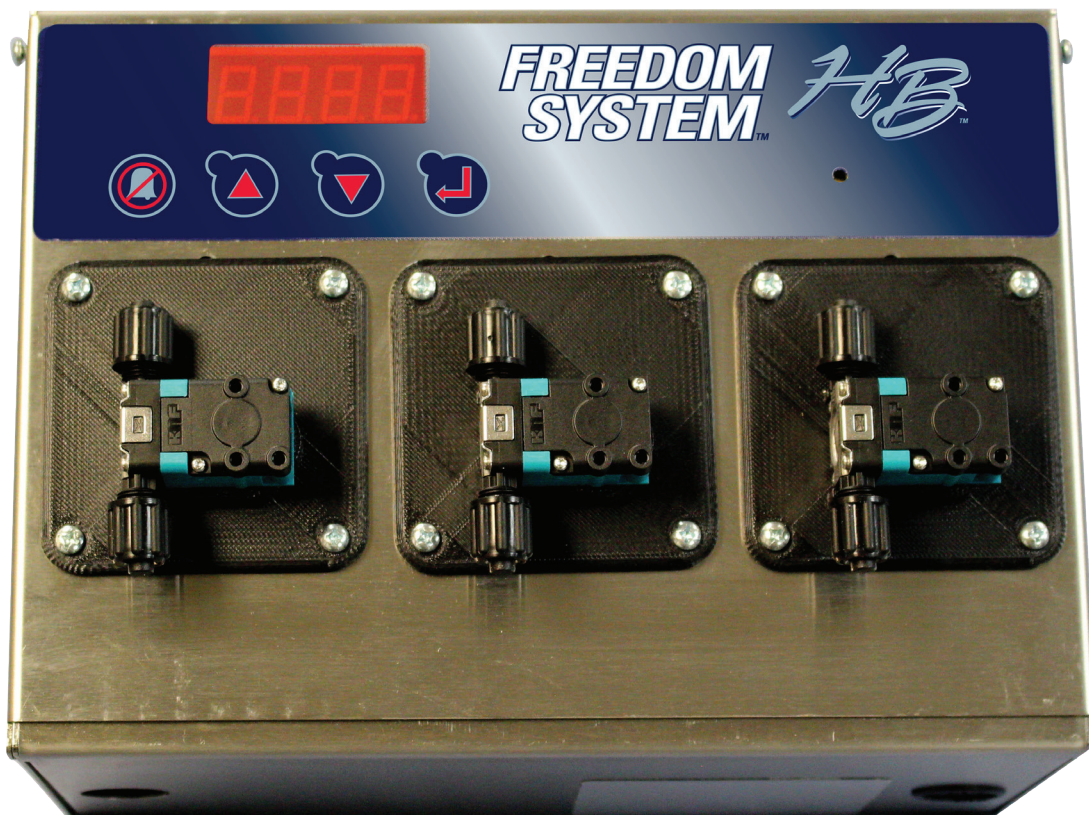
PROGRAMMING

The Freedom System HB features a digital microprocessor to provide precise chemical control for commercial dishmachines. The system settings are programmed using the display and keys on the front panel.

FRONT PANEL

The system has four keys and a four digit LED display for making adjustments to the system. In normal use the last three arrow keys are used to prime the detergent, rinse, and sanitizer/destainer pumps. To prime the system simply press and hold the key to prime the line. When a pump is active a small LED in the prime key lights up to indicate that it is active.

The following pages detail the step by step programming instructions for the Freedom System HB. These instructions are also available upon request from the U S Chemical Literature Department.







(fig. 4)



FREEDOM SYSTEM HB STEP BY STEP PROGRAMMING INSTRUCTIONS

Version U01.09










FREEDOM SYSTEM - NORMAL OPERATION

- Programmed Display – The display will show your programmed “DISP” selection.
- Alarm Silence key - ( , FIRST BUTTON) - Allows operator to temporarily turn off the audible alarm.
- Prime Detergent key - ( , SECOND BUTTON) - Allows dishmachine operator to prime detergent 1st pump or solenoid.
- Prime Rinse Aid key - ( , THIRD BUTTON) - Allows operator to prime the Rinse Aid (2nd position) pump.
- Prime Sanitizer key - ( , FOURTH BUTTON) - Allows operator to prime the Sanitizer/Destainer (3rd position) pump.
- NOTE: The ability for an operator to prime the chemical products is determined by your programming selection (0 or 1) in the “Pr 1” programming step.












