

Warewashing Systems

# INSTALLATION, OPERATION, AND SERVICE MANUAL





**DISHSTAR® SERIES UNDERCOUNTER DISHMACHINES** 

DishStar<sup>®</sup> HT-E Manual • 07610-004-43-79-G

#### MANUFACTURER'S LIMITED WARRANTY (APPLICABLE ONLY IN THE UNITED STATES AND CANADA)

#### WARRANTY REGISTRATION:

To register your Jackson Dishmachine's warranty go to www.jacksonwws-warranty.com or call 1-888-800-5672. Failure to register the Dishmachine will void the warranty.

#### **ONE YEAR LIMITED PARTS AND LABOR WARRANTY**

For a period of one (1) year from date of original installation of a new Jackson Dishmachine (but in no event to exceed eighteen (18) months from date of shipment from Jackson's factory), Jackson WWS, Inc. (Jackson) will repair or replace, at its discretion, any original part that proves defective in materials or workmanship at the time the Dishmachine was purchased; provided that (i) the Dishmachine has not been altered, (ii) the Dishmachine has been properly installed, maintained, and operated under normal use conditions and in accordance with the applicable installation, operation and service manual available on the Jackson website, and (iii) a warranty claim is reported to a Jackson Authorized Service Agency within the warranty period. This warranty includes replacement with Jackson specified genuine replacement parts, purchased directly from a Jackson Authorized Parts Distributor or Service Agency. Use of generic replacement parts may create a hazard and shall void this warranty.

#### THIS WARRANTY DOES NOT APPLY OUTSIDE THE UNITED STATES AND CANADA.

Jackson will pay the labor to repair or replace a defective original part as a part of the warranty, provided that a Jackson Authorized Service Agency performs the labor. Any repair or replacement work by anyone other than a Jackson Authorized Service Agency is the sole responsibility of the purchaser. Labor coverage is limited to regular hourly rates; Jackson will not pay overtime premiums or emergency service charges.

Accessory components (such as table limit switches, pressure regulators, and drain water tempering kits) that are not installed by Jackson at the factory and are shipped with the Dishmachine carry only a (1) one year parts warranty. Labor to repair or replace these components is not included in the warranty or covered by Jackson. Booster heaters not manufactured by Jackson are not covered by this warranty, but are warranted by their respective manufacturers.

This warranty is void if any defect or failure is a direct result from shipping, handling, fire, water, accident, alteration, modification, misuse, abuse, flood, acts of God, burglary, casualty, attempted repair by unauthorized persons, use of replacement parts not authorized by Jackson, improper installation, installation not in accordance with local electrical and plumbing codes, if the serial number has been removed or altered, if the Dishmachine is used for any purpose other than originally intended, or if the equipment is installed for residential use.

Jackson does not authorize any other entity or person, including, without limitation, any entity or person who deals in Jackson's Dishmachines, to change this warranty or create any other obligation in connection with Jackson's Dishmachines.

#### **TRAVEL LIMITATIONS:**

Jackson limits warranty travel time to the customer site within 50 miles of the Jackson authorized service agents office and during regular business hours. Jackson will not pay for travel time and mileage that exceeds these limits, or any fees such as those for air or boat travel without prior authorization.

#### **REPLACEMENT PARTS WARRANTY:**

For a period of (90) ninety days from the date of installation by a Jackson Authorized Service Agency (but in no event to exceed (180) one-hundred-eighty days from the date of purchase from a Jackson Authorized Parts Distributor or Service Agency), Jackson will repair or replace, at its discretion, any Jackson genuine replacement parts that prove defective in materials or workmanship at the time the replacement parts were installed. This warranty does not include paying the labor to repair or replace the replacement part. This warranty is subject to all conditions, exclusions and limitations applicable to the Dishmachine.

#### MANUFACTURER'S LIMITED WARRANTY (CONT.) (APPLICABLE ONLY IN THE UNITED STATES AND CANADA)

#### **PRODUCT CHANGES:**

Jackson reserves the right to make changes in design and specification of any component of the Dishmachine as engineering or necessity requires.

#### **DISCLAIMER OF WARRANTIES:**

THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, THAT ARE NOT SET FORTH HEREIN, OR THAT EXTEND BEYOND THE DURATION HEREOF.

#### LIMITATION OF REMEDIES AND LIABILITIES:

YOUR SOLE AND EXCLUSIVE REMEDY UNDER THIS LIMITED WARRANTY SHALL BE PRODUCT REPAIR OR REPLACEMENT AS PROVIDED HEREIN.

UNDER NO CIRCUMSTANCES WILL JACKSON BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, OR FOR DAMAGES IN THE NATURE OF PENALTIES. JACKSON'S LIABILITY ON ANY CLAIM OF ANY KIND WITH RESPECT TO THE GOODS OR SERVICES COVERED HEREUNDER SHALL IN NO CASE EXCEED THE PRICE OF THE GOODS OR SERVICES OR PART THEREOF WHICH GIVES RISE TO THE CLAIM.

#### **ITEMS NOT COVERED:**

THIS WARRANTY DOES NOT COVER (1) ADJUSTMENTS INCLUDING, BUT NOT LIMITED TO, TIMER CAMS, THERMOSTATS, DOORS, TANK HEATER ADJUSTMENTS OR CLUTCHES; (2) AIR FREIGHT OR OVERNIGHT FREIGHT; (3) ANY AMOUNT EXCEEDING ORIGINAL PURCHASE PRICE; (4) CLEANING OF DRAIN VALVES, GAS LINES, RINSE/WASH NOZZLES, STRAINERS, SCREENS, OR SPRAY PIPES; (5) CLEANING OR DELIMING OF THE DISHMACHINE OR ANY COMPONENT INCLUDING, BUT NOT LIMITED TO, WASH ARMS, RINSE ARMS AND STRAINERS; (6) CONDITIONS CAUSED BY THE USE OF INCORRECT (NON-COMMERCIAL) GRADE DETERGENTS; (7) CORROSION FROM CHEMICALS DISPENSED IN EXCESS OF RECOMMENDED CONCENTRATIONS; (8) COSMETIC DAMAGE, INCLUDING BUT NOT LIMITED TO, SCRATCHES, DENTS, CHIPS, AND OTHER DAMAGE TO THE DISHMACHINE FINISHES, UNLESS SUCH DAMAGE RESULTS FROM DEFECTS IN MATERIALS AND WORKMANSHIP AND IS REPORTED TO JACKSON WITHIN (30) THIRTY DAYS FROM THE DATE OF INSTALLATION; (9) DAMAGE CAUSED BY LABOR DISPUTE; (10) DAMAGES RESULTING FROM IMPROPER CONNECTION TO UTILITY SERVICE; (11) DAMAGES RESULTING FROM WATER CONDITIONS, INADEQUATE OR EXCESSIVE WATER PRESSURE, ACCIDENTS, ALTERATIONS, IMPROPER USE, ABUSE, HANDLING, OVERLOADS, TAMPERING, IMPROPER INSTALLATION OR FAILURE TO FOLLOW MAINTENANCE AND OPERATING PROCEDURES; (12) DISCOLORATION, RUST OR OXIDATION OF SURFACES RESULTING FROM CAUSTIC OR CORROSIVE ENVIRONMENTS, INCLUDING, BUT NOT LIMITED TO, HIGH SALT CONCENTRATIONS, HIGH MOISTURE OR HUMIDITY, OR EXPOSURE TO CHEMICALS; (13) ELECTRIC BOOSTERS, FEED LINES, FLEX HOSE, FUSES, GARBAGE DISPOSALS, OR GAS PILOTS; (14) EXCESSIVE LIME, MINERAL, OR ALKALINE BUILDUP; (15) EXPENSES DUE TO DISCONNECTION, DELIVERY, RETURN AND REINSTALLATION; (16) FAILURE OF ELECTRICAL COMPONENTS DUE TO CONNECTION OF CHEMICAL DISPENSING EQUIPMENT INSTALLED BY OTHERS; (17) FAILURE OF FACILITY WATER HEATER TO MAKE TEMPERATURE; (18) FAILURE TO MAINTAIN WATER HARDNESS BETWEEN .25 AND 2.0 GRAINS, PH BETWEEN 7.0 AND 8.5 AND TOTAL DISSOLVED SOLIDS BELOW 250 PPM; (19) FAILURE TO COMPLY WITH LOCAL ELECTRICAL BUILDING CODES; (20) LEAKS OR DAMAGE RESULTING FROM SUCH LEAKS CAUSED BY THE INSTALLER, INCLUDING THOSE AT MACHINE TABLE CONNECTIONS, OR BY CONNECTION OF CHEMICAL DISPENSING EQUIPMENT INSTALLED BY OTHERS; (21) OPENING OR CLOSING OF UTILITY SUPPLY VALVES OR SWITCHING OF ELECTRICAL SUPPLY CURRENT; (22) PERFORMANCE OF REGULAR MAINTENANCE AND CLEANING AS OUTLINED IN THE OPERATOR'S GUIDE; (23) REMOVAL OR REINSTALLATION OF INACCESSIBLE DISHMACHINES OR BUILT-IN FIXTURES THAT INTERFERE WITH SERVICING, REMOVAL OR REPLACEMENT OF THE DISHMACHINE; (24) REPLACEMENT WEAR ITEMS INCLUDING, BUT NOT LIMITED TO, CURTAINS, DRAIN BALLS, DOOR GUIDES, GASKETS, O-RINGS, SEALS, SQUEEZE TUBES, AND BEARINGS; (25) RESIDENTIAL USE; (26) USE WITH UTILITY SERVICE OTHER THAN THAT DESIGNATED ON THE RATING PLATE.

### **REVISION HISTORY**

Revision Letter	Revision Date	Made by	Applicable ECNs	Details
А	4-11-17	JH	N/A	Initial release of the manual.
В	4-27-17	JH	N/A	Corrected pg. 2. Updated pg. 4 due to heaters not running simultaneously. Added description of the three cycles to the Operation section. Replaced item #14 on pg. 27 with new P/N. Added 1/4" brass plug to the rinse tank. Changed rinse heater P/N to 04540-004-45-12 on pg. 39. Added wash heater, thermostat, probe, and fitting to pg. 44. Updated the schematic to revision B.
С	6-4-17	JH	8523	Added the 460 V machine to the manual.
D	9-5-17	JH	8532	Updated depiction of the air-gap on pg. 6. Removed references to "screen" on pg. 20. Added communication cable (05700-004-33-64) to pg. 24. Corrected chemical tubes on pg. 28 and added tube length and color. Removed fill line (05700-002-62-37) from wash hub on pg. 33. Replaced 7/8" discharge hose with 5/8" discharge hose (05700-004-46-28) on pg. 33. Updated view of inlet plumbing on pg. 37 to show angle of elbow and adapter.
E	1-15-18	JH	8537 8574	Added the HT-E-SEER to the manual. Updated the Door Assembly pages. Added item #10 on pg. 48. Corrected P/N for item #10 on pg. 52.
F	2-5-19	JH	8585 8599 8619 8648	Added PRV to view on pg. 3. Added note about hot water heaters to pg. 7. Added motor rotation section to pg. 9. Added programming instructions and fault codes to pgs. 22–26. Updated P/N for item #2 on pg. 29. Updated pg. 31 to show panel and membrane together. Added item #14 on pg. 33. Updated item #11 on pg. 40. Added Door Interlock to pg. 41. Changed rinse arm bearing assembly on pg. 44. Changed rinse arm bearing kit P/N on pg. 44. Updated SEER plumbing, pgs. 48–49. Added note about water connection point to pg. 48. Updated pgs. 54–55. Added back panel and gaskets to pg. 56. Added new drain water tempering kit and 460 V drain water tempering kit to pg. 57. Updated schematics on pgs. 58–59.
G	4-24-19	JH	QOF 19-553	Updated 208-230 V schematic.



# Warewashing Systems

### **DishStar® HT-E**

Undercounter dishmachine; high-temperature, hot-water sanitizing, with a booster tank and detergent and rinse-aid chemical feeder pumps.

### DishStar<sup>®</sup> HT-E-SEER

Undercounter dishmachine; high-temperature, hot-water sanitizing, with a booster tank and detergent and rinse-aid chemical feeder pumps. Equipped with Steam Elimination and Energy Recovery System (SEER).

The manufacturer provides technical support for all of the dishmachines detailed in this manual. We strongly recommend that you refer to this manual before making a call to our technical support staff. Please have this manual open when you call so that our staff can refer you, if necessary, to the proper page. Technical support is not available on holidays.

Contact technical support toll free at 1-888-800-5672.

Technical support is available for service personnel only.

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### MAINTENANCE

Preventative Maintenance
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### **GUIDES**

### SYMBOLS



- Risk of Injury to Personnel



- Risk of Damage to Equipment



- Risk of Electrical Shock



Caustic Chemicals



- Reference Data Plate



- Lockout Electrical Power

NOTICE - Important Note



- Instructions Hyperlink

### **ABBREVIATIONS & ACRONYMS**

ANSI - American National Standards Institute GHT - Garden Hose Thread GPG - Grains per Gallon GPM - Gallons per Minute HP - Horse Power Hz - Hertz ID - Inside Diameter kW - Kilowatts NFPA - National Fire Protection Association NPT - National Pipe Thread OD - Outside Diameter PRV - Pressure Regulating Valve PSI - Pounds per Square Inch V - Volts

### **SPECIFICATIONS**

### **HT-E DIMENSIONS**

#### LEGEND

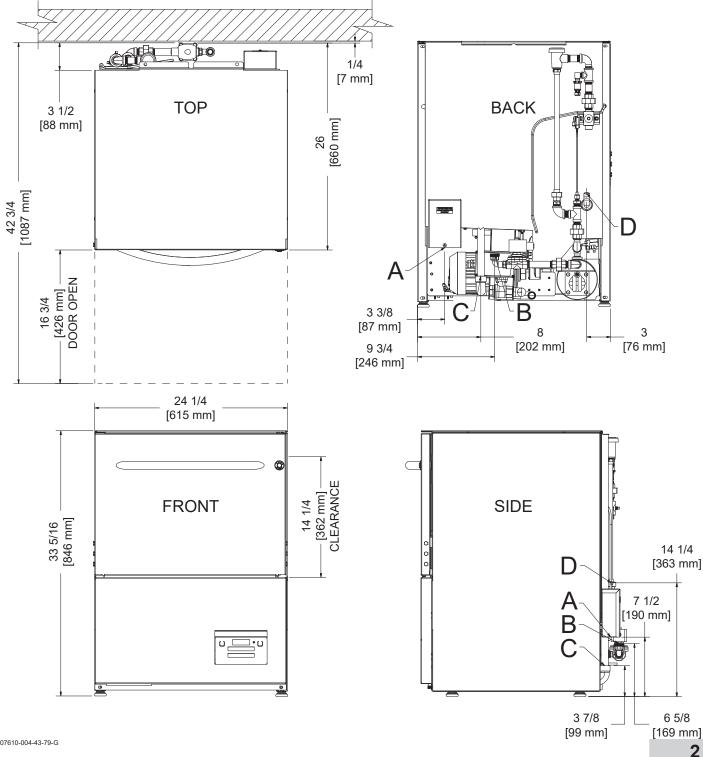
A - Electrical Connection

C - Drain Connection (1" ID, 1 3/8" OD) (Connect to MIN 1 1/2" Drain with Air-gap)

B - Water Inlet (with 6' Hose) (3/4" Male GHT, connect to true 1/2" ID line, MIN 110 °F)

D - Chemical Port

All dimensions from the floor can be increased 1" using the machine's adjustable feet.



