CUSTOMER SUPPORT

FT1000e-SERIES DISHWASHERS

MODELS
FT1000e-BAS
FT1000e-BAS-BD
FT1000e-EGR
FT1000e-EGR-BD
FT1000e-ADV
FT1000Se-BAS
FT1000Se-BAS-BD
FT1000Se-EGR
FT1000Se-EGR-BD

HOBART
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TROY, OHIO 45374-0001

https://www.hobartcorp.com/ft1000etraining

FORM 41320 (November 2024)

IMPORTANT FOR YOUR SAFETY

THIS MANUAL WAS PREPARED FOR EXPERIENCED, TRAINED PROFESSIONALS AND SHOULD NOT BE USED BY ANYONE ELSE. BEFORE SERVICING EQUIPMENT OR USING THIS MANUAL, YOU MUST FULLY REVIEW YOUR PRODUCT'S SAFETY AND INSTRUCTION MANUAL, WHICH MUST BE FOLLOWED IN ALL RESPECTS. ALL EQUIPMENT REFERENCED HEREIN SHOULD ONLY BE OPERATED, MAINTAINED, AND/OR SERVICED BY EXPERIENCED, TRAINED PROFESSIONALS. PLEASE REVIEW YOUR PRODUCT'S WARRANTY STATEMENT PRIOR TO ANY SERVICE OR REPAIRS BEING PERFORMED, AS IMPROPER REPAIRS MAY VOID THE WARRANTY.

THIS MANUAL HAS BEEN PREPARED FOR PERSONNEL QUALIFIED TO INSTALL GAS EQUIPMENT, WHO SHOULD PERFORM THE INITIAL FIELD START-UP AND ADJUSTMENTS OF THE EQUIPMENT COVERED BY THIS MANUAL.

POST IN A PROMINENT LOCATION THE INSTRUCTIONS TO BE FOLLOWED IN THE EVENT THE SMELL OF GAS IS DETECTED. THIS INFORMATION CAN BE OBTAINED FROM THE LOCAL GAS SUPPLIER.

IMPORTANT

IN THE EVENT A GAS ODOR IS DETECTED, SHUT DOWN UNITS AT MAIN SHUTOFF VALVE AND CONTACT THE LOCAL GAS COMPANY OR GAS SUPPLIER FOR SERVICE.

FOR YOUR SAFETY

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS OR LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.

FOR YOUR SAFETY
READ BEFORE OPERATING

DO NOT USE THIS APPLIANCE IF ANY PART HAS BEEN UNDER WATER. IMMEDIATELY CALL A QUALIFIED SERVICE TECHNICIAN TO INSPECT THE APPLIANCE AND TO REPLACE ANY PART OF THE CONTROL SYSTEM AND ANY GAS CONTROL WHICH HAS BEEN UNDER WATER.

IN THE EVENT OF A POWER FAILURE, DO NOT ATTEMPT TO OPERATE THIS DEVICE.

⚠ WARNING

DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES. THERE MAY BE MULTIPLE CIRCUITS. BE SURE ALL CIRCUITS ARE DISCONNECTED.

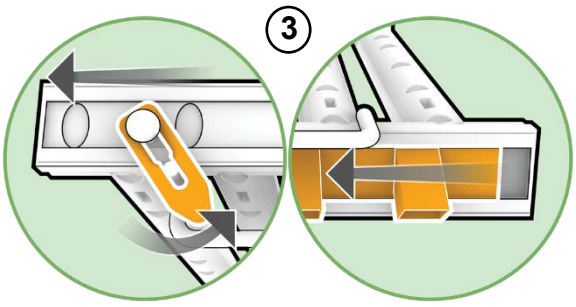
TABLE OF CONTENTS

OPERATION

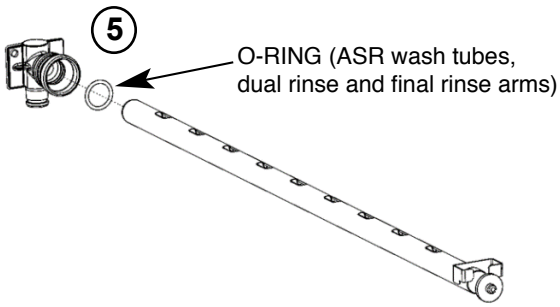
INTERNAL DISH MACHINE COMPONENTS

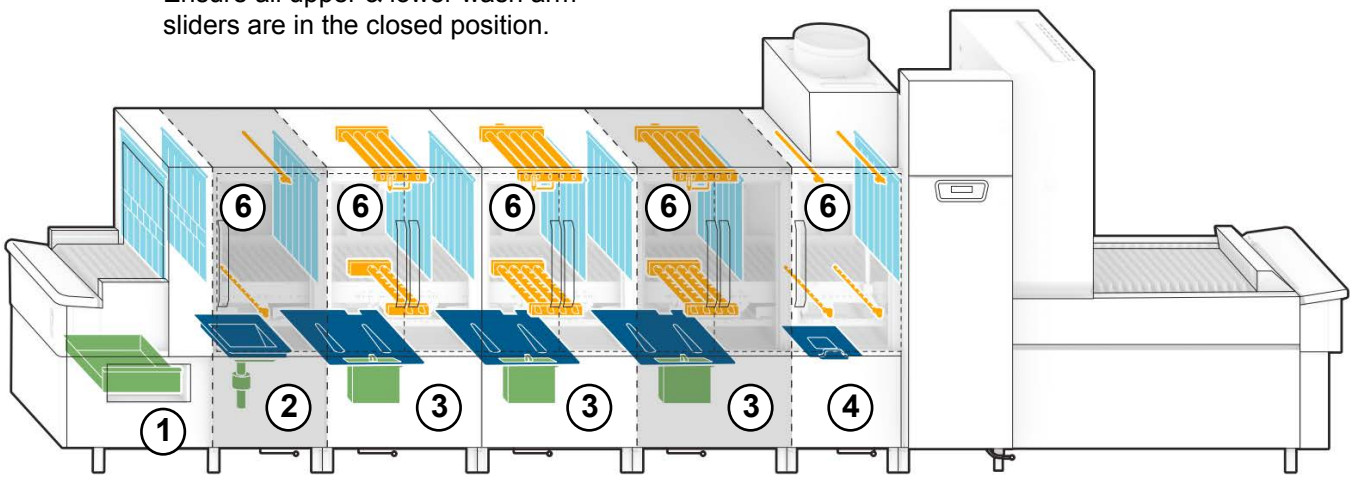
Ensure all internal dish machine components shown below are properly installed. If components are not properly installed, issues such as low tank temperatures, splash out, poor wash results, excessive steam, etc. may occur.

1. Ensure the external scrap basket is properly installed in the load end of the machine.
2. If the machine is equipped with the ASR section, ensure the soil collector, strainer pan, and wash tubes are clean and properly installed.
3. Ensure all strainer pans, scrap baskets, and wash arms are properly installed in the prewash, wash, and power rinse (if equipped) sections. The wash arm sliders must be in the closed position for proper machine operation and the wash arm nozzles should be free of debris.
4. Ensure strainer pan, dual rinse arms, and final rinse arms are properly installed in the dual rinse section.
5. Ensure the o-rings on the ASR wash tubes (if equipped), dual rinse arms, and final rinse arms are in place and are not worn or torn.
6. Ensure all curtains are in good clean condition and not brittle, torn or excessively curled. Refer to the CURTAIN INSTALLATION section of this manual for proper curtain layout to ensure all curtains are installed.



Ensure all upper & lower wash arm sliders are in the closed position.





LOAD | ASR *(if equipped)* | PREWASH | WASH | POWER RINSE *(if equipped)* | DUAL RINSE | UNLOAD

KEYPAD AND DISPLAY

The controls are mounted on the front of the control box.

NOTE: To enter the Manager Menu, enter code 1001. Refer to the Programming section on page 110 for more information.

ENTER
(Press to select an on-screen action.)

UP ARROW
(Press to toggle through menus.)

TEMPERATURE DISPLAYS
(* Rinse temperature only displays if machine is equipped with the Power Rinse tank.
* When Final Rinse is not active, display will show '---'.)

START
(Press to start the machine.)

POWER
(Press to power machine on and off.)

STOP / BACK
(Press to stop the machine or to toggle back when in a menu.)

MENU / DOWN ARROW
(Press to enter main menu & toggle through menus.)

SPEED SELECTION
(Press to toggle conveyor speed between LOW, MEDIUM & HIGH.)

AUTO CLEAN
(Press to initiate the Auto Clean cycle.)

NOTE: Temperatures displayed based on machine direction. R-L display shown.

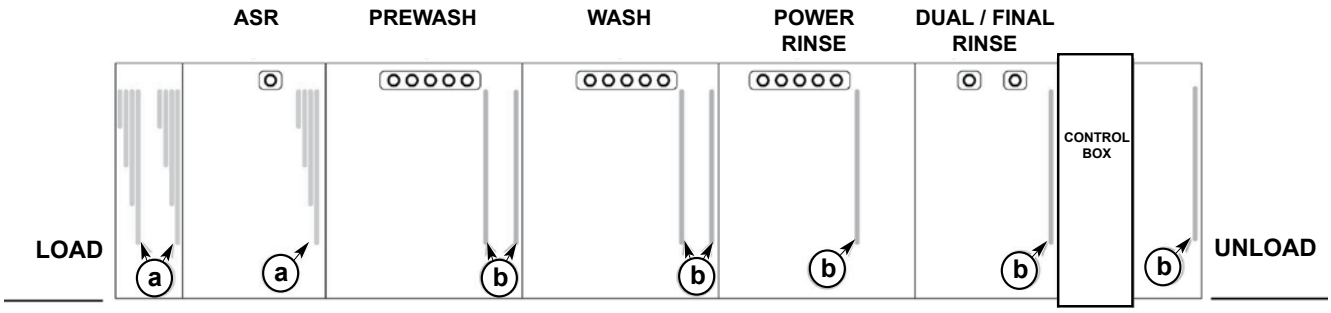
CURTAIN INSTALLATION

FT1000e-BAS & FT1000e-EGR (Standard Height)

(machine may not be equipped with ASR module)

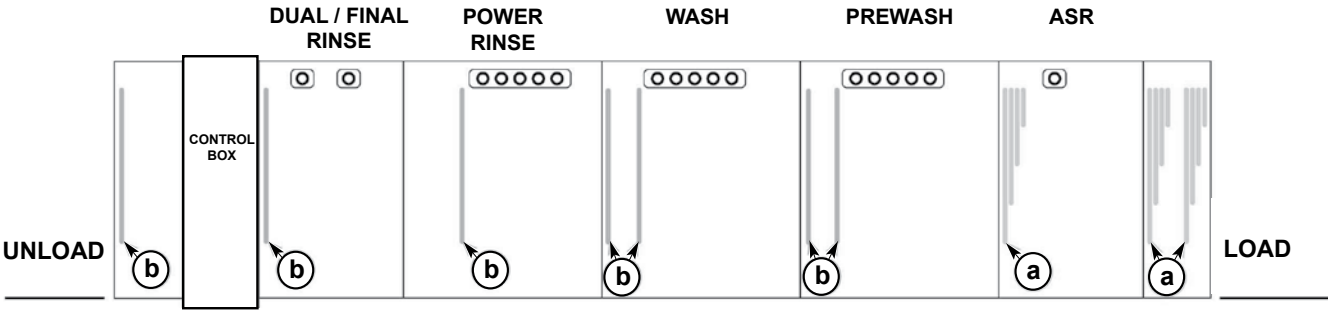
Left to Right

8' CENTER SECTION



Right to Left

8' CENTER SECTION



LEGEND

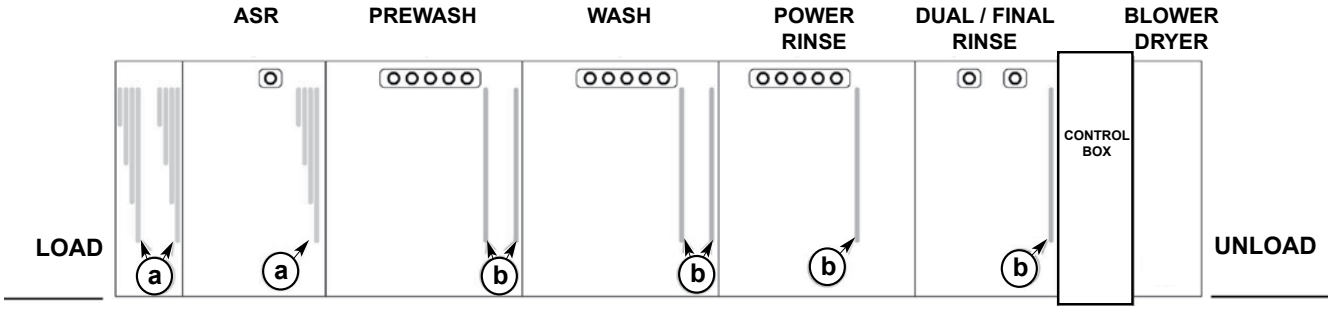
(a) 4-PLY CURTAINS
(b) LONG CURTAINS
(c) SHORT CURTAINS

FT1000e-BAS & FT1000e-EGR (With Blower Dryer, Standard Height)

(machine may not be equipped with ASR module)

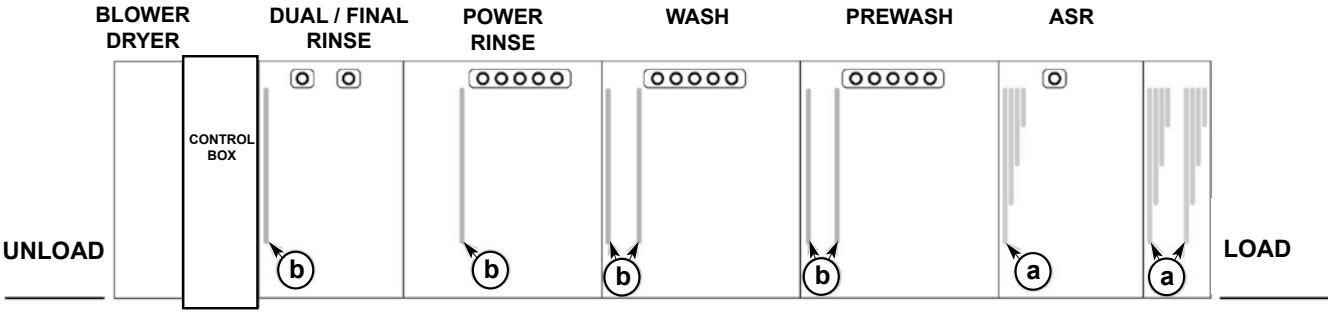
Left to Right

8’ CENTER SECTION



Right to Left

8’ CENTER SECTION



LEGEND

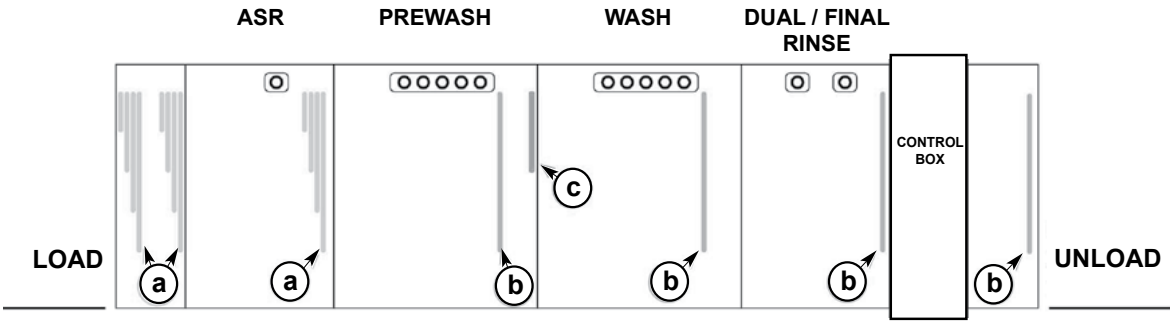
(a) 4-PLY CURTAINS
(b) LONG CURTAINS
(c) SHORT CURTAINS

FT1000Se-BAS & FT1000Se-EGR (Standard Height)

(machine may not be equipped with ASR module)

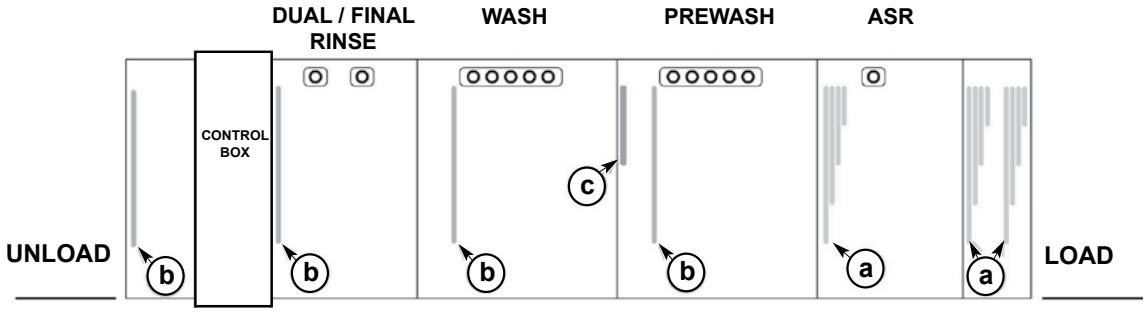
Left to Right

5' CENTER SECTION



Right to Left

5' CENTER SECTION



LEGEND

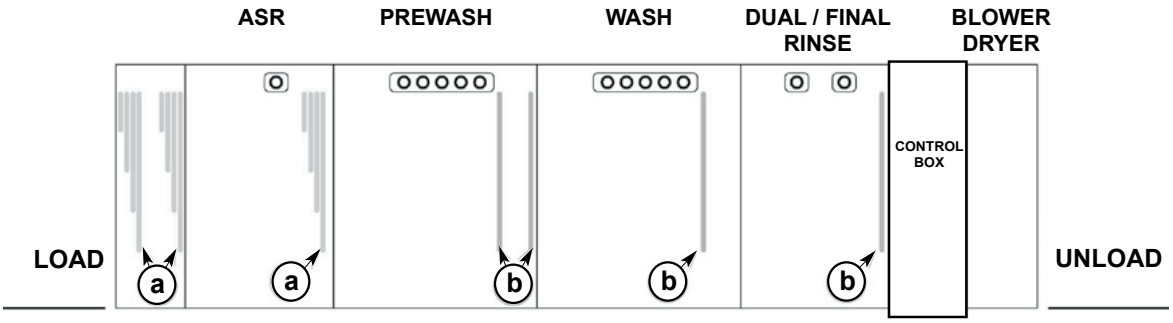
(a) 4-PLY CURTAINS
(b) LONG CURTAINS
(c) SHORT CURTAINS

FT1000Se-BAS & FT1000Se-EGR (With Blower Dryer, Standard Height)

(machine may not be equipped with ASR module)

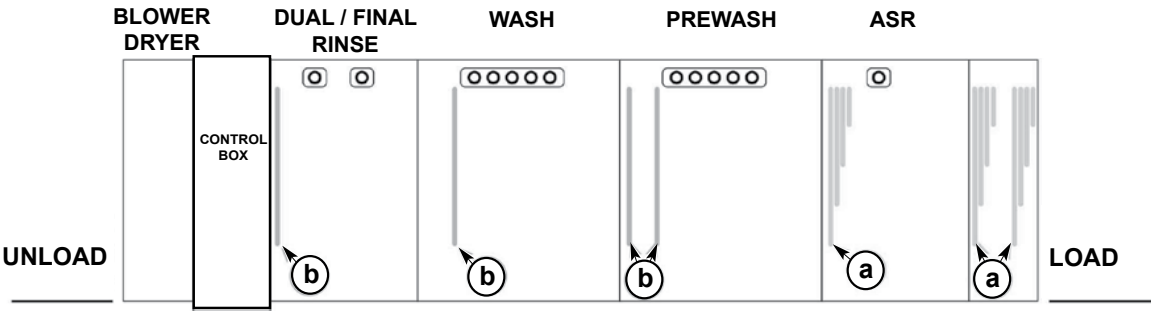
Left to Right

5' CENTER SECTION



Right to Left

5' CENTER SECTION



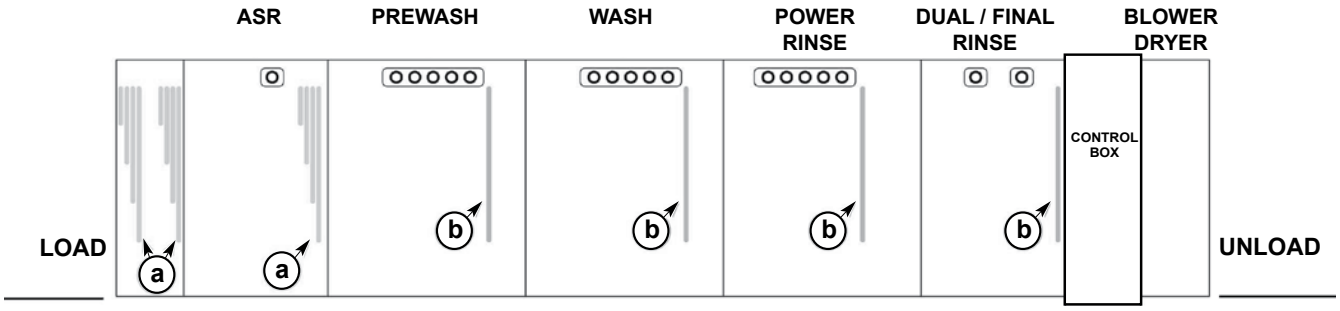
LEGEND

(a) 4-PLY CURTAINS
(b) LONG CURTAINS
(c) SHORT CURTAINS

FT1000e-ADV

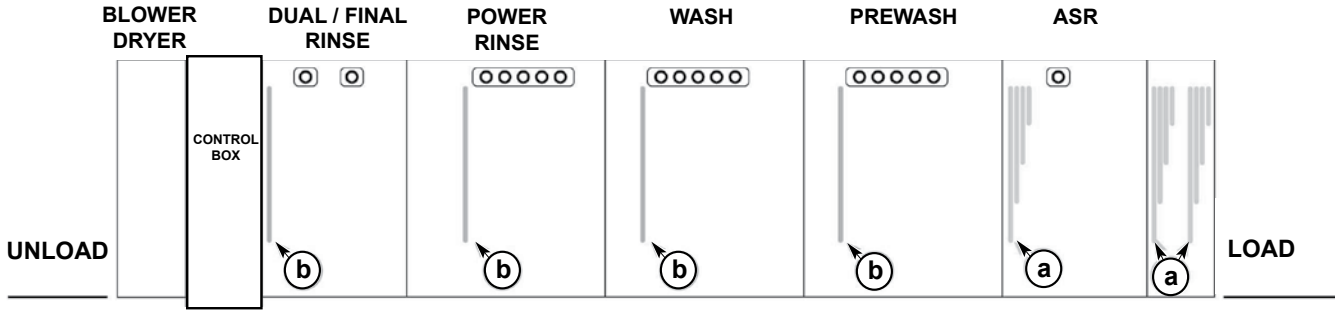
Left to Right

8’ CENTER SECTION



Right to Left

8’ CENTER SECTION



LEGEND

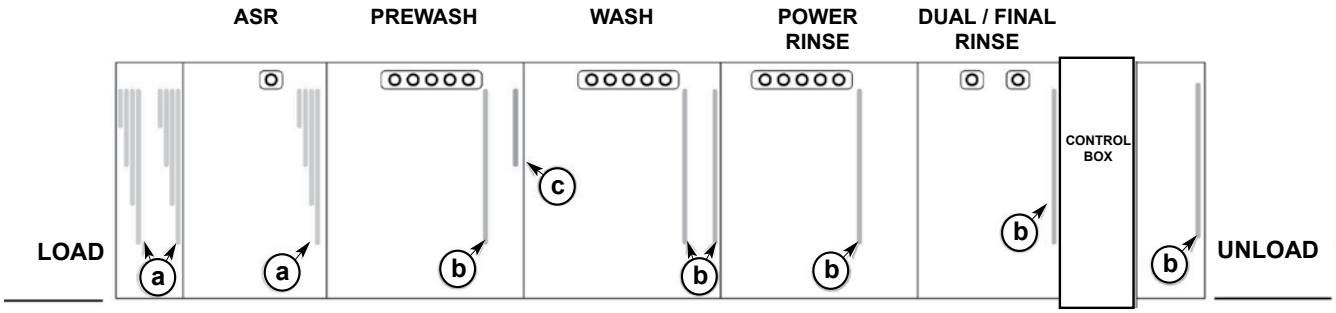
(a) 4-PLY CURTAINS
(b) LONG CURTAINS
(c) SHORT CURTAINS

FT1000e-BAS & FT1000e-EGR (Higher Than Standard)

(machine may not be equipped with ASR module)

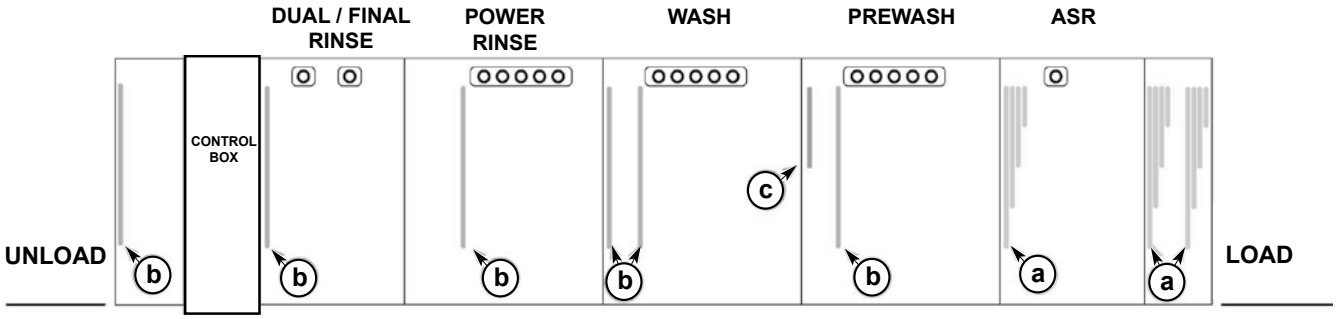
Left to Right

8’ CENTER SECTION



Right to Left

8’ CENTER SECTION



LEGEND

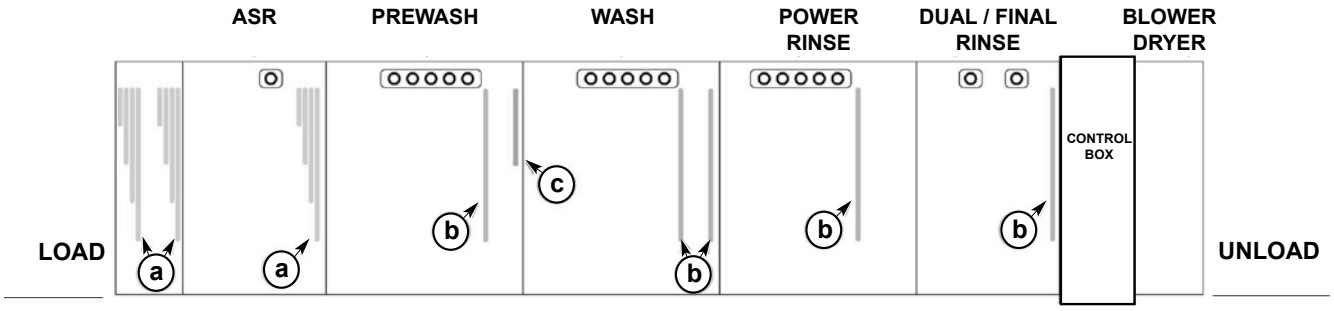
(a) 4-PLY CURTAINS
(b) LONG CURTAINS
(c) SHORT CURTAINS

FT1000e-BAS & FT1000e-EGR (With Blower Dryer, Higher Than Standard)

(machine may not be equipped with ASR module)

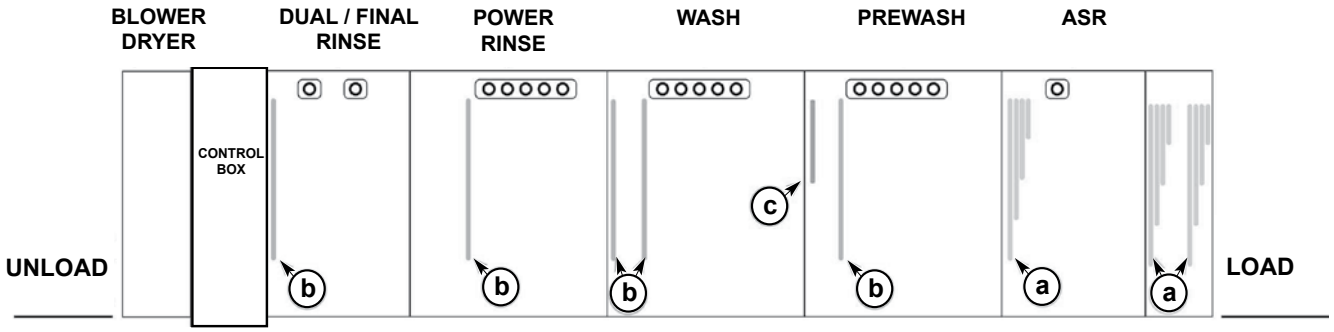
Left to Right

8’ CENTER SECTION



Right to Left

8’ CENTER SECTION



LEGEND

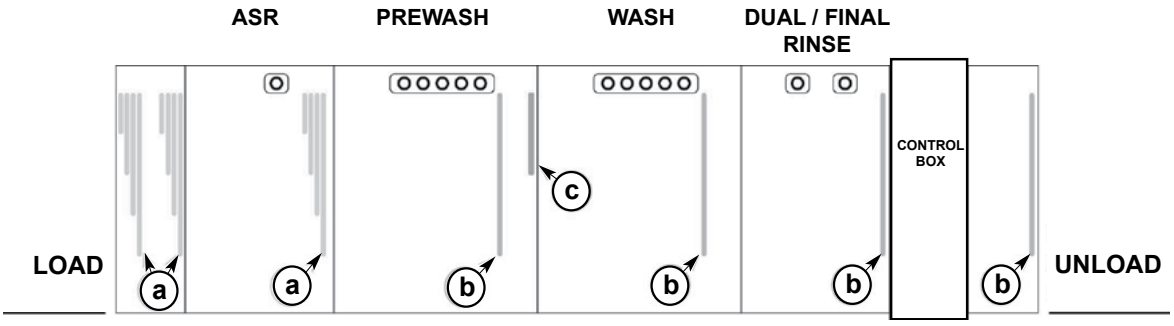
- (a) 4-PLY CURTAINS
- (b) LONG CURTAINS
- (c) SHORT CURTAINS

FT1000Se-BAS & FT1000Se-EGR (Higher Than Standard)

(machine may not be equipped with ASR module)

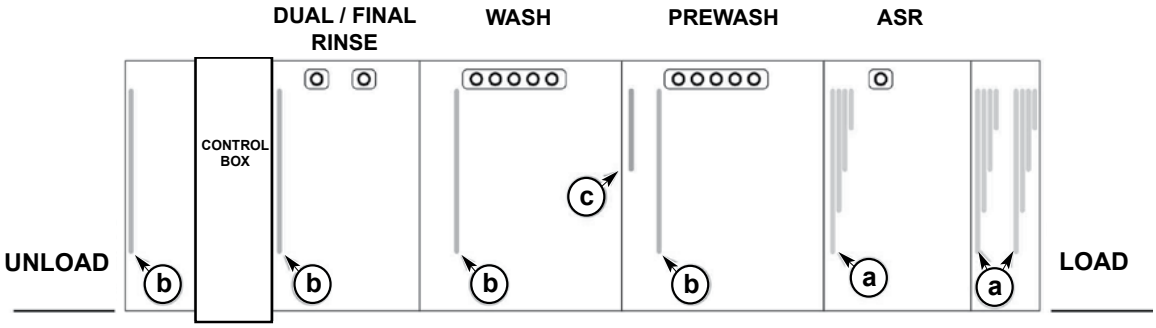
Left to Right

5' CENTER SECTION



Right to Left

5' CENTER SECTION



LEGEND

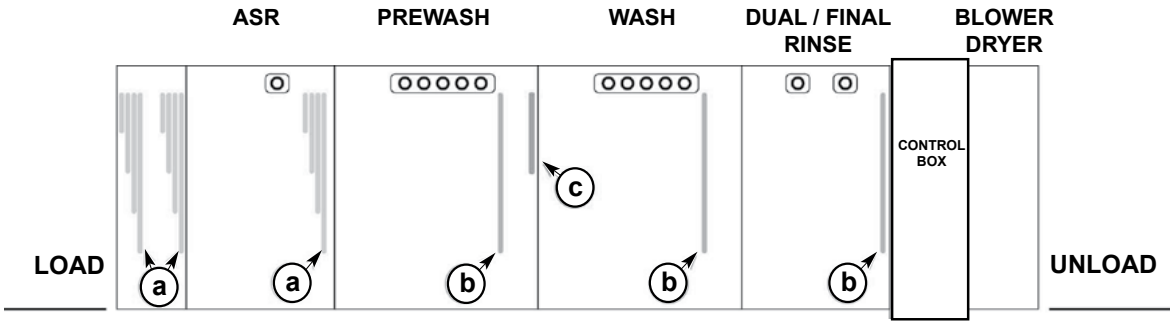
(a) 4-PLY CURTAINS
(b) LONG CURTAINS
(c) SHORT CURTAINS

FT1000Se-BAS & FT1000Se-EGR (With Blower Dryer, Higher Than Standard)

(machine may not be equipped with ASR module)

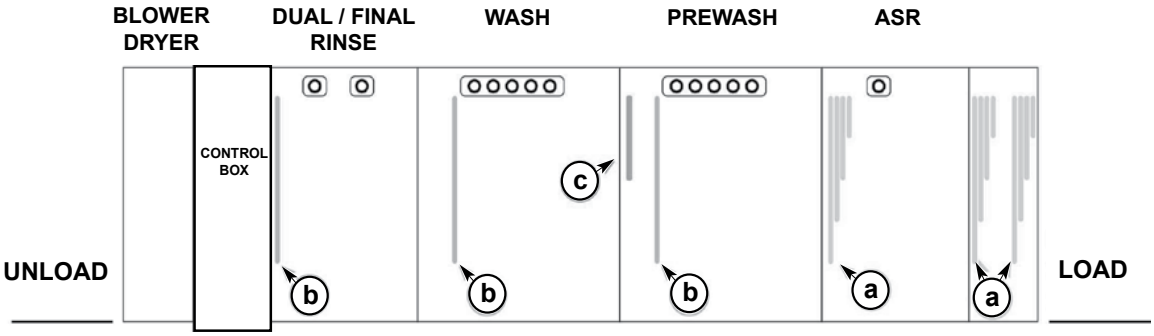
Left to Right

5’ CENTER SECTION



Right to Left

5’ CENTER SECTION



LEGEND

(a) 4-PLY CURTAINS
(b) LONG CURTAINS
(c) SHORT CURTAINS

COMMON INSPECTION INQUIRIES

Below are common inquiries that arise regarding code compliance from health and plumbing inspectors pertaining to dish machines.

Checking Dish Machine Temperature

Refer to the data label located on the upper left side of the control box for minimum temperature requirements for the wash, power rinse (if equipped), dual rinse and final rinse temperatures. Below are the NSF guidelines for checking temperatures in dishwashing machines taken from the NSF Recommended Field Evaluation Procedures for Commercial Warewashing Machines document.

1. Heat accumulation on dishes over a period of time in hot water sanitizing machines, not merely a single temperature, achieves proper sanitization. Therefore, each of the wash, power rinse (on some machines), dual rinse and final rise cycles must be operating at its proper temperature. For hot water sanitizing machines, the following should be determined:
   a. No deposits (e.g., lime, napkins, etc.) on the heating elements.
   b. On gas-heated machines, tank gas heater jets are not obstructed.
   c. No excessive ventilation in the removal of steam and condensation.
2. Unless the machine has been used just prior to testing, it should be run through at least two complete wash and final rise cycles before temperature readings are taken. On conveyor machines, this is done by running a rack through the machine twice.
3. The temperatures of wash water and pumped rinse water are taken directly from the tanks of the machines. As standard practice, the temperature of the water during the final rinse cycle should be taken at the inlet manifold.
4. Maximum-registering thermometers or thermo-labels (paper thermometers that change color when reaching specified temperatures) may be used to confirm the effectiveness of heat sanitization. **For hot water sanitizing machines, a reading of 160° F at the dish level, measured using a maximum registering or paper thermometer, is an indication of satisfactory sanitization**.
5. To give an accurate reading, the maximum registering thermometer should be attached in a vertical position to the machine. Rubber bands or clips may be used to hold the thermometer in place. The thermometer should also be removed from any case or guard when used. Thermo-labels are attached by pressure-sensitive adhesive tape to a clean, dry china plate.
6. Although absolute accuracy cannot be expected from thermometers, a variation of 1 to 2° F in either direction is acceptable.

Pumped Final Rinse System – Pressure Gauge Not Required

The FDA Food Code and NSF/ANSI Standard 3 for Commercial Warewashing Equipment require pressure gauges for machines that utilize line pressure sanitizing rinses. However, NSF/ANSI 3 goes on to state, “A pressure gauge is not required for non-recirculating pumped sanitizing rinses, recirculated sanitizing rinses, post-sanitizing rinses, or auxiliary rinses.”

In addition, the 2022 FDA Food Code includes the following wording:

4-204.118 Warewashing Machines, Flow Pressure Device

(A) WAREWASHING machines that provide a fresh hot water SANITIZING rinse shall be equipped with a pressure gauge or similar device such as a transducer that measures and displays the water pressure in the supply line immediately before entering the WAREWASHING machine; and

(B) If the flow pressure measuring device is upstream of the fresh hot water SANITIZING rinse control valve, the device shall be mounted in a 6.4 millimeter or one-fourth inch Iron Pipe Size (IPS) valve.

(C) Paragraphs (A) and (B) of this section do not apply to a machine that uses only a pumped or recirculated SANITIZING rinse.

All Hobart FT1000e commercial dish machines utilize a pumped final sanitizing rinse and produce a uniform spray pattern regardless of the incoming water pressure. For that reason, they are not required to have a pressure gauge.

Backflow Prevention

The Hobart FT1000e series commercial conveyor dishwashers are NSF Certified and meet the requirements of NSF 3 for Commercial Warewashing Equipment. NSF 3 requires backflow protection as follows:

Water Supply Protection

5.9.2 Water inlets intended to be connected to a water supply system under pressure shall be equipped with at least one of the following backflow prevention devices:

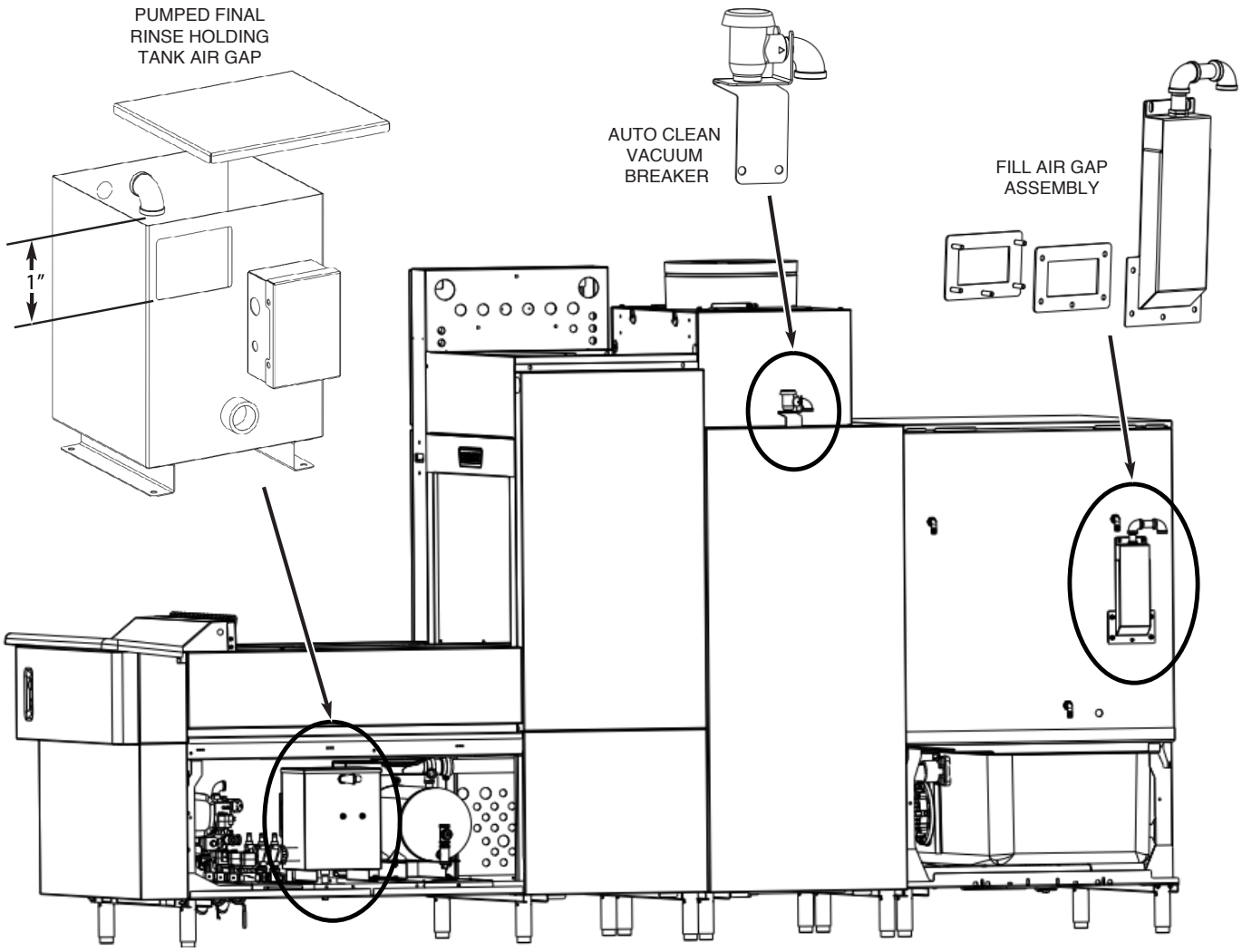
- an air gap that is:
  - installed in accordance with ANSI/ASSE 1004: *Commercial Dishwashing Machines*;
  - located on the outside of the machine wash and rinse chamers;
  - positioned above the overflow rim;
  - protected against suds, spray, splash and flooding; and
  - sized at least twice the diameter of the water supply inlet, but not < 1.0 in (25 mm).

  NOTE — Air gap need not be readily visible from the outside of the machine.

or

- a vacuum breaker that complies with ANSI/ASSE 1001, *Atmospheric Type Vacuum Breakers* (for intermittent pressure conditions), and is installed in accordance with ANSI/ASSE 1004: *Performance Requirements for Commercial Dishwashing Machines*.

The FT1000e series dish machines are provided with an air gap mounted at the rear of the chamber where the water fills the tanks and the water used for final sanitizing rinse is supplied by an air gap in the pumped rinse holding tank. When the optional auto-clean feature is installed, a vacuum breaker is provided to meet the requirements of NSF 3. Illustrations of these components are shown below. These design features have been tested and approved by NSF International as evidenced by the Certification Mark on the machines. Therefore, additional backflow protection is not required for the FT1000e series dish machines.


PUMPED FINAL
RINSE HOLDING
TANK AIR GAP
1″
AUTO CLEAN
VACUUM
BREAKER
FILL AIR GAP
ASSEMBLY

DELIMING

Delime Notification Setup

All FT1000e dish machines have the ability to notify the operator when to delime based on the incoming water hardness and dish machine usage. The factory default for water hardness is 0 grains/gallon which will not trigger the notification. Refer to the 'PROGRAMMING' section of this manual on page 112 to set the water hardness based on actual water conditions and activate the notification.

Manual Deliming Procedure

Follow the below steps to manually delime the machine.

1. Power machine OFF and drain all tanks.
2. Spray interior of machine with a hose to flush food soil into scrap baskets.
3. Remove, empty and clean all scrap baskets and strainer pans.
4. Disable the detergent feeder chemical system according to the chemical manufacturer's recommendation. This will prevent the addition of detergent during the deliming operation.
5. Close all tank drains and re-install the strainer pans and scrap baskets.
6. Power the machine ON allowing it to fill with fresh water.
7. Refer to the PROGRAMMING section of this manual and adjust the AUTO TIMEOUT time to 30 minutes by entering the MANAGER PROGRAMMING. This will allow the unit to run for 30 minutes for the delime cycle without shutting off. Note the AUTO TIMEOUT setting before adjusting to 30 minutes.
8. Once the fill cycle has completed, open the doors and pour the required amount of delimer in each tank according to the chemical manufacturer's instructions following their recommendations for personal protective equipment (PPE).
9. Close the doors and start the machine allowing the pumps to run for 30 minutes at normal operating temperatures.
10. After the 30 minutes has elapsed and the machine has timed out, open the doors and inspect the interior for any remaining lime scale residue. If lime scale remains, close the doors and run the machine for a longer period of time. Depending on the time between deliming cycles and the water hardness, the machine may need to run longer and/or adjust the amount of delimer being used.
11. Power machine OFF and drain all tanks.
12. Thoroughly spray the inside of the unit flushing the remaining delimer solution down the drain.
13. Close all tank drains and power the machine ON allowing it to fill with fresh water.
14. Refer to the PROGRAMMING section of this manual and adjust the AUTO TIMEOUT time back to the original setting as noted in Step 7 by entering the MANAGER PROGRAMMING.
15. Once the fill cycle has completed, start the machine and run the pumps for a few minutes to flush any remaining delimer from the system.
16. Power machine OFF and drain all tanks.
17. Following the chemical manufacturer's recommendation, enable the detergent feeder chemical system.
18. The unit is now ready for normal operation.

