SERVICE MANUAL

STERO UNDERCOUNTER DISHWASHER

SUnH	**ML - 130381**
SUnL	**ML - 130382**

- NOTICE -

This Manual is prepared for the use of trained Hobart Service Technicians and should not be used by those not properly qualified.

This manual is not intended to be all encompassing. If you have not attended a Hobart Service School for this product, you should read, in its entirety, the repair procedure you wish to perform to determine if you have the necessary tools, instruments and skills required to perform the procedure. Procedures for which you do not have the necessary tools, instruments and skills should be performed by a trained Hobart Service Technician.

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1. GENERAL

SERVICE UPDATES

August 2025
- Updated WIRING DIAGRAM (SUnH).
- Updated WIRING DIAGRAM (SUnL).

June 2025
- Updated SPECIFICATIONS.

INTRODUCTION

Specified SUnH unit is NSF rated, Stero high temperature undercounter dishwasher. Features soft start, two selectable cycles, one standard 2-minute cycle with optional extended cycle (factory set at 240 seconds); 0.84 gallons per rack, LED temperature and operator display, service diagnostics, detergent and rinse aid pumps. Constructed of stainless steel.

Specified SUnL unit is NSF rated, Stero chemical sanitizing undercounter dishwasher. Features soft start, two selectable cycles, one standard 2-minute cycle with optional extended cycle (factory set at 240 seconds); 0.84 gallons per rack, LED temperature and operator display, service diagnostics, detergent, rinse aid and sanitizer pumps. Constructed of stainless steel.

MODELS	
Model	**DESCRIPTION**
SUnH	High temperature rinse
SUnL	Low temperature chemical sanitizing rinse

TOOLS

Standard Tools
- Standard set of hand tools.
- Metric set of hand tools.
- VOM with measuring micro amp current tester. Any VOM with minimum of CAT III 600V, CE certified. Sensitivity of at least 20,000 ohms per volt can be used. In addition, meter leads must also be a minimum of CAT III 600V.
- Clamp on type amp meter with minimum of NFPA-70E CAT III 600V, UL/CSA/TUV listed.
- Temperature tester (thermocouple type).
- Field service grounding kit.

Special Tools	
Part Number	**Description**
01-605122-00003	Door Shim.
01-605121-00003	Door Side Shim.
EW-499095	Drain Body.
EW-199067	Lower Manifold Nut.
EW-199068	Upper Manifold Nut.
00-563998	Drain Body Kits.
NOTE: Purchased through Hobart parts. https://www.hobartservice.com/parts.	

SPECIFICATIONS

STANDARD ELECTRICAL OPTIONS					
MODEL	**HEAT TYPE**	**ELEC SPECS**	**RATED AMPS**	**MIN SUPPLY CIRCUIT AMPACITY**	**MAXIMUM PROTECTIVE DEVICE**
SUnH High Temp Rinse	Electric	208/60/1	24.2	30	30
		240/60/1	27.5	30	30
SUnL Chemical Sanitizing	Electric	120/60/1	17.5	20	20

SPECIFICATIONS		
	High Temp Rinse	**Chemical Sanitizing**
	SUnH	**SUnL**
Capacities		
Cycle Time (seconds)	90	90
Racks per Hour	30	30
Tank Capacity - US Gallons	5.3	5.3
Motor Horsepower		
Wash	0.62	0.62
Rinse	0.20	0.20
Water Consumption		
U.S. Gallons per Hour (maximum use)	20.2	20.2
U.S. Gallons per Rack (maximum use)	0.84	0.84
Peak Drain Flow - U.S. Gallons		
U.S. Gallons per Minute (initial rate with full tank)	2.8	2.8

SPECIFICATIONS			
	High Temp Rinse	Chemical Sanitizing	
	SUnH	SUnL	
Temperatures °F			
Wash	150°F	120°F	
Rinse	180°F	–	
Incoming Water Temperature (minimum recommenced)	110°F	120°F	
Heating			
Tank Heat, electric (kW)	5.5	2.0	
Electric Booster (kW)	6.5	–	
Standard 20" x 20" (508 x 508) Rack Complement			
Flat	1	1	1
Peg	1	1	1
Machine Timing			
Wash Minimum	59 sec	59 sec	
Rinse Minimum	16 sec	16 sec	

Sump Heater Amp Draw				Machine Type	Booster Heater Amp Draw			
L1	L2	L3	L4		L1	L2	L3	L4
16		16-15		SUnL	No Heater		No Heater	
22		22		SUnH	14		13.7	

Stero SUn Spec Sheet
STERO UNDERCOUNTER SPEC SHEET (ST50400)

INSTALLATION & OPERATION MANUAL

STERO UNDERCOUNTER INSTALLATION & OPERATION MANUAL (F41340)

PROGRAMMING CARD

STERO UNDERCOUNTER PROGRAMMING CARD (F41330)

OPERATION ERROR CARD

STERO UNDERCOUNTER OPERATION ERROR CARD (F41328)

WALL CHART

STERO UNDERCOUNTER WALL CHART

2. REMOVAL AND REPLACEMENT

SERVICE POSITION

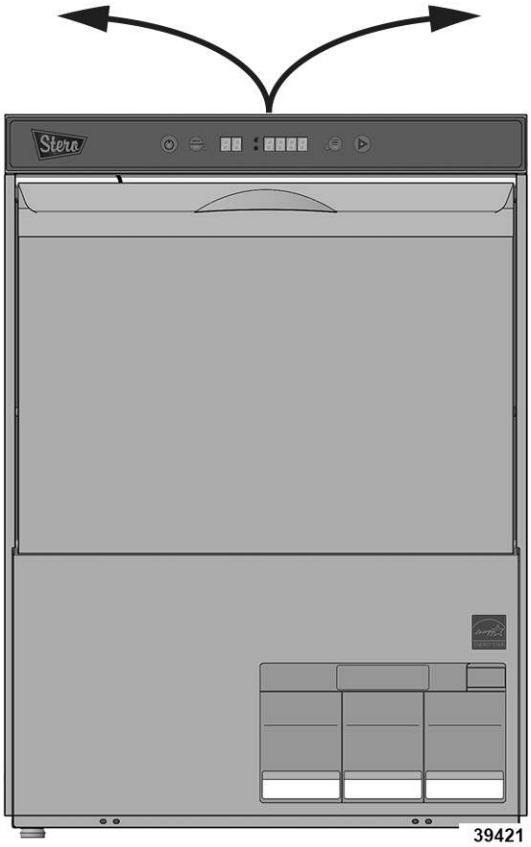


Fig. 1

1. Drain all water from system.

   NOTE: Use shop vac to remove excess water in wash tank sump housing and drain.

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

2. Turn unit on either side.
3. Reinstall in reverse order.

TOP PANEL

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove screws from left and right panel.

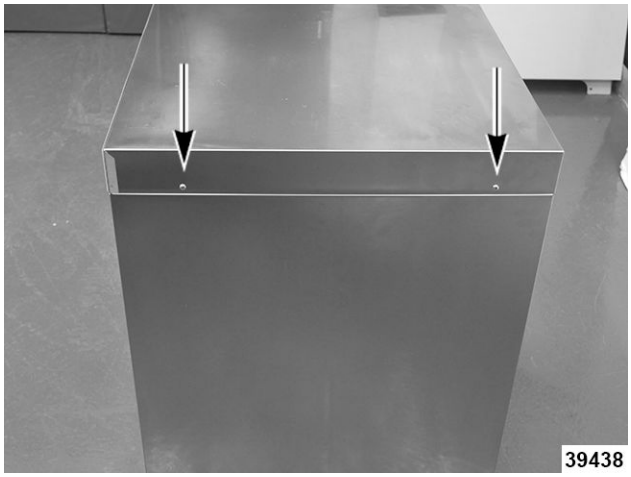


Fig. 2

NOTE: Use care when removing top panel, as HMI cable is connected.

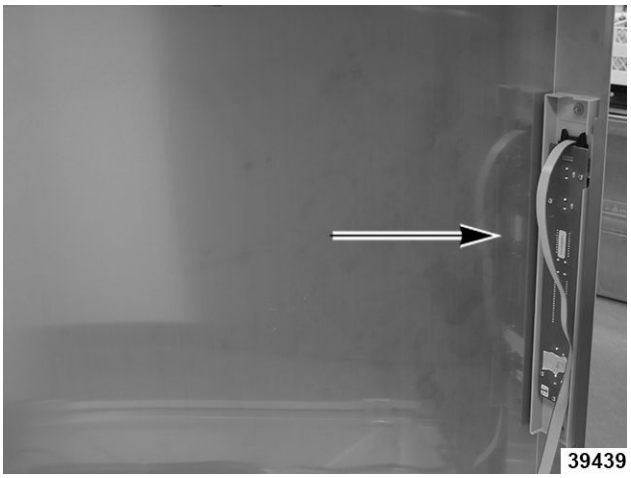


Fig. 3

2. Reinstall top panel.

BACK PANEL

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove back panel screws.

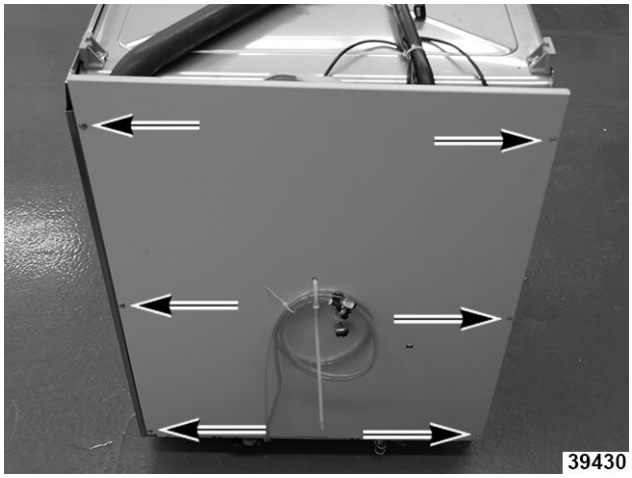


Fig. 4

2. Lift up and away to remove back panel.
3. Reverse procedure to install.

SIDE PANEL

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove TOP PANEL.
2. Remove BACK PANEL.
3. Remove side panel screws.

Fig. 5

4. Lift up and away to remove side panel.
5. Reverse procedure to install.

BOTTOM PANEL

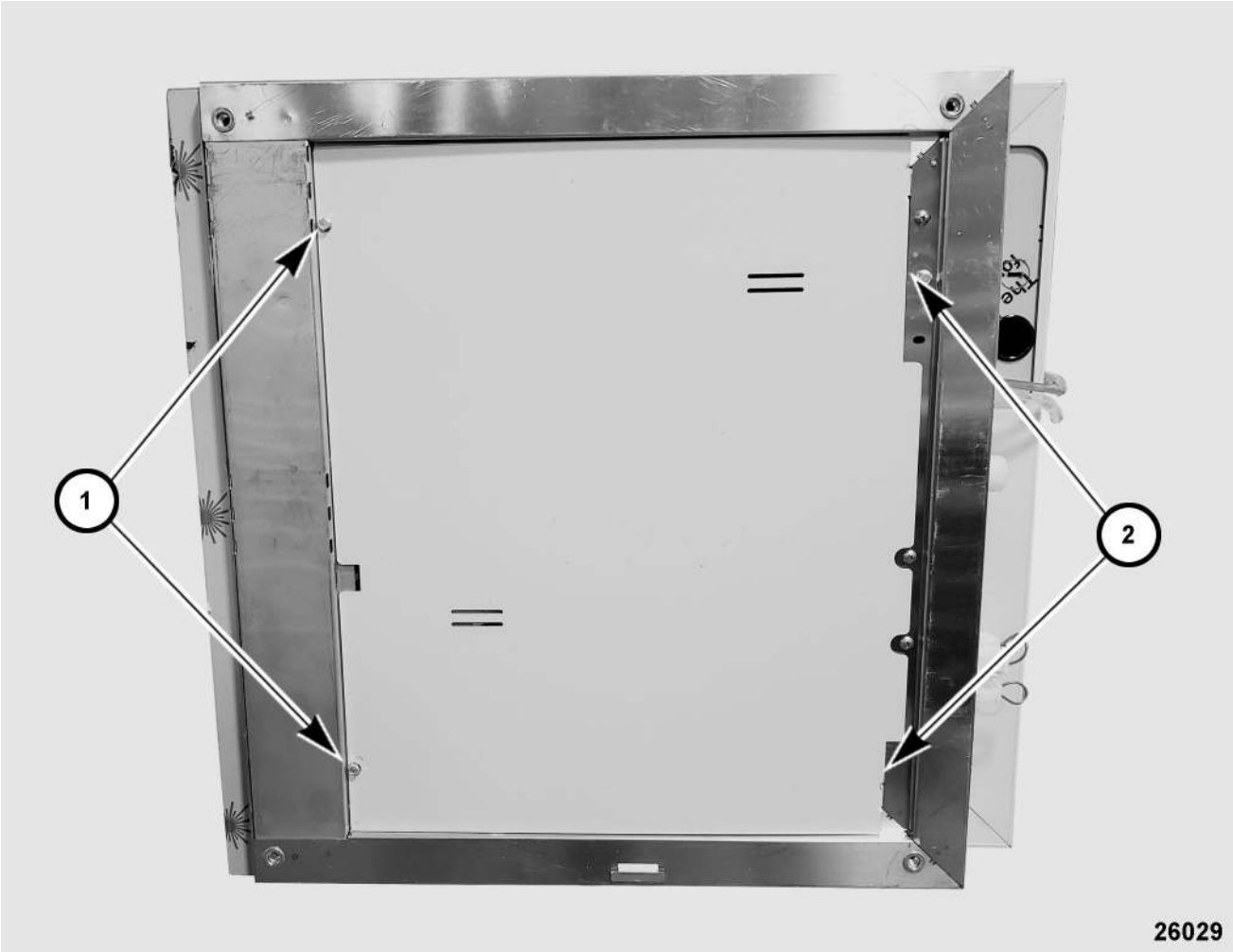


Fig. 6

1. Drain water from unit.

   NOTE: Use shop vac to remove excess water in wash tank, sump housing, and drain.

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

2. Place unit into SERVICE POSITION.
3. Remove hardware (1, Fig. 6).
4. Slide panel away from slots (2, Fig. 6).
5. Reinstall in reverse order.

FRONT PANEL

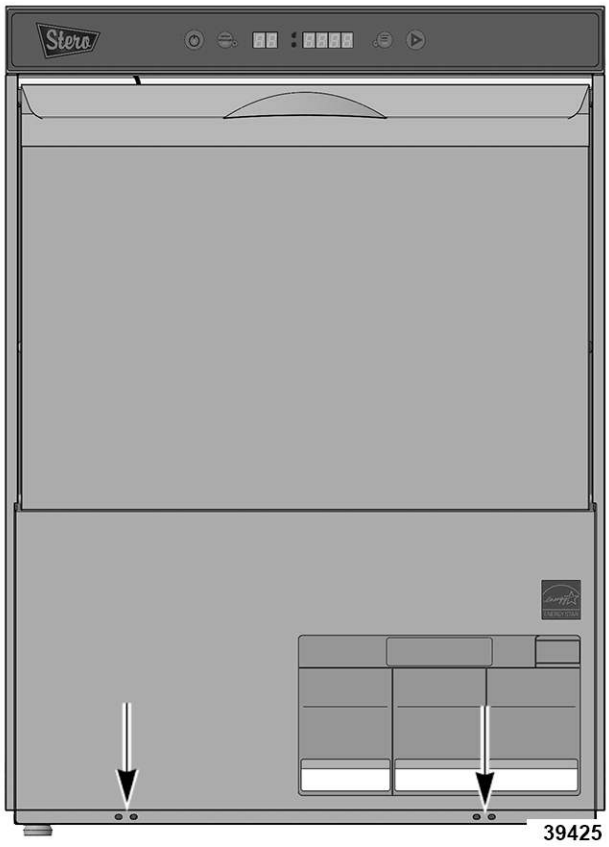


Fig. 7

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove screws from bottom of panel and remove panel.
2. Reverse procedures to install.

CONTROL BOARD (A1)

NOTE: Before replacing the control board, document customer chemical settings.

NOTE: Machine must be in ready (idle) state. If machine is turned off, open door and press "Start" and "Menu" simultaneously until LED is lit, then close door to enter Menu mode.

Record Chemical Settings

1. Press "Menu" button to access operator program settings.

   NOTE: Menu opens and Menu button LED illuminates.

   NOTE: Upper display will show for item "00".

Fig. 8

2. To scroll from one item to the next, press the "Start" button.

Fig. 9

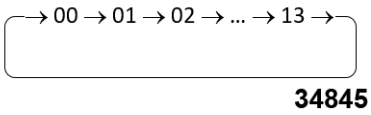


Fig. 10

NOTE: After the last item, the sequence will return to first item.

Fig. 11

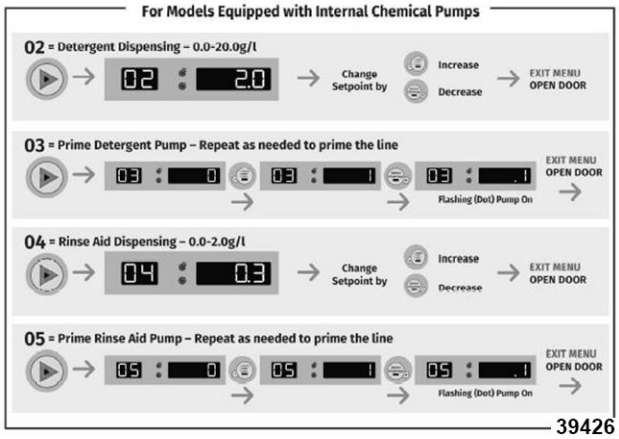


Fig. 12

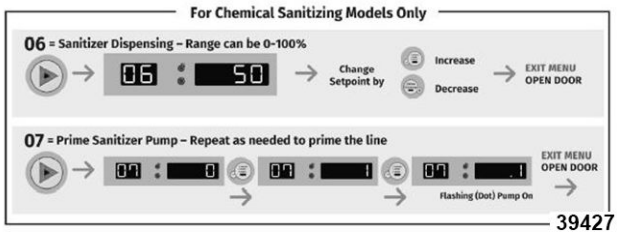


Fig. 13

Control Board Replacement

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove FRONT PANEL.
2. Remove nut to lower control mount bracket.

Fig. 14

3. Disconnect wiring to Control board.
4. Remove control board from standoffs securing control board to back plate by pushing locking lever of standoff toward center, releasing board.

   NOTE: Replace any broken standoffs.

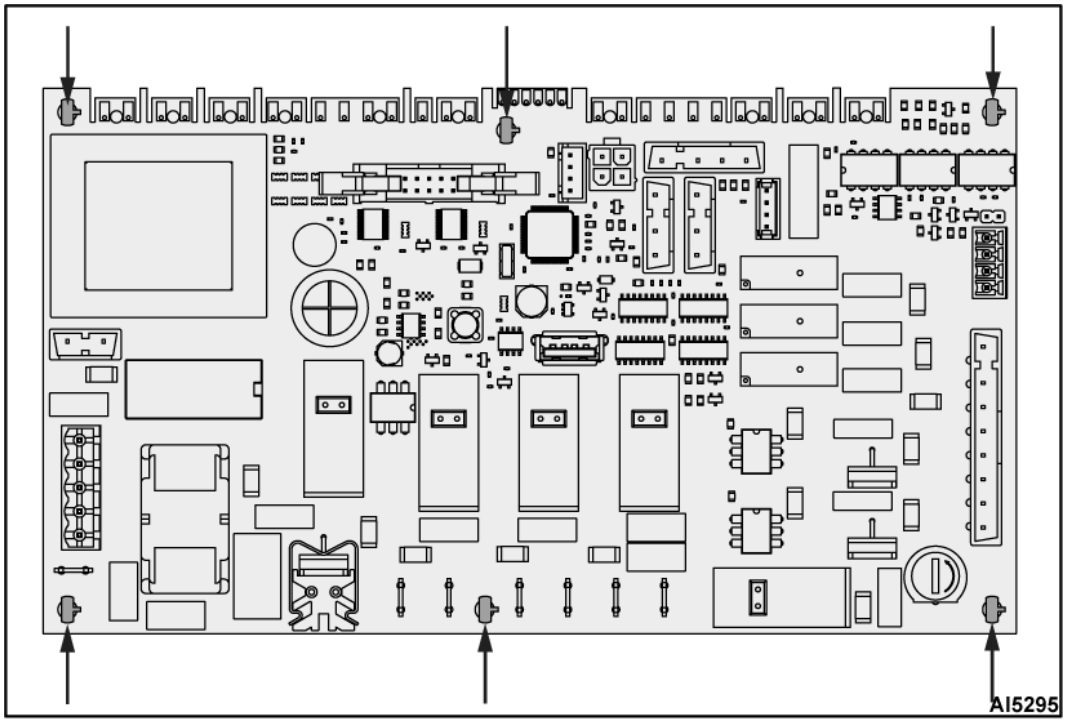


Fig. 15

5. Determine model and use correct model designator (Fig. 16) in model designation connector on control board.

   NOTE: Failure to install designator connector will trigger ER-18 upon power up or incorrect operation.

   NOTE: Only have rinse pump style connector.

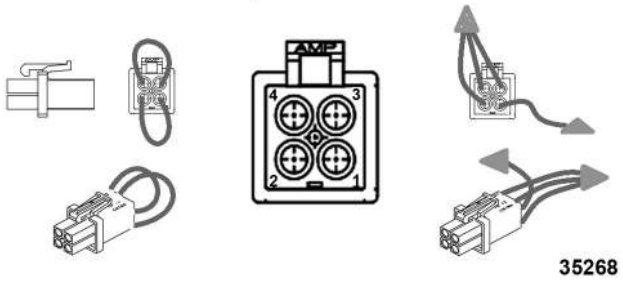
Rinse Pump
Wire Jump Pins: 1 & 2 Pins: 3 & 4


Fig. 16

6. Install board onto standoffs.
7. Reconnect wiring to control board. Reference CONTROL BOARD - WIRE CONNECTIONS.
8. Reinstall any removed panels.
9. Turn on power to the dishwasher.
10. Verify FIRMWARE VERSION (Displays 21).
11. Program dishwasher to machine type MACHINE TYPE PROGRAMMING (DISPLAY 23).

USER INTERFACE (A2)

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove TOP PANEL.

   NOTE: Use care when removing panel. User interface cable is connected.

2. Disconnect cable from user interface board.
3. Remove screws securing board to plastic base.

Fig. 17

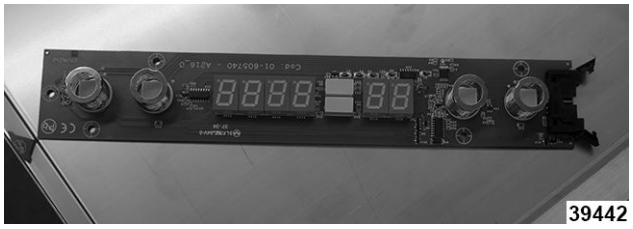


Fig. 18

4. Reassemble in reverse order.

   NOTE: Evenly tighten all screws, over tightening may result in it not working properly.

   NOTE: When inserting cable into board connector, verify locking arms latch over edge of cable end.

DOOR SEAL BRACKET & GASKET

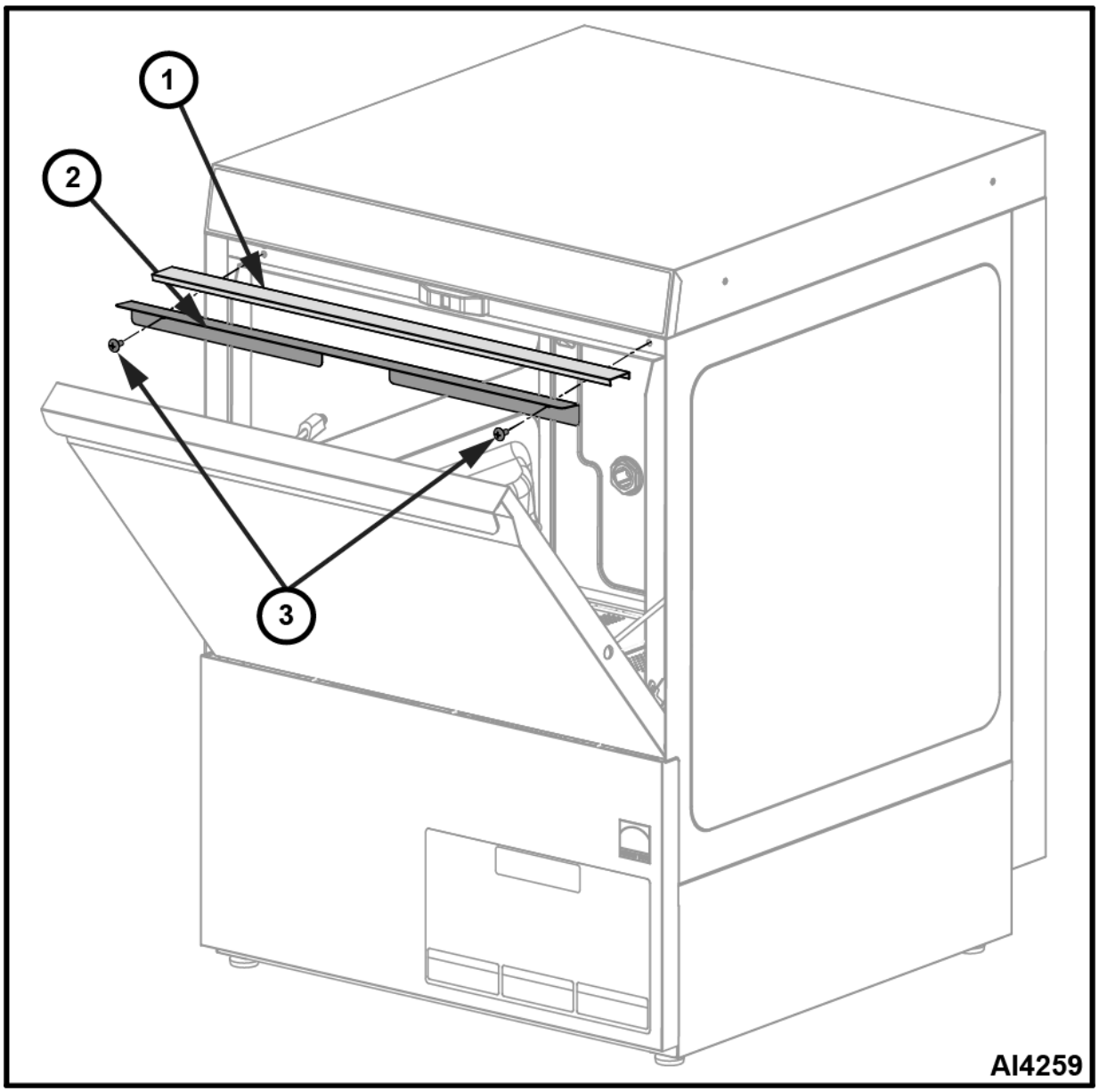


Fig. 19

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Open door.
2. Remove hardware (3, Fig. 19).
3. Remove door seal bracket (2, Fig. 19) and door gasket (1, Fig. 19).
4. Reinstall in reverse order.

   NOTE: Verify gasket is placed properly and evenly on the door seal bracket.

DOOR

⚠WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove TOP PANEL.
2. Remove BACK PANEL.
3. Remove SIDE PANEL.

   NOTE: Ensure door is closed.

   ⚠WARNING

   Door is under spring tension. Make sure door is secured into position before removing hardware.
4. Disconnect cable from spring.

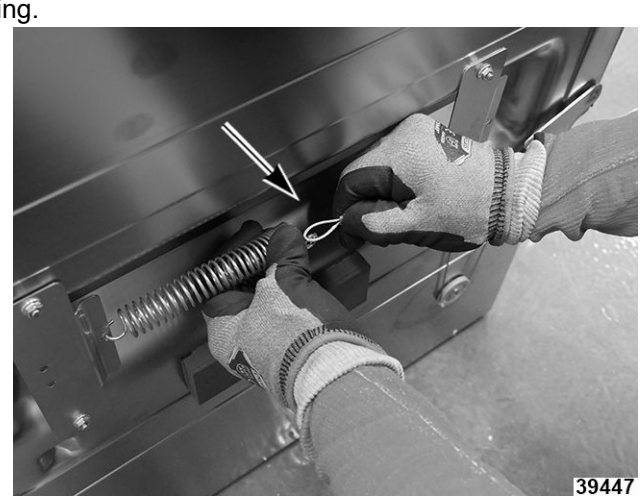


Fig. 20

5. Reverse procedure to install.

CHEMICAL PUMP MOTORS & SQUEEZE TUBES

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove FRONT PANEL.
2. Remove or tape up the plastic barrier.
3. Remove nut to lower control plate bracket assembly (1, Fig. 21).
4. Loosen ferrule nut from pump body (3, Fig. 21) and remove hose.

   NOTE: This may require cutting hose at barb end.
5. Remove nut from dosing pump assembly (2, Fig. 21) and lay forward.

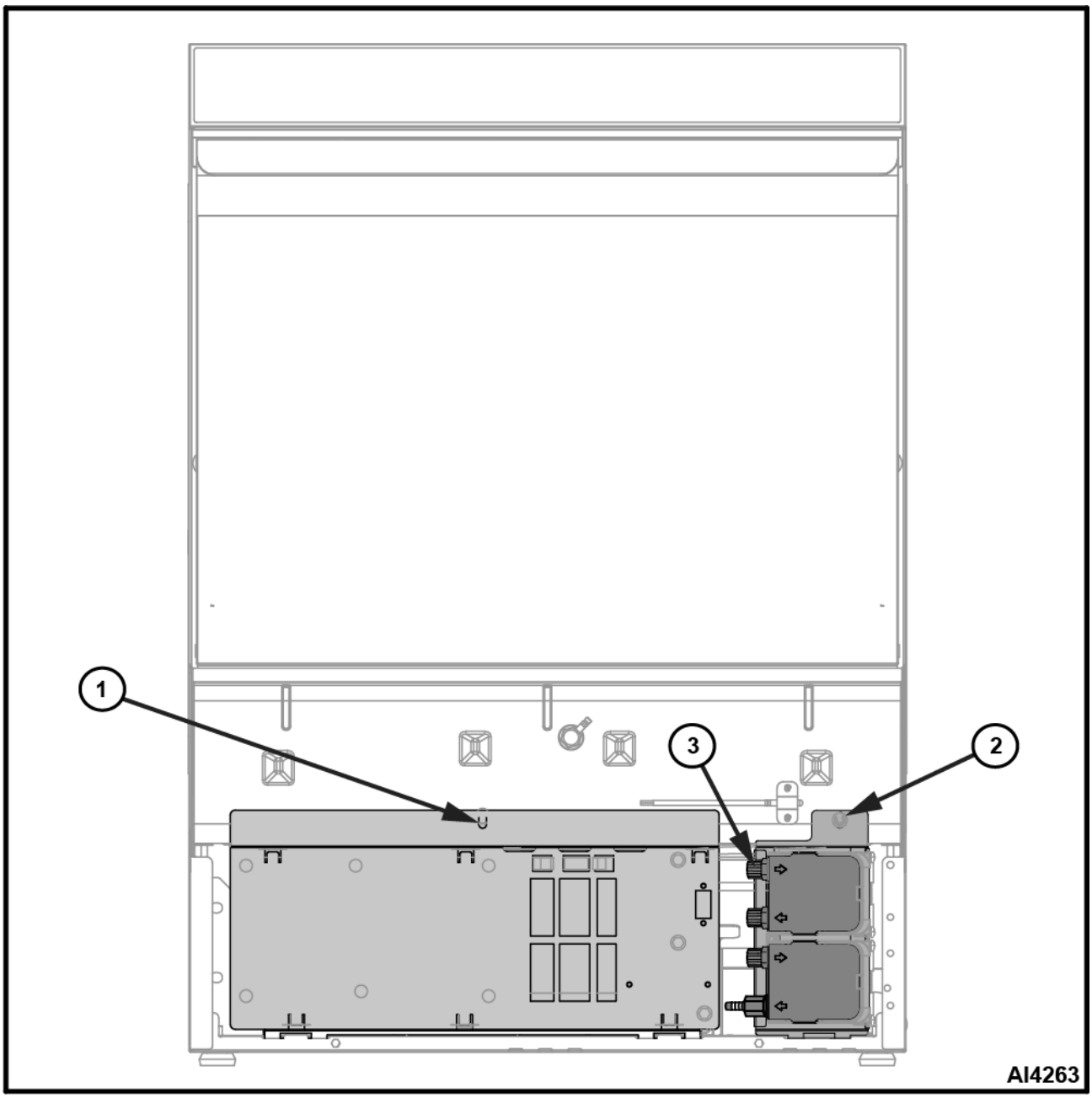


Fig. 21

6. Disconnect chemical pump motor wires (1, Fig. 22).
7. Loosen screws (2, Fig. 22) to remove chemical pump motor.

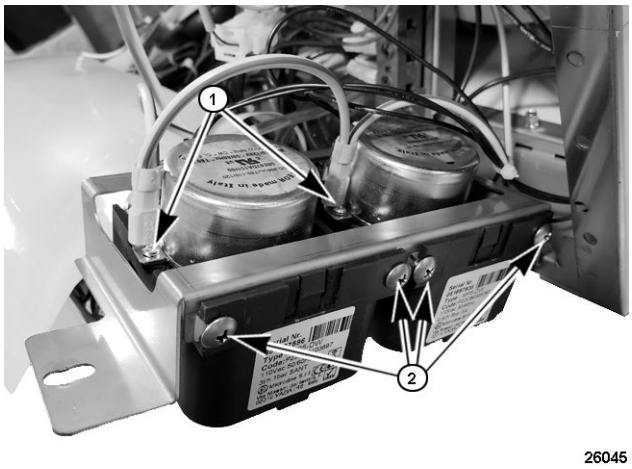


Fig. 22

NOTE: If replacing Squeeze Tube, continue with step (Step 8) otherwise skip to step (Step 12).

8. Remove cover by releasing clips.

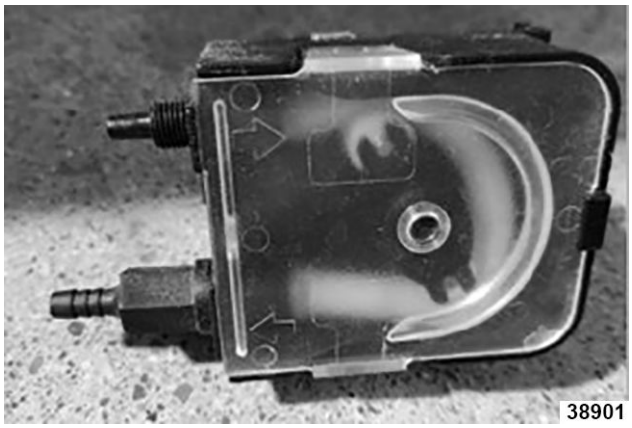


Fig. 23

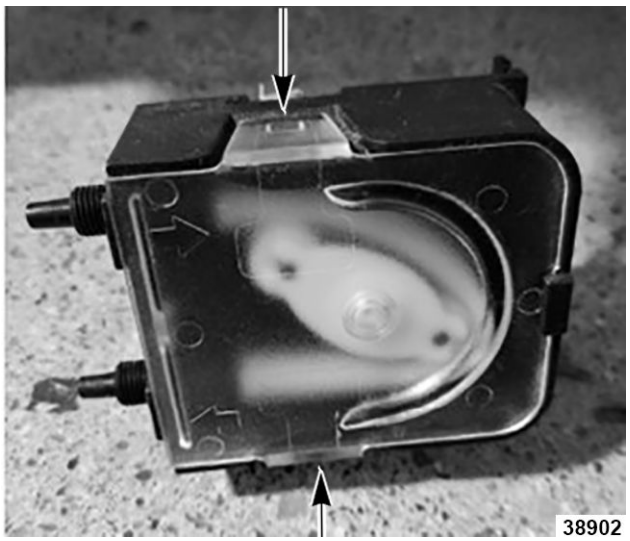


Fig. 24

Fig. 25

9. Pull top end of tube out of housing. Rotate shaft clockwise to release remainder of tube.

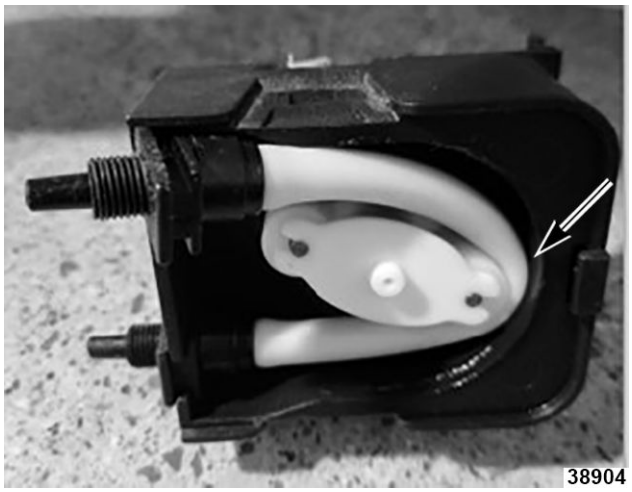


Fig. 26

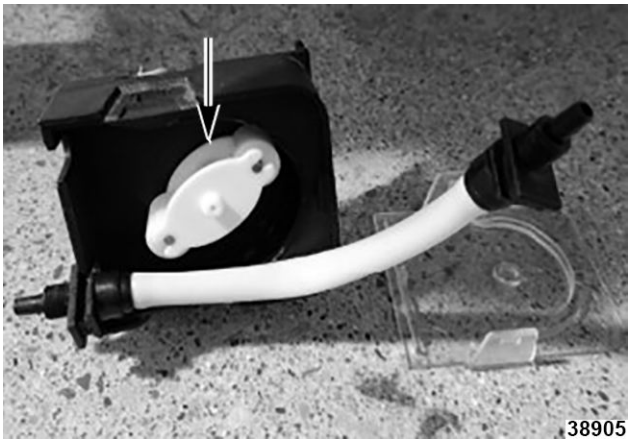


Fig. 27

10. To install new squeeze tube, press top into place while rotating the shaft clockwise until both ends and seat tube. (Fig. 25).
11. Replace cover (Fig. 23).