### **SPECIFICATIONS**

## HT-E-SEER DIMENSIONS

#### LEGEND

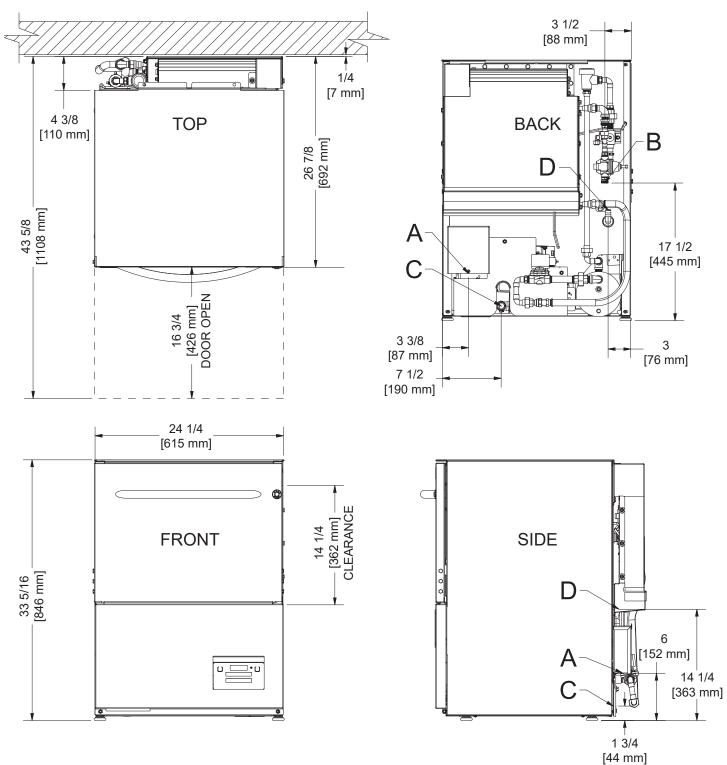
A - Electrical Connection

C - Drain Connection (1" ID, 1 3/8" OD) (Connect to MIN 1 1/2" Drain with Air-gap)

B - Water Inlet (with 6' Hose) (3/4" Male GHT, connect to true 1/2" ID line, 40–90 °F)

D - Chemical Port

All dimensions from the floor can be increased 1" using the machine's adjustable feet.



### HT-E OPERATING PARAMETERS

#### **DishStar® HT-E**

#### **Operating Capacity:**

Racks per Hour	27
Dishes per Hour	675
Glasses per Hour	972
Tank Capacity (Gallons):	
Wash Tank	3
Rinse Tank	1.66



**NOTICE** Always refer to the machine data plate for specific electrical and water requirements. The material provided on this page is for reference only and is subject to change without notice.

#### Water Temperatures (°F):

Incoming water is from a "hot" water line.

Minimum Wash Temperature	155
Minimum Rinse Temperature	180
Minimum Incoming Water Temperature	110

#### **Other Water Requirements:**

Water Flow Pressure (PSI)	10
Flow Rate Minimum (GPM)	4.33
Water Line Size (NPT)	3/4" Male GHT Connect to true 1/2" ID Line
Drain Line Size (NPT)	1" ID 1 3/8" OD

Connect to MIN 1 1/2" Drain with Air-gap

### HT-E-SEER OPERATING PARAMETERS

#### DishStar® HT-E-SEER

#### **Operating Capacity:**

Racks per Hour	20
Dishes per Hour	500
Glasses per Hour	720
Tank Capacity (Gallons):	
Wash Tank	3
Rinse Tank	1.66



**NOTICE** Always refer to the machine data plate for specific electrical and water requirements. The material provided on this page is for reference only and is subject to change without notice.

#### Water Temperatures (°F):

Minimum Wash Temperature	155
Minimum Rinse Temperature	180
Minimum Incoming Water Temperature	40
Maximum Incoming Water Temperature	90

#### **Other Water Requirements:**

Water Flow Pressure (PSI)	10
Flow Rate Minimum (GPM)	4.33
Water Line Size (NPT)	3/4" Male GHT Connect to true 1/2" ID Line
Drain Line Size (NPT)	1" ID 1 3/8" OD Connect to MIN 1 1/2" Drain with Air-gap

Incoming water is from a "cold" water line.

### ELECTRICAL REQUIREMENTS



All electrical ratings provided in this manual are for reference only. Always refer to the machine data plate to get exact electrical information for this machine. All electrical work performed on machines should be done in accordance with applicable local, state, territorial, and national codes. Work should only be performed by qualified electricians and authorized service agents.

Note that all electrical wiring used must be rated, at a minimum, for 212 °F (100 °C) and that only copper conductors must be used.

Where applicable, heating element amperage draws have been adjusted for the assumed input voltage. The manufacturer assumes incoming voltages will be either 208 or 230 volts. Some heating elements used in the machines are rated for other voltages, such as 240 volts. Always verify the amperage draw of the machine in operation when sizing circuit protection.

Amperage loads for motors and heaters are indicated on the machine data plate.

The electrical configurations are as follows:

#### Available Electrical Characteristics:

- 208 V, 60 Hz, Single-phase
- 230 V, 60 Hz, Single-phase
- 460 V, 60 Hz, Three-phase

#### Available Wash Motors:

- 1 HP (208/230 V)
- 3/4 HP (460 V)

#### Available Wash Tank Heaters:

- 3.3 kW (208 V)/4 kW (230 V)
- 4 kW (460 V)

#### Available Rinse Tank Heaters:

- 4.1 kW (208 V)/5.45 kW (230 V)
- 5.45 kW (460 V)

#### DishStar<sup>®</sup> HT-E/HT-E-SEER Electrical Characteristics

VOLTS	208	230	460
PHASE	1	1	3
FREQ	60	60	60
WASH MOTOR AMPS	5.0 A	5.0 A	1.4 A
WASH HEATER AMPS	15.9 A	17.4 A	6.3 A
RINSE HEATER AMPS	19.7 A	21.7 A	4.6 A
TOTAL LOAD	24.7 A*	26.7 A*	7.7 A*

\*The DishStar® HT-E is designed so the heaters never run simultaneously. Total Load is based on the higher of the two loads.

### **INSTRUCTIONS**

#### INSPECTION

Do not throw away packaging if damage is evident!

Before installing the machine, check packaging and machine for damage. Damaged packaging might be an indication of damage to the machine. If there is any type of damage to both packaging and unit, do not throw away the packaging. The machine has been inspected at the factory before shipping and is expected to arrive in new, undamaged condition. However, rough handling by carriers or others might result in damage to the machine while in transit. If this occurs, do not return the machine to the manufacturer. Instead, contact the carrier and ask them to send a representative to the site to inspect the damage and request that an inspection report be completed. Contact the carrier within 48 hours of receiving the machine as well as the dealer that sold you the machine.

**UNPACKING** The machine should be unpacked and removed from the pallet before installing. Open the front door and remove all materials from inside. Once unpacked, verify there are no missing parts. If a part is missing, contact the manufacturer immediately.

The plumber must flush the incoming water line!

PLUMBING All plumbing connections must be made to adhere to local, state, territorial, and national codes. The installing plumber is responsible for ensuring the incoming water lines are flushed of debris before connecting to the machine. Note that chips and materials from cutting processes can become lodged in the solenoid valves and prevent them from opening or closing. Any valves that are found to be fouled or defective because of foreign matter left in the water line, and any subsequent damage, are not the responsibility of the manufacturer.

> See the HT-E Dimensions or HT-E-SEER Dimensions page (depending on your model) and reference item "B" for water inlet connection location.

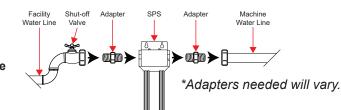
NOTICE The manufacturer does NOT endorse "Tankless On-demand" water heaters for use with their dishmachines. The manufacturer DOES endorse, and highly recommends, the standard "Tank" style water heaters, sized to properly handle the water heating requirements of the facility.

### **CONNECTIONS:** WATER HARDNESS **HIGHER THAN 3 GPG**

WATER SUPPLY A water hardness test must be performed. There is a hardness test kit on the warning tag attached to the incoming plumbing connection on the back of the machine. If water hardness is higher than 3 GPG and a water softener is not being used, install an SPS (see Plumbing Options page) into the water line between the facility water line and the machine water line (installed at the factory). Observe proper inlet/outlet water directions. A water shut-off valve should be installed before installing the SPS to allow access for service. The water supply must be capable of a minimum of 10 PSI "flow" pressure at the recommended temperature indicated on the data plate.

A water hardness test must be performed.

Example



# **CONNECTIONS:** WATER HARDNESS

WATER SUPPLY If water hardness tests at 3 GPG or lower, connect the machine water line (installed at the factory) to the facility water line. A water shut-off valve should be installed in the water line between the facility supply and the machine to allow access for service. The water supply line must be capable of a minimum of 10 PSI "flow" pressure at the LOWER THAN 3 GPG recommended temperature indicated on the data plate.

# REGULATOR

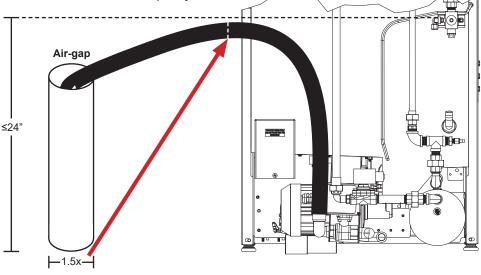
Take care not to confuse static pressure with flow pressure!

**PRESSURE** The manufacturer recommends the installation of a pressure regulating valve (PRV) in the incoming water line to ensure proper flowrate at all times and offers them as an option (see the Plumbing Options page). The PRV comes standard on the HT-E-SEER. Do not confuse static pressure with flow pressure. Static pressure is the line pressure in a "no flow" condition (all valves and services are closed). Flow pressure is the pressure in the fill line when the fill valve is opened during the cycle.

SHOCK ABSORBER The manufacturer also recommends the installation of a shock absorber on the incoming water line and offers them as an option (see the Plumbing Options page). A shock absober comes standard on the HT-E-SEER. This prevents water hammer or hydraulic shock—induced by the solenoid valve as it operates—from causing damage to the equipment.

# **DRAIN LINE**

**CONNECTING THE** The machine has a pumped (pressure) drain capable of pumping waste water to a height of 24" above the floor to the kitchen's drain system. Each dishmachine is supplied with a drain hose. When installed, it will extend from the rear side of the machine. There must be an air-gap between the machine drain line and the floor sink or drain at least 1.5 times larger than the drain hose. If a grease trap is required by code, it should have a flow capacity of 12 GPM.



#### PLUMBING CHECK After installing the incoming fill line and drain line, turn on the water supply to the machine. Check for any leaks and repair as required. All leaks must be repaired before operating the machine.

### **INSTRUCTIONS**

#### ELECTRICAL POWER Electrical and grounding conductors must comply with the applicable portions of the CONNECTIONS



Disconnect electrical

power at the breaker or

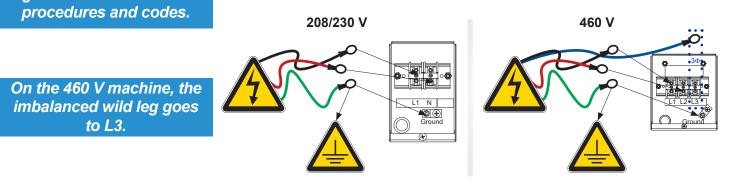
disconnect switch and

tag-out in accordance with

National Electric Code ANSI/NFPA 70 (latest edition) and/or other electrical codes.

The data plate is located on the left-front of the dishmachine. Refer to the data plate for machine operating requirements, machine voltage, total amperage, and serial number.

Remove the back panel and set aside. Remove the terminal block box cover. Install 3/4" conduit into the hole in the bottom of the terminal block box. Route power wires and connect to terminal block. Install the grounding wire onto the lug provided. "DE-OX" or another similar anti-oxidation agent should be used on all power connections.

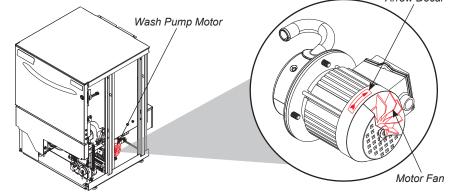




**CAUTION!** On 3-Phase machines only, correct pump motor rotation must be verified before operation!

MOTOR ROTATION On 3-Phase machines only, correct pump motor rotation must be verified before the machine is operated. Failure to do so can result in damage to the machine and components.

- 1. Follow the Filling the Wash Tub section.
- 2. Using a 7/16 nutdriver, remove front kick panel and keep hardware. Using a phillips screwdriver, remove right dress panel and keep hardware. Leave start switch wires connected.
- 3. Locate the wash pump motor and identify the arrow decal which shows the correct motor rotation. Arrow Decal



- 4. Press the Start button on the right dress panel and immediately open the door.
- 5. This will stop the cycle. Observe rotation of motor fan.
- 6. If incorrect, disconnect electrical power and reverse the L1 and L2 connections at terminal block shown in the section above. Replace panels.