SPECIAL DELIMING FEATURE:

- To shut off the system for dishmachine delimiting purposes, press the ALARM SILENCE  and DOWN  buttons at the same time. The display will read “OFF.”
- When delimiting is complete and the dishmachine has been drained and rinsed, press those two keys at the same time to return the system to normal operation.
- **NOTE: Internal power is still HOT. Pumps are only disabled from dispensing.**







PROGRAMMING THE FREEDOM SYSTEM HB

- Activate power on Line 1&2. This should be the constant power, usually supplied from the dishmachine to the Freedom System HB power supply.
- Display reads “FILL”. This is the normal startup display.
- Press ALARM SILENCE  and ENTER  buttons together.
- If the Freedom System HB display reads “PASS”, no password has been entered on this unit. Password protection is recommended.
- To start programming, press the  or  key. Note that no password has been entered. To do so, skip to next step.
- To enter a password, press ENTER  key (last button).
- The display reads “0000”. (default)
- Scroll  or  to your desired password.
- Press ENTER.
- The display reads “PASS”.
- To start programming, press the  or  key.







ENTERING OR CHANGING YOUR FREEDOM SYSTEM HB PASSWORD (PASS)

- Activate power on Line 1&2.
- Display reads "FILL".
- ALARM SILENCE  and ENTER  buttons together.
- If the Freedom System HB display reads "0000", a password has been entered on this unit. If it reads "PASS," no password has been entered previously.
- Use the  or  buttons to scroll to your previously entered password. Press ENTER  key.
- If the system beeps and the display goes back to "FILL," you have not entered the correct password.
- If you don't know your password, call Training for a "back door" code.
- If the display reads "PASS", the correct password has been entered.
- Press the ENTER  key.
- Display reads "0000".
- Use the  or  key to scroll to your new password.
- Press the ENTER  key.
- The display reads "PASS". You have now entered the new password.
- To start programming, press the  or  key.

PROGRAMMING NOTES

- All Freedom System HB entries can be found by scrolling up  from the low end of the range or down  from the high end.
- For example, if your Password (0-9999) is 7580, use the  key to go down to 7580.
- When programming, the ENTER  key does two things:
 - It shows display screen settings or values.
 - It locks in your programmed settings.
- The  or  keys either:
 - Change the display settings.
 - Move you to the next display screen.

SETTING DETERGENT CONCENTRATION (COct)

- After entering your password, and the display reads "PASS," press the ENTER  key.
- Press the  key to get to the next display:
- "COct" = Detergent Concentration.
- Press ENTER  key.
- Range = 0-250 Default = 40
- Use the  or  key to program the desired detergent concentration setting, push ENTER  key to set.
- The use of your Total Test Kit (Don't leave home without it!) is required for determining the actual ppm concentration of detergent in the wash tank.

PROGRAMMING NOTE

- The Freedom System HB can be used as a probeless system by programming COct = 0. See page 18.
- **DO NOT hook up wash signal in probeless mode**
- When the Freedom System HB is used in a probeless installation, the ProbeLogic™ feature will not be available, as there is no probe that can fail.
- The Wash Temperature display and alarm requires a thermal sensor probe, and those related features are also not available in a probeless installation.

SETTING THE PUMP SPEED (PR_1, PR_2, PR_3)

- Press ENTER ↵, then ▲ to get to the next display.
- Pr_2 = Rinse Aid pump speed. (middle of unit)
- This regulates the pump speed from 0 to 100% of the maximum speed of the motor.
- Default = 20%. Press ENTER ↵, then use ▲ or ▼ to select and ENTER ↵ to set.
- Press ENTER ↵, then ▲ .
- Pr_3 = Sanitizer or Destainer pump speed. (far right of unit)
- This regulates the pump speed from 0-100% of the maximum speed of the motor.
- Default = 20%. Press ENTER ↵, then use ▲ or ▼ to select and ENTER ↵ to set.
- Press ENTER ↵, then ▲ .
- CU_3 = Choice of if and/or how liquid chlorine will be used in the dishmachine.
- Sanitizer = "2"
- Destainer = "1"
- Neither = "0" (default)
- Press ENTER ↵ to set.

