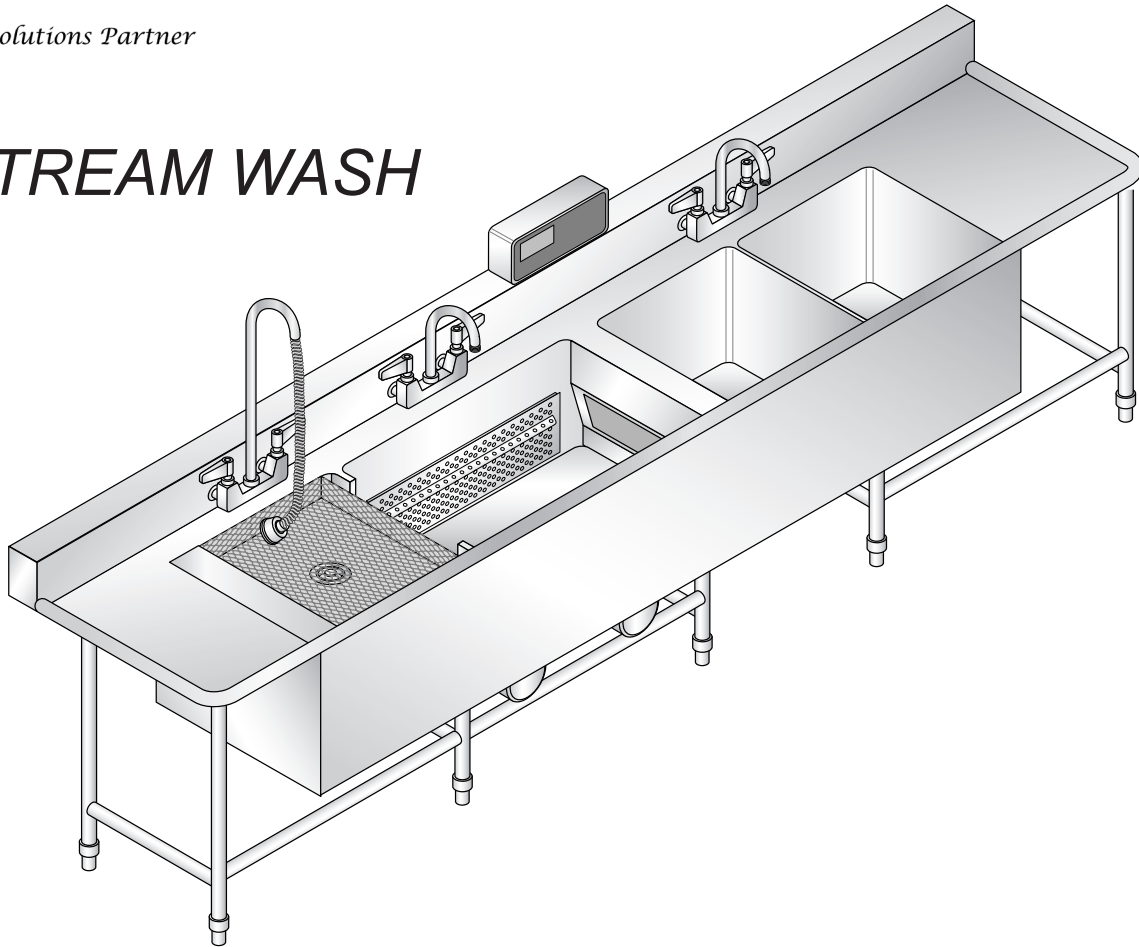




Your Solutions Partner

Installation and Operation Manual

X-STREAM WASH



**Please read this manual completely before attempting
to install, operate or service this equipment**

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SAFETY AND ELECTRICAL WARNINGS

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

READ THIS MANUAL THOROUGHLY BEFORE OPERATING, INSTALLING OR PERFORMING MAINTENANCE ON THE EQUIPMENT.

⚠ WARNING: Failure to follow all the instructions in this manual can cause property damage, injury or death.

⚠ WARNING: Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death.

⚠ WARNING: Electrical connections should be performed only by a certified professional.