    NOTE: Ensure right side of cover is under clip prior to snapping into place.
12. Reverse procedure to install

    NOTE: Wire tie wires into place.

WASH PUMP MOTOR

1. Drain all water from system.

   NOTE: Use shop vac to remove excess water in wash tank sump housing and drain.

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

2. Place unit into SERVICE POSITION.
3. Remove BOTTOM PANEL.
4. Disconnect wash pump motor and capacitor wires (1, Fig. 28).
5. Remove capacitor (4, Fig. 28).
6. Disconnect wash pump motor hoses (2, Fig. 28).
7. Remove bolt (3, Fig. 28) and remove motor from unit.

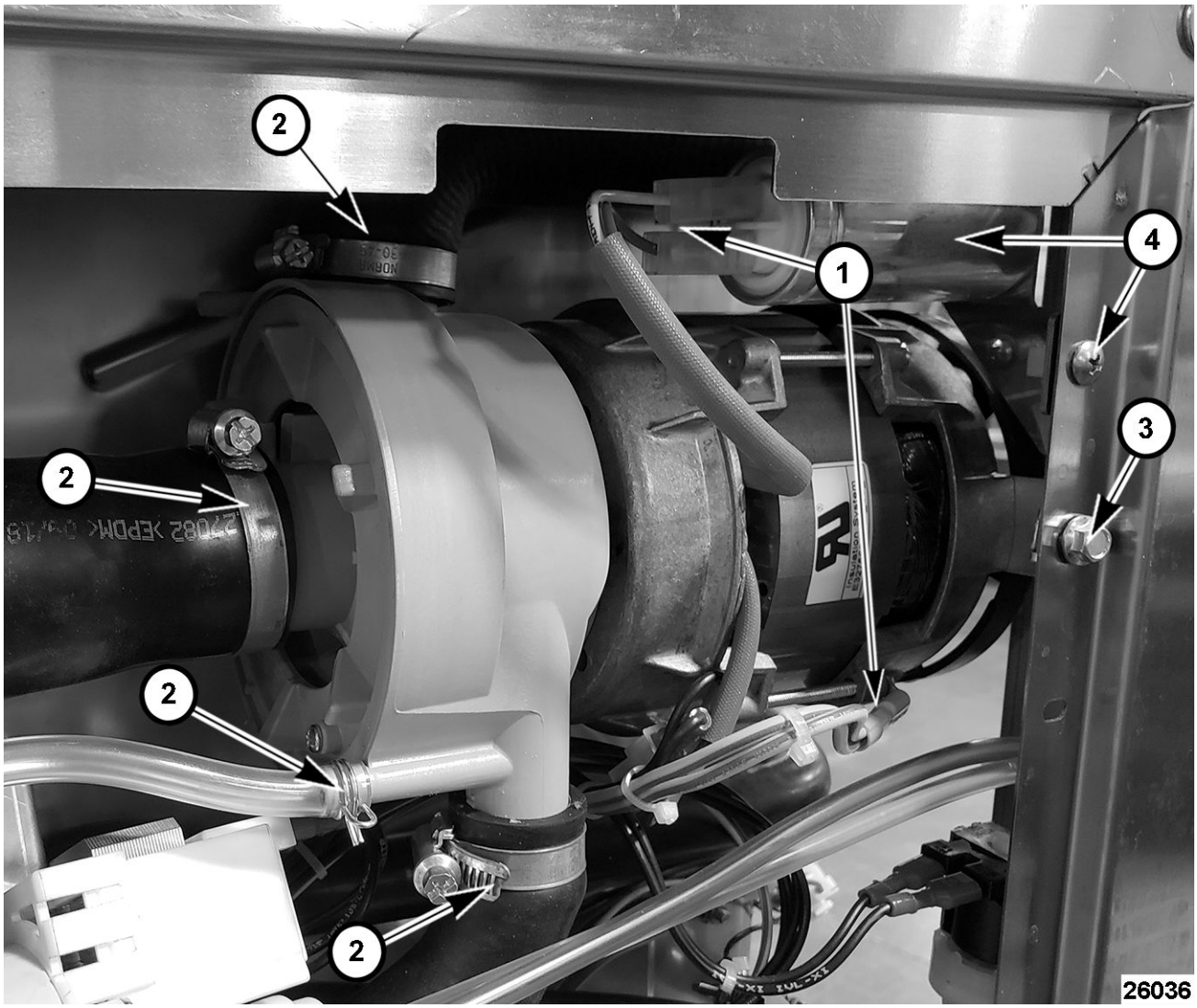


Fig. 28

8. Transfer bracket to replacement wash pump motor.
   A. Turn on dishwasher and run a cycle.

9. Reverse procedure to install.
10. Check for leaks.
11. Install any panels removed.

RINSE PUMP MOTOR

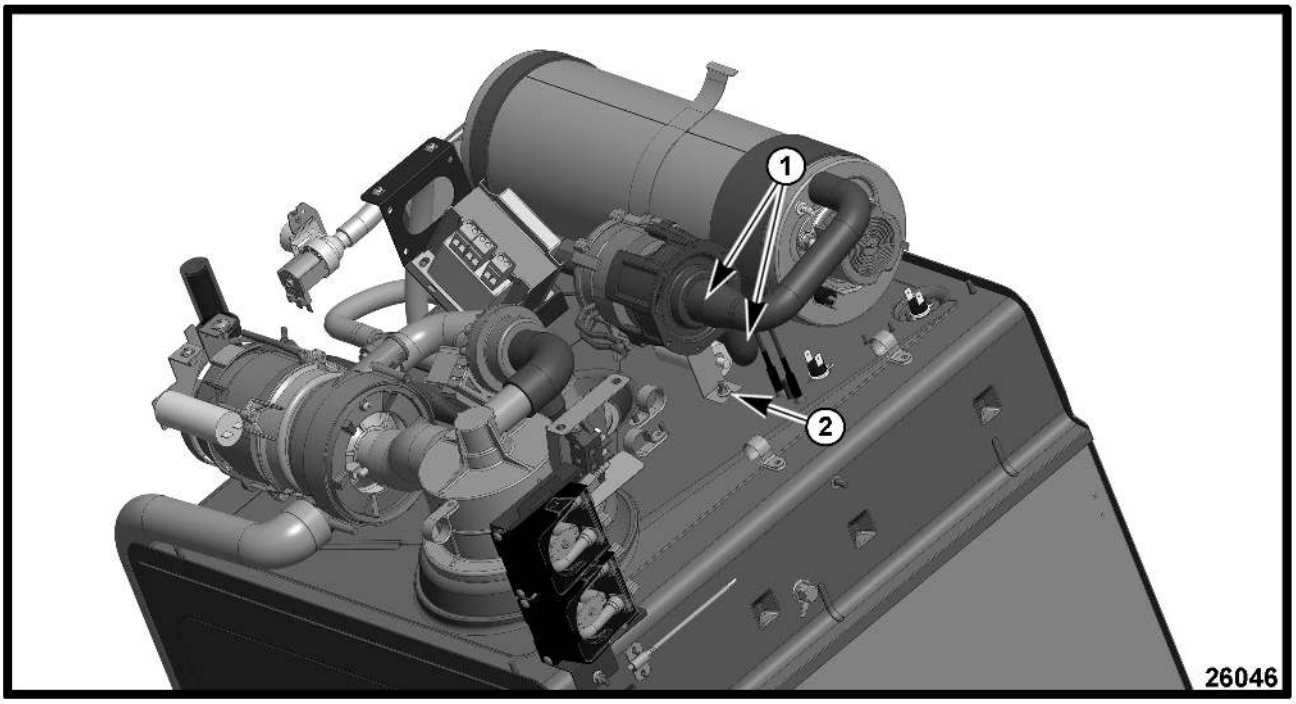


Fig. 29

1. Drain all water from system.

   NOTE: Use shop vac to remove excess water from wash tank, sump housing, and drain, before placing into service position.

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

2. Place unit in SERVICE POSITION.
3. Remove BOTTOM PANEL.
4. Disconnect rinse pump motor and capacitor wires.
5. Disconnect and remove hoses from rinse pump motor (1, Fig. 29).

   NOTE: Excess hot water may leak out from booster.
6. Loosen hardware with bracket and remove rinse pump motor (2, Fig. 29).
7. Transfer bracket to replacement rinse pump motor.
8. Reverse procedure to install.
9. Place unit into service and test.
10. Check for leaks.

TRANSFORMER

NOTE: Drain all water from system. May need to vacuum out tanks.

NOTE: If caster assembly is installed, remove caster assembly. Reinstall after replacement.

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

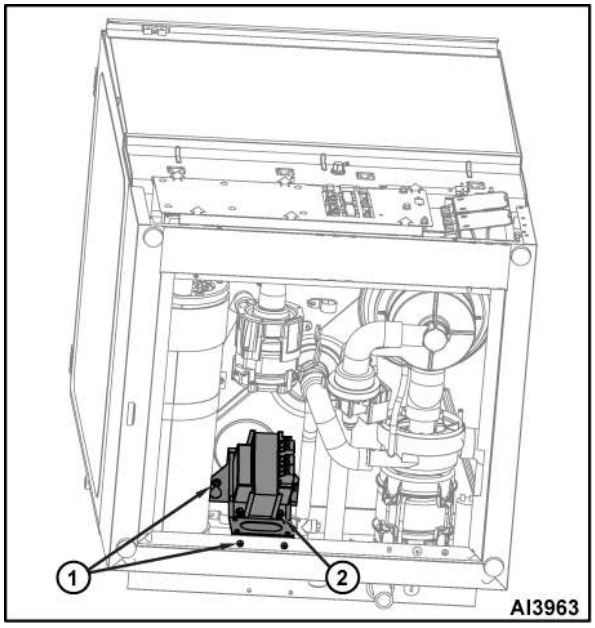


Fig. 30

1. Place unit in SERVICE POSITION.

   NOTE: Transformer is located in the back, in between the booster and wash pump.

2. Remove BOTTOM PANEL.
3. Document and disconnect transformer wires.

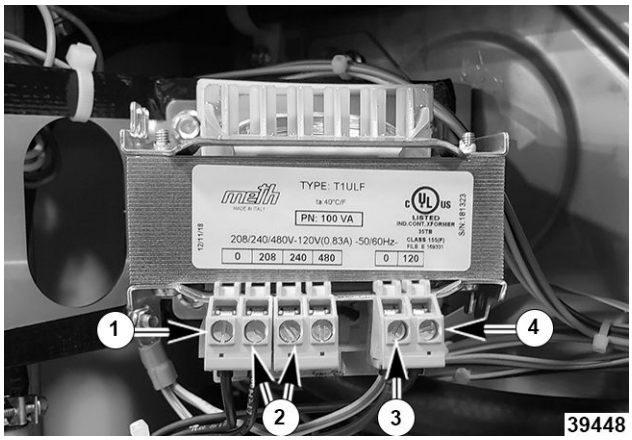


Fig. 31

Number	Wire
1	1T - COM

Number	Wire
2	1T-H
	208VAC / 240VAC
3	1T - X2 / GND
4	1T - X1

4. Loosen hardware from transformer bracket (1, Fig. 30).
5. Remove transformer with bracket out of machine (Fig. 32), then remove transformer from bracket (2, Fig. 30).

   NOTE: Transfer transformer bracket to replacement transformer.

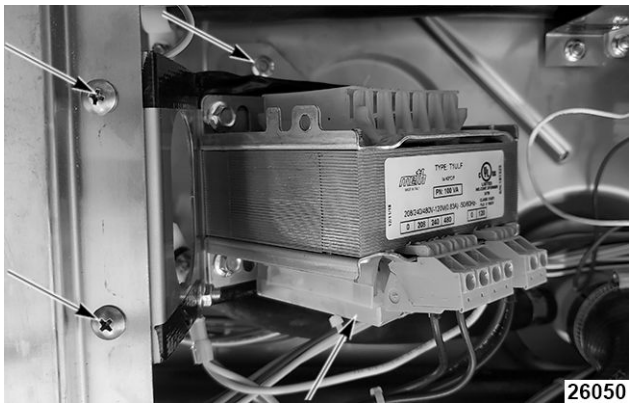


Fig. 32

6. Reverse procedure to install.
7. Verify transformer is wired correctly and tapped correctly at 3TB.
8. Turn on machine and run a wash cycle to verify proper operation.

BOOSTER TANK

1. Drain unit.

   NOTE: Use shop vac to remove excess water in wash tank sump housing and drain.

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

2. Remove RINSE PUMP MOTOR.

   NOTE: Water may drain from booster.

   NOTE: Document transformer wire locations.

3. Remove TRANSFORMER.
4. On the back of the booster, disconnect and remove hoses (1, Fig. 33).

   NOTE: Water may drain from booster.

5. From back of booster, remove hardware (2, Fig. 33) from booster to chamber.

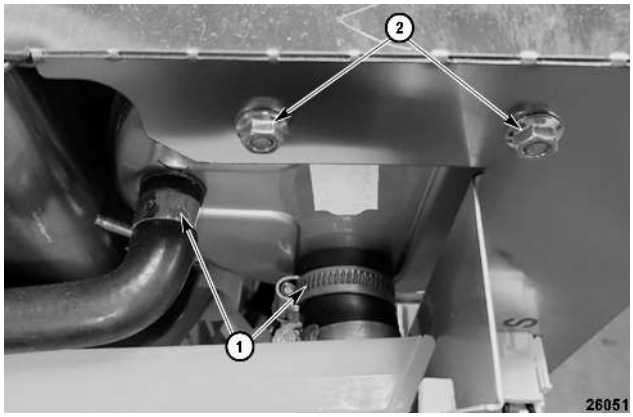


Fig. 33

6. On front of booster, disconnect wires and hoses.

Fig. 34

7. Remove nut to booster strap and remove booster (Fig. 35).

   NOTE: Angle booster to remove.

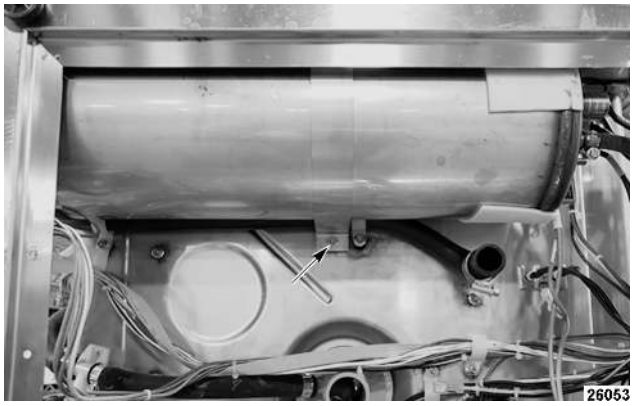


Fig. 35

8. Reverse procedure to install.

   NOTE: Verify transformer is tapped correctly.

9. Place dishwasher into service and test for proper operation.

BOOSTER HEATER (E1) (SUnH)

1. **DRAIN MACHINE** by pressing and holding power on/off button.

   NOTE: Pressing and holding (3 seconds) activates self-cleaning cycle, **drains machine**, and then switches the machine off automatically.

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

2. **Shut off and LOCK OUT incoming water source.**
3. Remove FRONT PANEL.
4. Remove control mount bracket to access booster.

   NOTE: Use care when removing to prevent cables from being pulled.

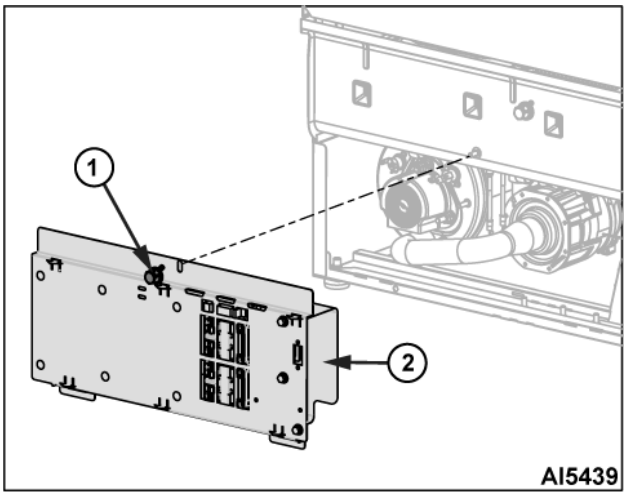


Fig. 36

5. Drain Booster Tank.

⚠ WARNING

Tank and Water are EXTREMELY HOT. Allow to cool before servicing.

- Place container under booster to catch water.
- Loosen clamp and remove hose.

Fig. 37

6. Remove nut securing plastic cover.

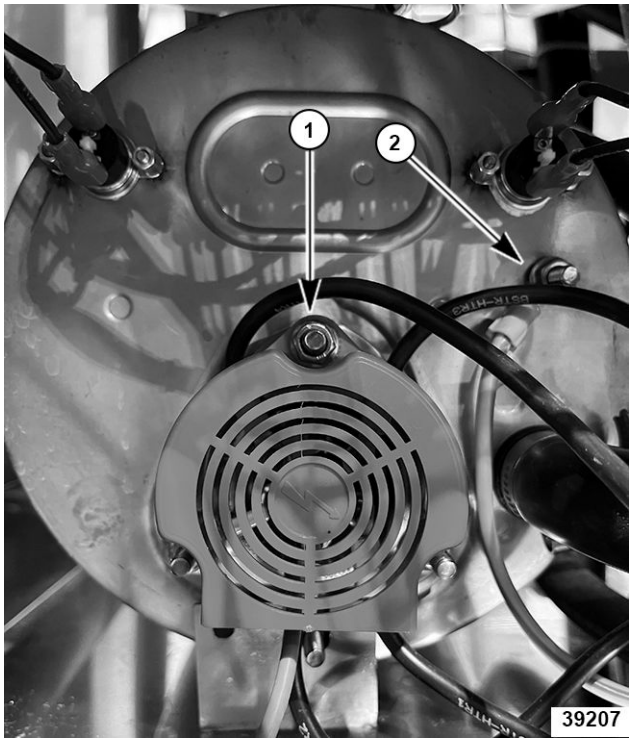


Fig. 38

7. Remove cover, disconnect thermistor wire at harness and remove thermistor (2, Fig. 40).

Fig. 39

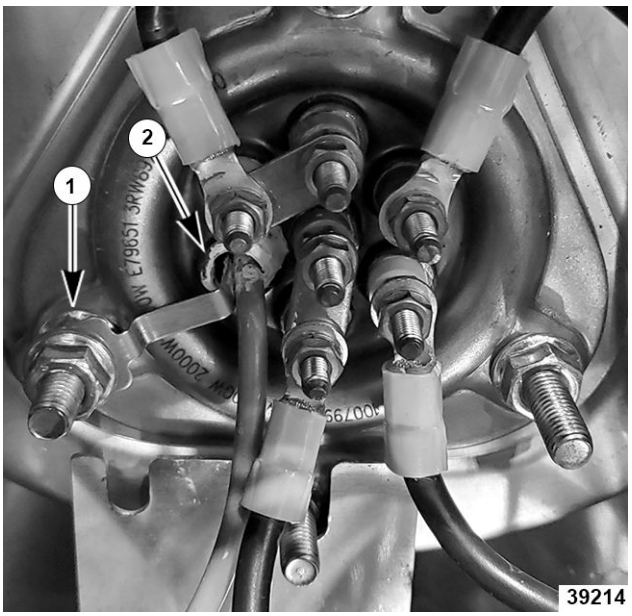


Fig. 40

8. Remove nuts securing heater wires and jumper bars.

   NOTE: Position of the jumper bar on the booster heating element. Locations are dependent on incoming voltage (3PH or 1PH). Reference for further information.

9. Remove three nuts securing element assembly and remove assembly (Fig. 41).

10. Clean any remaining gasket material from tank opening prior to reinstallation.

Fig. 41

11. Apply thermal paste to temperature probe and install onto probe holder.

    NOTE: Verify grove of temperature probe is at the left of the probe holder prongs as shown.

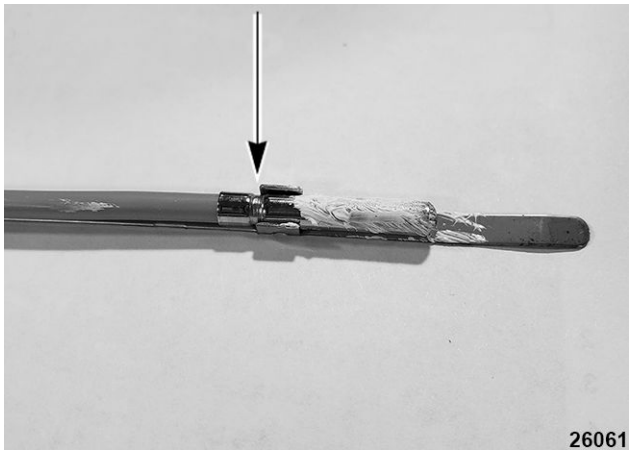


Fig. 42

12. Reassemble in reverse order.

    NOTE: When installing Jumper bars on new heater assembly, ensure spacing between bars is a minimum of 1.6mm (1/16”) gap (Fig. 43). A 1/16” Allen wrench may be used as a gauge.

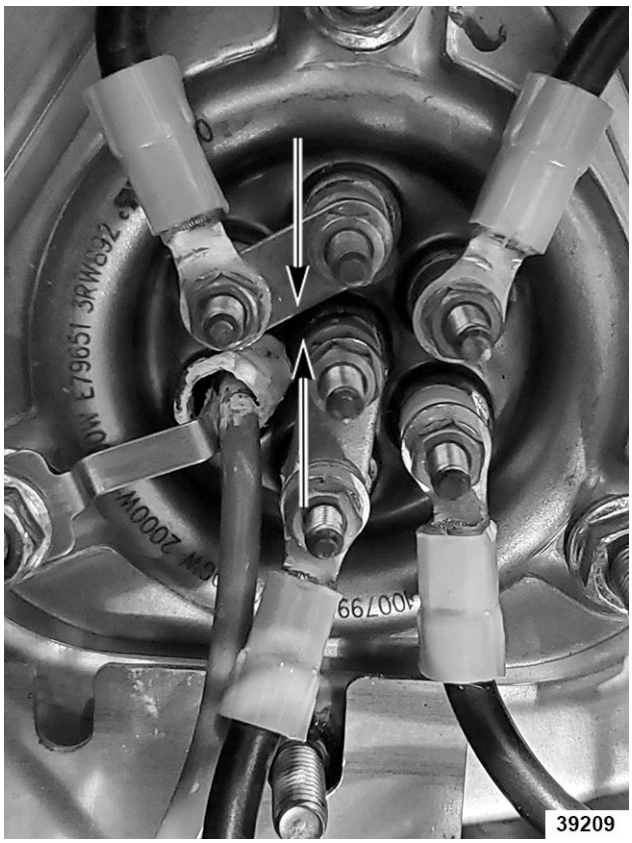


Fig. 43

NOTE: Tighten each nut to 16 in-lb. Use 7 mm wrench to hold back (rear) nut when tightening. (Fig. 44).

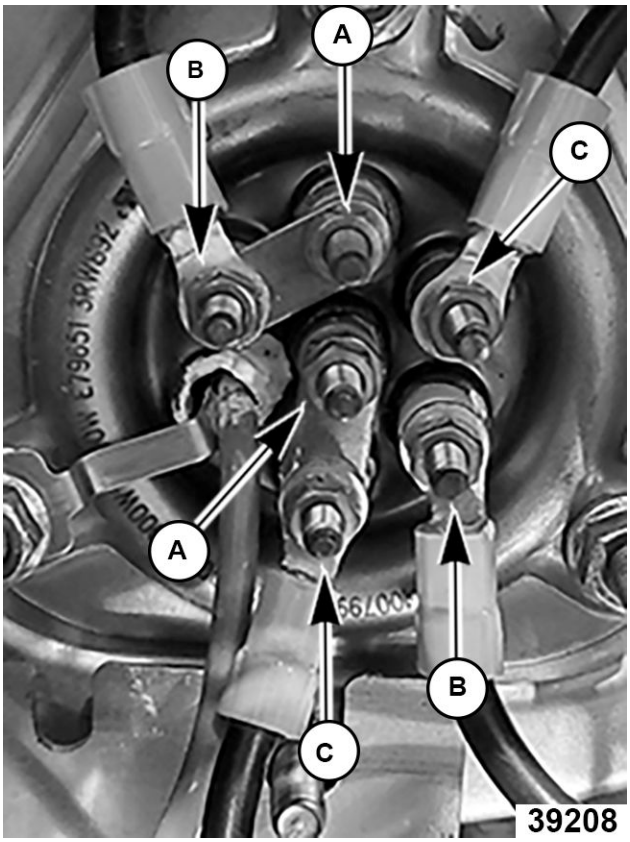


Fig. 44

3. SERVICE PROCEDURES TESTS AND ADJUSTMENTS

WASH CYCLE EXTENDED WASH ADJUSTMENT

NOTE: Procedure to extend wash time for heavier soiled ware.

NOTE: Wash cycle can be extended by up to 4 minutes. Refer to operator manual on how to extend wash cycle.

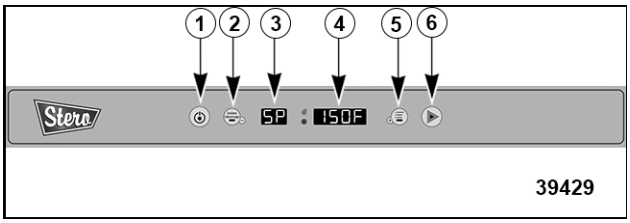


Fig. 45

1. Start a normal 2-minute washing cycle by pressing Start button (6, Fig. 45).
2. Press Start button a second time, within first 10 seconds of cycle starting.

   NOTE: While extended washing cycle is running, both Start button LED and Menu button LED flashes.

   NOTE: As soon as Start button LED light stays solid, rinsing process is complete, and cycle ends.

DOOR ADJUSTMENT

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

Adjustment

1. Insert (door shim) between door and front panel.

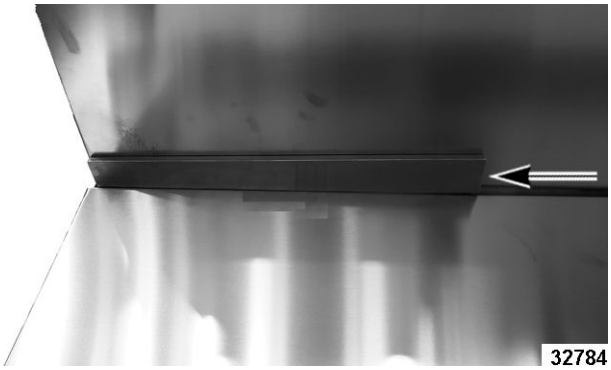


Fig. 46

2. Insert (door side shim) between door hinge bracket and frame.

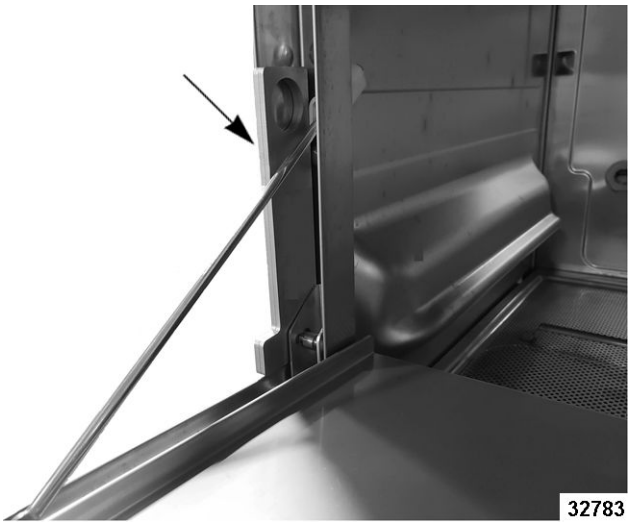
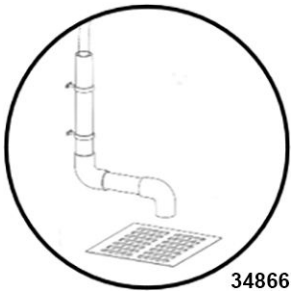


Fig. 47

3. Tighten bolts securing door hinge bracket to frame.
4. Move both special tools to other side of door and tighten bolts securing the door hinge bracket on that side.

DRAIN CONNECTION

Drain Connection			
Incorrect	**Acceptable**	**Preferred (Meets Code Requirements)**	
 34864	 34865	 34866	 34867
Fig. 48	**Fig. 49**	**Fig. 50**	**Fig. 51**

NOTICE

An improper drain connection or a kinked hose could result in reduced machine performance and errors. An air gap connection is the preferred connection method.

TESTING SANITIZER (BLEACH) CONCENTRATION (PPM) (SUnL)

NOTE: If servicing a new machine or a machine that has run out of sanitizer and a new bottle is being installed, it may be necessary to prime the pump, refer to PRIMING CHEMICALS.

1. Verify rack in dishwasher is empty.
2. Close door and start a cycle.
3. After wash cycle and before rinse cycle starts, open door and place a 6 to 8 ounce clean glass upright in each corner of rack and one in center to collect water. Close door and finish rinse cycle.
4. Open door and pour all liquid from five glasses into glass.
5. Follow directions precisely on litmus paper vial and test water in the glass.

   NOTE: Concentration should be 50 PPM minimum to 100 PPM maximum.
6. If sanitizer concentration is outside of bounds, adjust dosing settings (INSTALLATION & OPERATION MANUAL).
7. Repeat procedure until proper reading is obtained.

TEMPERATURE PROBE (BOOSTER/WASH TANK)

NOTE: Room temp: 72°F or (22.2°C).

NOTE: Unit Power Off: 10.99 @ 71.6°F or (22.0°C).

Temperature		K Ohm
°F	**°C**	**Reading**
71.6	22.0	10.99

Temperature		K Ohm
°F	°C	Reading
93.2	34.0	7.14
104.0	40.0	5.86
109.4	43.0	5.32
125.6	52.0	3.91
131.0	55.0	3.40
145.4	63.0	2.75
159.8	71.0	2.19
185.0	85.0	1.48
195.8	91.0	1.26

BOOSTER TEMP ADJUSTMENT (DISPLAY 24)

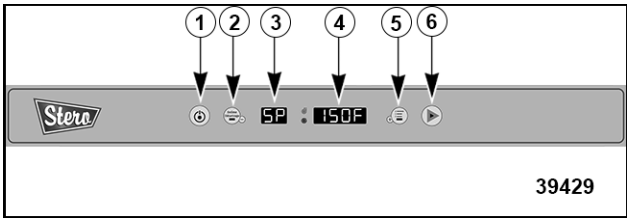


Fig. 52

NOTE: If unit is OFF, Skip to Step 3.

Item	Name	Item	Name
1	Power / Drain Button	4	Temperature Display
2	Delime Button	5	Menu Button
3	Information Display	6	Play / Start / Wash Button

1. Push and hold "Power" button to turn off machine.
2. While machine is draining, push and hold "Power" button within 20 seconds, until machine powers off and draining stops.
3. With machine off, open door and press and hold "Menu" and "Delime" buttons simultaneously until LEDs light up.

   NOTE: Verify LED lights, located underneath "Menu" and "Delime" buttons, are lit up.

Fig. 53

4. Close door. Display shows 21.

Fig. 54

5. Press "Play" button until display reads 24, Configuration Parameter.

Fig. 55

6. To enter settings menu press "Power" button.

Fig. 56

   NOTE: "t0 - 12" will be displayed.

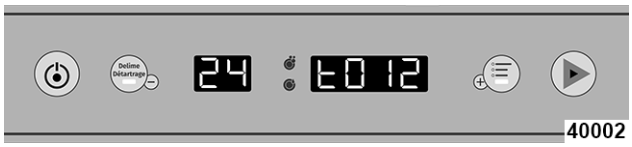


Fig. 57

7. Continue to press "Play" until "A0-xx" is displayed.

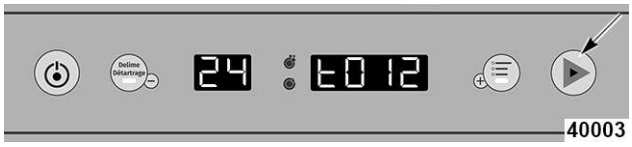


Fig. 58

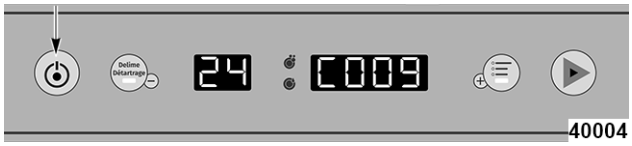


Fig. 59

8. Press "Power" button to edit parameter.

   NOTE: Use Menu and Delime buttons to toggle thru Analog (A) parameters. A0-02 (Boiler Rinse temp), A0-07 (Boiler Standby temp).

Fig. 60

   NOTE: The temperature setting is in Celsius. One degree in Celsius equals approx. 1.8°F. The display reads from left to right, top to bottom. The illustration above is set at 085.0°C (185°F).

9. Press "Menu" button to increase and "Delime" button to decrease value.

   NOTE: Refer to parameter setting PARAMETER - ANALOG VALUES.

   NOTE: High limit cut off is around 235°F, so a setting above 087.0 may cause nuisance tripping (manual reset).

Fig. 61

10. After setting desired parameter, save and return to main menu by pressing and holding the "Power" button for 3 seconds.
11. Once display is back to "A0-xx", use "Menu" and "Delime" buttons to navigate thru other Analog (A) parameters.
12. Open door to exit.

INPUT TEST (Displays 31)

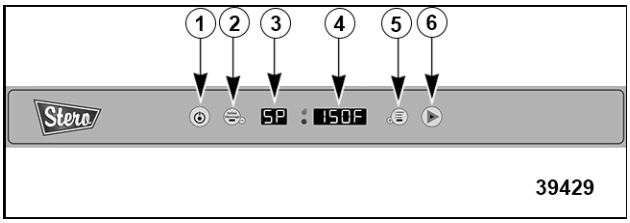


Fig. 62

INPUT TEST DISPLAY SUMMARY
NOTE: Upper display references.

INPUT TEST DISPLAY SUMMARY	
1 - Door sensor.	9 - Not used.
2 - Not used.	10 - Not used.
3 - Not used.	11 - Not used.
4 - Not used.	12 - Not used.
5 - Not used.	13 - Not used.
6 - Rinse aid level sensor.	14 - Not used.
7 - Detergent level sensor.	15 - Not used.
8 - Sanitize level sensor.	16 - Not used.

PLAY / WASH BUTTON (2)	MENU BUTTON (3)	UPPER DISPLAY (5) LOWER DISPLAY (6)	DELIME BUTTON (4)	POWER / DRAIN BUTTON (1)	INPUT TEST - 31
				Off	1. Unit power off on display. **NOTE:** If unit is On: • **Step 1:** Press and hold Power/Drain button for 3 seconds to fully drain tank. • **Step 2:** Start with option 1 and wait until unit starts to drain. Press & hold Power button until machine powers off and stops draining. **NOTE:** Will power off unit without draining completely. **NOTE:** When power is back on, unit will start drain process 25 seconds before it starts filling.
				Off	1. Open door.
X	X		X		1. Press and hold Play/Wash (2), Menu (3) and Delime (4) until Delime and Menu Led lights are ON.
		31		X	1. Close door and press Power/Drain (1) button.
		01 1			**01 - Checking Door Switch Operation** 1. Closed door = 1. 2. Open door = 0.

PLAY / WASH BUTTON (2)	MENU BUTTON (3)	UPPER DISPLAY (5) LOWER DISPLAY (6)	DELIME BUTTON (4)	POWER / DRAIN BUTTON (1)	INPUT TEST - 31
	X		X		**NOTE:** Increase or decrease (±) by buttons program selection.
					NOTE: 02 thru 05 not used.
		06 1			**06 - Checking Rinse Aid Deficiency by (Jumper / Chem Bottle Level Sensor** **NOTE:** Check by removing / inserting jumper or Chem Bottle Level Sensor 1. Rinse Aid Detected = 1 (Full). 2. Rinse Aid Not Detected = 0 (Empty). **NOTE:** With Jumper = 1. **NOTE:** Missing Jumper = 0.
		07 1			**07 - Checking Detergent Deficiency by (Jumper / Chem Bottle Level Sensor** **NOTE:** Check by removing / inserting jumper or Chem Bottle Level Sensor 1. Detergent Detected = 1 (Full). 2. Detergent Not Detected = 0 (Empty). **NOTE:** With Jumper = 1. **NOTE:** Missing Jumper = 0.

PLAY / WASH BUTTON (2)	MENU BUTTON (3)	UPPER DISPLAY (5) LOWER DISPLAY (6)	DELIME BUTTON (4)	POWER / DRAIN BUTTON (1)	INPUT TEST - 31
		08 1			**08 - Checking Sanitize Deficiency by (Jumper / Chem Bottle Level Sensor** **NOTE:** Check by removing / inserting jumper or Chem Bottle Level Sensor 1. Sanitize Detected = 1 (Full). 2. Sanitize Not Detected = 0 (Empty). **NOTE:** With Jumper = 1. **NOTE:** Missing Jumper = 0.
					NOTE: 09 thru 16 not used.
					1. Press Power/Drain (1) button to return to configuration menu then press and hold Power/ Drain (1) button to exit menu.