SETTING DETERGENT CHARGE TIME FOR PROBELESS OPERATION (CH-t)

- Press ENTER ↵, then ▲ .
- CH_t = Charge time for the wash tank detergent when Freedom System HB is operating probeless.
- When the Freedom System HB senses a "FILL" condition, and the dishmachine is then filled, the initial charge of detergent must be enough for the full wash tank. In a manual fill machine, the initial charge activates when the rinse is activated for the first time.
- Range = 0-120 seconds of detergent charge time. Default = 30 seconds.
- Press ENTER ↵ to set.

SETTING DETERGENT DISPENSING TIME - PER RACK - FOR PROBELESS OPERATION (dE_t)

- Press ENTER ↵, then ▲ .
- dE_t = Detergent charge time per rack when the Freedom System HB is operating probeless.
- Range is programmed in increment of 0.0-100 seconds
- Default = 2 seconds.
- Press ENTER ↵ to set.

ENTERING THE TYPE OR STYLE OF DISHMACHINE (tYPE)

- Press ENTER ↵, then ▲ .
- tYPE = The type or style of dishmachine.
- "0" = Door type w/ auto fill (default).
- "1" = Conveyors of any kind, including rack or flight type machines, w/ auto fill.
- "2" = Door type w/ manual fill.
- "3" = Conveyor type w/ manual fill.
- Press ENTER ↵ to set.

NOTE: Auto fill machines that do not fill through the final rinse solenoid should use door or conveyor with manual fill. Detergent initial charge will activate on first rack in rinse cycle. Then every 45 minutes of idle time activates it.

ENTERING CONVEYOR RACK TIME (TO COUNT RACKS) (Ld_t)

- Press ENTER ↵, then ▲ key.
- Ld_t = Number of seconds it takes for one rack to go through just the final rinse section (not the wash) of any conveyor style dishmachine.
- Range = 5-250 seconds Default = 20 seconds.
- Press ENTER ↵ to set.

SETTING RINSE AID OVERFEED “STOP” (rOVF)

- Press the ▲ key.
- rOVF = Rinse Overfeed “STOP”, the number of seconds before the rinse pump stops.
- Range = 0-60 seconds Default = 15 seconds.
- This feature is only designed for door style machines that auto fill through the rinse. (Type = 0)
- Press ENTER ↵ to set.

SETTING RINSE AID PUMP DELAY TIME (rdEL)

- Press the ▲ key.
- rdEL = Number of seconds to delay the activation of the rinse aid (middle) pump.
- NOTE: This only applies to door type machines.
- Range = 0-10 seconds. Default = 0 seconds.
- Press ENTER ↵ to set.

SETTING LOW WASH TEMPERATURE LIMIT (tL01)

- Press the ▲ key.
- tL01 = Low wash tank temperature limit.
- ***Requires use of the Thermal Sensor probe.**
- Range = 100°- 210° F Default = 130° F.
- Press ENTER ↵ to set.

SETTING THE LOW RINSE TEMPERATURE LIMIT (tL02)

- Press the ▲ key.
- tL02 = Low temperature limit for the rinse cycle.
- The Freedom System HB alerts the operator if rinse temperatures fall below level programmed.
- ***Requires optional rinse line Thermal Sensor.**
- Range = 100°- 210°F Default = 170° F.
- Press ENTER ↵ to set.

SETTING THE DELAY TIME FOR “OUT OF DETERGENT” ALARM (AdEL)

- Press the ▲ key.
- AdEL = Alarm delay time for “out of detergent” alarm.
- Set for 20 - 30 seconds more than the observed total dishmachine charge time when the dishmachine is filled.
- Freedom System HB does not restart timing with the next rack.
- Range = 15 - 480 seconds. Default = 90 seconds.
- Press ENTER ↵ to set.