### **INSTRUCTIONS**



**VOLTAGE CHECK** Apply power to machine. Check the incoming power at the terminal block and ensure it corresponds with the voltage listed on the data plate. If not, contact a qualified service agency to examine the problem. Do not run the machine if voltage is too high or too low. Advise all proper personnel of the location of the breaker and any problems. Replace the terminal block box cover and tighten-down the screws.

SURROUNDING AREA This is a commercial machine and reaches temperatures that can exceed those generated by a residential machine. Surrounding countertops, cabinets, flooring material, and subflooring material must be designed and/or selected with these higher temperatures in mind.



**CAUTION!** Damage to materials not recommended for higher temperatures will not be covered under warranty or by the manufacturer.

# SETPOINTS

**TEMPERATURE** The temperature setpoints on this unit have been set at the factory. They should only be adjusted by an authorized service agent.

LEVELING A level machine is important to prevent any damage to the machine during operation and to ensure the best possible results. The machine comes equipped with adjustable bullet feet which can be turned using a pair of pliers. Since this machine is an undercounter unit, it should be leveled as close as possible to the unit's location before it is pushed under the counter.

# **EQUIPMENT**

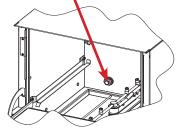


CAUTION! Using deionized water or other aggressive fluids will result in corrosion and failure of components and will void the warranty.

CHEMICAL FEEDER The bottom of the chemical container cannot be located any higher than 8" from the floor. If the unit is equipped with the 6" or 18" table stand, the highest position will be 14" or 26" respectively from the floor.



**CAUTION!** Chemical tube must not extend past port into wash chamber.



#### **PREPARING** This machine is supplied with detergent and rinse-aid chemical feeder pumps. **CHEMICAL** Locate the open ends of the chemical tubes with the tube stiffeners and place each **FEEDER PUMPS** one in the appropriate container. • Red Tubing = Detergent • Blue Tubing = Rinse-aid

PRIMING CHEMICAL **FEEDER PUMPS** 

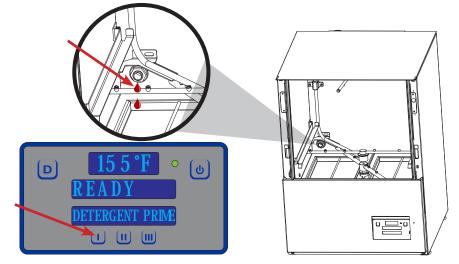
Chemical feeder pumps need priming when the machine is first installed or if the chemical lines have been removed and air was allowed to enter.



**CAUTION!** Water must be in the sump and wash tank before dispensing chemicals.

WARNING! Some of the chemicals used in dishwashing may cause chemical burns if they come in contact with skin. Wear protective gear when handling these chemicals. If any skin comes in contact with these chemicals, immediately follow the instructions provided with the chemicals for treatment.

- Verify that the proper chemical tube stiffener inlet is in the proper container. 1.
- 2. To prime the detergent pump, press the I button until the chemical is seen entering the wash tank. The amount of detergent might need to be adjusted depending on water quality and type of detergent.



3. To prime the rinse-aid pump, press the II button and hold for one minute. The amount of rinse-aid might need to be adjusted depending on water hardness and results.



4. Refer to the next section for instructions on adjusting the amount of chemicals being dispensed.

### **INSTRUCTIONS**

# PROGRAMMING To access the programming m CHEMICAL cycles). FEEDER PUMPS On the timer board, press and h

To access the programming mode, the machine must be ON and "READY" (between cycles).

On the timer board, press and hold both the MOVE and ENTER buttons simultaneously for two seconds.

The PROGRAM (PGM) light and light A will illuminate.

**NOTICE** Once in the programming mode, the MOVE button is used to scroll between the programming categories and the ENTER button is used to select the category.

Press the MOVE button to move the solid light to the desired location. Please note that options A, B, C, D, E, and F are not adjustable outputs.

Press the ENTER button for the chosen category. Now, the (PGM) light will illuminate along with lights corresponding to the time values for the chosen category. The ACCEPT light will blink.

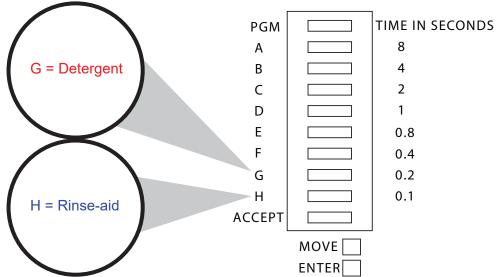
The PROGRAM light will illuminate.

To change the value of a parameter, use the MOVE button to illuminate the light next to the time option (time is measured in seconds). In the time categories, each second in use will light up. To deselect the option, press ENTER and the light will go off, press ENTER again and it will illuminate. Once you have set your time category, press the MOVE button until the ACCEPT light illuminates and press ENTER. This will save the changed parameters and exit the programming mode.

To change any other values, you will have to return to the programming mode. To revert back to a previous setting, you must return to that option and change the parameter back to the previous setting.

Once in the programming mode, if there have been no keypad inputs for approximately two minutes, the system will automatically exit out of the programming mode. Any changes to parameters will be lost when the programming mode is automatically exited. The wash and drain cycles are not adjustable.

All time adjustments are in seconds. Refer to the chart for adjustable outputs.



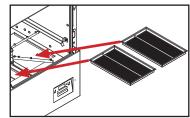
#### TIMER PROGRAMMING BOARD

### **OPERATING INSTRUCTIONS**

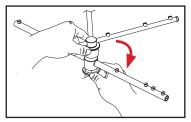
**PREPARATION** 1. Verify strainers are in place and clean.



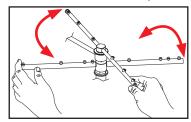
CAUTION! The Preparation section must be followed before operating machine!



2. Ensure wash and rinse arms are screwed securely in place and end-caps are tight.



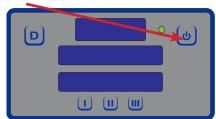
3. Verify wash and rinse arms rotate freely.



4. Confirm chemical levels are correct.

**POWER UP** To energize the machine, turn on the power at the service breaker. The voltage should have been previously verified as correct. If not, the voltage must be verified before energizing the machine.

FILLING THE 1. Press the Power button. WASH TUB



- 2. The machine will automatically begin the fill cycle.
- 3. Once the wash tub is filled, the machine displays "HEATING."
- 4. Wait for wash temperature to display at least 155 °F and for the status to display "READY" before operating the machine.



### **OPERATING INSTRUCTIONS**

#### WARE PREPARATION

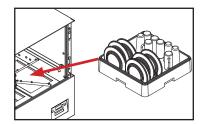
Proper ware preparation helps ensure good results and fewer re-washes. If not done properly, ware might not come out clean and the efficiency of the dishmachine will be reduced. Scraps should always be removed from ware before being loaded into a rack. Pre-rinsing and pre-soaking are good ideas, especially for silverware and casserole dishes.

Place cups and glasses upside-down in racks so they don't hold water during the cycle. The machine sanitizes as well as cleans. To do this, ware must be properly prepared before being placed in the machine.

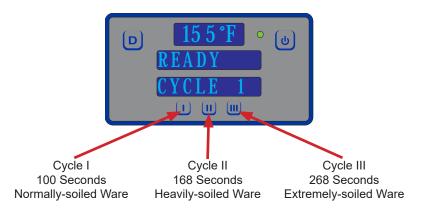
**WASHING A RACK** 1. Follow the Filling the Wash Tub section, ensuring temperature is at least 155 °F and the status displays "READY."

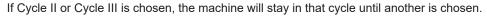


- 2. Open the door completely.
- 3. Slide the rack into the machine.



- 4. Close the door.
- 5. Choose the cycle.

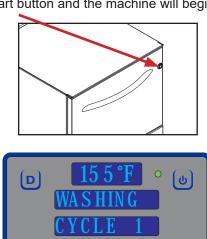




## **OPERATING INSTRUCTIONS**

**WASHING A RACK** 6. Press the Start button and the machine will begin the wash cycle.





- Temperature shown is the minimum required temperature.
- 7. After the wash cycle is complete, the machine will automatically enter the rinse cycle.

Temperature shown is the minimum required temperature.



8. Once the rinse cycle is complete, the machine will automatically enter the sanitize cycle.



9. After the sanitize cycle is complete, the machine will automatically go back to being "READY." Open door and remove rack of ware. To start another cycle, load another rack of ware, close door, and push the Start button.



### **OPERATING INSTRUCTIONS**

#### OPERATIONAL INSPECTION

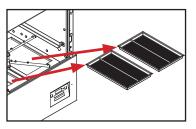
Based on use, the strainers might become clogged with soil and debris as the workday progresses. Operators should regularly inspect the strainers to ensure they have not become clogged. Clogged strainers will reduce the washing capability of the machine. Instruct operators to clean out the strainers at regular intervals or as required by workload.

#### SHUTDOWN & 1 CLEANING

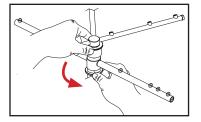
**SHUTDOWN &** 1. Close the door and turn the machine off by pushing the Power button.



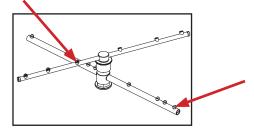
- 2. The drain valve will activate and empty the machine of water.
- 3. When draining stops and the display is off, open door and remove and clean the strainers and set aside.



4. Unscrew the wash and rinse arms from their manifolds.



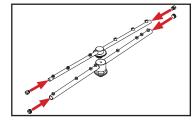
5. Verify the nozzles and arms are free from obstruction. If clogged, remove endcaps, clean nozzles with a brush, and flush with fresh water.



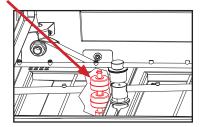
#### SHUTDOWN & G CLEANING

Use a screwdriver to ensure end-caps are tight.

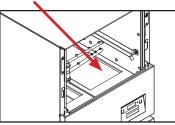
**SHUTDOWN &** 6. Replace end-caps and use a screwdriver to ensure they are tight.



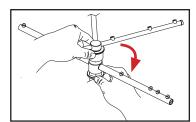
7. Ensure the float (located under left strainer) is free of debris.



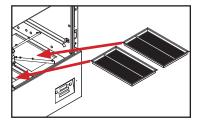
8. Spray or wipe out interior of machine.



9. Replace wash and rinse arms.



10. Replace the strainers and ensure they are laying flat.



11. Use stainless steel polish to clean and protect outside of machine.

### DELIMINO

DELIMING In order to maintain the machine at its optimum performance level, lime and corrosion deposits must be removed. The frequency for deliming will be based on water conditions. A deliming solution is available from your chemical supplier. Read and follow all instructions on the label.

If the machine is equipped with an SPS and lime is becoming a frequent problem, the cartridge needs to be replaced.

To order a replacement cartridge, see the

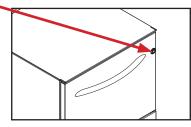
Plumbing Options page.

To delime machine:

- 1. Remove the rinse arms and place in sink with deliming solution (leave for the amount of time recommended by the chemical supplier).
- 2. Replace the rinse arms.
- 3. If machine is full of water, close door, press the Power button, and allow machine to drain and shut-off.
- 4. Follow the Filling the Wash Tub section of this manual.
- 5. Open the door and add the amount of deliming solution recommended by the chemical supplier.
- 6. Close the door and press the Delime button on the display. The status will display "DELIME."



7. Press the Start button.



- 8. The machine will delime, drain, and refill.
- 9. Wait five minutes, then inspect the machine. If the machine is not delimed, run again.
- 10. When clean, press the Delime button. The status will display "READY."
- 11. Run the machine through two regular cycles to remove residual deliming solution.
- 12. The machine is now ready for normal operation.

### DETERGENT CONTROL

# CONTROL

DETERGENT Detergent usage and water hardness are two factors that greatly contribute to the machine's operating efficiency. Using the proper amount of detergent can become a source of substantial savings. A qualified water-treatment specialist can determine what is needed for maximum efficiency from the detergent.

- Hard water greatly affects the performance of the machine, causing the amount of detergent required for washing to increase. If the machine is installed in an area with hard water, the manufacturer recommends the installation of water treatment equipment.
- Deposited solids from hard water can cause spotting that will not be removed with a drying agent. Treated water will reduce this occurence.
- Treated water might not be suitable for use in other areas of operation and it might be necessary to install a water treatment system for the water going to the machine only. Discuss this option with a qualified water treatment specialist.
- Properly train operators on how much detergent is to be used per cycle. Meet with a water treatment specialist and chemical supplier to discuss a complete training program for operators.



- Water temperature is an important factor in ensuring the machine functions properly, and the machine's data plate details what the minimum temperatures must be for the incoming water supply, the wash tank, and the rinse tank. If minimum requirements are not met, it's possible that dishes will not be clean or sanitized.
- Instruct operators to observe the required temperatures and to report when they fall below the minimum allowed. A loss of temperature can indicate a larger problem.

### MAINTENANCE

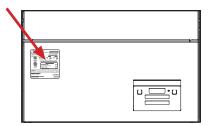
### PREVENTATIVE MAINTENANCE

#### PREVENTATIVE MAINTENANCE

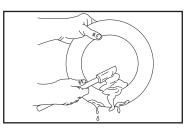
The manufacturer of this machine highly recommends that any maintenance and repairs not specifically discussed in this manual only be performed by qualified service personnel. Performing maintenance on the machine may void a warranty.

By following the operating and cleaning instructions in this manual, users should get the most efficient results from the machine. As a reminder, here are some steps to ensure that the machine is used properly:

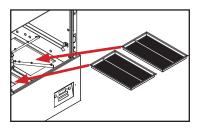
1. Ensure that the water temperatures match those listed on the machine data plate (on the front-left of machine).



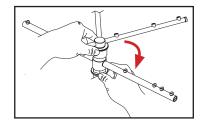
2. Remove as much soil as possible from ware before loading into racks.



3. Ensure that strainers are in place, laying flat in tub, and free of soil and debris before operating the machine. To clean strainers, wipe them out with a rag and rinse under a faucet. For stubborn debris, a toothpick can be used. Do not beat strainers on waste cans; once bent, they will not work properly.