OUTPUT TEST (TEMP / PRESSURE SWITCH) (Displays 32)

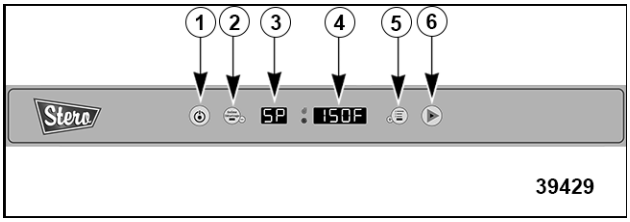


Fig. 63

OUTPUT TEST DISPLAY SUMMARY				
Machine Type	Booster Tank		Wash Tank	
	Full	Empty	Full	Empty
SUnH	0.78	0.5	0.73	0.5
SUnL	0.78	0.5	0.73	0.5

PLAY / WASH BUTTON (2)	MENU BUTTON (3)	UPPER DISPLAY (5) LOWER DISPLAY (6)	DELIME BUTTON (4)	POWER / DRAIN BUTTON (1)	OUTPUT TEST (TEMPERATURE / PRESSURE SWITCH) - 32
				Off	1. Unit power off on display. **NOTE:** If unit is On: • **Step 1:** Press and hold Power/Drain button for 3 seconds to fully drain tank. • **Step 2:** Start with option 1 and wait until unit starts to drain. Press & hold Power button until machine powers off and stops draining. **NOTE:** Will power off unit without draining completely. **NOTE:** When power is back on, unit will start drain process 25 seconds before it starts filling.
				Off	1. Open door.
X	X		X		1. Press and hold Play/Wash (2), Menu (3) and Delime (4) until Delime and Menu Led lights are ON.
		31			1. Close door.
X		32			1. Press Play/Wash (2) to scroll to 32.
		01 170		X	1. Press Power / Drain button to scroll to 01. **NOTE: 01 - Checking Booster Probe Temperature (Example 170°F).** **NOTE: Temperature displayed will be in °C or °F depending on what is configured in user menu.**

PLAY / WASH BUTTON (2)	MENU BUTTON (3)	UPPER DISPLAY (5) LOWER DISPLAY (6)	DELIME BUTTON (4)	POWER / DRAIN BUTTON (1)	OUTPUT TEST (TEMPERATURE / PRESSURE SWITCH) - 32
	X	02 170			1. Press Menu (3) button to scroll to 02. **NOTE: 02 - Checking Wash Probe Temperature (Example 170°F).** **NOTE: Temperature displayed will be in °C or °F depending on what is configured in user menu.**
	X	03 170			1. Press Menu (3) button to scroll to 03. **NOTE: 03 - Checking Rinse Probe Temperature (Example 170°F).** **NOTE: Temperature displayed will be in °C or °F depending on what is configured in user menu.**
	X	04 0.50			1. Press Menu (3) button to scroll to 04. **NOTE: 04 - Checking Booster Tank Pressure (Example 0.50V).**
	X	05 0.50			1. Press Menu (3) button to scroll to 05. **NOTE: 05 - Checking Wash Tank Pressure (Example 0.50V).**
				X	1. Press Power/Drain (1) button to return to configuration menu then press and hold Power/ Drain (1) button to exit menu.

OUTPUT TEST: ON/OFF FOR HEATER PUMPS & VALVES (Displays 33)

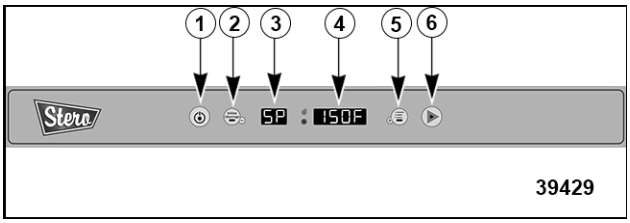


Fig. 64

OUTPUT TEST DISPLAY SUMMARY - HEATER, PUMPS, & VALVES	
⚠ WARNING	
Verify there is water in Booster or Wash Tank before testing. Check Booster and wash tank Pressure Sensor for water level is Full.	
1 - Booster heater. 2 - Tank heater. 3 - Safety - no action. 4 - Rinse pump. 5 - Fill valve. 6 - Not used.	7 - Det pump. 8 - Rinse aid pump. 9 - Drain pump. 10 - Sanitize pump (SUnL). 11 - Wash Pump.

⚠ WARNING

Outputs are actuated for as long as Play / Start / Wash (6) button is pressed.

PLAY BUTTON (6)	MENU BUTTON (5)	INFORMATION DISPLAY (3)	DELIME BUTTON (2)	POWER / DRAIN BUTTON (1)	OUTPUT TEST: ON/OFF FOR HEATER & PUMPS - 33
				Off	1. Unit power off on display. **NOTE:** If unit is On: • **Step 1:** Press and hold Power/Drain button for 3 seconds to fully drain tank. • **Step 2:** Start with option 1 and wait until unit starts to drain. Press & hold Power button until machine powers off and stops draining. **NOTE:** Will power off unit without draining completely. **NOTE:** When power is back on, unit will start drain process 25 seconds before it starts filling.
				Off	1. Open door.
X	X		X		1. Press and hold Play / Wash (2), Menu (3) and Delime (4) until Delime and Menu Led lights are ON.
		31			1. Close door.
X		33			1. Press Play/Wash (2) button until 33 is displayed.
				X	1. Press Power (1) button for lower display to appear.

PLAY BUTTON (6)	MENU BUTTON (5)	INFORMATION DISPLAY (3)	DELIME BUTTON (2)	POWER / DRAIN BUTTON (1)	OUTPUT TEST: ON/OFF FOR HEATER & PUMPS - 33
X		01 0			**01 - Check Booster Heater (On/Off) Function** **⚠ WARNING** **Make sure water is in Booster before testing. Check Booster Pressure Sensor to verify Booster water level is AT OR ABOVE .78V. Refer to <u>OUTPUT TEST (TEMP / PRESSURE SWITCH) (Displays 32)</u>.** 1. Off = 0 2. On = 1. **NOTE:** Press Play / Wash (2) button & hold to turn on.
	X		X		**NOTE:** Increase or decrease (±) by pressing Menu (3) and Delime (4) buttons program selection.
X		02 0			**02 - Check Tank Heater (On/ Off Function** **⚠ WARNING** **Make sure water is in Sump before testing. Check Sump Pressure Sensor to verify Sump water level is AT OR ABOVE .73V. Refer to <u>OUTPUT TEST (TEMP / PRESSURE SWITCH) (Displays 32)</u>.** 1. Off = 0 2. On = 1. **NOTE:** Press Play / Wash (2) button & hold to turn on.
X					**03 - Safety (no action)**
X		04 0			**04 - Rinse Pump (On/Off Function** 1. Off = 0 2. On = 1. **NOTE:** Press Play / Wash (2) button & hold to turn on.

PLAY BUTTON (6)	MENU BUTTON (5)	INFORMATION DISPLAY (3)	DELIME BUTTON (2)	POWER / DRAIN BUTTON (1)	OUTPUT TEST: ON/OFF FOR HEATER & PUMPS - 33
X		05 0			**05 - Fill Valve (On/Off Function** 1. Off = 0 2. On = 1. **NOTE:** Press Play / Wash (2) button & hold to turn on.
					06 - (Not used)
X		07 0			**07 - Detergent Pump (On/Off Function** 1. Off = 0 2. On = 1. **NOTE:** Press Play / Wash (2) button & hold to turn on.
X		08 0			**08 - Rinse Aid Pump (On/Off Function** 1. Off = 0 2. On = 1. **NOTE:** Press Play / Wash (2) button & hold to turn on.
X		09 0			**09 - Drain Pump (On/Off Function** 1. Off = 0 2. On = 1. **NOTE:** Press Play / Wash (2) button & hold to turn on.
X		10 0			**10 - Sanitize Pump (On/Off Function (Only active on Cold units (CUL / EUL)).** 1. Off = 0 2. On = 1. **NOTE:** Press Play / Wash (2) button & hold to turn on.
X		11 0			**11 - Wash Pump (On/Off Function** 1. Off = 0 2. On = 1. **NOTE:** Press Play / Wash (2) button & hold to turn on.

PLAY BUTTON (6)	MENU BUTTON (5)	INFORMATIO N DISPLAY (3)	DELIME BUTTON (2)	POWER / DRAIN BUTTON (1)	OUTPUT TEST: ON/OFF FOR HEATER & PUMPS - 33
				Off	1. Press Power/Drain (1) button to return to configuration menu then press and hold Power/ Drain (1) button to exit menu.

DIGITAL OUTPUT COMPONENT TEST (TechConnect)

⚠WARNING

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

NOTE: Digital and analog input and outputs can be added or removed as needed.

NOTE: Digital outputs can be turned on temporarily to test component.

1. Add or remove digital or analog Inputs and outputs.
   A. Select inputs / outputs.
   B. Select star to digital or analog inputs and outputs to the diagnosis screen.
      NOTE: Yellow star = added and empty star = removed.
2. Select diagnosis to remove back to diagnosis screen with added or removed I/O's.
3. Turn off dishwasher.
4. Connect laptop to dishwasher using USB able A-A, refer to USB PORT ACCESS.

NOTICE

Verify wash tank and booster tanks are full of water before starting any test. Not doing so may cause machine to dry fire heating elements.

5. On TechConnect, access PARAMETER DATA DIAGNOSIS (TechConnect) screen.
6. Select digital output to test and press and hold the "S" button.

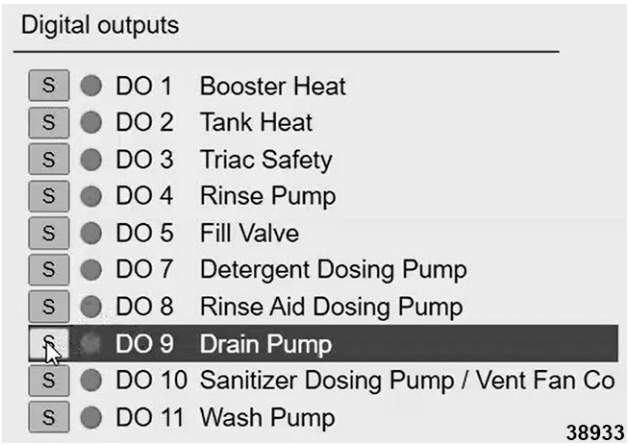


Fig. 65

NOTE: The red dot will turn green while "S" button is pressed.

NOTE: The Triac Safety (DO3) is required to run the Wash Pump (DO11). Activating DO11 will automatically activate DO3.

NOTE: Clicking any S button on diagnosis page will immediately switch machine off regardless of what it is currently doing and perform selected action.

7. Remove USB cable and place dishwasher into service once complete.

DATA LOGGING (TechConnect)

Fig. 66

Item	Name	Description
1	Data Logging	Record the operation of the machine or sequence of operation.
2	Data Logging	Cyclical recording of input / output signals and analog values.
3	Start Logging	Start recording the operation of the machine.
4	Logging Concept	Stop recording the operation of the machine.
5	Select Location	Where to save the data file and create a file name.

RINSE THERMISTOR

NOTE: Room temp: 72°F or (22.2°C).

NOTE: Unit Power Off: 10.99 @ 71.6°F or (22.0°C).

Temperature		K Ohm
°F	°C	Reading
68	20	127.31
77	25	100.00
86	30	79.09
95	35	62.99
104	40	50.49
113	45	40.72

Temperature		K Ohm
°F	°C	Reading
122	50	33.05
131	55	27.02
140	60	22.23
149	65	18.40
158	70	15.31
167	75	12.80
176	80	10.76
185	85	9.09
194	90	7.71
203	95	6.57
212	100	5.63

4. FIRMWARE / SOFTWARE

USB PORT ACCESS

NOTE: Machine should be in the “ON” position with power supplied at breaker.

NOTE: Firmware downloaded to download folder.

⚠ WARNING

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

ACCESSING USB PORT

1. Remove FRONT PANEL.
2. Lower control plate bracket.
3. Insert USB drive into USB slot on control board, located under Mylar protector.

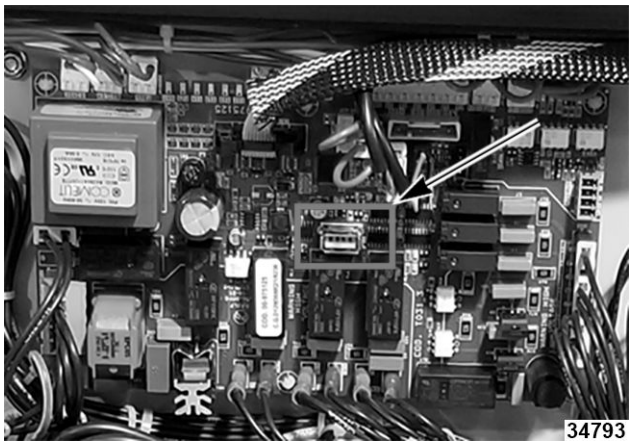


Fig. 67

FIRMWARE VERSION (Displays 21)

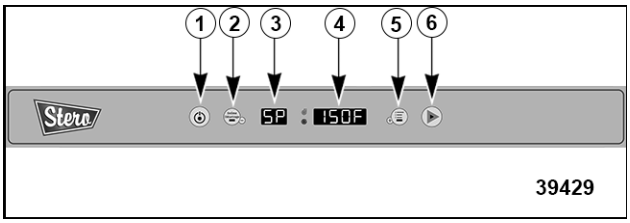


Fig. 68

Item	Name	Item	Name
1	Power / Drain Button	4	Temperature Display
2	Delime Button	5	Menu Button
3	Wash Cycle	6	Start Button

NOTE: If unit is OFF, skip to step # 3.

1. Push and hold "Power" button to turn off machine.
2. While machine is draining, push and hold "Power" button within 20 seconds, until machine powers off and draining stops.
3. With machine off and door open, press and hold "Menu" and "Delime" button simultaneously until LED lights up.

   NOTE: Verify LED lights, located underneath the Menu and Delime buttons, are lit up.
4. Close door. Display shows 21.
5. Press "Power" button for right side display to appear showing firmware version (10 digits).

   NOTE: Press "Start" button to view all digits. Example: "000-0200-000" = Version 2.0".

   NOTE: Firmware version is also displayed when power is applied to machine. Example: "_2" "___0" = Version 2.0.

   NOTE: If firmware version is **99.89**, contact Hobart Service to upload firmware to control board.

Fig. 69

6. Press Power / Drain button to return to configuration menu option 21.
7. Open and close door to exit configuration menu.

FIRMWARE DOWNLOAD INSTRUCTIONS

USB Flash Drive Requirements

NOTE: Remove any previous firmware downloads from USB flash drive.

The dishwasher's computer can read flash drives formatted only in FAT, FAT16, and FAT32 file system formats. NTFS and exFAT formats are not supported. Drives must be no less than 2GB and no more than 32GB.

Download Upgrade File

1. Log into Hobart Service Resource Center.

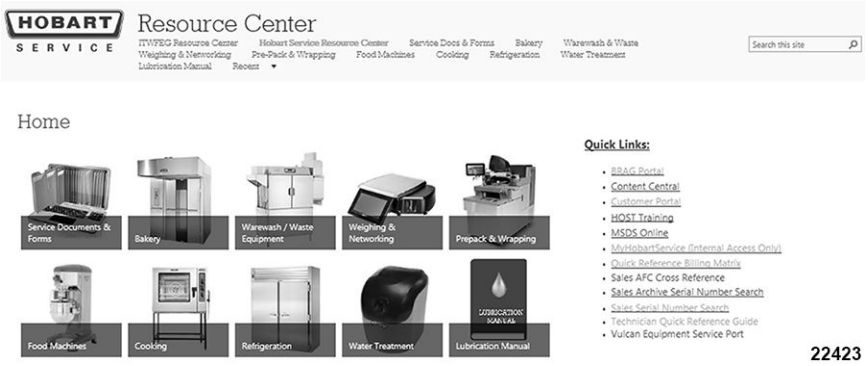


Fig. 70

2. Click on Warewash.

Fig. 71

3. Click on Software Updates.

Fig. 72

4. Click on General.

Fig. 73

5. Click on > next to Product Category: Centerline/Ecoline/Stero, Then Machine series: Door Type/ Undercounter.

6. Right click on three dots and on pop-up menu, click on download.

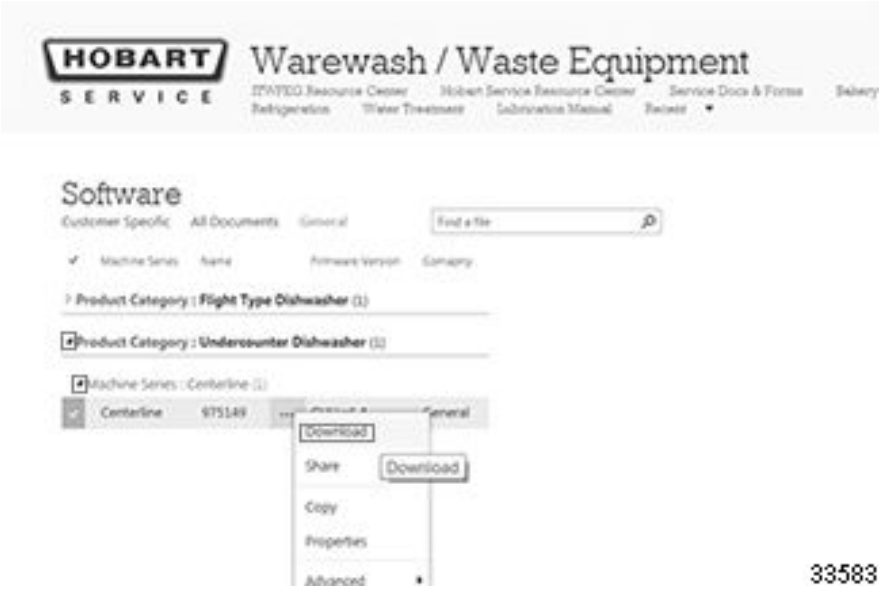


Fig. 74

7. Click on Save arrow and click again on save as. Browser window will open. Save file to a USB thumb drive.

Fig. 75

8. After download is complete, click on Open Folder to open the folder where the file was saved.

Fig. 76

9. Right mouse click on the 975149.zip folder. Select Extract All…

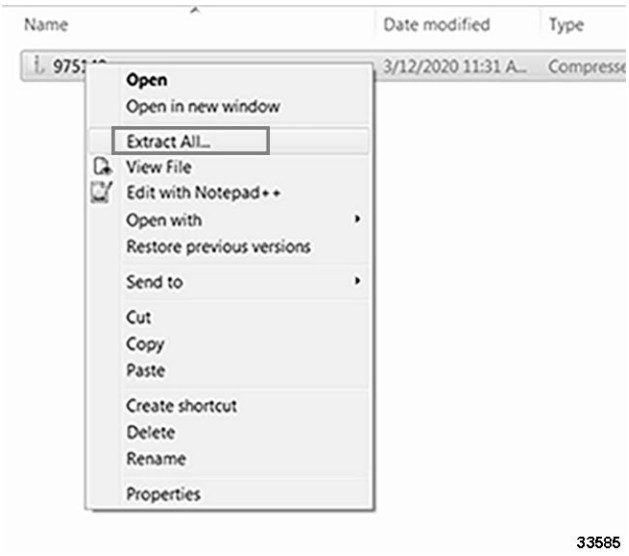


Fig. 77

10. Select Browse.

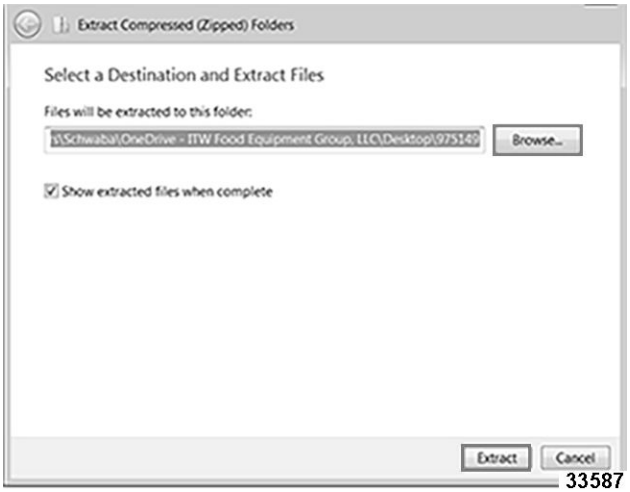


Fig. 78

11. Select USB DISK (D:), then Select Folder.

NOTE: Drive letter (D:) may vary.

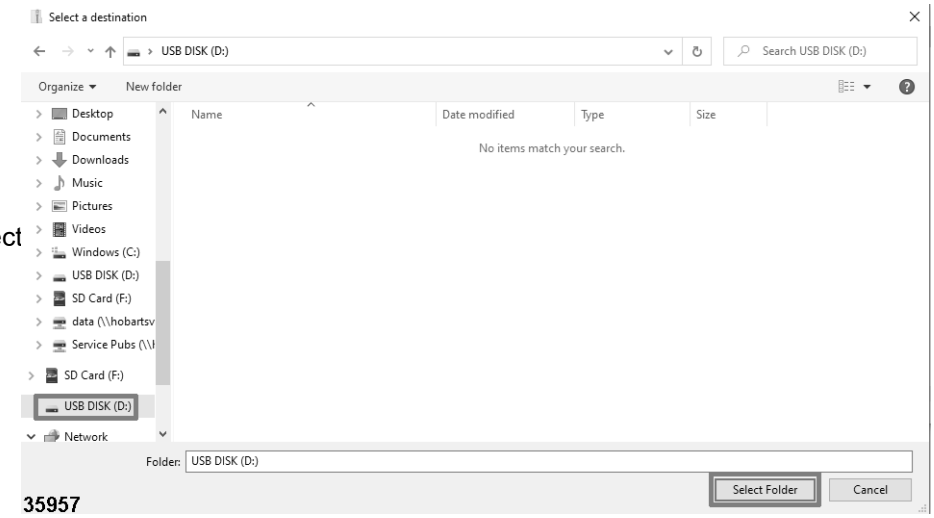


Fig. 79

12. Open the 975149 folder and verify firmware file is inside..

Fig. 80

FIRMWARE UPDATE (USB Thumb Drive - Displays 22)

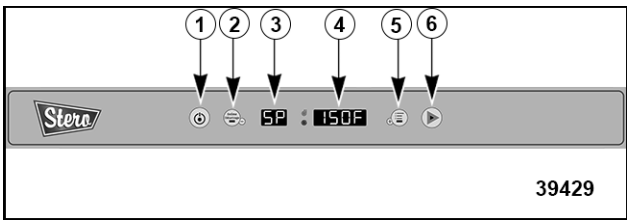


Fig. 81

NOTE: Firmware can be located on the Service Resource Center (Warewash > Software Updates > General > Centerline, Ecoline & Stero). To download the firmware from the Service Resource Center, refer to FIRMWARE DOWNLOAD INSTRUCTIONS.

NOTE: Only keep latest firmware version on USB.

NOTE: If error 24 displays while performing this procedure, refer to procedure below for alternate upload to control board.

NOTE: If Unit is OFF, Skip to Step 3.

1. Push and hold "Power" button to turn off machine.
2. While machine is draining, push and hold "Power" button within 20 seconds, until machine powers off and draining stops.
3. Remove BOTTOM PANEL.
4. Insert USB drive into USB slot on control board, located under Mylar protector.

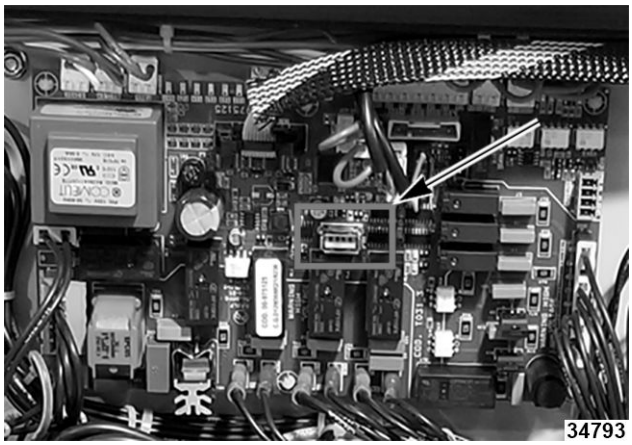


Fig. 82

5. Open door.
6. With machine off and door open, press and hold "Menu" and "Delime" button simultaneously until LED lights up.

Fig. 83

7. Close door. Display shows 21.

Fig. 84

8. Press "Play" button until display reads 22, Configuration Parameter.

Fig. 85

9. Press and hold "Power" button for 3 seconds. There will be a flashing dot between 22.

   NOTE: If Error 24 displays, the USB drive is not recognized the option to flash control board. Refer to USB DRIVE NOT DETECTED (ALTERNATE - ER-24).

10. Display will show last 2 digits of the firmware version in right side window. Refer to FIRMWARE VERSION (Displays 21).

11. Press "Power" button and hold 5 seconds.

    NOTE: Display turns off and back on.

12. Power LED will flash quickly.

Fig. 86

13. Display will appear and show software version.
14. Open door to exit.
15. Remove USB drive.
16. Re-install any panels removed.
17. Program board to machine type. Refer to MACHINE CONFIGURATION SELECTION (Displays 23).

FIRMWARE UPDATE (TechConnect)

NOTE: Machine should be in the "ON" position with power supplied at breaker.

NOTE: Firmware downloaded to download folder.

Firmware may be uploaded to the machine two ways: FIRMWARE UPDATE (USB Thumb Drive - Displays 22) or UPDATING WITH USB CABLE CONNECTION (TECH CONNECT).

UPDATING WITH USB CABLE CONNECTION (TECH CONNECT)

1. Access USB port, refer to USB PORT ACCESS.
2. Connect laptop to port, using USB cable type A-A.
3. Open TechConnect software.
4. Select Firmware Update.
5. Select "Open the Boot Loader".

Fig. 87

NOTE: Bootloader opens.

UPDATING WITH USB CABLE CONNECTION (TECH CONNECT)

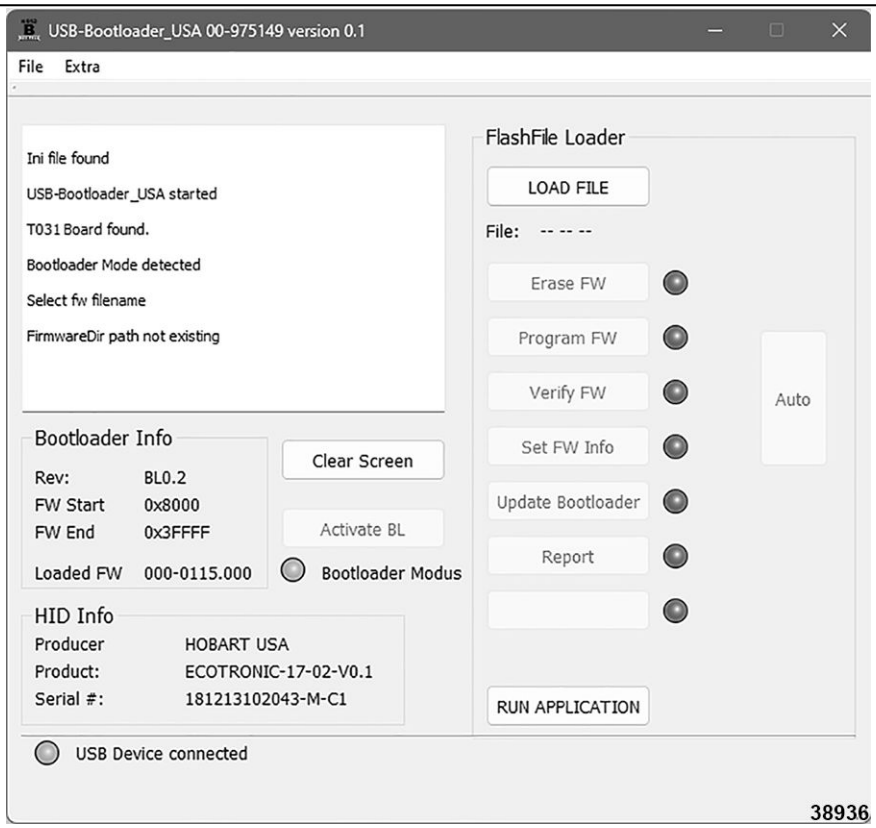


Fig. 88

6. Select "LOAD FILE" (1, Fig. 89).
7. Locate firmware on laptop.

   NOTE: Once firmware is loaded, current firmware version (2, Fig. 89) will be displayed by File.
8. Select "AUTO" (3, Fig. 89).

   NOTE: Do NOT click "RUN APPLICATION".

   NOTE: Bootloader will begin flashing new firmware to control board. Power button LED will blink.

UPDATING WITH USB CABLE CONNECTION (TECH CONNECT)

Fig. 89

9. Close bootloader application once bootloader states "Flashing Successful".
10. TechConnect will relaunch, prompting for machine type. Click "Yes".
11. Select Load Machine Program to program machine type, refer to MACHINE TYPE PROGRAMMING (TechConnect).

    NOTE: Whenever firmware is updated, machine type must always be configured.
12. Verify firmware version and program version.

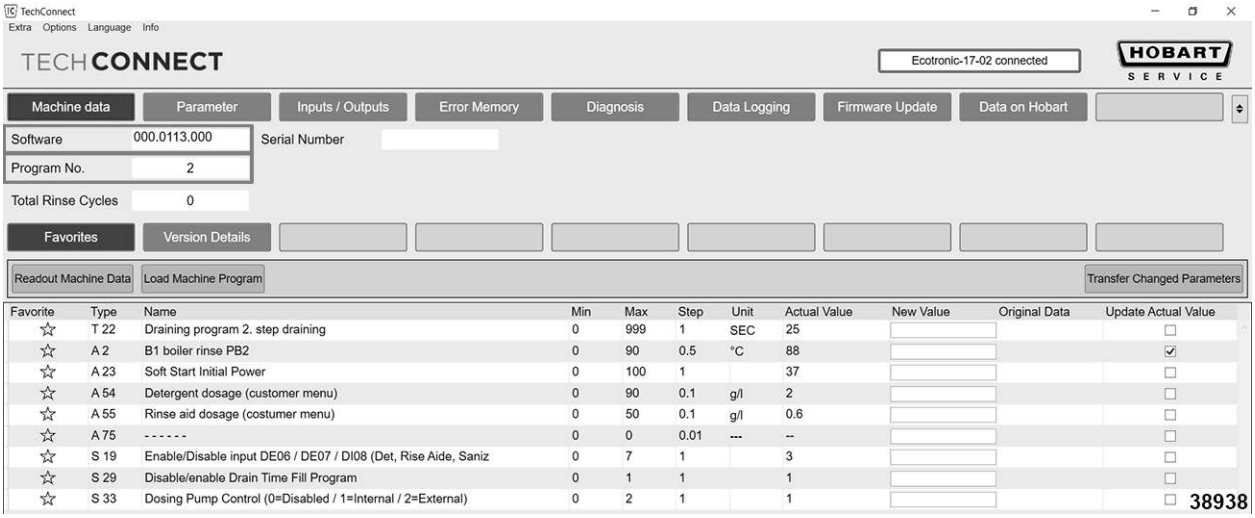


Fig. 90

FIRMWARE REVISIONS

This section contains the history for firmware revisions. This includes a short explanation of the features / fixes introduced with each version.

FIRMWARE VERSION	COMMENTS
V2.00	• Released for production.

USB DRIVE NOT DETECTED (ALTERNATE - ER-24)

NOTE: Use this procedure when firmware update does not recognize USB and unit displays ER-24.

NOTE: USB not properly configured or incorrect directory path.

NOTE: Alternate firmware update method.

1. Turn off main breaker power.
2. Insert USB into USB slot.
3. Turn on power at main breaker.
4. Display panel Power button led flashing.
5. Automatically uploads firmware to control board.

   NOTE: When Power LED stops flashing and new firmware revision is shown, remove USB drive.
6. Proceed to MACHINE TYPE PROGRAMMING (DISPLAY 23).

MACHINE CONFIGURATION SELECTION (Displays 23)

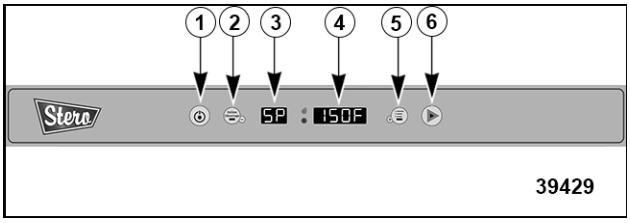


Fig. 91

Item	Name
1	Power Button
2	Delime Button
3	Information Display
4	Temperature Display
5	Menu Button
6	Start Button

1. Push and hold "Power" button to turn off machine.
2. Open door and press "Menu" and Delime" simultaneously.

Fig. 92

3. Press "Start" to scroll to 23 parameter.

Fig. 93

4. Press "Power" button for lower display to appear showing machine type.
5. Press "Menu" (increase) or "Delime" (decrease) to select correct machine type.

   NOTE: Incorrect selection of machine configuration can create possible damage to heater or incorrect water level in tank.

   - 01 = Centerline Undercounter Cold Unit (CUL - Undercounter only) (Not Used)
   - 02 = Centerline Undercounter Hot Unit (CUH - Undercounter only) (Not Used)
   - 03 = Centerline Cold Door Unit (CDL - Door Type only) (Not Used)
   - 04 = Centerline Hot Door Unit (CDH - Door Type only) (Not Used)
   - 05 = Ecoline Undercounter Cold Unit (EUL - Undercounter only) (Not Used)
   - 06 = Ecoline Undercounter Hot Unit (EUH - Undercounter only) (Not Used)
   - 07 = Ecoline Cold Door Unit (EDL - Door Type only) (Not Used)
   - 08 = Ecoline Hot Door Unit (EDH - Door Type only) (Not Used)
   - 09 = Stero Undercounter Cold Unit (SUnL - Undercounter only)
   - 10 = Stero Undercounter Hot Unit (SUnH - Undercounter only)
6. Press and hold "Power" button for 5 seconds to set parameter. LED light under Power button will flash indicating selection is complete.

   NOTE: Lower display will go blank when configuration is complete.

Fig. 94

   NOTE: When updating previous software version example 1.16 to 2.0, repeat steps 3 thru 5. To override the previous software version SUnL = 09 will need to select SUnL = 09 and then back to complete software update process.

7. Open door to exit program.
8. Run test cycles to check operation and final rinse temperature needing and adjustment.
9. If chemical settings were retained from previous board, use the "Menu" button to make changes.

NOTE: If not set correctly, system will use more detergent and rinse aid chemicals.

TRANSFER ERROR LIST MEMORY TO USB (Displays 27)

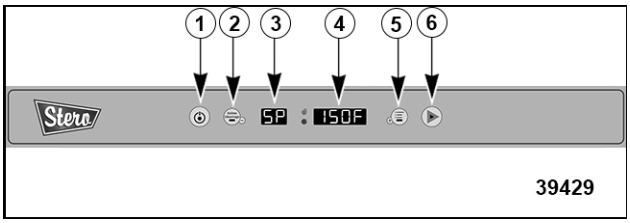


Fig. 95

PLAY / WASH BUTTON (6)	MENU (5)	Temperature Display (4)	DELIME (2)	POWER (1)	27 - TRANSFER ERROR LIST MEMORY TO USB
				Off	1. Unit power off on display. **NOTE:** If unit is On: • **Step 1:** Press and hold Power/Drain button for 3 seconds to fully drain tank. • **Step 2:** Start with option 1 and wait until unit starts to drain. Press & hold Power button until machine powers off and stops draining **NOTE:** Will power off unit without draining completely. **NOTE:** When power is back on, unit will start drain process 25 seconds before it starts filling.
				Off	1. Remove lower Front Trim Panel. 2. Lower Control Plate Bracket. 3. Remove part of Mylar cover to insert USB drive into socket on control board. 4. Open Door.
	X		X		1. Press and hold Menu (3) and Delime (4) until Delime LED light is ON.

PLAY / WASH BUTTON (6)	MENU (5)	Temperature Display (4)	DELIME (2)	POWER (1)	27 - TRANSFER ERROR LIST MEMORY TO USB
		21			1. Close door.
X		27			1. Press Wash cycle button (2) to scroll to 27, press Power (1), then flashing dot at end of 27.
		27			1. Detect/Reading USB drive and display 0.
		0			
		27			1. Once USB drive is detected, unit will automatically upload Error log and change display to 1 when upload is complete.
		1			
					1. Open door to exit.

5. PROGRAMMING

PROGRAMMING MENU (DISPLAY)

NOTE: ALWAYS ensure software is updated to most current version.

NOTE: To prevent unit from draining while restarting during programing, set parameter S0-29 to "0".