PROGRAMMING NOTE:

- The “out of detergent” alarm will sound for a total of 1.5 times the seconds programmed in AdEL.
- For example, if AdEL = 90 seconds, the alarm sounds for $1.5 \times 90 = 135$ seconds.
- The dishmachine operator can temporarily shut off the audible alarm by pressing the top ALARM SILENCE 🔇 key.
- If the detergent concentration problem is not corrected, the alarm will sound again when the next rack is washed, and will do so until alarm time expires.
- If the alarm time expires, ProbeLogic™ will change the Freedom System HB to probeless.

SETTING ALARM VOLUME LEVEL (AVOL)

- Press the ▲ key.
- AVOL = Alarm Volume Level.
- Range = 0 – 4.
- “0” is off, or silent.
- “4” is highest level.
- Default = 4
- Press ENTER ↵ to set.

ACTIVATING THE LOW WASH TEMPERATURE ALARM (AtL1)

- Press the ▲ key.
- AtL1 = Activates the low wash temperature alarm, based on tL01 setting.
- “0” = Alarm is OFF. (default)
- “1” = Alarm is ON.
- ***Requires the use of the Thermal Sensor probe.**
- Press ENTER ↵ to set.

ACTIVATING THE LOW RINSE TEMPERATURE ALARM (AtL2)

- Press the ▲ key.
- AtL2 = Activates the low rinse temperature alarm, based on tL02 setting.
- “0” = Alarm is OFF. (default)
- “1” = Alarm is ON.
- ***Requires the optional rinse line Thermal Sensor.**
- Press ENTER ↵ to set.

ACTIVATING THE RINSE AID LOW PRODUCT ALARM (ALL2)

- Press the ▲ key.
- ALL2 = Rinse Aid low product level alarm.
- “0” = Alarm is OFF. (default)
- “1” = Alarm is ON.
- ***Requires optional standpipe with float switch.**
- Press ENTER ↵ to set.

ACTIVATING THE SANITIZER LOW PRODUCT ALARM (ALL3)

- Press the ▲ key.
- ALL3 = Sanitizer low product level alarm.
- “0” = Alarm is OFF. (default)
- “1” = Alarm is ON.
- ***Requires optional standpipe with float switch.**
- Press ENTER ↵ to set.

STORING OR DELETING DATA RECORDS (rStd)

- Press the ▲ key.
- rStd = Resets all the Freedom System HB data records to zero.
- Freedom System HB will store all data records indefinitely if not reset by entering a “1” here.
- “0” = No change. (default)
- “1” = Resets “dAtA” to zero for next report period.
- **View the “dAtA” Report before resetting!!!**
- Press ENTER ↵ to set.

VIEWING THE DATA REPORT (dATA)

- Press the ▲ key.
- dAtA = Data Report. This report tells you what’s been happening since you last reset dAtA by programming rStd = 1.
- Press ENTER ↵. Freedom System HB will automatically scroll through the data recorded since the last time it was Reset. (rStd = 1). Make a note of the information so that you can complete your service report.

DATA RECORDED SINCE RESET (RSDT=1)

- rAC = # of racks washed since last reset.
- PbLS = # of racks washed probeless since last reset.
- FILL = # of times machine has been charged since last reset.
- U_rn = # of gallons of rinse water used.
- U_fl = # of gallons of used to fill machine.
- dEt = # of racks washed with low or no detergent since last reset.
- Prd2 = # of racks rinsed without rinse aid since last reset. *
- Prd3 = # of racks rinsed without sanitizer since last reset. *
- L_t1 = # of racks washed at low temperatures since last reset. *
- L_t2 = # of racks rinsed at low temperatures since last reset. *
- PrOb = The conductivity probe has failed. *
- E_t1 = Thermal Sensor in wash tank has failed. *
- E_t2 = Rinse line Thermal Sensor has failed. *
- If you wish to see the dAtA scroll again, press ENTER ↵. * *Requires appropriate sensors*

PROGRAMMING NOTE

- When performing a service call, you can get to the dAtA report quickly this way:
 - Press top and bottom keys to get into Programming.
 - Press ENTER once (the last button ↵).
 - Enter your Password, using ▲ or ▼ (0-9999).
 - Press ENTER ↵ again.
 - Press ▼ until you reach dAtA.
 - Press ENTER ↵ to scroll through dAtA. If you wish to repeat the dAtA, press ENTER ↵.
 - Press ▲ or ▼ to get to the next display screen.