⚠ WARNING: Electrical and grounding connections must comply with the applicable portions of the National Electrical Code and/or all local electric codes. Failure to comply with this procedure can cause property damage, injury or death.

⚠ WARNING: Plumbing connections must comply with applicable sanitary, safety and plumbing codes.

⚠ WARNING: Before connecting the unit to the electrical supply, verify that the electrical and grounding connections comply with the applicable portions of the National Electrical Code and/or other local electrical codes. Failure to comply with this procedure can cause property damage, injury or death.

⚠ WARNING: Before connecting the unit to the electrical supply, verify that the electrical connection agrees with the specifications on the data plate. Failure to comply with this procedure can cause property damage, injury or death.

⚠ WARNING: UL73 grounding instructions: This appliance must be connected to a grounded, metal, permanent wiring system or an equipment-grounding conductor must be run with the circuit conductors and connected to the equipment-grounding terminal or lead on the appliance. Failure to comply with this procedure can cause property damage, injury or death.

⚠ WARNING: Before performing any service that involves electrical connection or disconnection and/or exposure to electrical components, always perform the Electrical LOCKOUT/TAGOUT Procedure. Disconnect all circuits. Failure to comply with this procedure can cause property damage, injury or death.

⚠ WARNING: Before removing any sheet metal panels or servicing this equipment, always perform the Electrical LOCKOUT/TAGOUT Procedure. Be sure all circuits are disconnected. Failure to comply with this procedure can cause property damage, injury or death.

⚠ WARNING: Do not operate this equipment without properly placing and securing all covers and access panels. Failure to comply with this procedure can cause property damage, injury or death.

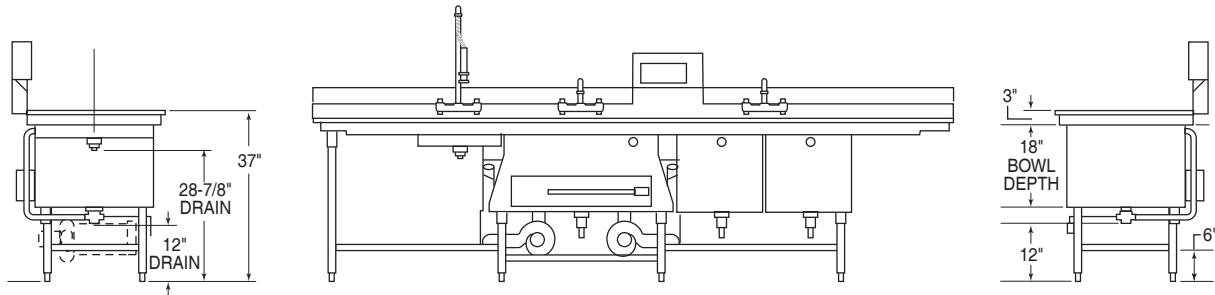
⚠ WARNING: Do not use or store gasoline or other flammable vapors or liquids in the vicinity of this or any other appliance. Failure to comply can cause property damage, injury or death.

⚠ WARNING: In the event of a power failure, do not attempt to operate this appliance. Failure to comply can cause property damage, injury or death.

I. GENERAL INFORMATION

A. X-STREAM WASH SPECIFICATION

DIMENSIONS:



MODEL NUMBER KEY:

SSSTUVW-XXYY with suffixes. Where:

- SSS** Indicates the type of unit
XSW – Denotes an X-Stream wash unit
- T** Indicates the options
– – Denotes no options
H – Denotes the heated sanitizer sink option
C – Denotes that chemical injection sanitizer sink option
- U** Indicates the controller model number
1 – K1000 Control (Not available on units with a heated sanitizer sink)
5 – K5000 Control
- V** Indicates the heating element wattage used in the powered wash sink
2 – 2500 watt
5 – 5000 watt
7 – 7000 watt (Not available on 208-240 VAC units that have a heated sanitizer sink)
- W** Indicates the number of soap pumps on the unit
0 – No Wash Sink Soap Pumps
1 – With Wash Sink Soap Pump
- XX** Indicates the overall length of the powered wash sink in inches
36 – 36 inches
42 – 42 inches
48 – 48 inches
54 – 54 inches
60 – 60 inches
72 – 72 inches
- YY** Indicates the overall width of the powered wash sink in inches
26 – 26-1/2 inches
28 – 28 inches

Voltage and Phase will be handled separately from the model number. They will be listed on the rating tag located in the Control Panel.