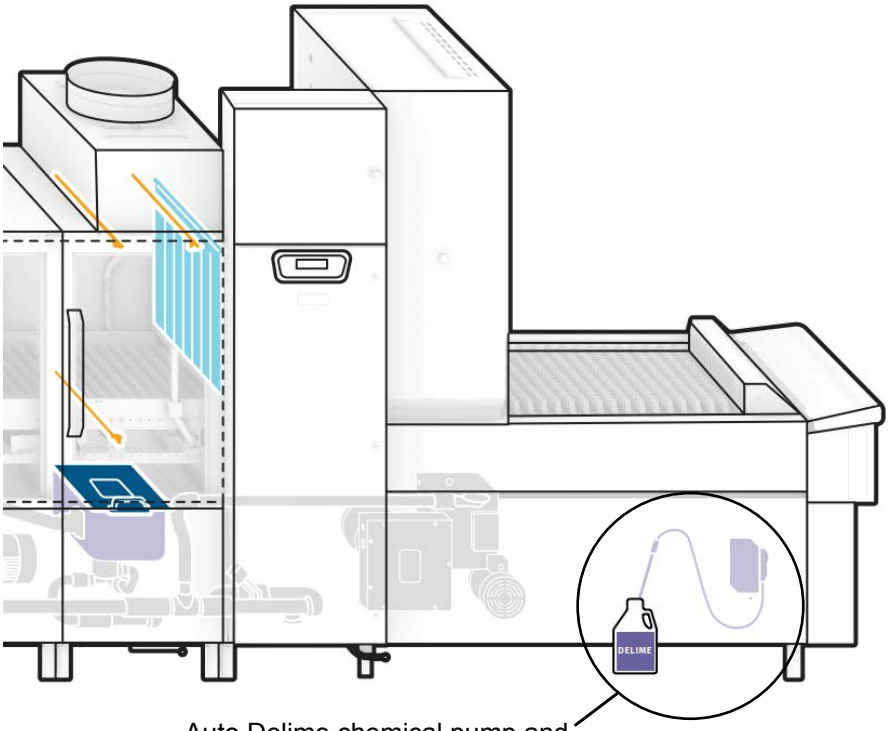
Certain areas of the machine, such as the loading, final rinse, and unloading sections, may still show signs of scale residue as these areas are not subjected to the recirculated wash containing the deliming solution. These areas will need to be cleaned/delimed manually as instructed below. **DO NOT spray or wipe the deliming solution on exterior surfaces of the dish machine as this could cause corrosion. If delimer solution is accidentally contacted with the exterior of the machine, flush with water and wipe. Always wear proper personal protective equipment (PPE) when using delimer following chemical manufacturer's recommendations.**

1. Following the chemical manufacturer's instructions, prepare a mixture of delimer and water, and pour or brush the solution onto the surface to be cleaned.
2. Allow to soak for 10 minutes. If required, scrub to remove heavy deposits.
3. Rinse thoroughly with fresh water.

Auto Delime Procedure (When Equipped)

To perform the Auto Delime procedure, follow the steps listed below (italics text indicates actual machine display prompts):

NOTE: The machine will automatically pump delime solution into the machine for deliming the booster heater and the final rinse system. Ensure sufficient chemical is present in the bottle and that the standpipe is fully inserted to the bottle.



Auto Delime chemical pump and standpipe/tube are located at the unload end of the machine.

1. When the display prompts *Delime Recommended*, refer to the 'PROGRAMMING' section of this manual when ready to initiate the delime cycle. Navigate to the 'Actions' menu and scroll down to 'Run Delime Cycle'. Press the ENTER button.
2. The display briefly reads *Press Stop key at any time to abort Delime cycle* before proceeding to step 3.
3. *Remove ware from machine. Press ENTER when done or STOP to abort*.
4. *Place Delime Pump hose in delime solution. Press Enter when done*. Place the hose from the delime chemical pump located at the unload end of the machine into the delime solution container.
5. *Open All Tank Drains-Leave drains open*. – open all tank drains located at the bottom of each tank.
6. *Clean Strainer Baskets, then replace. Press enter when done*.
7. *Tanks Draining Please Wait* – after all tanks have drained, the display toggles to step 8.
8. *Close Master Drain* – close the Master Drain manual valve located at either the load or unload end of the machine.

9. *Tanks Filling Please Wait* – after the machine has filled with approximately 1-2 inches of water in the tanks, the display toggles to step 10.
10. *Pour xx gallons delime into Tank 1. Press Enter when done* – the display prompts you to pour the required amount of delimer into Tank 1, located next to the dual rinse tank towards the load end of the machine and labeled *Delime Tank*.
11. *Press ENTER to start conveyor.*
12. *Delime Cycle Running. Approximate Time Left: XX:XX* – at this time, the machine is running the auto delime cycle and displays the time remaining.
13. *Auto Delime Complete. Press Enter key to refill. Otherwise, machine will power down in 5 minutes*.
14. *Open Master Drain* – after pressing Enter in the previous step or powering the machine back up from a power down, open the Master Drain manual valve located at either the load or unload end of the machine.
15. *Close all Tank Drains* – close all tank drains located at the bottom of each tank.

Pressing the STOP button at any time during the Auto Delime process will cancel the cycle. If the delime solution has not yet been introduced into the system, the display will read Tanks rinsed and ready for wash. Press Enter to refill. Or machine will power down in 5 minutes. If the delime solution has been introduced into the system, the display will read Delime solution in Tanks. Press Enter key to drain and rinse tanks. Press Stop key to skip rinse cycle.

Scan the QR code below to download the FT1000e delime wall chart.

SERVICE

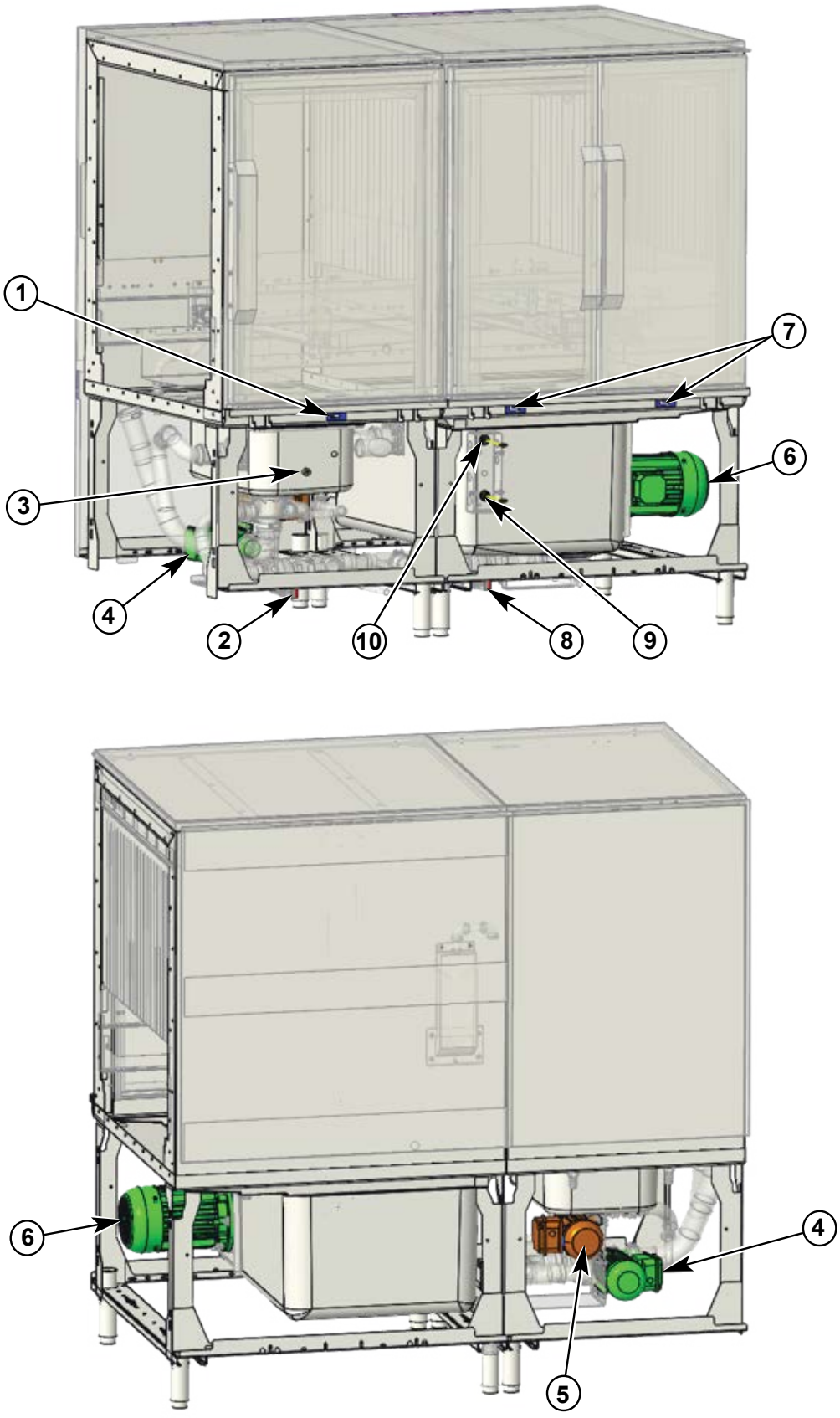
COMPONENT LAYOUT - ELECTRIC

Load Section

L-R Model Shown

Number	Name/ Electrical Callout	Function
1	Start Switch, Load (3PB)	Starts the dish machine for operation.
2	Stop Switch, Load (4PB)	Stops the dish machine operation. Returns the machine to the idle state.
3	Photo Eyes (Dish Sense)	Detects ware as it enters the machine for final rinse system timing. Receiver located at front of machine. Emitter located at rear of machine.

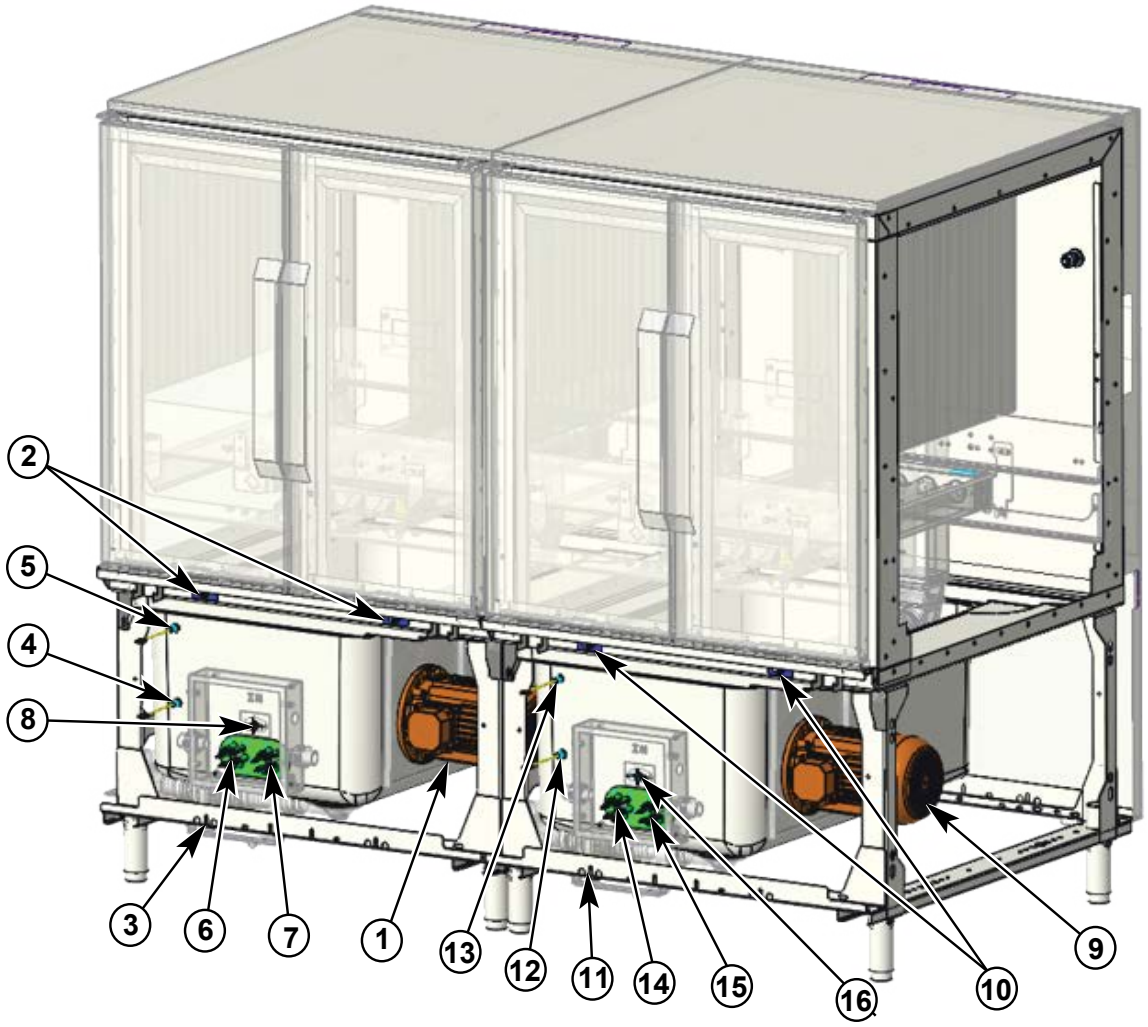
ASR / Prewash Section



L-R Model Shown

Number	Name/ Electrical Callout	Function
1	ASR Door Switch (8LS)	Detects door open or closed and prevents machine from running if door is opened.
2	ASR Drain Switch (6DS)	Detects drain open or closed. Will not prevent unit from running unless parameter is enabled in service programming.
3	ASR Float Switch (12FS)	Detects water level in ASR tank.
4	ASR Soil Pump Motor (9MTR)	Periodically pumps soil from ASR tank into external scrap basket.
5	ASR Recirculating Pump Motor (8MTR)	Recirculates water in ASR tank.
6	Prewash Motor (3MTR)	Recirculates water in prewash tank.
7	Prewash Door Switch (FT1000e: 6LS / 7LS, FT1000Se: 4LS / 5LS)	Detects door open or closed and prevents machine from running if door is opened.
8	Prewash Drain Switch (FT1000e: 5DS, FT1000Se: 4DS)	Detects drain open or closed. Will not prevent unit from running unless parameter is enabled in service programming.
9	Prewash Lower Float Switch (FT1000e: 5FS, FT1000Se: 3FS)	Detects water level in tank for temperature control and maintenance fill.
10	Prewash Upper Float Switch (FT1000e: 6FS, FT1000Se: 4FS)	Detects water level in tank to determine tank full condition.

Wash Power Rinse Section

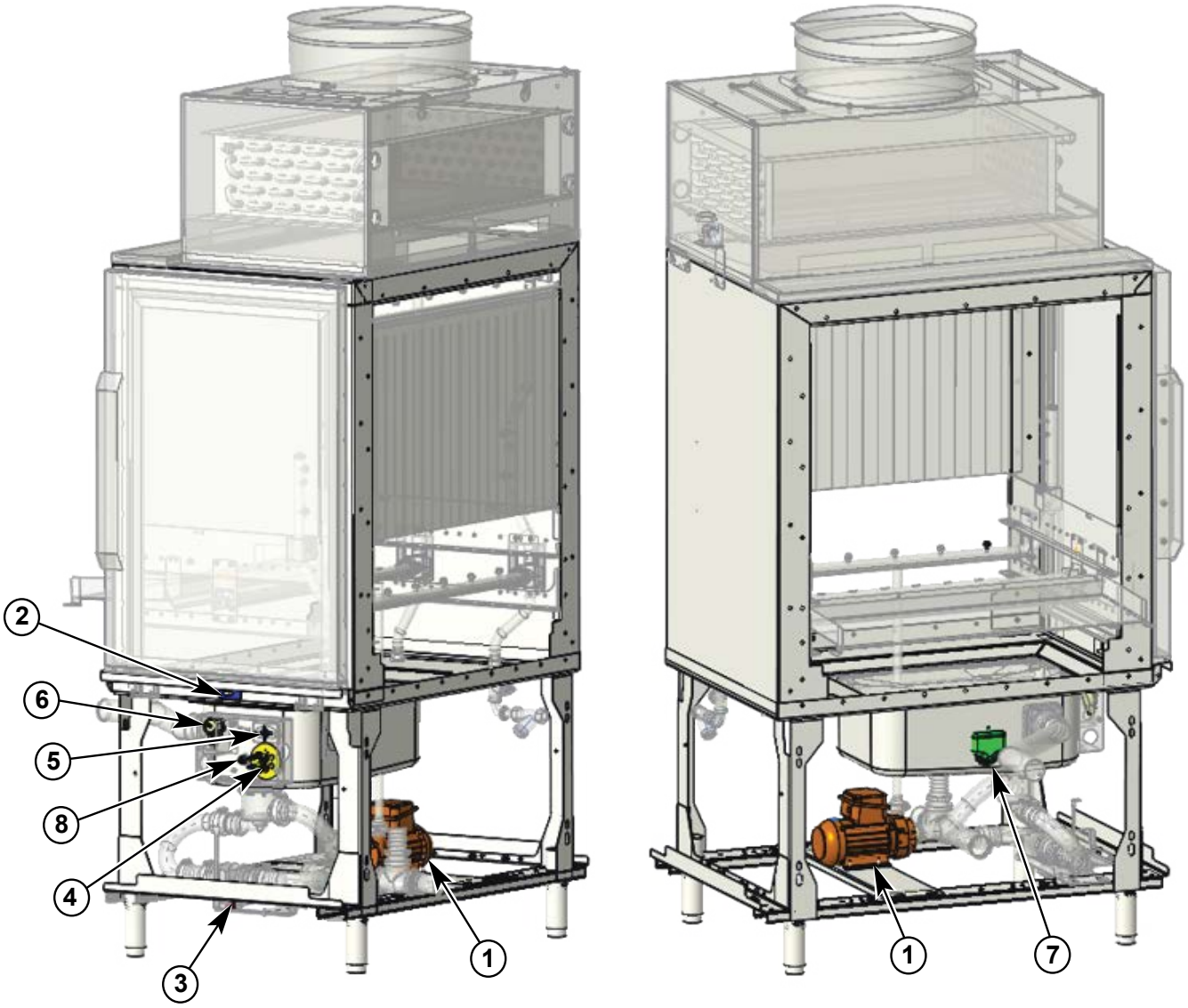


L-R Model Shown

NOTE: Power Rinse tank is not present on FT1000Se models.

Number	Name/ Electrical Callout	Function
1	Wash Motor (FT1000e: 2MTR, FT1000Se: 1MTR)	Recirculates water in wash tank.
2	Wash Tank Door Switch (FT1000e: 4LS / 5LS, FT1000Se: 2LS, 3LS)	Detects door open or closed and prevents machine from running if door is opened.
3	Wash Tank Drain Switch (FT1000e: 4DS, FT1000Se: 3DS)	Detects drain open or closed. Will not prevent unit from running unless parameter is enabled in service programming.
4	Wash Tank Lower Float Switch (FT1000e: 3FS, FT1000Se: 1FS)	Detects water level in tank for temperature control and maintenance fill.
5	Wash Tank Upper Float Switch (FT1000e: 4FS, FT1000Se: 2FS)	Detects water level in tank to determine tank full condition.
6	Wash Tank Electric Heater 1 (FT1000e: 3HTR, FT1000Se: 1HTR)	Heats water in wash tank. FT1000e: 9 kW, FT1000Se: 17.3 kW, FT1000e-ADV: 13.1 kW
7	Wash Tank Electric Heater 2 (FT1000e: 4HTR, FT1000Se: 2HTR)	Heats water in wash tank. FT1000e: 9 kW, FT1000Se: 17.3 kW
8	Wash Tank Overtemp Thermostat (FT1000e: 2TAS, FT1000Se: 1TAS)	High temperature protection. Prevents tank from overheating.
9	Power Rinse Motor (1MTR)	Recirculates water in power rinse tank.
10	Power Rinse Tank Door Switch (2LS / 3LS)	Detects door open or closed and prevents machine from running if door is opened.
11	Power Rinse Tank Drain Switch (3DS)	Detects drain open or closed. Will not prevent unit from running unless parameter is enabled in service programming.
12	Power Rinse Tank Lower Float Switch (1FS)	Detects water level in tank for temperature control and maintenance fill.
13	Power Rinse Tank Upper Float Switch (2FS)	Detects water level in tank to determine tank full condition.
14	Power Rinse Tank Electric Heater 1 (1HTR)	Heats water in power rinse tank. FT1000e: 10.7 kW, FT1000e-ADV: 10.7 kW
15	Power Rinse Tank Electric Heater 2 (2HTR)	Heats water in power rinse tank. FT1000e: 10.7 kW, FT1000e-ADV: 10.7 kW
16	Power Rinse Tank Overtemp Thermostat (1TAS)	High temperature protection. Prevents tank from overheating.

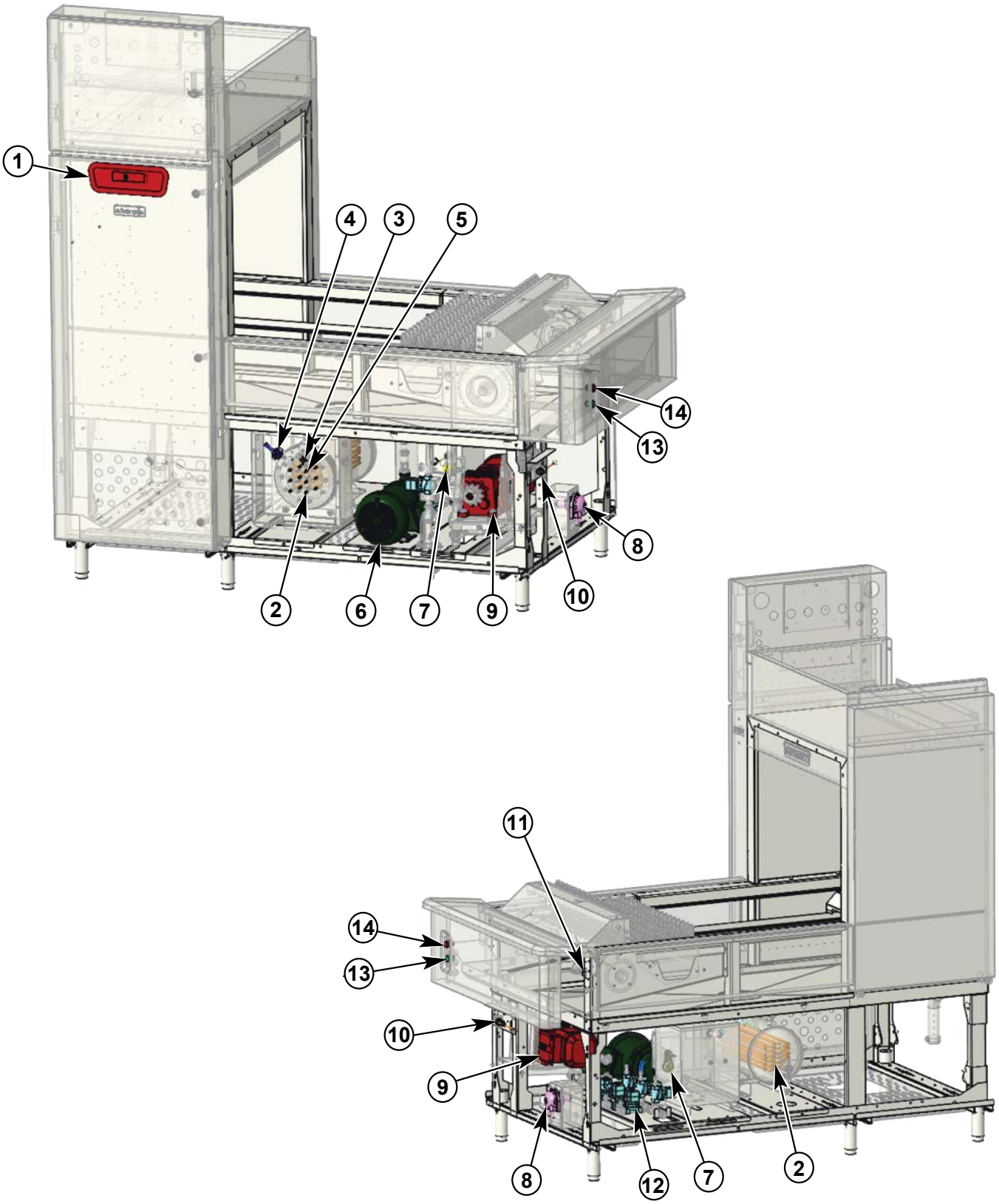
Dual Rinse / Final Rinse Section



L-R Model Shown

Number	Name/ Electrical Callout	Function
1	Dual Rinse Pump Motor (5MTR)	Recirculates water in dual rinse tank.
2	Dual Rinse Door Switch (1LS)	Detects door open or closed and prevents machine from running if door is opened.
3	Dual Rinse Drain Switch (2DS)	Detects drain open or closed. Will not prevent unit from running unless parameter is enabled in service programming.
4	Dual Rinse Electric Heater (5HTR)	Heats water in dual rinse tank. (10.7 kW)
5	Dual Rinse Overtemp Thermostat (4TAS)	High temperature protection. Prevents tank from overheating.
6	Pressure Sensor (1PS)	Supplies mV reading for water level control in dual rinse tank.
7	Air Trap	Provides input to pressure sensor for dual rinse tank water level.
8	Dual Rinse Thermistor (6QTM)	Monitors temperature in dual rinse tank.

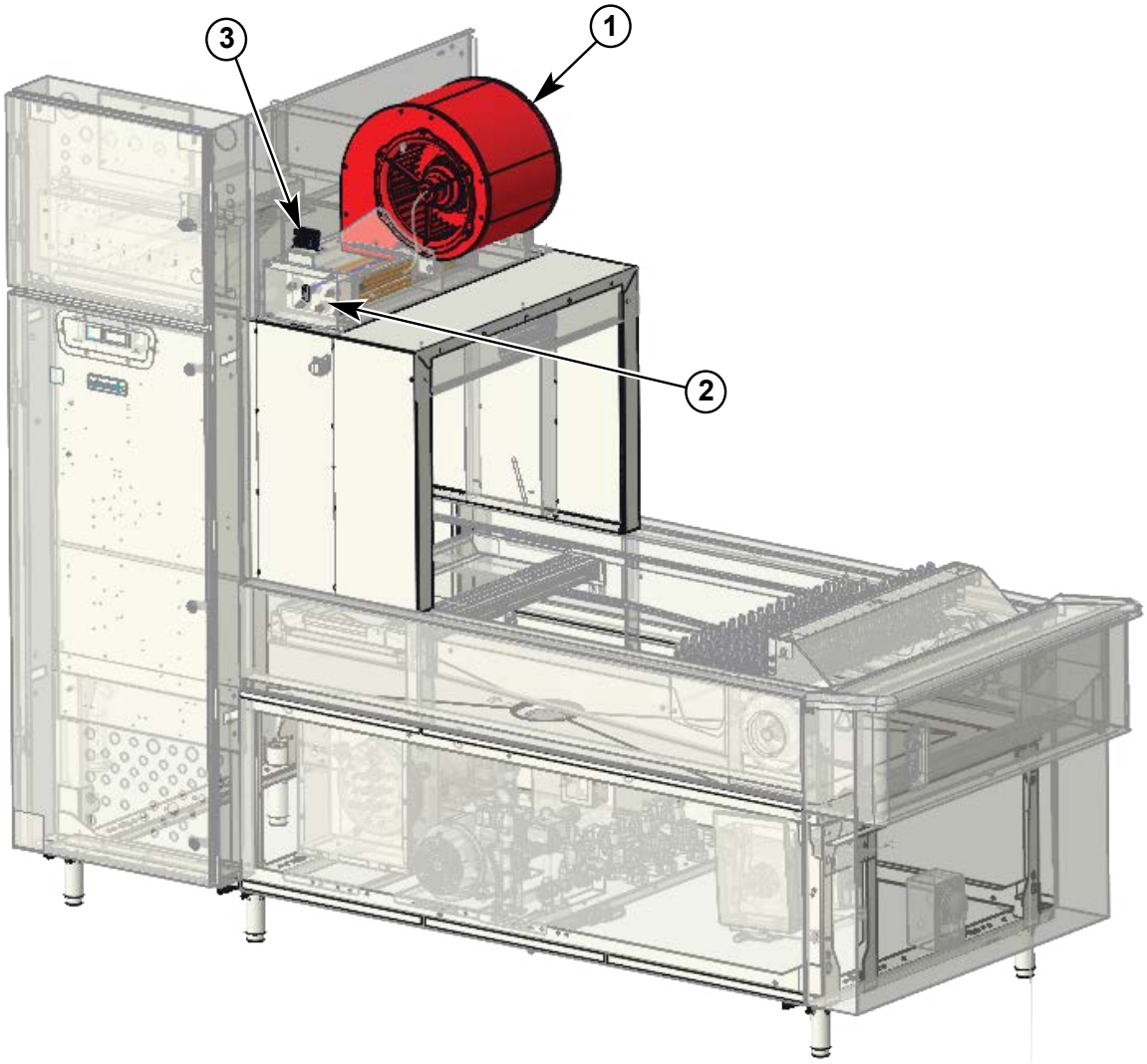
Unload Section



L-R Model Shown

Number	Name/ Electrical Callout	Function
1	Keypad	Contains buttons/switches for operator interface for machine operation and programming.
2	Booster Heater Element (6HTR)	Heats water in booster tank for final rinse cycles. FT1000e: 15 kW, FT1000Se: 15 kW, FT1000e-ADV: 10.7 kW
3	Booster Overtemp Thermostat (5TAS)	High temperature protection. Prevents booster tank from overheating.
4	Booster Overtemp Thermostat (6TAS)	High temperature protection. Prevents booster tank from overheating.
5	Booster Thermistor (8QTM)	Monitors temperature in booster tank.
6	Final Rinse Pump Motor (6MTR)	Pumps final rinse water through rinse system.
7	Holding Tank Float Switch (11FS)	Detects water level in final rinse holding tank.
8	Delime Pump (1PMP)	Pumps delime solution into the holding tank for deliming the internal electric booster and final rinse system.
9	Conveyor Drive Motor (7MTR)	Drives conveyor. Moves ware through dish machine.
10	Anti Jam Sensor (Photo Switch)	Monitors drive system for conveyor jam condition.
11	Dish Limit Switch (12LS)	Stops conveyor when ware activates dish limit.
12	Fill/Auto Clean Solenoid Valves	Provides water for machine fill and Auto Clean cycle.
13	Unload Start Switch (1PB)	Starts the dish machine for operation.
14	Unload Stop Switch (2PB)	Stops the dish machine operation. Returns the machine to the idle state.

Blower Dryer

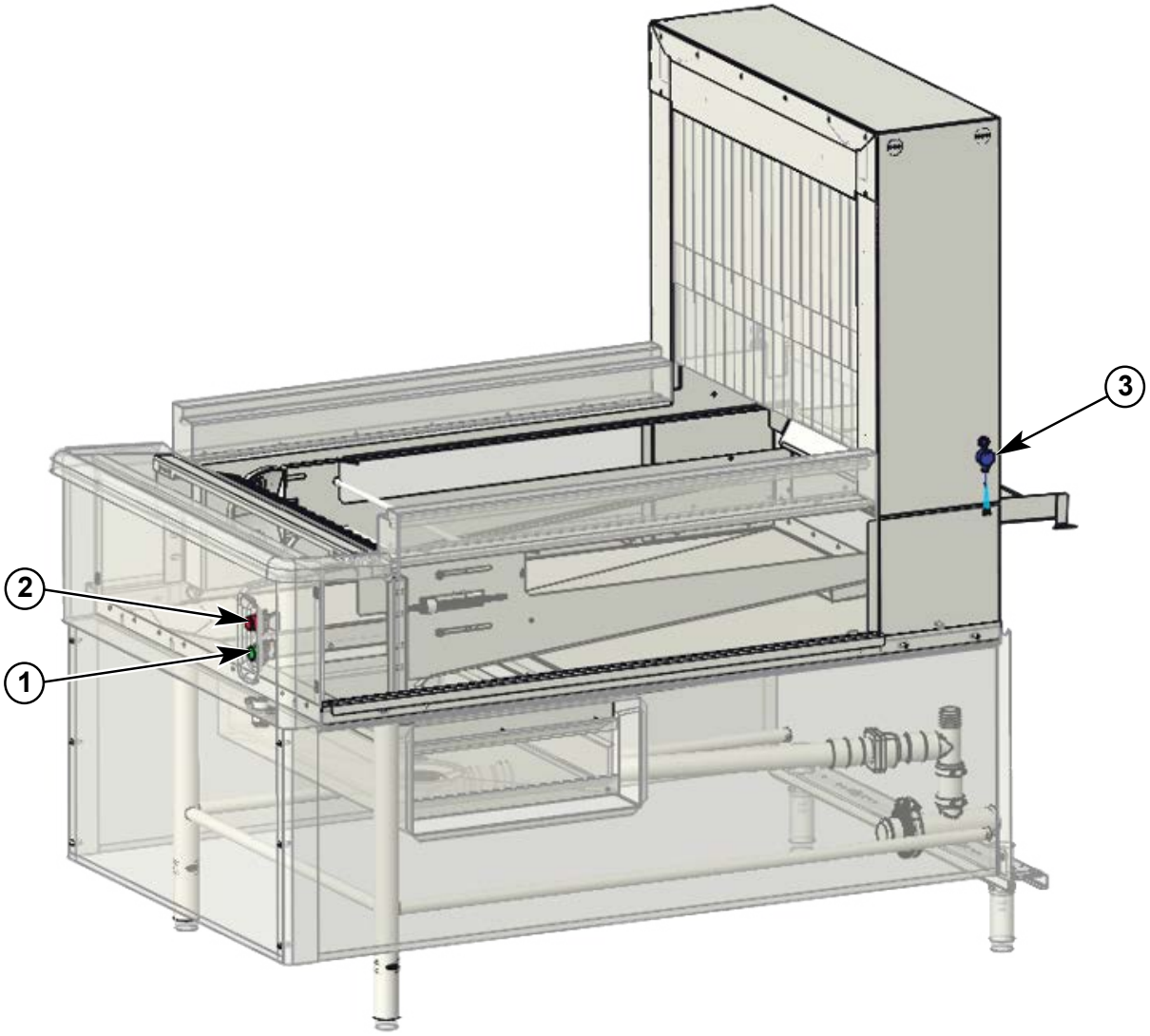


L-R Model Shown

Number	Name/ Electrical Callout	Function
1	Blower Motor (10MTR)	Blows air through heater to facilitate drying of ware.
2	Electric Heater (7HTR)	Heats air from blower.
3	Blower Dryer High Limit (8TAS)	High temperature protection. Prevents blower dryer from overheating.

COMPONENT LAYOUT - STEAM

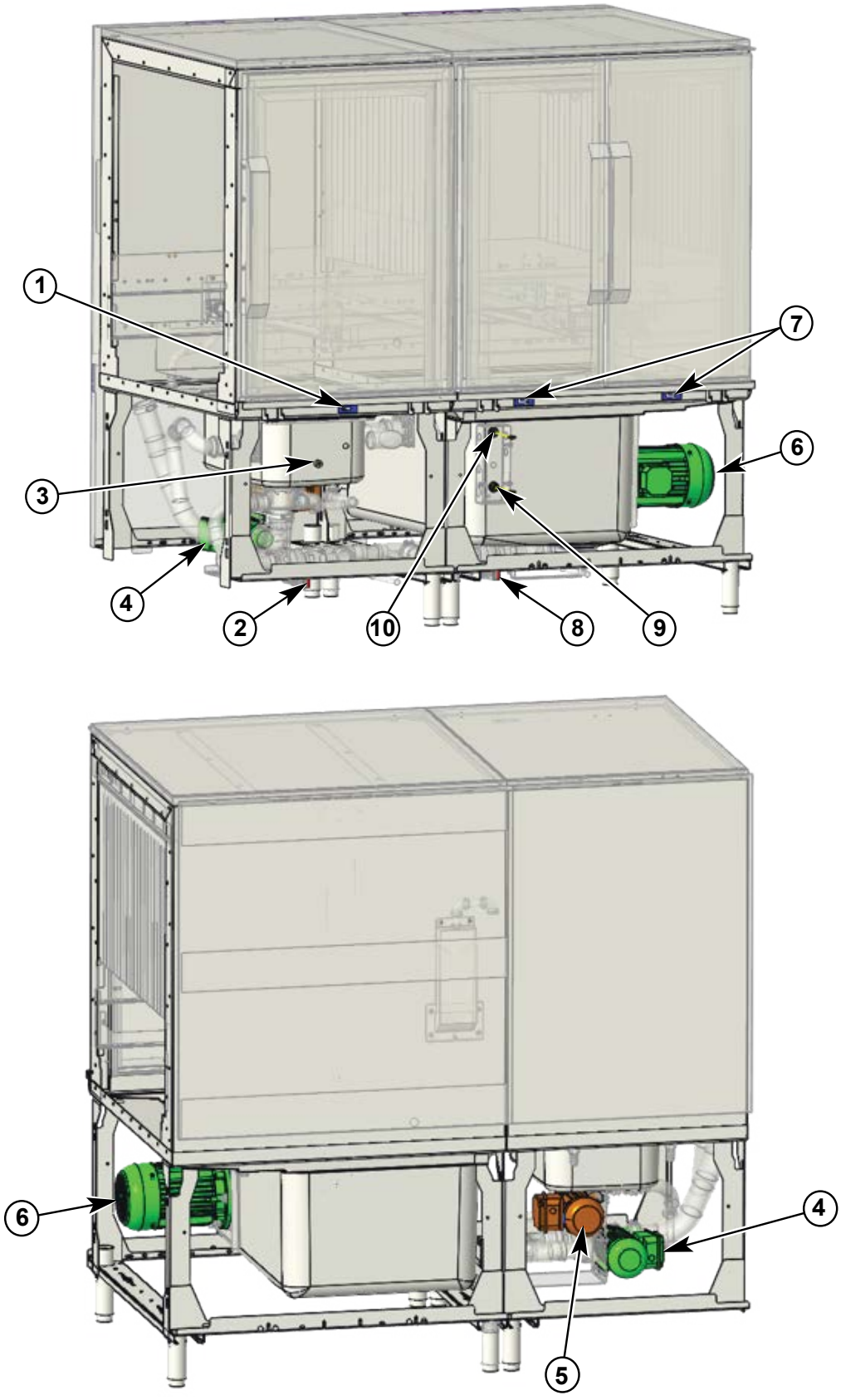
Load Section



L-R Model Shown

Number	Name/ Electrical Callout	Function
1	Start Switch, Load (3PB)	Starts the dish machine for operation.
2	Stop Switch, Load (4PB)	Stops the dish machine operation. Returns the machine to the idle state.
3	Photo Eyes (Dish Sense)	Detects ware as it enters the machine for final rinse system timing. Receiver located at front of machine. Emitter located at rear of machine.

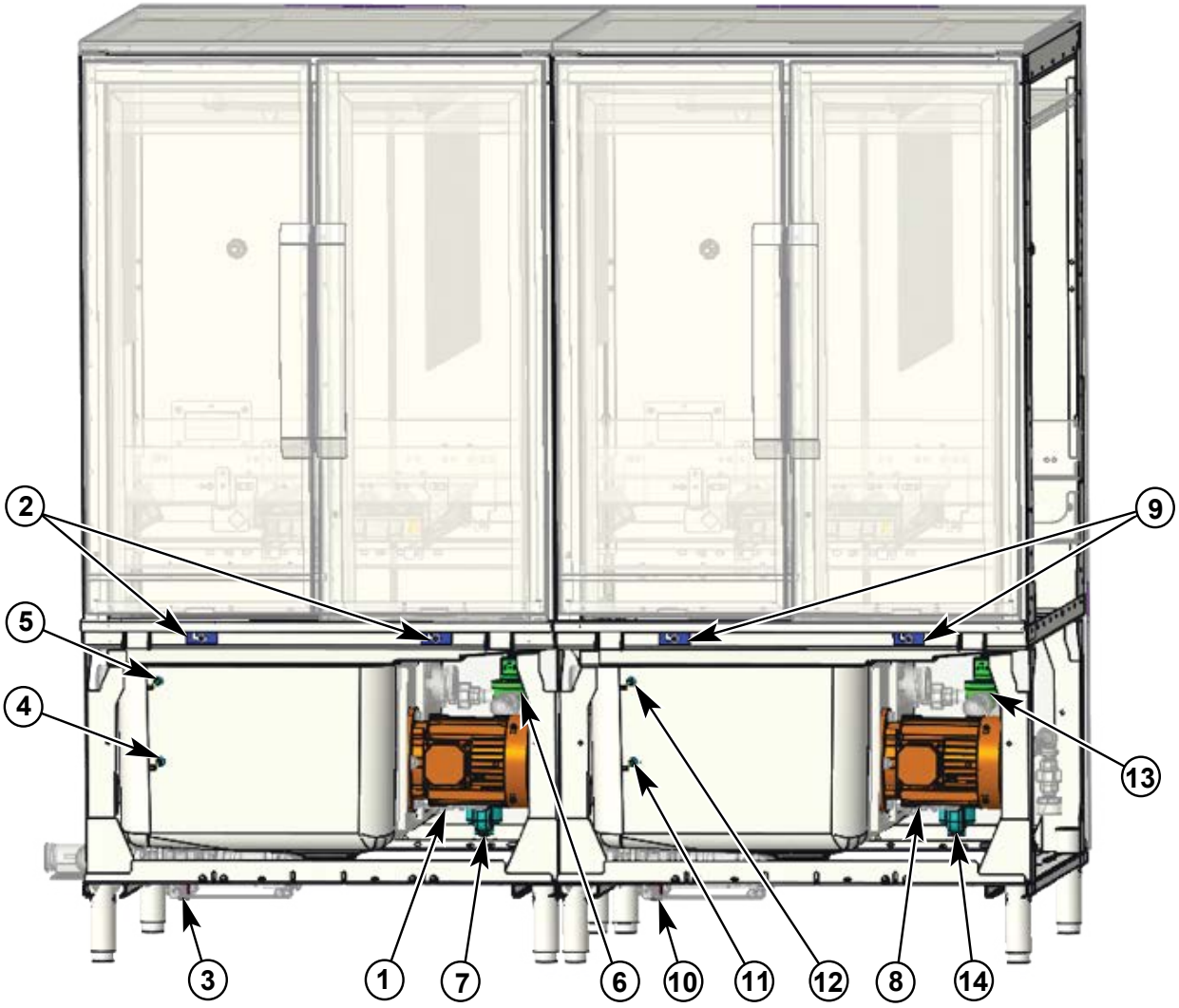
ASR / Prewash Section



L-R Model Shown

Number	Name/ Electrical Callout	Function
1	ASR Door Switch (8LS)	Detects door open or closed and prevents machine from running if door is opened.
2	ASR Drain Switch (6DS)	Detects drain open or closed. Will not prevent unit from running unless parameter is enabled in service programming.
3	ASR Float Switch (12FS)	Detects water level in ASR tank.
4	ASR Soil Pump Motor (9MTR)	Periodically pumps soil from ASR tank into external scrap basket.
5	ASR Recirculating Pump Motor (8MTR)	Recirculates water in ASR tank.
6	Prewash Motor (3MTR)	Recirculates water in prewash tank.
7	Prewash Door Switch (FT1000e: 6LS / 7LS, FT1000Se: 4LS / 5LS)	Detects door open or closed and prevents machine from running if door is opened.
8	Prewash Drain Switch (FT1000e: 5DS, FT1000Se: 4DS)	Detects drain open or closed. Will not prevent unit from running unless parameter is enabled in service programming.
9	Prewash Lower Float Switch (FT1000e: 5FS, FT1000Se: 3FS)	Detects water level in tank for temperature control and maintenance fill.
10	Prewash Upper Float Switch (FT1000e: 6FS, FT1000Se: 4FS)	Detects water level in tank to determine tank full condition.

Wash / Power Rinse Section

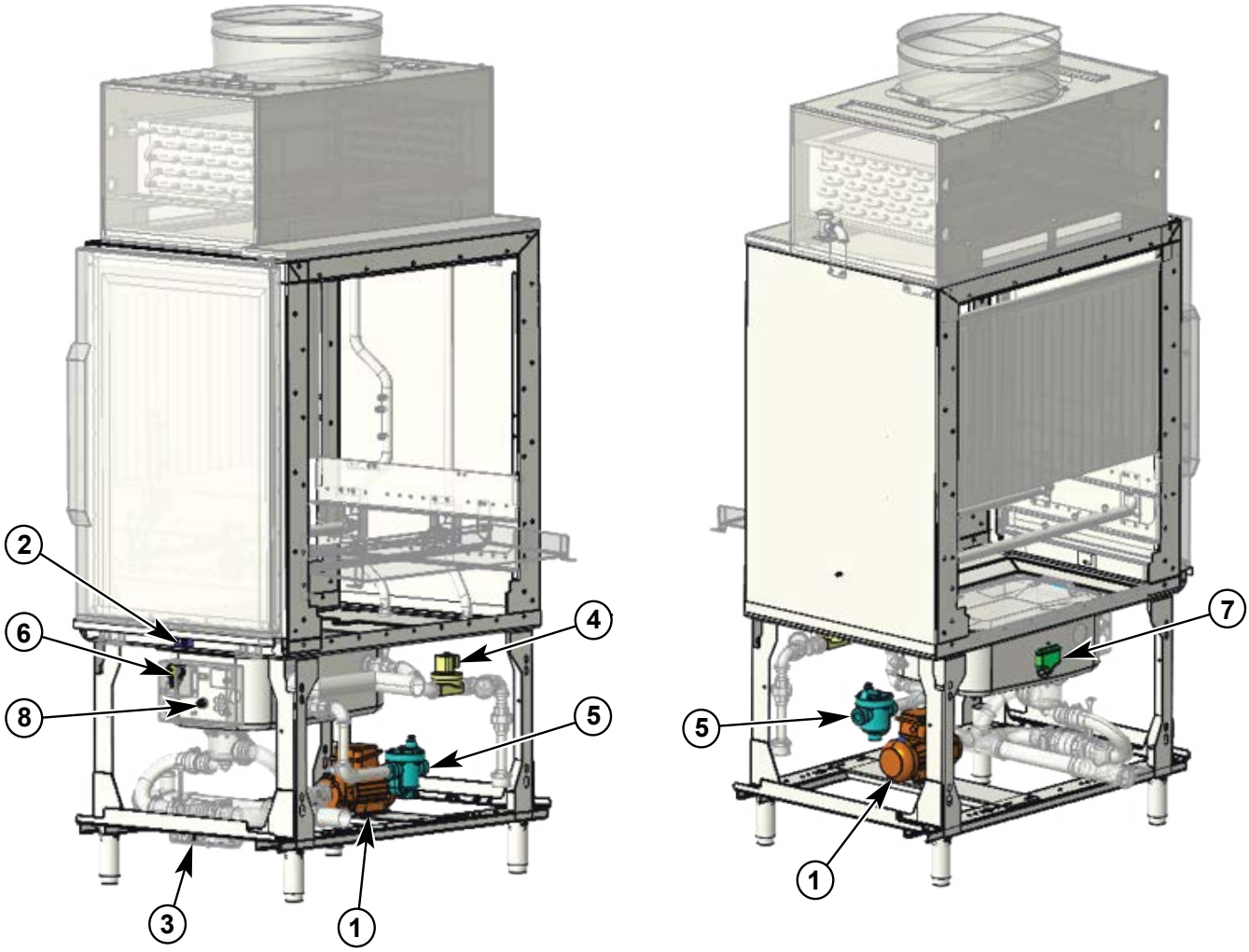


L-R Model Shown

NOTE: Power Rinse tank is not present on FT1000Se models.