PROGRAMMING OPERATIONAL DISPLAY SETTINGS

- Press ENTER ↵, then ▲.
- DISP = The information shown on the display screen when Freedom System HB is in normal operation.
- Use ▲ or ▼ to program one of seven (# 0-5) displays that are available, as follows:
 - 1 = Concentration (0-250) in the wash tank. (default)
 - 2 = Wash Temperature = °F in the wash tank. (requires use of a Thermal Sensor probe)
 - 3 = Rinse Temperature = °F in the rinse line. (requires rinse line Thermal Sensor)
 - 4 = Alternating °F Wash and Rinse Temperatures. (requires both Thermal Sensors)
 - 5 = Rack Count. (Total number of racks washed since last Reset)
 - 6 = Blank Screen
- Use ▲ or ▼ to set the information (# 1-6) that will show on the Freedom System HB display screen during normal dishmachine operation. Then press ENTER ↵ to set.

ENABLING THE PRIME KEYS FOR OPERATOR'S USE

- Press the ▲ key.
- Pr_1 = Choice of whether or not the 3 "Prime Product" keys will be activated for the operator's use.
▲ = Detergent, ▼ = Rinse Aid, and "Enter" = Sanitizer.
- "0" = No product priming is allowed.
- "1" = The 3 Prime Product keys are enabled.
- Press ENTER ↵ to set.

OPERATING PROBELOGIC™ IN "STEALTH" MODE

- Press the ▲ key.
- dPrb = Enables ProbeLogic™ to operate in stealth mode.
- "1" = PbLS ("Probeless") will be displayed as an Error Code if the probe fails. (default)
- "0" = No Error Code is shown if the probe fails.
- Press ENTER ↵ to set.

“FILS” WATER CONDUCTIVITY SETTING

- Press the ▲ key.
- “FILS” allows increased probe sensitivity when the water conditions are so good (very low TDS) that the probe can’t sense the water when the dishmachine has been filled. (The purer the water, the less conductive it is.)
- FILS has a 0-250 range, and the default is 100. This default will be fine in most water conditions.
- If the Freedom System HB display reads “FILL” after the machine is filled:
- Scroll to FILS and hit ENTER ↵. Reduce the default from 100 in 10 point increments, until the FILL condition changes to the normal display as programmed.
- **U_{rn}** allows you to reenter number of gallons the dishmachine uses per rinse cycle. Range = 0.0-10.0, Default = 001.0. Use ▲ or ▼ buttons to adjust according to manufacturers specifications. Press ENTER ↵ to set then press ▲.
- **U_{fl}** allows you to enter the number of gallons used to fill dishmachine. Range = 0.0-100 gallons, Default = 2 gallons. Use ▲ or ▼ buttons to adjust according to manufacturers specifications. Press ENTER ↵ to set then press ▲. Programming is now complete.
- Press ENTER ↵ to set.
- Return the Freedom System HB to normal operation by:
 1. Waiting about ten minutes, or...
 2. Pressing the top and bottom keys, or...
 3. Turning the machine power supply off and on.

NOTE: For delimiting purposes, press the top and down key together to turn the unit off. Repeat when delivery procedure is complete.

NOTE: In OFF mode, L1 and L2 are still HOT. Pumps are only deactivated from pumping.

NORMAL OPERATION

During normal dishmachine operation, the Freedom System HB displays information as programmed in DISP (# 1-6).

If an “Alarm Condition” occurs, an “Error Code” will display, describing one of the following conditions:

- FILL = Machine water level is below the probe level.
- LO dEt = Low detergent concentration.
- LO rnSE = Low rinse aid (requires optional float switch).
- LO SAnI = Low sanitizer (requires optional float switch).
- L_{t1} = Low wash temp. (requires Thermal Sensor probe).
- L_{t2} = Low rinse temp. (requires Rinse Thermal Sensor).
- PbLS = Dishmachine is running in probeless mode.
- In the “stealth” mode (dPrb = 0), or if the Freedom System HB is being used as a probeless system (COct = 0), the PbLS Error Code will not display.

ERROR CODE DISPLAYS - OPERATOR CORRECTIVE ACTIONS

FILL = Machine water level is below the probe level.