4. Ensure all wash and rinse arms are secure in the machine before operating.





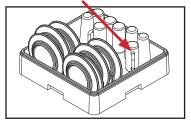
CAUTION! Do NOT beat strainers to remove soil and debris!

### MAINTENANCE

### PREVENTATIVE MAINTENANCE

#### **PREVENTATIVE** 5. Do not overfill racks. MAINTENANCE

6. Ensure that glasses are placed upside-down in the rack.



- 7. Ensure that all chemicals being injected into machine have been verified at the correct concentrations.
- 8. Clean the machine at the end of every workday (see Shutdown and Cleaning section).
- 9. If hard water is present, install an SPS into the water line connecting to the machine (see Water Supply Connections section).
- 10. Always contact a qualified service agency whenever a serious problem arises.
- 11. Follow all safety procedures, whether listed in this manual or put forth by local, state, or national codes/regulations.

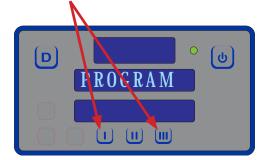
### PROGRAMMING

#### MODEL CONFIRMATION

To access programming mode, the machine should be on and not in cycle.

The machine's program number must be correct to ensure the machine works properly. To confirm the program number:

1. Press and hold the I and III buttons until "Program" flashes (2-3 seconds).



2. Confirm bottom display shows "8." If not, contact a qualified service agency.



3. Press the Delime button to exit.



### PROGRAMMING

### TROUBLESHOOTING

#### **USER SETUP**

A transparent guide to locating the programming buttons is included with the machine, behind the control kick panel. Lay the guide over the display and press where indicated. To access programming mode, the machine should be on and not in cycle.

The programming buttons (Up-arrow, Down-arrow, and Select) are hidden on the display and are shown below outlined with red dots.

1. Press and hold the Up-arrow and Down-arrow buttons until "Setup" flashes (2–3 seconds).



- 2. The display will then change to "Version" and show the firmware versions of the IO module and PCB, Digital Display.
- 3. Use the Up-arrow button to cycle through the categories (will be flashing).
  - Language
  - Temperature Scale
  - Wash Temperature
  - Boost Temperature

- Wash Offset
- Rinse Offset
- Boost Offset
- Spare Offset



- 4. Press the Select button to choose the category you want to change.
  - Regardless of the category, Steps 5–7 remain the same.
- 5. Use the Up-arrow button to change the options (will be flashing). Numerical options are shown in the top window.



- 6. Press the Select button to accept the changes.
- 7. Press the Delime button to exit.

## TROUBLESHOOTING

## FAULT CODES

DISPLAY SHOWS	POSSIBLE CAUSES	REMEDY
		1. Verify incoming water pressure is $10 \pm 2$ PSI.
	1. Low or no water pressure.	2. Verify that fill relay is supplying voltage to fill solenoid.
	2. Faulty inlet valve or fill relay.	Replace faulty component.
"E4 Opening upped at "	3. Contactor to booster heater not turning off.	3. Check for welded contacts. Verify that output from IO module turns off when above the set temperature.
"F1 Service needed," "No water in Booster"	4. Faulty temperature input (P12) on IO module.	4. Substitute a 1.2 $k\Omega$ resistor for T3, and verify that booster heater turns off. If not, replace IO module.
	5. Faulty temperature probe (T3).	5. Verify that the booster-probe resistance is correct with
	6. Faulty float switch allows heaters to operate with no water in tub.	respect to temperature (see table on pg. 24). If not, replace T3.
		6. Replace float switch.
	1. Contactor to booster heater not turning off.	1. Check for welded contacts. Verify that output from IO module turns off when above the set temperature.
"F2 Service needed," "Check booster	2. Faulty temperature input (P12) on IO module.	2. Substitute a 1.2 $k\Omega$ resistor for T3, and verify that booster heater turns off. If not, replace IO module.
thermostat"	3. Faulty temperature probe (T3).	3. Verify that the booster probe resistance is correct with respect to temperature (see table on pg. 24). If not, replace T3.
	1. Malfunction of fill solenoid or fill relay.	1. Replace faulty component.
"F3 No water in wash tank," "Check inlet water and door"	2. Door is open, which inhibits fill mode.	2. Close door to activate door switch.
	3. Faulty door switch.	3. Replace or adjust door switch.
"F4 Service needed,"	1. Incoming power not properly connected.	1. Check connections to heater.
"Check incoming power"	2. L3 is missing (3-phase machines only).	2. Verify that L3 is present and connected properly.
		1. Substitute a 1.8 k $\Omega$ resistor for T3, and verify that booster heater turns on. If not, replace IO module.
"F5 Service needed," "Check booster thermostat and high limit"	1. Faulty temperature input (P12) on IO module.	2. Verify that T3 resistance is consistent with the table on pg. 24. If not, replace T3.
	2. Faulty temperature probe (T3).	3. Replace high-limit switch.
	3. Faulty high-limit switch.	4. Check booster heater for proper resistance. Replace if
	4. Faulty booster heater.	incorrect.
	5. Booster-heater contactor not energizing.	5. Verify that drive voltage to contactor coil is present during a call for heat and that contactor closes. If voltage is present, replace contactor. If voltage is not present, check wiring.

## TROUBLESHOOTING

## FAULT CODES

DISPLAY SHOWS	POSSIBLE CAUSES	REMEDY
	<ol> <li>Low or no water pressure.</li> <li>Faulty inlet valve or fill relay.</li> </ol>	<ol> <li>Verify incoming water pressure is 10 ± 2 PSI.</li> <li>Verify that fill relay is supplying voltage to fill solenoid. Replace faulty component.</li> </ol>
"F6 Service needed," "No water in wash tank"	<ol> <li>Contactor to wash heater not turning off.</li> <li>Faulty temperature input (T1) on IO module.</li> <li>Faulty temperature probe (T1).</li> <li>Faulty float switch allows heaters to operate with no water in tub.</li> </ol>	<ol> <li>Check for welded contacts. Verify that output from IO module turns off when above the set temperature.</li> <li>Substitute a 1.2 kΩ resistor for T1, and verify that wash heater turns off. If not, replace IO module.</li> <li>Verify that T1 resistance is correct with respect to temperature (see table on pg. 24). If not, replace T1.</li> </ol>
"F7 Service needed," "Check wash tank thermostat"	<ol> <li>Contactor to wash heater not turning off.</li> <li>Faulty temperature input (P10) on IO module.</li> <li>Faulty temperature probe (T1).</li> </ol>	<ol> <li>6. Replace float switch.</li> <li>1. Check for welded contacts. Verify that output from IO module turns off when above the set temperature.</li> <li>2. Substitute a 1.2 kΩ resistor for T1, and verify that wash heater turns off. If not, replace IO module.</li> <li>3. Verify that T1 resistance is correct with respect to temperature (see table on pg. 24). If not, replace T1.</li> </ol>
"F8 No water in wash tank," "Check inlet water and door"	<ol> <li>Malfunction of fill solenoid or fill relay.</li> <li>Door is open, which inhibits fill mode.</li> <li>Faulty door switch.</li> </ol>	<ol> <li>Replace faulty solenoid or fill relay.</li> <li>Close door to activate door switch.</li> <li>Replace or adjust door switch.</li> </ol>
"F9 Service needed," 1. Incoming power not properly connected. 1. C		<ol> <li>Check connections to heater.</li> <li>Verify that L3 is present and connected properly.</li> </ol>
"F10 Service needed," "Check wash tank thermostat and high limit"	<ol> <li>Faulty temperature input (T1) on I/O module.</li> <li>Faulty temperature probe (T1).</li> <li>Faulty high-limit switch.</li> <li>Faulty wash heater.</li> <li>Wash-heater contactor not energizing.</li> </ol>	<ol> <li>Substitute a 1.8 kΩ resistor for T1, and verify that wash heater turns on. If not, replace I/O module.</li> <li>Verify that T1 resistance is correct with respect to temperature (see table on pg. 24). If not, replace T1.</li> <li>Replace high-limit switch.</li> <li>Check wash heater for proper resistance. Replace if incorrect.</li> <li>Verify that drive voltage to contactor coil is present during a call for heat and that contactor closes. If voltage present, replace contactor. If voltage not present, check wiring.</li> </ol>
F11 Service needed –check wash tank thermostat	Faulty temperature probe (T1).	Replace probe that connects to P10.

DISPLAY SHOWS	POSSIBLE CAUSES	REMEDY
F12 - Not Used	N/A	N/A
error. Check 6-pin cable	<ol> <li>Loose connection in 6-pin cable between display board and I/O module.</li> <li>Faulty 6-pin cable between display board and I/O module.</li> <li>Faulty communication port on I/O module or display board.</li> </ol>	<ol> <li>Fully disconnect 6-pin cable at each end, and reconnect each end until a click is heard.</li> <li>Inspect for broken wire or unseated terminal by gently pulling on each wire at each end of the cable. Reseat any loose terminals by inserting it fully into the housing using long-nosed pliers. Replace cable if broken wire is found.</li> <li>Temporarily substitute a verified good display board, and check if F13 message recurs. If so, repeat substitution with a good I/O module.</li> </ol>

# 

R (kΩ)	°F
11.58	69.8
10.37	75.2
9.30	80.6
7.78	89.6
3.05	140.0
2.54	150.8
2.18	159.8
1.58	179.6
1.45	185.0
1.33	190.4
1.16	199.4
0.96	212.0



**WARNING!** Inspection, testing, and repair of electrical equipment should only be performed by qualified service personnel. Certain procedures in this section require electrical tests or measurements while power is applied to the machine. Exercise extreme caution at all times. If test points are not easily accessible, disconnect power, attach test equipment, and reapply power to test. When replacing electrical parts, disconnect power at circuit breaker.

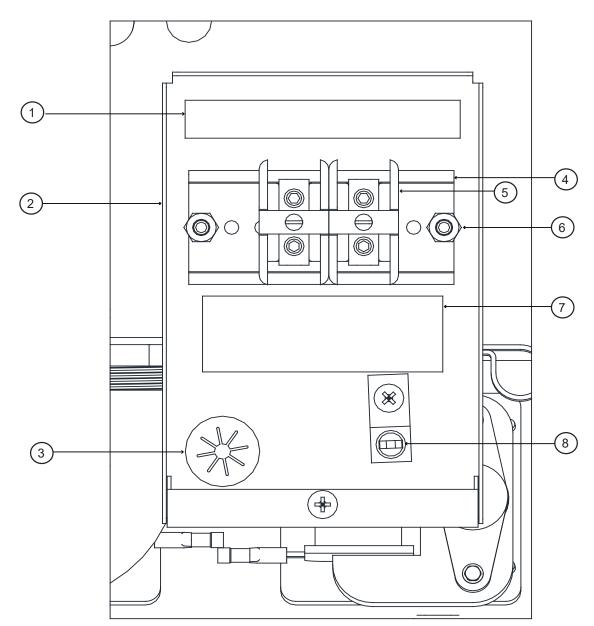
OBSERVATION	POSSIBLE CAUSE	REMEDY	
Water overflow	1. Clogged drain.	1. Remove obstruction.	
from bottom of			
door.	2. Machine not level.	2. Level machine or increase height to the front.	
	3. Excessive inlet pressure.	t pressure.3. Install pressure regulating valve or adjust if one is present.Ensure flow meets data plate specification.	
	4. Detergent foaming.	4. Reduce detergent quantity.	
	5. Wash or rinse arm end-cap missing.	5. Replace.	
Wash motor	1. Loose or broken wires.	1. Reconnect or replace wires in motor.	
doesn't			
operate on	2. Defective Start button.	2. Adjust button or replace.	
wash.			
	3. Defective motor contactor.	3. Replace.	
Little or no water	1. Limed-up rinse heads or piping.	1. Delime rinse heads.	
coming through			
the rinse	2. Low water pressure.	2. Increase pipe size to machine.	
assemblies.		Adjust pressure regulating valve.	



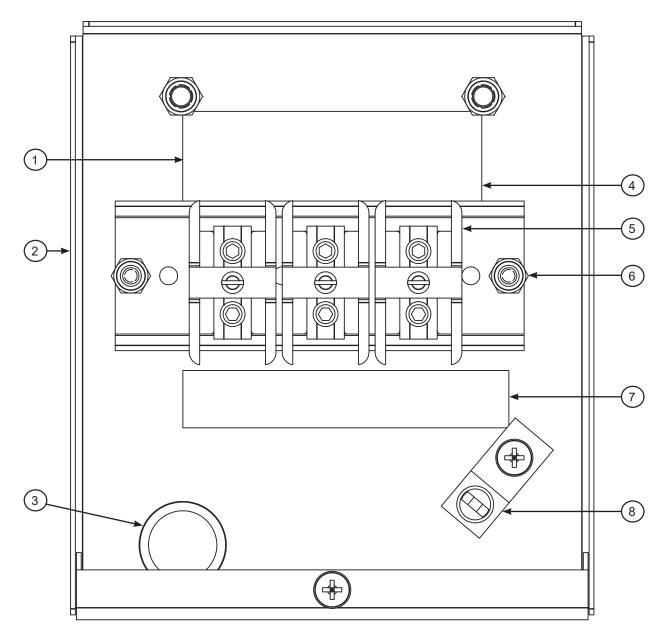
**WARNING!** Inspection, testing, and repair of electrical equipment should only be performed by qualified service personnel. Certain procedures in this section require electrical tests or measurements while power is applied to the machine. Exercise extreme caution at all times. If test points are not easily accessible, disconnect power, attach test equipment, and reapply power to test. When replacing electrical parts, disconnect power at circuit breaker.