Number	Name/ Electrical Callout	Function
1	Wash Motor (FT1000e: 2MTR, FT1000Se: 1MTR)	Recirculates water in wash tank.
2	Wash Tank Door Switch (FT1000e: 4LS / 5LS, FT1000Se: 2LS / 3LS)	Detects door open or closed and prevents machine from running if door is opened.
3	Wash Tank Drain Switch (FT1000e: 4DS, FT1000Se: 3DS)	Detects drain open or closed. Will not prevent unit from running unless parameter is enabled in service programming.
4	Wash Tank Lower Float Switch (FT1000e: 3FS, FT1000Se: 1FS)	Detects water level in tank for temperature control and maintenance fill.
5	Wash Tank Upper Float Switch (FT1000e: 4FS, FT1000Se: 2FS)	Detects water level in tank to determine tank full condition.
6	Wash Tank Steam Solenoid Valve (FT1000e: 17SOL, FT1000Se: 16SOL)	Supplies steam to steam coil for wash tank heat.
7	Wash Tank Steam Condensate Trap	Controls condensate in steam return lines.
8	Power Rinse Motor (1MTR)	Recirculates water in power rinse tank.
9	Power Rinse Tank Door Switch (2LS / 3LS)	Detects door open or closed and prevents machine from running if door is opened.
10	Power Rinse Tank Drain Switch (3DS)	Detects drain open or closed. Will not prevent unit from running unless parameter is enabled in service programming.
11	Power Rinse Tank Lower Float Switch (1FS)	Detects water level in tank for temperature control and maintenance fill.
12	Power Rinse Tank Upper Float Switch (2FS)	Detects water level in tank to determine tank full condition.
13	Power Rinse Tank Steam Solenoid Valve (16SOL)	Supplies steam to steam coil for power rinse tank heat.
14	Power Rinse Tank Steam Condensate Trap	Controls condensate in steam return lines.

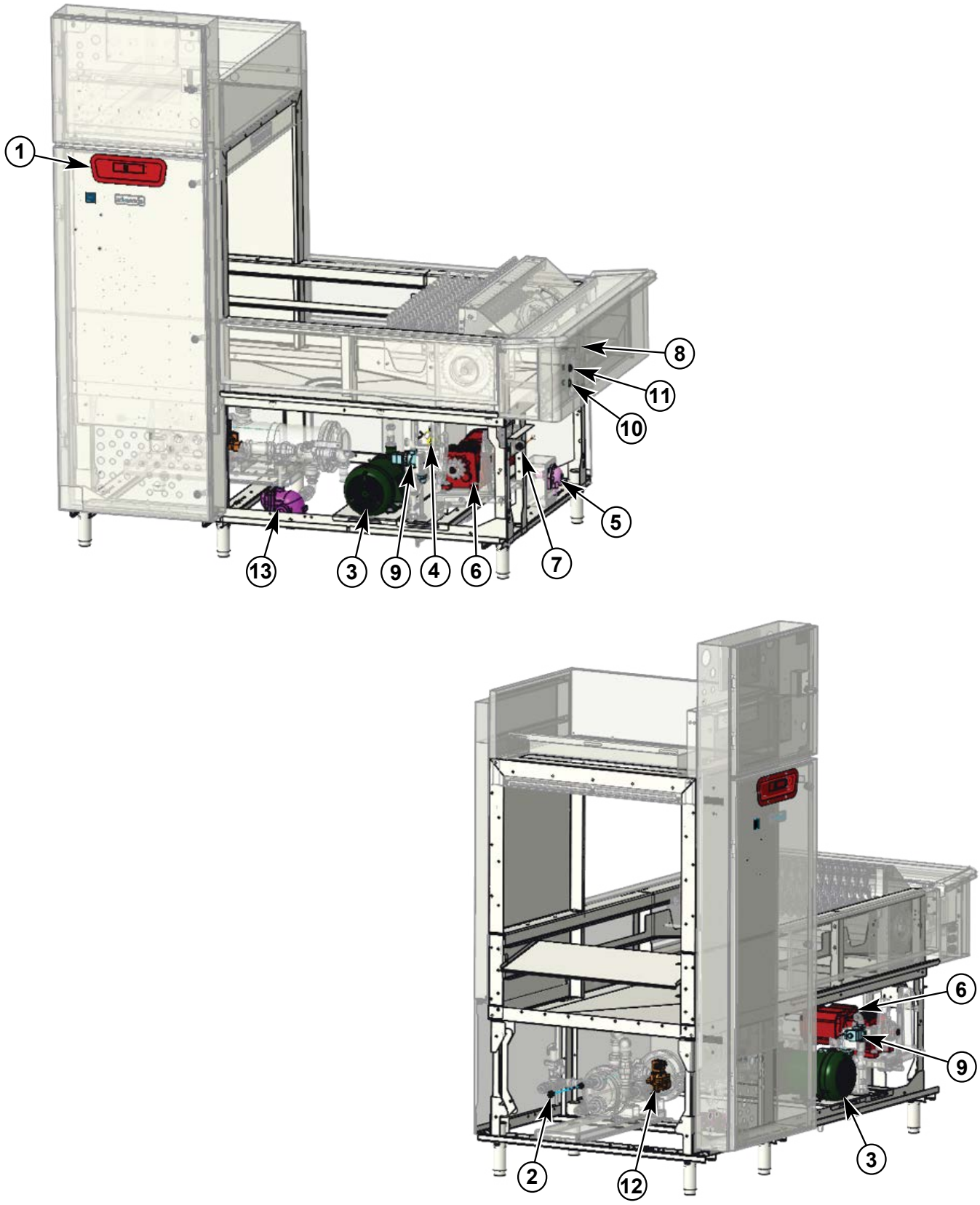
Dual Rinse / Final Rinse Section



L-R Model Shown

Number	Name/ Electrical Callout	Function
1	Dual Rinse Pump Motor (5MTR)	Recirculates water in dual rinse tank.
2	Dual Rinse Door Switch (1LS)	Detects door open or closed and prevents machine from running if door is opened.
3	Dual Rinse Drain Switch (2DS)	Detects drain open or closed. Will not prevent unit from running unless parameter is enabled in service programming.
4	Dual Rinse Steam Solenoid Valve (19SOL)	Supplies steam to steam coil for dual rinse tank heat.
5	Steam Condensate Trap	Controls condensate in steam return lines.
6	Pressure Sensor (1PS)	Supplies mV reading for water level control in dual rinse tank.
7	Air Trap	Provides input to pressure sensor for dual rinse tank water level.
8	Dual Rinse Thermistor (6QTM)	Monitors temperature in dual rinse tank.

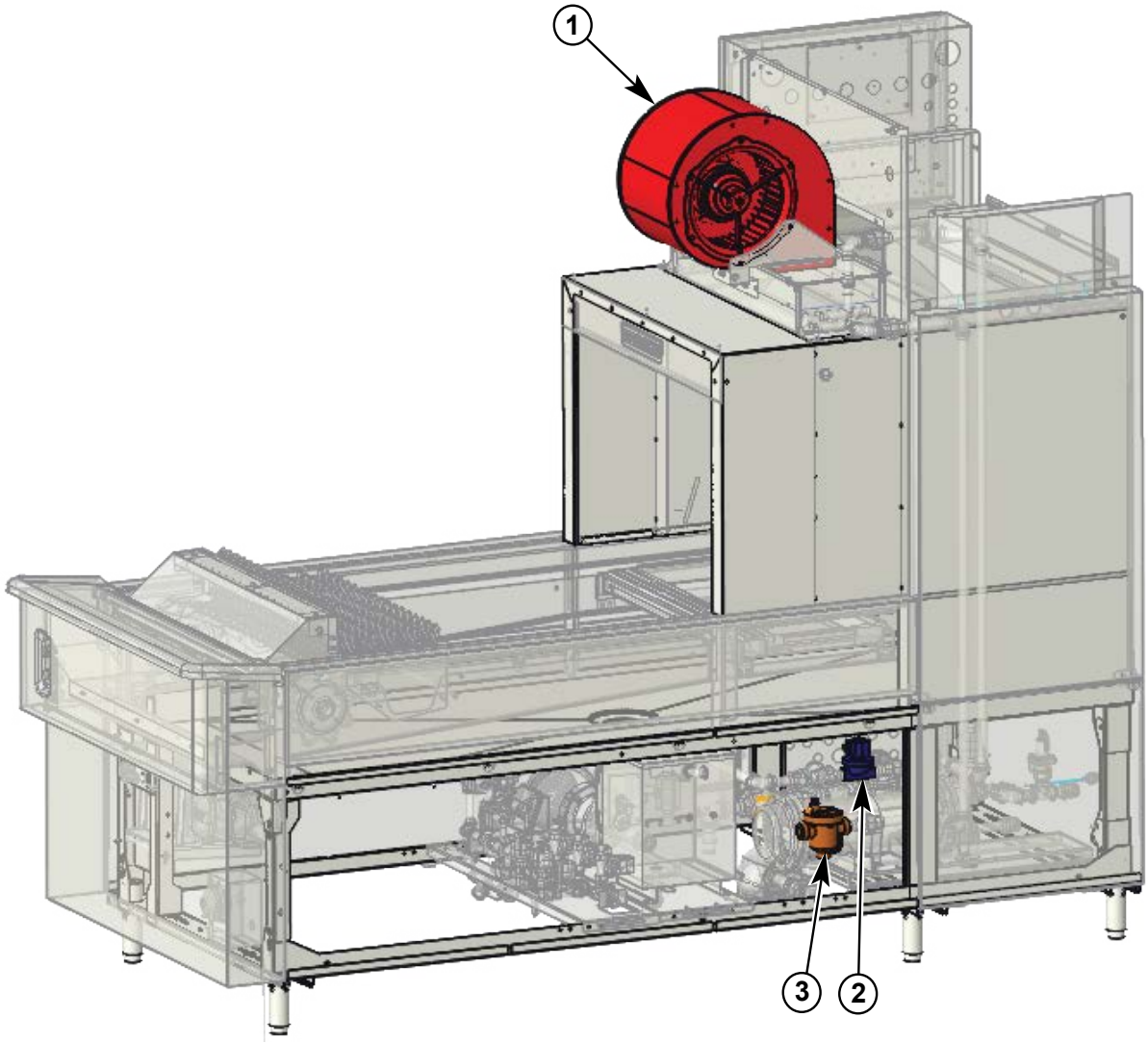
Unload Section



L-R Model Shown

Number	Name/ Electrical Callout	Function
1	Keypad	Contains buttons/switches for operator interface for machine operation and programming.
2	Steam Booster Thermistor (8QTM)	Monitors temperature in steam booster heater.
3	Final Rinse Pump Motor (6MTR)	Pumps final rinse water through rinse system.
4	Holding Tank Float Switch (11FS)	Detects water level in final rinse holding tank.
5	Delime Pump (1PMP)	Pumps delime solution into the holding tank for deliming the internal electric booster and final rinse system.
6	Conveyor Drive Motor (7MTR)	Drives conveyor. Moves ware through dish machine.
7	Anti Jam Sensor (Photo Switch)	Monitors drive system for conveyor jam condition.
8	Dish Limit Switch (12LS)	Stops conveyor when ware activates dish limit.
9	Fill/Auto Clean Solenoid Valves	Provides water for machine fill and Auto Clean cycle.
10	Unload Start Switch (1PB)	Starts the dish machine for operation.
11	Unload Stop Switch (2PB)	Stops the dish machine operation. Returns the machine to the idle state.
12	Steam Booster Steam Solenoid Valve (20SOL)	Supplies steam to steam booster heater for final rinse water.
13	Steam Booster Steam Condensate Trap	Controls condensate in steam return lines.

Blower Dryer



L-R Model Shown

Number	Name/ Electrical Callout	Function
1	Blower Motor (10MTR)	Blows air through steam coil to facilitate drying of ware.
2	Steam Solenoid Valve (21SOL)	Supplies steam to blower dryer coil to heat air from blower.
3	Steam Condensate Trap	Controls condensate in steam return lines.

WIRING DIAGRAMS

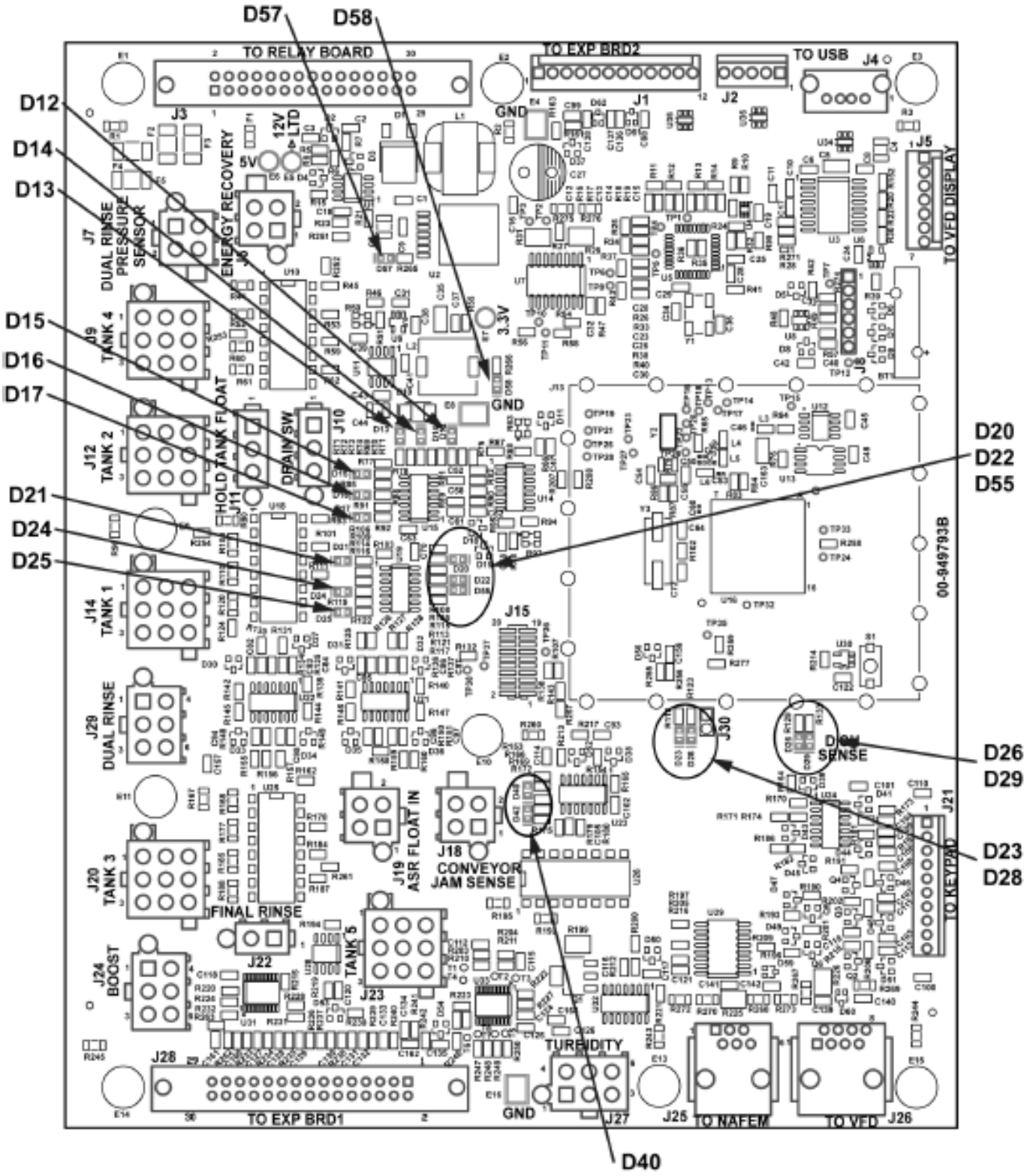
The FT1000e dish machine wiring diagrams are located inside the control box.

For .PDF files of all FT1000e wiring diagrams, scan the below QR code or visit visit **https://warewash.hobartcorp.com/ft1000ewiringdiagrams**.

CONTROL / RELAY BOARD LEDS AND WIRE CONNECTIONS

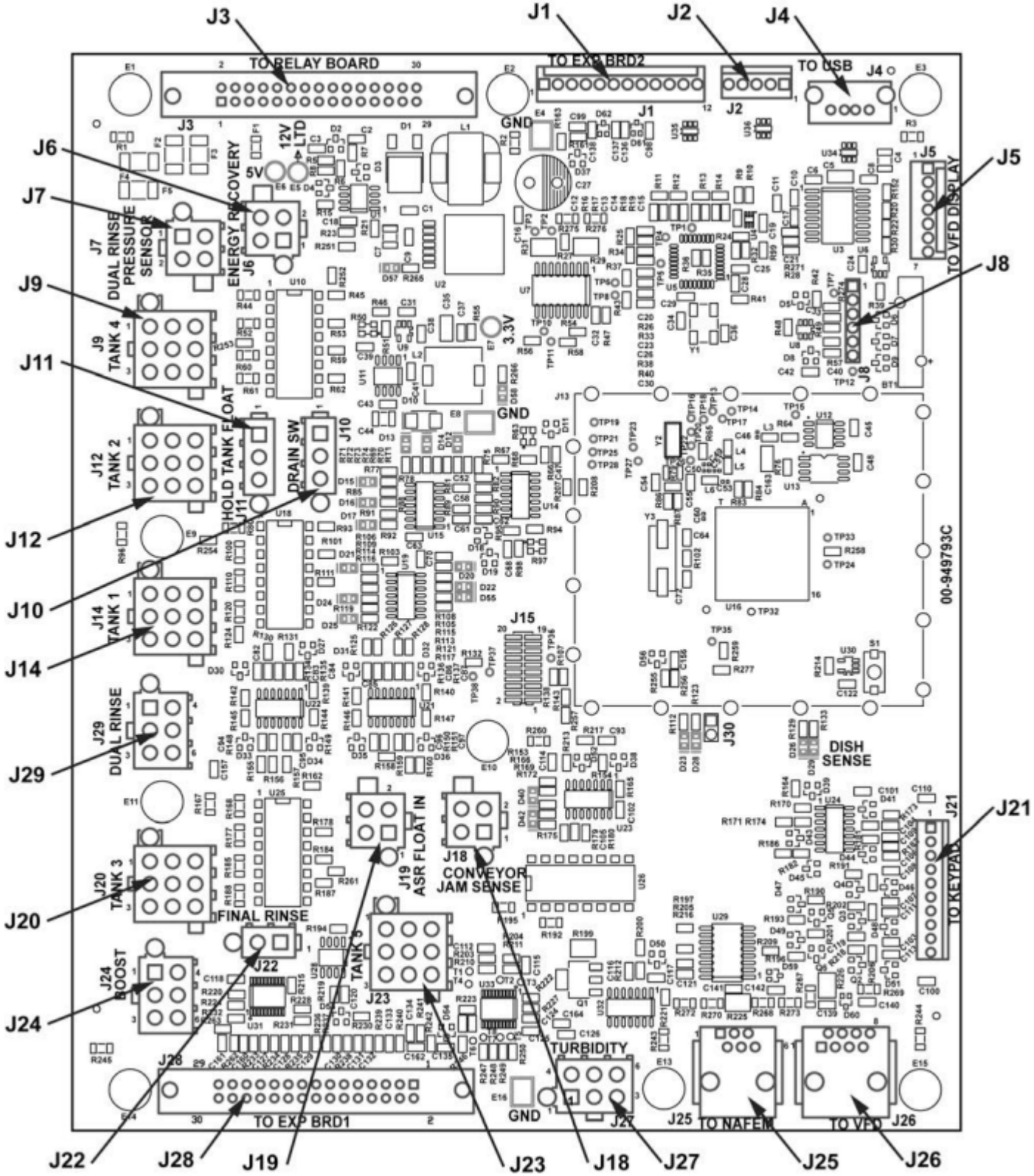
The below diagrams are for quick reference in locating LEDs and wire connections on the control board and relay board when troubleshooting.

Control Board LEDs



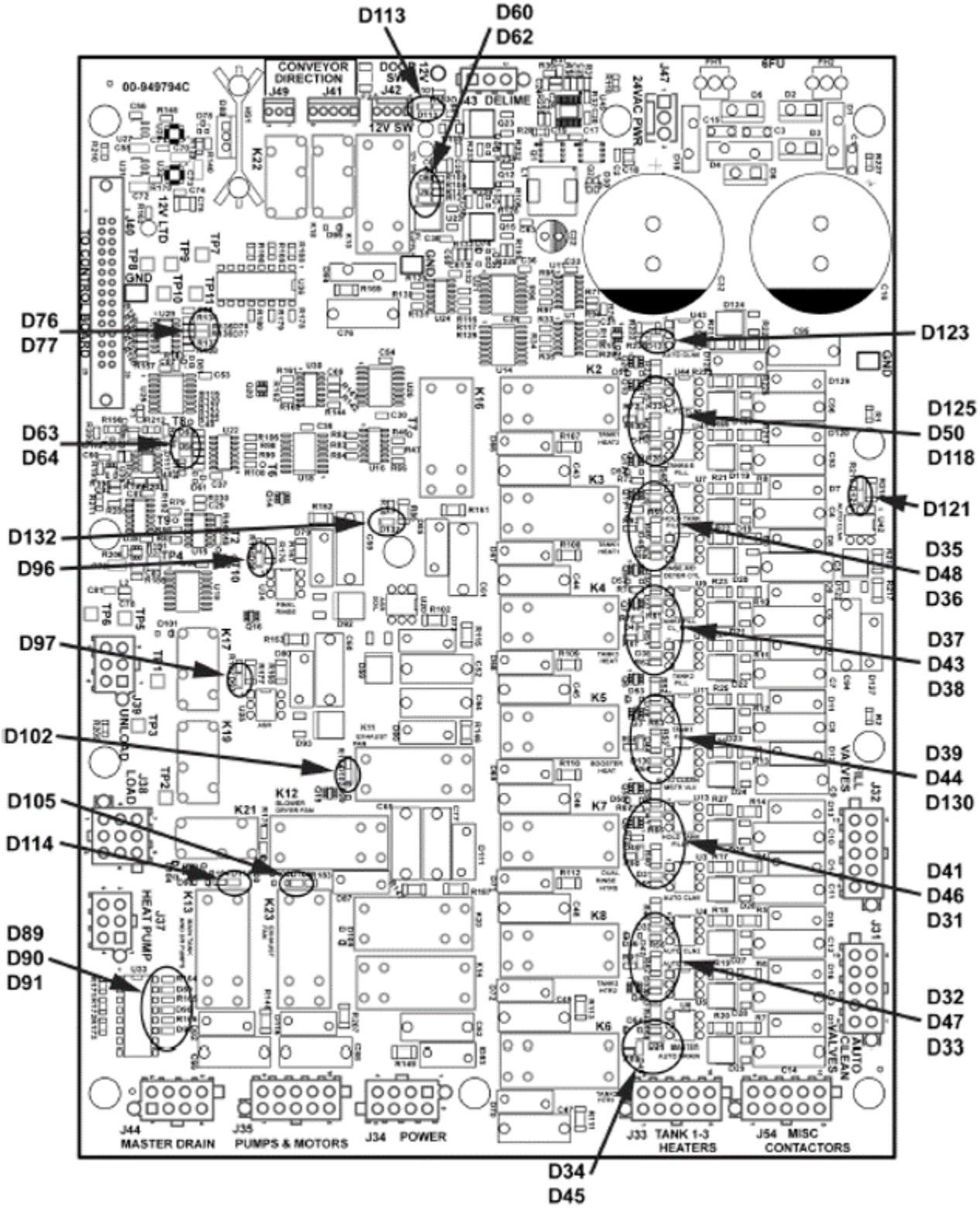
LED	DESCRIPTION	LED "LIT"	COLOR
D12	Tank drain switches	All drains closed	Red
D13	Tank 2 lower float	Float switch closed	Red
D14	Tank 2 upper float	Float switch closed	Red
D15	Tank 1 lower float	Float switch closed	Red
D16	Tank 4 lower float	Float switch closed	Red
D17	Tank 4 upper float	Float switch closed	Red
D20	Tank 1 upper float	Float switch closed	Red
D21	Holding tank float switch	Float switch closed	Red
D22	Tank 5 upper float	Float switch closed	Red
D24	Tank 3 lower float	Float switch closed	Red
D25	Tank 3 upper float	Float switch closed	Red
D26	Initial fill solenoid		Red
D29	Dish sense	Dish sensed between emitter and receiver (Dish sensor beam broken).	Red
D40	ASR float	Float switch closed	Red
D55	Tank 5 lower float	Float switch closed	Red
D57	5VDC	5VDC on	Red
D58	3.3VDC	3.3VDC on	Red

Control Board Wire Connections



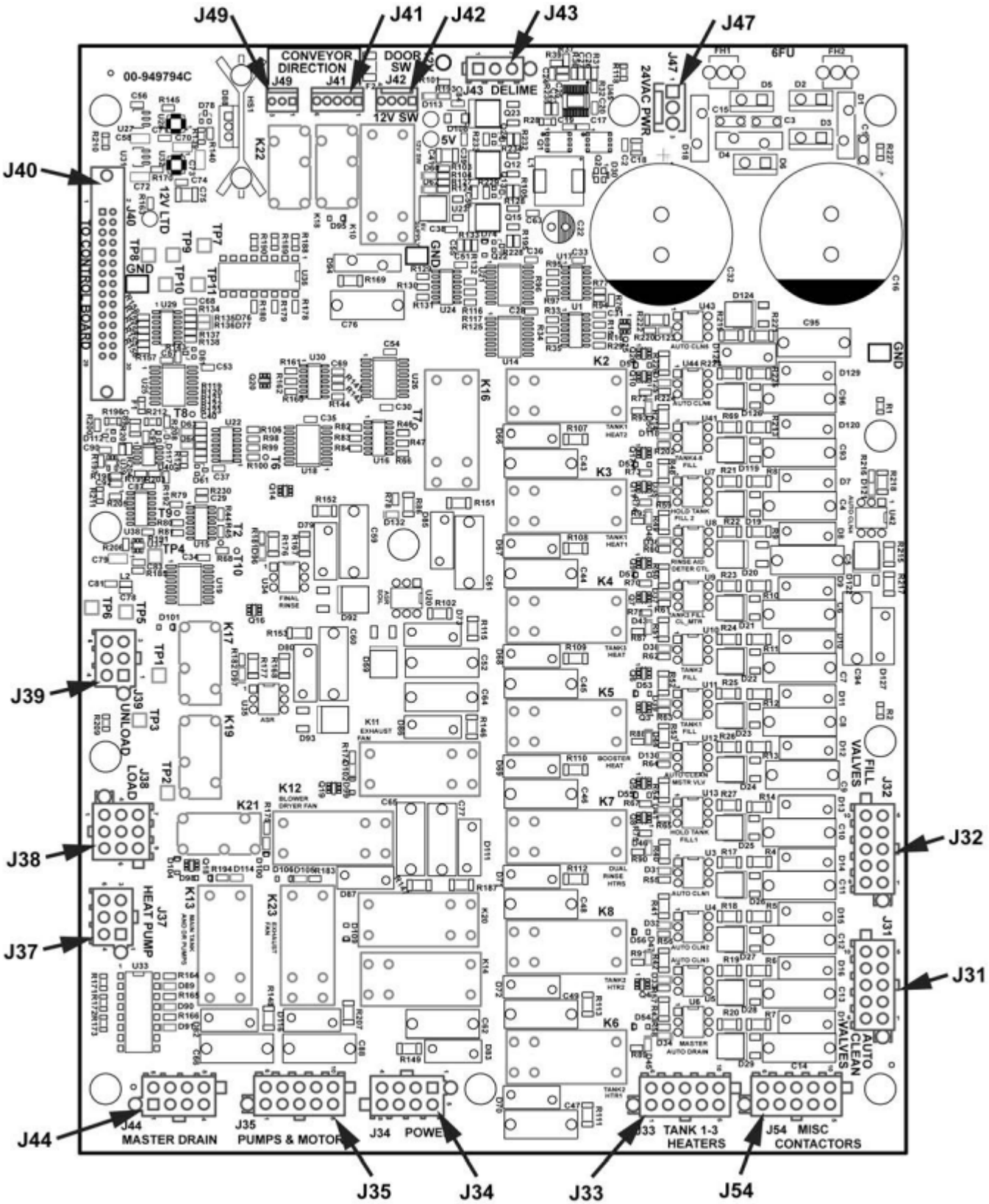
WIRE CONNECTION	DESCRIPTION
J1	To expansion board 2.
J2	USB Expansion
J3	To relay board
J4	USB Port
J5	To variable frequency drive (VFD)
J6	Energy Recovery
J7	Dual rinse pressure sensor
J8	Engineering Use ONLY
J9	Tank 4
J10	Drain switch
J11	Holding tank float switch
J12	Tank 2
J14	Tank 1
J19	ASR float
J20	Tank 3
J21	Key Pad
J22	Final Rinse
J23	Tank 5
J24	Booster
J25	Factory Test Connector
J26	Variable Frequency Drive
J28	Expansion Board 1
J29	Dual rinse

Relay Board LEDs



LED	DESCRIPTION	LED "LIT"	COLOR
D31	Auto clean 1	Valve ON	Red
D32	Auto clean 2	Valve ON	Red
D33	Auto clean 3	Valve ON	Red
D34	Master drain valve	Valve ON	Red
D35	Holding tank fill 2 (Hot)	Valve ON	Red
D36	Rinse aid / Detergent control	Rinse aid / Detergent enabled	Red
D37	Tank 3 fill	Valve ON	Red
D38	Tank 2 fill	Valve ON	Red
D39	Tank 1 fill	Valve ON	Red
D41	Holding tank fill 1 (Cold/Hot)	Valve ON	Red
D43	Tank 3 heat	Heater Energized	Red
D44	Booster heater	Heater Energized	Red
D45	Tank 2 heat 1	Heater Energized	Red
D46	Dual rinse heaters	Heater Energized	Red
D47	Tank 2 heat 2	Heater Energized	Red
D48	Tank 1 heat 1	Heater Energized	Red
D50	Tank 1 heat 2	Heater Energized	Red
D60	12VDC supply switch	12VDC ON	Red
D62	5VDC supply	5VDC ON	Red
D63	Dish tripped switch	Dish bar not tripped	Red
D64	Rack switch photo eye	No Dish present	Red
D76	Conveyor (running)	Conveyor Running	Red
D77	Door Switches	Doors Closed	Red
D91	Manual master drain switch	Drain Closed	Red
D96	Final rinse pump	Pump ON	Red
D97	ASR pump	Pump ON	Red
D102	Exhaust fan	Fan ON	Red
D103	Blower dryer fan	Fan ON	Red
D113	Auto delime pump	Pump ON	Red
D114	Pumps	Pump ON	Red
D118	Tank 4 and 5 fill	Valve ON	Red
D121	Auto clean 4	Valve ON	Red
D123	Auto clean 5	Valve ON	Red
D125	Auto clean 6	Valve ON	Red
D130	Auto clean master valve	Valve ON	Red
D132	ASR slurry pump	Pump ON	Red

Relay Board Wire Connections



WIRE CONNECTION	DESCRIPTION
J31	120VAC supply to autoclean 1,2,3,4,5,6 and auto clean master drain valve.
J32	120VAC supply to tank 1 fill, tank 2 fill, tank 3 fill, tank 4 and 5 fill, holding tank fill 1, and holding tank fill 2.
J33	120VAC supply to tank 1 (Heat 1 and 2), tank 2 (Heat 1 and 2), and tank 3 heat.
J34	120VAC input supply.
J5	120VAC supply to pumps, ASR pump, ASR soil pump, exhaust fan, blower dryer fan, final rinse pump, and Heat Pump Compressor.
J37	12VDC supply to heat pump pressure trip source switch and heat pump pressure trip switch.
J38	12VDC supply to conveyor running, conveyor state, and rack dish sense in.
J39	12VDC supplied to conveyor ready, conveyor enabled, conveyor state, conveyor running, and dish tripped.
J40	12VDC supply to control board, doors, T1 TAS, T2 TAS, T3 TAS, DR TAS, booster TAS, and 5V Control Signals.
J41	24VDC supply from variable frequency drive. Fed back to drive to enable conveyor forward or reverse.
J42	12VDC supplied to door switches.
J43	12VDC supply to delime pump.
J44	12VDC supply for manual master drain switch. 120VAC supplied to automatic master drain valve.
J45	12VDC supplied for sail switch.
J47	24VAC power
J49	12VDC supply to conveyor reversing switch.
J54	Exhaust Fan, Rinse Aid/Det On, BD_Heat, Booster Heat, DR Heat

SEQUENCE OF OPERATION (ELECTRIC HEAT)

Initial Fill - Electric

1. The following conditions are assumed:
   a. Main breakers off
   b. Doors open.
   c. Tanks are drained.
   d. Water supply on.
2. Main breakers at wall (and controls breaker on machine, if applicable) turned ON.
   a. Line voltage will be at 1T inputs (if 208 or 240 volt machines check 1T input taps to verify that transformer is wired to match machine supply voltage).
      1) 1T output 120VAC.
   b. 1FU will be 120VAC.
   c. 2T input will be 120VAC.
      1) 2T nominal output 24VAC.

   NOTE: Actual output voltage may range from 19 - 30 VAC.
   d. 6FU will be 24VAC input to 12VDC power supply.
   e. 12VDC-LTD applied to control board.
      1) 12VDC-LTD limited applied to 5V.
      2) 12VDC-LTD applied to A5VP.
      3) 12VDC-LTD applied to 3V3.
   f. 5VDC applied to relay board.
3. Operator presses POWER button on keypad.
   a. 12VDC-SW switched on.
      1) 12VDC applied to door switches.
      2) 12VDC applied to conveyor jam sensor (LED on sensor "ON"). 8CR energizes (8CR LED "ON"). 8CR "NO" contacts close.
      3) 12VDC output from power supply.
         a) 120VAC “ON” (K14) energized. N.O. contacts close.
            i. 7CON energized.
            ii. 7CON, L3 / T3 close at terminal block VF1 and VF2.
            iii. Applies line voltage at L1 and L2 to Variable Frequency Drive (VFD).
            iv. Frequency Inverter is energized. Frequency Inverter Display will indicate "rdY".
   b. Display turns ON. "Hobart FT1000" displays for a few seconds.
   c. Display will show "Tank(s) Filling...".
   d. K14 relay energizes, signaling external booster (if applicable) controller that the machine is on.
   e. Exhaust fan energizes (16CON, K11, D102) FT1000e Advansys.
   f. If doors are open, display will show "Door(s) Open".
      1) If doors are open, 12VDC DOORS are de-energized (K10, D77 (relay board)).
   g. If drains are open, display will show "Drain(s) Open".
   h. D64 (relay board) illuminates when beam broken - indicating dish present.
   i. D29 (control board) de-energizes when beam broken.
4. User closes Dual Rinse, Tank 1, Tank 2, Tank 3 doors (if applicable), ASR (if applicable), (1LS, 2LS, 3LS, 4LS, 5LS, 6LS, 7LS, 8LS (if applicable)).
   a. 12VDC DOORS (K10, D77) energizes. N.O. contacts close.
   b. 120VAC DOORS (K16) energizes. N.O. contacts close.

5. Hold Tank fill valve (5SOL, U13, D41) energies until float (11FS, D21) closes.
   a. Final Rinse pump energizes (6CON, U34, D96).
      1) Dual Rinse tank begins to fill through final rinse arms.
         a) Dual rinse tank will continue to fill until 1PS senses approximately 1000 mV.

NOTE: Hold tank fill valve cycles based on float switch opening and closing.

6. Tank 1 fill valve (1SOL, U11, D39) energizes.
   a. Tank 1 begins to fill.
   b. Tank 1 lower float switch (1FS) closes. D15 (control board) illuminates.
      1) Temperature control begins.
   c. 12VDC (control board) provided to K3 & K2 through tank 1 over temp (1TAS).
      1) Tank 1 / Heat 1 (K3) energizes. D48 (relay board) illuminates.
         a) 17CON energizes 1HTR.
      2) Tank 1 / Heat 2 (K2) energizes. D50 (relay board) illuminates.
         a) 18CON energizes 2HTR.
   d. Upper float (2FS) closes. D20 (control board) illuminates.
   e. Tank 1 overflows into Tank 2.
      1) Tank 2 lower float switch (3FS) closes. D13 (control board) illuminates.
         a) Temperature control begins.
   f. 12VDC (control board) provided to K6 & K8 through tank 2 over temp (2TAS).
      1) Tank 2 / Heat 1 (K6) energizes. D45 (relay board) illuminates.
         a) 19CON energizes 3HTR.
      2) Tank 2 / Heat 2 (K8) energizes. D47 (relay board) illuminates.
         a) 20CON energizes 4HTR.
7. Tank 2 upper float (4FS) closes. D14 (control board) illuminates.
8. Blower Dryer blower motors energizes when pump motors on (10CON, K12, D103).
9. Tank 3 fill valve (3SOL, U9, D37) energizes. (Not applicable with FT1000S).
   a. Tank 3 begins to fill.
   b. Tank 3 lower float switch (5FS) closes. D24 (control board) illuminates.
   c. Upper float (6FS) closes. D25 (control board) illuminates.
   d. Tank 3 overflows into ASR.
      1) ASR float switch (ASR-12FS) closes. D40 (control board) illuminates.
      2) ASR tank filled.
   e. 1SOL and 3SOL de-energize. Fill complete.
10. Display will show tank temperatures.

NOTE: Tank pump motors turn on periodically for 15 seconds as machine is heating, until tank 2 has reached its setpoint.

NOTE: Until set temperature is reached, display will show “Tanks Filling…”.

NOTE: Machine will not start, until Tank 2 temperature is met.

Normal Operation - Electric

NOTE: Heat is being maintained by microprocessor.
NOTE: Until set temperature is reached, display will show “Tanks Filling…”.
NOTE: Machine will not start, until Tank 2 temperature is met.

1. The following conditions are assumed:
   a. Main breakers on.
   b. Doors closed.
   c. Tanks are full.
   d. Water supply on.
   e. "Tanks Filling" complete.
2. Operator presses "START" switch (unload start switch (1PB), load start switch (3PB), or the Keypad Start).

NOTE: If breaker is turned off or main power is removed from machine and main power or breaker is turned back on, the machine assumes there is ware on the conveyor. As the machine is first started up, the final rinse will automatically run for 2 minutes to ensure items on the conveyor are properly rinsed.

   a. Dish tripped (K22, D63) energizes, as long as dish limit switch (12LS) is closed. K22 N.O. contacts close for VFDrive forward operation.
   b. Conveyor motor (7MTR, K19, D76) energizes as long as jam sensor (11LS and 8CR) are energized.
   c. “All pump motors on” from microprocessor, signal energizes pump motor (K13, D98), closing contact, turning on pumps.
      1) Tank 1 pump motor (1CON).
      2) Tank 2 pump motor (2CON).
      3) Tank 3 pump motor (3CON). (Not applicable with FT1000Se).
      4) DR motor (5CON).
   d. ASR pump motor (U35, D97, 8CON) energized.
   e. Rinse Aid / Detergent (2CR, U8, D36) energizes.
      1) Line voltage provided to DP1 and DP2, when 2CR and 1CON are energized.
   e. Rinse Aid / Detergent (2CR, U8, D36) energizes.
   f. Blower Dryers energize (K12, D103, 10CON, 10MTR).
      1) 120VAC Blower Dryer (BD) Heat (K20).
      2) BD heat (25CON, 26CON) energizes 7HTR, as long as 10CON and 11CON are energized and 6TAS is not tripped.
   g. Exhaust fan (K11, D102, 16CON) energizes FT1000e Advansys.
3. The following conditions are assumed:
   a. Ware interrupts dish sense beam. D64 relay board, lit when beam broken (dish present).
   b. Final rinse (U34, D96, 6CON) pump turns on when ware reaches beginning of final rinse zone.

NOTE: Final rinse zone minimum is dual rinse zone + pre and post buffer. Pre and post rinse zone buffers service adjustable in Service Menu > Operation parameter menu.

   c. Line voltage provided to RP1 and RP2, when Dual Rinse Pump (5CON) and Rinse Aid / Detergent (2CR) are energized.
   d. Final rinse (U34, D96, 6CON) de-energize, when post buffer has been met.
   e. Hold tank continues to maintain proper water level by monitoring hold tank float (11FS, D21).

Normal Operation - User Presses Any Stop Button - Electric

NOTE: Tank Heat is being maintained by microprocessor.

1. The following conditions are assumed:
   a. Normal Operation is running.
2. Operator presses any "STOP" switch (unload stop switch (2PB), load stop switch (4PB), or the Keypad Stop).
   a. Conveyor motor (7MTR, K19, D76 & K22, D63) de-energizes.
   b. 120VAC Blower Dryer (BD) Heat (K20) de-energizes.
      1) BD heat contactors (26CON) de-energizes.
   c. After 60 seconds, the microprocessor de- energizes BD motors (K12, D103).
      1) 10MTR de-energizes (10CON).
   d. “All pump motors stop” from microprocessor, signal de-energizes pump motor (K13, D98), opening contact, turning off pumps.
      1) Tank 1 pump motor (1CON).
      2) Tank 2 pump motor (2CON).
      3) Tank 3 pump motor (3CON).
      4) Dual Rinse (DR) motor (5CON).

NOTE: If machine has been running consecutively for 30 minutes or more, the ASR soil pump will turn on for 15 seconds prior to machine converting to idle mode.

   e. ASR pump (U35, D97) de-energizes.
   f. Rinse Aid / Detergent (2CR, U8, D36) de-energizes.
   g. If final rinse was on when operator presses stop, Final Rinse (U34, D96, 6CON) pump turns off.
   h. Line voltage removed to RP1 and RP2.

Ware Trips Dish Limit Bar - Electric

NOTE: Tank Heat is being maintained by microprocessor.
NOTE: Exhaust Fan remains on FT1000e Advansys.

1. The following conditions are assumed:
   a. Normal Operation is running.
2. Ware trips dish limit bar.
   a. Conveyor stops (7MTR, K19, D76 & K22, D63) de-energizes.
   b. 120VAC Blower Dryer (BD) Heat (K20).
      1) Dish tripped (K22, D63) de-energizes.
   c. Final rinse (U34, D96, 6CON) pump turns off.
   d. Pump motors de-energize after 1 minute.
3. If ware is not removed from dish limit bar within 300 seconds, blower dryer motor (K12, D103) and blower dryer heat (26CON, K20) will turn off.

Ware Trips Dish Limit Bar - User Removes Ware - Electric

NOTE: Tank Heat is being maintained by microprocessor.
NOTE: Exhaust Fan remains on FT1000e Advansys.
NOTE: Pumps remain on.

1. Ware removed from dish limit bar.
   a. Conveyor running (7MTR, K19, D76 & K22, D63) energizes.
   b. 120VAC Blower Dryer (BD) Heat (K20).

1) Dish tripped (K22, D63) energizes.
2) BD motor (K12, D103) energizes.
   a) 10MTR energizes (10CON).

c. Final rinse (U34, D96, 6CON) pump turns on, if product did not finish rinsing.

Opening Doors - Electric

NOTE: Tank Heat is being maintained by microprocessor.

1. The following conditions are assumed:
   a. Normal Operation is running.
2. Operator opens any door.
   a. Conveyor stops (K19, D76) de-energizes. N.O. contacts open for VFDrive forward operation. All pump motors stop..
   b. 120VAC Blower Dryer (BD) Heat (K20) de-energizes.
      1) BD heat contactor (26CON) de-energizes.
      2) Conveyor motor stops (7MTR) de-energizes.
      3) “Pumps Off” from microprocessor, signal de-energizes pump motor (K13, D98), opening contact, turning off pumps.
         a) Tank 1 pump motor (1CON).
         b) Tank 2 pump motor (2CON).
         c) Tank 3 pump motor (3CON). (Not applicable with FT1000Se).
         d) Dual Rinse (DR) motor (5CON).
         e) BD heat relay (K5, D44) de-energize.
            i. BD heat contactors (26CON) de-energizes.
      4) ASR pump (U35, D97) de-energizes.
      5) Rinse Aid / Detergent (2CR, U8, D36) de-energizes.
   c. BD motors (K12, D103) de-energizes.
      1) BD motor contactors (10CON) de-energizes.
   d. If final rinse was on when operator opens door, Final rinse (U34, D96, 6CON) pump turns off.
   e. Line voltage removed to RP1 and RP2.
   f. Final rinse (U34, D96, 6CON) de-energizes.

Idle Mode - Electric

NOTE: Heat is being maintained by microprocessor.

NOTE: When machine starts idle mode, Blower Dryer (BD) heaters are de-energized immediately, but the blowers will remain on for 60 seconds to cool blower dryer heaters. Once BD heaters are cooled, BD motors de-energize, until machine is put into running mode.

1. The following conditions are assumed:
   a. Machine in idle mode.

NOTE: If enabled, microprocessor turns pumps on for 15 seconds, every 15 minutes, to maintain heat in upper chambers.

   b. “Pumps On” from microprocessor, signal energizes pump motor (K13, D98), closing contact, turning on pumps.
      1) Tank 1 pump motor (1CON).
      2) Tank 2 pump motor (2CON).
      3) Tank 3 pump motor (3CON). (Not applicable with FT1000S).
      4) Dual Rinse (DR) motor (5CON).

Delime - Electric

NOTE: Press Stop key at any time to abort Delime cycle.
NOTE: Delime is only active in idle mode and must be initiated through Manager or Service menu.

1. Enter Manager or Service Menu.
   a. Actions > Run Delime Cycle.
2. Display reads “Press Stop key at any time to abort Delime cycle” for 3 seconds.
3. Display reads “Place Delime Pump hose in delime solution. Press Enter when done.”