- *Fill machine and check temperatures.*

LO dEt = Low detergent concentration.

- *Check detergent container and replace if needed.*

LO rnSE = Low rinse aid (requires optional float switch).

- *Check rinse aid container and replace if needed.*

LO SAnI = Low sanitizer (requires optional float switch).

- *Check sanitizer container and replace if needed.*

L_{t1} = Low wash temps. (requires Thermal Probe).

- *Be sure machine and booster heater power is “on.”*

L_{t2} = Low rinse temperature (requires rinse sensor).

- *Be sure booster heater is “on” and up to temperature.*

PbLS = Dishmachine is running probeless, COct 0.

- *Check probe for cleanliness, foreign objects.*



START-UP SCREENS & OPERATION

Ensure all installation steps, plumbing and electrical connections are complete prior to operation. Ensure power is restored to the dish-machine and product is available. The Freedom System HB will display several different screens on start-up, depending on the type of installation and programming. Here are some examples of the displays seen at start-up and what they mean:

1. **“U01.09”** – this displays briefly at startup. It represents the version of the Freedom System HB programming. U01.07 is the newest version as of the time of this writing.
2. **FILL** – indicates that the dishmachine is empty and requires a fill to begin the washing operation. If the dishmachine is filled, see FILS programming step.
3. **PbLS** – (probeless) will display if ProbeLogic has been enabled in the dPrb programming step and the unit is running in probeless for any reason. This display can be turned off by programming “dPrb” to “0”.
4. **“C1” - followed by a number between 0 and 250** – will display the current probe reading in the wash tank. “dISP” has been set to “1”.
5. **“t1,” “t2,” or “t1t2,” - followed by a temperature** – will display if either the Wash Tank and/or the Rinse temperature has been chosen in “dISP” by choosing “2,” “3,” or “4.” These displays require the use of the Thermal Sensor probe for the wash temperatures, and/or the optional Rinse Line Thermal Sensor for the rinse temperatures.
6. **“rAC” - followed by a number between 0 and 9999** – will display if “dISP” was programmed at “5” which represents the total rack count since the last time the “dAtA” report was reset. (“rStd” = 1)

DISHMACHINE DELIMING

Normally, the presence of rinse aid (present when the machine fills through the final rinse) is of no consequence to the delimiting activity. Once delimer is in the wash tank, detergent will not feed. However, in a machine that fills through the rinse (such as a Hobart AM-14) that is also using a chlorine sanitizer, it is necessary to turn off the pumps to prevent a hazardous mixture of chlorine sanitizer and the delimer.

To do this, simply press the Alarm Silence  key and the third key  at the same time. The display will read “OFF” and the Freedom System HB is deactivated. Be sure to press those keys again when delimiting is complete, to return the Freedom System HB to normal operation.

NOTE: This deactivates the pumps, but the board is still HOT.

PROBLESS OPERATION

The Freedom System HB can be used as a full time, probeless installation. Setup of this is simple, but somewhat different than an installation using a probe, as follows:

- Mount the Freedom System HB head and whatever product delivery methods will be used.
- No probe or probe wire will be used.
- Connect the constant power 110-240 VAC (L1 + L2) to the power supply terminals on the right hand side.
- Connect the rinse signals from the dishmachine to the two appropriate terminals on the Freedom System HB board labeled “Rinse Signal”.
- DO NOT connect a detergent signal to the Freedom System HB.

When programming the Freedom System HB for probeless operation, be sure to set COCT = 0 and dPrb = 0.

When the machine is being filled with fresh water and COCT = 0, the Freedom System HB will dispense an initial charge (Ch_t) of detergent, as programmed in Ch_t. Thereafter, during each rinse cycle, the detergent will run for the number of seconds programmed in dE_t

NOTE: If dishmachine doesn't fill through the rinse solenoid, on “FILL” set machine type to “2 or 3”. When the first rack is run, the initial fill will activate. Process will repeat after 45 minutes of down time.

TROUBLESHOOTING THE FREEDOM SYSTEM HB

1. “FILL” displays on dispenser after the dishmachine is filled with water.