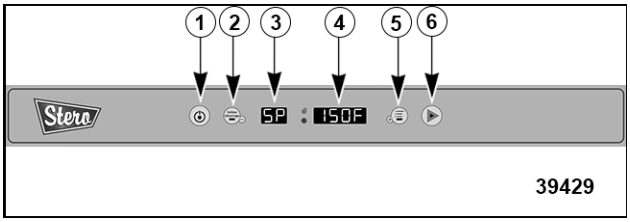


Fig. 96

ITEM	NAME	DESCRIPTION
1	Power / Drain Button	Pressing this button switches the machine on, fills and heats the wash tank. Pressing and holding (3 seconds) activates self-cleaning cycle, drains machine, and then switches the machine off automatically.
2	Delime Button	Pressing and holding this button (3 seconds) initiates the deliming cycle.
3	Wash Cycle	Displays current wash cycle.
4	Temperature Display	Displays wash tank temperature while machine is in ready state or in a wash cycle.
5	Menu Button	Pressing this button enters the customer menu.
6	Start Button	Pressing this button or closing the door starts the wash cycle.

MACHINE TYPE PROGRAMMING (TechConnect)

NOTE: Machine type programming will need to be entered during initial installation, when a control board is replaced, or when the firmware is updated.

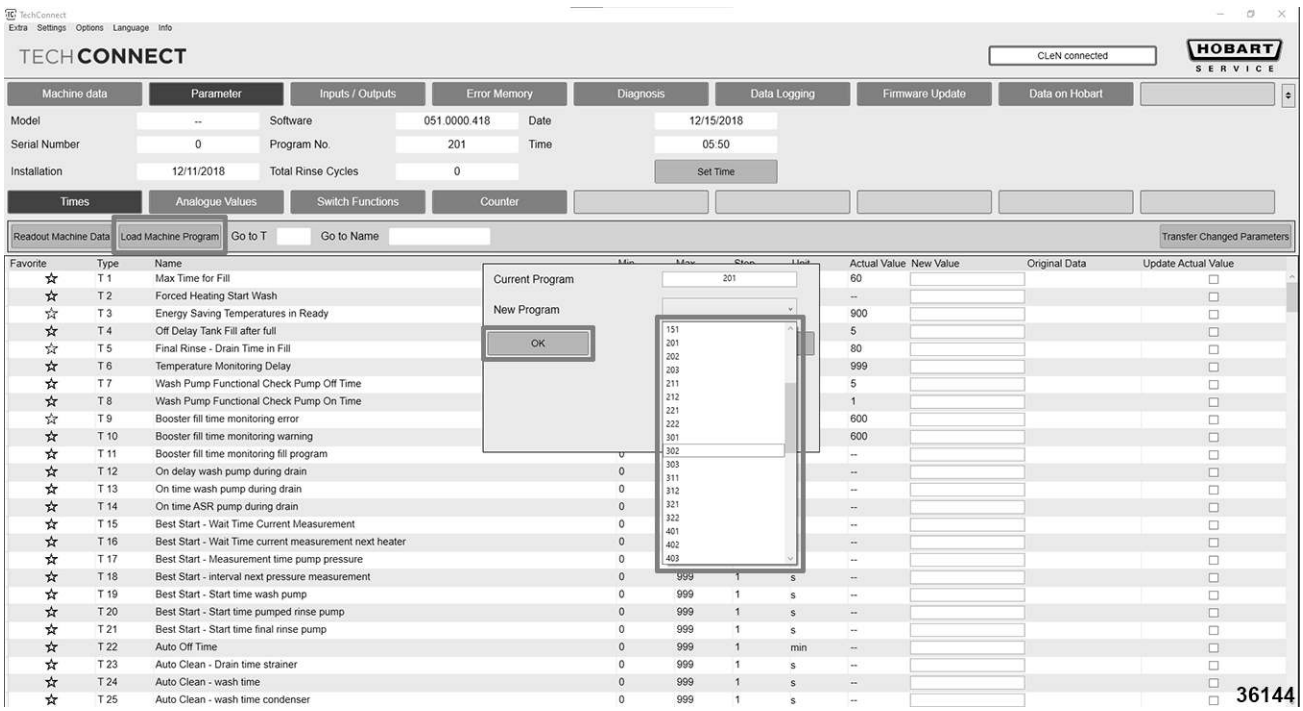


Fig. 97

1. Select "Machine Data".
2. Select "Load Machine Program".
3. Select the drop-down list for New Program and select the machine type per list below.
4. Select "OK" to enter program.

   NOTE: Program will load.

   NOTE: Program No. will change to selected program.

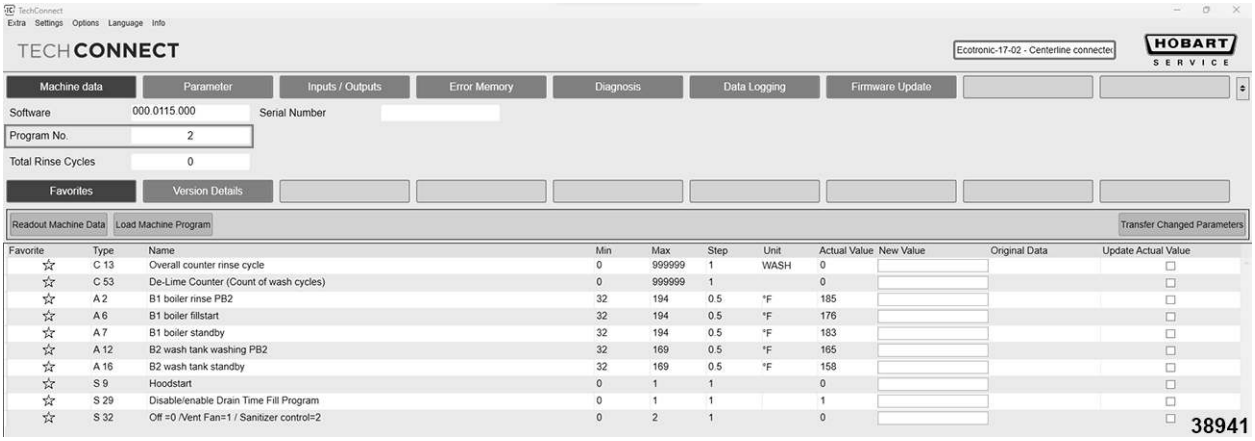


Fig. 98

Program Number	Machine Type
01	Centerline Undercounter Cold Unit Program (CUL - Undercounter only) (Not Used)
02	Centerline Undercounter Hot Unit Program (CUH - Undercounter only) (Not Used)

Program Number	Machine Type
03	Centerline Cold Door Unit Program (CDL - Door Type only) (Not Used)
04	Centerline Hot Door Unit Program (CDH - Door Type only) (Not Used)
05	Ecoline Undercounter Cold Unit Program (EUL - Undercounter only) (Not Used)
06	Ecoline Undercounter Hot Unit Program (EUH - Undercounter only) (Not Used)
07	Ecoline Cold Door Unit Program (EDL - Door Type only) (Not Used)
08	Ecoline Hot Door Unit Program (EDH - Door Type only) (Not Used)
09	Stero Undercounter Cold Unit Program (SUnL - Undercounter only)
10	Stero Undercounter Hot Unit Program (SUnH - Undercounter only)

1. Select "Readout Machine Data."
2. Verify correct parameters are displayed.
3. Update capture settings from previous software version, if applicable.
   A. High Temp Units:
      1) Final rinse needs to meet 180°F.
      2) Update capture settings from previous software version.
      3) Adjust booster temperature setting as needed.

BASIC DISPLAY (TechConnect)

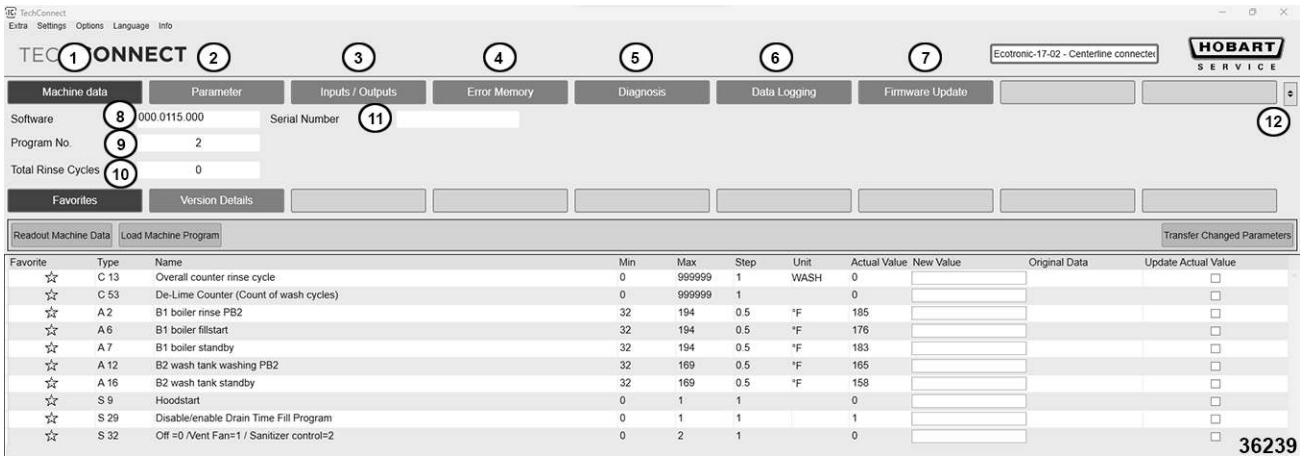


Fig. 99

Item	Name	Description
1	Machine Data	Display machine information, favorite parameters.
2	Parameter	List of times, counters, analogue values, and switching functions.
3	Inputs / Outputs	List of all analogue and digital inputs and outputs.
4	Error Memory	List of errors and the number of times they have been triggered.
5	Diagnosis	Summary overview of all input/output information.
6	Data Logging	Recording of input / output signals and analog values. For more details, refer to DATA LOGGING (TechConnect).
7	Firmware Update	Updates the firmware on the control board using bootloader.

Item	Name	Description
8	Software	Firmware version on machine control board. **Software information example:** • • 000.0103.00 means the software version is 1.03. • 000.0115.00 means the software version is 1.15.
9	Program Number	Current machine configuration. Can be loaded via machine type programming.
10	Total Rinse Cycles	Rinse cycle counter reading.
11	Serial Number	Not applicable.
12	Expand or minimize	Expand or minimize the machine data information window.

MACHINE TYPE PROGRAMMING (DISPLAY 23)

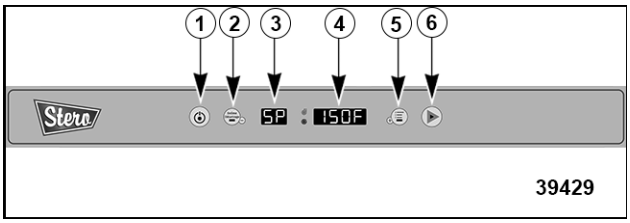


Fig. 100

ITEM	NAME	ITEM	NAME
1	Power / Drain Button	4	Temperature Display
2	Delime Button	5	Menu Button
3	Information Display	6	Start Button

NOTE: If unit is OFF, skip to step # 3.

1. Push and hold Power button to turn off machine.
2. While machine is draining, push and hold Power button within 20 seconds, until machine powers off and drain stops.
3. With machine off and door open, press and hold "Menu" and "Delime" button simultaneously until display changes.

   NOTE: Verify LED lights, located underneath the buttons, are lit up.
4. Close door. Display shows 21.
5. Press "Start" button until display reads 23 parameter.
6. Press "Power" button for 3 seconds, to select dishwasher parameter.

   NOTE: Incorrect selection of machine configuration can create possible damage to heater or incorrect water level in tank.

   NOTE: Press Menu or Delime buttons to cycle thru machine configurations types.

   - 01 = Undercounter Cold Unit (CUL - Undercounter only) (Not Used)
   - 02 = Undercounter Hot Unit (CUH - Undercounter only) (Not Used)
   - 03 = Cold Door Unit (CDL - Door Type only) (Not Used)
   - 04 = Hot Door Unit (CDH - Door Type only) (Not Used)
   - 05 = Undercounter Cold Unit (EUL - Undercounter only) (Not Used)
   - 06 = Undercounter Hot Unit (EUH - Undercounter only) (Not Used)
   - 07 = Cold Door Unit (EDL - Door Type only) (Not Used)
   - 08 = Hot Door Unit (EDH - Door Type only) (Not Used)
   - 09 = Cold Door Unit (SUnL - Undercounter only)
   - 10 = Hot Door Unit (SUnH - Undercounter only)
   -
7. Press and hold "Power" button for 5 seconds to set parameter. LED light under Power button will flash indicating selection is complete.

   NOTE: Right side display will go blank when configuration is complete.
8. Open door to exit program.

   NOTE: When updating previous software version example, 1.16 to 2.0, repeat steps 3 through 5. To override the previous software version SUnL = 09 will need to select SUnH = 10 and then back to SUnL = 09 to complete software update process.

MACHINE DATA (TechConnect)

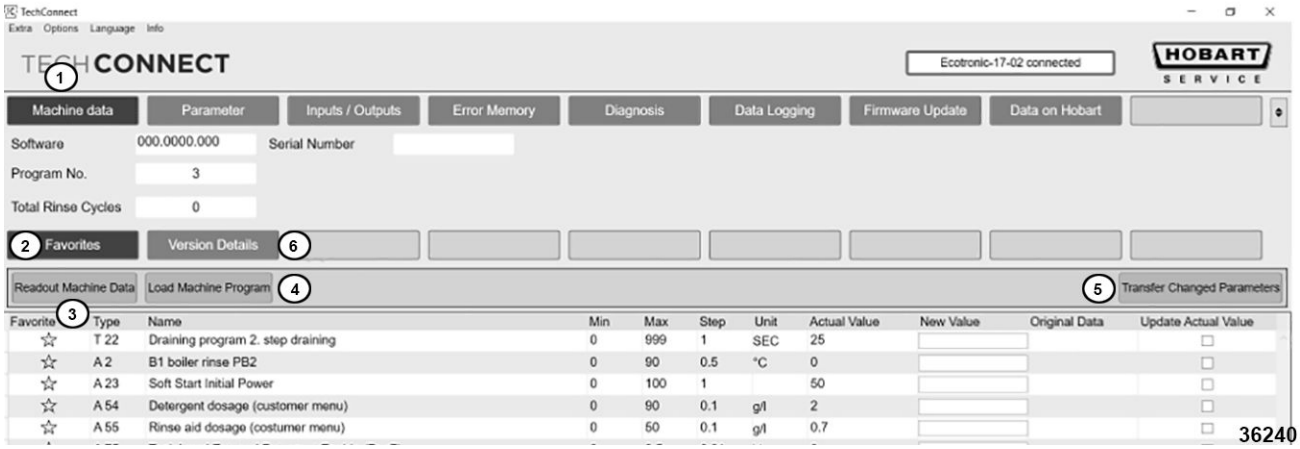


Fig. 101

Item	Name	Description
1	Machine Data	Display machine information.
2	Favorites	Only displays selected favorites defined in parameters.
3	Readout Machine Data	Communicate with the control board to read machine configuration data.
4	Load Machine Program	Select machine configuration. **NOTE:** Changing different configurations will reset all settings to default. For example, the Booster temp currently set as (88°C) 190°F after switching the machine program will reset the default to (85°C) 185°F.
5	Transfer Changed Parameters	Update any changes and read machine data.
6	Version Details	Software and hardware Information.

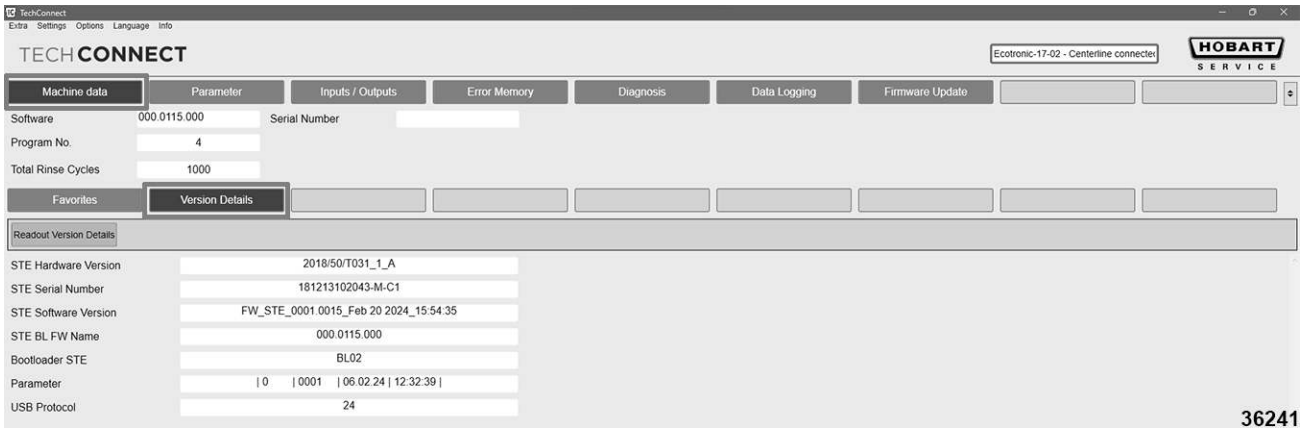


Fig. 102

PARAMETER SETTING CHANGE (TechConnect)

NOTE: This procedure shows how to make changes to parameter settings for Timer, Counter, Analog Value, and Switch Functions.

Booster Temper Analog Value Change Example

1. Place curser inside "New Value" box next to value being updated.
2. Enter new value and hit enter on keyboard or select "Transfer Changed Parameters".

   NOTE: New value will be transferred to machine and updated on the screen.

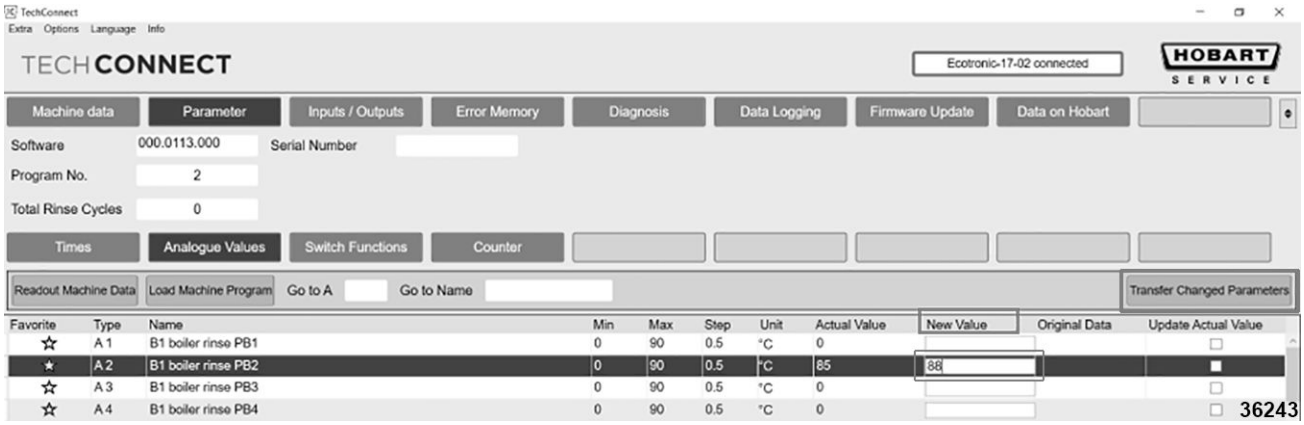


Fig. 103

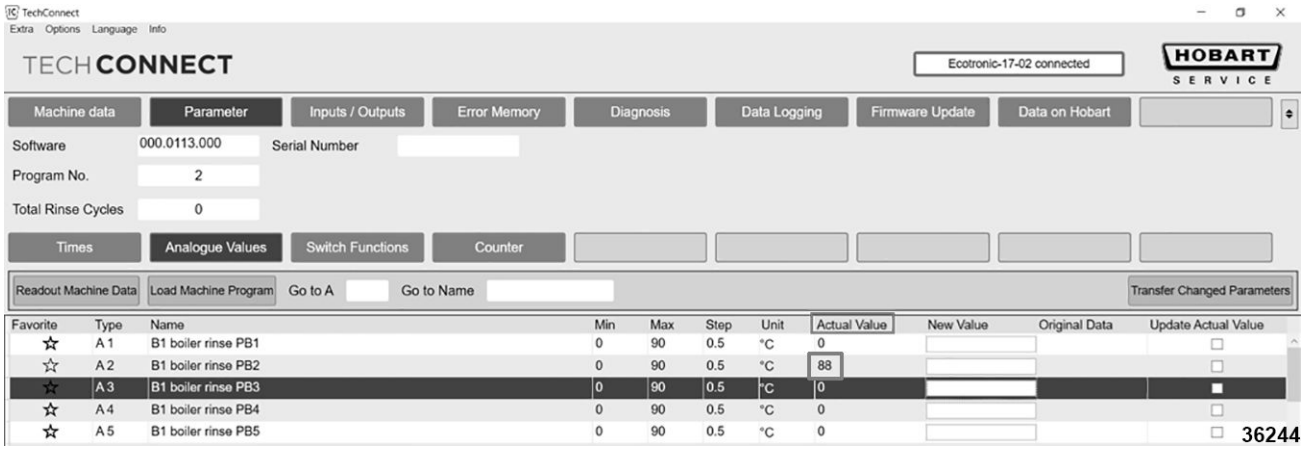
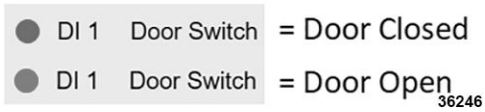
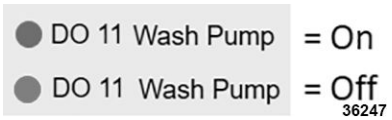


Fig. 104

PARAMETER DATA INPUTS/OUTPUTS (TechConnect)

Fig. 105

Item	Name	Description
1	Inputs / Outputs	List of inputs and outputs per dishwasher readings.
2	Inputs / Outputs	Displays a list of inputs and output values per dishwasher current setup.
3	Only Show Favorites	Only display favorites Inputs/Outputs. **NOTE:** Select the "Star" next to the input or output to add to favorites. Refer to Add or Remove Digital or Analog Inputs and Outputs. • Empty Star = Removed from favorites. • Yellow Star = Added to Favorite list on diagnosis screen.
4	Unlock Manual Control	To actuate the outputs the machine must be off and the door must be closed. If the button "Unlock Manual Control" is actuated with the left mouse button all the same, the message "Machine off and DOOR closed" is displayed and the LED to the right of the button "Unlock Manual Control" remains off. An output is activated as long as the F button is pressed! The DOs are actuated with the F buttons or with Shift + F buttons. Example DO 6 shows the actuation of drain pump MTR3. **NOTE:** Refer to Unlock Manual Control Button Function for more details.

Item	Name	Description
5	Digital Inputs (DI)	Displays current readings per dishwasher inputs. Inputs - it is possible to actuate the switching states / values of inputs by means of push-button function (with closed door / machine off). Red circle = sensor disengaged. No connection from dishwasher to tech connect. Input has "high" signal / input is actuated. Green circle = sensor engaged. Connection from dishwasher to tech connect has been established.  **Fig. 106**
6	Digital Outputs (DO)	Displays current readings per dishwasher outputs. Outputs - it is possible to actuate the switching states / values of outputs by means of push-button function (with closed door / machine off). **NOTE:** An output is activated as long as the "F" button on laptop is pressed! Red circle = sensor disengaged. No connection from dishwasher to tech connect. Output has "high" signal / output is actuated. Green circle = sensor engaged. Connection from dishwasher to tech connect has been established.  **Fig. 107**
7	Analog Inputs	Display the status of the analog inputs.
8	Analog Outputs	Display the status of the analog outputs. (Unused)

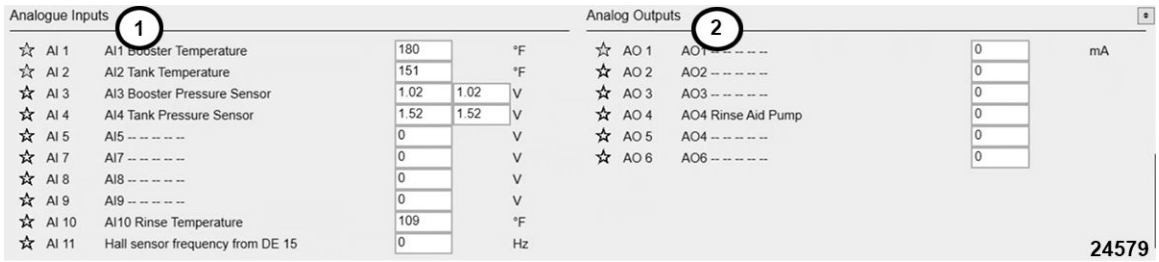


Fig. 108

Item	Name	Description
1	Analog Inputs (AI)	Displays current readings per dishwasher analog inputs.
2	Analog Outputs (AO)	Displays current readings per dishwasher analog outputs.

Add or Remove Digital or Analog Inputs and Outputs

NOTE: Digital and analog input and outputs can be added or removed as needed.

1. Select Inputs / Outputs.
2. Select the star to add the digital or analog inputs and outputs to the diagnosis screen.
   - Yellow Start = Added.
   - Empty Start = Removed.

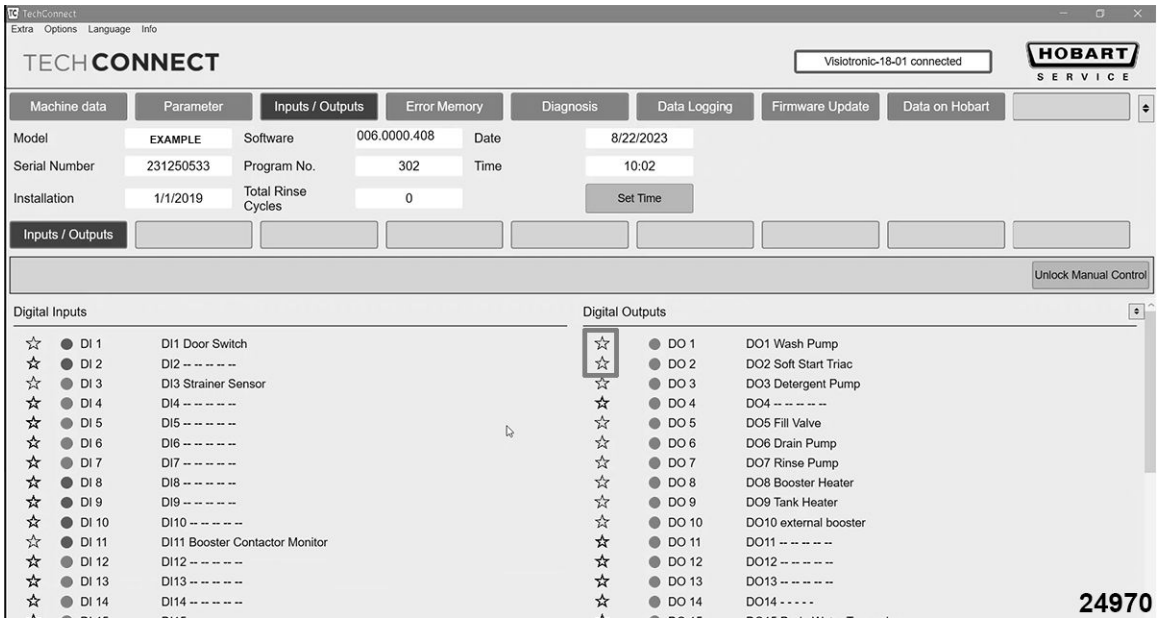


Fig. 109

3. Once all I/O are selected, select Diagnosis to return back to the diagnosis screen with the added or removed I/O's.

Unlock Manual Control Button Function

NOTE: To switch normal operation of dishwasher to diagnosis mode, switch off dishwasher to test Digital Output of each component.

NOTICE

Verify wash and booster tanks are full of water before performing any heating element test. Not having tanks filled may result in **dry firing heating element**.

1. Click on Unlock Manual Control (Step 1) to unlock outputs.

   NOTE: Click Unlock Manual Control to unlock outputs and Disable Manual Control to disable outputs.

Fig. 110

   NOTE: Machine switches off and displays off.

2. Select component to test. Fill valve example shown.
3. Select box next to star.

   NOTE: Checkbox will display.

   NOTE: Triac Safety (DO3) is required to run Wash Pump (DO11). Activating DO11 will automatically activate DO3.

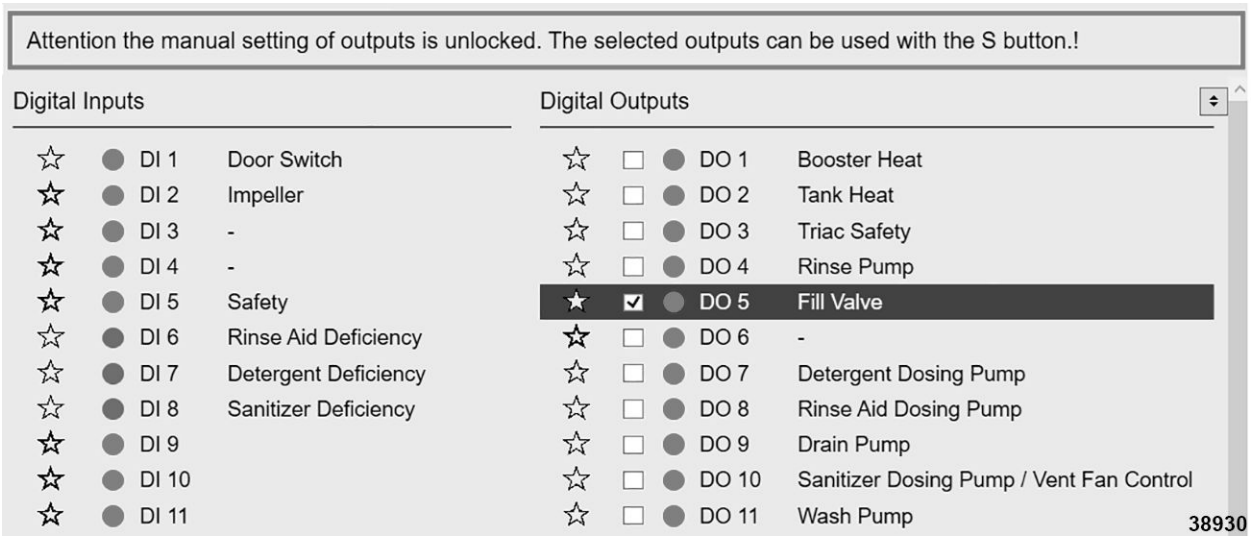


Fig. 111

4. Press "S" key on keyboard of computer.

   NOTE: Fill valve energizes filling booster while "S" key is pressed.

   - Booster pressure sensor voltage shown in AI3 (analog input 3).
   - Red dot will change to green, when component is energized.

5. Unpress "S" key to stop.
6. Press Disable Manual Control (Step 1) to stop test.

   NOTE: Failure to switch back to Unlock Manual Control will lock out machine from powering on.

PARAMETER DATA ERROR MEMORY (TechConnect)

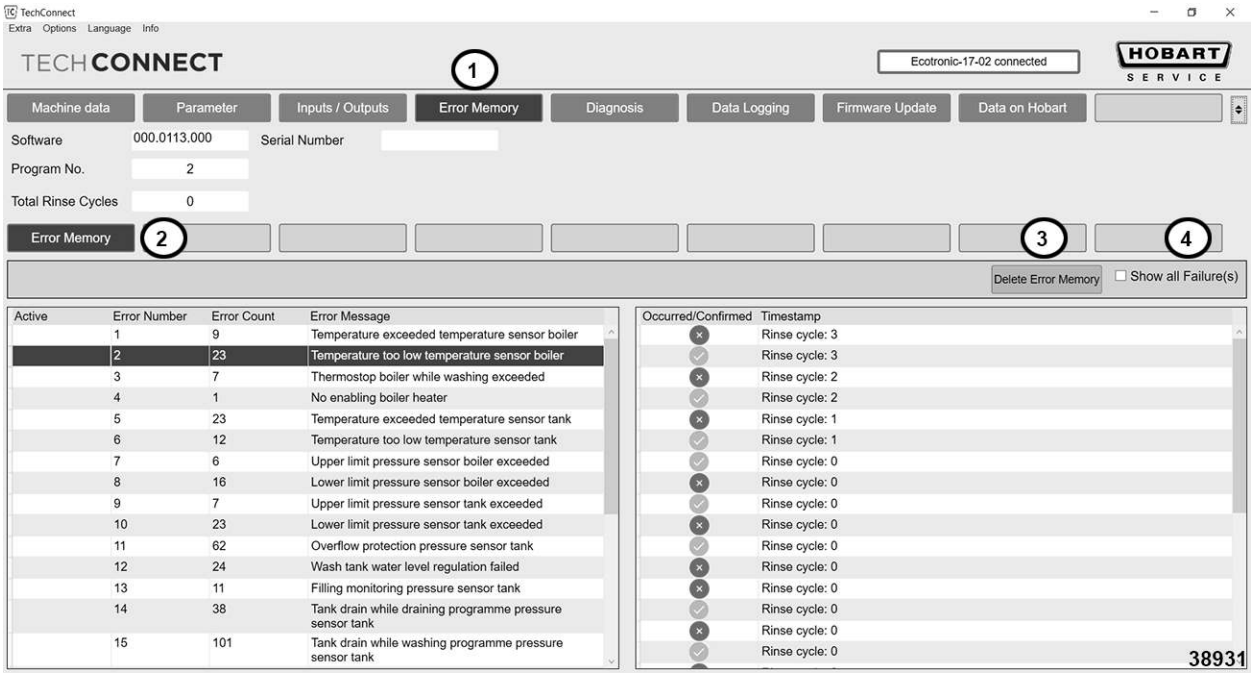


Fig. 112

Item	Name	Description
1	Error Memory	Displays the last errors parameter.
2	Error Memory	Displays all triggered error codes since last reset. Scroll down to see more. List of error numbers or messages that have been triggered. Shows the number of times the errors have been triggered.
3	Delete Error Memory Button	Clear all error messages.
4	Show All Failures	List all error numbers.

PARAMETER DATA DIAGNOSIS (TechConnect)

Purpose: Summary overview of all selected inputs/outputs at a glance to troubleshoot or watch the operation of the machine.

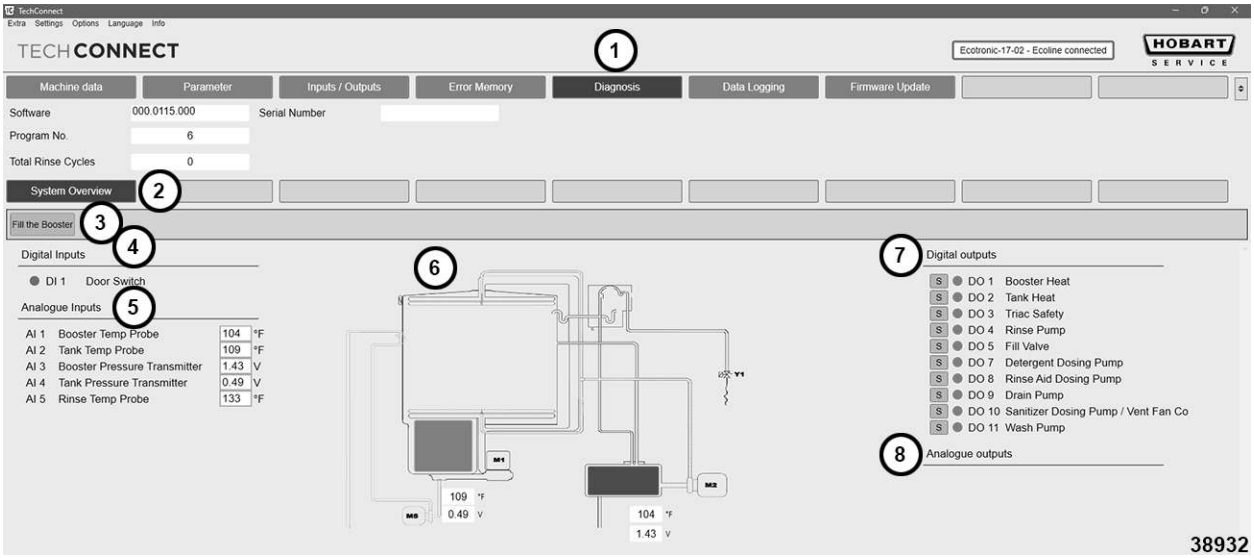


Fig. 113

Item	Name	Description
1	Diagnosis	Summary overview of all input/output information. Dishwasher diagnosis: System Overview, Softener, Soft Start, Turbidity Sensor, Flow Rate Measurement.
2	System Overview	Displays the selected favorite digital and analog inputs and outputs. The inputs are located on the left of the screen and the outputs on the right of the screen. These are the favorites previously selected. Favorite inputs and outputs can be added or removed at any time.
3	Fill the Booster Button	Manually fill the booster.
4	Digital Inputs (DI)	DI added to favorites (yellow star) on Input/Output screen. Favorites can be added at any time.
5	Analog Inputs (AI)	Displays AI added to favorite (yellow start) on Parameter > Analog screen. Favorites can be added at any time.
6	Wash/Rinse System Diagram	Displays the wash/booster tank temperature and water levels.
7	Digital Outputs (DO)	DO added to favorites (yellow star) on Input/Output screen. Favorites can be added at any time. DO's can be turned on and off by pressing and holding the "**S**" button next to the green (on) or red (off) light. For detailed instructions on testing components, refer to DIGITAL OUTPUT COMPONENT TEST (TechConnect).
8	Analog Outputs (AO)	Not used.
NOTE: System Overview screen will always display wash tank and booster tank temperatures and voltage readings.		

NOTE: Digital and analog input and outputs can be added or removed as needed.

NOTE: Digital outputs can be turned on temporarily to test component.