II. INSTALLATION INSTRUCTIONS

A. QUALIFIED PERSONNEL

These installation instructions are for the use of **qualified installation and service personnel only**. Installation or service by other than qualified personnel may result in damage to the unit and/or injury to the operator.

Qualified installation personnel are those individuals, firms, companies or corporations which either in person or through an agent is engaged in and responsible for:

- The installation of electrical wiring from the electric meter, main control box or service outlet to the electrical appliance. Qualified installation personnel must be familiar with all precautions required and have complied with all requirements of state and local authorities having jurisdiction. See: National Electrical Code, ANSI/NFPA70.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

B. DELIVERY AND INSPECTION

Duke Manufacturing Co. does everything within its power to ensure you received your unit in good condition. They are crated on heavy wooden skids and packed to prevent shipping damage. They have all been carefully inspected before they were packaged and consigned to the carrier.

Upon delivery of your Duke unit:

- Look over the shipping container, carefully noting any exterior damage on the delivery receipt, which must also be signed by the driver/ delivery person.
- Unpack and check for any damage, which was not evident on the outside of the shipping container.
- Check for concealed damage. The carrier must be notified within fifteen (15) days of the delivery of the unit and the crate and all packaging materials must be retained for inspection.

Duke Manufacturing Co. cannot assume liability for loss or damage suffered in transit. The carrier assumes full responsibility for delivery in good order when the shipment was accepted. However, we are prepared to assist you in filing your claim.

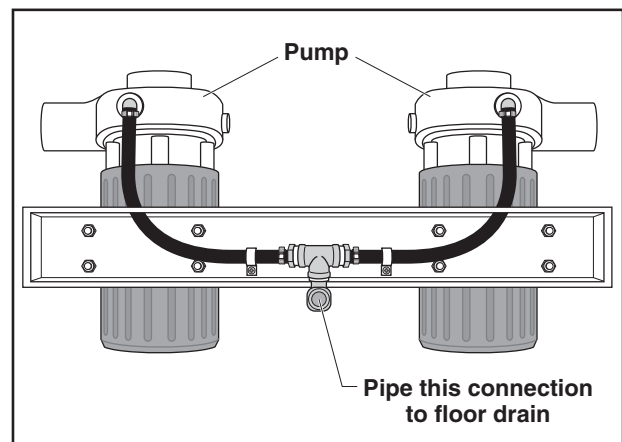
C. PLACEMENT

- **HANDLING** – The units are very heavy and may require the use of moving equipment. Consult with your local restaurant equipment supplier.
- **INSPECTION** – Inspect the area where the unit is being installed. Check for proper clearance with shut off valves and drain line hook ups.
- **LEVELING** – The unit is equipped with adjustable bullet feet. Use a wrench or pliers to adjust up or down.
- **SEALING** – Seal the top of the backsplash to the wall using an NSF approved silicone sealant.

⚠ WARNING: Equipment is heavy. Heavy lifting may result in bodily injury. Do not lift or move without adequate help.