The probe can not sense the water in the machine due to lack of conductivity in the water supply. This only happens in extremely good water supplies. Adjust the “FILS” sensitivity level down, per the directions in the Reference Manual (pg. 17), so that the probe can sense the water in the machine.

2. “PbLS” flashes on the dispenser display when the dishmachine is started.

The probe did not sense product concentration in the wash tank and switched to a probeless mode. As soon as the first rack passes through the machine and activates the rinse, it will automatically dispense a small amount of detergent based on the programmed setting in “dE_t.” This will allow the probe to sense product concentration rise in the wash tank and the dispenser will automatically switch back into a probed mode of operation.

3. No products dispense during dishmachine cycle.

- a. Check to make sure wash and rinse connections provide a signal to the dispenser.
- b. Make sure that there is a constant power supply present on the power supply on the right terminals, accept 110-208, 220 and 240 volt AC.
- c. Check the plug in connector strip for wash and rinse signals in the dispenser to make sure the wires are secured and the terminal strip is pushed tightly into place.

4. How can I eliminate the flashing “PbLS” error code display?

The PbLS display appears when ProbeLogic switches the unit into a probeless mode, due to the probes inability to sense product concentration for any reason. If you do not want your customers to know when this happens, you can deactivate the ProbeLogic display feature by programming “dPrb” = 0.

5. I can’t get a concentration reading on the display.

- a. Be sure DISP is programmed “1”.
- b. Check probe connections both at the probe in the dishmachine and at the dispenser. The wires for conductivity readings must be connected in the dispenser at SNSR.
- c. If you are using a thermal sensor probe in the wash tank, make sure the conductivity wires are connected to the terminal marked SNSR and the thermal sensor wires are connected to the terminal marked “wash temp.”
- d. Check the probe to make sure it is not fouled by minerals or debris.

6. The display read ___ F why?

You have selected a setting to be displayed that requires the use of a temperature sensing device and you are not using one. Choose a different display setting. (see page 16 DISP).

PARTS LIST	ITEM	SKU #
	FREEDOM SYSTEM HB control board	D1227446
	FREEDOM SYSTEM 60W Power Supply	D1227448
	1/4" 24v. DC solenoid valve	D3719301
	440 V to 110 V step down transformer	D011002
	1 gallon low level sensor	D014497
	5 gallon low level sensor	D014498
	Remote pressure switch	D011771
	7 conductor wire 16 gauge per ft	D3336239
	2 conductor wire per foot (required if using the button probe)	D011003
	1/4" copper tubing @ 10 feet (solenoid hookup)	D011459
	1/4" polyflow tubing @ 15 feet	D011472
	Angle overflow barb	D011389
	Rubber overflow washer	D011701
	Plastic overflow washer	D011723
	Basin nut	D011702
	Button Probe Kit (no wire)	D011770
	Button Probe Kit (2 conductor wire)	D1228164
	Thermal sensor probe (comes with wiring)	DEQ0099926
	5 gallon standpipe (sanitizer, detergent and rinse)	D014499
	1 set of standpipe identification tags includes detergent, rinse and sanitizer	D011966
	Detergent standpipe identification tag	D014141
	Rinse standpipe identification tag	D014144
	Sanitizer standpipe identification tag	D014147
	Check valve 1/4" Poly x 1/8" npt for rinse and sanitizer	D051466
	Bulkhead fitting 1/4" poly x 7x8" mpt for detergent	D022031
	Deliver cap (conversion cap) with 90 degree barb	D5722491
	Deliver cap (conversion cap) with straight barb	D6081606
	PML 15225-FF12 IP40 24V Hummingbird-Pump	D1229128

PARTS LIST (RETRO)

SKU #	QUANTITY	DESCRIPTION
D3338568	1	Freedom Retro Dispenser (With Installation Kit)
D011381	5 feet	5/8" ID x 7/8" OD PVC Tubing
D014467	1	1/4" Vacuum Breaker ASSEMBLY
D011397	1	1/4" Poly x 1/4" MPT Straight
D011385	per foot	1/4" Poly Flow Tubing per foot
D015382	1	S.S. Spray Nozzle with vane
D011773	1	Retro Mounting Kit
D014463	1	1/2" Ball Brass
D011374	1	1/4"cc x 1/4" NPT Brass Straight
D011372	1	1/4"cc x 1/8" NPT Needle Valve
D014450	1	Spray arm with nozzle and vacuum breaker
D014449	1	Spray arm with nozzle NO vacuum breaker
D011479	1	1/4" Poly Flow @ 100 feet