OBSERVATION	POSSIBLE CAUSE	REMEDY	
Rinse water runs1. Defective plunger in solenoid valve.1. Replace plunger.continuously		1. Replace plunger.	
with breaker turned off.	2. Defective diaphragm in solenoid valve.	2. Replace diaphragm.	
Wash temperature not	1. Water level low.	1. Check water level. If low, run new fill cycle.	
within range.	2. RTD setpoint too low.	2. Adjust setpoint.	
	3. Defective RTD.	3. Replace RTD.	
	4. Wash heater defective.	4. Replace heater element.	
	5. Defective heater contactor R1.	5. Replace contactor.	
Rinse temperature not	1. RTD is defective.	1. Replace if necessary.	
within range.	2. Incoming rinse water does not meet minimum criteria indicated machine data plate.	2. Adjust as required.	
	3. Rinse heaters damaged.	3. Check amperages. Replace if necessary.	
	4. Setpoint screens set low.	4. Adjust rinse tank setpoint.	
Machine doesn't drain	1. Drain clogged.	1. Remove obstruction.	
when power button is pressed.	2. Defective drain valve.	2. Replace.	
Incorrect water pressure	1. Water turned off.	1. Turn water on.	
displayed during Fill or	2. Transducer disconnected.	2. Verify wiring.	
Rinse.	3. Pressure transducer defective.	3. Replace pressure transducer.	

## TERMINAL BLOCK BOX, 208/230 V

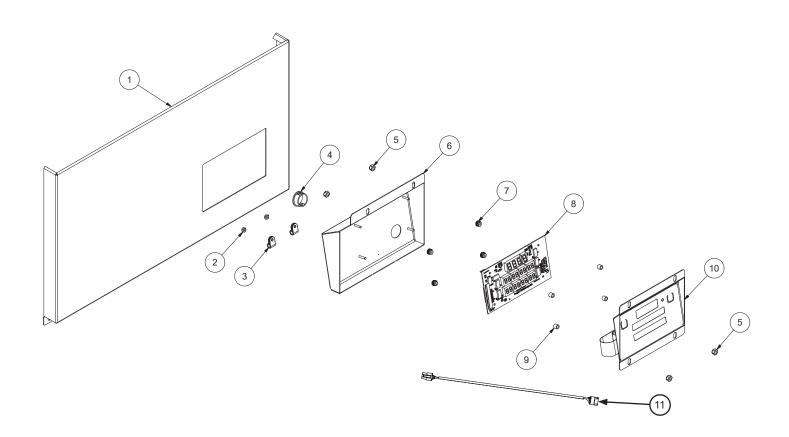


ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	Power Connection Decal	09905-011-47-35
2	1	Terminal Block Box	05700-004-36-47
	1	Terminal Box Cover (Not Shown)	05700-003-27-70
3	1	Strain Relief	05975-003-37-56
4	1	Terminal Block Track	05700-000-43-60
5	2	Terminal Block	05940-500-02-19
6	2	Locknut, 10-24 Hex with Nylon Insert	05310-373-01-00
7	1	Decal, L1, N	09905-011-62-72
8	1	Ground Lug	05940-200-76-00



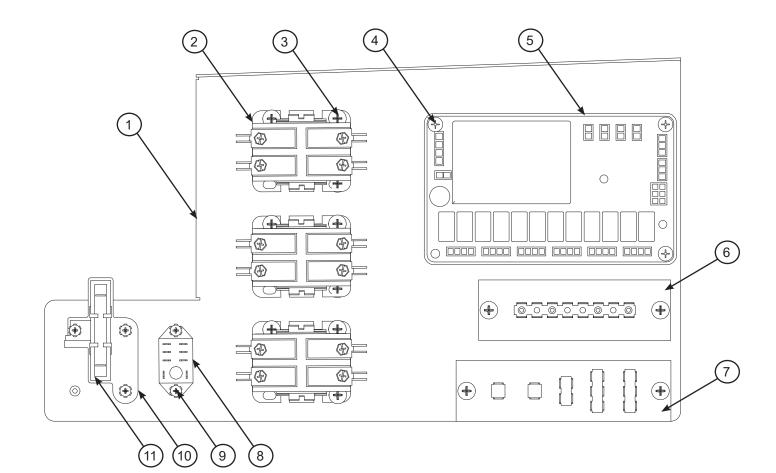
ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	Power Connection Decal	09905-011-47-35
2	1	Terminal Block Box	05700-004-44-79
	1	Terminal Box Cover (Not Shown)	05700-004-44-80
3	1	Strain Relief	05975-210-03-00
4	1	Terminal Block Track	05700-004-44-72
5	3	Terminal Block	05940-500-02-19
6	2	Locknut, 8-32 Low Profile	05310-004-23-83
7	1	Decal, L1, L2, L3	09905-101-12-66
8	1	Ground Lug	05940-200-76-00

# CONTROL KICK PANEL



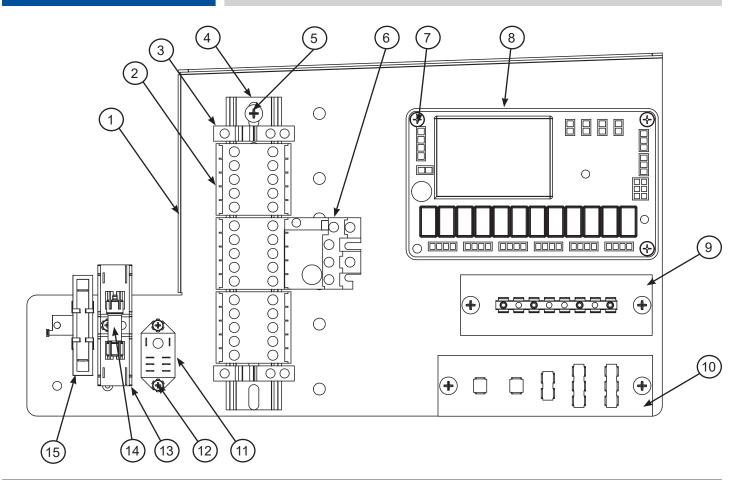
ITEM	QTY	DESCRIPTION	PART NUMBER
		Complete Control Kick Panel Assembly	05700-004-41-87
1	1	Control Kick Panel	05700-004-41-86
2	2	Locknut, 6-32 Hex with Nylon Insert	05310-373-03-00
3	2	P-clamp, 1/4" ID	05975-002-61-42
4	1	Bushing, Snap	05975-210-09-00
5	4	Locknut, 10-24 Hex with Nylon Insert	05310-373-01-00
6	1	Cover, Display	05700-004-46-05
7	4	Nut, Thumb 6-32 Nylon	05310-002-83-12
8	1	PCB, Digital Display	05945-004-19-48
9	4	Spacer, Unthreaded, 9/32" Nylon	05975-004-47-89
10	1	Panel & Membrane Switch Assembly	05700-004-58-72
11	1	Communication Cable	05700-004-33-64

## HT-E ELECTRICAL PANEL, 208/230 V



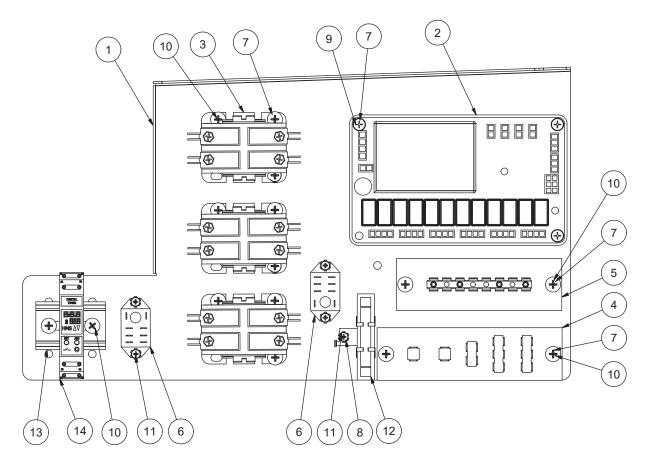
ITEM	QTY	DESCRIPTION	PART NUMBER
		Complete HT-E Electrical Panel Assembly, 208/230 V	05700-004-42-07
1	1	Electrical Panel	05700-004-40-63
2	3	Contactor, 208/230 V	05945-002-74-20
3	13	Screw, 10-32 x 5/8"	05305-003-02-12
4	3	Screw, 10-32 x 1"	05305-002-19-42
5	1	I/O Module	06401-004-76-15
6	1	Terminal Board	05940-004-21-34
7	1	Terminal Board	05940-002-78-97
8	1	Relay	05945-111-89-75
9	5	Screw, 6-32 x 3/8"	05305-002-25-91
10	1	Bracket, Resistor Mount	05700-004-44-51
11	1	Resistor, Wire Wound Power, 1/4" Tabs	05935-004-44-44

# HT-E ELECTRICAL PANEL, 460 V



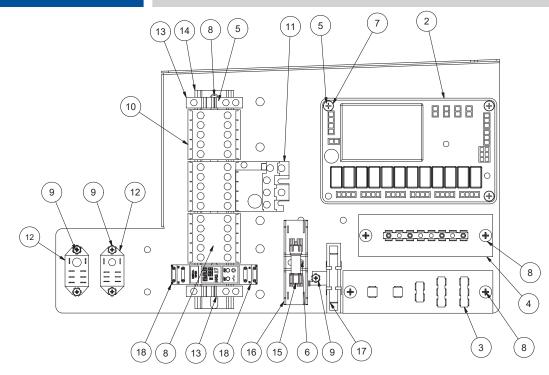
ITEM	QTY	DESCRIPTION	PART NUMBER
		Complete HT-E Electrical Panel Assembly, 460 V	05700-004-44-50
1	1	Electrical Panel	05700-004-40-63
2	3	Contactor, 460 V	05945-111-60-07
3	2	End-cap, Contactor	05940-111-60-30
4	1	Dinrail, 7 3/4"	05700-002-79-13
5	6	Screw, 10-32 x 5/8"	05305-003-02-12
6	1	Motor Overload, 1.35–2 A	05945-111-60-08
7	3	Screw, 10-32 x 1"	05305-002-19-42
8	1	I/O Module	06401-004-76-15
9	1	Terminal Board	05940-004-21-34
10	1	Terminal Board	05940-002-78-97
11	1	Relay	05945-002-47-41
12	3	Screw, 6-32 x 3/8"	05305-002-25-91
13	1	Fuse Holder	05920-011-72-89
14	1	Fuse, 1/2 A	05920-011-72-88
15	1	Resistor, Wire Wound Power, 1/4" Tabs	05935-004-44-44

### HT-E-SEER ELECTRICAL PANEL, 208/230 V



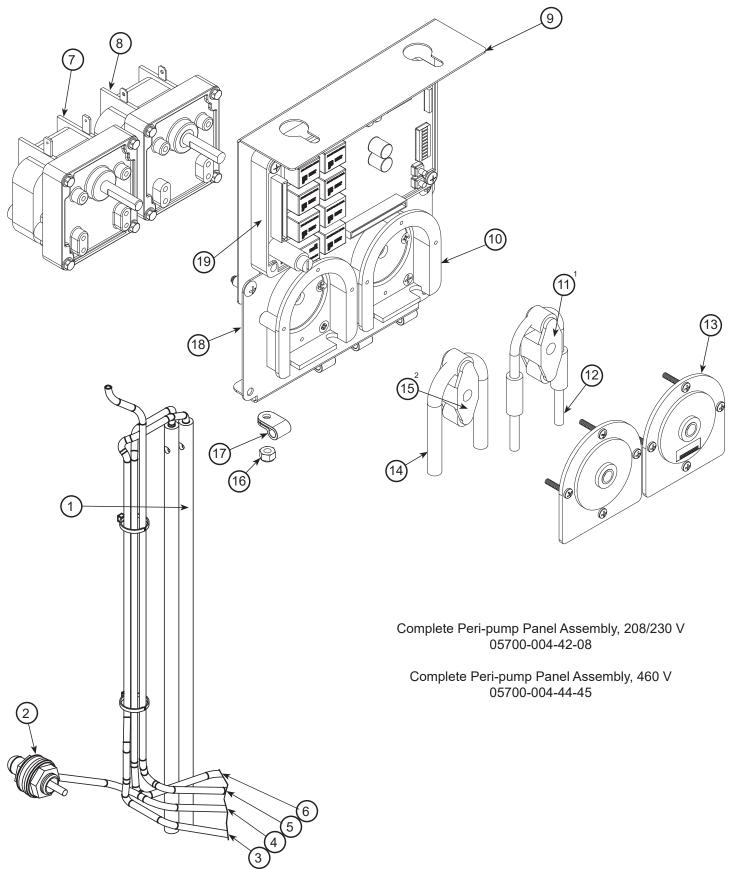
ITEM	QTY	DESCRIPTION	PART NUMBER
		Complete HT-E-SEER Electrical Panel Assembly, 208/230 V	05700-004-51-91
1	1	Electrical Panel	05700-004-40-63
2	1	I/O Module	06401-004-76-15
3	3	Contactor, 208/230 V	05945-002-74-20
4	1	Terminal Board	05940-002-78-97
5	1	Terminal Board	05940-004-21-34
6	2	Relay	05945-111-89-75
7	18	Fastener	05340-111-58-10
8	5	Nut, Plated	05340-118-04-00
9	3	Screw, 10-32 x 1"	05305-002-19-42
10	15	Screw, 10-32 x 5/8"	05305-003-02-12
11	5	Screw, 6-32 x 3/8"	05305-002-25-91
12	1	Resistor, Wire Wound Power, 1/4" Tabs	05935-004-44-44
13	1	Dinrail, 2"	05700-002-36-09
14	1	Timer, Universal Digital	05945-004-22-78

# HT-E-SEER ELECTRICAL PANEL, 460 V



ITEM	QTY	DESCRIPTION	PART NUMBER
		Complete HT-E-SEER Electrical Panel Assembly, 460 V	05700-004-51-92
1	1	Electrical Panel	05700-004-40-63
2	1	I/O Module	06401-004-76-15
3	1	Terminal Board	05940-002-78-97
4	1	Terminal Board	05940-004-21-34
5	9	Fastener	05340-111-58-10
6	6	Nut, Plated	05340-118-04-00
7	3	Screw, 10-32 x 1"	05305-002-19-42
8	6	Screw, 10-32 x 5/8"	05305-003-02-12
9	6	Screw, 6-32 x 3/8"	05305-002-25-91
10	3	Contactor, 460 V	05945-111-60-07
11	1	Motor Overload, 1.35–2 A	05945-111-60-08
12	2	Relay	05945-002-47-41
13	2	End-cap, Contactor	05940-111-60-30
14	1	Dinrail, 7 3/4"	05700-002-79-13
15	1	Fuse, 1/2 A	05920-011-72-88
16	1	Fuse Holder	05920-011-72-89
17	1	Resistor, Wire Wound Power, 1/4" Tabs	05935-004-44-44
18	1	Timer, Universal Digital	05945-004-22-78