Add or Remove Digital or Analog Inputs and Outputs

1. Select Inputs / Outputs.
2. Select the star to add the digital or analog inputs and outputs to the diagnosis screen. Yellow star = added, empty star = removed.

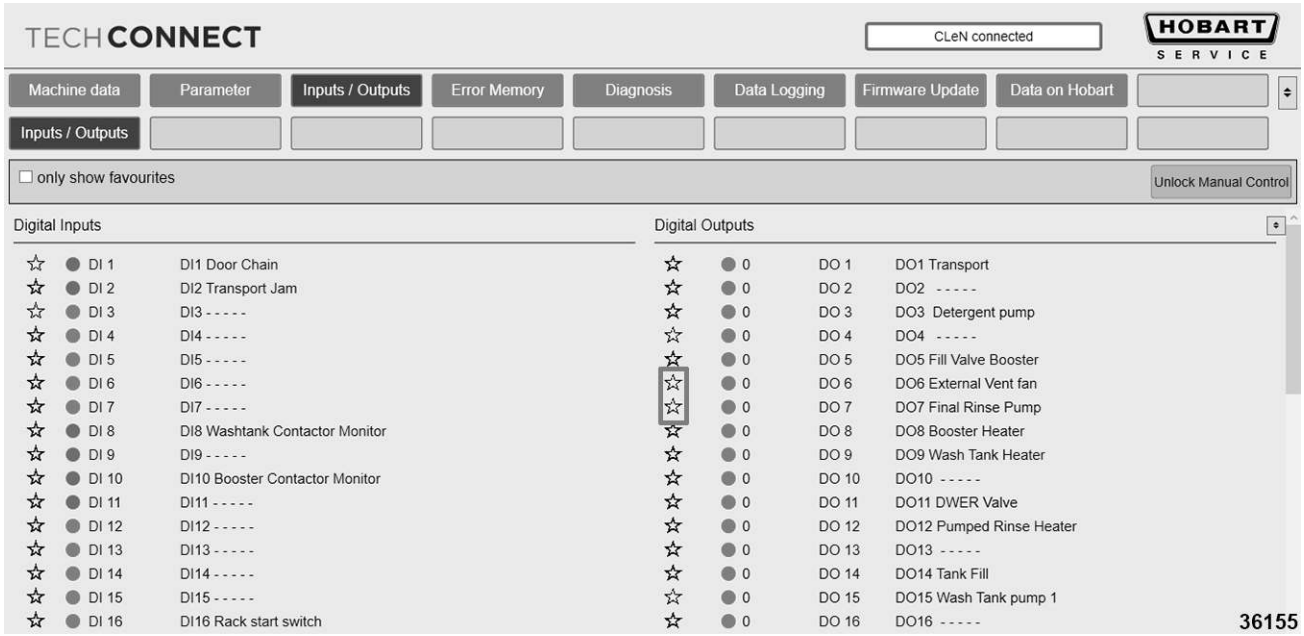


Fig. 114

3. Once all I/O are selected, select Diagnosis to return back to the diagnosis screen with the added or removed I/O's.

Turn on Digital outputs Temporarily to Test Component

1. Select Diagnosis screen.
2. Select and hold "S" button to temporally turn on component. The red light will turn green while component is energized.

   NOTE: When "S" button is released, component will turn off.

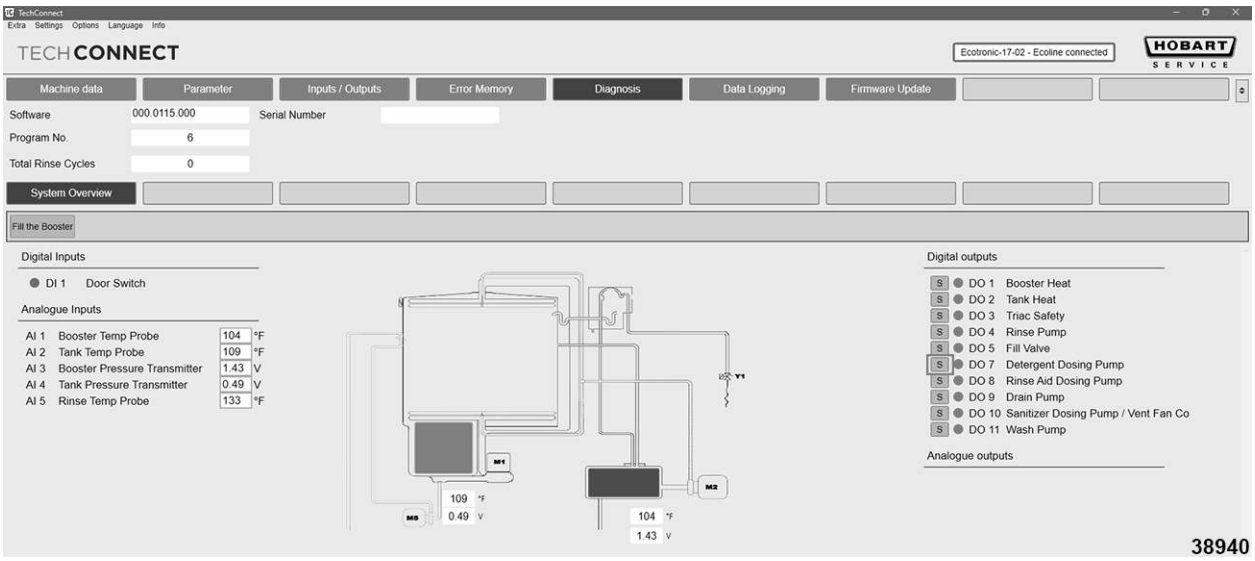


Fig. 115

PARAMETER - ANALOG VALUES

NOTE: These parameters are reference for either machine HMI Programming (Fig. 116) or using TechConnect (Fig. 117).

Fig. 116

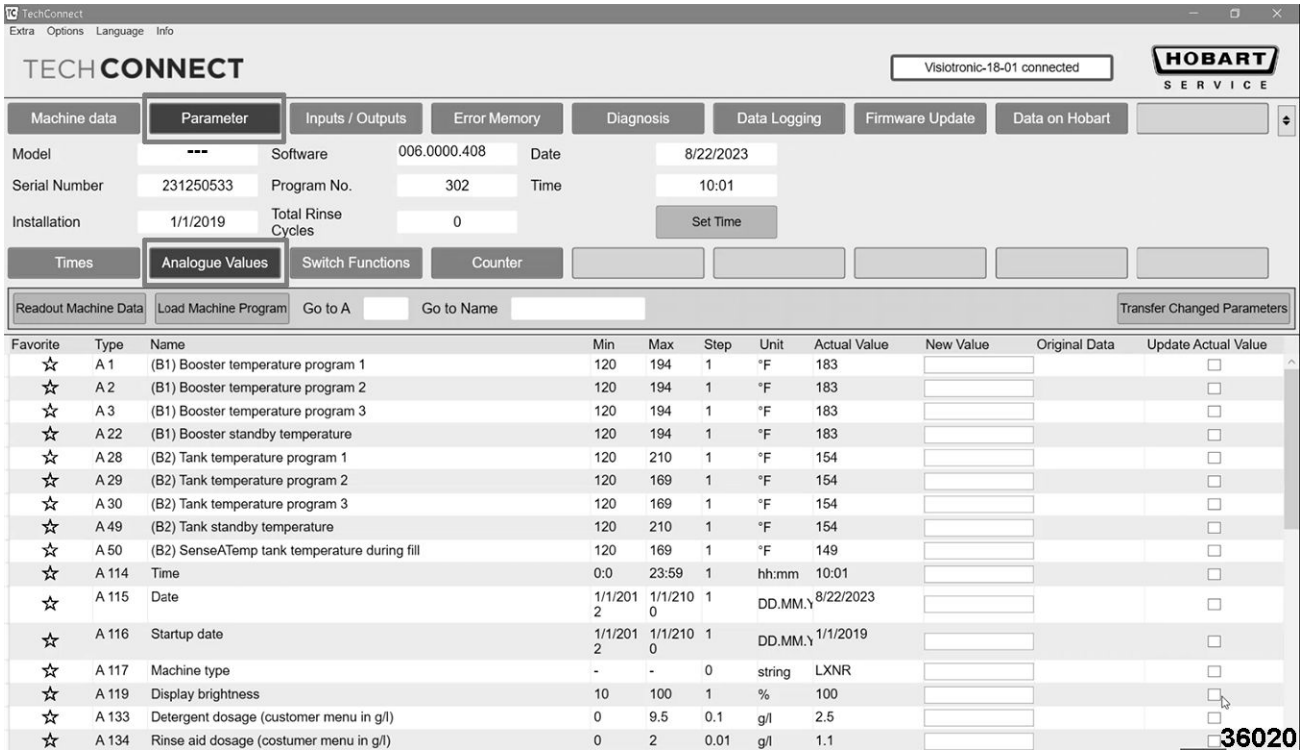


Fig. 117

TYPE	Name	MIN	MAX	INCREMENT	UNIT	REMANENT	SUnL COLD	SUnH HOT
A2	B1 boiler rinse PB2	0	90	0.5	°C	0	0.0	77.0
A7	B1 boiler standby	0	90	0.5	°C	0	0.0	84.0
A16	B2 wash tank standby	0	76	0.5	°C	0	55.0	70.0
A21	De-Lime Wash Cycle Limit (Multiply by 100*A21)	0	999	1	Cycles	1	15.0	15.0
A22	Sanitization Dose	0	100	2	Percent	1	50.0	0.0
A23	Soft Start Initial Power	0	100	1	Percent	1	47.0	37.0
A24	Modbus Address	1	255	1	N/A	1	1.0	1.0
A25	Modbus Baud Rate 9600/19200/115400	0	2	1	N/A	1	1.0	1.0
A26	Modbus Parity -- Even/ Odd/None	1	3	1	N/A	1	1.0	1.0
A28	Rinse Temp target (Final Rinse) max **ER-22**	0	90	0.1	°C	0	10.0	15.0
A32	B3 Booster "full"	0.50	3.50	0.01	V	0	0.78	0.78
A35	B3 - Low temp boiler -full during wash cycle	0.50	3.50	0.01	V	0	0.78	0.0
A43	B4 Intermediate draining	0.5	3.5	0.01	V	0	0.75	0.77
A44	B4 Tank full	0.5	3.5	0.01	V	0	0.73	0.73

TYPE	Name	MIN	MAX	INCREMENT	UNIT	REMANENT	SUnL COLD	SUnH HOT
A46	B4 Safety of over flow on	0.5	3.5	0.01	V	0	1.00	1.00
A47	B4 Safety of over flow off	0.5	3.5	0.01	V	0	0.90	0.90
A54	Detergent dosage (customer menu)	0.0	90.0	0.1	g/l	1	2.0	2.0
A55	Rinse aid dosage (costumer menu)	0.0	50.0	0.1	g/l	1	0.6	0.6
A57	Detergent dosage during filling program	0.0	90	0.5	g/l	1	2.0	2.0
A59	B4 level control when wash program starts **ER-28 = FIL**	0.0	3.50	0.01	V	0	0.70	0.70
A65	**ER-1** Boiler Temp upper limit	0	115	0.5	°C	0	0.0	112.0
A66	**ER-2** Boiler Temp lower limit	1	90	0.5	°C	0	1.0	2.0
A67	**ER-5** Wash Temp upper limit	0	125	0.5	°C	0	65.0	80.0
A68	**ER-6** Wash Temp lower limit	1	90	0.5	°C	0	2.0	2.0
A69	**ER-7** Boiler Pressure level upper limit	0	5	0.01	V	0	3.50	3.50
A70	**ER-8** Boiler Pressure level **lower** limit	0	5	0.01	V	0	0.30	0.30
A71	**ER-9** Wash Pressure level upper limit	0	5	0.01	V	0	3.50	3.50
A72	**ER-10** Wash Pressure level **lower** limit	0	5	0.01	V	0	0.30	0.30
A75	Tank Level External Detergent Enable (**Dos7**)	0	3.5	0.01	V	0	0.00	0.00

PARAMETER - SWITCH FUNCTION

NOTE: These parameters are reference for either machine HMI Programming (Fig. 118) or using TechConnect (Fig. 119).

Fig. 118

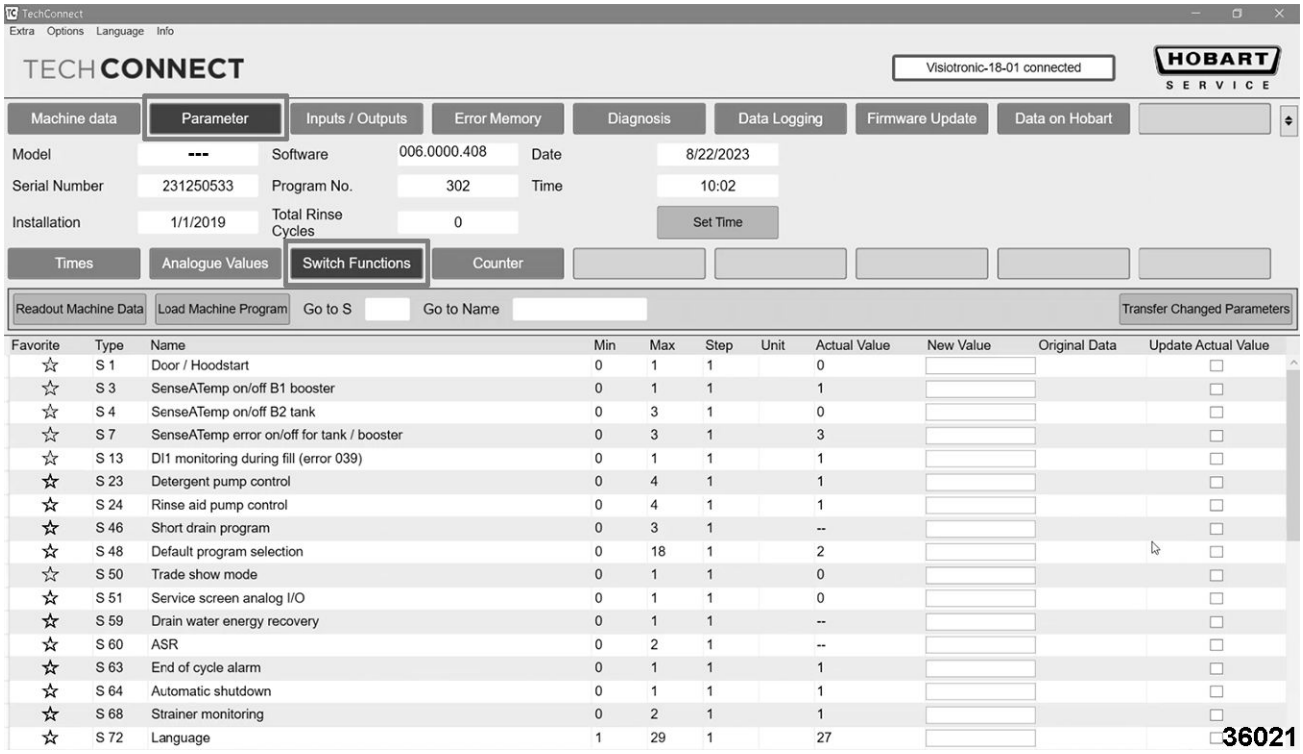


Fig. 119

NOTE: All Models have the same parameters.

Type	Timer	Min	Max	Increment	Unit	REMANENT	SUnL COLD	SUnH HOT
S7	Locking tank heater-boiler heater	0	1	1		0	0	0
S9	Hoodstart	0	1	1		0	0	0
S19	Enable/Disable input DE06 / DE07 / DI08 (Det, Rise Aide, Sanizt)	0	7	1		0	7	3
S26	Degrees °F = 0 (or) °C = 1	0	1	1	F / C	1	0	0
S29	Disable/enable Drain Time Fill Program	0	1	1	Off / On	0	1	1
S33	Dosing Pump Control (0=Disabled / 1=Internal / 2=External)	0	2	1	Select	1	1	1
S38	A216 Touch Sensitivity	0	4	1	Off / On	1	2	2

PARAMETER - COUNTERS

NOTE: These parameters are reference for either machine programming (Fig. 120) or using TechConnect (Fig. 121).

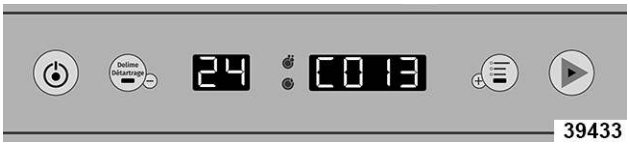


Fig. 120

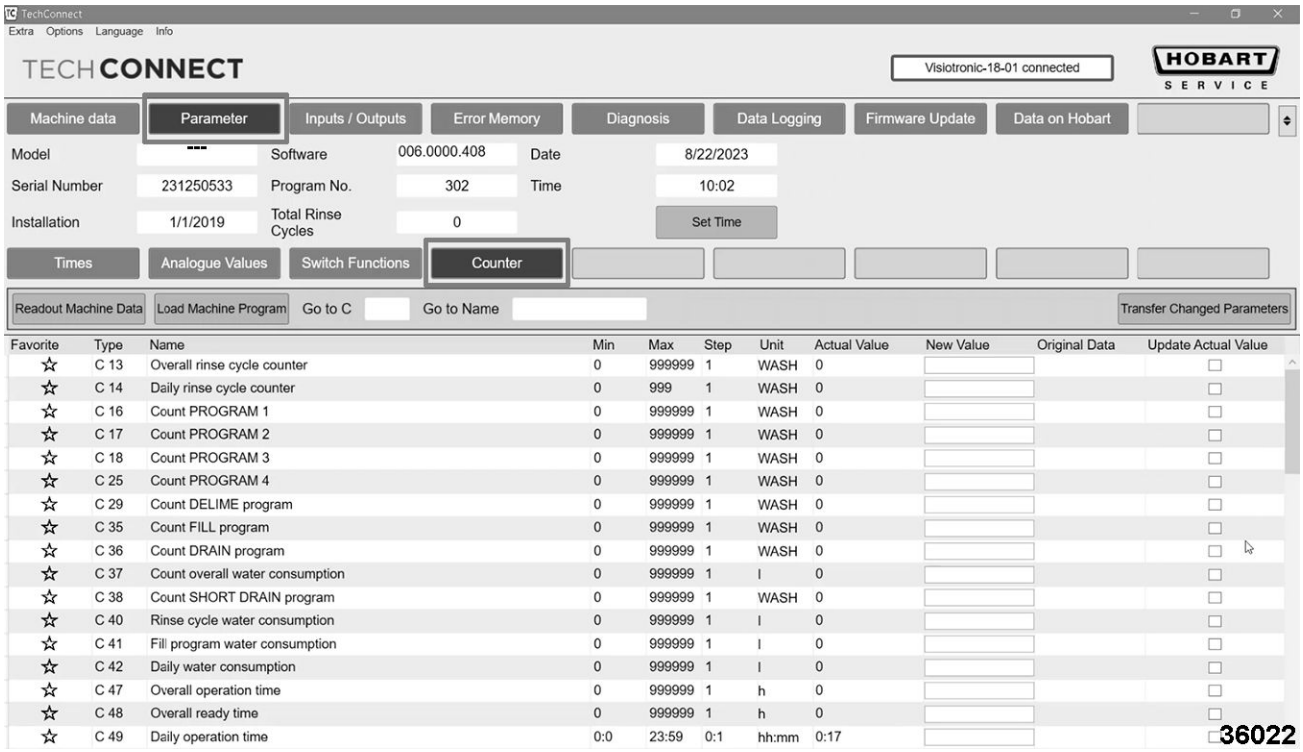


Fig. 121

TYPE	NAME	MIN	MAX	INCREMENT	UNIT	REMANENT	SUnL COLD	SUnH HOT
C9	Count PB2 - Wash	0	999999	1	WASH	1	0	0
C13	Overall counter rinse cycle	0	999999	1	WASH	1	0	0
C18	Counter FILLING program	0	999999	1	FILL	1	0	0
C19	Counter DRAINING program	0	999999	1	DRAIN	1	0	0
C53	De-Lime Counter (Count of wash cycles)	0	999999	1	IMP	1	0	0
C60	De-lime Counter (Count of De-lime cycles or reset)	0	999999	1	DELIME	1	0	0
C61	Stir Wash Tank - Det injection - Repeat	1	999	1	STIR	0	0	0

TYPE	NAME	MIN	MAX	INCREMENT	UNIT	REMANENT	SUnL COLD	SUnH HOT
C63	Delay counter monitoring delime program (ER-32)	0	10	1	RINSE	0	3	3

PARAMETER - TIMERS

NOTE: These parameters are reference for either machine programming (Fig. 122) or using TechConnect (Fig. 123).

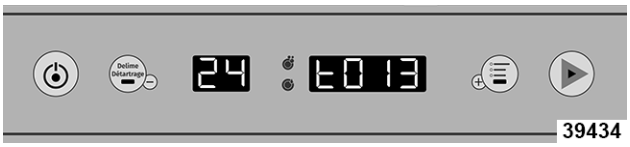


Fig. 122

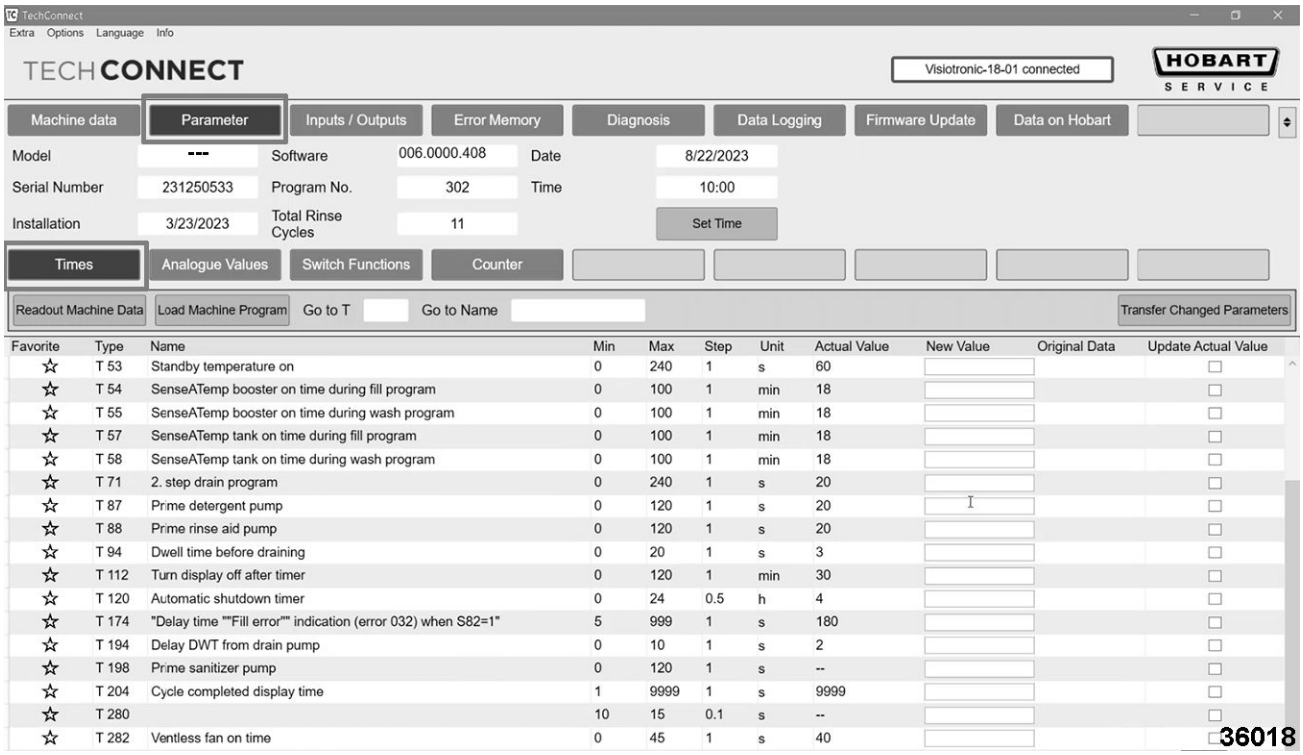


Fig. 123

TYPE	NAME	MIN	MAX	INCREMENT	UNIT	REMANENT	SUnL	SUnH
T12	Max. interdraining time	1	500	1	SEC	0	24	24
T14	Thermostop boiler wash program **ER-3**	0	99	1	MIN	0	6	10
T15	Thermostop boiler filling program **ER-30**	0	99	1	MIN	0	20	35

TYPE	NAME	MIN	MAX	INCREMENT	UNIT	REMANENT	SUnL	SUnH
T18	Rinse time fill program	1	50	0.1	SEC	0	28	28
T21	Draining program 1. step draining	0	999	1	SEC	0	110	110
T22	Draining program 2. step draining	0	999	1	SEC	01	25	25
T22	Draining program 2. step draining	0	999	1	SEC	0	25	25
T31	Tube filling detergent	0	999	1	SEC	0	60	60
T32	Tube filling rinse aid	0	999	1	SEC	0	180	180
T43	Fill valve monitoring ER-31	0	999	1	SEC	0	240	240
T49	Delime Time Delime Program = **DL time**	0	2000	1	SEC	1	240	240
T50	Wash Time Delime Program = **SDL & DL clean time**	60	2000	1	SEC	1	60	60
T51	Wash Timer Extension Ref T2 * ext time	3	6	1	MIN	1	4	4
T52	Tube filling sanitizer	0	999	1	SEC	0	140	0
T57	Stir Wash Tank - on time	0	999	1	SEC	1	0	0
T63	Delime Fill Monitoring ER-32 Limit	0	2000	1	SEC	0	600	600

6. ELECTRICAL OPERATION

CONTROL BOARD - WIRE CONNECTIONS

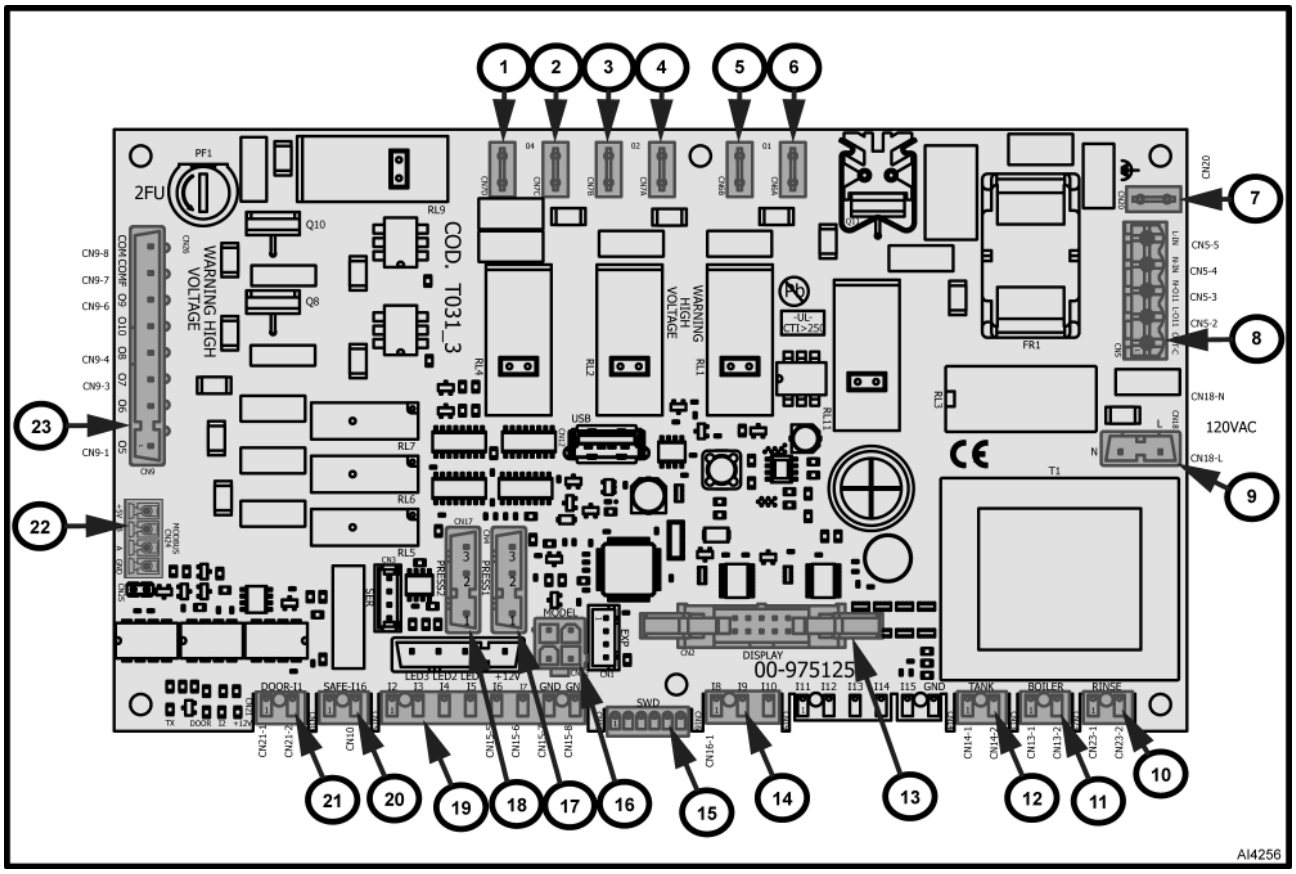


Fig. 124

NUMBER	NAME / ELECTRICAL CALLOUT	FUNCTION
1	2MTR	Connect to rinse pump motor.
2	1FU	From main power through fuse.
		Connects to (CN5-5).
3	CN7C	To tank overtemp (1TAS).
4	CN7A CN7A	CN7A connects to (CN9-8) (COM). Connects to (CN6A) (SUnH). Connects to (CN18L) (SUnL).
5	CN6B	Booster overtemp (3TAS) (SUnH). Not used (SUnL).

NUMBER	NAME / ELECTRICAL CALLOUT	FUNCTION
6	CN6A	Connects to (CN7A) (SUnH).
		Not used (SUnL).
	CN6A	Connects to (CN18L) (SUnH).
		Not used (SUnL).
7	CN20	Connects to ground.
8	CN5-2	Connects to wash pump motor (1MTR) (SUnH).
	CN5-2	Connect to control relay (CR1) (SUnL).
	CN5-3	Connects to wash pump motor (1MTR).
	CN5-4	Connects to (2TB-L) (SUnH).
	CN5-4	Connects to (2TB-N) (SUnL).
	CN5-5	connects to CN7C.
9	CN18-L	Connects to (CN6A) (SUnH).
	CN18-L	Connects to (CN7A) (SUnL).
	CN18-N	Connects to (2TB-N).
10	CN23-1	Connects to rinse probe (B1).
	CN23-2	Connects to rinse probe (B1).
11	CN13-1	Connects to booster temp probe (B2) (SUnH).
		Not used (SUnL).
	CN13-2	Connects to booster temp probe (B2) (SUnH).
		Not used (SUnL).
12	CN14-1	Connects to tank temp probe (B3).
	CN14-2	Connects to tank temp probe (B3).
13	CN2	Connects to display / user interface.
14	CN16-1	connects to sanitizer level sensor connector (S4).
15	N/A	Not used.
16	CN22	Designated jumper.
17	PRESS1	Booster pressure sensor.
18	PRESS2	Tank pressure sensor.
19	CN15-5	Connects to rinse aid level sensor connector (S3).
	CN15-6	Connects to detergent level sensor connector (S2).
	CN15-7	Connects to detergent level sensor connector (S2).
	CN15-8	Connects to rinse aid level sensor connector S3.
20	CN10	Jumper
21	CN21-1	Connects to door switch (CN21).
	CN21-2	Connects to door switch (CN21).
22	CN24	MODBUS communications.

NUMBER	NAME / ELECTRICAL CALLOUT	FUNCTION
23	CN9-1	Connects to fill valve (1VL).
	CN9-3	Connects to detergent pump motor (4MTR).
	CN9-4	Connects to rinse aid pump motor (5MTR).
	CN9-5	Connects to sanitizer pump motor (6MTR) (SUnL).
	CN9-6	Connects to drain pump (3MTR).
	CN9-7	Connects to transformer (1T-X1) (SUnH).
	CN9-7	Connects from main power through fuse (1FU) (SUnL).
	CN9-8	Connects to CN7A.
NOTE: (SUnH): CN9-7 (COMF) and CN9-8 (COM) are connected to fuse 2FU (PF1) on the board. 120VAC power from transformer X1 comes into board on CN9-7, goes through PF1 fuse (2FU), comes back out on CN9-8 and then runs to tank heat board relay, booster heat board relay, and then board power (CN18). **NOTE: (SUnL):** CN9-7 (COMF) and CN9-8 (COM) are connected to fuse 2FU (PF1) on the board. 120VAC power from fuse (1FU) comes into board on CN9-7, goes through PF1 fuse (2FU), comes back out on CN9-8 and then runs to tank heat board relay and then board power (CN18).		

240V TO 120V TRANSFORMER CONVERSION (SUnH)

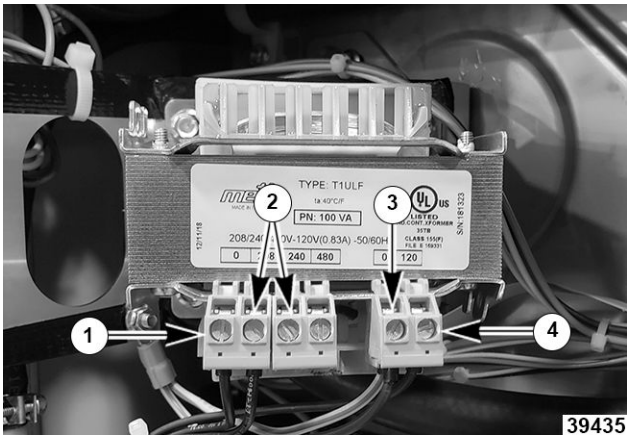


Fig. 125

Item	Callout
1	1T - COM
2	1T - H 208VAC / 240VAC
3	1T - X2 / GND
4	1T - X1
NOTE: A control transformer is used to step 208V or 240V incoming power to 120V for control circuitry, drain pump, fill valve and on board chemical pumps.. The transformer is factory-preset to 240V.	

⚠WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove FRONT PANEL.
2. For 208V incoming power, relocate jumper bar connecting 3TB-1 and 3TB-2 (240V) to 3TB-2 and 3TB-3 for (208V).

   NOTE: Refer to wiring diagram supplied with machine.

   NOTE: An incorrectly connected transformer can result in machine draining issues.

Fig. 126

COMPONENT LOCATION (FRONT) & DESCRIPTION (SUnL)

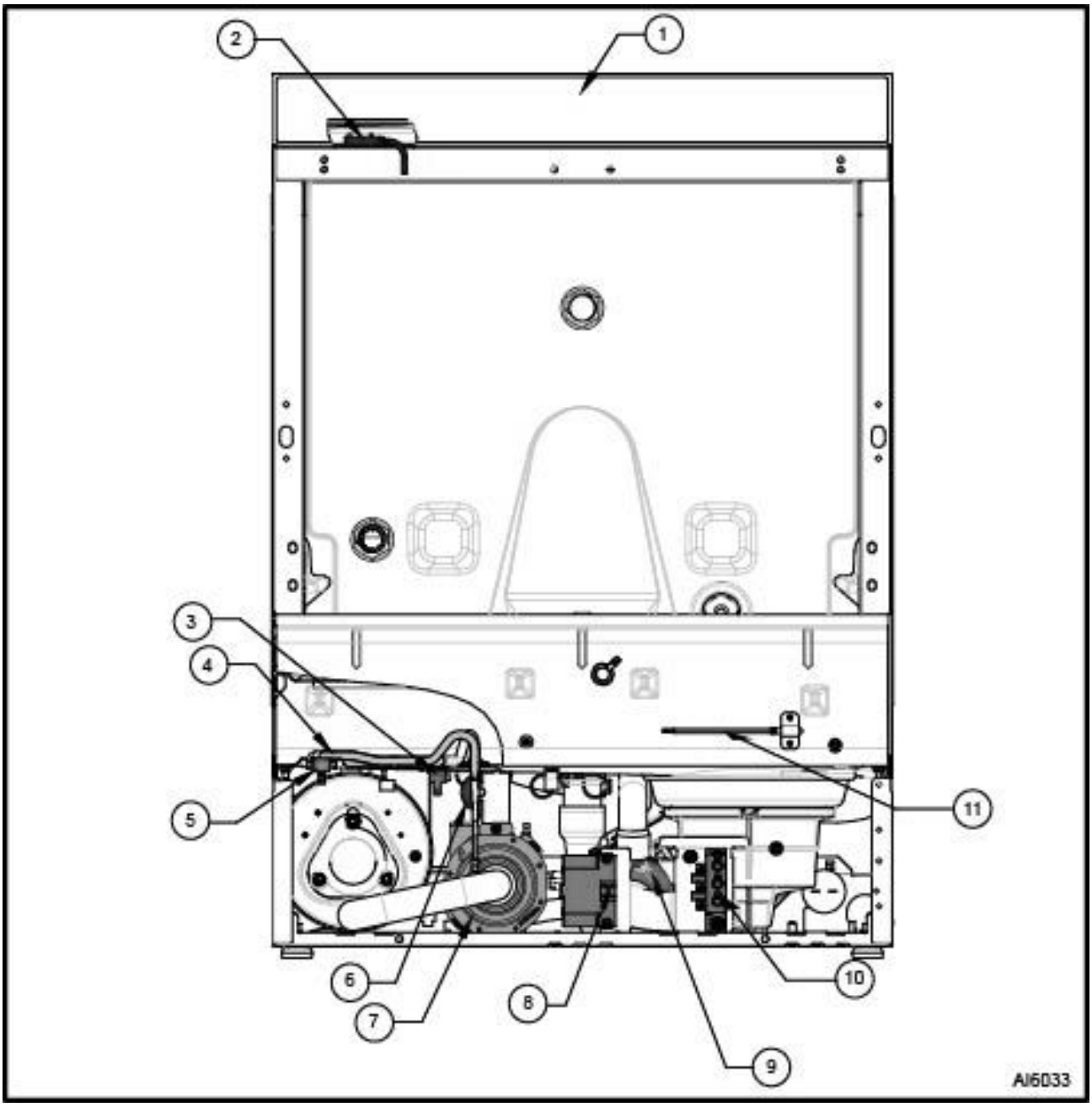


Fig. 127

NUMBER	NAME / ELECTRICAL CALLOUT	FUNCTION
1	User Interface (A2)	Provides user interface to control board. Visual display shown in window of keypad. Shows machine operation and programming.
2	Door Switch (S1)	Disables wash and rinse pumps while door is open.
3	Tank Thermostat (2TAS)	Tank heat hi-limit temp thermostat.
4	Tank Heating Element (E2)	Heats water in tank.