Concentrations and Use Dilutions For Mechanical Warewash Detergents

500	ppm is	1 oz in	15.6	gal	1 oz in	1	gal is	7,813	ppm
600	ppm is	1 oz in	13.0	gal	1 oz in	2	gal is	3,906	ppm
700	ppm is	1 oz in	11.2	gal	1 oz in	3	gal is	2,604	ppm
800	ppm is	1 oz in	9.8	gal	1 oz in	4	gal is	1,953	ppm
900	ppm is	1 oz in	8.7	gal	1 oz in	5	gal is	1,563	ppm
1000	ppm is	1 oz in	7.8	gal	1 oz in	6	gal is	1,302	ppm
1100	ppm is	1 oz in	7.1	gal	1 oz in	7	gal is	1,116	ppm
1200	ppm is	1 oz in	6.5	gal	1 oz in	8	gal is	977	ppm
1300	ppm is	1 oz in	6.0	gal	1 oz in	9	gal is	868	ppm
1400	ppm is	1 oz in	5.6	gal	1 oz in	10	gal is	781	ppm
1500	ppm is	1 oz in	5.2	gal	1 oz in	11	gal is	710	ppm
1600	ppm is	1 oz in	4.9	gal	1 oz in	12	gal is	651	ppm
1700	ppm is	1 oz in	4.6	gal	1 oz in	13	gal is	601	ppm
1800	ppm is	1 oz in	4.3	gal	1 oz in	14	gal is	558	ppm
1900	ppm is	1 oz in	4.1	gal	1 oz in	15	gal is	521	ppm
2000	ppm is	1 oz in	3.9	gal	1 oz in	16	gal is	488	ppm
2100	ppm is	1 oz in	3.7	gal	1 oz in	17	gal is	460	ppm
2200	ppm is	1 oz in	3.6	gal	1 oz in	18	gal is	434	ppm
2300	ppm is	1 oz in	3.4	gal	1 oz in	19	gal is	411	ppm
2400	ppm is	1 oz in	3.3	gal	1 oz in	20	gal is	391	ppm
2500	ppm is	1 oz in	3.1	gal					

Undercounter and Fill & Dump Machines

1.8 gallon wash tank

400	ppm is	3	ml
600	ppm is	4	ml
800	ppm is	6	ml
1000	ppm is	7	ml
1200	ppm is	8	ml
1400	ppm is	10	ml
1600	ppm is	11	ml
1800	ppm is	12	ml
2000	ppm is	14	ml
2200	ppm is	15	ml
2400	ppm is	17	ml

Door-Type High Temp Machines

15 gallon wash tank

400	ppm is	0.8	oz
600	ppm is	1.2	oz
800	ppm is	1.5	oz
1000	ppm is	1.9	oz
1200	ppm is	2.3	oz
1400	ppm is	2.7	oz
1600	ppm is	3.1	oz
1800	ppm is	3.5	oz
2000	ppm is	3.8	oz
2200	ppm is	4.2	oz
2400	ppm is	4.6	oz

Conveyor or Flight-Type Machines

30 gallon wash tank

400	ppm is	1.5	oz
600	ppm is	2.3	oz
800	ppm is	3.1	oz
1000	ppm is	3.8	oz
1200	ppm is	4.6	oz
1400	ppm is	5.4	oz
1600	ppm is	6.1	oz
1800	ppm is	6.9	oz
2000	ppm is	7.7	oz
2200	ppm is	8.4	oz
2400	ppm is	9.2	oz

Reduced Tank Door-Type High Temp Machine, 11 gallon wash tank

400	ppm is	0.6	oz
600	ppm is	0.8	oz
800	ppm is	1.1	oz
1000	ppm is	1.4	oz
1200	ppm is	1.7	oz
1400	ppm is	2.0	oz
1600	ppm is	2.3	oz
1800	ppm is	2.5	oz
2000	ppm is	2.8	oz
2200	ppm is	3.1	oz
2400	ppm is	3.4	oz