NOTE: At this point, the microprocessor remembers there is delime solution in the machine. If user aborts delime cycle, machine will display “Delime solution in Tanks. Press Enter Key to Drain and Rinse tanks. Press Stop Key to skip rinse cycle.”
NOTE: Once enter is pressed, the “final rinse system delime process” begins. The final rinse system consists of: hold tank, final rinse pump, energy recovery coil (if equipped), heat pump heat exchanger (if equipped), internal booster, and final rinse arms. Delime solution pumped into hold tank and circulated through final rinse system.
NOTE: This process continues throughout the following steps.

4. Final Rinse system delime fill cycle automatically begins and consists of following steps:
   a. Booster water heated to 140°F, only in delime mode.
   b. Final rinse pump (U34, D96, 6CON) turns on, until float switch (11FS) is open, to drain hold tank.
   c. Delime pump (Q23, D113, 1PMP) turns on for approximately 8 seconds.
   d. Hold tank fill valve (U13, D41, 5SOL) turns on until float switch (11FS) is closed.
   e. Final rinse pump (U34, D96, 6CON) turns on to drain hold tank and pump delime solution into the final rinse system.
   f. Microprocessor repeats steps 4c through 4e until appropriate amount of delime solution has been injected into the system.
5. Display reads “Drain all tanks. Leave drains open.”
6. Microprocessor waits until main tanks upper floats are open (2FS & D20, 4FS & D14, 6FS & D25).
7. Display reads “Clean Strainer Baskets, then replace. Press enter when done.”
8. Once main tanks and ASR tanks are drained, display reads “Close Master Drain”.
   a. Lower floats will be open (1FS & D15, 3FS & D13, 5FS & D24, ASR 12FS & D40).
9. After manual master drain closed (1DS, D91), main tank fill valves turn on for approximately 30 seconds.

NOTE: If doors are open, display reads “Close all doors.”

10. Display reads “Pour X Y gallons delime into Tank.
    a. Press Enter when done.”

NOTE: Where X = number of gallons, Y = fractional number of gallons.

11. Display reads “Delime Cycle Running. Approximate Time Left: xx:yy”, where xx:yy is time countdown time display.

NOTE: No further user intervention is required, until delime cycle is complete.

12. Main tanks are filled, by alternating fill valves (1SOL, U11, D39 and 3SOL, U9, D37), until tanks are full.

NOTE: Water in tanks heated to 140°F, only in delime mode.

a. Tank 1 lower float (1FS) energizes.
    1) Tank 1 heat (K3, D48, 17CON) energize.
    2) Tank 1 heat (K2, D50, 18CON) energizes.
b. Tank 2 lower float (3FS) energizes.
    1) Tank 2 heat (K6, D45, 19CON) energizes.

NOTE: Supplementary heater for Advansys. Not applicable with Advansys Shorty.

    2) Tank 2 heat (K8, D47, 20CON) energizess.

NOTE: Not applicable with Advansys machines.

c. Tank 3 lower float (5FS) energizes. (Not applicable with FT1000Se).
d. ASR 12FS (D40) energizes.
e. Dual Rinse (1PS) energizes.

13. When main tanks are full and final rinse system has the correct concentration of delime solution, Dual Rinse, tanks 1 & 2, tank 3 (Not applicable with FT1000Se), and ASR pumps energized 30 minutes.
14. After 30 minutes, automatic drain opens until machine is completely drained. Once drained, automatic drain valve closes.
15. Final Rinse system will be purged with fresh water.
16. Fill valves 1SOL (tank 1), 2SOL (tank 2, FT1000Se only), and 3SOL (tank 3, not applicable with FT1000Se) energize until main tanks are full.
17. Dual Rinse, tanks 1 & 2, tank 3 (Not applicable with FT1000Se), and ASR pumps energized 4 minutes. Pumps stop.
18. Automatic drain opens until machine is completely drained. Once drained, automatic drain valve closes.
19. Display reads “Auto Delime complete. Press Enter Key to refill. Otherwise, machine will power down in 5 minutes”.
20. If user presses Enter key, Display reads “Open Master Drain”.
21. When master drain opened, display reads “Close all tank drains”.
22. Machine transitions to initial fill.

SEQUENCE OF OPERATION (STEAM HEAT)

Initial Fill - Steam

1. The following conditions are assumed:
   a. Main breakers off
   b. Doors open.
   c. Tanks are drained.
   d. Water supply on.
2. Main breakers at wall (and controls breaker on machine, if applicable) turned ON.
   a. Line voltage will be at 1T inputs.
      1) 1T output 120VAC.
   b. 1FU will be 120VAC.
   c. 2T input will be 120VAC.
      1) 2T nominal output 24VAC.

   NOTE: Actual output voltage may range from 19 - 30 VAC.
   d. 6FU will be 24VAC input to 12VDC power supply.
   e. 12VDC-LTD applied to control board.
      1) 12VDC-LTD limited applied to 5V.
      2) 12VDC-LTD applied to A5VP.
      3) 12VDC-LTD applied to 3V3.
   f. 5VDC applied to relay board.
3. Operator presses POWER button on keypad.
   a. 12VDC-SW switched on.
      1) 12VDC applied to door switches.
      2) 12VDC output from power supply.
         a) 120VAC “ON” (K14) energized. N.O. contacts close.
            i. 7CON energized.
            ii. 7CON, L3 / T3 close at terminal block VF1 and VF2.
            iii. Applies line voltage at L1 and L2 to Variable Frequency Drive (VFD).
            iv. Frequency Inverter is energized. Frequency Inverter Display will indicate "rdY".
   b. Display turns ON. "Hobart FT1000" displays for a few seconds.
   c. Display will show "Tank(s) Filling...".
   d. K14 relay energizes, signaling external booster (if applicable) controller that the machine is on.
   e. If doors are open, display will show "Door(s) Open".
      1) If doors are open, 12VDC DOORS are de-energized (K10, D77 (relay board)).
   f. If drains are open, display will show "Drain(s) Open".
   g. D64 (relay board) illuminates when beam broken - indicating dish present.
   h. D29 (control board) de-energizes when beam broken.
4. User closes Dual Rinse, Tank 1, Tank 2, Tank 3 doors (if applicable), ASR (if applicable), (1LS, 2LS, 3LS, 4LS, 5LS, 6LS, 7LS, 8LS (if applicable)).
   a. 12VDC DOORS (K10, D77) energizes. N.O. contacts close.
   b. 120VAC DOORS (K16) energizes. N.O. contacts close.
5. Hold Tank fill valve (5SOL, U13, D41) energies until float (11FS, D21) closes.
   a. Final Rinse pump energizes (6CON, U34, D96).

1) Dual Rinse tank begins to fill through final rinse arms.
   a) Dual rinse tank will continue to fill until 1PS senses approximately 1000 mV.

NOTE: Hold tank fill valve cycles based on float switch opening and closing.

6. Tank 1 fill valve (1SOL, U11, D39) energizes.
   a. Tank 1 begins to fill.
   b. Tank 1 lower float switch (1FS) closes. D15 (control board) illuminates.
      1) Temperature control begins.
   c. 12VDC (control board) provided to K3.
      1) Tank 1 / Heat 1 (K3) energizes. D48 (relay board) illuminates.
         a) 16SOL energizes.
   d. Upper float (2FS) closes. D20 (control board) illuminates.
   e. Tank 1 overflows into Tank 2.
      1) Tank 2 lower float switch (3FS) closes. D13 (control board) illuminates.
         a) Temperature control begins.
   f. 12VDC (control board) provided to K6. (Not applicable with FT1000Se).
      1) Tank 2 / Heat 1 (K6) energizes. D45 (relay board) illuminates.
         a) 17SOL energizes.
7. Tank 2 upper float (4FS) closes. D14 (control board) illuminates.
8. Tank 3 fill valve (3SOL, U9, D37) energizes. (Not applicable with FT1000Se).
   a. Tank 3 begins to fill.
   b. Tank 3 lower float switch (5FS) closes. D24 (control board) illuminates.
   c. Upper float (6FS) closes. D25 (control board) illuminates.
   d. Tank 3 overflows into ASR.
      1) ASR float switch (ASR-12FS) closes. D40 (control board) illuminates.
      2) ASR tank filled.
   e. 1SOL and 3SOL de-energize. Fill complete.
9. Display will show tank temperatures.

Normal Operation - Steam

NOTE: Heat is being maintained by microprocessor.

1. The following conditions are assumed:
   a. Main breakers on.
   b. Doors closed.
   c. Tanks are full.
   d. Water supply on.
   e. "Tanks Filling" complete.

NOTE: Heat pump will not start until Tank 2 temperature has reached set point.

   f. 7CON energizes. N.O. contacts close.
      1) Sends line voltage in L1 & L2 on VFD.
2. Operator presses "START" switch (unload start switch (1PB), load start switch (3PB), or the Keypad Start).

NOTE: If breaker is turned off or main power is removed from machine and main power or breaker is turned back on, the machine assumes there is ware on the conveyor. As the machine is first started up, the final rinse will automatically run for 2 minutes to ensure items on the conveyor are properly rinsed.

a. Conveyor running (K19, D76) energizes as long as jam sensor and 8CR are energized (LED's on both c components lite.
b. 120VAC Blower Dryer (BD) Heat (K20).
   1) BD heat relay (K5, D44) energizes.
      a) BD heat (21SOL) energizes 7HTR.
c. BD motors (K12, D103) energize.
   1) 10MTR energizes (10CON).
d. Dish tripped (K22, D63) energizes, as long as dish limit switch (12LS) is closed. K22 N.O. contacts close for VFDrive forward operation.

NOTE: Dish tripped LED (D63) not lit when dish limit switch is opened.

   1) Conveyor motor (7MTR) energizes.
   2) “All pump motors on” from microprocessor, signal energizes pump motor (K13, D98), closing contact, turning on pumps
      a) Tank 1 pump motor (1CON).
      b) Tank 2 pump motor (2CON).
      c) Tank 3 pump motor (3CON). (Not applicable with FT1000S).
      d) DR motor (5CON).
   3) ASR pump motor (U35, D97, 8CON) energized.
   4) Rinse Aid / Detergent (2CR, U8, D36) energizes.
      a) Line voltage provided to DP1 and DP2, when 2CR and 1CON are energized.
e. Exhaust fan (K11, D102, 16CON) energizes FT1000e Advansys.

3. Operator inserts ware.
   a. Ware interrupts dish sense beam. D64 relay board, lit when beam broken (dish present).
   b. Final rinse (U34, D96, 6CON) pump turns on when ware reaches beginning of final rinse zone.

NOTE: Final rinse zone minimum is dual rinse zone + pre and post buffer. Pre and post rinse zone buffers service adjustable in Operation parameter menu.

   c. Line voltage provided to RP1 and RP2, when Dual Rinse Pump (5CON) and Rinse Aid / Detergent (2CR) are energized.
   d. Final rinse (U34, D96, 6CON) de-energize, when post buffer has been met.
   e. Hold tank continues to maintain proper water level by monitoring hold tank float (11FS, D21).

Normal Operation - User Presses Any Stop Button - Steam

NOTE: Tank Heat is being maintained by microprocessor.
NOTE: Customer Exhaust Fan may remain on.

1. The following conditions are assumed:
   a. Normal Operation is running.
2. Operator presses any "STOP" switch (unload stop switch (2PB), load stop switch (4PB), or the Keypad Stop).
   a. Conveyor stops (K19, D76) de-energizes.
   b. Conveyor motor stops (7MTR) de-energizes.
   c. 120VAC Blower Dryer (BD) Heat (K20) de-energizes.
      1) BD heat relay (K5, D44) energizes.
         a) BD Heat (21SOL) energizes.
   d. After 60 seconds, the microprocessor de-energizes BD motors (K12, D103).
      1) 10MTR de-energizes (10CON).

e. “All pump motors stop” from microprocessor, signal de-energizes pump motor (K13, D98), opening contact, turning off pumps.
   1) Tank 1 pump motor (1CON).
   2) Tank 2 pump motor (2CON).
   3) Tank 3 pump motor (3CON).
   4) Dual Rinse (DR) motor (5CON).

NOTE: If machine has been running consecutively for 30 minutes or more, the ASR soil pump will turn on for 15 seconds prior to machine converting to idle mode.

f. ASR pump (U35, D97) de-energizes.
g. Rinse Aid / Detergent (2CR, U8, D36) de-energizes.
h. If final rinse was on when operator presses stop, Final Rinse (U34, D96, 6CON) pump turns off.
i. Line voltage removed to RP1 and RP2.

Ware Trips Dish Limit Bar - Steam

NOTE: Tank Heat is being maintained by microprocessor.
NOTE: Exhaust Fan remains on.

1. The following conditions are assumed:
   a. Normal Operation is running.
2. Ware trips dish limit bar.
   a. Conveyor stops (7MTR, K19, D76 & K22, D63) de-energizes.
   b. 120VAC Blower Dryer (BD) Heat (K20).
      1) Dish tripped (K22, D63) de-energizes.
   c. Final rinse (U34, D96, 6CON) pump turns off.
   d. Pump motors de-energize after 1 minute.
3. If ware is not removed from dish limit bar within 300 seconds, blower dryer motor (K12, D103) and blower dryer heat (26CON, K20) will turn off.

Ware Trips Dish Limit Bar - User Removes Ware - Steam

NOTE: Tank Heat is being maintained by microprocessor.
NOTE: Exhaust Fan remains on FT1000e Advansys.
NOTE: Pumps remain on.

1. Ware removed from dish limit bar.
   a. Conveyor running (K19, D76) energizes.
   b. 120VAC Blower Dryer (BD) Heat (K20).
      1) Dish tripped (K22, D63) energizes.
      2) BD motor (K12, D103) energizes.
         a) 10MTR energizes (10CON).
      3) Conveyor motor (7MTR) energizes.
   c. Final rinse (U34, D96, 6CON) pump turns on, if product did not finish rinsing.

Opening Doors - Steam

NOTE: Tank Heat is being maintained by microprocessor.

1. The following conditions are assumed:
   a. Normal Operation is running.

2. Operator opens any door.
   a. Conveyor stops (K19, D76) de-energizes. N.O. contacts open for VFDrive forward operation. All pump motors stop.
   b. 120VAC Blower Dryer (BD) Heat (K20) de-energizes.
      1) BD heat contactor (26CON) de-energizes.
      2) Conveyor motor stops (7MTR) de-energizes.
      3) “Pumps Off” from microprocessor, signal de-energizes pump motor (K13, D98), opening contact, turning off pumps.
         a) Tank 1 pump motor (1CON).
         b) Tank 2 pump motor (2CON).
         c) Tank 3 pump motor (3CON). (Not applicable with FT1000S).
         d) Dual Rinse (DR) motor (5CON).
         e) BD heat relay (K5, D44) de-energize.
            i. BD heat contactors (26CON) de-energizes.
      4) ASR pump (U35, D97) de-energizes.
      5) Rinse Aid / Detergent (2CR, U8, D36) de-energizes.
   c. BD motors (K12, D103) de-energize after 60 seconds.
      1) BD motor contactors (10CON) de-energize.
   d. If final rinse was on when operator opens door, Final rinse (U34, D96, 6CON) pump turns off.
   e. Line voltage removed to RP1 and RP2.
   f. Final rinse (U34, D96, 6CON) de-energizes.

Idle Mode - Steam

NOTE: Heat is being maintained by microprocessor.
NOTE: When machine starts idle mode, Blower Dryer (BD) heaters are de-energized immediately, but the blowers will remain on for 60 seconds to cool blower dryer heaters. Once BD heaters are cooled, BD motors de-energize, until machine is put into running mode.

1. The following conditions are assumed:
   a. Machine in idle mode.

NOTE: Microprocessor turns pumps on for 15 seconds, every 15 minutes, to maintain heat in upper chambers.

   b. “Pumps On” from microprocessor, signal energizes pump motor (K13, D98), closing contact, turning on pumps.
      1) Tank 1 pump motor (1CON).
      2) Tank 2 pump motor (2CON).
      3) Tank 3 pump motor (3CON). (Not applicable with FT1000S).
      4) Dual Rinse (DR) motor (5CON).

Delime - Steam

NOTE: Press Stop key at any time to abort Delime cycle.
NOTE: Delime is only active in idle mode and must be initiated through Manager or Service menu.

1. Enter Manager or Service Menu.
   a. Actions > Run Delime Cycle.
2. Display reads “Press Stop key at any time to abort Delime cycle” for 3 seconds.

3. Display reads “Place Delime Pump hose in delime solution. Press Enter when done.”

NOTE: At this point, the microprocessor remembers there is delime solution in the machine. If user aborts delime cycle, machine will display “Delime solution in Tanks. Press Enter Key to Drain and Rinse tanks. Press Stop Key to skip rinse cycle.”

NOTE: Once enter is pressed, the “final rinse system delime process” begins. The final rinse system consists of: hold tank, final rinse pump, energy recovery coil (if equipped), heat pump heat exchanger (if equipped), internal booster, and final rinse arms. Delime solution pumped into hold tank and circulated through final rinse system.

NOTE: This process continues throughout the following steps.

4. Final Rinse system delime fill cycle automatically begins and consists of following steps:
   a. Booster water heated to 140°F, only in delime mode.
   b. Final rinse pump (U34, D96, 6CON) turns on, until float switch (11FS) is open, to drain hold tank.
   c. Delime pump (Q23, D113, 1PMP) turns on for approximately 8 seconds.
   d. Hold tank fill valve (U13, D41, 5SOL) turns on until float switch (11FS) is closed.
   e. Final rinse pump (U34, D96, 6CON) turns on to drain hold tank and pump delime solution into the final rinse system.
   f. Microprocessor repeats steps 4c through 4e until appropriate amount of delime solution has been injected into the system.
5. Display reads “Drain all tanks. Leave drains open.”
6. Microprocessor waits until main tanks upper floats are open (2FS & D20, 4FS & D14, 6FS & D25).
7. Display reads “Clean Strainer Baskets, then replace. Press enter when done.”
8. Once main tanks and ASR tanks are drained, display reads “Close Master Drain”.
   a. Lower floats will be open (1FS & D15, 3FS & D13, 5FS & D24, ASR 12FS & D40).
9. After manual master drain closed (1DS, D91), main tank fill valves turn on for approximately 30 seconds.

NOTE: If doors are open, display reads “Close all doors.”

10. Display reads “Pour X Y gallons delime into Tank.
    a. Press Enter when done.”

NOTE: Where X = number of gallons, Y = fractional number of gallons.

11. Display reads “Delime Cycle Running. Approximate Time Left: xx:yy”, where xx:yy is time countdown time display.

NOTE: No further user intervention is required, until delime cycle is complete.

12. Main tanks are filled, by alternating fill valves (1SOL, U11, D39 and 3SOL, U9, D37), until tanks are full.

NOTE: Water in tanks heated to 140°F, only in delime mode.

   a. Tank 1 lower float (1FS) energizes.
      1) Tank 1 heat (K3, D48, 16SOL) energize.
   b. Tank 2 lower float (3FS) energizes.
      1) Tank 2 heat (K6, D45, 17SOL) energizes.
   c. Tank 3 lower float (5FS) energizes. (Not applicable with FT1000Se).
   d. ASR 12FS (D40) energizes.
   e. Dual Rinse (1PS) energizes.

13. When main tanks are full and final rinse system has the correct concentration of delime solution, Dual Rinse, tanks 1 – 3 (Not applicable with FT1000Se), and ASR pumps energized 30 minutes.
14. After 30 minutes, automatic drain opens until machine is completely drained. Once drained, automatic drain valve closes.
15. Final Rinse system will be purged with fresh water.
16. Fill valves 1SOL (tank 1) and 3SOL (tank 3) energize until main tanks are full.
17. Dual Rinse, tanks 1 – 3 (Tank 3 not applicable with FT1000Se), and ASR pumps energized 4 minutes. Pumps stop.
18. Automatic drain opens until machine is completely drained. Once drained, automatic drain valve closes.
19. Display reads “Auto Delime complete. Press Enter Key to refill. Otherwise, machine will power down in 5 minutes”.
20. If user presses Enter key, Display reads “Open Master Drain”.
21. When master drain opened, display reads “Close all tank drains”.
22. Machine transitions to initial fill.

SEQUENCE OF OPERATION (ELECTRIC HEAT) ADVANSYS

Initial Fill - Electric - ADV

1. The following conditions are assumed:
   a. Main breakers off
   b. Doors open.
   c. Tanks are drained.
   d. Water supply on.
2. Main breakers at wall (and controls breaker on machine, if applicable) turned ON.
   a. Line voltage will be at 1T inputs (if 208 or 240 volt machines check 1T input taps to verify that transformer is wired to match machine supply voltage).
      1) 1T output 120VAC.
   b. 1FU will be 120VAC.
   c. 2T input will be 120VAC.
      1) 2T nominal output 24VAC.

   NOTE: Actual output voltage may range from 19 - 30 VAC.
   d. 6FU will be 24VAC input to 12VDC power supply.
   e. 12VDC-LTD applied to control board.
      1) 12VDC-LTD limited applied to 5V.
      2) 12VDC-LTD applied to A5VP.
      3) 12VDC-LTD applied to 3V3.
   f. 5VDC applied to relay board.
3. Operator presses POWER button on keypad.
   a. 12VDC-SW switched on.
      1) 12VDC applied to door switches.
      2) 12VDC applied to conveyor jam sensor (LED on sensor "ON"). 8CR energizes (8CR LED "ON"). 8CR "NO" contacts close.

3) 12VDC output from power supply.
   a) 120VAC “ON” (K14) energized. N.O. contacts close.
      i. 7CON energized.
      ii. 7CON, L3 / T3 close at terminal block VF1 and VF2.
      iii. Applies line voltage at L1 and L2 to Variable Frequency Drive (VFD).
      iv. Frequency Inverter is energized. Frequency Inverter Display will indicate "rdY".
b. Display turns ON. "Hobart FT1000" displays for a few seconds.
c. Display will show "Tank(s) Filling...".
d. K14 relay energizes, signaling external booster (if applicable) controller that the machine is on.
e. Exhaust fan energizes (16CON, K11, D102).
f. If doors are open, display will show "Door(s) Open".
   1) If doors are open, 12VDC DOORS are de-energized (K10, D77 (relay board)).
g. If drains are open, display will show "Drain(s) Open".
h. D64 (relay board) illuminates when beam broken - indicating dish present.
i. D29 (control board) de-energizes when beam broken.

4. User closes Dual Rinse, Tank 1, Tank 2, Tank 3 doors (if applicable), ASR (if applicable), (1LS, 2LS, 3LS, 4LS, 5LS, 6LS, 7LS, 8LS (if applicable)).
   a. 12VDC DOORS (K10, D77) energizes. N.O. contacts close.
   b. 120VAC DOORS (K16) energizes. N.O. contacts close.
5. Hold Tank fill valve (5SOL, U13, D41) energizes until float (11FS, D21) closes.
   a. Final Rinse pump energizes (6CON, U34, D96).
      1) Dual Rinse tank begins to fill through final rinse arms.
         a) Dual rinse tank will continue to fill until 1PS senses approximately 1000 mV.

NOTE: Hold tank fill valve cycles based on float switch opening and closing.

6. Tank 1 fill valve (1SOL, U11, D39) energizes.
   a. Tank 1 begins to fill.
   b. Tank 1 lower float switch (1FS) closes. D15 (control board) illuminates.
      1) Temperature control begins.
   c. 12VDC (control board) provided to K3 & K2 through tank 1 over temp (1TAS).
      1) Tank 1 / Heat 1 (K3) energizes. D48 (relay board) illuminates.
         a) 17CON energizes 1HTR.
      2) Tank 1 / Heat 2 (K2) energizes. D50 (relay board) illuminates.
         a) 18CON energizes 2HTR.
   d. Upper float (2FS) closes. D20 (control board) illuminates.
   e. Tank 1 overflows into Tank 2.
      1) Tank 2 lower float switch (3FS) closes. D13 (control board) illuminates.
         a) Supplementary electric heater energized (20CON, K8, D47) until tank 2 reaches setpoint temperature plus 4F.

NOTE: Compressor will not energize until tank 2 reaches setpoint temperature plus 4F.

   f. 12VDC (control board) provided to K6 & K8 through tank 2 over temp (2TAS).
      1) Tank 2 / Heat 1 (K6) energizes. D45 (relay board) illuminates.
         a) 19CON energizes 3HTR.

7. Tank 2 upper float (4FS) closes. D14 (control board) illuminates.
8. Compressor energizes (30CON, K23, D105) when tank 2 temperature is above 104°F.

NOTE: Compressor will not energize if Johnsom Controls pressure switch (P78) detects a high or low pressure condition or if CoreSense compressor control module detects a compressor fault.

9. Blower Dryer blower motors energizes (10CON, K12, D103).
10. Tank 3 fill valve (3SOL, U9, D37) energizes. (Not applicable with FT1000Se).
    a. Tank 3 begins to fill.
    b. Tank 3 lower float switch (5FS) closes. D24 (control board) illuminates.
    c. Upper float (6FS) closes. D25 (control board) illuminates.
    d. Tank 3 overflows into ASR.
        1) ASR float switch (ASR-12FS) closes. D40 (control board) illuminates.
        2) ASR tank filled.
    e. 1SOL and 3SOL de-energize. Fill complete.
11. Display will show tank temperatures.

NOTE: Tank pump motors turn on periodically for 15 seconds as machine is heating, until tank 2 has reached its setpoint.

NOTE: Until set temperature is reached, display will show “Tanks Filling…”.

NOTE: Machine will not start, until Tank 2 temperature is met.

Normal Operation - Electric - ADV

NOTE: Heat is being maintained by microprocessor.

NOTE: Until set temperature is reached, display will show “Tanks Filling…”.

NOTE: Machine will not start, until Tank 2 temperature is met.

1. The following conditions are assumed:
    a. Main breakers on.
    b. Doors closed.
    c. Tanks are full.
    d. Water supply on.
    e. "Tanks Filling" complete.
2. Operator presses "START" switch (unload start switch (1PB), load start switch (3PB), or the Keypad Start).

NOTE: If breaker is turned off or main power is removed from machine and main power or breaker is turned back on, the machine assumes there is ware on the conveyor. As the machine is first started up, the final rinse will automatically run for 2 minutes to ensure items on the conveyor are properly rinsed.

    a. Dish tripped (K22, D63) energizes, as long as dish limit switch (12LS) is closed. K22 N.O. contacts close for VFDrive forward operation.
    b. Conveyor motor (7MTR, K19, D76) energizes as long as jam sensor and 8CR are energized.
    c. “All pump motors on” from microprocessor, signal energizes pump motor (K13, D98), closing contact, turning on pumps.
        1) Tank 1 pump motor (1CON).
        2) Tank 2 pump motor (2CON).
        3) Tank 3 pump motor (3CON). (Not applicable with FT1000Se).
        4) DR motor (5CON).
    d. ASR pump motor (U35, D97, 8CON) energized.
    e. Rinse Aid / Detergent (2CR, U8, D36) energizes.
        1) Line voltage provided to DP1 and DP2, when 2CR and 1CON are energized.
    e. Rinse Aid / Detergent (2CR, U8, D36) energizes.
    f. Blower Dryers energize (K12, D103, 10CON, 10MTR).

g. Compressor energizes (30CON, K23, D105).

NOTE: Compressor will not energize if Johnsom Controls pressure switch (P78) detects a high or low pressure condition or if CoreSense compressor control module detects a compressor fault.

h. Exhaust fan (K11, D102, 16CON) energizes.

3. Operator inserts ware.
   a. Ware interrupts dish sense beam. D64 relay board, lit when beam broken (dish present).
   b. Line voltage provided to RP1 and RP2, when Dual Rinse Pump (5CON) and Rinse Aid / Detergent (2CR) are energized.
   c. Hold tank continues to maintain proper water level by monitoring hold tank float (11FS, D21).

Normal Operation - User Presses Any Stop Button - Electric - ADV

NOTE: Tank Heat is being maintained by microprocessor.

1. The following conditions are assumed:
   a. Normal Operation is running.
2. Operator presses any "STOP" switch (unload stop switch (2PB), load stop switch (4PB), or the Keypad Stop).
   a. Conveyor motor (7MTR, K19, D76 & K22, D63) de-energizes.
   b. After 60 seconds, the microprocessor de-energizes BD motors (K12, D103).
      1) 10MTR de-energizes (10CON).
   c. “All pump motors stop” from microprocessor, signal de-energizes pump motor (K13, D98), opening contact, turning off pumps.
      1) Tank 1 pump motor (1CON).
      2) Tank 2 pump motor (2CON).
      3) Tank 3 pump motor (3CON).
      4) Dual Rinse (DR) motor (5CON).

NOTE: If machine has been running consecutively for 30 minutes or more, the ASR soil pump will turn on for 15 seconds prior to machine converting to idle mode.

   d. ASR pump (U35, D97) de-energizes.
   e. Rinse Aid / Detergent (2CR, U8, D36) de-energizes.
   f. If final rinse was on when operator presses stop, Final Rinse (U34, D96, 6CON) pump turns off.
   g. Line voltage removed to RP1 and RP2.

Ware Trips Dish Limit Bar - Electric - ADV

NOTE: Tank Heat is being maintained by microprocessor.

NOTE: Exhaust Fan remains on FT1000e Advansys.

1. The following conditions are assumed:
   a. Normal Operation is running.
2. Ware trips dish limit bar.
   a. Conveyor stops (7MTR, K19, D76 & K22, D63) de-energizes.
   b. Final rinse (U34, D96, 6CON) pump turns off.
   c. After 5 minutes, "All pump motors stop" from microprocessor, signal de-energizes pump motor (K13, D98), opening contact, turning off pumps.
      1) Tank 1 pump motor (1CON).
      2) Tank 2 pump motor (2CON).
      3) Dual Rinse (DR) motor (5CON).
3. If ware is not removed from dish limit bar within 300 seconds, blower dryer motor (K12, D103) will turn off.

Ware Trips Dish Limit Bar - User Removes Ware - Electric - ADV

NOTE: Tank Heat is being maintained by microprocessor.
NOTE: Exhaust Fan remains.
NOTE: Pumps remain on.

1. Ware removed from dish limit bar.
   a. Conveyor running (7MTR, K19, D76 & K22, D63) energizes.
   b. BD motor (K12, D103) energizes.
      1) 10MTR energizes (10CON).
   c. Final rinse (U34, D96, 6CON) pump turns on, if product did not finish rinsing.

Opening Doors - Electric - ADV

NOTE: Tank Heat is being maintained by microprocessor.

1. The following conditions are assumed:
   a. Normal Operation is running.
2. Operator opens any door.
   a. Door relay de-energizes (K10, D77).
   b. Conveyor stops (7MTR, K19, D76, & K22, D63) de-energizes. All pump motors stop.
   c. “Pumps Off” from microprocessor, signal de-energizes pump motor (K13, D98), opening contact, turning off pumps.
      1) Tank 1 pump motor (1CON).
      2) Tank 2 pump motor (2CON).
      3) Dual Rinse (DR) motor (5CON).
   d. ASR pump (U35, D97) de-energizes.
   e. Rinse Aid / Detergent (2CR, U8, D36) de-energizes.
   f. BD motors (K12, D103) de-energizes.
      1) BD motor contactor (10CON) de-energizes.
   g. Line voltage removed to RP1 and RP2.
   h. Final rinse (U34, D96, 6CON) de-energizes.

Idle Mode - Electric - ADV

NOTE: Heat is being maintained by microprocessor.
NOTE: The set temperature for Tank 2 can NOT be set any higher than 152°F. This will be sufficient energy to maintain Tank 2 temperature.
NOTE: When machine starts idle mode, Blower Dryer (BD) heaters are de-energized immediately, but the blowers will remain on for 60 seconds.
NOTE: Compressor, exhaust fan, and BD motor are periodically energized to maintain Tank 2 heat. Tank 2 supplementary electric heater does not energize during idle mode.

1. The following conditions are assumed:
   a. Machine in idle mode.
   b. Stir Cycle activated.

NOTE: If enabled, microprocessor turns pumps on for 15 seconds, every 15 minutes, to maintain heat in upper chambers.

   c. “Pumps On” from microprocessor, signal energizes pump motor (K13, D98), closing contact, turning on pumps.
      1) Tank 1 pump motor (1CON).
      2) Tank 2 pump motor (2CON).
      3) Dual Rinse (DR) motor (5CON).

Delime - Electric - ADV

NOTE: Press Stop key at any time to abort Delime cycle.
NOTE: Delime is only active in idle mode and must be initiated through Manager or Service menu.

1. Enter Manager or Service Menu.
   a. Actions > Run Delime Cycle.
2. Display reads “Press Stop key at any time to abort Delime cycle” for 3 seconds.
3. Display reads “Place Delime Pump hose in delime solution. Press Enter when done.”

NOTE: At this point, the microprocessor remembers there is delime solution in the machine. If user aborts delime cycle, machine will display “Delime solution in Tanks. Press Enter Key to Drain and Rinse tanks. Press Stop Key to skip rinse cycle.”
NOTE: Once enter is pressed, the “final rinse system delime process” begins. The final rinse system consists of: hold tank, final rinse pump, energy recovery coil (if equipped), heat pump heat exchanger (if equipped), internal booster, and final rinse arms. Delime solution pumped into hold tank and circulated through final rinse system.
NOTE: This process continues throughout the following steps.

4. Final Rinse system delime fill cycle automatically begins and consists of following steps:
   a. Booster water heated to 140°F, only in delime mode.
   b. Final rinse pump (U34, D96, 6CON) turns on, until float switch (11FS) is open, to drain hold tank.
   c. Delime pump (Q23, D113, 1PMP) turns on for approximately 8 seconds.
   d. Hold tank fill valve (U13, D41, 5SOL) turns on until float switch (11FS) is closed.
   e. Final rinse pump (U34, D96, 6CON) turns on to drain hold tank and pump delime solution into the final rinse system.
   f. Microprocessor repeats steps 4c through 4e until appropriate amount of delime solution has been injected into the system.
5. Display reads “Drain all tanks. Leave drains open.”
6. Microprocessor waits until main tanks upper floats are open (2FS & D20, 4FS & D14, 6FS & D25).
7. Display reads “Clean Strainer Baskets, then replace. Press enter when done.”
8. Once main tanks and ASR tanks are drained, display reads “Close Master Drain”.
   a. Lower floats will be open (1FS & D15, 3FS & D13, 5FS & D24, ASR 12FS & D40).
9. After manual master drain closed (1DS, D91), main tank fill valves turn on for approximately 30 seconds.

NOTE: If doors are open, display reads “Close all doors.”

10. Display reads “Pour X Y gallons delime into Tank.
    a. Press Enter when done.”

NOTE: Where X = number of gallons, Y = fractional number of gallons.

11. Display reads “Delime Cycle Running. Approximate Time Left: xx:yy”, where xx:yy is time countdown time display.

NOTE: No further user intervention is required, until delime cycle is complete.

12. Main tanks are filled, by alternating fill valves (1SOL, U11, D39 and 3SOL, U9, D37), until tanks are full.

NOTE: Water in tanks heated to 140°F, only in delime mode.
   a. Tank 1 lower float (1FS) energizes.

1) Tank 1 heat (K3, D48, 17CON) energize.
2) Tank 1 heat (K2, D50, 18CON) energizes.

b. Tank 2 lower float (3FS) energizes.
1) Tank 2 heat (K6, D45, 19CON) energizes.

c. Tank 3 lower float (5FS) energizes.
d. ASR 12FS (D40) energizes.
e. Dual Rinse (1PS) energizes.

13. When main tanks are full and final rinse system has the correct concentration of delime solution, Dual Rinse, tanks 1 & 2, and ASR pumps energized 30 minutes.
14. After 30 minutes, automatic drain opens until machine is completely drained. Once drained, automatic drain valve closes.
15. Final Rinse system will be purged with fresh water.
16. Fill valves 1SOL (tank 1) and 2SOL energize until main tanks are full.
17. Dual Rinse, tanks 1 & 2, and ASR pumps energized 4 minutes.
18. Automatic drain opens until machine is completely drained. Once drained, automatic drain valve closes.
19. Display reads “Auto Delime complete. Press Enter Key to refill. Otherwise, machine will power down in 5 minutes”.
20. If user presses Enter key, Display reads “Open Master Drain”.
21. When master drain opened, display reads “Close all tank drains”.
22. Machine transitions to initial fill.

SEQUENCE OF OPERATION (STEAM HEAT) ADVANSYS

Initial Fill - Steam - ADV

1. The following conditions are assumed:
   a. Main breakers off
   b. Doors open.
   c. Tanks are drained.
   d. Water supply on.
2. Main breakers at wall (and controls breaker on machine, if applicable) turned ON.
   a. Line voltage will be at 1T inputs.
      1) 1T output 120VAC.
   b. 1FU will be 120VAC.
   c. 2T input will be 120VAC.
      1) 2T nominal output 24VAC.

   NOTE: Actual output voltage may range from 19 - 30 VAC.

   d. 6FU will be 24VAC input to 12VDC power supply.
   e. 12VDC-LTD applied to control board.
      1) 12VDC-LTD limited applied to 5V.
      2) 12VDC-LTD applied to A5VP.
      3) 12VDC-LTD applied to 3V3.
   f. 5VDC applied to relay board.
3. Operator presses POWER button on keypad.
   a. 12VDC-SW switched on.
      1) 12VDC applied to door switches.

2) 12VDC output from power supply.
   a) 120VAC “ON” (K14) energized. N.O. contacts close.
      i. 7CON energized.
      ii. 7CON, L3 / T3 close at terminal block VF1 and VF2.
      iii. Applies line voltage at L1 and L2 to Variable Frequency Drive (VFD).
      iv. Frequency Inverter is energized. Frequency Inverter Display will indicate "rdY".
b. Display turns ON. "Hobart FT1000" displays for a few seconds.
c. Display will show "Tank(s) Filling...".
d. K14 relay energizes, signaling external booster (if applicable) controller that the machine is on.
e. Exhaust fan energizes (16CON, K11, D102).
f. If doors are open, display will show "Door(s) Open".
   1) If doors are open, 12VDC DOORS are de-energized (K10, D77 (relay board)).
g. If drains are open, display will show "Drain(s) Open".
h. D64 (relay board) illuminates when beam broken - indicating dish present.
i. D29 (control board) de-energizes when beam broken.

4. User closes Dual Rinse, Tank 1, Tank 2, Tank 3 doors (if applicable), ASR (if applicable), (1LS, 2LS, 3LS, 4LS, 5LS, 6LS, 7LS, 8LS (if applicable)).
   a. 12VDC DOORS (K10, D77) energizes. N.O. contacts close.
   b. 120VAC DOORS (K16) energizes. N.O. contacts close.
5. Hold Tank fill valve (5SOL, U13, D41) energies until float (11FS, D21) closes.
   a. Final Rinse pump energizes (6CON, U34, D96).
      1) Dual Rinse tank begins to fill through final rinse arms.
         a) Dual rinse tank will continue to fill until 1PS senses approximately 1000 mV.

NOTE: Hold tank fill valve cycles based on float switch opening and closing.

6. Tank 1 fill valve (1SOL, U11, D39) energizes.
   a. Tank 1 begins to fill.
   b. Tank 1 lower float switch (1FS) closes. D15 (control board) illuminates.
      1) Temperature control begins.
   c. 12VDC (control board) provided to K3 & K2 through tank 1 over temp (1TAS).
      1) Tank 1 / Heat 1 (K3) energizes. D48 (relay board) illuminates.
         a) 16SOL energizes.
   d. Upper float (2FS) closes. D20 (control board) illuminates.
   e. Tank 1 overflows into Tank 2.
      1) Tank 2 lower float switch (3FS) closes. D13 (control board) illuminates.
         a) Supplementary electric heater energized (20CON, K8, D47), until tank 2 reaches setpoint temperature plus 4F.

   NOTE: Compressor will not energize until tank 2 temperature is above 104°F
   f. 12VDC (control board) provided to K6 & K8 through tank 2 over temp (2TAS).
      1) Tank 2 / Heat 1 (K6) energizes. D45 (relay board) illuminates.
         a) 19CON energizes 3HTR.
7. Tank 2 upper float (4FS) closes. D14 (control board) illuminates.
8. Compressor energizes (30CON, K23, D105), when tank 2 temperature is above 104°F.

NOTE: Compressor will not energize if Johnson Controls pressure switch (P78) detects a high or low pressure condition.

9. Blower Dryer blower motors energizes (10CON, 11CON, K12, D103).
10. Tank 3 fill valve (3SOL, U9, D37) energizes.

a. Tank 3 begins to fill.
b. Tank 3 lower float switch (5FS) closes. D24 (control board) illuminates.
c. Upper float (6FS) closes. D25 (control board) illuminates.
d. Tank 3 overflows into ASR.
    1) ASR float switch (ASR-12FS) closes. D40 (control board) illuminates.
    2) ASR tank filled.
e. 1SOL and 3SOL de-energize. Fill complete.

11. Display will show tank temperatures.

NOTE: Tank pump motors turn on periodically for 15 seconds as machine is heating, until tank 2 has reached its setpoint.

NOTE: Until set temperature is reached, display will show “Tanks Filling…”.

NOTE: Machine will not start, until Tank 2 temperature is met.

Normal Operation - Steam - ADV

NOTE: Heat is being maintained by microprocessor.

NOTE: Until set temperature is reached, display will show “Tanks Filling…”.

NOTE: Machine will not start, until Tank 2 temperature is met.

1. The following conditions are assumed:
    a. Main breakers on.
    b. Doors closed.
    c. Tanks are full.
    d. Water supply on.
    e. "Tanks Filling" complete.
2. Operator presses "START" switch (unload start switch (1PB), load start switch (3PB), or the Keypad Start).

NOTE: If breaker is turned off or main power is removed from machine and main power or breaker is turned back on, the machine assumes there is ware on the conveyor. As the machine is first started up, the final rinse will automatically run for 2 minutes to ensure items on the conveyor are properly rinsed.

a. Dish tripped (K22, D63) energizes, as long as dish limit switch (12LS) is closed. K22 N.O. contacts close for VFDrive forward operation.
b. Conveyor motor (7MTR, K19, D76) energizes as long as jam sensor and 8CR are energized (LED's on both c components lit).
c. “All pump motors on” from microprocessor, signal energizes pump motor (K13, D98), closing contact, turning on pumps
    1) Tank 1 pump motor (1CON).
    2) Tank 2 pump motor (2CON).
    3) Tank 3 pump motor (3CON).
    4) Dual Rinse (DR) motor (5CON).
d. ASR pump motor (U35, D97, 8CON) energized.
e. Rinse Aid / Detergent (2CR, U8, D36) energizes.
    1) Line voltage provided to DP1 and DP2, when 2CR and 1CON are energized.
f. Blower Dryers energize (K12, D103, 10CON, 10MTR).
g. Compressor energizes (30CON, K23, D105).

NOTE: Compressor will not energize if Johnson Controls pressure switch (P78) detects a high.

h. Exhaust fan (K11, D102, 16CON) energizes.
i. Final Rinse energizes (U34, D96, 6CON) when conveyor is running and will remain energized until conveyor stops.

NOTE: Supplementary electric heater energizes (20CON, K8, D47) if tank 2 temperature falls below 151°F and stays on until tank 2 temperature reaches 152°F.

3. Operator inserts ware.
   a. Ware interrupts dish sense beam. D64 relay board, lit when beam broken (dish present).
   b. Line voltage provided to RP1 and RP2, when Dual Rinse Pump (5CON) and Rinse Aid / Detergent (2CR) are energized.
   c. Hold tank continues to maintain proper water level by monitoring hold tank float (11FS, D21).

Normal Operation - User Presses Any Stop Button - Steam - ADV

NOTE: Tank Heat is being maintained by microprocessor.

1. The following conditions are assumed:
   a. Normal Operation is running.
2. Operator presses any "STOP" switch (unload stop switch (2PB), load stop switch (4PB), or the Keypad Stop).
   a. Conveyor motor stops (7MTR, K19, D76 & K22, D63) de-energizes.
   b. After 60 seconds, the microprocessor de-energizes BD motors (K12, D103).
      1) 10MTR de-energizes (10CON).
   c. “All pump motors stop” from microprocessor, signal de-energizes pump motor (K13, D98), opening contact, turning off pumps.
      1) Tank 1 pump motor (1CON).
      2) Tank 2 pump motor (2CON).
      3) Tank 3 pump motor (3CON).
      4) Dual Rinse (DR) motor (5CON).

NOTE: If machine has been running consecutively for 30 minutes or more, the ASR soil pump will turn on for 15 seconds prior to machine converting to idle mode.

   d. ASR pump (U35, D97) de-energizes.
   e. Rinse Aid / Detergent (2CR, U8, D36) de-energizes.
   f. If final rinse was on when operator presses stop, Final Rinse (U34, D96, 6CON) pump turns off.
   g. Line voltage removed to RP1 and RP2.

Ware Trips Dish Limit Bar - Steam - ADV

NOTE: Tank Heat is being maintained by microprocessor.
NOTE: Exhaust Fan remains on.

1. The following conditions are assumed:
   a. Normal Operation is running.
2. Ware trips dish limit bar.
   a. Conveyor stops (7MTR, K19, D76 & K22, D63) de-energizes.
   b. Final rinse (U34, D96, 6CON) pump turns off.
   c. After 5 minutes, "All pump motors stop" from microprocessor, signal de-energizes pump motor (K13, D98), opening contact, turning off pumps.
      1) Tank 1 pump motor (1CON).
      2) Tank 2 pump motor (2CON).
      3) Tank 3 pump motor (3CON).
      4) Dual Rinse (DR) motor (5CON).
3. If ware is not removed from dish limit bar within 300 seconds, blower dryer motor (K12, D103 will turn off.

Ware Trips Dish Limit Bar - User Removes Ware - Steam - ADV

NOTE: Tank Heat is being maintained by microprocessor.
NOTE: Exhaust Fan remains on.
NOTE: Pumps remain on.

1. Ware removed from dish limit bar.
   a. Conveyor running (7MTR, K19, D76 K22, D63) energizes.
   b. BD motor (K12, D103) energizes.
      1) 10MTR energizes (10CON).
   c. Final rinse (U34, D96, 6CON) pump turns on, if product did not finish rinsing.

Opening Doors - Steam - ADV

NOTE: Tank Heat is being maintained by microprocessor.