NUMBER	NAME / ELECTRICAL CALLOUT	FUNCTION
5	Tank Thermostat (1TAS)	Tank heat hi-limit temp thermostat.
6	Rinse Pump Capacitor (C2)	Power to start Rinse pump. Capacitor 120V, 14µf.
7	Rinse Pump Motor (2MTR)	Drives rinse pump, which pumps for rinse cycles.
8	Sanitizer Pump Motor (6MTR)	Drives sanitizer pump, which pumps for sanitizer cycles.
9	Drain Pump Motor (3MTR	Drives drain pump, which pumps for drain cycles.
10	Terminal Block (1TB)	Connects incoming line voltage to controls.
11	Tank Temp Probe (B3)	Measures wash tank temperature.

COMPONENT LOCATION (FRONT) & DESCRIPTION (SUnH)

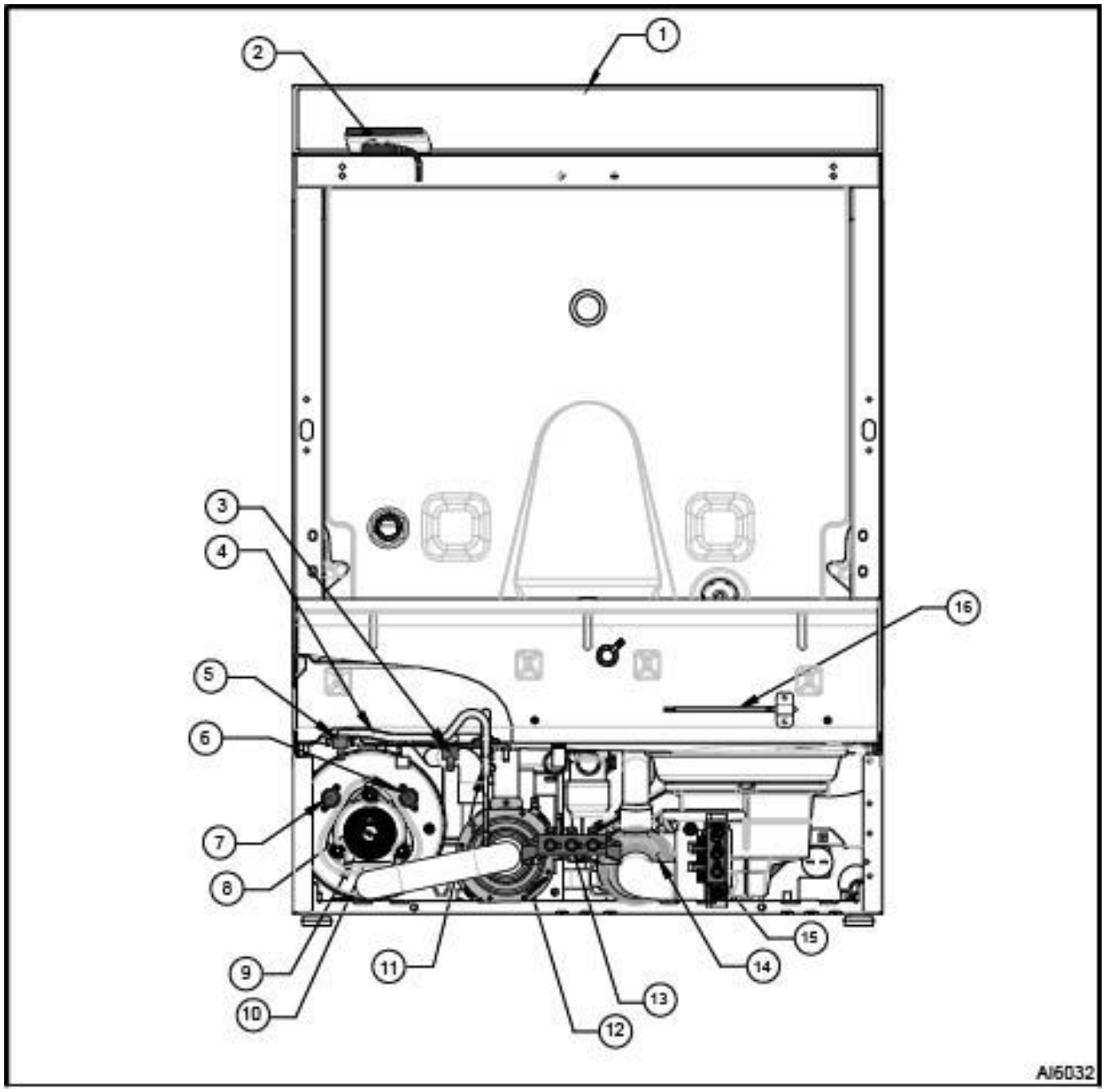


Fig. 128

NUMBER	NAME / ELECTRICAL CALLOUT	FUNCTION
1	User Interface (A2)	Provides user interface to control board. Visual display shown in window of keypad. Shows machine operation and programming.
2	Door Switch (S1)	Disables wash and rinse pumps while door is open.
3	Tank Thermostat (1TAS)	Tank hi-limit temp sensor.
4	Tank Heating Element (E2)	Heats water in tank.

NUMBER	NAME / ELECTRICAL CALLOUT	FUNCTION
5	Tank Thermostat (2TAS)	Tank hi-limit temp sensor.
6	Booster Thermostat (4TAS)	Booster hi-limit temp sensor.
7	Booster Thermostat (3TAS)	Booster hi-limit temp sensor.
8	Booster Temp Probe (B2)	Measures booster tank temperature.
9	Booster Heater (E1)	Heats water in booster.
10	Booster Heating Element Bridge (W1)	Bridge (Jumpers) booster elements (2 QTY).
11	Rinse Pump Capacitor (C2)	Power to start Rinse pump. Capacitor 208-240V, 4µf.
12	Rinse Pump Motor (2MTR)	Drives rinse pump, which pumps for rinse cycles.
13	Terminal Block (3TB)	Transformer selection of 240V or 208V.
14	Drain Pump Motor (3MTR)	Drives drain pump, which pumps drain cycles.
15	Terminal Block (1TB)	Connects incoming line voltage to controls.
16	Tank Temp Probe (B3)	Measures wash tank temperature.

COMPONENT LOCATION (BACK) & DESCRIPTION (SUnL)

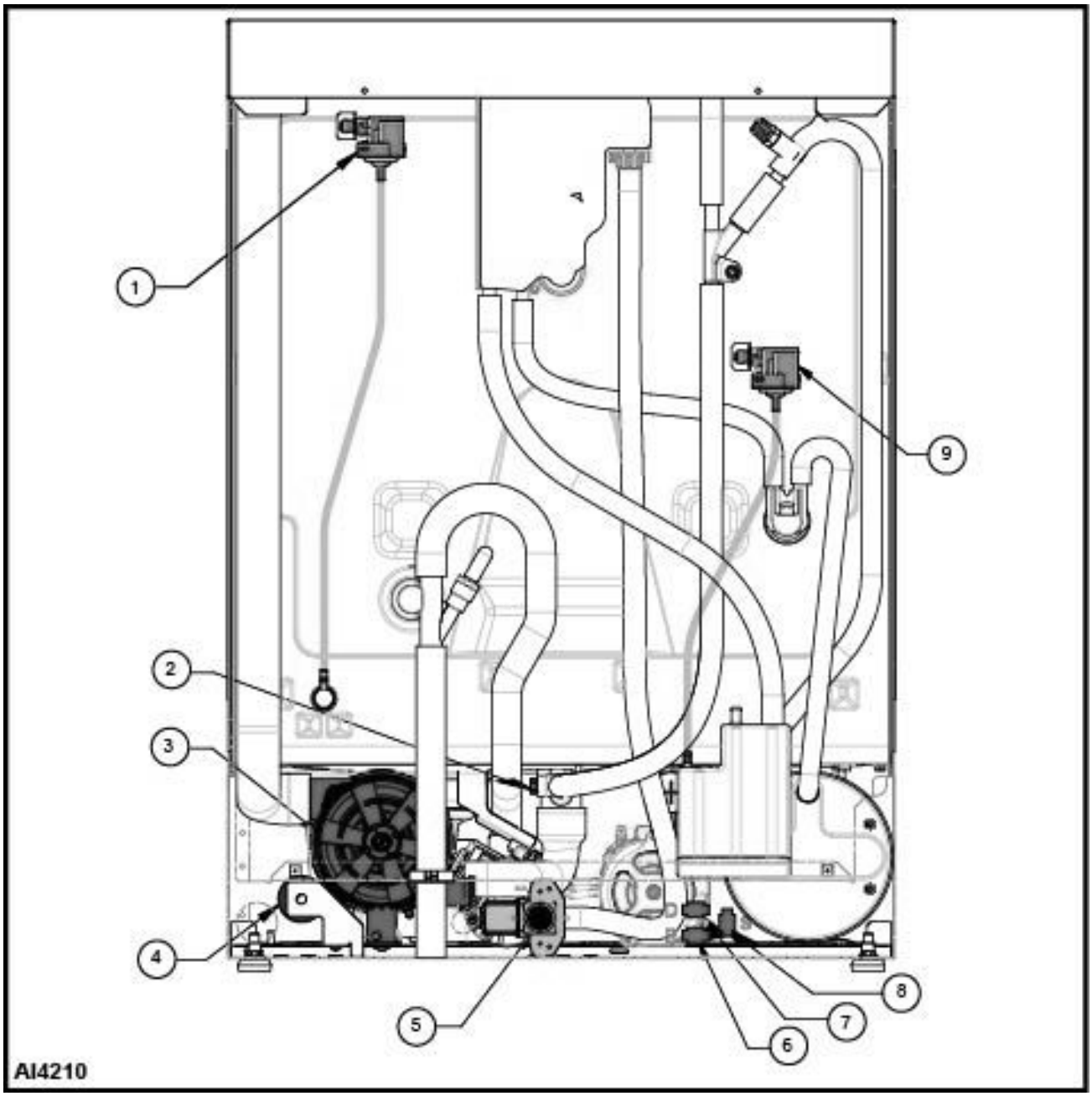


Fig. 129

NUMBER	NAME / ELECTRICAL CALLOUT	FUNCTION	
1	Tank Pressure Sensor (B5)	Supplies V reading for water level in tank. Acceptable range: 0.5 - 0.73V.	
		SUnL	
		Full	**Empty**
		0.73	0.5

<table>
<tr><th>NUMBER</th><th>NAME / ELECTRICAL CALLOUT</th><th>FUNCTION</th></tr>
<tr><td>2</td><td>Rinse Probe (B1)
(100kOHM)</td><td>Measures final rinse temperature.</td></tr>
<tr><td>3</td><td>Wash Pump Motor (1MTR)</td><td>Drives wash pump, which pumps for wash cycles.</td></tr>
<tr><td>4</td><td>Wash Pump Capacitor (C1)</td><td>Power to start Wash pump.
Capacitor 120, 30µf.</td></tr>
<tr><td>5</td><td>Fill Valve (1VL)</td><td>When energized, allows water to enter the booster.</td></tr>
<tr><td>6</td><td>Rinse Aid Level Sensor (S3)</td><td>Detects presence of rinse aid level in container bottle (optional accessory).</td></tr>
<tr><td>7</td><td>Det. Level Sensor (S2)</td><td>Detects presence of detergent level in container bottle (optional accessory).</td></tr>
<tr><td>8</td><td>Sanitizer Level Sensor (S4)</td><td>Detects presence of sanitizer level in container bottle (optional accessory). Not included in SUnL models.</td></tr>
<tr><td rowspan="4">9</td><td rowspan="4">Holding Tank Pressure Sensor(B4)</td><td colspan="2">Supplies V reading for water level in booster. Acceptable range: 0.5 - 2.25V.</td></tr>
<tr><td colspan="2">SUnH</td></tr>
<tr><td>Full</td><td>Empty</td></tr>
<tr><td>.78</td><td>0.5</td></tr>
</table>

COMPONENT LOCATION (BACK) & DESCRIPTION (SUnH)

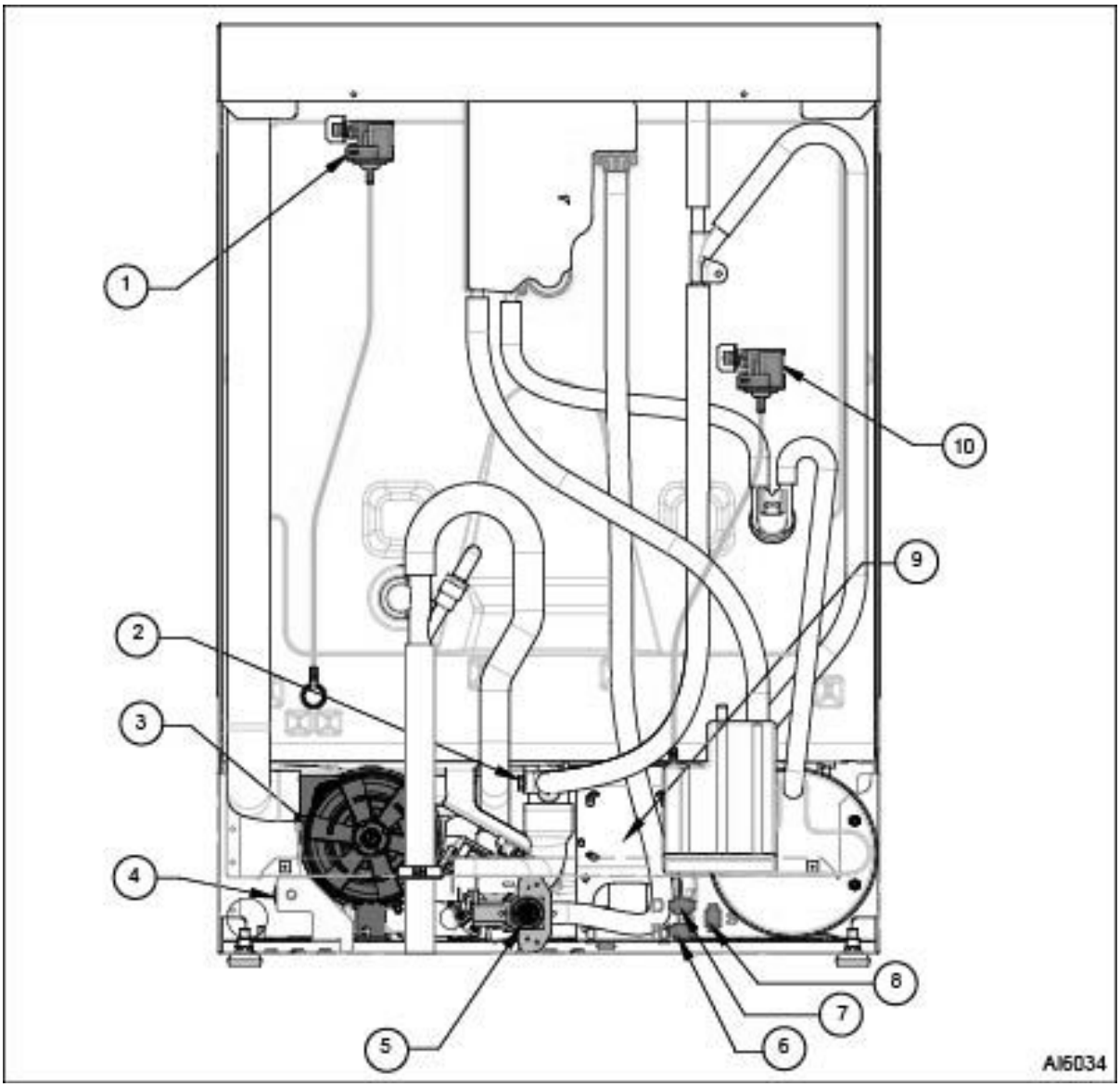


Fig. 130

NUMBER	NAME / ELECTRICAL CALLOUT	FUNCTION	
1	Tank Pressure Sensor (B5)	Supplies V reading for water level in tank. Acceptable range: 0.5 - 0.73V.	
		SUnH	
		Full	**Empty**
		0.73	0.5
2	Rinse Probe (B1)	Measures final rinse temperature.	
3	Wash Pump Motor (1MTR)	Drives wash pump, which pumps for wash cycles.	

<table>
<tr><th>NUMBER</th><th>NAME / ELECTRICAL CALLOUT</th><th colspan="2">FUNCTION</th></tr>
<tr><td>4</td><td>Wash Pump Capacitor (C1)</td><td colspan="2">Power to start Wash pump.
Capacitor 208-240V, 10µf.</td></tr>
<tr><td>5</td><td>Fill Valve (1VL)</td><td colspan="2">When energized, allows water to enter the booster.</td></tr>
<tr><td>6</td><td>Rinse Aid Level Sensor (S3)</td><td colspan="2">Detects presence of rinse aid level in container bottle (optional accessory).</td></tr>
<tr><td>7</td><td>Det. Level Sensor (S2)</td><td colspan="2">Detects presence of detergent level in container bottle (optional accessory).</td></tr>
<tr><td>8</td><td>Sanitizer Level Sensor (S4)</td><td colspan="2">Detects presence of sanitizer level in container bottle (optional accessory). Not included in SUnH models.</td></tr>
<tr><td>9</td><td>Transformer (1T)</td><td colspan="2">Transforms primary voltage of 208VAC or 240VAC down to secondary voltage (120VAC).</td></tr>
<tr><td rowspan="4">10</td><td rowspan="4">Booster Pressure Sensor (B4)</td><td colspan="2">Supplies mV reading for water level in booster. Acceptable range: 0.5 - 0.92V.</td></tr>
<tr><td colspan="2">SUnH</td></tr>
<tr><td>Full</td><td>Empty</td></tr>
<tr><td>0.78</td><td>0.5</td></tr>
</table>

COMPONENT LOCATION (LOWER FRONT) & DESCRIPTION (SUnL)

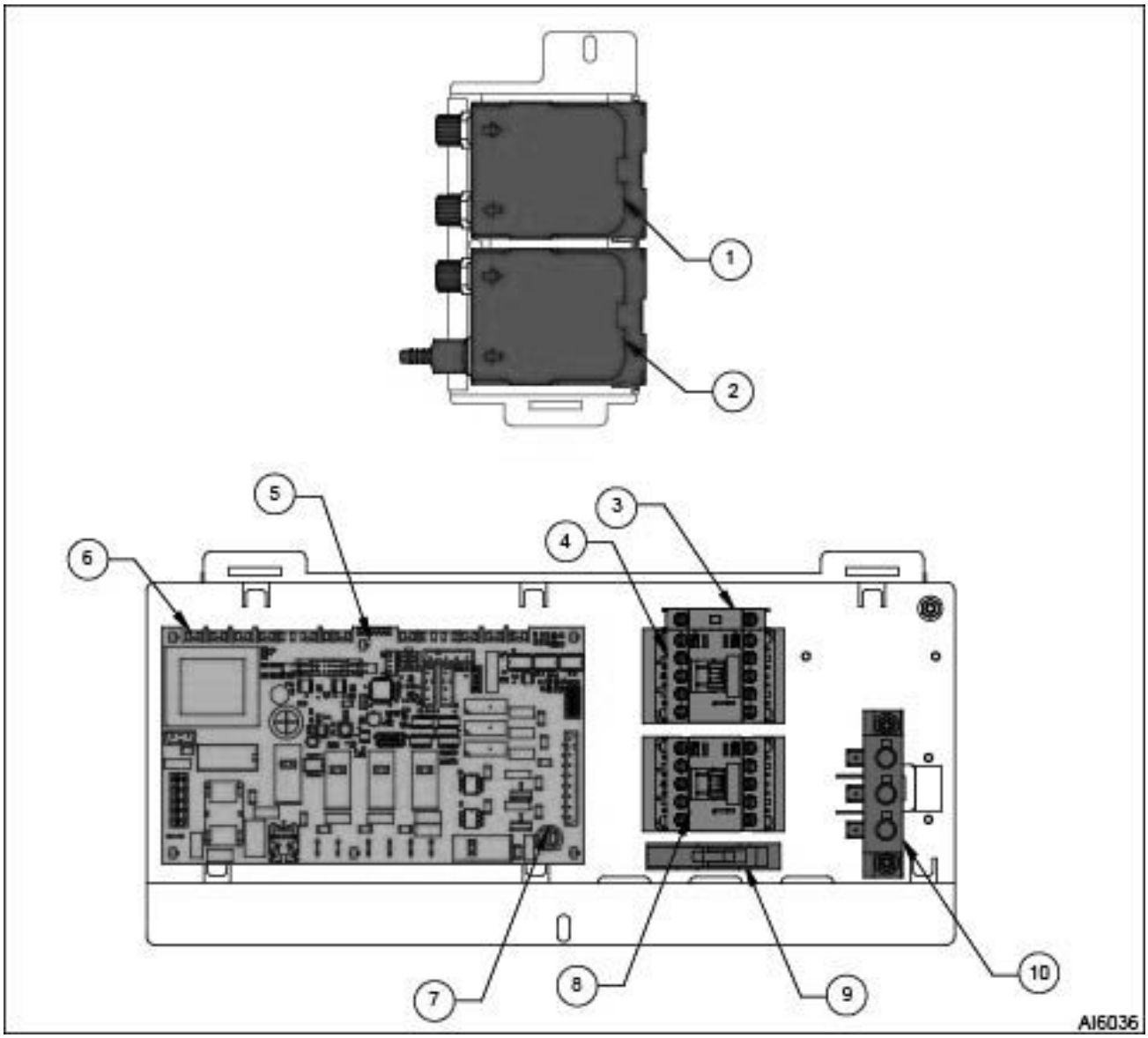


Fig. 131

NUMBER	NAME / ELECTRICAL CALLOUT	FUNCTION
1	Det. Pump (4MTR)	Drives detergent pump, which pumps detergent into machine.
2	Rinse Aid Pump (5MTR)	Drives rinse aid pump, which pumps rinse aid into machine.
3	Control Relay (CR1)	Control relay 120V.
4	Wiring Harness Designator (CN22)	Wiring harness designator.
5	Control Board (A1)	Controls operation of dishwasher.
6	Control Board Fuse (2FU)	T 2A; 250 VAC; 5x20mm, Fuse.
7	Tank Contactor (K2)	Controls power to tank heater.

NUMBER	NAME / ELECTRICAL CALLOUT	FUNCTION
8	Control Fuse (1FU)	Protects control board and overload from power surges. T 6.3A; 250VAC; 6.3 x 32mm.
9	Terminal Block (2TB)	Connects group neutral.

COMPONENT LOCATION (LOWER FRONT) & DESCRIPTION (SUnH)

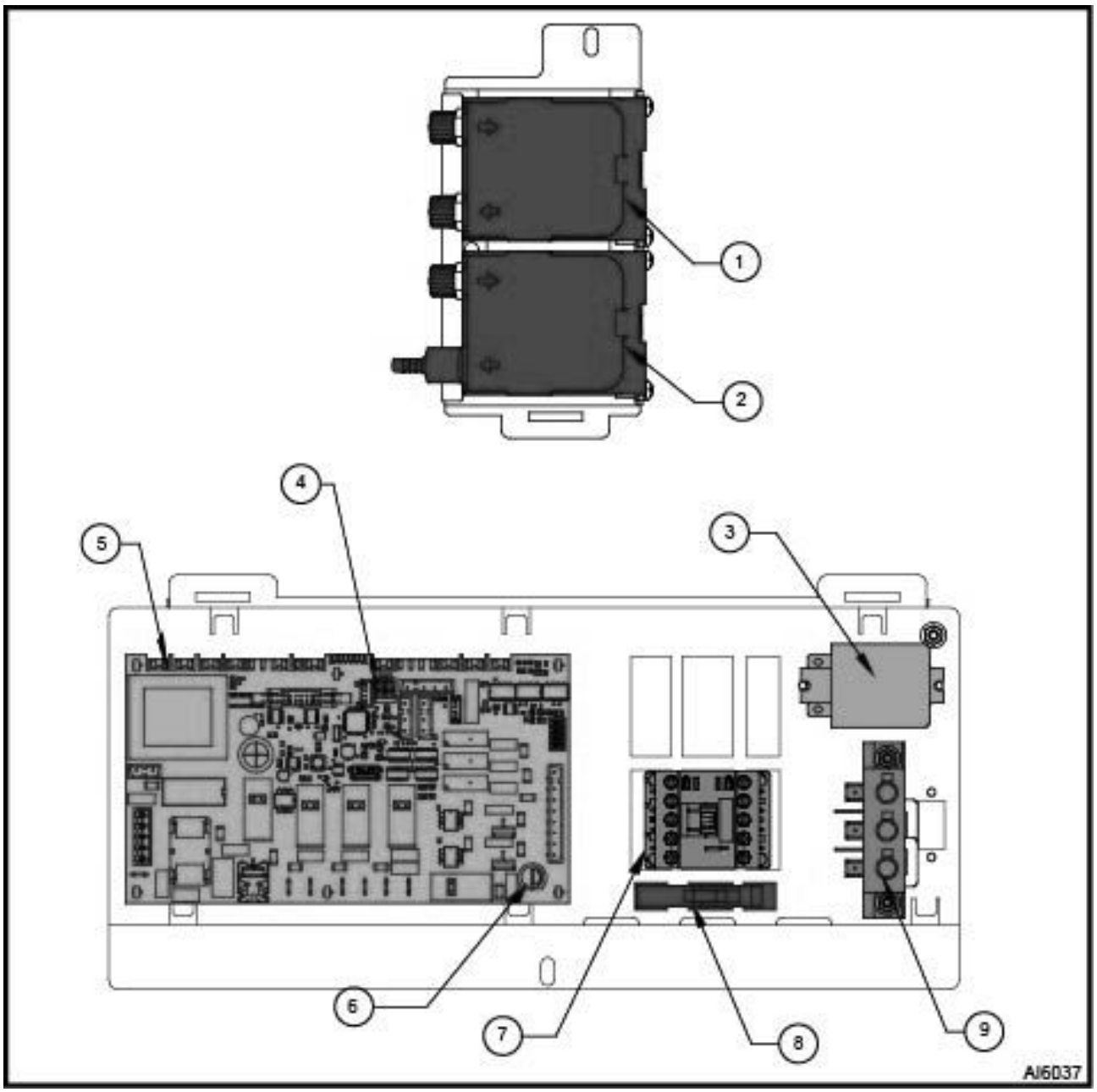


Fig. 132

NUMBER	NAME / ELECTRICAL CALLOUT	FUNCTION
1	Det. Pump (4MTR)	Drives detergent pump, which pumps detergent into machine.
2	Rinse Aid Pump (5MTR	Drives rinse aid pump, which pumps rinse aid into machine.
3	Booster Contactor Switch (KS1)	Controls how power is regulated to the booster contactor (K1) and tank contactor (K2).
4	Booster Contactor (K1)	Controls power to booster heater.
5	Wiring Harness Designator (CN22)	N/A
6	Control Board (A1)	Controls operation of dishwasher.
7	Control Board Fuse (2FU)	T 2A; 250 VAC; 5x20mm, Fuse.
8	Tank Contactor (K2)	Controls power to tank heater.
9	Control Fuse (1FU)	Protects control board and overload from power surges. T 6.3A; 250VAC; 6.3 x 32mm.
10	Terminal Block (2TB)	Connects group neutral.

CHEMICAL BOTTLE LEVEL SENSOR

⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

⚠ WARNING

When performing service work, corrosive chemicals may be present. Exposure to these chemicals could result in injury. It is very important to follow the manufacturer's instructions as found in the (Material) Safety Data Sheet/(M) SDS. Information regarding the Personal Protective Equipment (PPE) requirements can be found in the (M) SDS that accompanies product, or can be found online.

NOTE: For SUnH chemical bottle level sensors are an optional accessory.

NOTE: For SUnL detergent and rinse aid chemical bottle level sensors are an optional accessory. The sanitizer bottle level sensor comes standard with machine.

NOTE: The Chemical Lines are located on back of the dishwasher.

1. Cut the line away from the filter screen.

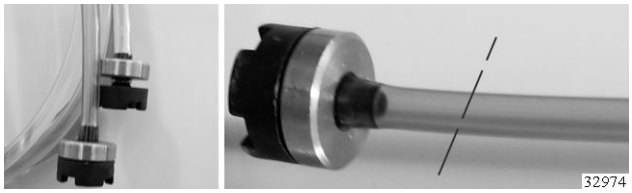


Fig. 133

2. Insert line into the chemical bottle level sensor.

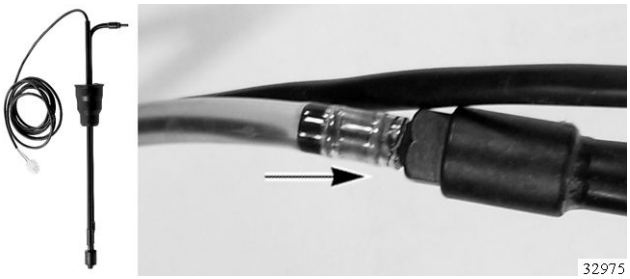


Fig. 134

NOTE: The detergent and rinse aid bottle level sensors have a black cable and black rubber stopper. The sanitizer bottle level sensor will have a blue cable and a blue rubber stopper.

3. Place chemical bottle level sensor into 1 gallon bottle or 5 gallon bucket.
4. Adjust chemical bottle level sensor rubber stopper to correct bottle or bucket height.
5. On the back of the dishwasher, lower right, remove the corresponding jumper plug. (D = Detergent / R = Rinse Aid / S = Sanitizer).

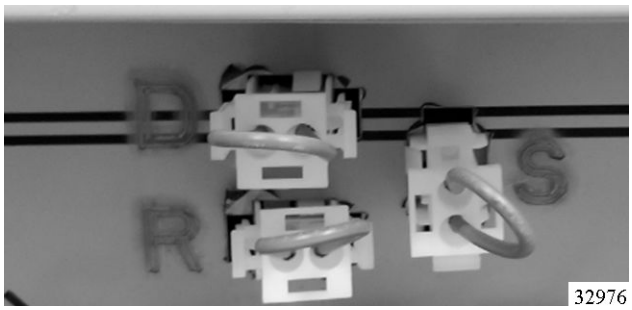


Fig. 135

6. Plug connector from chemical bottle level sensor into corresponding plug.
7. Repeat steps for other chemical lines. Once all chemical lines are connected, prime all dosing pumps, refer to PRIMING CHEMICALS.

PRIMING CHEMICALS

Fig. 136

NOTE: See INSTALLATION & OPERATION MANUAL for priming information.

Priming Chemicals

1. Power (1, Fig. 136) on the dishwasher and allow to fill/heat.
2. Wait until LED lights (1 & 4, Fig. 136) (Power and Play buttons) stop flashing stating dishwasher is in ready state.

   NOTE: Machine must be in “Ready” state for Priming Process to begin.
3. Press “Menu” button (3, Fig. 136).
4. The Display reads “00” (00 = Extended Wash).

Priming Chemicals Alternate

1. Power off dishwasher.
2. Open door.
3. Press and hold for 3 & 4 until LED light up.
4. Close door will display "00" (00 = Extended Wash).

Priming Detergent Pump

Fig. 137

1. Press “Wash” button (3, Fig. 137) to scroll.
2. Navigate until Display reads “03” (03 = Prime Detergent Pump).
3. Press “Menu” button (2, Fig. 137) the “0” under “03” should change to “1”.
4. Press “Delime” button (3, Fig. 137).

   NOTE: LED next to “1” (4, Fig. 137) should begin to blink on display.

   NOTE: Priming started (look at chemical bottle or container for fluid movement).
5. Once flashing LED goes away, priming is completed.
6. Verify chemicals flowing from the chemical container through tubing with no air bubbles and into the machine.

   NOTE: Repeat process as needed to ensure chemicals in machine.
7. Once fully primed, open and close door to exit menu.

Priming Rinse Aid Pump

Fig. 138

1. Press “Wash” button (3, Fig. 138) to scroll.
2. Navigate until Display reads “05” (05 = Prime Rinse Aid Pump).
3. Press “Menu” button (2, Fig. 138) the “0” under “05” should change to “1”.
4. Press “Delime” button (1, Fig. 138).

   NOTE: LED next to “1” (4, Fig. 138) should begin to blink on display.

   NOTE: Priming started (look at chemical bottle or container for fluid movement).
5. Once flashing LED goes away, priming is completed.
6. Verify chemicals flowing from the chemical container through tubing with no air bubbles and into the machine.

   NOTE: Repeat process as needed to ensure chemicals in machine.
7. Once fully primed, open and close door to exit menu.

Priming Sanitizer Pump

Fig. 139

1. Press “Wash” button (3, Fig. 139) to scroll.
2. Navigate until Display reads “07” (07= Prime Sanitizer Pump).
3. Press “Menu” button (2, Fig. 139) the “0” under “07” should change to “1”.
4. Press “Delime” button (1, Fig. 139).

   NOTE: LED next to “1” (4, Fig. 139) should begin to blink on display.

   NOTE: Priming started (look at chemical bottle or container for fluid movement).
5. Once flashing LED goes away, priming is completed.
6. Verify chemicals flowing from the chemical container through tubing with no air bubbles and into the machine.

   NOTE: Repeat process as needed to ensure chemicals in machine.
7. Once fully primed, open and close door to exit menu.

7. SEQUENCE OF OPERATION (SUnH)

STARTUP or INITIAL FILL (SUnH)

NOTE: For the purpose of this explanation, refer to Centerline CUH, Centerline & Ecoline - Undercounter - High Temp - 208-240V - 60Hz - 1Ph - 975183H - AI4240.

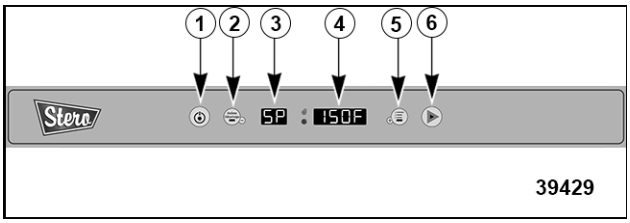


Fig. 140

NOTE: All times are based off of 240 volts. Times will vary slightly at 208 Volts.

Display Settings			
Display Buttons	**LED**	**Display**	**Status or Action**
Power & Play (Power On) (1, Fig. 140)	Flashes	dr FiL FiLL	System lock out. Press Power button and turn on. **NOTE:** The Play, Menu, and Delime buttons are locked out. **NOTE:** To abort, hold Power button for 3 seconds to start drain and power off.
Power & Play (Power On) (1, Fig. 140)	Flashes	Shows tank temp after 0:08:21 minutes or 501 seconds.	System lock out. **NOTE:** The Play, Menu, and Delime buttons are locked out.
Start Button LED On	Solid	Wash tank temp.	System in ready mode.
Power & Play (Power On) (1, Fig. 140)	Solid		System in ready mode.

Internal Control Board Process				
Startup or Initial Fill Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Drain:	0:00:25	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank by time.	25 s
Fill 1:	0:01:16	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.5V
Rinse 1:	0:00:28	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V

Internal Control Board Process				
Startup or Initial Fill Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Detergent 1:	0:00:28	Activate CN9-3 turn on 4MTR (Det pump).	Dose Sump Tank by calculation.	N/A
Fill 2:	0:01:14	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse 2:	0:00:26	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Detergent 2:	0:00:26	Activate CN9-3 turn on 4MTR (Det pump).	Dose Sump Tank by calculation.	N/A
Pause 1:	0:00:01	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	N/A
Fill 3:	0:01:13	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse 3:	0:00:28	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Detergent 3:	0:00:28	Activate CN9-3 turn on 4MTR (Det pump).	Dose Sump Tank by calculation.	N/A
Fill 4:	0:01:14	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse 4:	0:00:07	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Detergent 4:	0:00:07	Activate CN9-3 turn on 4MTR (Det pump).	Dose Sump Tank by calculation.	N/A
Tank Heat 1:	0:00:21	Activate CN7B turn on K2 (Tank Heater).	Turn on Sump heater until Booster Full.	0.67V
Fill 5:	0:00:19	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse Aid 1:	0:00:24	Activate CN9-4 turn on 5MTR (Rinse Aid pump).	Dose Booster Tank by calculation.	N/A
Booster Heat 1:	0:01:38	Activate CN6B turn on K1 (Booster Heater).	Turn on Booster heater until setpoint.	0.67V
Tank Heat 2:	0:06:39	Activate CN7B turn on K2 (Tank Heater).	Turn on Sump heater until setpoint.	183.2°F (84°C)
Booster Heat 2:	0:00:41	Activate CN6B turn on K1 (Booster Heater).	Turn on Booster heater until setpoint.	183°F (84°C)
Total Startup Time:	0:18:23			

STARTUP or INITIAL FILL (SUnL)

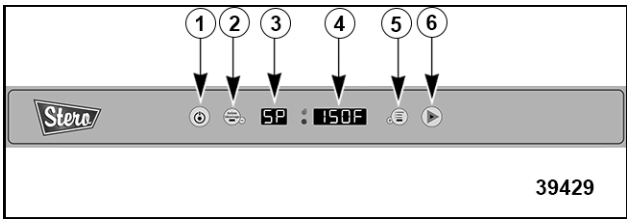


Fig. 141

Display Settings			
Display Buttons	**LED**	**Display**	**Status or Action**
Power & Play (1, Fig. 141)	Flashes	dr FiLL FiLL	System lock out. Press Power button and turn on. **NOTE:** The Play, Menu, and Delime buttons are locked out. **NOTE:** To abort, hold Power button for 3 seconds to start drain and power off.
Power & Play (1, Fig. 141)	Flashes	Shows tank temp after 0:08:21 minutes or 501 seconds.	System lock out. **NOTE:** The Play, Menu, and Delime buttons are locked out.
Power & Play (1, Fig. 141)	Solid	Wash tank temp.	System in ready mode.