## CHEMICAL FEEDER PUMPS

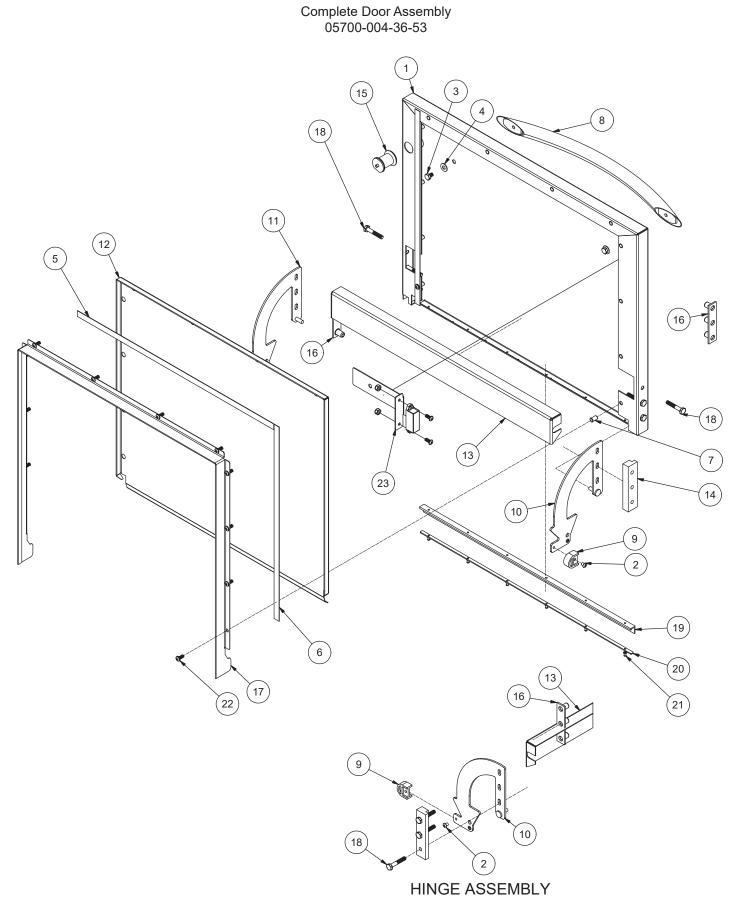


## CHEMICAL FEEDER PUMPS

ITEM	QTY	DESCRIPTION	PART NUMBER
1	2	Stiffener, Chemical Tube	05700-002-66-49
2	1	Chemical Port Assembly	05700-004-30-86
3	1	Tubing, Red, 1/4" x 120"	05700-011-37-15
4	1	Tubing, Red, 1/4" x 80"	05700-011-37-14
5	1	Tubing, Clear, 1/8" x 120"	05700-002-76-14
6	1	Tubing, Clear, 1/8" x 48"	05700-002-76-15
	1	Complete Peri-pump Assembly, 36 RPM, 208/230 V	05700-003-78-74
	1	Motor Only, Peri-pump, 36 RPM, 208/230 V	04320-111-47-47
7	1	Complete Peri-pump Assembly, 36 RPM, 115 V (for 460 V machine)	05700-002-96-08
	1	Motor Only, Peri-pump, 36 RPM, 115 V (for 460 V Machine)	04320-111-35-14
	1	Complete Peri-pump Assembly, 14 RPM, 208/230 V	05700-002-72-48
	1	Motor Only, Peri-pump, 14 RPM, 208/230 V	04320-111-47-46
8	1	Complete Peri-pump Assembly, 14 RPM, 115 V (for 460 V machine)	05700-002-96-09
	1	Motor Only, Peri-pump, 14 RPM, 115 V (for 460 V Machine)	04320-111-35-13
9	1	Panel, Outer Control	05700-004-41-89
10	2	Pump Housing	04320-111-37-09
<b>11</b> <sup>1</sup>	1	Roller, Black Plastic	04320-111-65-27
	1	Roller, Red Plastic (36 RPM, 460 V Assembly Only)	04320-111-36-70
12	1	Tube, 8", 208/230 V	05700-011-65-21
12	1	Tube, 8", 460 V	05700-011-76-41
13	2	Pump Cover	04320-111-37-08
14	1	Tube, 8", 208/230 V	05700-003-22-89
14	1	Tube, 8", 460 V	05700-111-35-29
15 <sup>2</sup>	1	Roller, White Plastic	04320-002-82-28
16	4	Locknut, 10-24 Hex with Nylon Insert	05310-373-01-00
17	4	P-clamp, 1/4"	05975-002-61-42
18	1	Plate, Peri-pump	05700-004-36-03
19	1	Universal Timer	05945-003-75-23

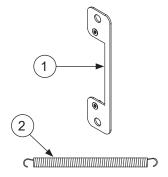
<sup>1</sup>On the 460 V machine, the 36 RPM peri-pump assembly uses the red roller. So for the 460 V machine, this would be item #15 on the previous page.

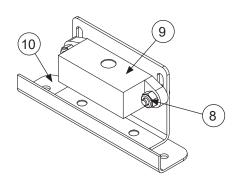
<sup>2</sup> On the 460 V machine, the 14 RPM peri-pump assembly uses the white roller. So for the 460 V machine, this would be item #11 on the previous page.

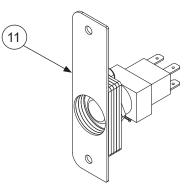


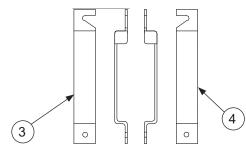
ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	Outer Door Weldment	05700-004-52-86
2	2	Screw, 10-32 x 1/4"	05305-173-01-00
3	2	Bolt, 1/4-20 x 3/8" Hex	05305-274-20-00
4	2	Washer, 1/4-20 ID	05311-174-01-00
5	1	Gasket, Door 20"	05330-003-58-35
6	2	Gasket, Door 17 1/8"	05330-003-58-36
7	12	Fastener, 10-32	05340-111-58-10
8	1	Door Handle	05700-003-26-62
9	2	Stop, Door Hinge	05700-003-32-55
10	1	Hinge, Left	05700-003-32-71
11	1	Hinge, Right	05700-003-32-72
12	1	Inner Door	05700-003-33-21
13	1	Baffle, Door	05700-003-33-38
14	2	Hinge Spacer	05700-003-33-42
15	1	Switch Assembly	05700-003-34-80
16	2	Retaining Plate	05700-011-44-37
17	1	Channel, Door Seal	05700-003-55-49
18	6	Screw, 1/4-20 x 1 1/2" Hex Head	05305-274-23-00
19	1	Gasket, Door L	05330-004-36-05
20	1	Gasket Clamp	05700-004-36-56
21	6	Pop Rivet, 1/8" x 3/8"	05320-003-06-98
22	12	Screw, 10-32 x 1/2" with Washer	05305-002-32-37
23	1	Bracket, Door Magnet	05700-004-52-73

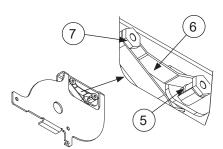
Parts are not shown to scale in relation to each other.









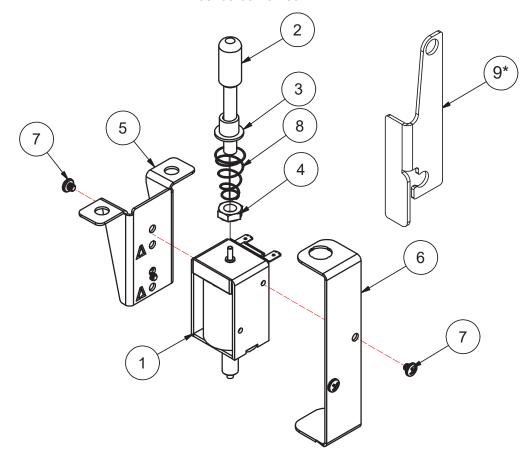


ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	Switch Mounting Plate Assembly	05700-003-33-54
2	1	Door Spring	05700-003-32-85
3	1	Cover, Left Hinge Weldment	05700-004-36-80
4	1	Cover, Right Hinge Weldment	05700-004-36-81
		Hinges secured with Locknut, 1/4-20 Hex with Nylon Insert	05310-374-01-00
5	2	O-ring	05330-003-32-34
6	1	Latch Spring	05340-004-67-82
7	2	Latch Nut	05700-003-32-33
8	2 2	Locknut, 6-32 Hex with Nylon Insert Screw, 6-32 x 1/4"	05310-373-03-00 05305-171-01-00
9	1	Door Switch	05930-003-31-44
10	1 1	Door Switch Bracket Door Switch & Bracket Assembly	05700-003-31-43 05700-003-32-21
11	1	Complete Switch Mount Assembly	06401-004-47-76

## HT-E-SEER DOOR INTERLOCK

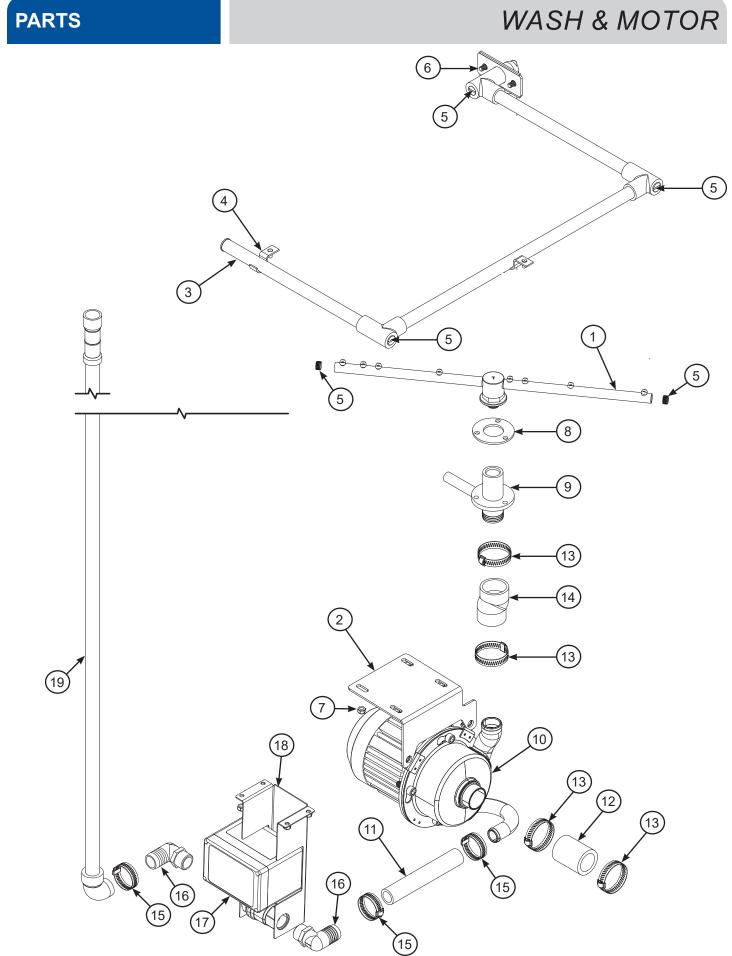
Complete Door Interlock Assembly, 208/230 V 05700-004-47-47

Complete Door Interlock Assembly, 115 V (for 460 V Machine) 05700-004-52-89



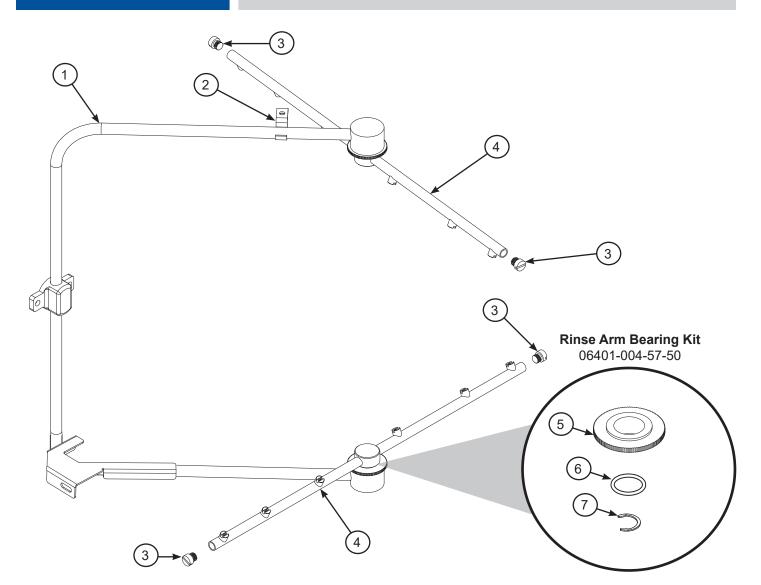
ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	Solenoid, Door Interlock, 208/230 V Solenoid, Door Interlock, 115 V (for 460 V Machine)	05999-004-47-49 05700-004-52-88
2	1	Solenoid Stop	05700-004-47-51
3	1	Bearing, Dry Running Sleeve, 1/4" ID	03120-004-47-52
4	1	Locknut, 1/4-20 Low Profile with Nylon Insert	05310-374-02-00
5	1	Bracket, Solenoid	05700-004-50-99
6	1	Bracket, Solenoid Guide	05700-004-51-00
7	4	Screw, 6-32 x 1/8", Pan Head Phillips	05305-004-51-01
8	1	Spring, Conical Compression	05340-004-47-53
9*	1	Guide Plate, Door Interlock	05700-004-47-40

\*Item not included in part number of complete door interlock assembly and must be ordered separately.