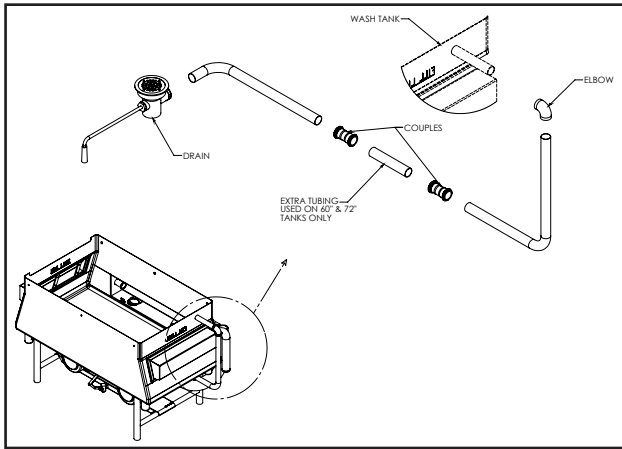
D. PLUMBING REQUIREMENTS

- **WATER SUPPLY** – Hot and Cold Water should be supplied by ½" or ¾" water lines, with the ¾" being the preferred method.
- **DRAINS** – A 1-1/2" minimum waste connection is required. If equipped, the scrapping sink should have a 1-1/2" NPS connection, while the wash, rinse, and sanitize sinks typically have a 2" NPS connection.
- **PUMPS** – The wash tank pumps will need to be piped to a floor drain. This uses a ½" NPT connection.



Bottom View of Pump Assembly

- Any plumbing overflows for the unit are shipped uninstalled and will need to be installed during installation. See below for a depiction of the main tank overflow (Note: A main tank overflow is an option and is not provided on some units).



Overflow Kit (Optional)

E. ELECTRICAL CONNECTIONS

⚠ WARNING: Electrical Hazard – May result in electrical shock, burns, or death.

⚠ CAUTION: Terminal block is phase sensitive. Improper phase can cause incorrect pump rotation. Pump rotation must be verified during installation.

Your unit is supplied for connection to a 208, 240 or 480 volt grounded circuit. The electric motor, indicator lights and control circuit are connected internally and require no secondary power supply.

Before making any connections to these units, check the rating plate to ensure that the voltage and phase of the unit is compatible with the electrical supply. When installing, all units must be electrically grounded in accordance with local codes, or in the absence of local codes, with the National Electrical Code, ANSI/NFPA 70 (in Canada - CSA Std. C22.2). Wiring diagrams are located in the control compartment area of the unit. Standard wiring schematics are also provided with this manual.

To ensure service reliability and safety, use water-tight connections and the proper wire gauge. A wire diagram is located inside the control panel lid and also at the back of this manual.

F. XSTREAM WASH OPTIONS

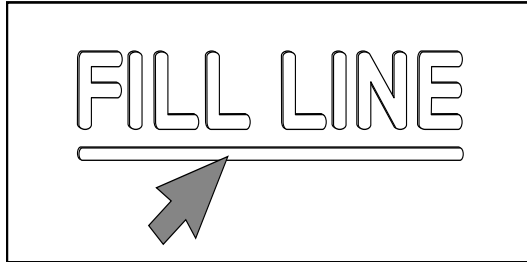
ITEM	PART NAME	PART NO.
1	Scrap Basket, X-Stream Engine, 26.5"	115749
2	Scrap Basket, X-Stream Engine, 28"	115650
3	Pan Rack, Fixed, 26.5" Wide by 60" Long Unit	115800
4	Pan Rack, Fixed, 28" Wide by 60" Long Unit 1	115801
5	Pan Rack, Adjustable, 26.5" Wide by 36" Long Unit	115811
6	Pan Rack, Adjustable, 26.5" Wide by 42" Long Unit	115812
7	Pan Rack, Adjustable, 26.5" Wide by 48" Long Unit	115813
8	Pan Rack, Adjustable, 26.5" Wide by 54" Long Unit	115814
9	Pan Rack, Adjustable, 26.5" Wide by 60" Long Unit	115815
10	Pan Rack, Adjustable, 26.5" Wide by 72" Long Unit	115816
11	Pan Rack, Adjustable, 28" Wide by 36" Long Unit	115817
12	Pan Rack, Adjustable, 28" Wide by 42" Long Unit	115818
13	Pan Rack, Adjustable, 28" Wide by 48" Long Unit	115819
14	Pan Rack, Adjustable, 28" Wide by 54" Long Unit	115820
15	Pan Rack, Adjustable, 28" Wide by 60" Long Unit	115821
16	Pan Rack, Adjustable, 28" Wide by 72" Long Unit	115822
17	Pan Rack, Drop-in	115891
18	Basket, Skewer	115833
19	Basket, Utensil	115653

III. OPERATION INSTRUCTIONS

A. INITIAL STARTUP

A-10 Fill Tanks with Water

- WASH TANK – Fill wash tank with hot water to the marked Fill Line. The water temperature should be 110° to 115° F (43° to 46° C).