1. The following conditions are assumed:
   a. Normal Operation is running.
2. Operator opens any door.
   a. Door relay de-energizes (K10, D77).
   b. Conveyor stops (7MTR, K19, D76 & K22, D63) de-energizes. All pump motors stop.
   c. “Pumps Off” from microprocessor, signal de-energizes pump motor (K13, D98), opening contact, turning off pumps.
      1) Tank 1 pump motor (1CON).
      2) Tank 2 pump motor (2CON).
      3) Tank 3 pump motor (3CON). (Not applicable with FT1000S).
      4) Dual Rinse (DR) motor (5CON).
   d. ASR pump (U35, D97) de-energizes.
   e. Rinse Aid / Detergent (2CR, U8, D36) de-energizes.
   f. BD motors (K12, D103) de-energize.
      1) BD motor contactors (10CON) de-energize.
   g. Line voltage removed to RP1 and RP2.
   h. Final rinse (U34, D96, 6CON) de-energizes.

Idle Mode - Steam - ADV

NOTE: Heat is being maintained by microprocessor.
NOTE: The set temperature for Tank 2 can NOT be set any higher than 152°F. This will be sufficient energy to maintain Tank 2 temperature.
NOTE: When machine starts idle mode, Blower Dryer (BD) heaters are de-energized immediately, but the blowers will remain on for 60 seconds.
NOTE: Compressor, exhaust fan, and BD motor are periodically energized to maintain Tank 2 heat. Tank 2 supplementary electric heater does not energize during idle mode.

1. The following conditions are assumed:
   a. Machine in idle mode.
   b. Stir Cycle activated.

NOTE: If enabled, microprocessor turns pumps on for 15 seconds, every 15 minutes, to maintain heat in upper chambers.

   c. “Pumps On” from microprocessor, signal energizes pump motor (K13, D98), closing contact, turning on pumps.
      1) Tank 1 pump motor (1CON).
      2) Tank 2 pump motor (2CON).

3) Tank 3 pump motor (3CON).
4) Dual Rinse (DR) motor (5CON).

Delime - Steam - ADV

NOTE: Press Stop key at any time to abort Delime cycle.
NOTE: Delime is only active in idle mode and must be initiated through Manager or Service Menu.

1. Enter Manager or Service Menu.
   a. Actions > Run Delime Cycle.
2. Display reads “Press Stop key at any time to abort Delime cycle” for 3 seconds.
3. Display reads “Place Delime Pump hose in delime solution. Press Enter when done.”

NOTE: At this point, the microprocessor remembers there is delime solution in the machine. If user aborts delime cycle, machine will display “Delime solution in Tanks. Press Enter Key to Drain and Rinse tanks. Press Stop Key to skip rinse cycle.”
NOTE: Once enter is pressed, the “final rinse system delime process” begins. The final rinse system consists of: hold tank, final rinse pump, energy recovery coil (if equipped), heat pump heat exchanger (if equipped), internal booster, and final rinse arms. Delime solution pumped into hold tank and circulated through final rinse system.
NOTE: This process continues throughout the following steps.

4. Final Rinse system delime fill cycle automatically begins and consists of following steps:
   a. Booster water heated to 140°F, only in delime mode.
   b. Final rinse pump (U34, D96, 6CON) turns on, until float switch (11FS) is open, to drain hold tank.
   c. Delime pump (Q23, D113, 1PMP) turns on for approximately 8 seconds.
   d. Hold tank fill valve (U13, D41, 5SOL) turns on until float switch (11FS) is closed.
   e. Final rinse pump (U34, D96, 6CON) turns on to drain hold tank and pump delime solution into the final rinse system.
   f. Microprocessor repeats steps 4c through 4e until appropriate amount of delime solution has been injected into the system.
5. Display reads “Drain all tanks. Leave drains open.”
6. Microprocessor waits until main tanks upper floats are open (2FS & D20, 4FS & D14, 6FS & D25).
7. Display reads “Clean Strainer Baskets, then replace. Press enter when done.”
8. Once main tanks and ASR tanks are drained, display reads “Close Master Drain”.
   a. Lower floats will be open (1FS & D15, 3FS & D13, 5FS & D24, ASR 12FS & D40).
9. After manual master drain closed (1DS, D91), main tank fill valves turn on for approximately 30 seconds.

NOTE: If doors are open, display reads “Close all doors.”

10. Display reads “Pour X Y gallons delime into Tank.
    a. Press Enter when done.”

NOTE: Where X = number of gallons, Y = fractional number of gallons.

11. Display reads “Delime Cycle Running. Approximate Time Left: xx:yy”, where xx:yy is time countdown time display.

NOTE: No further user intervention is required, until delime cycle is complete.

12. Main tanks are filled, by alternating fill valves (1SOL, U11, D39 and 3SOL, U9, D37), until tanks are full.

NOTE: Water in tanks heated to 140°F, only in delime mode.

a. Tank 1 lower float (1FS) energizes.
   1) Tank 1 heat (K3, D48, 1SOL) energizes.
b. Tank 2 lower float (3FS) energizes.
   1) Tank 2 heat (K6, D45, 19CON) energizes.

NOTE: Supplementary heater for.

c. Tank 3 lower float (5FS) energizes.
d. ASR 12FS (D40) energizes.
e. Dual Rinse (1PS) energizes.

13. When main tanks are full and final rinse system has the correct concentration of delime solution, Dual Rinse, tanks 1 , tank 2, tank 3, and ASR pumps energized 30 minutes.
14. After 30 minutes, automatic drain opens until machine is completely drained. Once drained, automatic drain valve closes.
15. Final Rinse system will be purged with fresh water.
16. Fill valves 1SOL (tank 1), 2SOL (tank 2), and 3SOL energize until main tanks are full.
17. Dual Rinse, tanks 1, 2, 3, and ASR pumps energized 4 minutes.
18. Automatic drain opens until machine is completely drained. Once drained, automatic drain valve closes.
19. Display reads “Auto Delime complete. Press Enter Key to refill. Otherwise, machine will power down in 5 minutes”.
20. If user presses Enter key, Display reads “Open Master Drain”.
21. When master drain opened, display reads “Close all tank drains”.
22. Machine transitions to initial fill.

SEQUENCE OF OPERATION – AUTOCLEAN

NOTE: Auto Clean is only active through idle mode and must be initiated through Auto Clean button.

1. Operator presses Autoclean button.
2. Display reads “Press “Enter” to begin Auto Clean Cycle”. In addition, Dirty water Time Remaining and Time Remaining until Delime required will be displayed.

NOTE: If operator presses Auto Clean, while machine is running, display reads “Stop the machine, remove ware, and press the Auto Clean button to initiate Auto Clean”. In addition, Dirty Water Time Remaining and Time Remaining until Delime required will be displayed.

NOTE: If machine is not equipped with autoclean, display reads “Dirty Water Time Remaining and Time Remaining until Delime required." will be displayed.

3. Display reads “Press Stop Key at any time to abort Auto Clean”, for 3 seconds.
4. Display reads “Close Master Drain”.

NOTE: ontrol waits until Master Drain is opened.

5. Once Master Drain is closed, display reads “Open all tank drains. Press Enter when done”.
6. Once tank drains are open and Enter is pressed, display reads “Tanks draining. Please wait a few seconds.”
7. Master drain valve (7SOL, U6, D34) energized for 30 seconds.
8. Master drain valve (7SOL, U6, D34) de- energized.

9. Display reads, ”Clean and replace all strainer basket. Open all wash arm sliders, Close Doors, Press Enter when done”.
10. When Enter button pressed, display reads “No additional user action required. Autoclean will take approximately 30 minutes”.
11. Rinse aid / Detergent relay (2CR, U8, D36) de- energizes.
    a. Rinse / Detergent / Vent Fan control terminal block (9TB), RPS1 and RPS2 de- energized.
    b. Rinse / Detergent / Vent Fan control terminal block (9TB), DPS1 and DPS2 de- energized.
12. Normal start up tank 1 – 3, ASR, final rinse, DR pumps energize for 90 seconds.
    a. ASR tank contactor (8CON, U34, D96) energizes.
    b. Tank 1 pump contactor (1CON, K13, D98) energizes.
    c. Tank 2 pump contactor (2CON, K13, D98) energizes.
    d. Tank 3 pump contactor (3CON, K13, D98) energizes (if applicable).
    e. Dual Rinse pump contactor (5CON, K13, D98) energizes.
    f. Final Rinse pump contactor (6CON, U34, D96) energizes.
13. Master drain valve (7SOL, U6, D34) energized.
14. All pumps de-energized 30 seconds after master drain is opened.
15. Master autoclean valve (15SOL, U12, D130) energized.

    NOTE: Master autoclean valve must be energized to allow main incoming water to flow to other autoclean valves, when autoclean valves are energized.
16. The following solenoid valves are energized in sequential order for approximately 220 seconds each.
    a. ASR Autoclean solenoid (9SOL, U3, D31).
    b. Prewash / Wash Lower nozzles autoclean solenoid valve (10SOL, U4, D32).
    c. Prewash Upper nozzles autoclean solenoid valve (11SOL, U5, D33).
    d. Wash Upper nozzles autoclean solenoid valve (12SOL, U42, D121).
    e. Power Rinse nozzles autoclean solenoid valve (13SOL, U43, D123).

    NOTE: Power Rinse autoclean solenoid valve is removed on shorty machines.
    f. Dual Rinse nozzles autoclean solenoid valve (14SOL, U44, D125).
17. Master autoclean valve (15SOL, U12, D130) de- energized.
18. Nothing is energized for 180 seconds.
19. Master drain valve (7SOL, U6, D34) de- energized.
20. Display reads “Close wash arm sliders, then close all doors. Press Enter when done.”
21. Display reads “Open Master Drain”.

    NOTE: Control waits until Master Drain is opened. (Add this note to top. Nothing happens until user presses a button or sensor changes.)
22. Display reads “Close tank drains”.
23. Display reads “Auto Clean finished. Press Enter key to refill. Otherwise, machine will power down in 60 seconds”.

SEQUENCE OF OPERATION – ASR

ASR - Normal Operation

1. The following conditions are assumed:
   a. Main breaker on.
   b. Doors closed.
   c. Tanks full.
   d. Water supply on.
   e. Machine running.
   f. Ware being run through machine.
2. ASR pump (U35, D97) energized. NOTE: After initial 10 gallons of sprayed final rinse water, the following cycle repeats for every 10 gallons of final rinse water used.
3. ASR pump (Opto U35, D97, 8CON) de-energize.
4. ASR Soil pump (Opto U20, D132, 9CON) energizes for 8 seconds, to remove solid waste from ASR section.
5. ASR Soil pump (Opto U20, D132, 9CON) de- energizes.
6. ASR pump (Opto U35, D97, 8CON) energize.

ASR - Machine Stop Mode

NOTE: If machine has been running more than 30 consecutive minutes and machine has been stopped (stop button, time out dish limit) soil pump turns on for 15 seconds, to remove solid waste from ASR section.

1. ASR pump (Opto U35, D97, 8CON) de-energize.
2. ASR Soil pump (Opto U20, D132, 9CON) energizes for 15 seconds, to remove solid waste from ASR section.
3. ASR Soil pump (Opto U20, D132, 9CON) de- energizes.

TROUBLESHOOTING CHART

NOTE: Refer to Troubleshooting Error Codes on page 88 when the machine displays an error code.

SYMPTOM	POSSIBLE CAUSE
Machine Won't Operate After Start Button is Pressed.	1. Conveyor jammed. Check for jam in conveyor. If a physical jam is found, use Reverse Jog button to clear jam. 2. Verify conveyor jam sensor operation. LED on proximity sensor should be lit when not jammed. If a jam occurs, the LED will go out. 3. Blown fuse or tripped circuit breaker at power supply. 4. Test switch membrane (keypad) for proper operation of switches. Refer to Keypad - Membrane Test, page 129. 5. Wire connections on relay and control boards loose or not connected. 6. Loss of 12VDC supply to relay board. Verify LED D60 is lit. Refer to Relay Board LEDs, page 52.
Ware Not Clean.	1. Insufficient pre-scraping or tank water may need to be changed. 2. Wash arm sliders open. 3. Wash arm nozzle obstruction. 4. Verify pump operation (all tanks). a. Manual overload, in control box, may have tripped. b. Improper rotation on all pump motors. 5. Low tank water temperature(s). 6. Water leaking past wash arm manifold. 7. Water leaking past ASR (if equipped) and/or dual rinse arm o-rings. 8. Wash arms installed incorrectly. Wash arms improperly seated. 9. Loss of water from improperly placed or missing curtains. 10. Ware not loaded properly. 11. Low final rinse water temperature (minimum 180° F). 12. Incorrect detergent dispensing. (Inspect for excessive foaming.) Contact chemical supplier. 13. Incorrect detergent for water type. Contact chemical supplier. 14. Incorrect rinse aid dispensing. Contact chemical supplier. 15. Improper water hardness (3 grains or less is the recommended range). 16. Improper dual rinse operation. 17. ASR strainer and soil collector standpipe obstruction (if machine is equipped with ASR).
Spotting Of Ware.	1. Ware not loaded properly 2. Incorrect final rinse water temperature (minimum 180° F). 3. Incorrect detergent and/or rinse aid dispensing. Contact chemical supplier. 4. Improper water hardness (3 grains or less is the recommended range). 5. Clogged final rinse nozzle(s). 6. Verify rinse arms are seated and latched correctly. 7. Water leaking past rinse arm manifold o-ring.
Inadequate Rinse.	1. Dirty line strainer causing reduced water flow. Located in final rinse plumbing under dual rinse section. 2. Rinse arm(s) are not properly inserted in the hubs. 3. Clogged dual rinse/final rinse arm nozzle(s). 4. Dual rinse tank strainer pan is clogged. 5. Final rinse/dual rinse pump malfunction.
Leaking Vacuum Breaker.	1. Foreign material or corrosion could be preventing proper valve operation.

SYMPTOM	POSSIBLE CAUSE
No Final Rinse.	1. Malfunctioning photo eyes. 2. Inoperative final rinse pump.
Continuous Rinse Operation.	1. Photo eyes are blocked or dirty. 2. Malfunctioning photo eyes. 3. Dual rinse tank water level low. 4. Dual rinse drain open. **NOTE:** Advansys models only. The final rinse is active whenever the conveyor is running.
Final Rinse Temperature is Below 180° F.	1. Circuit breaker(s) to booster heater tripped (electric heat). 2. Booster heater overtemp(s) tripped (electric heat). (5TAS & 6TAS) 3. Booster heater element malfunction (electric heat). 4. Steam supply valve(s) to steam booster are not opened completely or supply pressure too low (steam heat). 5. Improperly operating steam booster solenoid valve(s) (steam heat). 6. Inoperative steam booster mechanical thermostat (steam heat). Prior to serial number 271197621. 7. Inoperative steam booster solid state thermostat (steam heat). Starting serial number 271197621. a. Malfunctioning or defective steam booster temperature probe. Refer to Component Operating Values, page 106, and check resistance. 8. Building hot water malfunction (base models only). 9. Inoperative final rinse pump motor. 10. Final rinse probe malfunction. Refer to Component Operating Values, page 106, and check resistance.
Tank(s) Not Heating.	1. Circuit breaker(s) to heat system tripped (electric heat). 2. Low float probe switch malfunction. 3. Steam supply valve(s) are not opened completely or supply pressure too low (steam heat). 4. Overtemp protector tripped (electric heat). (High limit tripped) 5. Failed heating element (electric heat). 6. Bucket trap not functioning correctly (steam heat). 7. Malfunctioning steam solenoid valve(s) (steam heat). 8. Malfunctioning relay board. 9. Temperature probe malfunction. Refer to Component Operating Values, page 106, and check resistance. 10. Dual rinse pressure sensor malfunction.
Not Heating Properly / Not Maintaining Tank Temperatures.	1. Curtains worn, improperly placed, missing or improper length. 2. Incorrect voltage supply (electric) or low steam supply pressure (steam). 3. Excessive lime scale build up on heating elements (electric heat) or steam coils (steam heat). Delime cycle recommended. 4. Inoperative steam solenoid (steam heat). 5. Bucket trap not functioning correctly (steam heat). 6. Clogged ASR, prewash, wash, power rinse, dual rinse and/or final rinse arm nozzles. 7. Low final rinse temperature (180° F) or no final rinse. 8. Cold air source blowing on machine (fans, air conditioning, ventilation). 9. Improper soap concentration (excessive foaming). Contact chemical supplier. 10. Improper air balance. Too much steam exiting load and/or unload. Refer to Steam Troubleshooting section, page 142. 11. Improper loading of ware. Ware too cold (colder than room temperature). 12. Improper air temperature from blower dryer (too cold). 13. Improper pump motor operation.

SYMPTOM	POSSIBLE CAUSE
No Fill / Slow Fill / Continuous Fill.	1. Drain(s) open. 2. Water valve prior to machine closed. 3. Restricted line strainer causing reduced water flow. 4. Low incoming water supply pressure. 5. Malfunctioning solenoid valve. 6. Malfunctioning upper or lower float(s). 7. Malfunctioning dual rinse pressure sensor. 8. Improper dual rinse mV threshold settings. Refer to Dual Rinse Upper & Lower Pressure Sensor Threshold Calibration, page 127
No or Low Blower-Dryer Heat (Electric Blower Dryer).	1. Blower motor not operating properly. 2. Blower motor wired incorrectly. Blower motor running backwards. 3. Circuit breaker to electric blower-dryer heaters tripped. 4. Overtemp protector tripped. 5. Blower dryer air intake adjusted too high. 6. Malfunctioning contactor.
No or Low Blower-Dryer Heat (Steam Blower Dryer).	1. Blower motor not operating properly. 2. Blower motor wired incorrectly. Blower motor running backwards. 3. Malfunctiong steam solenoid valve. 4. Steam supply valve is not completely open or supply pressure is too low. 6. Bucket trap not functioning correctly. 6. Blower dryer air intake adjusted too high.
Conveyor Moving Too Slowly or Too Quickly.	1. Conveyor speed selection set incorrectly. Press conveyor speed button on mkeypad located on front of control box. 2. Conveyor speed not set properly on control board.
Conveyor Will Not Move.	1. Malfunctioning VFDrive frequency inverter. 2. Inoperative conveyor drive motor. 3. Broken conveyor drive chain. 4. Conveyor jam. 5. Conveyor jam sensor out of ajustment. Refer to Conveyor Maintenance, page 132. 6. Malfunctioning conveyor jam sensor or 8CR relay. 7. Malfunctioning relay on relay board.
Customer Cannot Access Manager Mode.	1. User is not entering code properly. 2. Manager Code was changed from the default 1001 value.
Not Draining / Continuous Draining	1. Open drain valve(s) 2. Clogged drains. 3. Inoperative drain valve. 4. Master drain switch closed during operation.
Machine runs with door open.	1. Inoperative door switch(s) (Door switch stuck closed).
Detergent / Rinse Aid not working properly.	1. Inoperative Detergent / Rinse Aid relay (2CR). 2. Inoperative side switch on Tank 1 pump motor (1CON-side switch), Dual rinse pump motor (5CON-side switch), final rinse pump motor (6CON-side switch. 3. Malfunctioning chemical system. Contact chemical supplier.
ASR not working properly. (Only Machines Equipped With ASR.)	1. Nozzles clogged. 2. Clogged strainer. 3. Strainer not seated properly in bottom of tank. 4. Scrap pan not seated properly preventing strainer from seating properly. 5. Inoperative ASR recirculating and/or soil pump motor(s). 6. Malfunctioning contactor.

SYMPTOM	POSSIBLE CAUSE
Excessive Amount of Steam Exiting Load, Unload, or Doors.	1. Refer to Excessive Steam Escaping From Load End Troubleshooting, page 142.
Auto Clean Not Performing.	1. Auto Clean master water solenoid valve malfunctioning. 2. Improper incoming water supply pressure. 3. Broken or clogged Auto Clean nozzles. 4. Damaged hose or braided hose. 5. Inoperative manual master drain switch.
Blowing fuses on startup or during operation. (12VDC fuse or 120VAC fuse)	1. Shorted load: solenoid coil (any), (steam and water), door switch, drain switches, float and probe assembly, contactor coil, wiring harness (any), photo eyes, or keypad. 2. Corrosion on control or relay board.
Loud or noisy during operation.	1. Malfunctioning motor(s), pump obstruction or motor(s) running backwards. 2. Bent conveyor rods. 3. Bent or broken flowback trays. 4. Buzzing solenoid coil. 5. Chattering contactor or control relay. 6. Improperly aligned conveyor or conveyor drive mechanisms. 5. Damaged blower dryer blower / motor.
Dual Rinse Pressure Sensor Inoperable.	1. Water in pressure sensor tube. 2. Pressure sensor tube popped off. 3. Air leaking in pressure sensor tube. 4. Pressure sensor tube routed incorrectly. 5. Malfunctioning pressure sensor.

TROUBLESHOOTING ERROR CODES

Refer to the Component Layout diagrams section (page 22) for component locations.

Error No.	Message on Display		Description
201	Door(s) Open	Software	One or more of the doors are open. Check/Close doors. Control Board looking for completed circuit between J42 pins 1 and 2.
		Possible Problems	1. Door switches mounted under door have shifted out of alignment. 2. Door switch has failed. 3. Door switch connection to J42 cable has bad connection in terminal box. 4. J42 cable has break or short. 5. Control Board not correctly reading input from J42 cable.
		Tech Tips	Use magnet to check door switches. Use multimeter to check continuity on door switches and cable.
202	Unload Dishes	Software	Dish Limit Bar is tripped. Relay Board looking for completed circuit between J39 pins 5 and 6.
		Possible Problems	1. Dish limit switch or magnet have shifted out of alignment. 2. Dish limit switch has failed. 3. Damaged or missing spring. 4. Dish limit switch connection to J39 cable has bad connection. 5. J39 cable has break or short. 6. Relay board not correctly reading input from j39 cable.
		Tech Tips	Use multimeter to check continuity on dish limit switch and cable. Verify dish limit hood returns to operating postion. Use magnet to check dish limit switch.
301	"No Comms. w/VFD"	Software	VFDrive Error. Control Board looking for RS485 communication from VFD on J26.
		Possible Problems	1. J26 Cable at Control Board and VFD has loose connection or break in wire. 2. The VFD is losing power or has grounding issue. 3. VFD lost its memory and needs to be re-initialized.
		Tech Tips	Reseat all cable and wire connections to VFD and boards.
501	Probe Err- Tank 1	Software	Tank 1 temperature probe is open circuit. Active when temperature is less than 32°F. Control Board looking for resistance value lower than 150,000 ohms on J14 pins 8 and 9
		Possible Problems	1. J14 Cable has loose connection at control board. 2. J14 has a loose connection at lower float in tank 1. 3. Lower float temperature probe has degraded, no longer providing accurate resistance.
		Tech Tips	Verify whether the tank temperature is actually low or not. Check resistance value of lower float temperature probe. Refer to Component Operating Values on page 106. Check wiring connections at probe and board.

Error No.	Message on Display		Description
502	Tank 1 Temp Low	Software	Tank 1 temperature is too low. Active when tank temperature is 1°F less than minimum tank temperature set point. Control Board looking for resistance value that is equal to or below the minimum tank set in the parameters on J14 pins 8 and 9.
		Possible Problems	1. J14 Cable has loose connection at control board. 2. J14 has a loose connection at lower float in tank 1. 3. Lower float temperature probe has degraded, no longer providing accurate resistance 4. Tank 1 heaters not turning on. 5. Tank 1 heaters not heating correctly.
		Tech Tips	Verify whether the tank temperature is low or not. **If tank temperature is low and temperature probe is working correctly:** Verify all curtains are installed in correct locations and not worn, curled or missing. **Steam Machine** Verify tank 1 steam valve turning on. **If steam valve turning on.** Verify tank 1 steam trap working correctly. Verify condensate properly leaving system. Verify line strainer is not clogged. **If steam valve not turning on.** Check wiring connections from steam valve to relay board (J33). Verify steam solenoid valve coil is energizing. **Electric Machine.** Verify contactors pulling in. **If contactors are pulling in.** Verify there is machine voltage on load side of contactors. Verify heating element resistance values. Refer to Component Operating Values, page 106. Verify there is no excessive scale or soil buildup on heating element. **If contactors are not pulling in.** Check wiring connections from contactor to relay board (J33) Verify relay board is getting signal from control board to heat. Refer to Control/Relay Board LEDs & Wire Connections, page 48. **If tank temp is not low and float temperature probe is not working correctly:** Check resistance of lower float temperature probe. Check wiring connections from float to board.
503	Tank 1 Temp Hi	Software	Tank 1 temperature is too hot. Active when temperature is greater than 195°F. Control Board looking for resistance value higher than 7700 ohms on J14 pins 8 and 9.
		Possible Problems	1. J14 Cable has loose connection at control board. 2. J14 has a loose connection at lower float in tank 1. 3. Lower float temperature probe has degraded, no longer providing accurate resistance. 4. Tank 1 heaters stuck on. 5. Tank 1 heaters not heating correctly.
		Tech Tips	Verify whether the tank temperature is high or not **If tank temp is high and float temperature probe is working correctly:** Check if lower float reads closed but there is insufficient water in the tank **Steam Machine** Verify operation of Tank 1 steam solenoid valve **Electric Machine** Verify contactors are not stuck closed. **If tank temp is not high and the float temperature probe is working correctly:** Check resistance value of lower float temperature probe. Check wiring connections from float to board.

Error No.	Message on Display		Description
504	Probe Err- Tank 1	Software	Tank 1 temperature Probe is short circuit. Active when temperature is greater than 220°F. Control Board looking for resistance value higher than 5500 ohms on J14 pins 8 and 9.
		Possible Problems	1. J14 Cable has loose connection at control board. 2. J14 has a loose connection at lower float in tank 1. 3. Lower float temperature probe has degraded, no longer providing accurate resistance.
		Tech Tips	Verify whether the tank temperature is high or not. **If tank temp is high and the float temperature probe is working correctly:** Check if lower float reads closed but there is insufficient water in the tank. **Steam Machine** Verify operation of Tank 1 steam solenoid valve. **Electric Machine** Verify contactors are not stuck closed. **If tank temp is not high and the float temperature probe is working correctly:** Check resistance value of lower float temperature probe. Check wiring connections from float to board.
505	Probe Err- Tank 2	Software	Tank 2 temperature probe is open circuit. Active when temperature is less than 32°F. Control Board looking for resistance value lower than 150,000 ohms on J12 pins 8 and 9.
		Possible Problems	1. J12 Cable has loose connection at control board. 2. J12 has a loose connection at lower float in tank 2. 3. Lower float temperature probe has degraded, no longer providing accurate resistance.
		Tech Tips	Verify whether the tank temperature is low or not. Check resistance value of lower float temperature probe. Refer to Component Operating Values on page 106. Check wiring connections at probe and board.

Error No.	Message on Display		Description
506	Tank 2 Temp Low	Software	Tank 2 temperature is too low. Active when tank temperature is 1°F less than minimum tank temperature setpoint. Control Board looking for resistance value on J12 pins 8 and 9 that is equal to or below the minimum tank set in the parameters.
		Possible Problems	1. J12 Cable has loose connection at control board. 2. J12 has a loose connection at lower float in tank 2. 3. Lower float temperature probe has degraded, no longer providing accurate resistance. 4. Tank 2 heaters not turning on. 5. Tank 2 heaters not heating correctly.
		Tech Tips	Verify whether the tank temperature is actually low or not. **If tank temperature is low and temperature probe is working correctly:** Verify all curtains are installed in correct locations and not worn, curled or missing. **<u>Steam Machine</u>** Verify tank 2 steam valve turning on. **If steam valve turning on** Verify tank 2 steam trap working correctly. Verify condensate properly leaving system. Verify line strainer is not clogged. **If steam valve not turning on** Check wiring connections from steam valve to relay board (J33). Verify steam solenoid valve coil is energizing. **<u>Electric Machine</u>** Verify contactors pulling in. **If contactors are pulling in** Verify there is machine voltage on load side of contactors. Verify heating element resistance values. Refer to Component Operating Values, page 106. Verify there is no excessive scale or soil buildup on heating element. **If contactors are not pulling in** Check wiring connections from contactor to relay board (J33). Verify relay board is getting signal from control board to heat. Refer to Control/Relay Board LEDs & Wire Connections, page 48. **If tank temp is not low and float temperature probe is not working correctly:** Check resistance of lower float temperature probe. Check wiring connections from float to board.

Error No.	Message on Display		Description
507	Tank 2 Temp Hi	Software	Tank 2 temperature is too hot. Active when temperature is greater than 195°F. Control Board looking for resistance value higher than 7700 ohms on J12 pins 8 and 9.
		Possible Problems	1. J12 Cable has loose connection at control board. 2. J12 has a loose connection at lower float in tank 2. 3. Lower float temperature probe has degraded, no longer providing accurate resistance. 4. Tank 2 heaters stuck on. 5. Tank 2 heaters not heating correctly.
		Tech Tips	Verify whether the tank temperature is actually high or not. **If tank temp is high and float temperature probe is working correctly:** Check if lower float reads closed but there is insufficient water in the tank. **Steam Machine** Verify operation of Tank 2 steam solenoid valve. **Electric Machine** Verify contactors are not stuck closed. **If tank temp is not high and the float temperature probe is working correctly:** Check resistance value of lower float temperature probe. Check wiring connections from float to board.
508	Probe Err- Tank 2	Software	Tank 2 temperature Probe is short circuit. Active when temperature is greater than 220°F. Control Board looking for resistance value higher than 5500 ohms on J12 pins 8 and 9.
		Possible Problems	1. J12 Cable has loose connection at control board. 2. J12 has a loose connection at lower float in tank 2. 3. Lower float temperature probe has degraded, no longer providing accurate resistance.
		Tech Tips	Verify whether the tank temperature is actually high or not. **If tank temp is high and the float temperature probe is working correctly:** Check if lower float reads closed but there is insufficient water in the tank. **Steam Machine** Verify operation of Tank 2 steam solenoid valve. **Electric Machine** Verify contactors are not stuck closed. **If tank temp is not high and the float temperature probe is working correctly:** Check resistance value of lower float temperature probe. Check wiring connections from float to board.
509	Probe Err- Tank 3	Software	Tank 3 temperature probe is open circuit. Active when temperature is less than 32°F. Control Board looking for resistance value lower than 150,000 ohms on J20 pins 8 and 9.
		Possible Problems	1. J20 Cable has loose connection at control board. 2. J20 has a loose connection at lower float in tank 1. 3. Lower float temperature probe has degraded, no longer providing accurate resistance.
		Tech Tips	Verify whether the tank temperature is actually low or not. Check resistance value of lower float temperature probe. Refer to Component Operating Values on page 106. Check wiring connections at probe and board.

Error No.	Message on Display		Description
510	Tank 3 Temp Low	Software	Tank 3 temperature is too low. Active when tank temperature is 1°F less than minimum tank temperature setpoint. Control Board looking for resistance value on J20 pins 8 and 9 that is equal to or below the minimum tank set in the parameters.
		Possible Problems	If tank is an unheated prewash - machine program error. If tank is heated: 1. J20 Cable has loose connection at control board. 2. J20 has a loose connection at lower float in tank 3. 3. Lower float temperature probe has degraded, no longer .providing accurate resistance. 4. Tank 3 heaters not turning on (if tank 3 heated). 5. Tank 3 heaters not heating correctly.
		Tech Tips	Verify whether the tank temperature is actually low or not. **If tank temperature is low and temperature probe is working correctly:** Verify all curtains are installed in correct locations and not worn, curled or missing. **Steam Machine** Verify tank 3 steam valve turning on. **If steam valve turning on** Verify tank 3 steam trap working correctly. Verify condensate properly leaving system. Verify line strainer is not clogged. **If steam valve not turning on** Check wiring connections from steam valve to relay board. Verify steam solenoid valve coil is energizing. **Electric Machine** Verify contactors pulling in. **If contactors are pulling in** Verify there is machine voltage on load side of contactors. Verify heating element resistance values. Refer to Component Operating Values, page 106. Verify there is no excessive scale or soil buildup on heating element. **If contactors are not pulling in** Check wiring connections from contactor to relay board. Verify relay board is getting signal from control board to heat. Refer to Control/Relay Board LEDs & Wire Connections, page 48. **If tank temp is not low and float temperature probe is not working correctly:** Check resistance of lower float temperature probe. Check wiring connections from float to board. **If tank is a prewash:** Go to machine's program and parameters and reset the tank 3 temp limits.

Error No.	Message on Display		Description
511	Tank 3 Temp Hi	Software	Tank 3 temperature is too hot. Active when temperature is greater than 150°F (PW only). Control Board looking for resistance value higher than 7700 ohms on J20 pins 8 and 9.
		Possible Problems	1. J20 Cable has loose connection at control board. 2. J20 has a loose connection at lower float in tank 3. 3. Lower float temperature probe has degraded, no longer providing accurate resistance. 4. If heated: Tank 3 heaters not turning on. 5. Water and airflow from other sections are causing tank to gain too much heat.
		Tech Tips	Verify whether the tank temperature is actually low or not. **If section is heated** Verify whether the tank temperature is high or not. **If tank temp is high and float temperature probe is working correctly:** Check if lower float reads closed but there is insufficient water in the tank. **Steam Machine** Verify operation of Tank 3 steam solenoid valve. **Electric Machine** Verify contactors are not stuck closed. **If tank temp is not high and the float temperature probe is working correctly:** Check resistance value of lower float temperature probe. Check wiring connections from float to board. **If section is prewash, refer to Excessive Steam Escaping From Load End Troubleshooting, page 142.**
512	Probe Err- Tank 3	Software	Tank 3 temperature probe is short circuit. Active when temperature is greater than 220°F. Control Board looking for resistance value higher than 5500 ohms on J20 pins 8 and 9.
		Possible Problems	1. J20 Cable has loose connection at control board. 2. J20 has a loose connection at lower float in tank 3. 3. Lower float temperature probe has degraded, no longer providing accurate resistance.
		Tech Tips	Heated Tank 3 only: Verify whether the tank temperature is high or not. **If tank temp is high and the float temperature probe is working correctly:** Check if lower float reads closed but there is insufficient water in the tank. **Steam Machine** Verify operation of Tank 3 steam solenoid valve. **Electric Machine** Verify contactors are not stuck closed. **If tank temp is not high and the float temperature probe is working correctly:** Check resistance value of lower float temperature probe. Check wiring connections from float to board.

Error No.	Message on Display		Description
513	Probe Err- Tank D	Software	Tank D temperature probe is open circuit. Active when temperature is less than 32°F. Control Board looking for resistance value less than 150,000 on J29 pins 4 and 5.
		Possible Problems	1. J29 Cable has loose connection at control board. 2. J29 has a loose connection at the pressure sensor in the Dual Rinse Tank. 3. Dual rinse temperature probe has degraded, no longer providing accurate resistance.
		Tech Tips	Verify whether the tank temperature is low or not. Check resistance value of dual rinse temperature probe. Check wiring connections at probe and control board (J29).
514	Tank D Temp Low.	Software	Tank D temperature is too low. Active when tank temperature is less than 160°F. Control Board looking for resistance value less than 15,000 on J29 pins 4 and 5.
		Possible Problems	1. J29 Cable has loose connection at control board. 2. J29 has a loose connection at dual rinse temperature probe. 3. Dual rinse temperature probe has degraded, no longer providing accurate resistance. 4. Dual Rinse tank heater not turning on. 5. Dual Rinse tank heater not heating correctly. 6. Blower Dryer models - Blower dryer not working. 6. Blower Dryer models - Blower dryer heater not working. 7. Blower Dryer models - Blower dryer baffles incorrectly set. 8. Blower Dryer models - Blower dryer deflector pan missing.
		Tech Tips	Verify all curtains are installed in correct locations and not worn, curled or missing and that the proper CFM is being pulled from the vent connection. Verify dual rinse arms are in place and seated properly. Verify whether the tank temperature is low or not. **If tank temp is low and temperature probe is working correctly:** **<u>Blower Dryer Models</u>** Verify blower motor is running the proper direction. **Steam Machine** - Verify blower dryer steam solenoid valve operation. **Electric Machine** - Check blower dryer heater elements turning on and have correct resistance measurements. Refer to Component Operating Values, page 106. **<u>Steam Machine</u>** Verify dual rinse tank steam solenoid valve operation. **If steam valve turning on** Verify dual rinse tank steam trap working correctly.Verify condensate properly leaving system. **If steam valve not turning on** Check wiring connections from steam valve to board. **<u>Electric Machine</u>** Verify contactors pulling in. **If contactors are pulling in** Verify there is machine voltage on load side of contactors. Verify heater element ohm values. Verify there is not scale or soil buildup on heater element. **If contactors are not pulling in** Check wiring connections from contactor to board. **If tank temp is not actually low (means temperature probe is probably not working correctly):** Check ohm value of dual rinse temperature probe. Check wiring connections from temperature probe to board (J29).

Error No.	Message on Display		Description
515	Tank D Temp Hi	Software	Tank D temperature is too hot. Active when temperature is greater than 195°F. Control Board looking for resistance value higher than 7700 ohms on J29 pins 4 and 5.
		Possible Problems	1. J29 Cable has loose connection at control board. 2. J29 has a loose connection at temperature probe. 3. Dual rinse temperature probe has degraded, no longer providing accurate resistance. 4. Dual rinse pressure sensor not working correctly. 5. Dual rinse pressure sensor programmed incorrectly. Refer to DUAL RINSE UPPER & LOWER PRESSURE SENSOR THRESHOLD CALIBRATION, page 127.
		Tech Tips	Verify whether the tank temperature is high or not. **If tank temp is high and the temperature probe is working correctly:** Check if pressure sensor is reading closed but there is insufficient water in the tank. **Steam Machine** Verify dual rinse tank steam solenoid valve operation. **Electric Machine** Check if contactors are stuck closed. **If tank temp is not high and the temperature probe is working correctly:** Check resistance value of dual rinse temperature probe. Check wiring connections from probe to board (J29).
516	Probe Err - Tank D	Software	Tank D temperature probe is short circuit. Active when temperature is greater than 220°F. Control Board looking for resistance value higher than 5500 ohms on J29 pins 4 and 5.
		Possible Problems	1. J29 Cable has loose connection at control board. 2. J29 has a loose connection at temperature probe. 3. Dual Rinse temperature probe has degraded, no longer providing accurate resistance. 4. Dual Rinse pressure sensor not working correctly. 5. Dual Rinse pressure sensor programmed incorrectly. 6. Dual Rinse tank heater not turning on. 7. Dual Rinse tank heater not heating correctly.
		Tech Tips	Verify whether the tank temperature is actually high or not. **If tank temp is high and the float temperature probe is working correctly:** Check if pressure sensor is reading closed but there is insufficient water in the tank. **Steam Machine** Verify operation of Dual Rinse steam solenoid valve. **Electric Machine** Check if contactors are stuck closed. **If tank temp is not high and the float temperature probe is working correctly:** Check resistance value of lower float temperature probe. Check wiring connections from probe to board (J29)

Error No.	Message on Display		Description
517	Probe Err- FnlRinse	Software	Final rinse temperature probe is open circuit. Active when temp is less than 32 F. Control Board looking for resistance value less than 150,000 on J22 pins 1 and 2.
		Possible Problems	1. J22 Cable has loose connection at control board. 2. J22 has a loose connection at the final rinse temperature probe. 3. Final rinse temperature probe has degraded, no longer providing accurate resistance.
		Tech Tips	Verify whether the tank temperature is low or not. Check resistance value of final rinse temperature probe. Check wiring connections at probe and board (J22).
518	FnlRinse Temp Low	Software	Final rinse temperature is too low. Active when temp is less than 180°F. Control Board looking for resistance value less than 10,000 on J22 pins 1 and 2.
		Possible Problems	1. J22 Cable has loose connection at control board. 2. J22 has a loose connection at final rinse temperature probe. 3. Final rinse temperature probe has degraded, no longer providing accurate resistance. 4. Booster heater not turning on. 5. Booster heater not heating correctly. 6. Water not passing through final rinse arms. 7. Insufficient water temperature supplied to booster heater. 8. Excessive lime scale in booster heater.
		Tech Tips	Verify whether the final rinse temperature is actually low or not. If machine is equipped with Auto Delime, run a delime cycle. **If final rinse temperature is low and the temperature probe is working correctly:** Verify final rinse pump is properly pumping water thru final rinse arms. **<u>Steam Machine</u>** Verify booster heater steam solenoid valve operation. **If steam valve turning on** Verify booster steam trap working correctly. Verify condensate properly leaving system. **If steam valve not turning on** Check wiring connections from steam valve to solid state temperature (SST) board or mechanical thermostat. **<u>Electric Machine</u>** Verify contactors pulling in. **If contactors are pulling in** Verify there is machine line voltage on load side of contactors. Verify booster heater element resistance values. Refer to Component Operating Values, page 106. Verify there is no excessive scale or soil buildup on heater element. **If contactors are not pulling in** Check wiring connections from contactor to board. **If final rinse temperature is not low and the temperature probe is not working correctly:** Check resistance value of final rinse temperature probe. Refer to Component Operating Values, page 106. Check wiring connections from temperature probe to board (J22).

Error No.	Message on Display		Description
519	FnlRinse Temp High	Software	Final rinse temperature is too hot. Active when temp is greater than 210°F. Control Board looking for resistance value higher than 5900 ohms on J22 pins 1 and 2.
		Possible Problems	1. J22 Cable has loose connection at control board. 2. J22 has a loose connection at temperature probe. 3. Final Rinse temperature probe has degraded, no longer providing accurate resistance. 4. Holding tank float sensor not working correctly. 5. Booster heater stuck on. 6. Water not passing through final rinse arms.
		Tech Tips	Verify whether the tank temperature is actually high or not. **If final rinse temperature is high and the temperature probe is working correctly:** Check if holding tank float reading closed but there is insufficient water in the tank. **Steam Machine** Verify operation of steam booster heater solenoid valve. **Electric Machine** Check if contactors are stuck closed. **If final rinse temperature is not high and the temperature probe is not working correctly:** Check resistance value of final rinse temperature probe. Refer to Component Operating Values, page 106. Check wiring connections from temperature probe to board (J22).
520	Probe Err - FnlRinse	Software	Final rinse temperature probe is short circuit. Active when temp is greater than 220°F. Control Board looking for resistance value higher than 5500 ohms on J22 pins 1 and 2.
		Possible Problems	1. J22 Cable has loose connection at control board. 2. J22 has a loose connection at temperature probe. 3. Final Rinse temperature probe has degraded, no longer providing accurate resistance. 4. Holding tank float sensor not working correctly. 5. Booster heater stuck on. 6. Water not passing through final rinse arms.
		Tech Tips	Verify whether the tank temperature is actually high or not. **If final rinse temperature is high and the temperature probe is working correctly:** Check if holding tank float reading closed but there is insufficient water in the tank. **Steam Machine** Verify operation of steam booster heater solenoid valve. **Electric Machine** Check if contactors are stuck closed. **If final rinse temperature is not high and the temperature probe is not working correctly:** Check resistance value of final rinse temperature probe. Refer to Component Operating Values, page 106. Check wiring connections from probe to board (J22).

Error No.	Message on Display		Description
521	Probe Err- Bstr	Software	Booster temperature probe is open circuit. Active when temp is less than 32°F. Control Board looking for resistance value less than 150,000 on J24 pins 4 and 6.
		Possible Problems	1. J6 and/or J24 Cable has loose connection at control board. 2. J6 and/or J24 has a loose connection at the final rinse temperature probe. 3. Booster temperature probe has degraded, no longer providing accurate resistance.
		Tech Tips	Verify whether the booster temperature is low or not. Check resistance value of booster temperature probe. Refer to Component Operating Values, page 106. Check wiring connections at probe and board (J24).
522	Booster Temp Hi	Software	Booster temperature is too hot. Active when booster temperature is greater than 205°F. Control Board looking for resistance value higher than 6300 ohms on J24 pins 4 and 6.
		Possible Problems	1.J6 and/or J24 Cable has loose connection at control board. 2.J6 and/or J24 has a loose connection at temperature probe. 3. Booster temperature probe has degraded, no longer providing accurate resistance. 5. Booster heater stuck on.
		Tech Tips	Verify whether the booster temperature is high or not **If booster temperature is high and temperature probe is working correctly:** **<u>Steam Machine</u>** Error should not be active on a steam machine as it is an "external booster". Check programming if this error appears. Verify steam booster solid state thermosat (SST) or mechanical thermostat operation and/or set point. **<u>Electric Machine</u>** Check if contactors are stuck closed **If final rinse temperature is not high and the temperature probe is not working correctly:** Check resistance value of booster temperature probe. Refer to Component Operating Values, page 106. Check wiring connections from probe to board (J24)

Error No.	Message on Display		Description
523	Probe Err - Bstr	Software	Booster temperature probe is short circuit. Active when booster temperature is greater than 220°F. Control Board looking for resistance value higher than 5500 ohms on J24 pins 4 and 6.
		Possible Problems	1.J6 and/or J24 Cable has loose connection at control board. 2.J6 and/or J24 has a loose connection at temperature probe. 3. Booster temperature probe has degraded, no longer providing accurate resistance. 4. Holding tank float sensor not working correctly. 5. Booster heater stuck on. 6. Water not passing through final rinse arms.
		Tech Tips	Verify whether the tank temperature is actually high or not. **If booster temperature is high and temperature probe is working correctly:** Check if holding tank float reading closed but there is insufficient water in the tank. **Steam Machine** Error should not be active on a steam machine as it is an "external booster". Check programming if this error appears. **Electric Machine** Check if contactors are stuck closed. **If final rinse temperature is not high and the temperature probe is not working correctly:** Check resistance value of booster temperature probe. Refer to Component Operating Values, page 106. Check wiring connections from probe to board (J24).
524	Probe Err- Tank 4	Software	Tank 4 temperature Probe is short circuit. Actine when temperature is greater than 220°F. Control Board looking for resistance value higher than 5500 ohms on J9.
		Possible Problems	See problems from Error 512 "Probe Err - Tank 3" but reference Tank 4 circuit.
		Tech Tips	See tech tips from Error 512 "Probe Err - Tank 3" but reference Tank 4 circuit.
525	Probe Err- Tank 4	Software	Tank 4 temperature probe is open circuit. Active when temperature is less than 32°F. Control Board looking for resistance value lower than 150,000 ohms on J9.
		Possible Problems	See problems from Error 509 "Probe Err - Tank 3" but reference Tank 4 circuit.
		Tech Tips	See tech tips from Error 509 "Probe Err - Tank 3" but reference Tank 4 circuit.
526	Tank 4 Temp Hi	Software	Tank 4 temperature is too hot. Active when temperature is greater than 195°F. Control Board looking for resistance value higher than 7700 ohms on J9.
		Possible Problems	See problems from Error 511 "Tank 3 Temp Hi" but reference Tank 4 circuit.
		Tech Tips	See tech tips from Error 511 "Tank 3 Temp Hi" but reference Tank 4 circuit.
527	Tank 4 Temp Low	Software	Tank 4 temperature is too low. Active when tank temperature is 1°F less than minimum tank temperature set point. Control Board looking for resistance value that is equal to or below the minimum tank set in the parameters on J9.
		Possible Problems	See problems from Error 510 "Tank 3 Temp Low" but reference Tank 4 circuit.
		Tech Tips	See tech tips from Error 510 "Tank 3 Temp Low" but reference Tank 4 circuit.