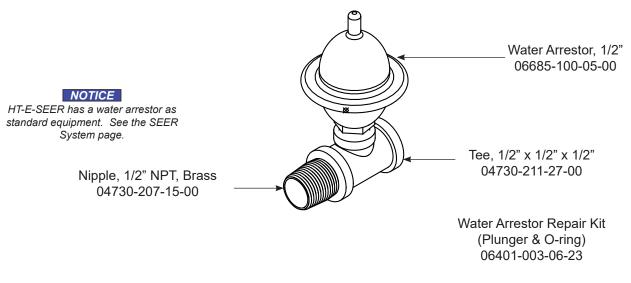
# WASH & MOTOR

ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	Wash Arm Assembly	05700-021-39-23
2	1	Motor Support	05700-004-40-61
3	1	Wash Halo	05700-004-42-21
4	2	Pipe Clamp	05700-000-35-06
5	5	Wash Arm End-cap	05700-003-31-59
6	2	Screw, 1/4-20 x 1/2"	05307-011-36-96
7	4	Locknut, 1/4-20 Hex with Nylon Insert	05310-374-01-00
8	1	Manifold Gasket	05330-002-34-77
9	1	Wash Hub	05700-004-43-04
10	1	Pump and Motor, 208/230 V	06105-004-35-22
10	1	Pump and Motor, 460 V	06105-003-52-78
11	1	Discharge Hose, 5/8" x 8"	05700-004-46-28
12	1	Hose, 1 1/4" x 2 3/4"	05700-011-44-48
13	4	Clamp, 1 1/16" to 2"	04730-719-18-00
14	1	Hose, Manifold Bottom	05700-001-22-92
15	3	Clamp, 13/16" to 1 1/2"	04730-719-06-09
16	2	Hosebarb, 90-Degree, 3/4" x 1"	04730-011-65-87
17	1	Drain Valve Assembly, 208/230 V	04730-003-33-64
	1	Drain Valve Assembly, 115 V (for 460 V Machine)	04730-003-34-60
18	1	Bracket, Drain Valve Support, 208/230 V	05700-004-35-85
10	1	Bracket, Drain Valve Support, 460 V	05700-004-42-01
19	1	Drain Hose	04720-004-32-00



ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	Complete Rinse Manifold Assembly	05700-004-40-58
2	1	Pipe Clamp	05700-000-35-06
3	4	Rinse Arm End-cap	04730-111-60-41
4	2	Complete Rinse Arm Assembly	05700-004-39-39
4	2	Rinse Arm	05700-004-38-75
5	2	Bearing Assembly, Rinse Arm	05700-004-54-71
6	2	O-ring (included in item #5)	05330-002-60-69
7	2	Retaining Ring	05340-112-01-11

#### SHOCK ABSORBER (WATER ARRESTOR) OPTION



#### PRESSURE REGULATING VALVE (PRV) OPTION



**NOTICE** HT-E-SEER has a PRV as standard equipment. See the SEER System page.

#### SCALE PREVENTION SYSTEM (SPS) OPTION

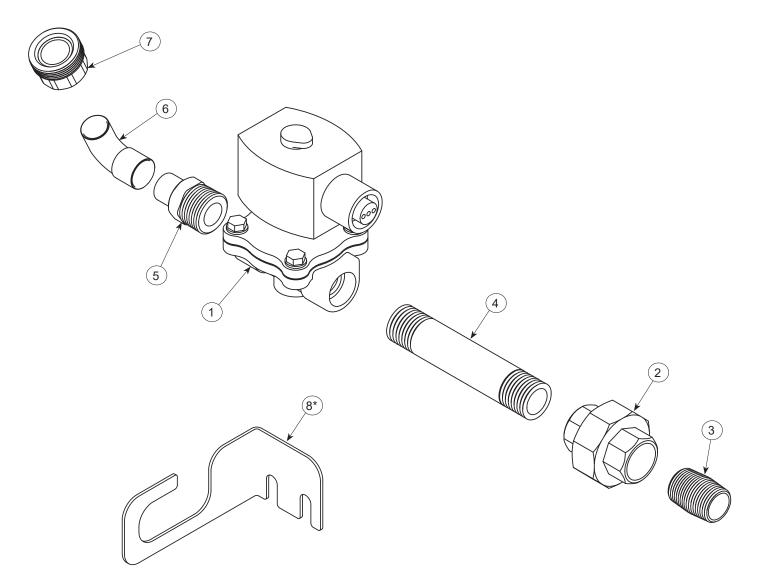
- Replacement Cartridge (inspect at least every 6 months) 0 04730-003-28-04 0 SPS System **Replacement Test Strip** 04730-003-28-03 (Not Shown) 06401-003-28-06 NOTICE Must be installed vertically. The provided bracket is secured to the wall. Observe proper inlet/outlet water directions (flow directions are molded into the top of the head). Line pressure should be released before changing cartridges. Machine should be delimed before installation.



### HT-E PLUMBING

Complete Inlet Plumbing Assembly, 208/230 V 05700-004-09-03

Complete Inlet Plumbing Assembly, 115 V (for 460 V Machine) 05700-004-44-40

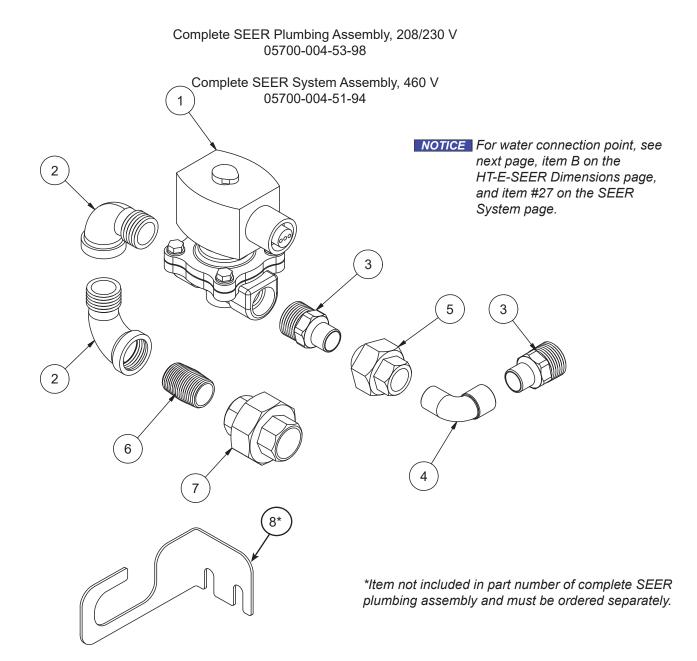


\*Item not included in part number of complete plumbing assembly and must be ordered separately.

# HT-E PLUMBING

ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	Valve, 1/2", 208/230 V Valve, 1/2", 115 V (for 460 V Machine)	04810-003-71-56 04810-003-71-55
2	1	Union, 1/2" x 1/2" Brass	04730-003-62-44
3	1	Nipple, 1/2" Close Brass	04730-207-15-00
4	1	Nipple, 1/2" x 4" NPT Brass	04730-207-04-00
5	1	Adapter, 1/2" Fitting, Male	04730-011-59-53
6	1	Elbow, 1/2"	04730-406-31-01
7	1	Hose Adapter	04720-004-24-68
8*	1	Bracket, Plumbing Support	05700-004-56-19

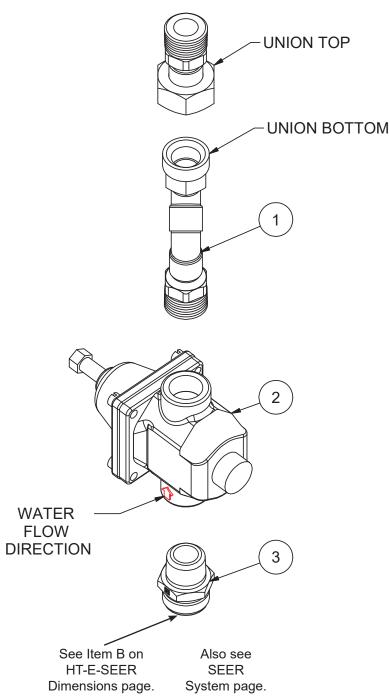
## HT-E-SEER PLUMBING



ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	Valve, 1/2", 208/230 V	04810-003-71-56
1		Valve, 1/2", 115 V (for 460 V Machine)	04810-003-71-55
2	2	Elbow, 90-Degree, 1/2" Street Brass	04730-206-08-00
3	2	Adapter, 1/2"	04730-011-59-53
4	1	Elbow, 1/2"	04730-406-31-01
5	1	Union, 1/2"	04730-412-05-01
6	1	Nipple, 1/2" Close Brass	04730-207-15-00
7	1	Union, 1/2" x 1/2" Brass	04730-003-62-44
8*	1	Bracket, Plumbing Support	05700-004-56-19

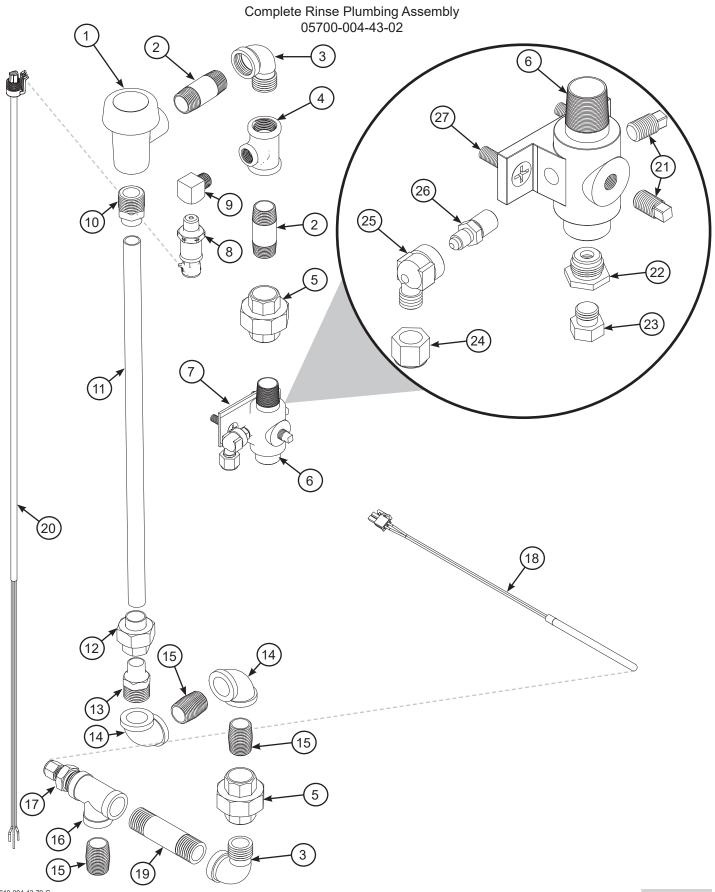
### HT-E-SEER PLUMBING

Complete SEER PRV Plumbing Assembly 05700-004-56-92



ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	Plumbing Inlet, Offset	05700-004-56-93
2	1	PRV, 1/2"	04820-004-09-37
3	1	Garden Hose Connector	04730-004-24-76

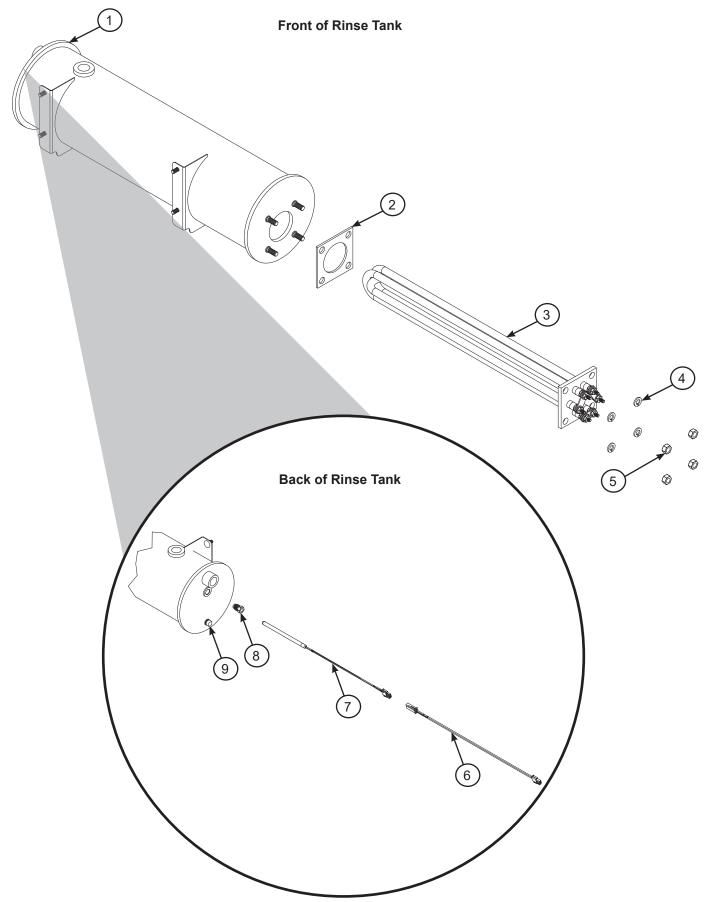
## RINSE PLUMBING



## **RINSE PLUMBING**

ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	Vacuum Breaker, 1/2" Brass	04820-003-06-13
2	2	Nipple, 1/2" Brass, 2" Long	04730-207-19-00
3	2	Elbow, 90-Degree, 1/2" Street Brass	04730-206-08-00
4	1	Tee, 1/2" x 1/2" x 1/4"	04730-002-22-56
5	2	Union, 1/2" x 1/2" Brass	04730-003-62-44
G	1	Complete Rinse Injector Assembly	05700-004-43-86
6	1	Rinse Injector	09515-004-22-73
7	1	Gasket, Rinse Manifold	05330-003-75-91
8	1	Pressure Transducer	05945-004-17-01
9	1	Elbow, 90-Degree, 1/4" x 1/4" Brass	04730-003-77-83
10	1	Adapter, Male	04730-401-03-01
11	1	Copper Tube, 1/2" x 15 1/2"	05700-000-97-23
12	1	Union	04730-412-05-01
13	1	Adapter, Male, 1/2" Fitting	04730-011-59-53
14	2	Elbow, 90-Degree, 1/2" Brass	04730-011-42-96
15	3	Nipple, 1/2" Brass	04730-207-15-00
16	1	Tee, 1/2" Brass	04730-211-27-00
17	1	Compression Fitting, 1/2" x 1/4"	04730-004-36-38
18	1	Thermistor Probe, 4" with 18" Cable	06685-004-34-58
19	1	Nipple, Brass 1/2" x 3"	04730-004-20-10
20	1	Harness, Transducer	05700-004-33-62
21	2	Plug, 1/8" Brass	04730-209-07-37
22	1	Adapter	05700-002-29-75
23	1	Thermostat Fitting, Brass	05700-011-73-73
24	1	Nut, Tube, 1/8"	04730-011-59-45
25	1	Fitting, Outlet Elbow	04820-111-51-18
26	1	Check Valve	04820-111-51-14
27	2	Screw, 1/4-20 x 1"	05305-011-81-58