Internal Control Board Process				
Startup or Initial Fill Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Drain	0:00:25	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank by time.	25 s
Fill 1:	0:01:16	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse 1:	0:00:26	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5 v
Detergent 1:	0:00:26	Activate CN9-3 turn on 4MTR (Det pump).	Dose Sump Tank by calculation.	N/A
Pause 1:	0:00:01	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	N/A
Fill 2:	0:00:53	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse 2:	0:00:27	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Detergent 2:	0:00:27	Activate CN9-3 turn on 4MTR (Det pump).	Dose Sump Tank by calculation.	N/A

Internal Control Board Process				
Startup or Initial Fill Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Pause 2:	0:00:01	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	N/A
Fill 3:	0:00:54	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse 3:	0:00:27	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Detergent 3:	0:00:27	Activate CN9-3 turn on 4MTR (Det pump).	Dose Sump Tank by calculation.	N/A
Pause 3:	0:00:01	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	N/A
Fill 4:	0:00:56	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse 4:	0:00:27	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Detergent 4:	0:00:07	Activate CN9-3 turn on 4MTR (Det pump).	Dose Sump Tank by calculation.	N/A
Fill 5:	0:00:57	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Tank Heat 1:	0:12:19	Activate CN7B turn on K2 (Tank Heater).	Turn on Sump heater until setpoint.	131°F (55°C)
Total Startup Time:	0:19:14			

WASH CYCLE (SUnH)

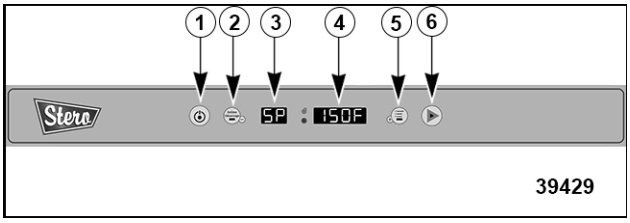


Fig. 142

NOTE: All times are based off of 240 volts. Times will vary slightly at 208 Volts.

Display Settings			
Display Buttons	**LED**	**Display**	**Status or Action**
Play (6, Fig. 142) or Start Wash Cycle (6, Fig. 142)	Flashes		Start wash cycle.

Display Settings			
Display Buttons	**LED**	**Display**	**Status or Action**
Play (6, Fig. 142) or Start Wash Cycle (6, Fig. 142) (SUnH Only) **NOTE:** If pressed within 10 seconds of the previous Play button.	Flashes LEDs (Play & Menu) are flashing		Press Play again to extend wash cycle. Normal wash cycle = 2 min. Extended default = 4 min. **NOTE:** Extended time is adjustable see WASH CYCLE EXTENDED WASH ADJUSTMENT .

Internal Control Board Process				
Drain Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Soft start wash pump:	0:00:10	Activate a relay on control board.	Turn on relay control board start wash pump until full speed.	37% (Power)
Wash Pump: **NOTE:** Option Extended Wash total 4 min.	0:01:28	Activate CN5-2 turn on 1MTR (Wash Pump).	Turn on soft start and run until full speed.	90 sec
Detergent Pump:	0:00:07	Activate CN9-3 turn on 4MTR (Det pump).	Dose Sump Tank by calculation.	N/A
Tank Heater 1	0:01:28	Activate CN7B turn on K2 (Tank Heater).	Turn on Sump heater until setpoint.	165.2°F (74°C)
Rinse Pump:	0:00:14	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	15 sec
Tank Heater 2	0:01:28	Activate CN7B turn on K2 (Tank Heater).	Turn on Sump heater until setpoint.	165.2°F (74°C)
Rinse Aid Pump:	0:00:13	Activate CN9-4 turn on 5MTR (Rinse Aid pump).	Dose Booster Tank by calculation.	N/A
Fill 1:	0:00:44	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Booster Heater:	0:01:32	Activate CN6B turn on K1 (Booster Heater).	Turn on Booster heater until setpoint.	185°F (85°C)
Tank Heat 3:	0:01:12	Activate CN7B turn on K2 (Tank Heater).	Turn on Sump heater until setpoint.	165.2°F (74°C)
Total Wash Time (Normal):	0:08:36			

WASH CYCLE (SUnL)

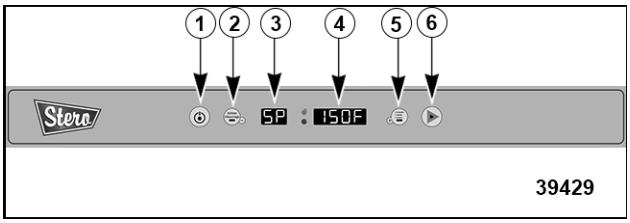


Fig. 143

Display Settings			
Display Buttons	**LED**	**Display**	**Status or Action**
Play (6, Fig. 143) or Start Wash Cycle (6, Fig. 143).	Flashes	sd drAn AC drAn	Start wash cycle.
Play (6, Fig. 143) or Start Wash Cycle (6, Fig. 143). **NOTE:** If pressed within 10 seconds of the previous Play button.	Flashes LEDs (Play & Menu) are flashing	sd drAn AC drAn	Press Play again to extend wash cycle. Normal wash cycle = 2 min. Extended default = 4 min. **NOTE:** Extended time is adjustable see WASH CYCLE EXTENDED WASH ADJUSTMENT.

Internal Control Board Process				
Drain Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Soft start wash pump:	0:00:10	Activate a relay on control board.	Turn on relay control board start wash pump until full speed.	37% (Power)
Wash Pump: **NOTE:** Option Extended Wash total 4 min.	0:01:29	Activate CN5-2 turn on 1MTR (Wash Pump).	turn on soft start and run until full speed.	90 sec
Detergent Pump:	0:00:07	Activate CN9-3 turn on 4MTR (Det pump).	Dose Sump Tank by calculation.	N/A
Rinse Aid Pump:	0:00:14	Activate CN9-4 turn on 5MTR (Rinse Aid pump).	Dose Booster Tank by calculation.	N/A
Fill 1:	0:00:30	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause 1:	0:00:03	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause to check booster level.	N/A
Fill 2:	0:00:01	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause 2:	0:00:03	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause to check booster level.	N/A
Fill 3:	0:00:01	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V

Internal Control Board Process				
Drain Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Pause 3:	0:00:04	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause to check booster level.	N/A
Fill 4:	0:00:01	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause 4:	0:00:17	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause to check booster level.	N/A
Fill 5:	0:00:01	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause 5:	0:00:04	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause to check booster level.	N/A
Fill 6:	0:00:01	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	.78V
Pause 6:	0:00:09	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause to check booster level.	N/A
Fill 7:	0:00:01	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Tank Heat 1:	0:03:00	Activate CN7B turn on CR1 (Relay) to K2 (Tank Heater).	Turn on Sump heater until setpoint.	165.2°F (74°C)
Pause 7:	0:00:10	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause or Dwell Time after wash pump.	10 sec
Drain Pump:	0:00:09	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump tank down to.	0.75V
Rinse Pump:	0:00:15	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump tank.	15 sec
Total Wash Time (Normal):	0:02:02			

DELIME (SUnH)

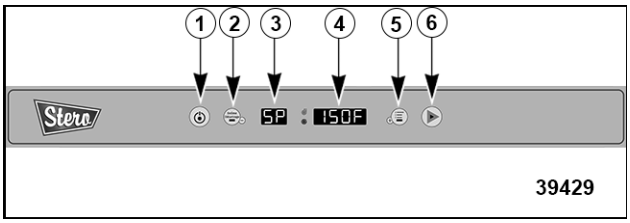


Fig. 144

NOTE: All times are based off of 240 volts. Times will vary slightly at 208 Volts.

Display Settings			
Display Buttons	**LED**	**Display**	**Status or Action**
Delime (2, Fig. 144).	Flashes		Inform time for Delime after 1500 cycles.
Delime (2, Fig. 144). **NOTE:** Manual Delime process.	Off	Wash Temp	Idle, then press and hold Delime for 3 seconds.

Tank full with Chemicals - Internal Control Board Process				
Tank Full with Chem Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Drain - 1	0:00:24	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause - 1	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain - 2	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause - 2	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain - 3	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause - 3	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain - 4	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause - 4	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain - 5	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V

Fill With Clean Water Only - Internal Control Board Process				
Clean Water ONLY Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Rinse pump 1	0:00:27	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Pause	0:00:01	Deactivate CN7D turn on 2MTR (Rinse pump).	Pause.	
Fill 1	0:01:27	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse Pump 2	0:00:28	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Fill 2	0:01:28	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse pump 3	0:00:27	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V

Fill With Clean Water Only - Internal Control Board Process				
Clean Water ONLY Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Fill 3	0:01:29	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse pump 4	0:00:19	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Fill 4	0:01:35	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Wash	0:00:59	Activate CN5-2 turn on 1MTR (Wash Pump).	Turn on soft start and run until full speed.	60 sec

Drain Tank Water - Internal Control Board Process				
Drain Tank Water Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Drain - 1	0:00:23	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause - 1	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain - 2	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause - 2	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain - 3	0:00:06	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause - 3	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain - 4	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts	0.5V
Pause - 4	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain - 5	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V

Fill With Clean Water ONLY & Heat - Internal Control Board Process				
Clean Water & Heat Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Rinse Pump 1	0:00:27	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V.
Fill 1	0:01:29	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse pump 2	0:01:56	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V.
Pause	0:00:01	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V

Fill With Clean Water ONLY & Heat - Internal Control Board Process				
Clean Water & Heat Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Fill 2	0:01:28	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V.
Rinse Pump 3	0:00:27	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause	0:00:01	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V.
Fill 4	0:01:29	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse Pump 4	0:00:22	Activate CN5-2 turn on 1MTR (Wash Pump).	Turn on soft start and run until full speed.	60 sec
Tank Heater	0:03:56	Activate CN7B turn on K2 (Tank Heater).	Turn on Sump heater until setpoint.	140°F (60°C)
Fill 5	0:01:26	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V

Add Delime - Internal Control Board Process				
Add Delime Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Add Delimer			Add Delimer.	N/A
Door Open	0:00:09	Activate S1 by Opening Door (Door switch).	Open door to add - Delime chemical.	N/A
Wash	0:03:57	Activate CN5-2 turn on 1MTR (Wash Pump).	Turn on soft start and run until full speed.	240 sec
Drain 1	0:00:24	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V.
Pause 1	0:00:07	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain 2	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V.
Pause 2	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain 3	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V.
Pause 3	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain 4	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V.
Pause 4	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain 5	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V.

Fill With Clean Water ONLY - Internal Control Board Process				
Clean Water ONLY Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Rinse pump 1	0:00:27	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V.
Fill 1	0:01:25	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse pump 2	0:00:27	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V.
Fill 2	0:01:28	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse pump 3	0:00:21	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V.
Fill 3	0:01:22	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Wash	0:00:59	Activate CN5-2 turn on 1MTR (Wash Pump).	Turn on soft start and run until full speed.	60 sec
Drain 1	0:00:24	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V.
Pause 1	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain 2	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V.
Pause 2	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain 3	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V.
Pause 3	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain 4	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V.
Pause 4	0:00:07	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain 5	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V.
Power off display		Power off display.		
Total Delime Time:	0:30:00	About 30 min depend on voltage for heating water.		

DELIME (SUnL)

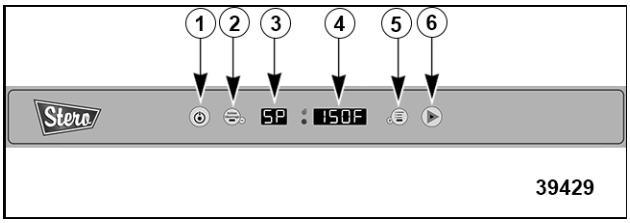


Fig. 145

Display Settings			
Display Buttons	**LED**	**Display**	**Status or Action**
Delime (2, Fig. 145)	Flashes		Inform time for Delime after 1500 cycles.
Delime (2, Fig. 145) **NOTE:** Manual Delime process.	Off	Wash Temp	Idle, then press and hold Delime for 3 seconds.

Tank full with Chemicals - Internal Control Board Process				
Tank Full with Chem Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Drain - 1	0:00:24	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause -1	0:00:05	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain - 2	0:00:06	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause - 2	0:00:05	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain - 3	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause - 3	0:00:05	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain - 4	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause - 4	0:00:05	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain - 5	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V

Fill With Clean Water Only - Internal Control Board Process				
Clean Water ONLY Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Rinse pump 1	0:00:26	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Pause	0:00:01	Deactivate CN7D turn on 2MTR (Rinse pump).	Pause.	
Fill 1	0:01:17	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse Pump 2	0:00:27	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Fill 2	0:00:56	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause Fill 1	0:00:01	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 3	0:00:57	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse pump 3	0:00:26	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Pause Fill 2	0:00:01	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 4	0:00:57	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse pump 4	0:00:12	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Pause Fill 3	0:00:01	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 5	0:00:28	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Wash	0:00:59	Activate CN5-2 turn on 1MTR (Wash Pump).	Turn on soft start and run till full speed.	60 sec
Pause Fill 1	0:00:02	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 1	0:00:01	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause Fill 2	0:00:01	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 2	0:00:01	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause Fill 3	0:00:03	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 3	0:00:01	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause Fill 4	0:00:02	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	

Fill With Clean Water Only - Internal Control Board Process				
Clean Water ONLY Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Fill 4	0:00:01	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause Fill 5	0:00:03	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 5	0:00:01	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause Fill 6	0:00:04	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 6	0:00:01	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause Fill 7	0:00:09	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 7	0:00:01	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause Fill 8	0:00:02	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 8	0:00:01	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V

Drain Tank Water - Internal Control Board Process				
Drain Tank Water Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Drain - 1	0:00:25	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause - 1	0:00:05	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain - 2	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause - 2	0:00:05	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain - 3	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause - 3	0:00:05	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain - 4	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause - 4	0:00:04	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain - 5	0:00:06	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V

Fill With Clean Water ONLY & Heat - Internal Control Board Process				
Clean Water & Heat Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Rinse Pump 1	0:00:27	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Pause	0:00:01	Deactivate CN7D turn off 2MTR (Rinse pump).	Pause.	
Fill 1	0:00:56	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse pump 2	0:00:27	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Fill 2	0:00:57	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse Pump 3	0:00:27	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Fill 3	0:00:57	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse Pump 4	0:00:27	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Fill 4	0:00:58	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Tank Heater	0:05:23	Activate CN7B turn on CR1 (Relay) to K2 (Tank Heater).	Turn on Sump heater till setpoint.	140°F (6°C)
Pause	0:00:02	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 5	0:00:01	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause	0:00:01	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 6	0:00:01	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause	0:00:08	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 7	0:00:01	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause	0:00:08	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 8	0:00:01	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V

Add Delime - Internal Control Board Process				
Add Delime Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Add Delimer			Add Delimer.	N/A
Door Open	0:00:09	Activate S1 by Opening Door (Door switch).	Open door to add - Delime chemical.	N/A

Add Delime - Internal Control Board Process				
Add Delime Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Wash	0:03:57	Activate CN5-2 turn on 1MTR (Wash Pump).	Turn on soft start and run till full speed.	240 sec
Drain 1	0:00:24	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause 1	0:00:05	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain 2	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause 2	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain 3	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause 3	0:00:05	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain 4	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause 4	0:00:05	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain 5	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V

Fill With Clean Water ONLY - Internal Control Board Process				
Clean Water ONLY Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Rinse pump 1	0:00:27	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Pause	0:00:01	Deactivate CN7D turn off 2MTR (Rinse pump).	Pause.	
Fill 1	0:01:25	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse pump 2	0:00:27	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Pause	0:00:01	Deactivate CN7D turn off 2MTR (Rinse pump).	Pause.	
Fill 2	0:01:28	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse pump 3	0:00:21	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Fill 3	0:01:22	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Rinse pump 4	0:00:21	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster by fill Sump Tank.	0.5V
Fill 4	0:01:22	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V

Fill With Clean Water ONLY - Internal Control Board Process				
Clean Water ONLY Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Wash	0:00:59	Activate CN5-2 turn on 1MTR (Wash Pump).	Turn on soft start and run till full speed.	60 sec
Pause	0:00:01	Deactivate CN5-2 turn off 1MTR (Wash pump).	Pause.	
Fill 5	0:01:22	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause	0:00:01	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 6	0:01:22	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause	0:00:01	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 7	0:01:22	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78V.	0.78V
Pause	0:00:01	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 8	0:01:22	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause	0:00:01	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 9	0:01:22	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause	0:00:01	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 10	0:01:22	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause	0:00:01	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 11	0:01:22	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Pause	0:00:01	Deactivate CN9-1 turn off 1VL (Fill valve).	Pause Check booster level.	
Fill 12	0:01:22	Activate CN9-1 turn on 1VL (Fill valve).	Fill Booster to 0.78 Volts.	0.78V
Drain 1	0:00:24	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause 1	0:00:05	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain 2	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause 2	0:00:05	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain 3	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Vots.	0.5V

Fill With Clean Water ONLY - Internal Control Board Process				
Clean Water ONLY Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Pause 3	0:00:05	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain 4	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause 4	0:00:05	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain 5	0:00:06	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Total Delime Time:	0:30:0	About 30 min depend on voltage for heating water.		

POWER DOWN or DRAIN (SUnH)

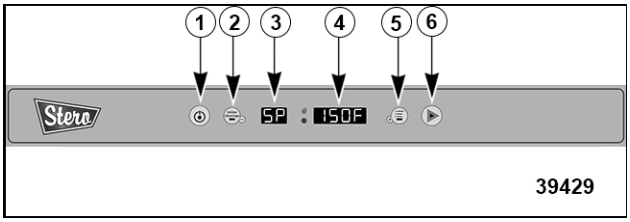


Fig. 146

NOTE: All times are based off of 240 volts. Times will vary slightly at 208 Volts.

Display Settings			
Display Buttons	**LED**	**Display**	**Status or Action**
Power (1, Fig. 146)	Flashes	Sd drAn	Press and hold Power button for 3 seconds.
Power (1,Fig. 146) **NOTE:** If pressed within 20 seconds of the previous Power button.	Flashes	AC drAn	Press and hold Power button for 3 seconds. (Quick shut down) **NOTE:** Only use for Service Diagnosis. When powered on, unit will drain for 25 seconds and fill wash tank.

Internal Control Board Process				
Drain Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Drain Pump 1: (110 sec max)	0:01:12	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Rinse 1:	0:00:28	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster down to 0.5 Volts.	0.5V

Internal Control Board Process				
Drain Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Drain Pump 2:	0:00:25	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause 1:	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain Pump 3:	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause 2:	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain Pump 4:	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause 3:	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause	
Drain Pump 5:	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause 4:	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain Pump 6:	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Machine Turn Off Display.				
Total Drain Time:	0:03:31			

POWER DOWN or DRAIN (SUnL)

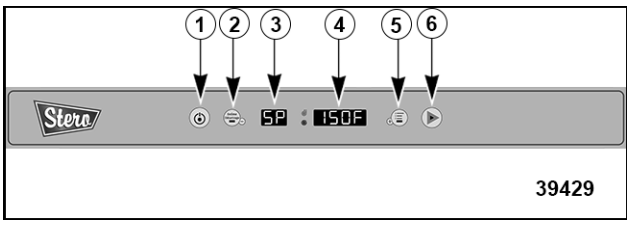


Fig. 147

Display Settings			
Display Buttons	**LED**	**Display**	**Status or Action**
Power (1, Fig. 147)	Flashes	drAin	Press and hold Power button for 3 seconds.
Power (1, Fig. 147) **NOTE:** If pressed within 20 seconds of the previous Power button.	Flashes	drAin	Press and hold Power button for 3 seconds. (Quick shut down) **NOTE:** Only use for Service Diagnosis. When powered on, unit will drain for 25 seconds and fill wash tank.

Internal Control Board Process				
Drain Sequence	**Time**	**Electrical Explanation Process**	**Process**	**Reading**
Drain Pump 1: (110 sec max)	0:01:12	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Rinse 1:	0:00:28	Activate CN7D turn on 2MTR (Rinse pump).	Drain Booster down to 0.5 Volts.	0.5V
Drain Pump 2:	0:00:25	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause 1:	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain Pump 3:	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause 2:	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain Pump 4:	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause 3:	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain Pump 5:	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Pause 4:	0:00:06	Deactivate CN9-6 turn off 3MTR (Drain pump).	Pause.	
Drain Pump 6:	0:00:05	Activate CN9-6 turn on 3MTR (Drain pump).	Drain Sump Tank down to 0.5 Volts.	0.5V
Machine Turn Off Display:				
Total Drain Time:	0:03:31			

8. DIAGRAMS

WIRING DIAGRAM (SUnH)

Stero - Undercounter - High Temp - 208-240V - 60Hz - 957183K - AI6038

WIRING DIAGRAM (SUnL)

Stero - Undercounter - Low Temp 120V - 60Hz - 1Ph - 975184E - AI6039

HYDRAULIC DIAGRAM (SUnH)

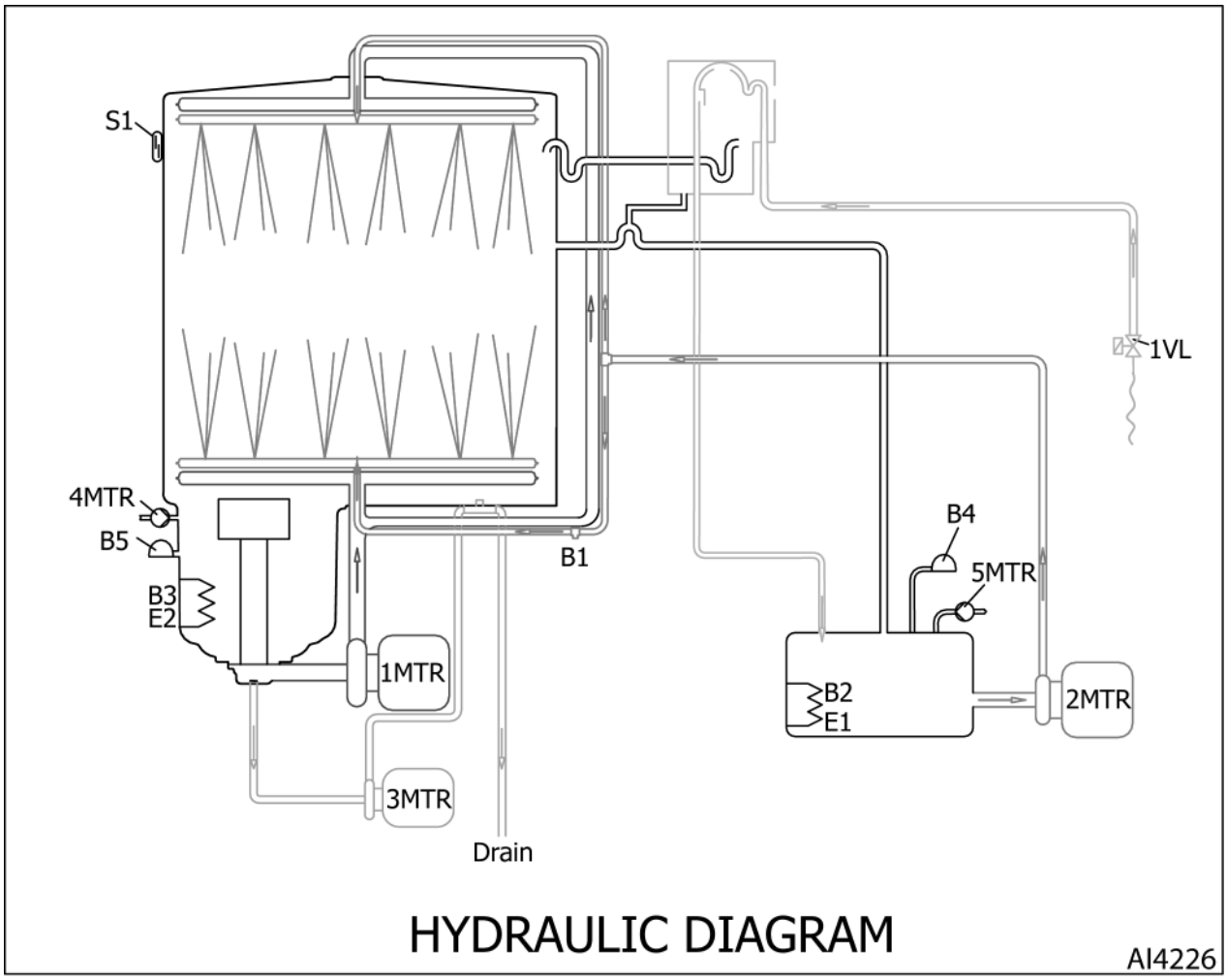


Fig. 148

CALLOUT	DESCRIPTION
1VL	Fill valve, 120VAC.

CALLOUT	DESCRIPTION
1MTR	Wash pump motor, 208-240VAC/60-1N US.
2MTR	Rinse pump motor, 150W, 230VAC/60-1N US.
3MTR	Drain pump motor, 120VAC/60-1N US.
4MTR	Detergent dosing pump motor.
5MTR	Rinse aid dosing pump motor.
B1	Rinse probe assembly, 100kOHM.
B2	Booster temperature probe, 10kOHM.
B3	Tank temperature probe, 10kOHM.
B4	Booster pressure sensor.
B5	Tank pressure sensor.
DRAIN	Drain.
E1	Booster heater, 6000W / 230VAC.
E2	Tank heater, 5500W / 240VAC.
S1	Door switch.

HYDRAULIC DIAGRAM (SUnL)

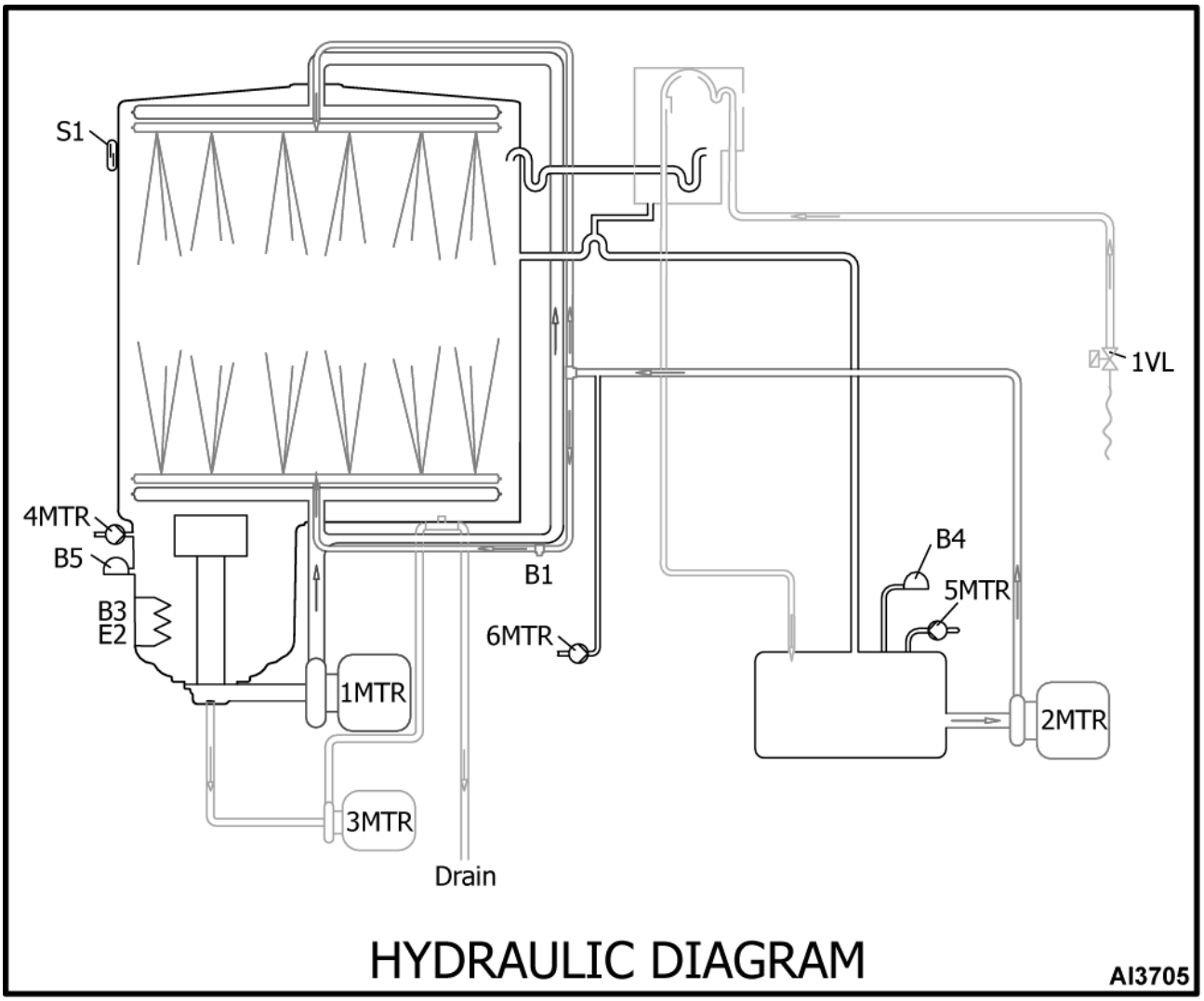


Fig. 149

CALLOUT	DESCRIPTION
1VL	Fill valve, 120VAC.
1MTR	Wash pump motor, 120VAC/60-1N US.
2MTR	Rinse pump motor, 120VAC/60-1N US.
3MTR	Drain pump motor, 120VAC/60-1N US.
4MTR	Detergent dosing pump motor.
5MTR	Rinse aid dosing pump motor.
6MTR	Sanitizer dosing pump motor.
B1	Rinse probe assy, 100kOHM.
B3	Tank temperature probe, 10kOHM.
B4	Holding tank pressure sensor.
B5	Tank pressure sensor.

CALLOUT	DESCRIPTION
DRAIN	Drain.
E2	Tank heater, 2000W / 120V.
S1	Door switch.

WATER FLOW DIAGRAM

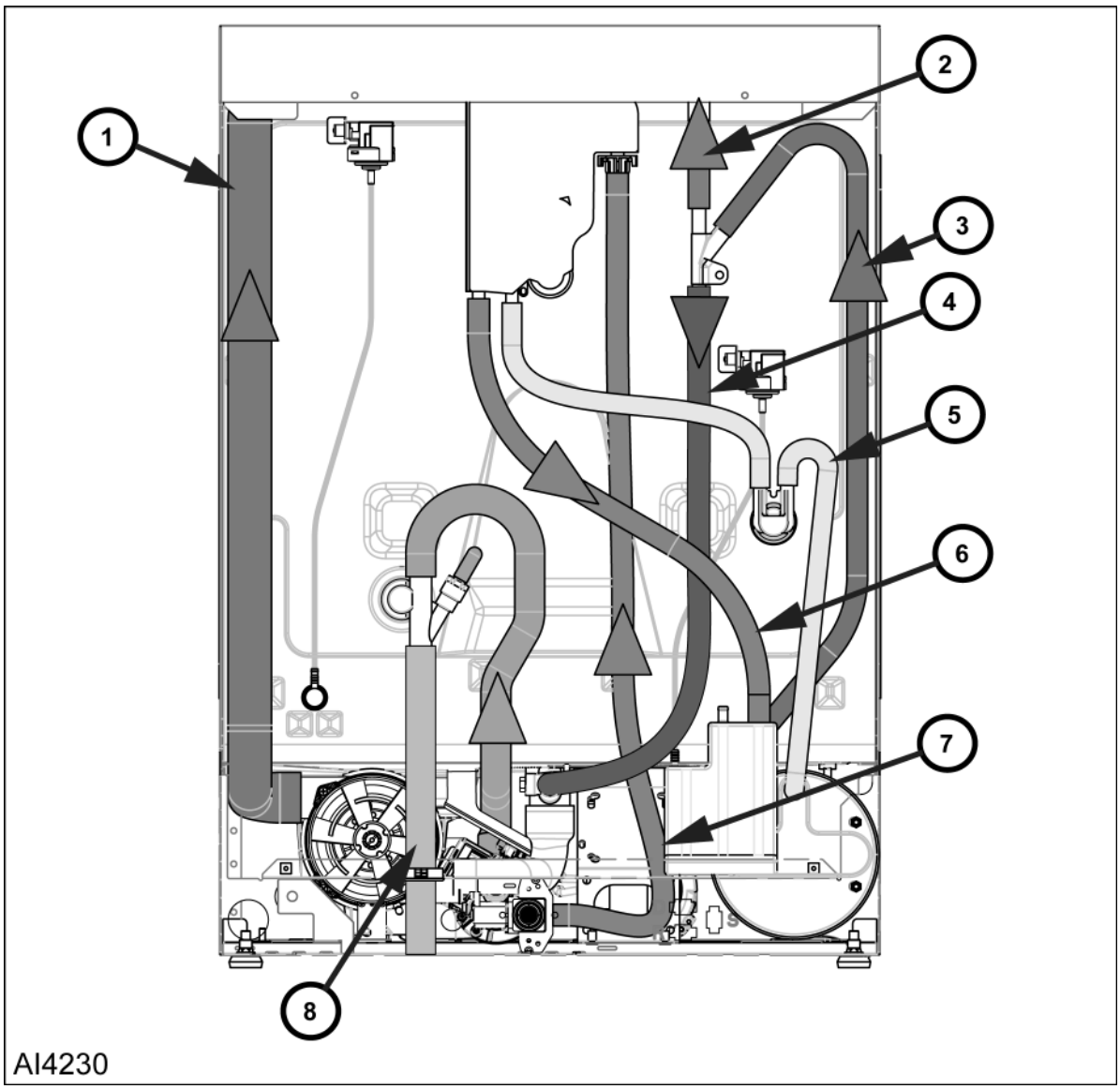


Fig. 150

NUMBER	DESCRIPTION
1	Upper wash hose.
2	Upper rinse hose.
3	From rinse pump.
4	Lower rinse hose.
5	Booster vent hose.

NUMBER	DESCRIPTION
6	Booster fill hose.
7	Fill hose.
8	Drain hose.

9. TROUBLESHOOTING

STERO ERROR CODES (Operator)

NOTE: ALWAYS update software to latest available version.

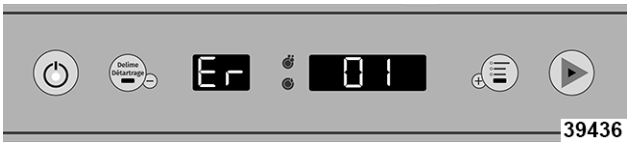


Fig. 151

ERROR CODE	REASON	REMEDY
01	Booster Temperature above upper limit	1. Press the power button to power off (Provide 20 min to cool off). 2. Restart as normal. 3. If error continues to display, possible high limit trip or heating element malfunction – contact Hobart Service.
02	Booster Temperature below lower limit	1. Press the power button to power off. 2. Restart as normal. 3. If error continues to display, possible high limit trip or heating element malfunction – contact Hobart Service.
03	Rinse Assurance Booster did not meet temperature or water level requirements	1. When booster does not reach temperature or water level set point, a long wash cycle of 10 to 20 minutes will trigger. 2. If error continues to display on next cycle, possible high limit trip or heating element malfunction – contact Hobart Service.
05	Wash Tank Temperature Temperature above upper limit	1. Press the power button to power off (Provide 20 min to cool off). 2. Restart as normal. 3. If error continues to display, possible high limit trip or heating element malfunction – contact Hobart Service.
06	Wash Tank Temperature Temperature below lower limit	1. Press the power button to power off. 2. Restart as normal. 3. If error continues to display, possible high limit trip or heating element malfunction – contact Hobart Service.