Error No.	Message on Display		Description
528	Probe Err- Tank 5	Software	Tank 5 temperature Probe is short circuit. Actine when temperature is greater than 220°F. Control Board looking for resistance value higher than 5500 ohms on J23
		Possible Problems	See problems from Error 512 "Probe Err - Tank 3" but reference Tank 5 circuit.
		Tech Tips	See tech tips from Error 512 "Probe Err - Tank 3" but reference Tank 5 circuit.
529	Probe Err- Tank 5	Software	Tank 5 temperature probe is open circuit. Active when temperature is less than 32°F. Control Board looking for resistance value lower than 150,000 ohms on J23.
		Possible Problems	See problems from Error 509 "Probe Err - Tank 3" but reference Tank 5 circuit.
		Tech Tips	See tech tips from Error 509 "Probe Err - Tank 3" but reference Tank 5 circuit.
530	Tank 5 Temp Hi	Software	Tank 5 temperature is too hot. Active when temperature is greater than 195°F. Control Board looking for resistance value higher than 7700 ohms on J23.
		Possible Problems	See problems from Error 511 "Tank 3 Temp Hi" but reference Tank 5 circuit.
		Tech Tips	See tech tips from Error 511 "Tank 3 Temp Hi" but reference Tank 5 circuit.
531	Tank 5 Temp Low	Software	Tank 5 temperature is too low. Active when tank temperature is 1°F less than minimum tank temperature set point. Control Board looking for resistance value that is equal to or below the minimum tank set in the parameters on J23.
		Possible Problems	See problems from Error 510 "Tank 3 Temp Low" but reference Tank 5 circuit.
		Tech Tips	See tech tips from Error 510 "Tank 3 Temp Low" but reference Tank 5 circuit.
601	Tank(s) Filling…	Software	Tanks going through Initial Fill sequence. Active in Initial Fill Sequence. Control board sees one or more water level probes open.
		Possible Problems	1. Tank floats not making good connection. 2. Tank floats have failed. 3. Dual Rinse pressure sensor not working. 4. Dual Rinse pressure sensor programming incorrect. 5. Final Rinse Pump not working. 6. Drain(s) open. 7. Water supply to machine shut off.
		Tech Tips	Access the service menu>actions>read sensors - verify which float(s) is reading open. Troubleshoot the floats from the connection at the float back to the control board. Troubleshoot the dual rinse pressure sensor - check the tube, then wiring connections. Refer to DUAL RINSE UPPER & LOWER PRESSURE SENSOR THRESHOLD CALIBRATION, page 127.

Error No.	Message on Display		Description
602	Float Err - Tank 1	Software	Upper and lower floats in Tank 1 are in an inconsistent state. Active when upper float closed and lower float open. Control board looking for continuity between J14 pins 6 and 7.
		Possible Problems	1. Tank floats not making good connection 2. Soil or foreign debris build up on floats 3. Tank floats have failed
		Tech Tips	Start at float and check continuity. Continue back to control board verifying continuity at each new cable connection
603	Float Err - Tank 2	Software	Upper and lower floats in Tank 2 are in an inconsistent state. Active when upper float closed and lower float open. Control board looking for continuity between J12 pins 6 and 7.
		Possible Problems	1. Tank floats not making good connection. 2. Soil or foreign debris build up on floats. 3. Tank floats have failed.
		Tech Tips	Start at float and check continuity. Continue back to control board verifying continuity at each new cable connection.
604	Float Err - Tank 3	Software	Upper and lower floats in Tank 3 are in an inconsistent state. Active when upper float closed and lower float open. Control board looking for continuity between J20 pins 6 and 7.
		Possible Problems	1. Tank floats not making good connection. 2. Soil or foreign debris build up on floats. 3. Tank floats have failed.
		Tech Tips	Start at float and check continuity. Continue back to control board verifying continuity at each new cable connection.
605	Float Err - Tank D	Software	Upper and lower floats in Tank D are in an inconsistent state. Active when upper float closed and lower float open. Control board looking for mV back from Dual rinse pressure sensor above minimum threshold set in program.
		Possible Problems	1. Dual rinse pressure sensor not making a good connection. 2. Dual rinse pressure sensor has failed. 3. Water or kink in pressure sensor tube.
		Tech Tips	Use the service menu>actions>read sensors - verify dual rinse mV level and troubleshoot the pressure sensor - check the tube, then wire connections. Refer to DUAL RINSE UPPER & LOWER PRESSURE SENSOR THRESHOLD CALIBRATION, page 127.
606	Check Water Level	Software	12 minutes has passed since the last float closed during Initial Fill. Active in Initial Fill sequence only.
		Possible Problems	1. Tank floats not making good connection. 2. Tank floats have failed. 3. Insufficient water supply to machine. Low water pressure.
		Tech Tips	Check float switch(s) continuity at float switch. Verify continuity at each cable connection back to control board.
607	Float Err - Tank 4	Software	Upper and lower floats in Tank 4 are in an inconsistent state. Active when upper float closed and lower float open. Control board looking for continuity on J9.
		Possible Problems	1. Tank floats not making good connection. 2. Soil or foreign debris build up on floats. 3. Tank floats have failed.
		Tech Tips	Start at float and check continuity. Continue back to control board verifying continuity at each new cable connection.

Error No.	Message on Display		Description
608	Float Err - Tank 5	Software	Upper and lower floats in Tank 5 are in an inconsistent state. Active when upper float closed and lower float open. Control board looking for continuity on J23.
		Possible Problems	1. Tank floats not making good connection. 2. Soil or foreign debris build up on floats. 3. Tank floats have failed.
		Tech Tips	Start at float and check continuity. Continue back to control board verifying continuity at each new cable connection.
609	Hold Tank Empty	Software	Hold Tank Fill Timeout. Active when Holding tank float has taken longer than expected to close after holding tank fill valve was turned on. Control Board looking for continuity between J11 Pins 2 and 3.
		Possible Problems	1. Hold tank float switch malfunction. 2. Hold tank fill solenoid (5 SOL) malfunction. 3. Low water supply pressure to hold tank or water supply is shut off.
		Tech Tips	Start at float and check continuity. Continue back to control board verifying continuity at each new cable connection. Access service menu>actions>toggle outputs - test hold tank fill to see if valve energizes and passes water into the hold tank.
610	Hold Tank Error	Software	Hold Tank Fill Failure. Active when Holding tank float has taken longer than expected to close after holding tank fill valve was turned on. The machine shuts down to avoid damaging itself. Control Board looking for continuity between J11 Pins 2 and 3.
		Possible Problems	1. Hold tank float switch malfunction. 2. Hold tank fill solenoid (5 SOL) malfunction. 3. Low water supply pressure to hold tank or water supply is shut off.
		Tech Tips	Start at float and check continuity. Continue back to control board verifying continuity at each new cable connection. Access service menu>actions>toggle outputs - test hold tank fill to see if valve energizes and passes water into the hold tank.
611	Tank Drain(s) Open	Software	Tank Drains Open. Active when one or more tank drains are open. Control Board looking for completed circuit between J10 pins 1 and 2.
		Possible Problems	1. Drain switches out of adjustment. 2. Drain switch has failed. 3. Drain switch connection to J10 cable has bad connection in .terminal box. 4. J10 cable has break or short. 5. Control Board not correctly reading input from J10 cable.
		Tech Tips	Use magnet to check drain switches. Use multimeter to check continuity on drain switches and cable.
612	Open Master Drain	Software	Open Master Drain. Indicates Master Drain is closed and overflow may occur. Active during all states except Auto Clean and Auto Delime. Control board looking for continuity between J44 pins 1 and 5.
		Possible Problems	1. Master drain switch out of adjustment. 2. Drain switch has failed. 3. Drain switch connection to 8TB has bad connection in terminal block.
		Tech Tips	Use magnet to check drain switch. Use multimeter to check continuity on drain switch and cable.

Error No.	Message on Display		Description
801	Ht Pmp Hi Pr Trip	Software	Heat Pump HP Trip. Active when Heat Pump is in high pressure state. Control board seeing open circuit on J37 pin 5.
		Possible Problems	1. ADV heat pump issues. 2. Loose connection within ADV circuit. 3. Tank heat not working correctly. 4. Booster heat not working correctly. 5. Pumps not running. 6. Exhaust fan not running.
		Tech Tips	Contact Hobart Service if heat pump issues persist.
802	Ht Pmp Lo Pr Trip	Software	Heat Pump LP Trip. Active when Heat Pump is in low pressure state. Control board seeing closed circuit on J37 pin 4.
		Possible Problems	1. ADV heat pump issues. 2. Loose connection within ADV circuit. 3. Tank heat not working correctly. 4. Booster heat not working correctly. 5. Pumps not running. 6. Exhaust fan not running.
		Tech Tips	Contact Hobart Service if heat pump issues persist.
803	Ht Pmp Hi Lockout	Software	Heat Pump HP Trip Lockout. Active when four Heat Pump high pressure trips have occurred within 15 minutes. Machine is shut down to avoid damage. Lockout due to consecutive HP trips. Control board seeing open circuit on J37 pin 5.
		Acknowledgement	Press power button twice to restart.
		Possible Problems	1. ADV heat pump issues. 2. Loose connection within ADV circuit. 3. Tank heat not working correctly. 4. Booster heat not working correctly. 5. Pumps not running. 6. Exhaust fan not running.
		Tech Tips	Contact Hobart Service if heat pump issues persist.
804	Ht Pmp Lo LP Lockout	Software	Heat Pump LP Trip Lockout. Active when four Heat Pump low pressure trips have occurred within 15 minutes. Machine is shut down to avoid damage. Lockout due to consecutive LP trips. Control board seeing closed circuit on J37 pin 4.
		Acknowledgement	Press power button twice to restart.
		Possible Problems	1. ADV heat pump issues. 2. Loose connection within ADV circuit. 3. Tank heat not working correctly. 4. Booster heat not working correctly. 5. Pumps not running. 6. Exhaust fan not running.
		Tech Tips	Contact Hobart Service if heat pump issues persist.
907	Delime recommended	Software	Delime counter expired and a delime cycle should be ran. Only displayed if Delime notification is activated.
		Tech Tips	Run delime cycle.
909	Change Water Soon	Software	5-minute warning before disabling machine due to dirty water alert. Only seen if Dirty Water alert is set to Alert and Lockout.
		Tech Tips	Drain tank(s) and refill.
910	Water Change Required	Software	Indicates a water change should/must occur due to dirty water. Option if Dirty Water alert is set to Alert. Mandatory if set to Alert and Lockout.
		Tech Tips	Drain tank(s) and refill.

COMPONENT OPERATING VALUES

Pressure Sensor Values

Pressure Sensor Value			
	Empty	Full	Heat On (Electric/Steam)
Dual Rinse	500 mV	950 mV	850 mV

Thermistor Charts

Dual Rinse Tank, Final Rinse & Electric Booster Temperature Probe (Part Number 00-328994) Wash & Power Rinse Tank Temperature Probe (Part Number 00-936547-00004) Steam Booster Heater Temperature Probe (Part Number 00-562194-00002)	
Degree (°F)	Resistance (Ω)
95°F	63,480
105.8°F	48,905
114.8°F	39,605
125.6°F	30,976
134.6°F	25,390
145.4°F	20,136
156.2°F	16,083
165.2°F	13,405
176.0°F	10,837
185.0°F	9,121
195.8°F	7,456
204.8°F	6,331
212°F	5,569

Tank Heater Values

FT1000e

9KW WASH TANK HEATER - 3 PHASE					
Hobart Part Number	Qty	Voltage	Watts Per Element	Amps Per Heater Element	Cold Resistance Per Heater Element (Ω)
00-562099-00001	2	208	3000	14.4	13.0 - 15.2
00-562099-00002	2	240	3000	12.5	17.3 - 20.2
00-562099-00003	2	380	3000	7.9	43.5 - 50.5
00-562099-00004	2	480	3000	6.3	69.4 - 80.5
00-562099-00005	2	600	3000	5.0	108.5 - 125.8
00-562099-00006	2	415	3000	7.2	51.9 - 60.2

FT1000Se

17.3KW WASH TANK HEATER - 3 PHASE					
Hobart Part Number	Qty	Voltage	Watts Per Element	Amps Per Heater Element	Cold Resistance Per Heater Element (Ω)
00-562100-00001	2	208	5767	27.7	6.7 - 7.9
00-562100-00002	2	240	5767	24.0	9.0 - 10.5
00-562100-00003	2	380	5767	15.2	22.6 - 26.3
00-562100-00004	2	480	5767	12.0	36.1 - 41.9
00-562100-00005	2	600	5767	9.6	56.4 - 65.4
00-562100-00006	2	415	5767	13.9	27.0 - 31.3

FT1000e and FT1000e ADVANSYS

10.7 KW POWER RINSE TANK HEATER - 3 PHASE					
Hobart Part Number	Qty	Voltage	Watts Per Element	Amps Per Heater Element	Cold Resistance Per Heater Element (Ω)
00-562096-00001	2	208	3567	17.1	10.9 - 12.8
00-562096-00002	2	240	3567	14.9	14.6 - 17.0
00-562096-00003	2	380	3567	9.4	36.6 - 42.5
00-562096-00004	2	480	3567	7.4	58.4 - 67.7
00-562096-00005	2	600	3567	6.0	91.3 - 105.8
00-562096-00006	2	415	3567	8.6	43.6 - 50.6

FT1000e ADVANSYS

13.1KW WASH TANK HEATER - 3 PHASE					
Hobart Part Number	Qty	Voltage	Watts Per Element	Amps Per Heater Element	Cold Resistance Per Heater Element (Ω)
00-562098-00001	1	208	4367	21.0	8.9 - 10.4
00-562098-00002	1	240	4367	18.2	11.9 - 13.9
00-562098-00003	1	380	4367	11.5	29.9 - 34.7
00-562098-00004	1	480	4367	9.1	47.7 - 55.3
00-562098-00005	1	600	4367	7.3	74.5 - 86.4
00-562098-00006	1	415	4367	10.5	35.6 - 41.4

FT1000e, FT1000Se and FT1000e ADVANSYS

10.7 KW DUAL RINSE TANK HEATER - 3 PHASE					
Hobart Part Number	Qty	Voltage	Watts Per Element	Amps Per Heater Element	Cold Resistance Per Heater Element (Ω)
00-562096-00001	1	208	3567	17.1	10.9 - 12.8
00-562096-00002	1	240	3567	14.9	14.6 - 17.0
00-562096-00003	1	380	3567	9.4	36.6 - 42.5
00-562096-00004	1	480	3567	7.4	58.4 - 67.7
00-562096-00005	1	600	3567	6.0	91.3 - 105.8
00-562096-00006	1	415	3567	8.6	43.6 - 50.6

Booster Heater Values

FT1000e and FT1000Se

15KW ELECTRIC BOOSTER HEATER - 3 PHASE					
Hobart Part Number	Qty	Voltage	Watts Per Element	Amps Per Heater Element	Cold Resistance Per Heater Element (Ω)
00-562104-00001	1	208	5000	24.0	7.8 -9.5
00-562104-00002	1	240	5000	20.8	10.8 - 12.6
00-562104-00003	1	380	5000	13.2	27.1 - 30.3
00-562104-00004	1	480	5000	10.4	43.3 - 48.3
00-562104-00005	1	600	5000	8.3	67.5 - 75.5
00-562104-00006	1	415	5000	12.1	32.3 - 37.7

FT1000e ADVANSYS

10.7KW ELECTRIC BOOSTER HEATER - 3 PHASE					
Hobart Part Number	Qty	Voltage	Watts Per Element	Amps Per Heater Element	Cold Resistance Per Heater Element (Ω)
00-562104-00007	1	208	3567	17.1	10.9 - 12.8
00-562104-00008	1	240	3567	14.9	14.6 - 17.0
00-562104-00009	1	380	3567	9.4	36.6 - 42.3
00-562104-00010	1	480	3567	7.4	58.4 - 67.7
00-562104-00011	1	600	3567	6.0	91.3 - 105.8
00-562104-00012	1	415	3567	8.6	43.6 - 50.6

Blower Dryer Heater Values

FT1000e and FT1000Se

1.5KW BLOWER DRYER HEATER - 3 PHASE					
Hobart Part Number	Qty	Voltage	Watts Per Element	Amps Per Heater Element	Cold Resistance Per Heater Element (Ω)
00-562095-00001	3	208	1500	7.2	27.4 - 30.2
00-562095-00002	3	240	1500	6.3	36.2 - 40
00-562095-00003	3	380	1500	4.0	90.3 - 99.8
00-562095-00004	3	480	1500	3.1	147.1 - 162.5
00-562095-00005	3	600	1500	2.5	228 - 252
00-562095-00006	3	415	1500	3.6	109.5 - 121.1

Motor Values

PREWASH, WASH, POWER RINSE PUMP MOTORS				
Hobart Part Number	Voltage	PH	Hz	FLA
00-974888-00002	208-240-277/415/480	3	60	8.9/8.3/4.8
	200-277/346-415	3	50	8.5/4.9
00-974888-00003	332-346/575-600	3	60	6.3/3.6

FINAL RINSE PUMP MOTOR				
Hobart Part Number	Voltage	PH	Hz	FLA
00-563651-00001	230/460	3	60	1.69/0.84
	190-220/380-415	3	50	1.8-1.7/0.9-0
00-563651-00002	575	3	60	0.7

CONVEYOR DRIVE MOTOR				
Hobart Part Number	Voltage	PH	Hz	FLA
00-947987	230	3	60	1.29

DUAL RINSE & ASR RECIRCULATING PUMP MOTOR				
Hobart Part Number	Voltage	PH	Hz	FLA
00-947899-00001	208-240/440-480	3	60	0.8/0.4
00-947899-00003	575	3	60	0.35
00-947899-00004	208-240/440-480	3	60	1.0/0.5

ASR SOIL PUMP MOTOR				
Hobart Part Number	Voltage	PH	Hz	FLA
00-947900-00001	208-240/440-480	3	60	1.08 - 0.54
00-947899-00003	575	3	60	0.45
00-947899-00004	208-240/440-480	3	60	1.08 - 0.54
00-947899-00006	575	3	60	0.45

BLOWER DRYER MOTOR				
Hobart Part Number	Voltage	PH	Hz	FLA
00-949855-00001	230/460	3	60	3.4/2.1
	380	3	60	2.1
	480	3	50	2.0
00-949855-00002	575	3	60	1.6

ADVANSYS FAN				
Hobart Part Number	Voltage	PH	Hz	FLA
00-815887-00001	230	3	60	1.0 @ HIGH SPEED
				.092 @ LOW SPEED
00-815887-00002	230	3	60	0.5 @ HIGH SPEED
				0.46 @ LOW SPEED

PROGRAMMING

The FT1000e dish machines allow customization options for machine operation. All customization is performed through the on-screen menu using the UP, DOWN/MENU, ENTER, and STOP/BACK buttons located on the keypad on the control box door.

The following prompts are used inside the programming menus.

The UP and DOWN arrow buttons are used to change parameter values and to navigate the menu.

The ENTER button is used to accept a value, perform a specified action or enter a submenu.

The BACK button will always revert back to the previous menu screen.

The text just to the right of the '>' symbol on the display screen shows what action or command will occur by pressing the ENTER button.

Manager Menu

To activate or change the editable features, follow the below procedure to enter the Manager Menu.

1. If the machine is powered off, press the POWER button to turn the dish machine on. The display will show the ready screen once the fill cycle has completed.
2. Press the MENU button to navigate into the *Main Menu*.
3. With the '>' symbol to the left of Manager, press the ENTER button. This will take you to the *Enter Security Code* screen and will display four asterisks [****].
4. Use the UP and DOWN buttons to change the digit of the Security Code to the appropriate value*.

   * **The default Security Code to enter the Manager programming menu is 1001.** This code can be changed by anyone with this knowledge, and it is recommended to change it from the default code. If the code is ever lost or forgotten, it can be reset in the Service programming menu.

5. With the appropriate value displayed, press the ENTER button to toggle to the next digit to the right.
6. Repeat steps 4 and 5 for each remaining digit. After pressing the ENTER button on the fourth digit, the *Manager Menu* will be displayed.
7. Press the UP and DOWN buttons until the '>' symbol is to the left of the desired option in the Manager menu and then press the ENTER button. The Manager Menu options are: *About, Actions, Logs,* and *Operations Parameters*.

About

The About screen displays the following information: *Machine Model, Control Board Revision, Relay Board Revision, Software Version, Sanitizing Mode,* and *Service Number*.

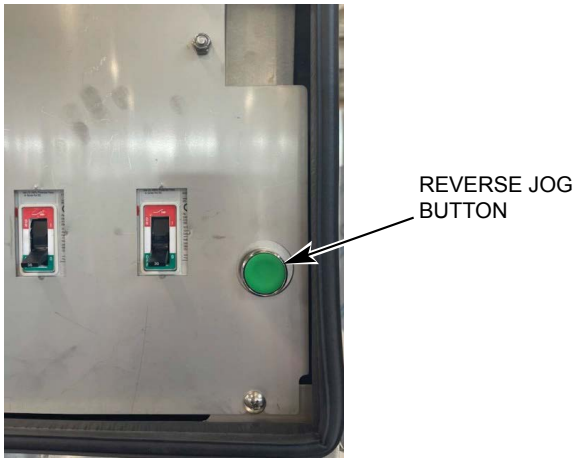
Actions

The Actions Menu provides the following options:

- *Change Manager Code*: Allows the manager security code to be changed from the default value.
- *Reverse Jog*: Allows the conveyor to be jogged in the reverse direction in case there is a conveyor jam. When entering this mode, the following message is displayed:

  Be sure all personnel clear of conveyor. Press button in upper Control Box while pressing Enter.
  > Exit without jogging
  Reverse jog conveyor

To reverse jog the conveyor, press the ENTER button with the '>' symbol located to the left of *Reverse jog conveyor* while also pressing the green button located behind the upper control box door.



- *Run Delime Cycle*: Initiates the Auto Delime cycle (if equipped); refer to the Deliming section on page 18 of this manual for the complete procedure.
- *Set Date/Time*: Enter this screen to set the date and time.

Logs

The Logs menu provides the following options:

- *Delime Counter*: Displays the time remaining before the delime recommended notification is displayed. Also allows the ability to clear the delime counter.
- *Error Log*: Displays the previous errors along with the date/time the errors occurred.
- *Statistics*: Entering the statistics screen will display the following information: *Time of Operation, Run Time Percent, Rinse Time,* and *Fill Time*.

Operations Parameters

NOTE: The parameters can be changed anytime the display is active, which is when the machine is operating or in idle mode.

Hobart believes that the default settings that leave the factory are suitable for the majority of kitchen operations. However, there are cases where kitchen managers may find the need to change one or more options; the Parameters Menu allows these changes.

Within the Parameters Menu, the manager (or operator, in some cases) may modify factory default settings. The menu structure and description of each option are detailed below.

Parameter Name	Description	Possible Values	Default Value
Auto Timeout	Adjustable timer for determining when to shut down the pumps and conveyor when no dishes are in the machine.	1 – 30 mins	6 mins
Conveyor Speed High	Sets the High conveyor speed setting when the operator presses the Speed Selection button on the keypad changing the setting to Speed: High.	4.0 – 8.5	8.5 ft/min
Conveyor Speed Low	Sets the Low conveyor speed setting when the operator presses the Speed Selection button on the keypad changing the setting to Speed: Low.	4.0 – 8.5	4.0 ft/min
Conveyor Speed Medium	Sets the Medium conveyor speed setting when the operator presses the Speed Selection button on the keypad changing the setting to Speed: Medium.	4.0 – 8.5	6.3 ft/min
Delime – Main Tanks Quantity	Sets the number of delimer gallons required per tank.	0.0 – 2.0	0.50
Delime – Water Hardness	Water hardness input setting which the control uses for determining when to delime the machine.	0 – 250	0
Delime Concentration	Sets the delimer concentration for the final rinse and booster system.	1.5% 3.0%	3.0%
Delime Demo Mode	Enables or disables the Delime Demo Mode. When enabled, this mode allows the Delime cycle to be demonstrated for training purposes without running the complete cycle.	Disabled Enabled	Disabled
Dish Limit till BD Heat Off	Sets the period of time (in seconds) until the blower dryer heat turns off after a dish activates the dish limit.	0 – 60 seconds	60 seconds
Dirty Water Interval	Sets the period (in hours) of rinsing before an alert is shown. This option is only available when Dirty Water Mode is set to “Alert” or to “Alert + Lockout”.	1 – 6 hours	4 hours

Parameter Name	Description	Possible Values	Default Value
Dirty Water Mode	Can be enabled to indicate that the water may be dirty and may need to be changed. Monitors the final rinse on time and when the final rinse on time exceeds a user-definable level, a message will display. The message will not be disabled until a water change event occurs by draining all tanks in the machine. There are three different modes. Disabled: Ignores dirty water. Alert : Displays “Water Change Required” after a period of operation but does not require refilling. Alert + Lockout: Displays “Change Water Soon” for 5 minutes after a period of operation; then “Water Change Required” displays and the machine cannot run until all tanks are drained and refilled.	Disabled Alert Alert + Lockout	Disabled
Disable When Drain Open	If enabled, prevents machine operation if any tank drain is open.	Disabled Enabled	Disabled
Energy Saver Time	After a period of machine inactivity, the control initiates Energy Saver Mode: All warewash components are turned off, and the display on the keypad dims, displaying “Energy Saver On”. To exit Energy Saver mode, press the STOP button on the keypad. You may also press the POWER button to completely turn the machine off. If ware is present in machine, Energy Saver mode will not activate.	1 – 6 hours	2 hours
Final Rinse Flow Setting	Sets the water flow rate used for calculating when the Delime Recommended notification is displayed. Low: standard 0.97 gpm final rinse High: 1.5 gpm final rinse	Low High	Low
Language Select	Enables or disables the ability for the operator to change the displayed language.	Disabled Enabled	Disabled

Parameter Name	Description	Possible Values	Default Value
Low FR Temperature Alarm	Enables or disables a visual alarm on the display that indicates that Final Rinse water temperature is below the NSF required minimum of 180°F (82°C). When enabled, a message will display notifying the user of this condition. However, machine operation will not change, and ware will continue to run through the machine as expected. When disabled, there will be no extra message indicating a low temperature event; however, the temperature display will still show the current Final Rinse water temperature.	Disabled Enabled	Disabled
Primary Language	This option sets the default language shown on the display.	English French Spanish	English
Remote Monitor	Turns on remote monitor. Sends a status message out a serial port on a time basis.	Disabled Enabled	Disabled
Remote Monitor Time	This is set to how often the remote monitor message is transmitted. **NOTE:** Contact support to request the message format for this feature.	1 – 900 secs	60 secs
Super Operator Access	Enables or disables the Super Operator access level. When enabled, this allows any user to modify values in the Parameters Menu that are marked as requiring only SO security without entering a password. When disabled, the only operation allowed by any user is the ability to enter the Security Code and exit the menu. No parameters are allowed to be modified.	Disabled Enabled	Disabled
Tank Stirring	Enables or disables the tank stirring mode which turns the pumps on for 15 seconds for every 15 minutes of idle time to keep the machine chambers hot.	Disabled Enabled	Disabled
Tank Temperature Alert	Displays a message when the water temperature for any tank falls below minimum requirement for at least ten minutes. After temperature increases past the minimum requirement, the message stops.	Disabled Enabled	Disabled
Temperature Units	Sets whether temperatures and set points are displayed in °F or °C.	F C	F

Service Menu

To activate or change the editable features, follow the below procedure to enter the Service Menu.

NOTE: Altering parameters from machine cofiguration as shipped may cause operation issues. Resetting parameters back to factory default settings is not covered under warranty.

1. If the machine is powered off, press the POWER button to turn the dish machine on. The display will show the ready screen once the fill cycle has completed.
2. Press the MENU button to navigate into the *Main Menu*.
3. With the '>' symbol to the left of Service, press the ENTER button. This will take you to the *Enter Security Code* screen and will display four asterisks [****].
4. Use the UP and DOWN buttons to change the digit of the Security Code to the appropriate value*.

   *** The Security Code to enter the Service programming menu is 8934.**
5. With the appropriate value displayed, press the ENTER button to toggle to the next digit to the right.
6. Repeat steps 4 and 5 for each remaining digit. After pressing the ENTER button on the fourth digit, the *Service Menu* will be displayed.
7. Press the UP and DOWN buttons until the '>' symbol is to the left of the desired option in the Service menu and then press the ENTER button. The Service Menu options are: *About, Actions, Logs, Machine Configuration* and *Operations Parameters*.

About

The About screen displays the following information: *Machine Model, Control Board Revision, Relay Board Revision, Software Version, Sanitizing Mode,* and *Service Number*.

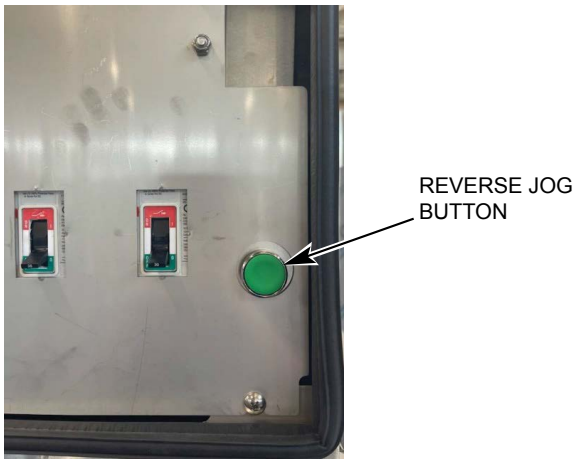
Actions

The Actions Menu provides the following options:

- *Change Manager Code*: Allows the manager security code to be changed from the default value.
- *Diagnostic Menu:*
  - *Read Sensors*: Displays real time sensor readings for temperatures, float conditions, pressure sensor voltage, switch conditions, etc.
  - *Toggle Outputs*: Toggles control board outputs on for 5 seconds for every 15 seconds off. **NOTE:** Toggle will remain on until turned off in controls.
- *Initialize Conveyor VFDrive*: Refer to Programming Variable Frequency Drive on page 124.
- *Reverse Jog*: Allows the conveyor to be jogged in the reverse direction in case there is a conveyor jam. When entering this mode, the following message is displayed:

  Be sure all personnel clear of conveyor. Press button in upper Control Box while pressing Enter.
  > Exit without jogging
  Reverse jog conveyor

To reverse jog the conveyor, press the ENTER button with the '>' symbol located to the left of *Reverse jog conveyor* while also pressing the green button located behind the upper control box door.



- *Run Delime Cycle*: Initiates the Auto Delime cycle (if equipped); refer to the Deliming section on page 18 of this manual for the complete procedure.
- *Set Date/Time*: Enter this screen to set the date and time.

Logs

The Logs menu provides the following options:

- *Delime Counter*: Displays the time remaining before the delime recommended notification is displayed. Also allows the ability to clear the delime counter.
- *Error Log*: Displays the previous errors along with the date/time the errors occurred.
- *Statistics*: Entering the statistics screen will display the following information: *Time of Operation, Run Time Percent, Rinse Time,* and *Fill Time*.

Machine Configuration (Replacement Control Board Programming)

After a control board has been replaced, the machine configuration must be set to match the configuration of the machine as it shipped from the factory. **NOTE: If the service programming menu is still accessible prior to replacing the control board, enter the Machine Configuration menu and note the settings of each parameter within the menu.** If the service programming menu is not accessible, email the serial number for the dish machine to **HobartDishwasherSupport@itwfeg.com** for a configuration sheet specific to the serial number.

Operation Parameters

NOTE: The parameters can be changed anytime the display is active, which is when the machine is operating or in idle mode.

The menu structure and description of each option are detailed below.

Parameter Name	Description	Possible Values	Default Value
Auto Timeout	Adjustable timer for determining when to shut down the pumps and conveyor when no dishes are in the machine.	1 – 30 minutes	6 minutes
Conveyor Speed High Limit	Sets the high limit for the High conveyor speed setting.	4.0 – 15.0 ft/min	8.5 ft/min
Conveyor Speed High	Sets the High conveyor speed setting when the operator presses the Speed Selection button on the keypad changing the setting to Speed: High.	4.0 – 8.5	8.5 ft/min
Conveyor Speed Low	Sets the Low conveyor speed setting when the operator presses the Speed Selection button on the keypad changing the setting to Speed: Low.	4.0 – 8.5	4.0 ft/min
Conveyor Speed Medium	Sets the Medium conveyor speed setting when the operator presses the Speed Selection button on the keypad changing the setting to Speed: Medium.	4.0 – 8.5	6.3 ft/min
Conveyor VFDrive Baud Rate	**DO NOT CHANGE**	0 = 4800 1 = 9600 2 = 19.2K	2 = 19.2K
Conveyor VFDrive ID	**DO NOT CHANGE**	1 – 247 (increments of 1)	247
Delime – Main Tanks Quantity	Sets the number of delimer gallons required per tank.	0.0 – 2.0	0.50
Delime – Water Hardness	Water hardness input setting which the control uses for determining when to delime the machine.	0 – 250	0
Delime Concentration	Sets the delimer concentration for the final rinse and booster system.	1.5% 3.0%	3.0%
Delime Demo Mode	Enables or disables the Delime Demo Mode. When enabled, this mode allows the Delime cycle to be demonstrated for training purposes without running the complete cycle.	Disabled Enabled	Disabled
Dish Limit till BD Heat Off	Sets the period of time (in seconds) until the blower dryer heat turns off after a dish activates the dish limit.	0 – 60 seconds	60 seconds
Dirty Water Interval	Sets the period (in hours) of rinsing before an alert is shown. This option is only available when Dirty Water Mode is set to “Alert” or to “Alert + Lockout”.	1 – 6 hours	4 hours

Parameter Name	Description	Possible Values	Default Value
Dirty Water Mode	Can be enabled to indicate that the water may be dirty and may need to be changed. Monitors the final rinse on time and when the final rinse on time exceeds a user-definable level, a message will display. The message will not be disabled until a water change event occurs by draining all tanks in the machine. There are three different modes. Disabled: Ignores dirty water. Alert : Displays “Water Change Required” after a period of operation but does not require refilling. Alert + Lockout: Displays “Change Water Soon” for 5 minutes after a period of operation; then “Water Change Required” displays and the machine cannot run until all tanks are drained and refilled.	Disabled Alert Alert + Lockout	Disabled
Disable When Drain Open	If enabled, prevents machine operation if any tank drain is open.	Disabled Enabled	Disabled
Dish Sensitivity	Adjusts the limit to which the control assumes a dish is blocking the photo beam. A higher number will make the control less sensitive to passing ware. A lower number will make the control more sensitive.	10mS – 2500mS (increments of 10mS)	300mS
DR Lower Float Threshold	Sets the lower threshold (mV) for DR pressure sensor. Sets the minimum water level which activates and deactivates the heater.	0mV – 3300mV (increments of 10mV)	800mV
DR Upper Float Threshold	Sets the higher threshold (mV) for DR pressure sensor. Sets the maximum water level which turns the dual rinse tank fill off.	0mV – 3300mV (increments of 10mV)	850mV
Dual Rinse Float Hysteresis	Supplies mV reading for water level in Dual Rinse tank. This is set to prevent immediate opening and closing of the pumped rinse from the bouncing of the water while machine is in operation.	0mV – 500mV (increments of 10mV)	20mV
Energy Saver Time	After a period of machine inactivity, the control initiates Energy Saver Mode: All warewash components are turned off, and the display on the keypad dims, displaying “Energy Saver On”. To exit Energy Saver mode, press the STOP button on the keypad. You may also press the POWER button to completely turn the machine off. If ware is present in machine, Energy Saver mode will not activate.	1 – 6 hours	2 hours

Parameter Name	Description	Possible Values	Default Value
Final Rinse Delay	Time dishes reach dish limit until Final Rinse turns off.	1 – 3 minutes (increment of 1 minute)	3 minutes
Final Rinse Flow Setting	Sets the water flow rate used for calculating when the Delime Recommended notification is displayed. Low: standard 0.97 gpm final rinse High: 1.5 gpm final rinse	Low High	Low
Final Rinse High Flow Rate	Sets the gpm value for the High Final Rinse Flow Setting.	0.0 – 10.0 gpm (increments of 0.01 gpm)	1.50 gpm
Final Rinse Low Flow Rate	Sets the gpm value for the Low Final Rinse Flow Setting.	0.0 – 10.0 gpm (increments of 0.01 gpm)	0.97 gpm
Final Rinse Post-Buffer	Sets Final Rinse to stay on for additional inches of conveyor travel past Dual Rinse tank.	0.0 – 24.0” (increments of 1.0”)	4.0”
Final Rinse Pre-Buffer	Sets Final Rinse to come on for additional inches of conveyor travel before Dual Rinse tank.	0.0 – 24.0” (increments of 1.0”)	2.0”
Final Rinse Setpoint	Sets a number of degrees to a setpoint for Final Rinse temperature.	180.1°F – 190.0°F (increments of .1°F)	185.0°F
Hold Tank Fill Timeout	Sets the time that the holding tank float switch must close once the holding tank fill has started before displaying the holding tank error.	0 – 1000 seconds (increments of 1 second)	30 seconds
Hold Tank Overfill Time	Time that the holding tank fill will remain on for once the holding tank float switch has closed.	0 – 300 seconds (increments of 1 second)	5 seconds
Language Select	Enables or disables the ability for the operator to change the displayed language.	Disabled Enabled	Disabled
Low FR Temperature Alarm	Enables or disables a visual alarm on the display that indicates that Final Rinse water temperature is below the NSF required minimum of 180°F (82°C). When enabled, a message will display notifying the user of this condition. However, machine operation will not change, and ware will continue to run through the machine as expected. When disabled, there will be no extra message indicating a low temperature event; however, the temperature display will still show the current Final Rinse water temperature.	Disabled Enabled	Disabled

Parameter Name	Description	Possible Values	Default Value
Main Tank Overfill Time	Time fill stays on after upper Pressure Sensors are closed.	1 – 500 seconds (increments of 1 second)	30 seconds
NAFEM DP Baud	**DO NOT CHANGE**	4800 9600 19.2K	9600
NAFEM DP ID	**DO NOT CHANGE**	1 – 247 (increments of 1)	5
Primary Language	This option sets the default language shown on the display.	English French Spanish	English
Remote Monitor	Turns on remote monitor. Sends a status message out a serial port on a time basis.	Disabled Enabled	Disabled
Remote Monitor Time	This is set to how often the remote monitor message is transmitted. **NOTE:** Contact support to request the message format for this feature.	1 – 900 seconds	60 seconds
Sanitizing Mode	Can be set to High Temperature or Low Temperature. High temperature mode runs the machine at current machine setpoints.	High Temperature Low Temperature	High Temperature
Super Operator Access	Enables or disables the Super Operator access level. When enabled, this allows any user to modify values in the Parameters Menu that are marked as requiring only SO security without entering a password. When disabled, the only operation allowed by any user is the ability to enter the Security Code and exit the menu. No parameters are allowed to be modified.	Disabled Enabled	Disabled
Tank Stirring	Enables or disables the tank stirring mode which turns the pumps on for 15 seconds for every 15 minutes of idle time to keep the machine chambers hot.	Disabled Enabled	Disabled
Tank Temperature Alert	Displays a message when the water temperature for any tank falls below minimum requirement for at least ten minutes. After temperature increases past the minimum requirement, the message stops.	Disabled Enabled	Disabled
Tank Temperature Hysteresis	Number of degrees after setpoint before shutting off heat. **NOTE:** Advansys Only: Tank 2 hysteresis is fixed to +4°F (Non-Adjustable)	2 – 10 (increments of 1)	6

Parameter Name	Description	Possible Values	Default Value
Tank D (Dual Rinse) Setpoint	Set for number of degrees set point for Tank D temperature.	High Temp: 160.1°F – 170.0°F (increments of .1°F) Low Temp: 70.0°F – 190.0°F (increments of .1°F)	High Temp: 165.0°F Low Temp: 125.0°F
Tank 1 Setpoint	Set for number of degrees set point for Tank 1 temperature.	Tank 1 (Rinse Tank) 160.1°F – 170.0°F (increments of .1°F) Tank 1 (Wash Tank) 160.1°F – 170.0°F (increments of .1°F)	Tank 1 (Rinse Tank) 165.0°F Tank 1 (Wash Tank) 165.0°F
Tank 2 Setpoint	Set for number of degrees set point for Tank 2 temperature. **NOTE:** Cannot change setpoint for Advansys.	Tank 2 (Wash Tank) 150.1°F – 160.0°F (increments of .1°F) Advansys Only: 150.1°F – 152.0°F (increments of .1°F) Tank 2 (Prewash Tank) 0.0°F (none)	Wash Tank 155.0°F Advansys 151.0°F
Tank 3 Setpoint	Set for number of degrees set point for Tank 3 temperature.	Tank 3 (Prewash) 0.0°F (none)	0.0°F (none)
Tank 4 Setpoint	Set for number of degrees set point for Tank 4 temperature.	0.0°F (none)	0.0°F (none)
Tank 5 Setpoint	Set for number of degrees set point for Tank 5 temperature.	0.0°F (none)	0.0°F (none)
Temperature Units	Sets whether temperatures and set points are displayed in °F or °C.	F C	F

Programming Variable Frequency Drive

NOTE: Variable Frequency Drive (VFD) will only need to be programmed when the drive is replaced. The VFD will not need to be programmed when the conveyor and/or conveyor motor are replaced.

1. Turn the machine on by pressing the POWER button on the keypad.

NOTE: Display will periodically show “No Comms. w/ VFD”.

2. Refer to the Programming section on page 112 and enter the Service Menu.
3. Navigate to Actions and press the ENTER button.
4. Select Initialize Conveyor VFDrive and press the Enter button.
5. Select Initialize VFDrive and press the ENTER button to program the drive.
6. The following sequence will be displayed on the Status line if the VFDrive is successfully initialized.
    a. “Initializing”.
    b. “Resetting VFDrive”.
        1) A countdown timer will be displayed indicating the approximate time left for the VFDrive reset.
    c. “Initialization Successful”.
7. If initialization is not successful, “Initialization Failed” will be displayed in place of “Initialization Successful”.
8. After returning to the “Run” screen, “No Comms. w/ VFD” will no longer be displayed.
9. To exit without Initializing VFDrive, select “Exit” and press the ENTER button or press the STOP/BACK button on the keypad.

Firmware Update

FT1000e Firmware Download Procedure

1. Scan the below QR code or visit **https://warewash.hobartcorp.com/ft1000ewiringdiagrams** and download the firmware file (.bin). **NOTE: When downloading the file, ensure the file name remains the same once downloaded.**

2. On a blank USB drive, load the .bin file onto the main directory. Do not load the file in a folder.

NOTE: SanDisc USB drive is recommended. Not all thumb drives are compatible with the control board.

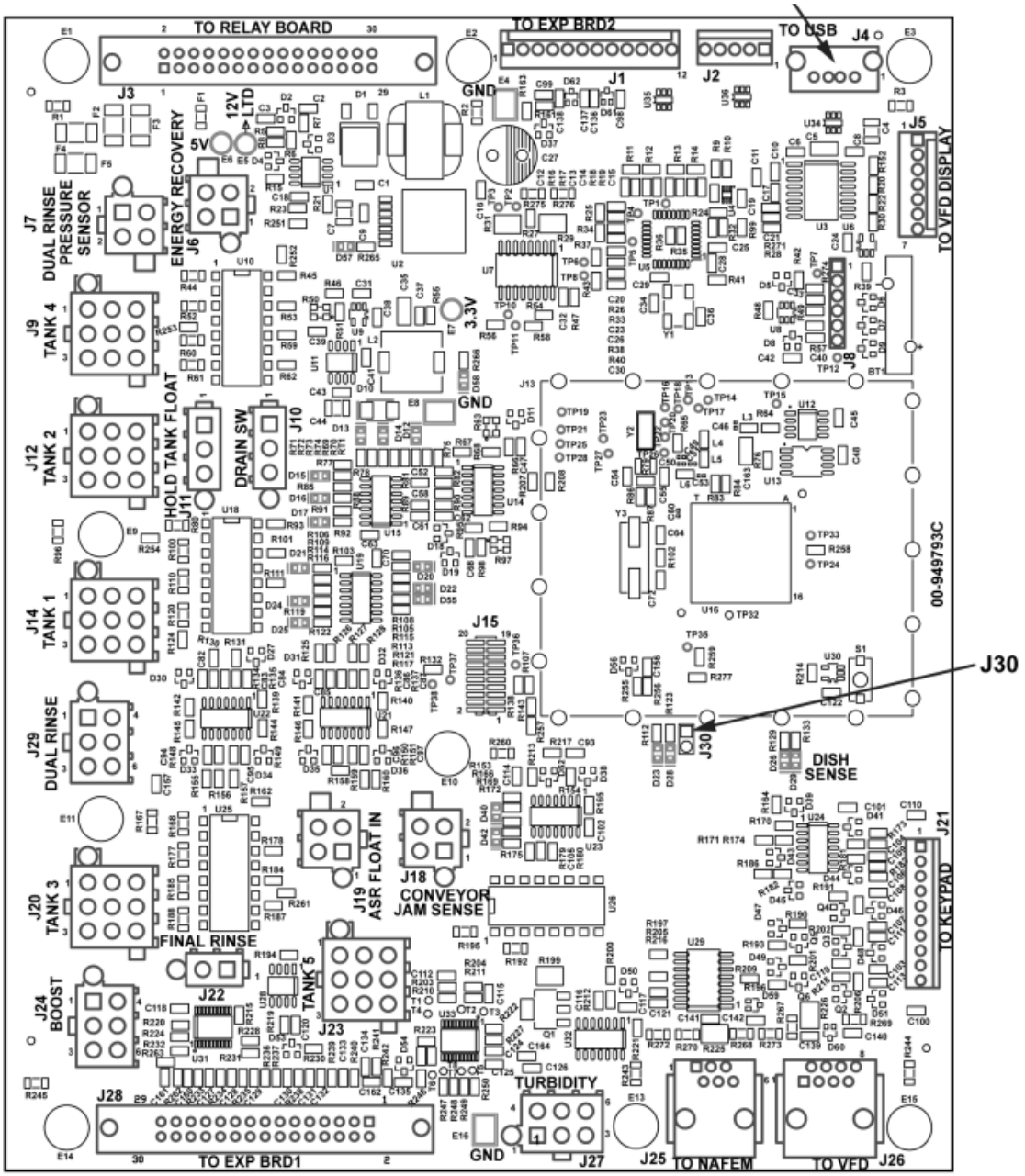
Updating Firmware

1. Refer to the MACHINE CONFIGURATION (Replacement Control Board Programming) section under SERVICE MENU and note all configuration settings. If the service menu is not accessible, email the serial number for the dish machine to HobartDishwasherSupport@itwfeg.com for a configuration sheet specific to the serial number.