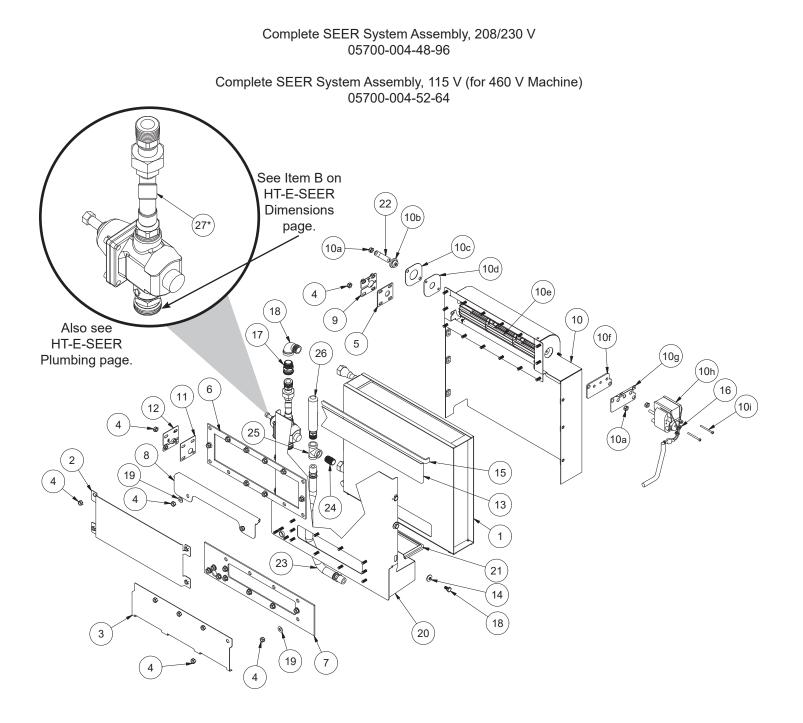
RINSE TANK



## RINSE TANK

ITEM	QTY	DESCRIPTION	PART NUMBER
	1	Rinse Tank, 208/230 V	05700-004-41-88
	1	Rinse Tank, 460 V	05700-004-44-46
2	1	Heater Gasket	05330-011-47-79
3	1	Rinse Heater, 5.45 kW, 208-230 V	04540-004-45-12
	1	Rinse Heater, 5.45 kW, 460 V	04540-121-65-99
4	4	Lockwasher, Split 5/16"	05311-275-01-00
5	4	Nut, Hex 5/16-18	05310-275-01-00
6	1	Cable, Temperature Probe	05700-004-33-23
7	1	Thermistor Probe, 4" with 18" Cable	06685-004-34-58
8	1	Fitting, 1/4", Brass Nut/Sleeve	05310-924-02-05
9	1	Plug, 1/4" Brass	04730-209-01-00
10	1	Thermostat, Rinse Tank High-limit (Not Shown)	05930-004-33-12

SEER SYSTEM

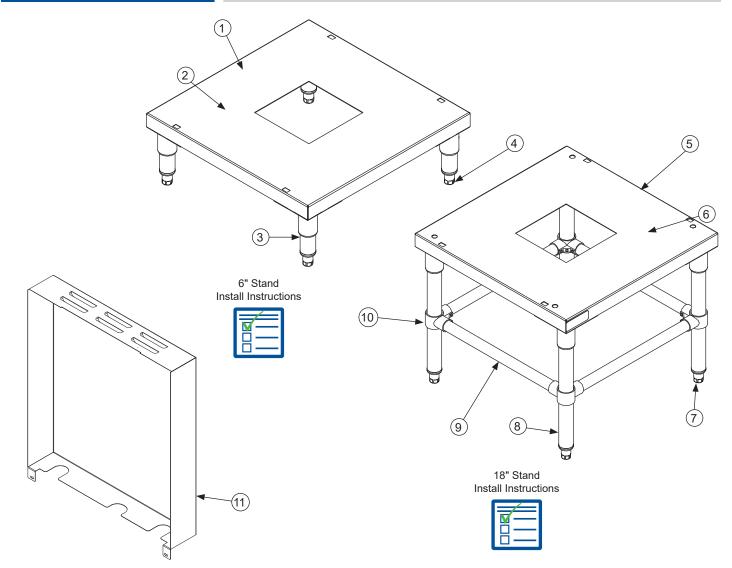


\*Item not included in part number of complete SEER system assembly and must be ordered separately.

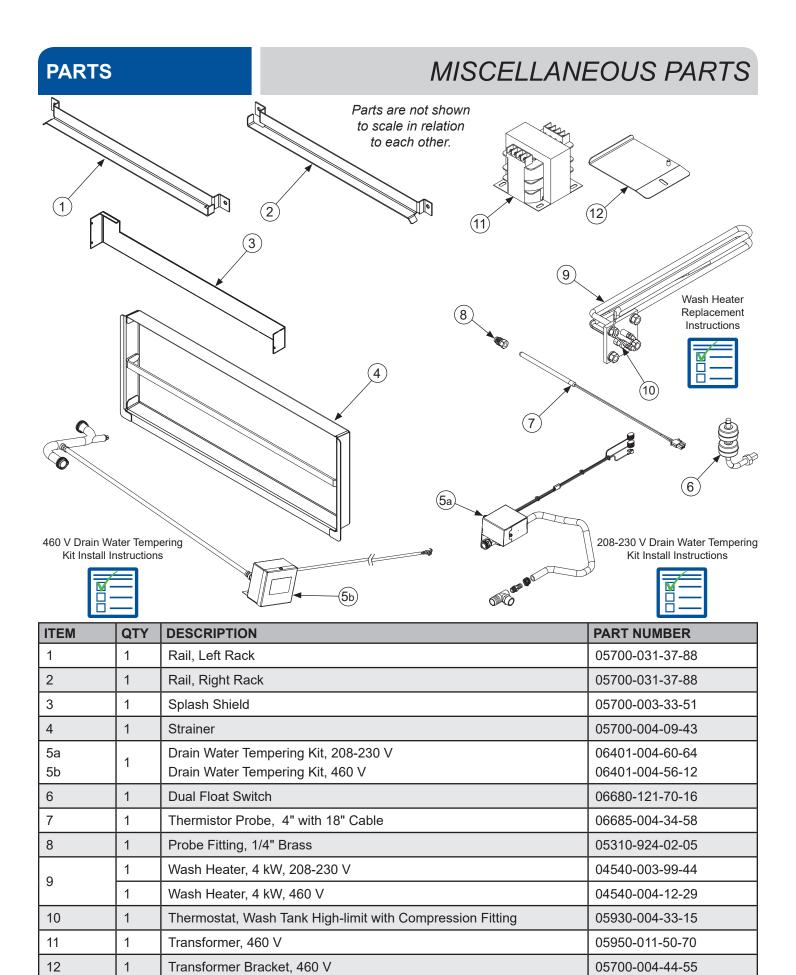
## SEER SYSTEM

1	QTY	DESCRIPTION	PART NUMBER
I I	1	Heat Exchanger, 3/8", Tubes 1/2"	04420-004-37-32
2	1	SEER System, Top Cover	05700-004-47-21
3	1	SEER System, Bottom Cover	05700-004-47-19
4	36	Locknut, 1/4-20 Hex with Nylon Insert	05310-374-01-00
5	1	SEER System, Plumbing	05330-004-55-58
6	1	SEER System, Top Gasket	05330-004-48-50
7	1	SEER System, Bottom Gasket	05330-004-48-51
8	1	SEER System, Diversion Plate	05700-004-47-27
9	1	SEER System, Plumbing Seal Bracket	05700-004-47-30
10 10a 10b	1 4 1	Complete Fan & Housing Assembly, 208/230 V Complete Fan & Housing Assembly, 115 V (for 460 V Machine) Locknut, 1/4-20 Hex with Nylon Insert Bushing & Housing Assembly	05700-004-50-83 05700-004-52-63 05310-374-01-00 03120-004-50-88
10c 10d 10e 10f 10g	1 1 1 1	Bracket, Interchangeable Bearing Boot Gasket, Interchangeable Bearing Boot Wheel, Blower Gasket, Motor Bracket, Motor Adjustment	05700-004-50-94 05330-004-50-95 05999-004-50-85 05330-004-50-90 05700-004-50-92
10h 10i	1 2	Motor, Fan, 208/230 V Motor, Fan, 115 V (for 460 V Machine) Screw, 6-32 x 1 3/4"	05999-004-50-84 05999-004-52-62 05305-004-36-67
11	1	SEER System, Plumbing Seal Gasket (Outlet)	05330-004-55-57
12	1	SEER System, Plumbing Seal Bracket (Outlet)	05330-004-51-27
13	1	SEER System, Gasket Top	05330-004-55-54
14	5	Washer, Bonded Sealing 1/4" x 3/4" OD	05311-002-77-79
15	1	Strip, 1/2" x 1/8" x 22" Sponge Rubber	05330-100-10-00
16	2	Tie, Panduit Cable	05975-602-01-16
17	1	Adapter, Double Male	04720-004-51-55
18	1	Elbow, 90-degree 1/2" Street Brass	04730-206-08-00
19	20	Washer, 1/4-20 ID	05311-174-01-00
20	1	SEER System, Bottom Mount	05700-004-47-22
21	1	Gasket, Enclosure Back	05330-004-56-02
22	1	Bracket, Bearing Hard Stop	05700-004-67-53
23	1	Discharge Hose, Rinse Tank	05700-004-51-56
24	1	Nipple, 1/2" Close Brass	04730-207-15-00
25	1	Tee, 1/2" Brass	04730-211-27-00
20			1
26	1	SEER System, Shock Absorber (Water Hammer)	04730-004-58-56

# STANDS & PANELS

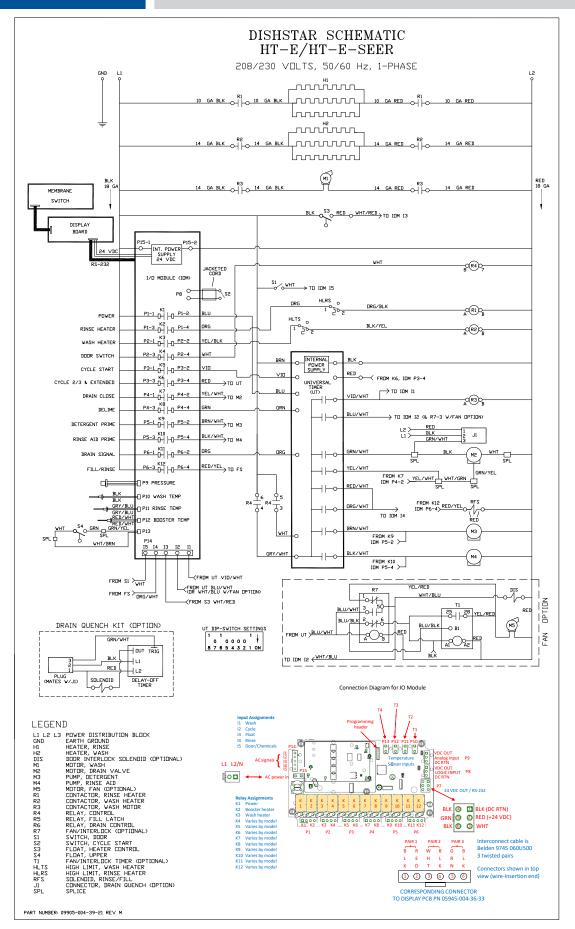


ITEM	QTY	DESCRIPTION	PART NUMBER
1	1	6" Stand Assembly	05700-003-34-24
2	1	Stand	05700-002-88-82
3	4	6" Leg	05700-021-61-10
4	4	Bullet Foot	05340-108-01-03
5	1	18" Stand Assembly	05700-003-34-25
6	1	Stand	05700-002-88-82
7	4	Bullet Foot	05340-108-01-03
8	4	18" Leg	05700-002-89-47
9	4	Cross Brace	05700-003-25-90
10	4	Cross Member Bracket	04730-003-25-89
11	1	Back Panel	05700-004-58-14
11a	3	Edge Guard, Back Panel (Not Shown)	05330-002-83-04



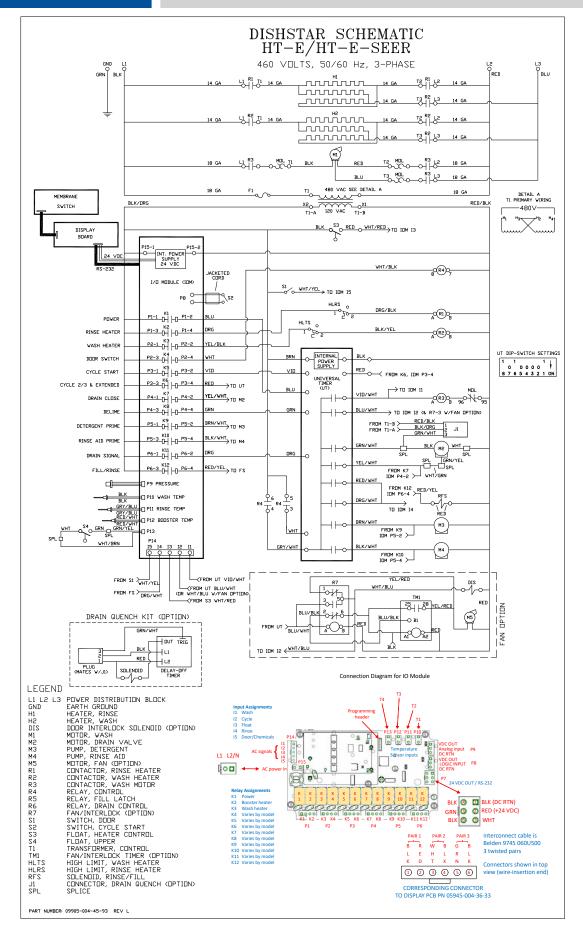
#### **SCHEMATICS**

#### 208/230 V, 50/60 HZ, 1-PHASE



#### **SCHEMATICS**

# 460 V, 60 HZ, 3-PHASE





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