ERROR CODE	REASON	REMEDY
07	Booster Pressure Level Sensor Voltage above upper limit	1. Press the power button off then on to start the draining process. 2. Drain tank and refill (should reset the pressure level sensors). 3. If error continues to display – contact Hobart Service.
08	Booster Pressure Level Sensor Voltage below lower limit	
09	Wash Tank Pressure Level Sensor Voltage above upper limit	
10	Wash Tank Pressure Level Sensor Voltage below lower limit	
12	Drain Overflow Limit Wash tank water level exceeded limit	1. Verify drain hose is not pinched or kinked. 2. Verify pump strainer is not clogged. 3. If error continues to display, possible drain pump malfunction – contact Hobart Service.
13	Wash Tank Fill Time Exceeded	1. Cycle power button off and then on to continue filling. 2. Check wash and rinse arms for clogged nozzles. 3. If error continues to display – contact Hobart Service.
14	Drain Error – Shutdown Machine took too long to drain	1. Verify drain hose is not pinched, kinked or incorrect drain connection to building drain. 2. Check drain hose for any debris and drain again. 3. If error continue to display – contact Hobart Service.
18	Fill Error – Booster took too long to fill	1. Verify supply hose is not pinched or kinked. 2. Check that water is being supplied to machine. 3. Error will clear once water fills booster to setpoint within set time. 4. If error continues to display, possible fill valve malfunction – contact Hobart Service.
19	Chemical Deficiency Detergent / Rinse Aid / Sanitizer	1. Low or no chemicals. 2. Float level on bottle level sensor below working condition. 3. If no bottle level sensor present, jumpers are missing from chemical level sensor connectors.

ERROR CODE	REASON	REMEDY
door	Program Interrupted Fill, wash, or delime cycle	1. Machine is in fill, wash or delime cycle. 2. Verify door is closed. 3. If cycle running, then there is a display updating delay.
 **Fig. 152**		
22	Low Rinse Temperature	1. Rinse temperature below setpoint on 3 consecutive cycles. 2. Error will clear if rinse temperature meets or exceeds setpoint. 3. If error continues to display – contact Hobart Service.
24	USB Drive Not Detected	1. USB not properly configured or incorrect directory path. 2. Contact Hobart Service.
25	Communication Error	1. Internal communication error. 2. Contact Hobart Service.
FIL	Low Water Level at Start of Wash Cycle	1. Check if item(s) from previous wash cycle removed large amount of water from dishwasher. 2. Check orientation of ware to ensure water is not collected. 3. Will automatically correct after starting of the next cycle. 4. Wash tank will fill to proper level and heat to temperature and then wash cycle will resume.
30	Booster Heat Up Time Exceeded at Startup	1. Press the power button to power off and drain tank. 2. Restart as normal. 3. If error continue to display, unplug the machine from the wall. If unit is hardwired, turn circuit breaker off then back on. 4. If error continues to display, possible tripped high limit or heating element malfunction – contact Hobart Service.

ERROR CODE	REASON	REMEDY
31	Fill Error	1. System exceeded maximum fill time. 2. Press the power button to power off machine. 3. Verify supply hose is not pinched or kinked. 4. Check that water is being supplied to machine. 5. Restart as normal. 6. If error continues to display, possible fill valve malfunction – contact Hobart Service.
NOTE: SWITCHING DISHWASHER OFF AND THEN ON "RESETS" THE SIGNALS.		

ERROR CODES (Service)

ERROR CODES - SERVICE				
Error Code	**Symptom / Trigger for Errors**	**Restrictions - How to Manage**	**Possible Solution**	**Failure Location Service Troubleshoot**
1	Booster Above Temperature Upper Limit. Monitoring booster temperature above 112°C (203°F) or software temperature limit to 95°C (203°F) will trigger ER-1. **NOTE:** Next version software correct software temperature limit. **NOTE:** 1.12 version software correct software temperature limit to 112°C (235°F).	Press Power button = Off Display. Press On = If Error not resolve will show ER. Only option to clear = Cycle power.	1. Press the power button to power off (Wait 20 min to cool off). 2. Check for tripped high limit protector or software temperature limit trip. 3. Manually fill booster to cool. (See Manual Output Test). 4. Restart as normal. If error continues, check these items. 5. Check booster temperature setpoint not above 88°C (190.4°F). **NOTE:** Contact Tech support/ Engineering. Update software to version 1.12 and later. 6. Incorrect high limit protector temperature range.	1. Tripped Over temp. 2. Stuck Contactor. 3. Software limit. **ER-1 did not clear error when cycling power** 1. Check booster temp thru software check input/output #24 for booster temp (A2), refer to . 2. Check booster probe Ohms values and correlate temp readings to determine if probe needs replaced, refer to .
2	Booster Below Temperature Lower Limit. Monitoring booster temperature below 2°C (35°F) will trigger ER-2.	Press Power button = Off Display. Press On = If Error not resolve will show ER. Only option to clear = cycle power.	1. Press the power button to power off. 2. Restart as normal. 3. Possible tripped high limit protector or heating element malfunction. 4. Incorrect machine configuration. 5. Room temp during winter months, not heated.	1. Tripped Over Temp. 2. Heater malfunction. 3. Temperature probe.

ERROR CODES - SERVICE				
Error Code	**Symptom / Trigger for Errors**	**Restrictions - How to Manage**	**Possible Solution**	**Failure Location Service Troubleshoot**
3	Rinse Assurance. Monitor booster level and temperature. If temperature and level are not meet will trigger long wash cycle time for 6-10 min. After time limit will trigger ER-3.	No lockout.	1. Booster did not meet temperature or water level requirements. 2. If booster does not reach temperature or water level set point, a long wash cycle of 6-10 minutes will be trigger. 3. If error continues to display on next cycle, there could be a tripped high limit protector or heating element malfunction.	1. Tripped Over Temp. 2. Heater malfunction. 3. Inlet water temperature trigger probe.
5	Wash Tank Above Temperature Upper Limit. Monitoring wash temperature above 127°C (260°F) / 90°C (194°F) will trigger ER-5.	Press Power button = Off Display. Press On = if Error not resolve will show ER. Only option to clear = cycle power.	1. Press the power button to power off (Wait 20 min to cool off). 2. Tripped high limit protector, heating element malfunction. 3. Restart as normal.	1. Tripped Over temp. 2. Stuck Contactor. 3. Software temp limit. 4. Temperature sensor.
6	Wash Tank Below Temperature Lower Limit. Monitoring wash temperature below 2°C (35°F) will trigger ER-6.	No restrictions - Just a warning label.	1. Press the power button to power off. 2. Restart as normal. 3. Possible tripped high limit protector or heating element malfunction.	1. Tripped Over Temp. 2. Heater malfunction. 3. Side-switch malfunction. 4. Temperature sensor.

ERROR CODES - SERVICE				
Error Code	**Symptom / Trigger for Errors**	**Restrictions - How to Manage**	**Possible Solution**	**Failure Location Service Troubleshoot**
7	Booster Pressure Level Sensor Above Upper Limit. Monitoring booster pressure level above 3.5-4.5 v will trigger ER-7.	Press Power button = Off Display. Press On = if Error not resolve will show ER. Only option to clear = cycle power.	1. Press the power button = power off/ on and start fill process. 2. Drain tank and check pressure switch tube for any water in tube. 3. Any water on pressure switch will cause high pressure reading readout. 4. Loose wire connection = low pressure reading. 5. Check for clog in air traps. 6. Possible malfunction pressure switch	1. Clog in the line. 2. Water in the line. 3. Drain tanks to zero. 4. Wet pressure switch. 5. Pressure switch malfunction.
8	Booster Pressure Level Sensor Below Lower Limit. Monitoring booster pressure level below 0.3 v will trigger ER-8.	Press Power button = Off Display. Press On = if Error not resolve will show ER. Only option to clear = cycle power.	1. Press the power button = power off/ on and start fill process. 2. Drain tank and check pressure switch tube for any water in tube. 3. Any water on pressure switch will cause high pressure reading readout. 4. Loose wire connection = low pressure reading. 5. Check for clog in air traps. 6. Possible malfunction pressure switch	1. Clog in the line. 2. Water in the line. 3. Drain tanks to zero. 4. Wet pressure switch. 5. Pressure switch malfunction.

ERROR CODES - SERVICE				
Error Code	**Symptom / Trigger for Errors**	**Restrictions - How to Manage**	**Possible Solution**	**Failure Location Service Troubleshoot**
9	Wash Tank Pressure Level Sensor Above Upper Limit. Monitoring wash pressure level above 3.5-4.5v will trigger ER-9.	Press Power button = Off Display. Press On = if Error not resolve will show ER. Only option to clear = cycle power.	1. Press the power button = power off/ on and start fill process. 2. Drain tank and check pressure switch tube for any water in tube. 3. Any water on pressure switch will cause high pressure reading readout. 4. Loose wire connection = low pressure reading. 5. Check for clog in air traps. 6. Possible malfunction pressure switch	1. Clog in the line. 2. Water in the line. 3. Drain tanks to zero. 4. Wet pressure switch. 5. Pressure switch malfunction.
10	Wash Tank Pressure Level Sensor Below Lower Limit. Monitoring wash pressure level below 0.3 v will trigger ER-10.	Press Power button = Off Display. Press On = if Error not resolve will show ER. Only option to clear = cycle power.	1. Press the power button = power off/ on and start fill process. 2. Drain tank and check pressure switch tube for any water in tube. 3. Any water on pressure switch will cause high pressure reading readout. 4. Loose wire connection = low pressure reading. 5. Check for clog in air traps. 6. Possible malfunction pressure switch	1. Clog in the line. 2. Water in the line. 3. Drain tanks to zero. 4. Wet pressure switch. 5. Pressure switch malfunction.

ERROR CODES - SERVICE				
Error Code	**Symptom / Trigger for Errors**	**Restrictions - How to Manage**	**Possible Solution**	**Failure Location Service Troubleshoot**
12	Drain Overflow Limit. Tank water level over 1 volt will trigger error and cycle drain pump. If water level does not drop below 1 volt, unit will try for another 90 seconds before disable drain pump and display ER-12.	Safety Lockout.	1. Tank water level reaches maximum level. Drain pump attempting to drain. 2. Verify drain hose is not pinched, clogged, or kinked. 3. Drain pump running until water level is below setpoint or time limit and then power off. 4. Check Transformer for correct incoming voltage tap. Will cause pump to not drain normally. 5. Check for proper air gap at drain hose and building drain.	1. Kinked hose. 2. Incorrect voltage setting. 3. Drain pump. 4. Building drain.
13	Wash Tank Fill Time Exceeded. Checking water level to reach setpoint voltage when full per machine type. If not reached within 10x, checking will trigger will trigger ER-13 (about 5-6 min trigger from startup).	Press Power button = Off Display. Press On = if Error not resolve will show ER. Only option to clear = cycle power.	1. Cycle power button off, then on to continue filling. 2. Check wash and rinse arms for clogged nozzles. 3. Quick check remove arms and restart unit. If no errors are triggered, then arms are clogged. 4. If error continues to display, then cycle power off to drain tank.	1. Slow fill pressure or flow. 2. Clog Rinse port. 3. Rinse pump. 4. Fill vale. 5. Rinse pump not working or pumping slowly.

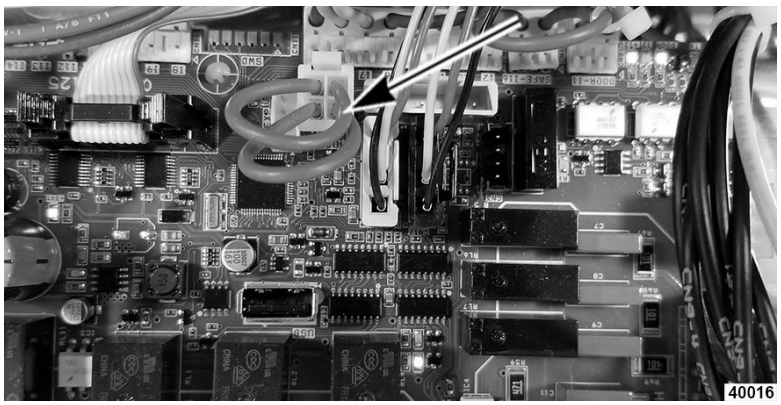
ERROR CODES - SERVICE				
Error Code	**Symptom / Trigger for Errors**	**Restrictions - How to Manage**	**Possible Solution**	**Failure Location Service Troubleshoot**
14	Drain Error – Shutdown (Took too long to drain). During the draining process will monitor tank level and want to see below 0.6 v or will trigger ER-14 (about 3-4 min trigger from start drain).	Press Power button = Off Display. Press On = if Error not resolve will show ER. Only option to clear = cycle power.	1. Verify drain hose is not pinched or correct drain connection. 2. Check drain hose for any debris and drain again. 3. Check Transformer for correct incoming voltage tap. This will cause pump to not drain normally.	1. Kinked hose. 2. Incorrect voltage setting on transformer. 3. Drain pump.
18	Fill Error – Booster (Booster taking too long to fill). Monitor booster fill and pressure switch for voltage change to setpoint after 90 sec (3 min) will trigger ER-18.	Press power Button = Drain.	1. Verify fill hose is not pinched or kinked. 2. Verify water is being supplied to machine. 3. Error will clear once water fills booster to setpoint. 4. Manually cycle fill vale (see Manual Output Test).	1. Inlet water malfunction. 2. Slow fill pressure or flow. 3. Fill vale. 4. Control board replacement due to missing key connector.
19	Chemical Deficiency Detergent / Rinse Aid / Sanitizer. ER-19 is trigger due to jumper pin is removed or chemical bottle float is out of fluids.	No lockout.	1. Low or no chemicals. 2. Float level on bottle level sensor below working condition. 3. If no bottle level sensor, jumper pins are missing from chemical level sensor connectors.	1. Low chemical level. 2. Float malfunction. 3. Missing jumper pin.
Do oR	Program Interrupted (fill, wash, or delime). Door switch or delay update to display board.	No lockout.	1. During machine is in fill, wash or delime cycle. 2. Verify door is closed. 3. If cycle running, then there is a display updating delay.	1. Door Switch. 2. Door out of adjustment. 3. Delay update to display.

ERROR CODES - SERVICE				
Error Code	**Symptom / Trigger for Errors**	**Restrictions - How to Manage**	**Possible Solution**	**Failure Location Service Troubleshoot**
22	Low Rinse Temperature. Temperature below 180°F after 3 rinse cycle will trigger ER-22.	No lockout.	1. Rinse temperature below setpoint on 3 consecutive cycles. 2. Error will clear if rinse temperature meets or exceeds setpoint. 3. Adjust Booster Temperature to increase final rinse temperature. 4. Tripped High limit protector. 5. Booster heater.	1. Inlet water temp. 2. Increase booster temp. 3. Tripped Over temp. 4. Heater malfunction.
24	USB Drive Not Detected	No lockout.	1. USB not properly configured or incorrect directory path.	N/A
25	Communication Error.	No lockout.	1. Internal communication error.	N/A
FIL	Low Water Level at Start of Wash Cycle. After pressing wash button, if water level drops below setpoint voltage, machine will fill up the tank and heat it until it reaches correct temperature. Then, it'll begin wash cycle. Display will show FIL in Rinse position.	Auto correct after press start wash cycle option Drain / Power off / Startup.	1. Item(s) from previous wash cycle removed large amount of water from dishwasher. 2. Automatically correct after press of Start button. 3. Wash tank will fill to proper level and heat to proper temperature then wash cycle will resume.	After wash cycle remove large amount of water in the tank.

ERROR CODES - SERVICE				
Error Code	**Symptom / Trigger for Errors**	**Restrictions - How to Manage**	**Possible Solution**	**Failure Location Service Troubleshoot**
30	Booster Heat Up Time Exceeded at Startup. Monitor Booster or Wash Tank temperature to reach setpoint within 20 min or will trigger ER-30.	Press Power Button = Drain.	1. Press the power button to power off and drain tank. 2. Restart as normal. 3. Tripped High Limit or heating element malfunction. 4. Verify incoming water supply is at the minimum required temperature. 5. If error continues to display, unplug the machine from the wall. 6. If unit is hardwired, turn off circuit breaker, then back on. Clear the error on display.	1. Tripped Over Temp. 2. Software temp limit. 3. Heater malfunction. 4. Inlet water temperature.
31	Fill Error. Monitor fill valve till booster full within 240 sec (4 min) or will trigger ER-31.	Press power button = Display off Press on will start fill process then back to ER after 240 sec.	1. System time out during fill, wash cycle, and delime. 2. Press the power button to power off machine. 3. Verify fill hose is not pinched or kinked. 4. Check that water is being supplied to machine. 5. Manually cycle fill vale (see Manual Output Test). 6. Restart as normal. 7. If error continues to display, possible fill valve malfunction.	1. Inlet water malfunction. 2. Slow fill pressure or flow. 3. Fill valve.

TROUBLESHOOTING MACHINE

Symptom	Possible Causes
No machine operation (no display).	1. Machine OFF. 2. Circuit breaker off at power supply. 3. Cord not plugged in. 4. Incorrect power input - 2 wire cable (No Neutral terminal for 208-240 volts) (SUnH). 5. Incorrect power input - 120 Volts with Neutral terminal (SUnL). 6. Loose connections on control and power supply board harnesses CN18 or CN9-8. 7. Control board fuse 2FU open. 8. Control fuse 1FU open. 9. Transformer (1T) malfunction. 10. Keypad malfunction - loose connection at Display ribbon on control board. 11. Keypad malfunction - loose connection at Display board connection. 12. Keypad malfunction - board wet. Do **NOT** operate and let dry. 13. Power supply board malfunction. 14. Missing jumper on control board: CN10; CN22. 15. Control Board malfunction.

Symptom	Possible Causes
Control Board	**Working Control Board** 1. Power off/on display board. 2. Control board LEDs active include: A. +12 B. Door C. +3V3 D. RL4 flashing **Non-Working Control Board** 1. Missing jumper on control board: CN10; CN22. 2. Power off/on display board. 3. Control board LEDs active include: A. +3V3 LED **NOT** on. B. RL4 LED **NOT** flashing. **No LEDs on Control Board** 1. Check 2FU (Control Board Fuse). 2. Check 1FU (Main Fuse). 3. Check for loose wires at 1TB to contactor or transformer.  40016 **Fig. 153**
No machine operation (with display).	1. Error message displayed. Correct error. 2. Keypad inoperative. 3. Keypad malfunction - board wet. Do **NOT** operate and let dry. 4. Turn circuit breaker off and back on. 5. Incorrect input voltage at 1TB. 6. See MACHINE WILL NOT FILL OR NOT FILL HIGH ENOUGH. 7. Missing jumper on control board: CN10; CN22.

Symptom	Possible Causes
Low temperature readings.	1. Low water supply temperature. 2. Rapid cycle use. 3. Heavy ware load cools wash water. 4. Incorrect line voltage or transformer (1T) incorrect voltage setting. 5. Loose connections on control / no power supply board harnesses. 6. Booster heater or sump heater set low – See PROGRAMMING MENU (DISPLAY). 7. Tripped temperature probes / high limit open or shorted. 8. Lime scale buildup on heater. 9. Component malfunction. A. Heater (Wash Tank or Booster), refer to OUTPUT TEST: ON/OFF FOR HEATER PUMPS & VALVES (Displays 33). B. K1 (booster contactor) malfunction. C. K2 (tank heater contactor) malfunction. 10. High limits open. 11. Control board malfunction.
Booster not heating. (Hot machines SUnH)	1. Tripped high limit 4TAS or 3TAS open. 2. Incorrect machine type program setting, refer to MACHINE CONFIGURATION SELECTION (Displays 23). 3. K1 booster contactor malfunction, refer to OUTPUT TEST: ON/OFF FOR HEATER PUMPS & VALVES (Displays 33). 4. 2TB neutral jumper missing or not properly seated. 5. Incorrect line voltage. 6. Water level in Booster. 7. B4 pressure sensor malfunction including pressure sensor tubing and water trap. 8. Booster heater inoperative; displaying booster level sensor error or fill error. 9. Temperature probe B2 open or shorted, refer to OUTPUT TEST (TEMP / PRESSURE SWITCH) (Displays 32). 10. Loose connections on control / no power supply board harnesses. 11. Control board malfunction.

Symptom	Possible Causes
Sump not heating.	1. Tripped high limit 1TAS or 2TAS open. 2. Incorrect machine type program setting, refer to MACHINE CONFIGURATION SELECTION (Displays 23). 3. K1 booster contactor malfunction, refer to OUTPUT TEST: ON/OFF FOR HEATER PUMPS & VALVES (Displays 33). 4. 2TB neutral jumper missing or not properly seated. 5. Incorrect line voltage. 6. Water level in Booster. A. B5 tank pressure sensor malfunction including pressure sensor, refer to OUTPUT TEST (TEMP / PRESSURE SWITCH) (Displays 32) B. Water in tubing or clogged pressure sensor air trap. C. Sump heater displaying sump level sensor error or fill error. 7. Temperature probe B2 open or shorted, refer to OUTPUT TEST (TEMP / PRESSURE SWITCH) (Displays 32). 8. Loose connections on control / no power supply board harnesses. 9. Control board malfunction.
Wash motor won't start.	1. Door open or door switch S1 malfunction, refer to INPUT TEST (Displays 31). 2. B5 tank pressure sensor malfunction, refer to OUTPUT TEST (TEMP / PRESSURE SWITCH) (Displays 32) 3. Wash pump motor 1MTR inoperative, refer to OUTPUT TEST: ON/OFF FOR HEATER PUMPS & VALVES (Displays 33). 4. Wash pump capacitor failure. 5. Loose wiring on control board wash motor terminals. 6. Control board malfunction.

Symptom	Possible Causes
Machine will not fill sump or will not fill high enough.	1. Fill valve 1VL malfunction or incoming water supply issue, refer to OUTPUT TEST: ON/OFF FOR HEATER PUMPS & VALVES (Displays 33). 2. Incoming water supply issue. 3. Set to incorrect voltage (SUnH Only). 4. Transformer 1T wired incorrectly. 5. Rinse pump motor (2MTR), refer to OUTPUT TEST: ON/OFF FOR HEATER PUMPS & VALVES (Displays 33). 6. Wash pump capacitor failure. 7. Loose wiring on control board rinse motor terminals. 8. Door Switch S1 inoperative, refer to INPUT TEST (Displays 31). 9. Control board malfunction. 10. Pressure sensor connection incorrect or 1PRS and 2PRS are wired backwards, refer to OUTPUT TEST (TEMP / PRESSURE SWITCH) (Displays 32). 11. Incorrect or B4 (booster pressure sensor) and B5 (sump water level sensor) are wired backwards or malfunction. 12. Rinse pump motor capacitor failure. 13. Clogged strainers in sump and sump pressure switch air trap. Verify no water in tube and all connections tight, and no debris in sump air trap. 14. Rinse Motor/Pump 2MTR inoperative.

Symptom	Possible Causes
Machine fills too high or high water level after wash cycle.	1. Pressure sensor connection incorrect or 1PRS and 2PRS are wired backwards, refer to OUTPUT TEST (TEMP / PRESSURE SWITCH) (Displays 32). 2. Sump Water Level Sensor B5 malfunction including pressure sensor tubing and water trap. 3. Booster/Holding Tank Water Level Sensor B4 malfunction including hose and water trap. 4. Clogged strainers in sump and sump pressure sensor tubing and water trap. 5. Verify no water in tube and all connections tight, and no debris in sump air trap. 6. Fill valve 1VL malfunction or incoming water supply issue, refer to OUTPUT TEST: ON/OFF FOR HEATER PUMPS & VALVES (Displays 33). 7. DRAIN PUMP malfunction or unit not leveled properly, refer to OUTPUT TEST: ON/OFF FOR HEATER PUMPS & VALVES (Displays 33). 8. Incorrect transformer voltage connection (SUnH). 9. Drain hose clogged or kinked. 10. Loose wiring on control board drain motor terminals. 11. Control Board malfunction. 12. Improper discharge draining of water on power down due to problems with drain water tempering (if applicable). Disconnect DWT and retest cycle.
Machine won't stop when door is opened.	1. Door switch S1 inoperative, refer to INPUT TEST (Displays 31). 2. Loose wiring on control board wash motor terminals. 3. Control board malfunction.
Machine leaks from door.	1. Machine not level. 2. Machine operated without a rack. 3. Improper adjustment of soft start. 4. Door seal damaged. 5. Door not adjusted correctly, refer to DOOR ADJUSTMENT. 6. DRAIN PUMP malfunction, refer to OUTPUT TEST: ON/OFF FOR HEATER PUMPS & VALVES (Displays 33). 7. Sump Water Level Sensor B5 malfunction, refer to OUTPUT TEST (TEMP / PRESSURE SWITCH) (Displays 32). 8. Fill valve stuck open. 9. Loose wiring on control board wash motor terminals. 10. Control board malfunction.

Symptom	Possible Causes
Door not staying closed during wash.	1. Soft start not operational COMPONENT FUNCTION or needs adjusted. 2. Door rods or spring malfunction. 3. Other door components malfunction. 4. Door not adjusted correctly, refer to DOOR ADJUSTMENT.
Machine will not drain.	1. Air pocket after install. Run a drain cycle or a wash cycle to remove air pocket. 2. Drain hoses restricted or kinked. 3. Incorrect input voltage at transformer (1T) (SUnH Only). 4. Check level of unit and floor. 5. Dishwasher needs power cycled. 6. DRAIN PUMP malfunction, refer to OUTPUT TEST: ON/OFF FOR HEATER PUMPS & VALVES (Displays 33). 7. Loose wiring on control board drain motor terminals. 8. Control board malfunction. 9. Anti siphon valve malfunction. 10. Drain water tempering malfunction. Water left in tank. 11. Sump water level sensor B5 malfunction including pressure sensor tubing and water trap, shutting down machine prematurely. Verify all connections are tight and no standing water in pressure tubing, refer to OUTPUT TEST (TEMP / PRESSURE SWITCH) (Displays 32).
Some water occasionally drips out of rinse arms.	1. After filling and rinse cycle is normal.
Booster or holding tank takes too long to fill or won't fill.	1. Fill valve (1VL) malfunction, refer to OUTPUT TEST: ON/OFF FOR HEATER PUMPS & VALVES (Displays 33). 2. Low water pressure or no incoming water flow. 3. Clogged hose strainer. A. Visual inspection of the booster air trap hose. B. Verify hose has not been pulled off or standing water visible in tube. 4. Water level sensor B4 (Booster) or B5 (Wash) malfunction including hose and air trap, refer to OUTPUT TEST (TEMP / PRESSURE SWITCH) (Displays 32). A. Verify there is no water in air hose and air hose is tightly secured. B. Incorrect or B4 (Booster) and B5 (Wash) wired backwards or malfunction. 5. Air trap or booster vent clogged; could result in intermittent booster level sensor error or fill error. 6. Control board malfunction. 7. Missing jumper on control board.

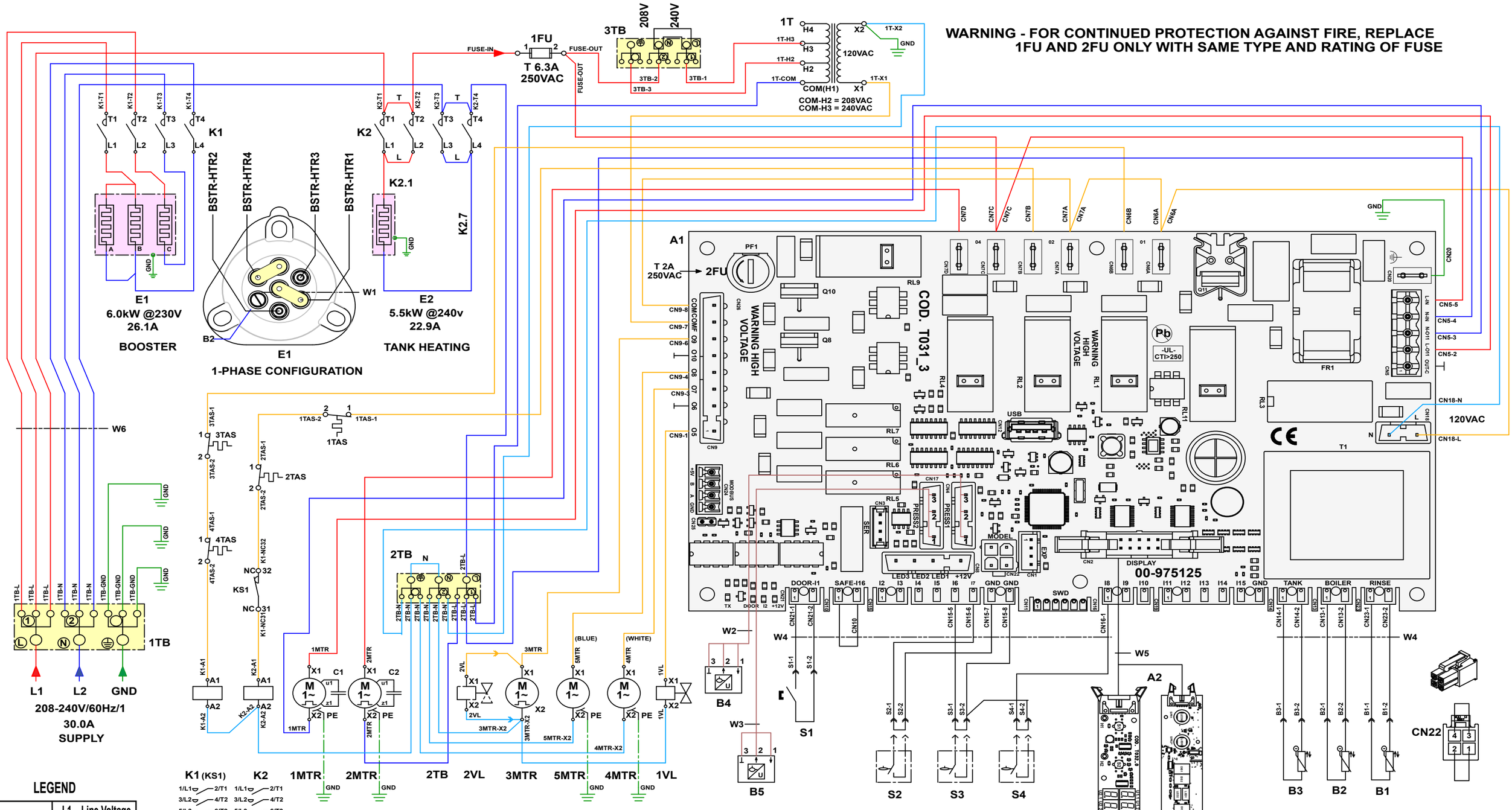
Symptom	Possible Causes
Chemicals not feeding	1. Low chemical supply or tubing not positioned in bottle correctly. 2. Pumps not primed. 3. Air in lines. 4. Lines kinked. 5. Control board not programmed correctly. 6. Chemical Sensors clogged or malfunctioning. 7. Pinched tubing or lines kinked. 8. Worn chemical pump tubing. 9. Clogging of injection fittings at booster or chemical vent adaptor. 10. Control board malfunction.
Noisy Wash Arm	1. Loose upper wash arm, lower wash arm, or both. 2. Verify wash arm hub or rinse shaft threads are not worn. 3. Verify wash arm sealing ring is not worn. 4. Verify wash arm is not cracked or damaged. 5. Verify rinse shafts are tight.
Upper and Lower wash arm falls off	1. Loose upper wash arm, lower wash arm, or both. 2. Verify nothing is blocking installation of wash arms 3. Verify wash arm hub or rinse shaft threads are not worn. 4. Verify wash arm and hub is not cracked or damaged. 5. Verify rinse shafts are tight and not stripped.

TROUBLESHOOTING DISHWARE

Fault Type	Possible Cause	Remedy
Ware not clean	Wash arm hard to turn (must rotate easily by hand).	Remove wash arms and clean them thoroughly. Also check that water manifold from machine to wash arm is clear. Delime machine.
	Wash arm nozzles are clogged (visual check).	Remove wash arm and rinse wash arm. Thoroughly clean both arms until all soil is removed.
	Rinse nozzles clogged (usually by lime deposit).	Remove rinse arms and delime them in separate container. Check building softening system for function. Delime machine if needed.
	Detergent concentration is too low or too high.	Check detergent concentration setting (See operating instructions).

Fault Type	Possible Cause	Remedy
	Tank strainers clogged.	Remove right, left and center strainer pans, empty and clean strainers.
	Pump strainer clogged.	Remove, empty and clean strainer.
	Wrong program selected for heavily soiled wash ware.	Extend the wash program for longer wash cycle.
Ware or glasses dry poorly.	Rinse aid concentration too low.	Increase concentration (see operating instructions).
	Wash ware still greasy.	Detergent concentration too low: increase (see operation instructions). Check if detergent is appropriate. If not, choose a stronger one. Drain contaminated water and refill machine. Ensure better pre-scrapping of the wash ware.
	Wash ware remains in the machine too long at the end of wash cycle.	Remove wash ware as soon as cycle is completed to enable it to dry.
Streaks and spots on ware or glasses.	Rinse aid concentration too high (stripe or bubble formation).	Reduce concentration (see operating instructions).
	Hard water or high mineral content.	Check water quality.
	Inadequate rinse aid dispensing causes stains.	Increase rinse aid concentration (see operating instructions).
Glasses are totally or partially cloudy.	Surface of glasses is rough and porous, this is called glass corrosion.	Use new glasses, this is not caused by a malfunction on the machine.
Glass/dish breakage.	Use of unsuitable dish or glass racks.	Use suitable racks.

WARNING - FOR CONTINUED PROTECTION AGAINST FIRE, REPLACE 1FU AND 2FU ONLY WITH SAME TYPE AND RATING OF FUSE



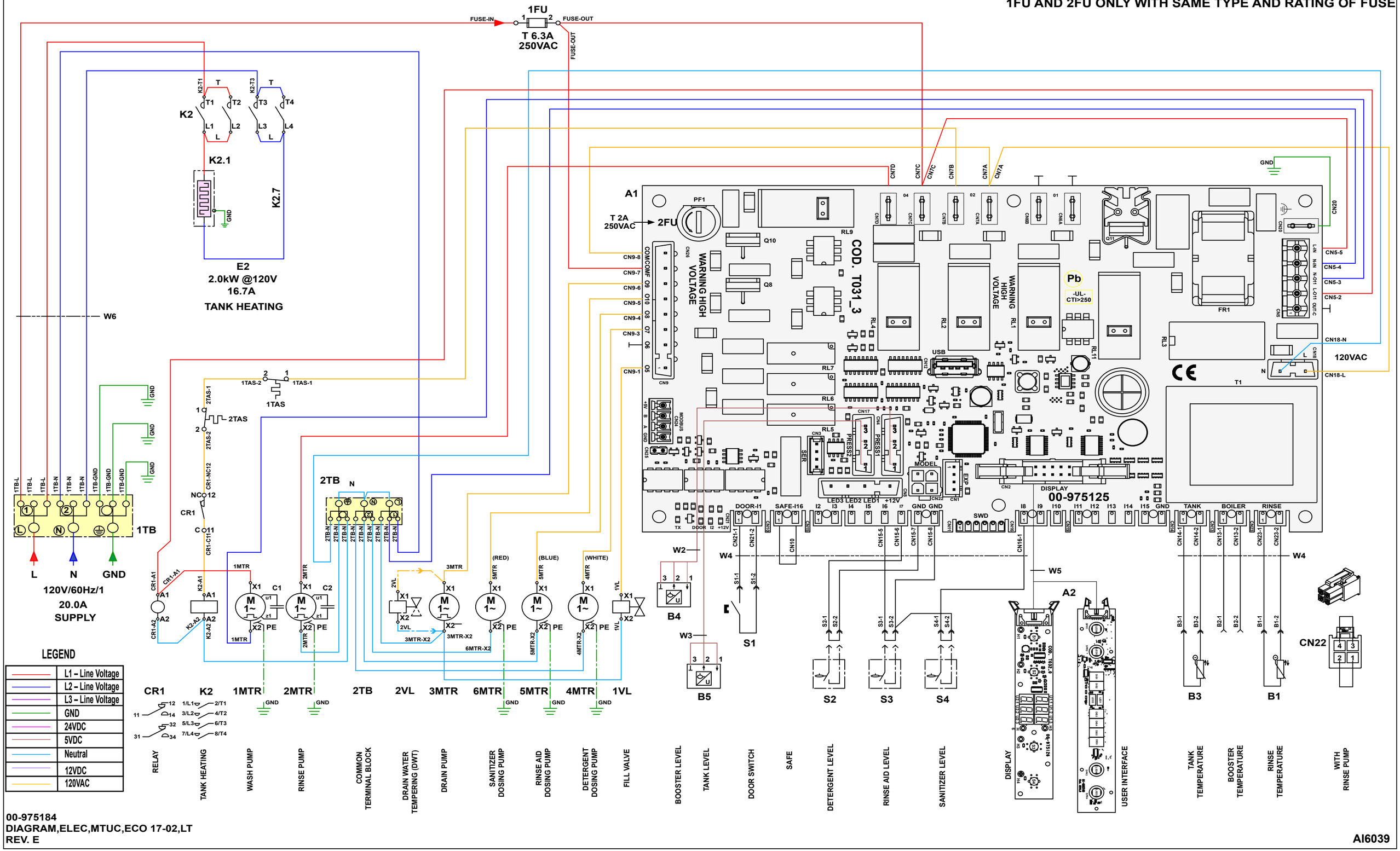
LEGEND

	L1 – Line Voltage
	L2 – Line Voltage
	L3 – Line Voltage
	GND
	24VDC
	5VDC
	Neutral
	12VDC
	120VAC

00-975183
DIAGRAM,ELEC,MTUC,ECO 17-02,HT
REV. K

A16038

WARNING - FOR CONTINUED PROTECTION AGAINST FIRE, REPLACE 1FU AND 2FU ONLY WITH SAME TYPE AND RATING OF FUSE



00-975184
DIAGRAM,ELEC,MTUC,ECO 17-02,LT
REV. E

AI6039