2. Press the POWER button to turn the machine off.

3. Insert the USB drive into the USB port (J4 on the control board). See below diagram.

4. Place the jumper located on J30 across both pins of J30. See below diagram.



5. Press the POWER button to turn the machine on.

6. Display should exhibit:

BOOTLOADER v.1.01	
Connecting to USB drive	
Searching for image file	Found
Verifying file CRC	Valid
Erasing flash memory	Done
Programming vX.XX (Where vX.XX is the firmware version being installed will be displayed.)	Done
Verifying application	Valid
Starting vX.XX (Where vX.XX is the firmware version being installed will be displayed.)	

7. Press the POWER button to turn the machine on.

8. Verify new firmware version is displayed.

9. Enter MACHINE CONFIGURATION (Replacement Control Board Programming) menu and set the machine parameters as noted in step 1 or from the machine configuration sheet obtained from the serial number.

10. Press the POWER button to turn the machine off.

11. Remove the jumper from J30 on the control board and place the jumper on one of the J30 pins for storage.

12. Remove the USB drive from the J4 USB port.

13. Press the POWER button to turn the machine on.

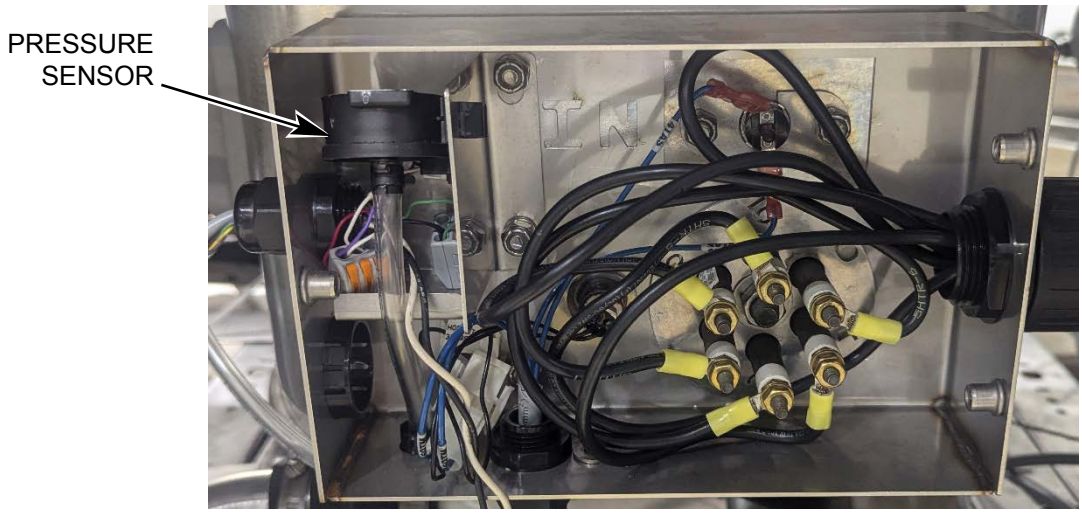
14. Verify that the machine configuration parameter settings haven't changed as entered in step 9.

15. Verify "BOOTLOADER v1.01" is **NOT** displayed.

DUAL RINSE UPPER & LOWER PRESSURE SENSOR THRESHOLD CALIBRATION

Follow the below procedure to set the dual rinse upper and lower pressure sensor threshold settings after replacing the pressure sensor or if experiencing issues with dual rinse tank water level.

A pressure sensor is a form of switch that closes an electrical contact when a certain set pressure has been reached on its input.



NOTE: Verify there is no water in the pressure sensor tube.

NOTE: Verify the pressure sensor tube is installed properly. Ensure the tube has no low points and is not looped. See image below for correct installation.

NOTE: This procedure should be done after the tank is full. Pressures will be measured by removing water from tank.

NOTE: Remove strainer pan to view water level.

1. Drain the water in the tank ½" below the overflow and record the DR Upper Float (Pressure Sensor) Threshold voltage.
   a. Enter the SERVICE MENU. Refer to the PROGRAMMING section on page 112.
   b. Select Action > Diagnostic Menu > Read Sensors and then scroll down to Dual Rinse Voltage. Record the dual rinse voltage displayed.
2. Drain the water in the tank ½" above the heating element (electric heat machines) or the steam coil (steam heat machines) and record the new dual rinse voltage that is displayed. This is the DR Lower Float (Pressure Sensor) Threshold voltage.

3. Press the back button to access the main SERVICE MENU and select Operations Parameters.

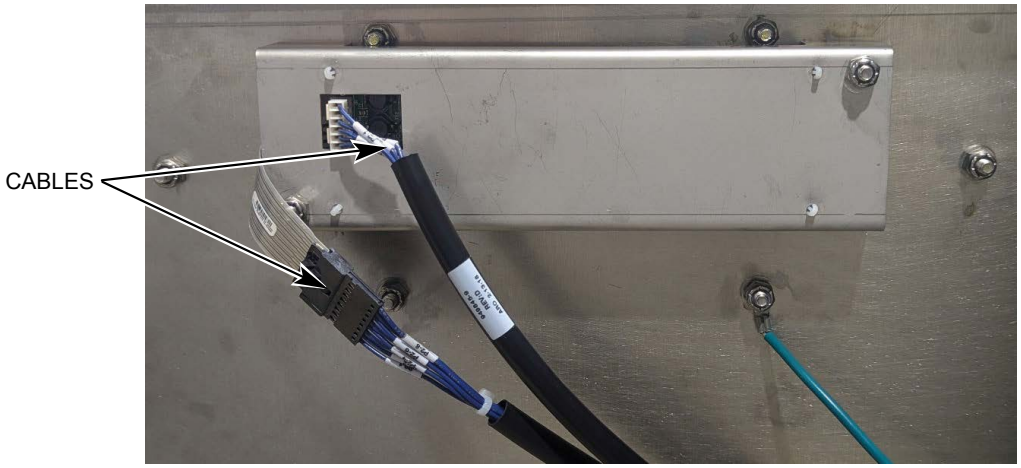
4. Once in the Operations Parameters menu, scroll down and change the DR Lower & Upper Float Threshold settings to the recorded values in steps 1 and 2 above.

Parameter Name	Description	Possible Values	Default Value
DR Lower Float Threshold	Sets the lower threshold (mV) for DR pressure sensor. Sets the minimum water level which activates and deactivates the heater.	0mV – 3300mV (increments of 10mV)	800mV
DR Upper Float Threshold	Sets the higher threshold (mV) for DR pressure sensor. Sets the maximum water level which turns the dual rinse tank fill off.	0mV – 3300mV (increments of 10mV)	850mV

KEYPAD – MEMBRANE TEST

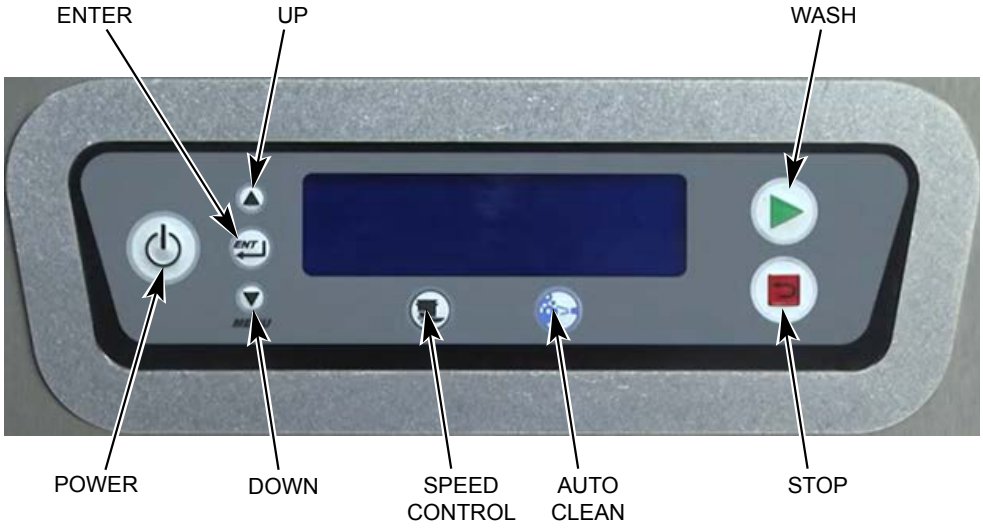
⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures. There may be multiple circuits. Be sure all circuits are disconnected.

1. Open the control box door.
2. Disconnect the cables from the keypad to the control panel.



3. Locate pins 1 through 8 on the keypad ribbon cable.

4. While pressing the buttons, check for resistance using the chart below.



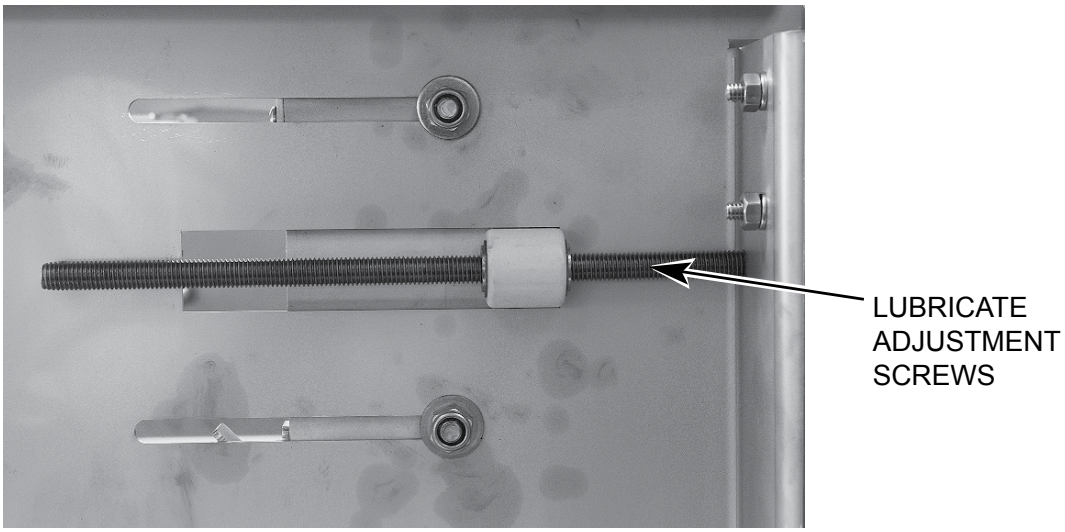
FUNCTION KEY	PINS	EXPECTED VALUE
POWER	1, 2	0-100 Ω
UP	3, 4	0-100 Ω
ENTER	6, 7	0-100 Ω
DOWN	4, 5	0-100 Ω
SPEED CONTROL	4, 7	0-100 Ω
AUTO CLEAN	7, 8	0-100 Ω
WASH	3, 8	0-100 Ω
STOP	5, 6	0-100 Ω

CONVEYOR MAINTENANCE

Lubrication

Conveyor Adjustment Screws

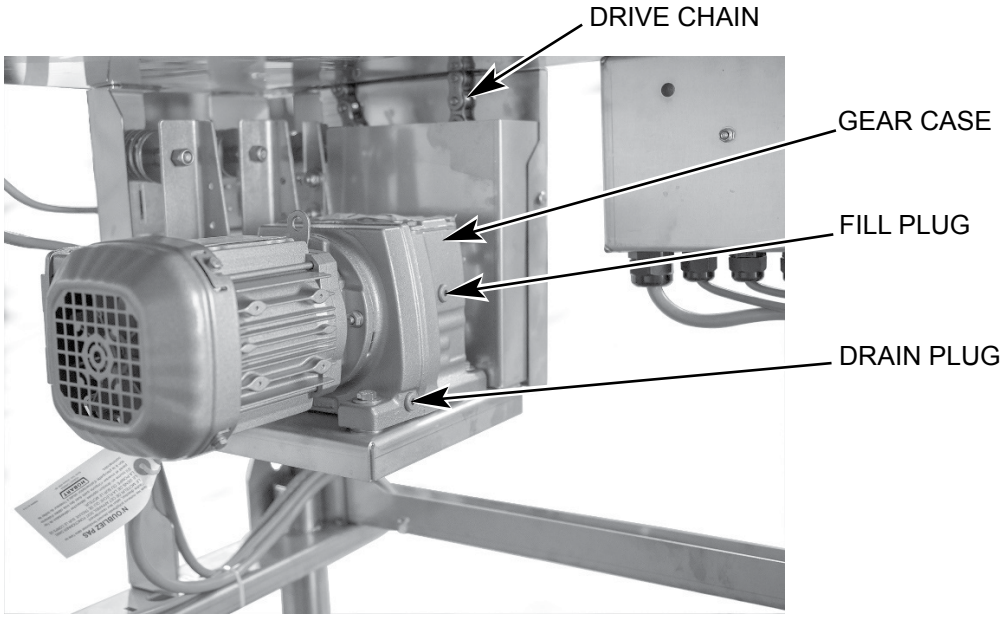
Lubricate the two conveyor adjustment screws at the load end (front and back) of the machine every 6 months with white lithium grease.



Conveyor Drive Chain & Conveyor Motor Gear Case

Inspect the conveyor drive chain every 6 months and lubricate as required with white lithium grease.

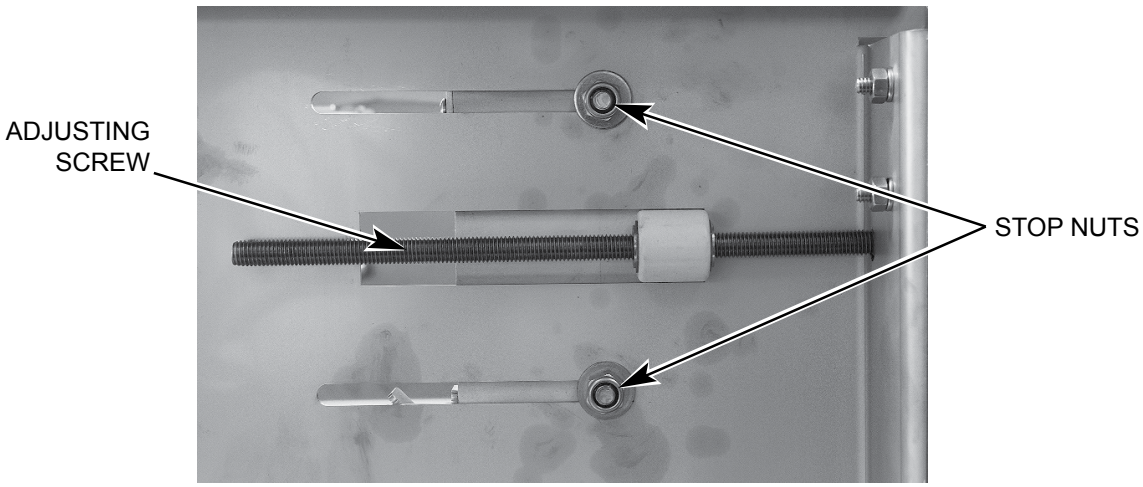
Check the oil level in the conveyor motor gear case every 6 months. The oil level should be at the bottom of the fill plug hole. Use only Mobilegear #630 to replenish or replace the oil.



Conveyor Tension Adjustment

Over time, the conveyor assembly may stretch & become loose requiring adjustment. Follow the below procedure to properly adjust the conveyor tension.

1. Loosen the two stop nuts located on both the front and rear take-up assemblies on the outside of the tracks located at the load end of the machine.



2. Tighten the tension on the conveyor by turning the adjusting screws on the take-up units clockwise. Proper tension is achieved when the conveyor rollers run freely on the bottom track and, by grasping a conveyor rod near the middle with both hands, the conveyor can be lifted vertically so that the conveyor rollers on both sides just clear the top of the tracks. **NOTE:** When turning the adjusting screws, ensure to adjust equally on front and back side of machine.

3. Run the conveyor for 20 minutes.

4. After running the conveyor for 20 minutes, stop the conveyor and re-check the tension. If required, repeat steps 2 through 4. **NOTE:** While the conveyor is running, ensure the roller shoulders are in bound of the track surfaces on both sides at each end.

5. Once the proper tension is achieved, re-tighten the two stop nuts located on both the front and rear take-up assemblies located at the load end of the machine.

FT1000 Conveyor Anti-Jam Switch Test

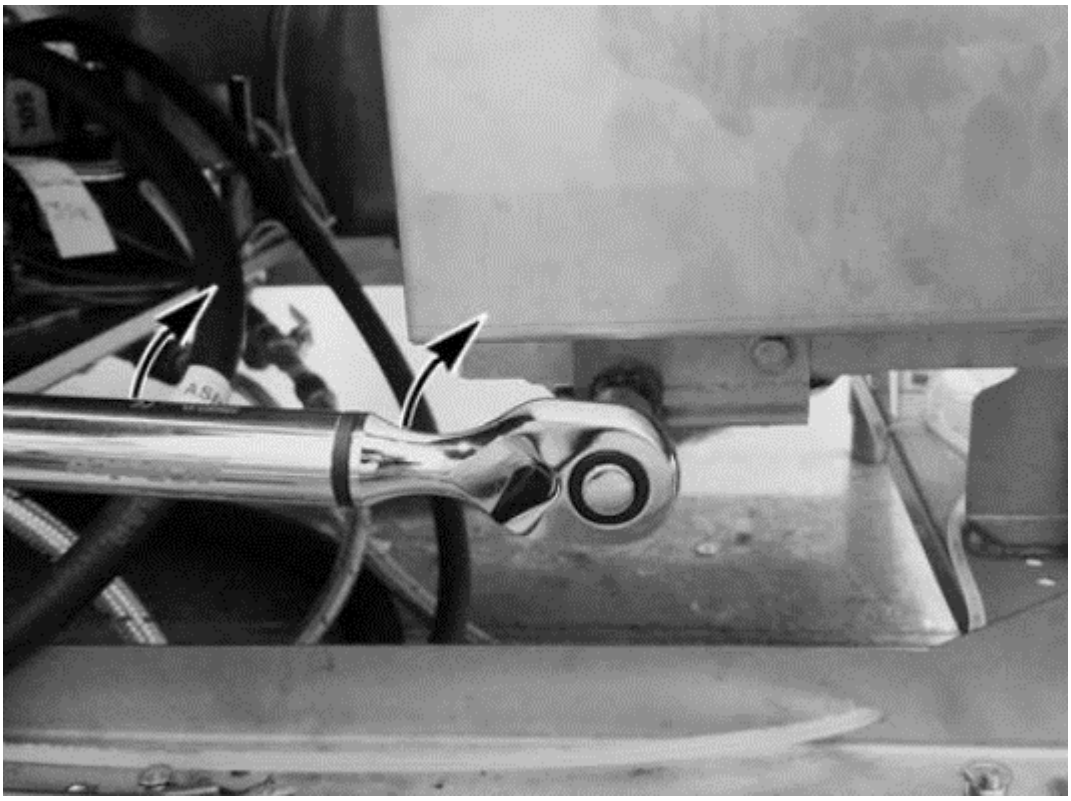
1. Remove unload lower trim panel on conveyor drive side of machine to access the conveyor drive assembly.

NOTE: This procedure should be performed after the machine is fully operational and will require a torque wrench capable of 150-foot pounds.

NOTE: Front panel on L-R machines. Rear panel on R-L machines.

2. Attach continuity meter leads to the switch connections.

3. Using a ½" drive torque wrench with a 5/8" deep well socket set to 135-foot pounds, place torque wrench at the 9 o'clock position, while facing the anti-jam device, and apply torque in a clockwise direction to the hex rod protruding from the base of the drive assembly.



NOTE: With the machine fully operational, that is with the conveyor moving, the torque required to trip the switch should fall between 80–88-foot pounds. However, if testing the switch actuation without the machine running, that is the conveyor is not moving, then the torque required to trip the switch should fall between 124–135-foot pounds.

4. The switch should actuate and break the continuity when torque wrench reaches the set point.

NOTE: If the conveyor jam switch shuts the machine off when torqued to 135-foot pounds, no further action is required. Install lower trim panel.

NOTE: If the conveyor jam switch does not shut the machine off when torqued to 80–88-foot pounds, then proceed to FT1000 Conveyor Anti-Jam Switch Adjustment (page 135) and FT1000 Conveyor Anti-Jam Actuator Plate Adjustment (page 136).

5. Install panels.

FT1000 Conveyor Anti-Jam Switch Adjustment (Serial number 271195888 thru 271196737)

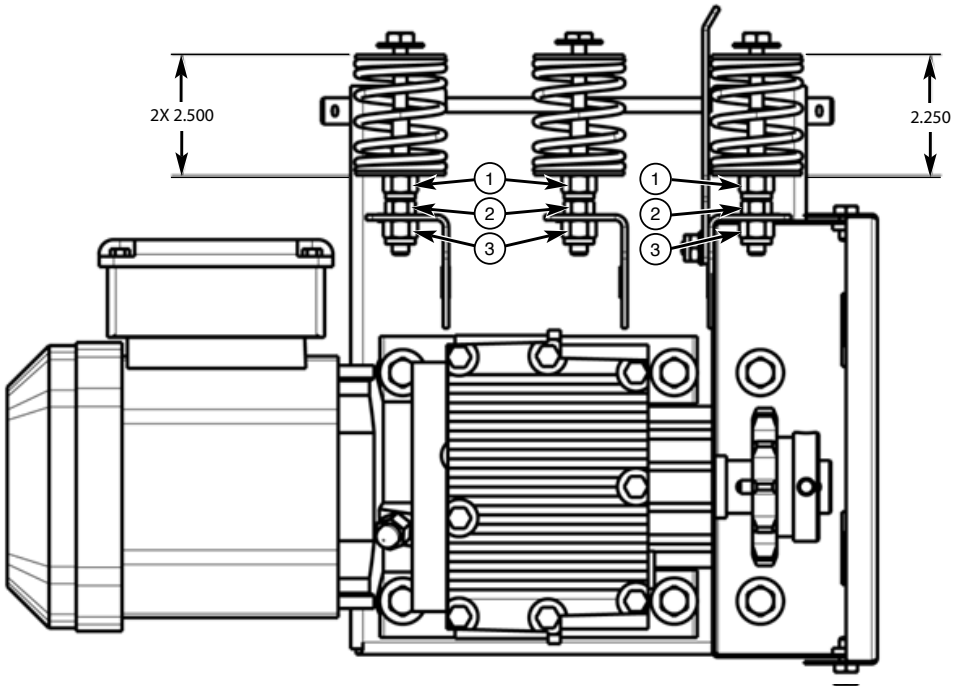
⚠WARNING Certain procedures in this section require electrical test or measurements while power is applied to the machine. Exercise extreme caution at all times. If test points are not easily accessible, disconnect power and follow lockout/tagout procedures, attach test equipment and reapply power to the test.

1. Remove unload lower trim panel on conveyor drive side of machine to access conveyor drive assembly.

NOTE: Front panel on L-R machines. Rear panel on R-L machines.

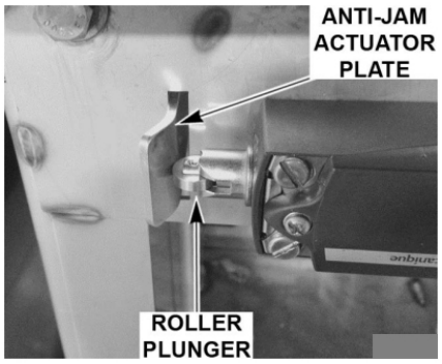
2. Verify the three springs are compressed to the correct dimension as shown below.

NOTE: If any springs are not compressed to the correct dimension, adjust the compression as necessary by loosening or tightening the nut adjacent to the spring(s). Refer to FT1000 Conveyor Anti-Jam Springs Adjustment (page 136).



3. Verify position of conveyor anti-jam actuator plate and jam switch roller plunger to ensure they are positioned as shown below and adjust as necessary.

NOTE: The actuator plate must be in contact with the jam switch roller plunger but **NOT** engaging the switch.



4. Refer to steps 2 and 3 and re-check conveyor jam switch operation.

5. Install panels.

FT1000 Conveyor Anti-Jam Actuator Plate Adjustment

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures. There may be multiple circuits. Be sure all circuits are disconnected.

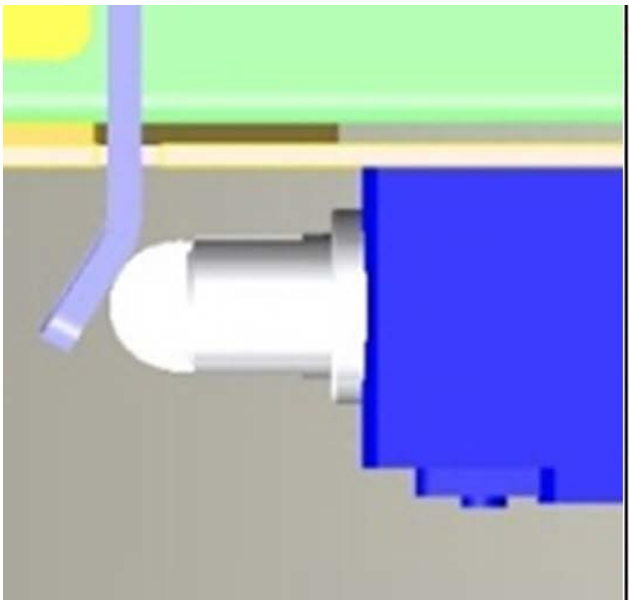
1. Slide actuator plate out until it touches the roller on the anti-jam switch.

2. Center actuator plate vertically in the slotted opening, while tightening the hardware.

3. Push in on the roller to actuate the switch.

4. Release roller to ensure it resets (clicks) into place.

NOTE: Top view shown below.



NOTE: Front view shown below.

FT1000 Conveyor Anti-Jam Springs Adjustment

⚠ WARNING Certain procedures in this section require electrical test or measurements while power is applied to the machine. Exercise extreme caution at all times. If test points are not easily accessible, disconnect power and follow lockout/tagout procedures, attach test equipment and reapply power to the test.

1. Remove unload lower trim panel on conveyor drive side of machine to access conveyor drive assembly.

NOTE: Front panel on L-R machines. Rear panel on R-L machines.

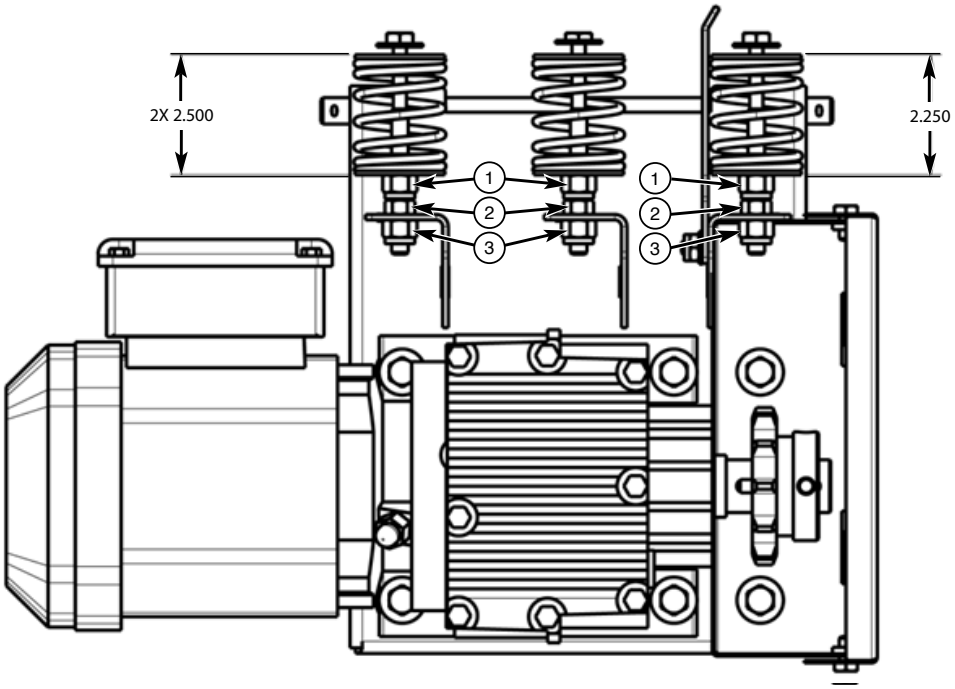
2. Tighten nut 3 just until it butts up to the upright support.

3. Loosen nut 2 until it has pinned the upright support against nut 3.

NOTE: Do this for each of the three locations.

4. Verify the three springs are compressed to the correct dimension as shown below.

NOTE: If any springs are not compressed to the correct dimension, adjust the compression as necessary by loosening or tightening the nut adjacent to the spring.



5. Refer to FT1000 Conveyor Anti-Jam Switch Test (page 134) and re-check conveyor jam switch operation.

6. Verify position of conveyor anti-jam actuator plate and jam switch roller plunger to ensure they are positioned properly. Refer to FT1000 Conveyor Anti-Jam Switch Adjustment (page 135) and FT1000 Conveyor Anti-Jam Actuator Plate Adjustment (page 136).

7. Install panels.

FT1000e Conveyor Anti-Jam Sensor Test

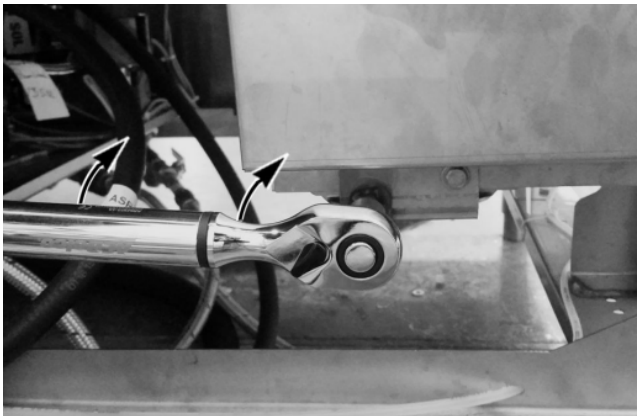
1. Remove unload lower trim panel on conveyor drive side of machine to access the conveyor drive assembly.

   NOTE: This procedure should be performed after the machine is fully operational and will require a torque wrench capable of 150-foot pounds.

   NOTE: Front panel on L-R machines. Rear panel on R-L machines.

2. Start the machine and allow the conveyor to run.

3. Using a ½" drive torque wrench, with a 5/8" socket set to 75-foot pounds, apply torque in a clockwise direction to the hex rod protruding from the base of the drive assembly.



a. If the conveyor jam switch shuts the machine off when torqued to 70-80-foot pounds, no further action is required. Replace lower trim panel.

b. If the conveyor jam switch does not shut the machine off when torqued to 70-80-foot pounds, refer to FT1000e Conveyor Anti-Jam Sensor Adjustment (page 138) and FT1000e Conveyor Anti-Jam Actuator Plate Adjustment (page 140).

4. Install panels.

FT1000e Conveyor Anti-Jam Sensor Adjustment

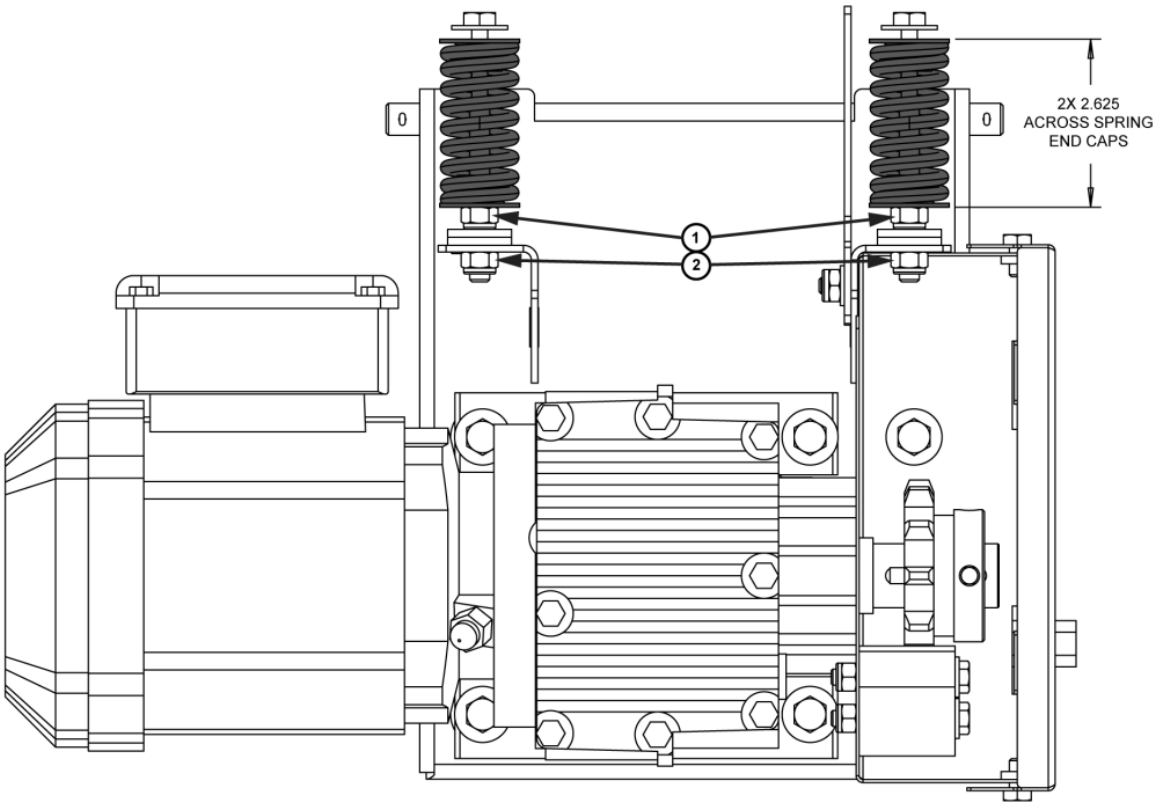
⚠ WARNING Certain procedures in this section require electrical test or measurements while power is applied to the machine. Exercise extreme caution at all times. If test points are not easily accessible, disconnect power and follow lockout/tagout procedures, attach test equipment and reapply power to the test.

1. Remove unload lower trim panel on conveyor drive side of machine to access conveyor drive assembly.

NOTE: Front panel on L-R machines. Rear panel on R-L machines.

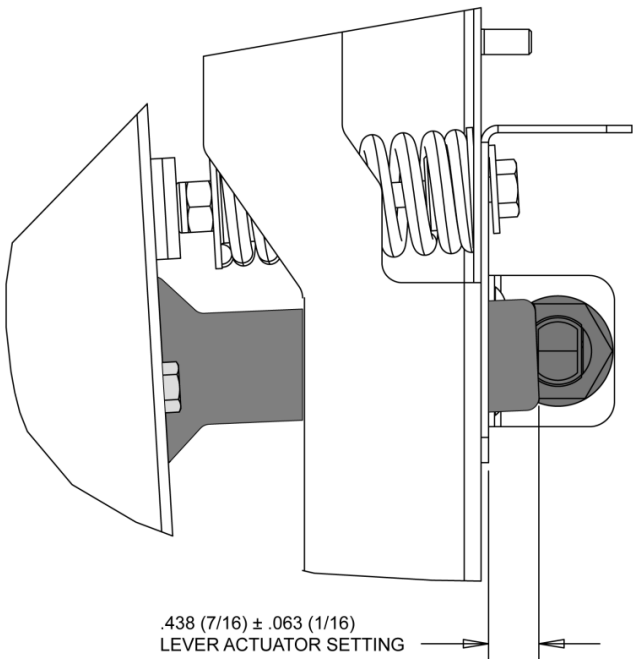
2. Verify the springs are compressed to the correct dimension as shown below. **NOTE:** The dimension shown below is prior to the assembly of the drive chain. After assembly of the drive chain, this dimension will decrease to **2.375" ± .125"**.

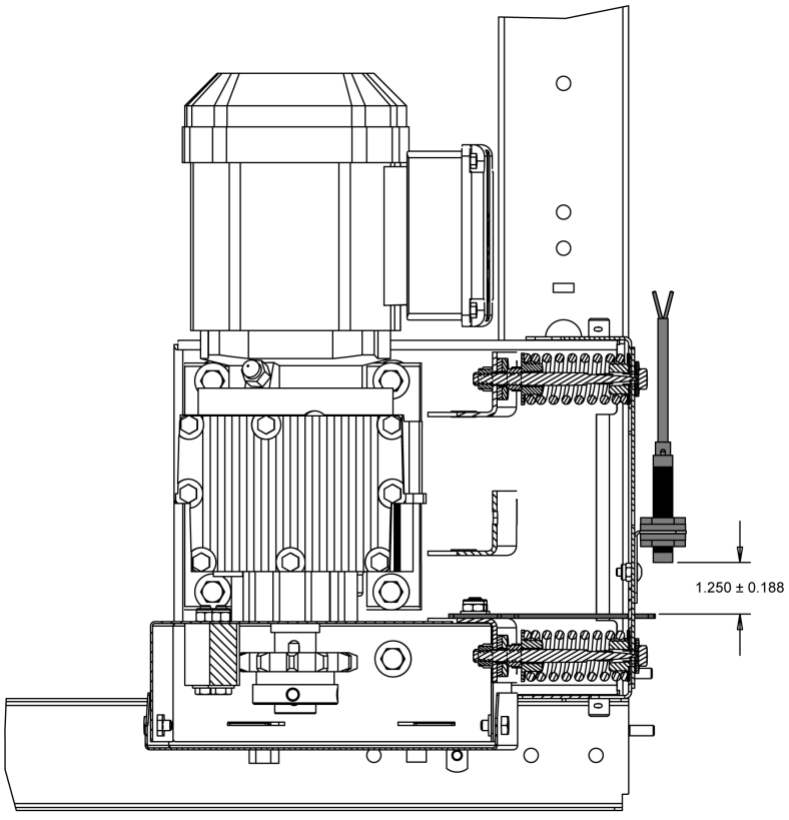
NOTE: If any springs are not compressed to the correct dimension, adjust the compression as necessary by loosening or tightening the nut adjacent to the spring(s). Refer to FT1000e Conveyor Anti-Jam Springs Adjustment (page 140).



3. Verify the position of the conveyor anti-jam actuator plate and jam sensor are positioned as shown below and adjust as necessary.

NOTE: The actuator plate must **NOT** be in front of the anti-jam sensor.





4.. Refer to steps 2 and 3 and re-check the conveyor jam sensor operation.

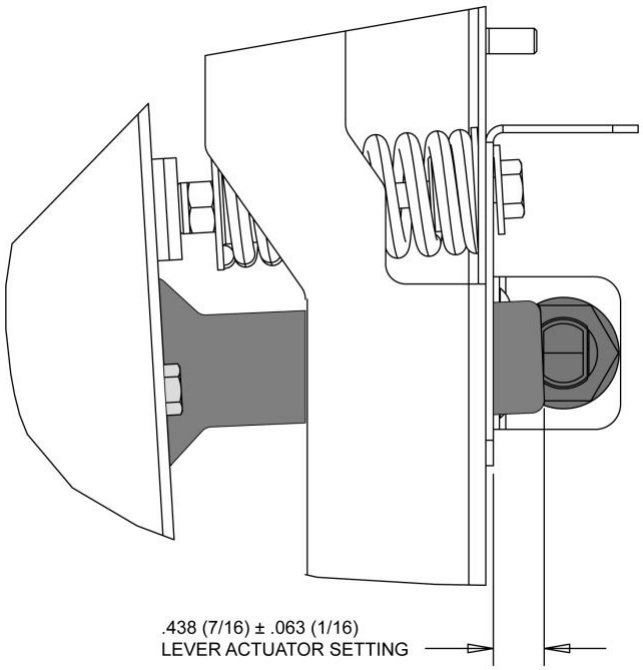
5. Install panels.

FT1000e Conveyor Anti-Jam Actuator Plate Adjustment

⚠ WARNING Disconnect the electrical power to the machine and follow lockout / tagout procedures. There may be multiple circuits. Be sure all circuits are disconnected.

1. Slide actuator plate out until the dimension is reached.

2. Center the actuator plate vertically in the slotted opening, while tightening the hardware.



FT1000e Conveyor Anti-Jam Springs Adjustment

⚠ WARNING Certain procedures in this section require electrical test or measurements while power is applied to the machine. Exercise extreme caution at all times. If test points are not easily accessible, disconnect power and follow lockout/tagout procedures, attach test equipment and reapply power to the test.

1. Remove unload lower trim panel on conveyor drive side of machine to access conveyor drive assembly.

NOTE: Front panel on L-R machines. Rear panel on R-L machines.

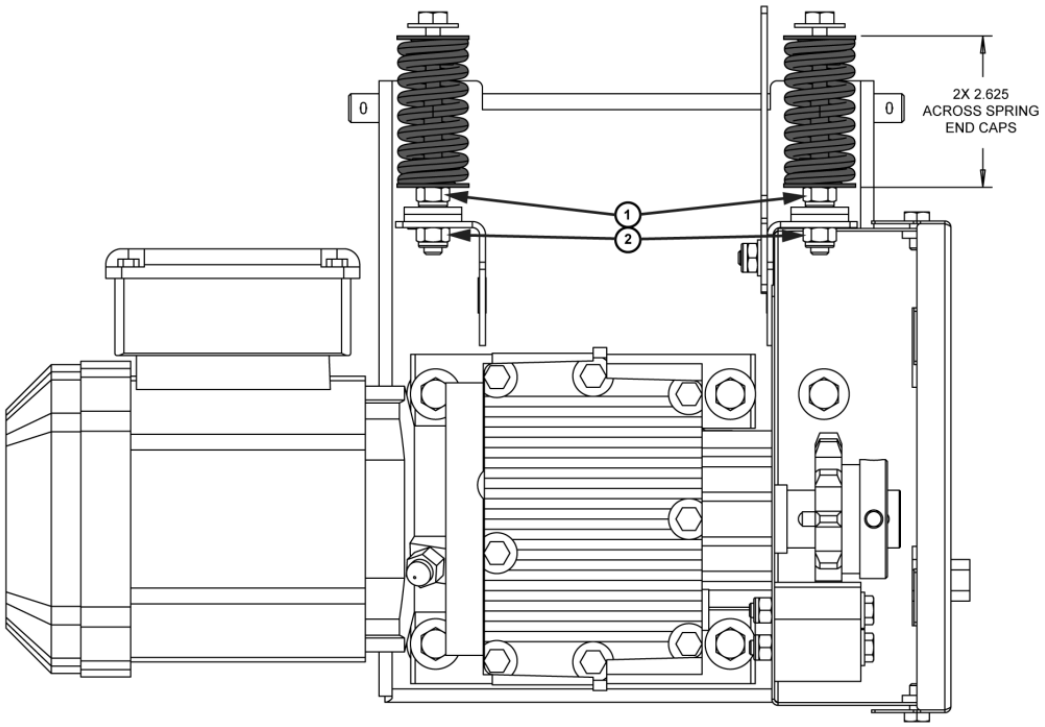
2. Tighten nut 2 just until it butts up to the upright support.

3. Tighten or loosen nut 1 until it reaches the correct dimension (2.625”) shown below**.**

NOTE: Do this for both springs.

NOTE: Verify the two springs are compressed to the correct dimension as shown below.

NOTE: If any springs are not compressed to the correct dimension, adjust the compression as necessary by loosening or tightening the nut adjacent to the spring.



NOTE: The dimension shown above is prior to the assembly of the drive chain. After assembly of the drive chain, this dimension will decrease to **2.375" ± .125"**.

4. Refer to FT1000e Conveyor Anti-Jam Sensor Test (page 137) and re-check the conveyor jam sensor operation.

5. Verify the position of the conveyor anti-jam actuator plate and jam sensor is positioned properly. Refer to FT1000e Conveyor Anti-Jam Sensor Adjustment (page 138) and FT1000e Conveyor Anti-Jam Actuator Plate Adjustment (page 140).

6. Install panels.

EXCESSIVE STEAM ESCAPING FROM LOAD END TROUBLESHOOTING

Excessive Steam Identification

Excessive steam is defined as condensation collecting on the ceiling and dripping.

Steam Troubleshooting

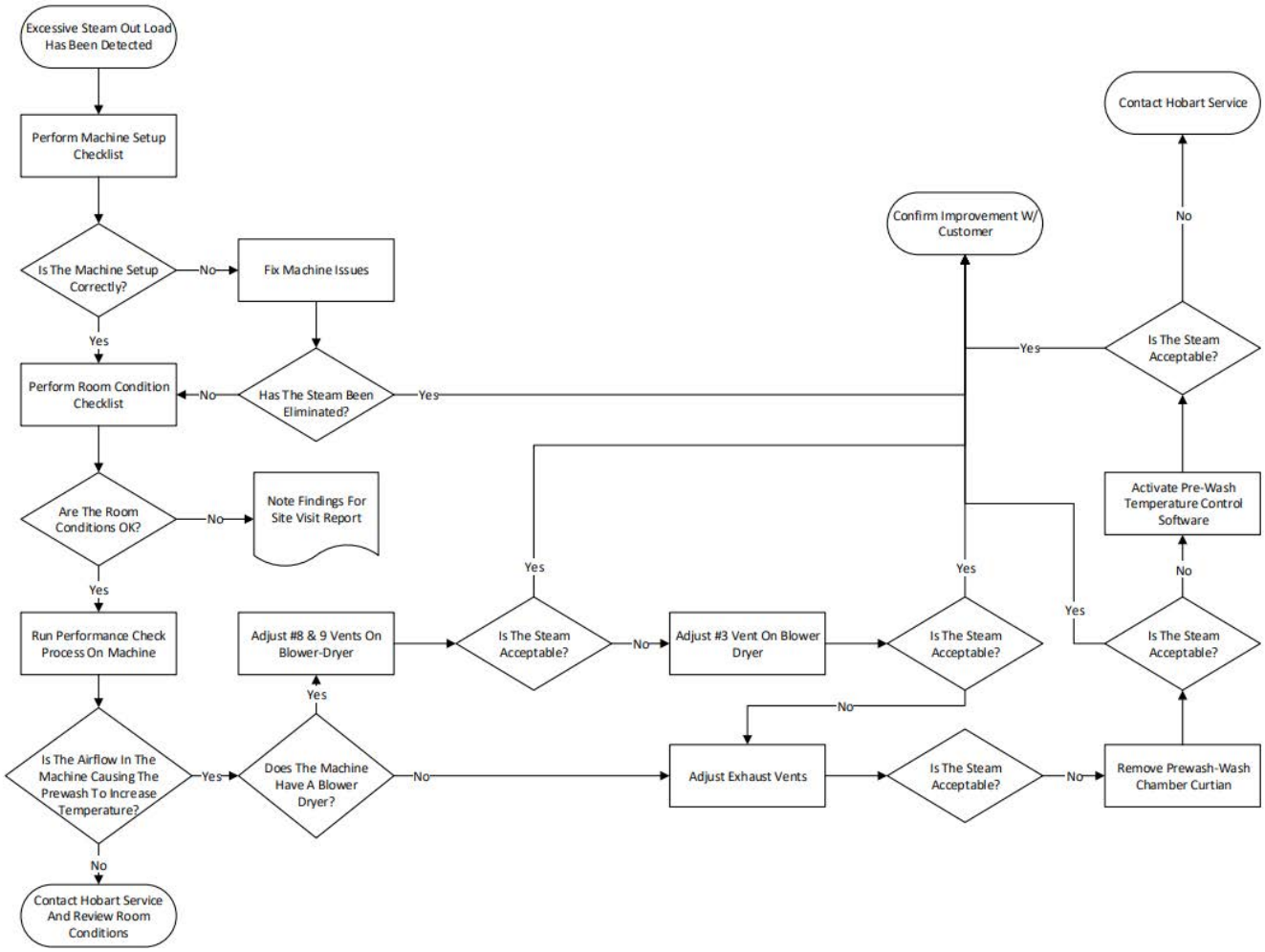
Check the level of detergent foam buildup in the machine before starting the troubleshooting process detailed in this manual. Excessive foam build up is known to cause steam issues. Excessive foam can be Pre-Soak Detergent getting into the machine or improper chemical levels being supplied to the machine. Contact chemical supplier if excessive foam is found.

Example of excessive foaming in tanks:

Process Summary

If a concern for excessive steam arises, the process outlined in the below flow chart should be used to troubleshoot the steam.

Flow Chart



Machine Setup Checklist

- ☐ Verify that all the curtains are correct and in their proper locations. Also, note that the short side of the tiered curtains should face the load end of the machine.
- ☐ Ensure all wash arm sliders are closed properly. Make sure they aren't sticking/blocked and are closed.
- ☐ Confirm wash arms are seated properly.
- ☐ Check for clogged wash arms.
- ☐ (If equipped) check that blower dryer pan is installed and in the correct orientation. (Item #7, pages 146 thru 148).
- ☐ Check for excessive foaming during operation, which can be caused by improper chemicals in the machine.
- ☐ Confirm all pump motors are operating and rotating in the correct direction.
- ☐ Confirm Blower/Dryer motor is operating and rotating in the correct direction.
- ☐ Confirm that the Blower Dryer outlets #8 & #9 are set to default settings and not out of alignment. Both openings should be about 7/8" wide along the entire length. (Items #8 & 9, pages 146 thru 148).
- ☐ Confirm condensation pan in exhaust housing isn't being pulled up from exhaust suction and closing off exhaust.
- ☐ Verify that all tank temperatures are set correctly and are not excessive (more than 10°F higher) during operation.
- ☐ **Verify spray pattern in each chamber.**
  Begin by removing all curtains from machine and turning off all wash pump contactors in the control panel.

  Operate 1 pump at a time (by turning on the appropriate contactor) Inspect that the water flow is correct and that there is nothing spraying into other tanks. (use a flashlight if possible)

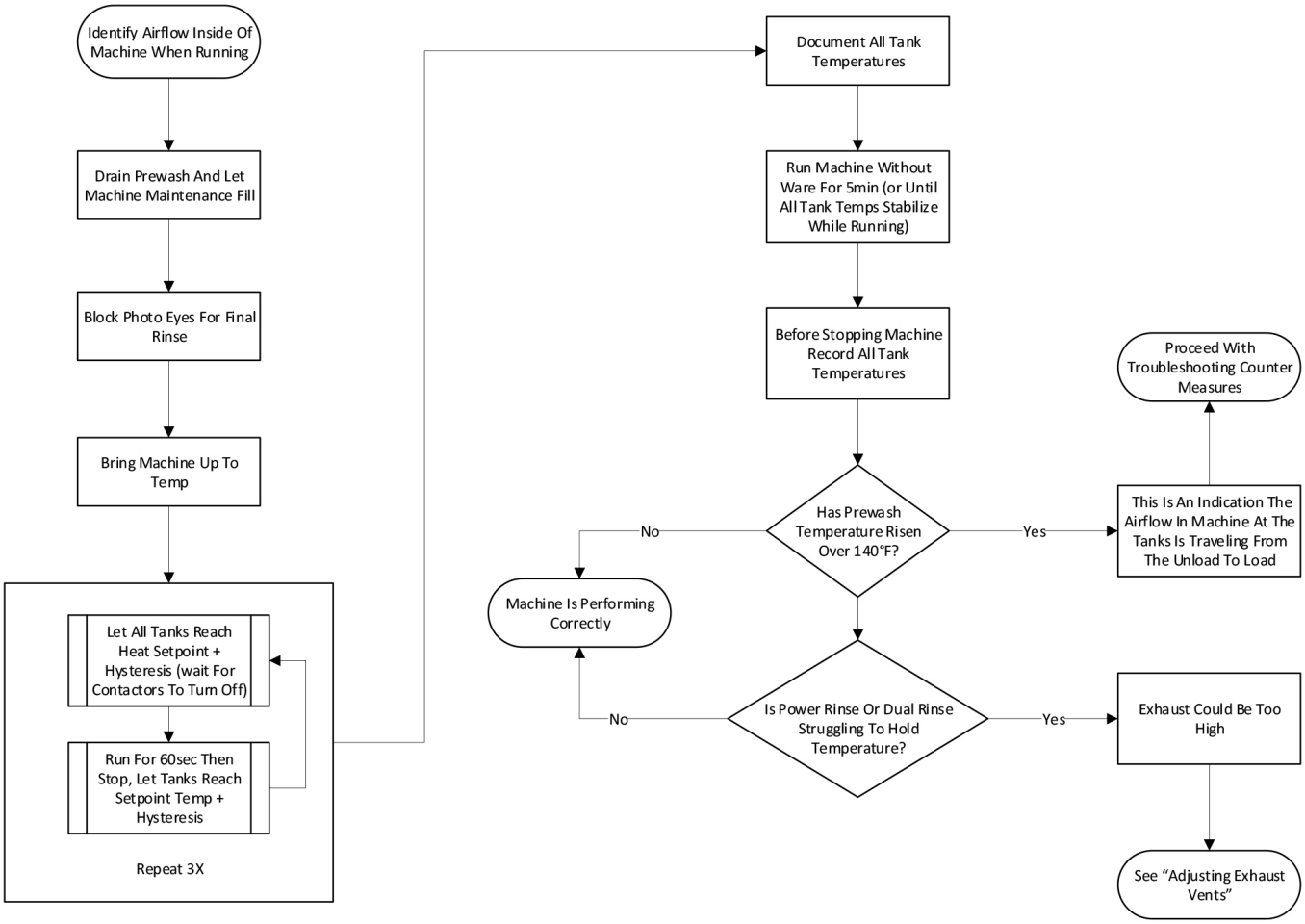
Room Condition Checklist

- ☐ Confirm that the customer's exhaust is operating and pulling the correct CFM from the connection to the FT1000E.
- ☐ Verify that no fans are pointed directly into the entrance or exit ends of the machine.
- HVAC (note any of the following).
  - ☐ Supply vents near unload (exit end of machine).
  - ☐ Supply vents near load (entrance end of machine).
  - ☐ Return vents near load (entrance end of machine).
  - ☐ General airflow in room from HVAC moving air from unload to load end of FT in the room.
- Air Balance
  - ☐ Determine if air is moving from an area of high pressure to low pressure. Such as:
  - ☐ Doors/openings in the dish room that connect to other areas.
    - hallway to a loading dock open to outside or an opening to an adjacent dining room at a different air temperature/pressure. (Possibly on a different air handling unit).
    - Windows open if the room has a negative pressure.
    - Tray pass throughs from dining to dish rooms.

Performance Check Process

Process Summary

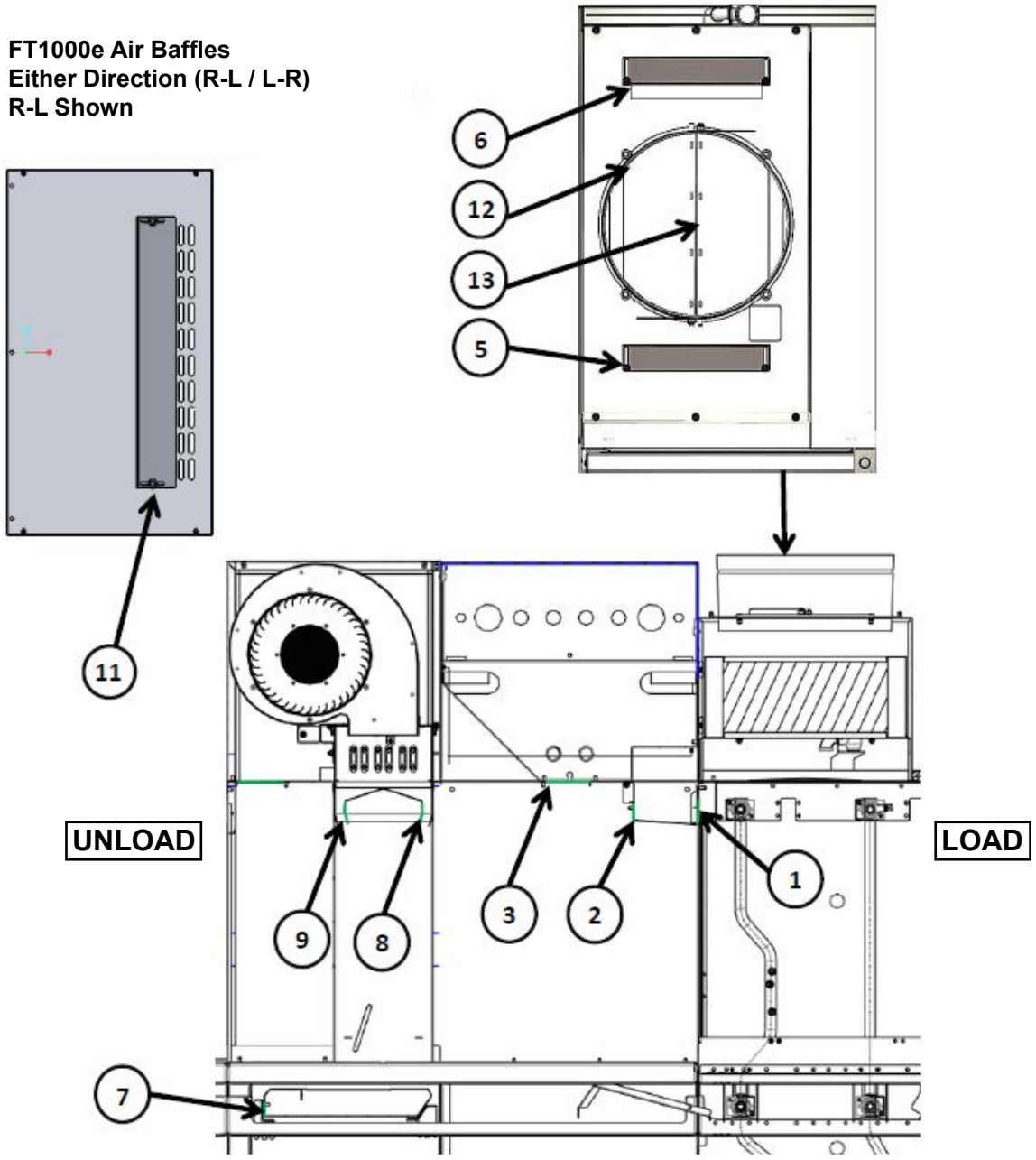
The following process can be used to bring the machine up to temperature and determine if there is a problem with steam escaping from the load end of the machine. This process ensures the whole machine is up to operating temperature.



Baffle / Vent Settings

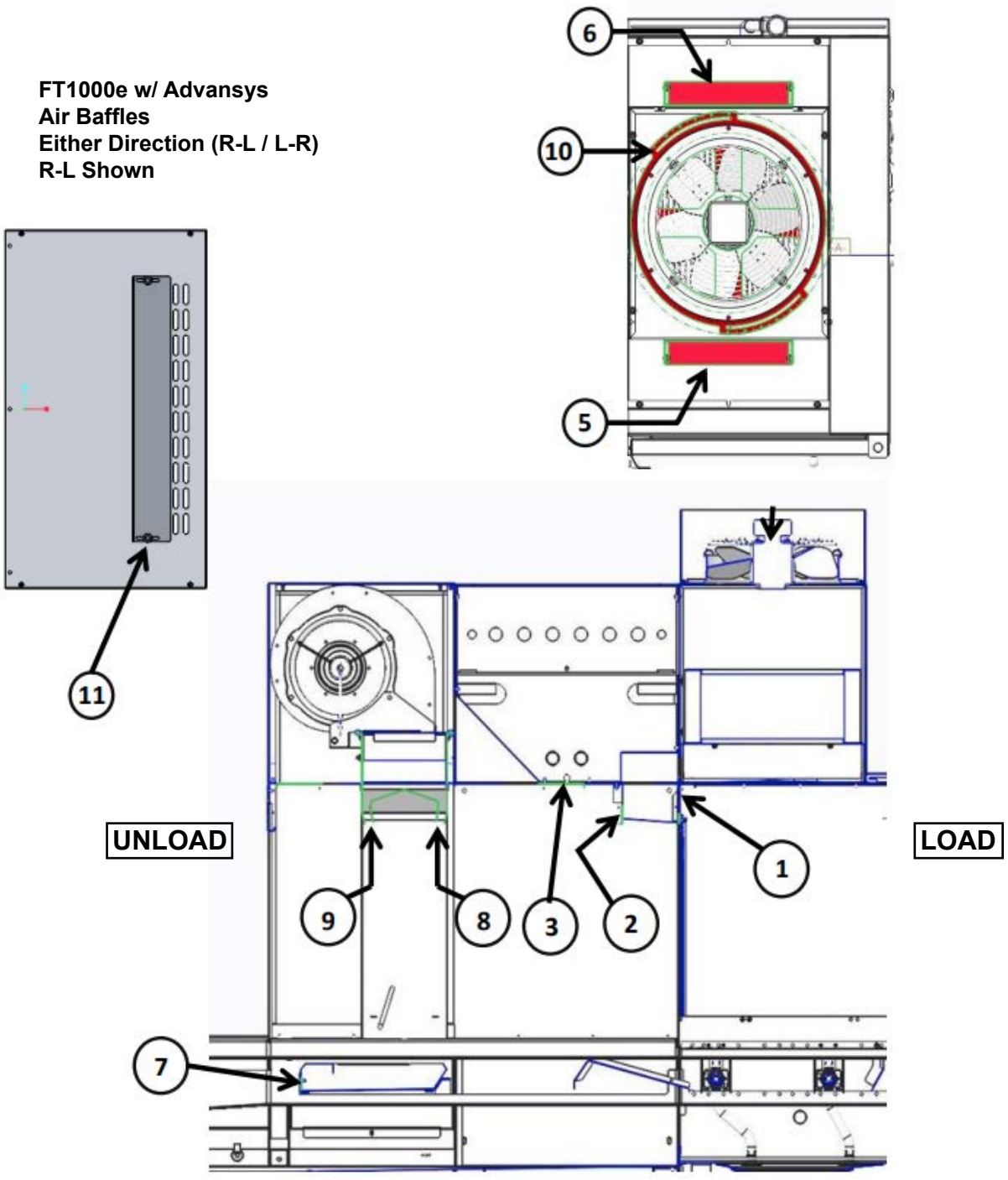
Vent Diagram (BAS/EGR W/ Blower Dryer)

FT1000e Air Baffles
Either Direction (R-L / L-R)
R-L Shown



Vent Diagram (ADV W/ Blower Dryer)

FT1000e w/ Advansys
Air Baffles
Either Direction (R-L / L-R)
R-L Shown



Descriptions

BAFFLE DESCRIPTION	
1	Captures the steam from the machine chambers and directs it through the machine exhaust.
2	Captures the steam from the unload and directs through the machine exhaust.
3	Controls the airflow from the load end to the hot air intake of the blower dryer.
5 & 6	Controls the amount of room air mixed with the exhaust air.
7	Controls the amount of air discharged to the unload end from the blower dryer outlet.
8	Controls the direction of air discharged from the blower dryer outlet at the unload end of the machine.
9	Controls the direction of air discharged from the blower dryer outlet at the load end of the machine.
10	Controls the amount of air flowing from the machine across the evaporator coil and exiting into the room.
11	Controls the amount of fresh air flowing from the room into the blower dryer.
12 & 13	Controls the amount of air that is pulled up through the customer's exhaust.

Default Settings

BAFFLE SETTING (OPEN)											
Machine Type	**1**	**2**	**3**	**5 & 6**	**7**	**8 (Entrance)**	**9 (Exit)**	**10**	**11**	**12 & 13**	**Exhaust Fan Speed**
W/O Blower Dryer	100%	50% (5/8")	N/A	Closed	N/A	N/A	N/A	N/A	N/A	45° Open	N/A
W/ Blower Dryer	100%	50% (5/8")	Closed	Closed	Closed	12° To Unload	0° (Vertical)	N/A	2 Rows Open	45° Open	N/A
Advansys w/ Blower Dryer	100%	25% (3/8")	Closed	Closed	Closed	12° To Unload	0° (Vertical)	#3	2 Rows Open	N/A	Low

Blower Dryer - Adjustment Instructions

Blower Dryer Outlet Adjustments (Vent #9)

Reset Prewash Tank Temperature

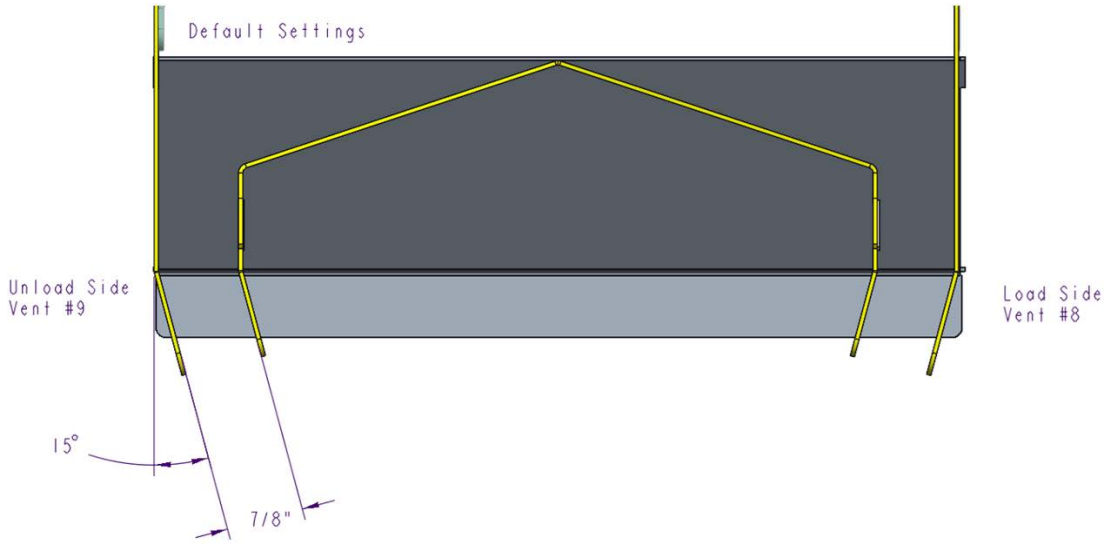
Follow steps 1 - 5 below to reset the machine conditions and then operate it to determine if the performance has improved or worsened from the adjustments.

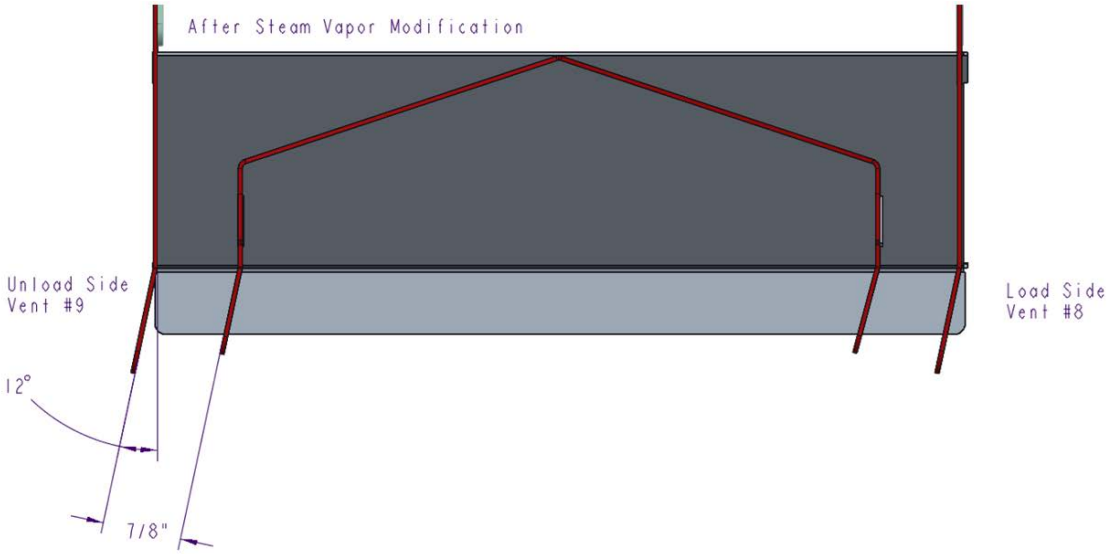
1. Lower prewash tank temp if over 135° (add ice/cold water). Try not to lower temp below 125-130° (will cause the run to take longer to stabilize).
2. Start machine (Make sure all tanks reach setpoint + hysteresis).
3. Record tank temps at beginning of run.
4. Run for 3-5min (or until all tank temps stabilize while running).
5. Before stopping record all tank temperatures.

Vent / Baffle Adjustments

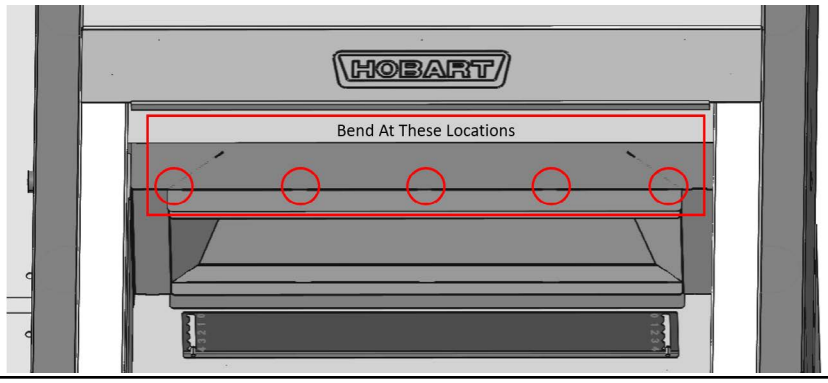
Adjust the #9 (Refer to Baffle / Vent Settings, page 143) Blower Dryer outlet (unload side) to 10-12° towards unload end to help pull the air back towards the Unload end of the machine.

Be sure to keep both fins parallel to each other keeping a 7/8 inch uniform gap across the distance of the vent opening.





NOTE: Try to bend vents where there is connecting material between the fin and the vent housing:



Test

Start machine (with final rinse running). Continue to run until the temperatures across all tanks stabilize (typically 3-5min).

Record all tank temps before stopping.

Results - How has adjusting the blower dryer outlet changed the machine?

Did this lower the steam exiting the load end while running?

Does the prewash temperature reach as high as before?

Do the Power Rinse or Dual Rinse tanks drop below their specified temperature?

VENT	OPENING – Angled Towards Unload	OPENING – Oriented Vertical
#8 & 9	Moves Air in Machine Towards the Unload End	Keeps Air in BD Chamber ○ Should Improve DR Temps ○ Could Cause More Steam

Blower Dryer Inlet Adjustments (Vents #11 & #3)

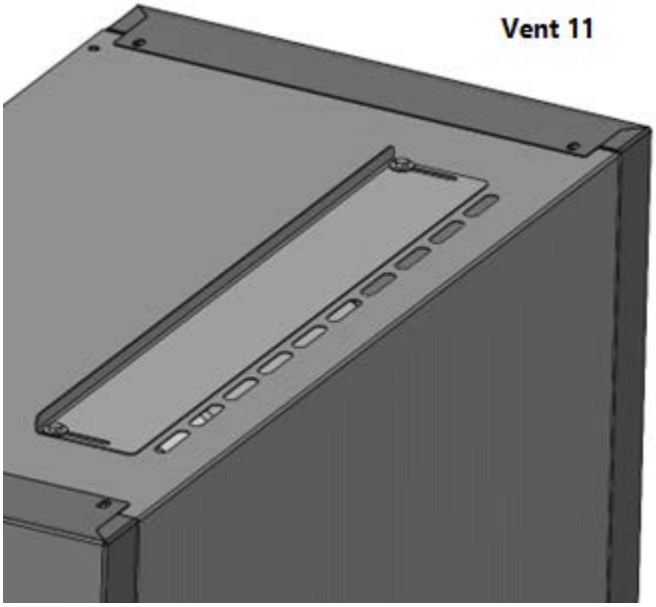
Reset Prewash Tank Temperature

Follow steps 1 - 5 below to reset the machine conditions and then operate it to determine if the performance has improved or worsened from the adjustments.

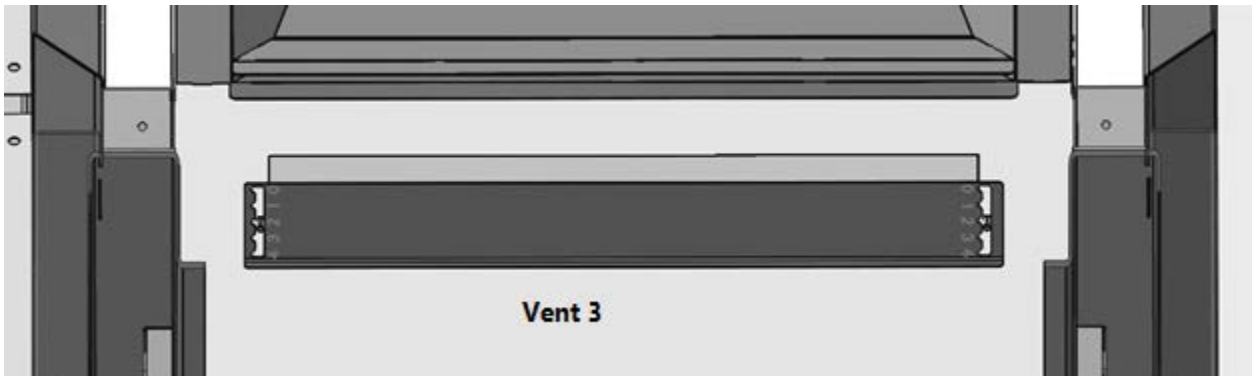
1. Lower prewash tank temp if over 135° (add ice/cold water). Try not to lower temp below 125-130° (will cause the run to take longer to stabilize).
2. Start machine (Make sure all tanks reach setpoint + hysteresis).
3. Record tank temps at beginning of run.
4. Run for 3-5min (or until all tank temps stabilize while running).
5. Before stopping record all tank temperatures.

Vent / Baffle Adjustments

Close #11, the outside Blower Dryer air intake baffle, to 1 row. This will decrease the amount of cooler/drier outside air entering the blower dryer unit.



Then Open #3, the inside Blower Dryer air intake baffle, halfway to maintain the same amount of air entering the blower. The Blower Dryer will now pull more warm/humid air from the machine and will direct it toward the unload end. Assuming baffle #9 is oriented towards the unload end.



NOTE: The more #3 is opened while closing #11 will increase the potential for food oils and chemicals to enter the Blower Dryer. Depending on the customer's operation this can lead to a shortened life cycle of the blower dryer motor. Use discretion when adjusting.

Test

Start machine (with final rinse running). Continue to run until the temperatures across all tanks stabilize (typically 3-5min).

Record all tank temps before stopping.

Results - How has adjusting the Blower Dryer air intake changed the machine?

Did this lower the steam exiting the load end while running?

Does the prewash temperature reach as high as before?

Do any of the other tanks drop below their specified setpoint?

If this improves but does not resolve the steam issue, open #3 vent further and test again.

- Only open more if other machine settings don't improve. LAST RESORT

VENT	OPENING IMPACT	CLOSING IMPACT
#3	● Higher BD output Air Temperature ● More Warm/Humid BD Air Pulled In From Machine. ● More Food Oil Pulled Into BD	● Lower BD Output Air Temperature ● More Cool/Dry BD Air Pulled in From Outside ● Less Food Oil Pulled Into BD
#11	● Lower BD Output Air Temperature ● More Cool/Dry BD Air Pulled In From Outside ● Less Food Oil Pulled Into BD	● Higher BD Output Air Temperature ● More Warm/Humid BD Air Pulled In From Machine. ● More Food Oil Pulled into BD

Exhaust Vent Settings - Adjustment Instructions

Exhaust Vent Settings (Vent #1)

Reset Prewash Tank Temperature

Follow steps 1 – 5 below to reset the machine conditions and then operate it to determine if the performance has improved or worsened from the adjustments.

1. Lower prewash tank temp if over 135° (add ice/cold water). Try not to lower temp below 125-130° (will cause the run to take longer to stabilize).
2. Start machine (Make sure all tanks reach setpoint + hysteresis).
3. Record tank temps at beginning of run.
4. Run for 3-5min (or until all tank temps stabilize while running).
5. Before stopping record all tank temperatures.

Vent / Baffle Adjustments

If machine exhaust vent baffle #1 is not open 100% then adjust it so that it is. (if 100% open already then skip to next step).

Test

Start machine (with final rinse running). Continue to run until the temperatures across all tanks stabilize (typically 3-5min).

Record all tank temps before stopping.

Results – What changes to the machine have occurred since opening the inside machine exhaust vent baffle #1?

Did this lower the steam exiting the load end while running?

Does the prewash temperature reach as high as before?

Does the Dual Rinse Tank drop below specified temp level?

1. If this improves/resolves the steam issue and Dual Rinse Tank Temp is OK then leave the setting and proceed to the next change (if necessary).

2. If there is improvement but Dual Rinse Tank Temp drops too low, then reduce exhaust. To do this, adjust air flow inside Dual Rinse / Final Rinse Tank chamber in one of the following ways (make small adjustments and re-run test) (Next Step).

3. If the machine has an Energy Recovery coil, monitor the Final Rinse temperatures when exhaust changes are made. Lowering the exhaust pull will reduce the performance of the ER coil (heat exchanger) and can drop water temperatures going to the booster, thus lowering the final rinse temperature.

VENT	OPENING IMPACT	CLOSING IMPACT
#1	● Lowers DR Temps ● Helps w/ Steam Out Load ● Hotter Air Across ER Coil ○ Higher FR Temps	● Increased DR Temps ● Less Air Across ER Coil ○ Lower FR Temps

Exhaust Vent Settings (Vent #12 & 13)

Reset Prewash Tank Temperature

Follow steps 1 - 5 below to reset the machine conditions and then operate it to determine if the performance has improved or worsened from the adjustments.

1. Lower prewash tank temp if over 135° (add ice/cold water). Try not to lower temp below 125-130° (will cause the run to take longer to stabilize).
2. Start machine (Make sure all tanks reach setpoint + hysteresis).
3. Record tank temps at beginning of run.
4. Run for 3-5min (or until all tank temps stabilize while running).
5. Before stopping record all tank temperatures.

Adjustments

1. Close down dampers (vents 12 & 13) in main exhaust (only adjust 10-15° at a time).
2. Open vent #2 in unload (only change in 1/8th inch increments).
3. This will draw less from #1.
4. Close vent #1 in 1/8th inch increments.
5. Open room air vents (#5 & 6) on top of exhaust to reduce suction in machine (Only change in ¼" increments).

Test

Start machine (with final rinse running). Continue to run until the temperatures across all tanks stabilize (typically 3-5min).

Record all tank temps before stopping.

Results

If the machine has an energy recovery coil, monitor the final rinse temperatures when exhaust changes are made. Lowering the exhaust pull will reduce the performance of the ER coil (heat exchanger) and can drop water temperatures going to the booster, thus lowering the final rinse temperature.

VENT	OPENING IMPACT	CLOSING IMPACT
#12 & 13	● Less Steam ○ Lower DR Temps	● More Steam ○ Higher DR Temps
#5 & 6	● Higher DR Temps ○ More Steam Out Load ● Lower FR Temps	● Lower DR Temps ● Less Steam Out Load ○ Higher FR Temps

Curtain Layout Modifications – Curtain Configuration Changes

Reset Prewash Tank Temperature

Follow steps 1 - 5 below to reset the machine conditions and then operate it to determine if the performance has improved or worsened from the adjustments.

1. Lower prewash tank temp if over 135° (add ice/cold water). Try not to lower temp below 125-130° (will cause the run to take longer to stabilize).
2. Start machine (Make sure all tanks reach setpoint + hysteresis).
3. Record tank temps at beginning of run.
4. Run for 3-5min (or until all tank temps stabilize while running).
5. Before stopping record all tank temperatures.

Adjustments

Remove the long curtain between the prewash and wash chamber.

Test

Start machine (with final rinse running). Continue to run until the temperatures across all tanks stabilize (typically 3-5min).

Record all tank temps before stopping.

Results

Has the steam improved while running?

Does the prewash temperature reach as high as before?

Did the wash tank temp drop below specified temp level?

- If this reduces the prewash temperature and improves the steam issue, but the wash tank temperature drops, order short curtain to replace long curtain in this location.
- If the wash temperature holds while reducing the prewash temperature and improving the steam issue, then leave the long curtain out.

Pre-Wash Temperature Control

Reset Prewash Tank Temperature

If all previous efforts to reduce steam coming out of the load end don't provide acceptable results, enable the prewash temperature control feature. When PWTC is enabled, the prewash tank will use the temperature setpoint specified in the paramaters to add cold water in the tank when the temperature rises above the setpoint. Keeping the prewash tank temperature down can be an affective way to mitigate the steam concern.

See Prewash Temperature Control Install guide for instructions on how to enable or install PWTC.

NOTE: If the wash/power rinse/ or dual rinse tank temperatures are not meeting the requirements, there is an airflow problem in the machine and enabling the PWTC feature will result in excessive cold water use.

Change Summary

VENT	OPENING IMPACT	CLOSING IMPACT
#1	● Lowers DR Temps ● Helps w/ Steam Out Load ● Hotter Air Across ER Coil ○ Higher FR Temps	● Increased DR Temps ● Less Air Across ER Coil ○ Lower FR Temps
#3	● Higher BD output Air Temperature ● More Warm/Humid BD Air Pulled In From Machine. ● More Food Oil Pulled Into BD	● Lower BD Output Air Temperature ● More Cool/Dry BD Air Pulled in From Outside ● Less Food Oil Pulled Into BD
#8 & 9	● Angled Towards Unload ○ More Air Through Machine	● Keeps Air in BD Chamber ○ Should Improve DR Temps ○ Could Cause More Steam
#11	● Lower BD Output Air Temperature ● More Cool/Dry BD Air Pulled In From Outside ● Less Food Oil Pulled Into BD	● Higher BD Output Air Temperature ● More Warm/Humid BD Air Pulled In From Machine. ● More Food Oil Pulled into BD
#12 & 13	● Less Steam ○ Lower DR Temps	● More Steam ○ Higher DR Temps
#5 & 6	● Higher DR Temps ● More Steam Out Load ● Lower FR Temps	● Lower DR Temps ● Less Steam Out Load ● Higher FR Temps

PREVENTATIVE MAINTENANCE CHECKLIST

The following items should be checked on a routine basis to ensure proper dish machine operation and prolong the life of the dish machine and its components. It is recommended that these items be checked every six months or as required based on machine usage.

CONTROL BOX / ELECTRICAL COMPONENTS

- [ ] Check operation of power, start, stop, speed selection and auto clean (if equipped) buttons on keypad.
- [ ] Check operation of load/unload stop and start switches.
- [ ] Check all door switches for proper operation.
- [ ] Visually inspect all contactors and relays for proper operation. Check for chattering or buzzing.
- [ ] Check operation of dish limit switch/hood travel.

FILL / FINAL RINSE SYSTEM

- [ ] Inspect rinse/fill system for leaks.
- [ ] Clean or replace vacuum breaker kit (if equipped with the Auto Clean feature).
- [ ] Clean photo sensor receiver/emitter area at load end of machine and verify operation.
- [ ] Clean line strainer(s) located under unload end of machine at supply connection(s).
- [ ] Clean upper and lower final rinse arms and nozzles.
- [ ] Verify final rinse temperature. If incorrect, check the thermistor resistance (refer to Component Operating Values section on page 106) and replace if required.

DOORS / PANELS

- [ ] Check all panels for damage, wear and proper fit.
- [ ] Check to ensure unit is level. Adjust as required.
- [ ] Check door hinge bearings.
- [ ] Clean bottom door seals.
- [ ] Ensure doors close fully and properly seat on tank sill. Adjust as required.
- [ ] Check for steam leaks around door sides and top while running. Adjust doors and/or baffles as required.

DRAIN SYSTEM

- [ ] Check drain to ensure no leaks while unit is idle and tank is full.
- [ ] Drain unit and check for leaks.
- [ ] Check drain handles operation. Adjust if needed. Ensure drain handle knobs (if equipped) are secure.
- [ ] Clean tank bottoms, pump intake guards and drain hub areas.

CONVEYOR DRIVE SYSTEM

- [ ] Check for oil or water leakage on or around conveyor motor and chain. Lubricate as needed.
- [ ] Check conveyor for uneven wear, bent rods, broken/missing rollers, and broken flight links.
- [ ] Check drive shaft, sprockets and bearings for wear. Lubricate drive bearings as required.
- [ ] Check conveyor reverse jog for proper operation.
- [ ] Check anti-jam switch operation. Adjust if needed.

PREWASH / WASH / POWER RINSE TANK SYSTEM

- [ ] Inspect and clean all upper and lower wash and rinse arms, including the ASR section if equipped. Ensure wash arm sliders are in the closed position for operation.
- [ ] Clean scrap baskets and strainer pans in each tank.
- [ ] Inspect flowback pans for damage.
- [ ] Clean curtains. Replace curtains if worn, brittle and curled.
- [ ] Clean all floats and verify operation for water level and heat control.

HEAT SYSTEMS (ALL HEATS)

- [ ] Check electric heating elements or steam coils for debris and clean as required.
- [ ] If excess lime scale is present on electric heating elements or steam coils, run delime cycle.
- [ ] Verify tank and final rinse temperatures meet minimum requirements as shown on the data label located on the upper left side of the control panel. Run machine with final rinse active for several minutes before checking temperatures.

BLOWER DRYER (IF EQUIPPED)

- [ ] Inspect blower fan & components for proper rotation/operation and clean if needed.
- [ ] Check for proper placement of blower dryer deflector pan.

NOTE: Reassemble any panels / covers or components that were removed.

RECOMMENDED SPARE PARTS

Below is a list of recommended spare parts. For the complete FT1000e parts manual, visit **www.hobartparts.com**.

All Heat Types

Qty.	Part Number	Description
1	00-749994	Push Button Switch Assy., Extended, Red (Load/Unload Stop Switch)
1	00-913102-00216	Push Button & Base Kit, Green (Load/Unload Start Switch)
1	00-563021	Photo Eye Kit (Includes Emitter and Receiver)
1	00-473109-005-2	Interlock Switch Assy. (Master Drain, Tank Drains, Door Switches, Dish Limit Switch)
5	00-067500-00031	O-Ring (ASR Wash Tubes, Dual Rinse Arms, Final Rinse Arms)
1	00-947899-00001	ASR Recirculating Pump Motor Assy. (208-240/480 V, 60 Hz, 3 Ph)
1	00-947900-00001	ASR Soil Pump Assy. (208-240/480 V, 60 Hz, 3 Ph) (L-R)
1	00-947900-00004	ASR Soil Pump Assy. (208-240/480 V, 60 Hz, 3 Ph) (R-L)
1	00-974888-00002	Pump Motor, 3.5HP, 50/60 Hz (Prewash, Wash, Power Rinse)
1	01-650027	Shaft Seal Service Kit (Includes Shaft Seal, Housing Gasket, Nuts & O-Rings) (Prewash, Wash, Power Rinse Pump Assy.)
1	00-947953-00001	Motor Gasket (Prewash, Wash, Power Rinse Pump Assy.)
1	00-936547-00004	Probe & Switch Assy., 4-wire (Lower Wash/Power Rinse Tank Float Switch Assy.)
1	00-936547-00003	Probe & Switch Assy., 2-wire (ASR, Upper Prewash/Wash/Power Rinse & Holding Tank Float Switch Assy.)
2	00-067500-00072	O-Ring (Float Assy.)
1	00-563609	Pressure Sensor Kit (Includes Pressure Sensor, Air Trap, O-Ring, Tube & Clamps) (Dual Rinse Tank)
1	00-563285-00001	Dual Rinse Pump Motor Assy. Upgrade Kit (208-240/480 V, 60 Hz, 3 Ph) Prior to Serial Number 271197621
1	00-947899-00001	Dual Rinse Pump Motor Assy. (208-240/480 V, 60 Hz, 3 Ph), Starting Serial Number 271197621
1	00-328994	Rinse Probe Assy. (Dual Rinse, Electric Booster Heater)
1	00-948595	Keypad Membrane Switch
1	00-949351	Graphics Display
3	FE-025-72	Fuse (6.25 Amp, 250 V)
5	FE-017-03	Fuse, Slo-Blo (2 Amp)
1	00-950660-00004	Relay (12 VDC, 6 Amp)
1	00-949095	Control Board Assy.
1	00-949096	Relay Board Assy.
1	00-87714-046-1	Relay (2-Pole, 30 Amp)
1	00-949952	Transformer (100 VA, 25 V)
1	00-948104	Contactor (8 Amp, 3-Pole)
1	00-918322	Contactor (40 Amp, 3-Pole)
1	00-087713-018-2	Contactor w/ Aux. Switch (40 Amp, 3-Pole)
1	00-563981-00001	Final Rinse Pump Motor Assy. Kit (208-240/380/480 V, 60 Hz, 3 Ph)
1	00-893100-00001	Solenoid Valve, 1/2", 120 V
1	00-947987	Conveyor Drive Motor
1	00-562130	Anti-Jam Proximity Sensor

Electric Heat Only

Qty.	Part Number	Description
1	00-562099-00001	9 kW Heater, 208 V (FT1000e Wash Tank)
1	00-562099-00002	9 kW Heater, 240 V (FT1000e Wash Tank)
1	00-562099-00004	9 kW Heater, 480 V (FT1000e Wash Tank)
1	00-562100-00001	17.3 kW Heater, 208 V (FT1000Se Wash Tank)
1	00-562100-00002	17.3 kW Heater, 240 V (FT1000Se Wash Tank)
1	00-562100-00004	17.3 kW Heater, 480 V (FT1000Se Wash Tank)
1	00-562096-00001	10.7 kW Heater, 208 V (FT1000e or Advansys Power Rinse Tank, Dual Rinse Tank)
1	00-562096-00002	10.7 kW Heater, 240 V (FT1000e or Advansys Power Rinse Tank, Dual Rinse Tank)
1	00-562096-00004	10.7 kW Heater, 480 V (FT1000e or Advansys Power Rinse Tank, Dual Rinse Tank)
1	00-562098-00001	13.1 kW Heater, 208 V (Advansys Wash Tank)
1	00-562098-00002	13.1 kW Heater, 240 V (Advansys Wash Tank)
1	00-562098-00004	13.1 kW Heater, 480 V (Advansys Wash Tank)
4	00-067500-00034	O-Ring (Tank Heaters)
1	00-294618	Temperature Control Service Kit (Wash/Power Rinse/Dual Rinse Tank, Electric Booster Heater)
1	00-562104-00001	15 kW Booster Heater Element, 208 V
1	00-562104-00002	15 kW Booster Heater Element, 240 V
1	00-562104-00004	15 kW Booster Heater Element, 480 V
1	00-562104-00007	10.7 kW Booster Heater Element, 208 V (Advansys)
1	00-562104-00008	10.7 kW Booster Heater Element, 240 V (Advansys)
1	00-562104-00010	10.7 kW Booster Heater Element, 480 V (Advansys)
1	00-271123	High Limit Protector (Electric Booster Heater)
1	00-294681-026-1	Electric Blower Dryer Thermostat
1	00-562095-00001	Blower Dryer Heater, 1.5 kW, 208 V
1	00-562095-00002	Blower Dryer Heater, 1.5 kW, 240 V
1	00-562095-00004	Blower Dryer Heater, 1.5 kW, 480 V

Steam Heat Only

Qty.	Part Number	Description
1	00-749983	Steam Solenoid Valve, 3/4", 120 Volt (Wash/Power Rinse/Dual Rinse Tank Heat, Blower Dryer)
1	00-562663	Steam Solenoid Valve Replacement Kit, 1", 120 Volt (Wash/Power Rinse Tank Heat, Steam Booster)
1	00-294681-031-4	Thermostat (Steam Booster) Prior to Serial Number 271197621
1	00-475458-00005	Temperature Control Board Assy. (Steam Booster) Starting Serial Number 271197621
1	00-562194-00002	Probe Assy. (Steam Booster) Starting Serial Number 271197621
1	00-118317	Steam Condensate Trap (Wash/Power Rinse/Dual Rinse Tanks, Steam Booster, Blower Dryer