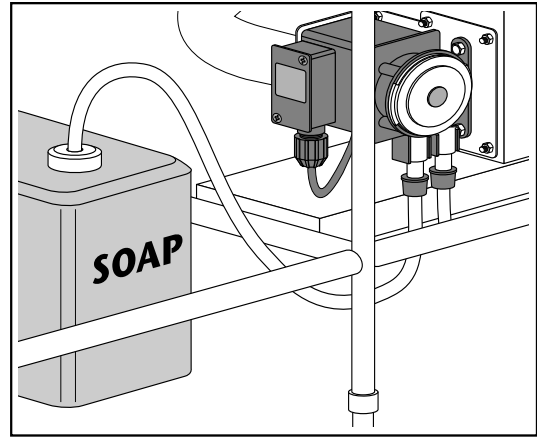
Fill Line

- RINSE TANK – If equipped, fill the rinse tank with hot water to the marked Fill Line. The water temperature should 75° to 80° F (24° to 27° C).
- SANITIZE TANK – If equipped, fill the sanitize tank with hot water to the marked Fill Line. The water temperature should 75° to 80° F (24° to 27° C).

⚠ WARNING: Do not connect to hot-water supply exceeding a temperature of 115°F (46°C).

A-20 Add Soap / Chemicals

- WASH TANK – If your unit is equipped with the soap injection option, then make sure that the soap pump pick up tube is inserted into the soap container. The soap will automatically be injected into the wash tank. Otherwise, manually add the soap into the wash tank in accordance with the chemical supplier's instructions.



Soap Pump Installation

- SANITIZE TANK – If equipped, add the appropriate sanitizing chemical to the sanitize tank. Consult chemical supplier and your local health code.

A-30 Approved Chemicals

It is recommended that chemicals that are low to non foaming, metal safe, and non-caustic be used in the wash and sanitize tank.

Caustic chemicals are capable of burning, corroding, or destroying living tissue and should not be used. If you plan on using caustic chemicals, then a rolling lid is required. If your unit did not come with a rolling lid, one can be ordered from the factory. Contact information is provided on the inside cover of this manual.

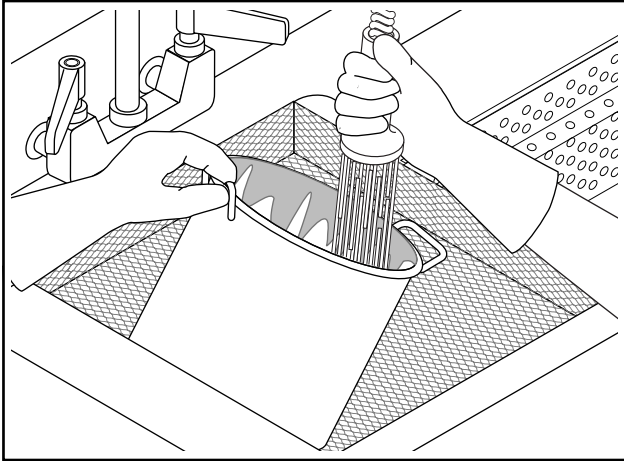
⚠ WARNING: Chemicals used in the wash tank that do not have de-foaming capabilities will not run properly and could damage the machine. Consult your chemical supplier before use.

⚠ WARNING: Chemical Hazard - could result in serious injury or death. Always consult with your chemical supplier and read all warning labels before handling new chemicals.

B. PRE-SCRAPPING

Wares should be scrapped, NOT SCRUBBED, prior to loading to remove heavy soils and debris. This will improve wash results, reduce chemical costs and reduce the number of water changes needed during the day.

Use the scrapping sink (if equipped) or scrap the wares in a separate waste area close to the unit. Do not scrape wares directly into the wash tank.

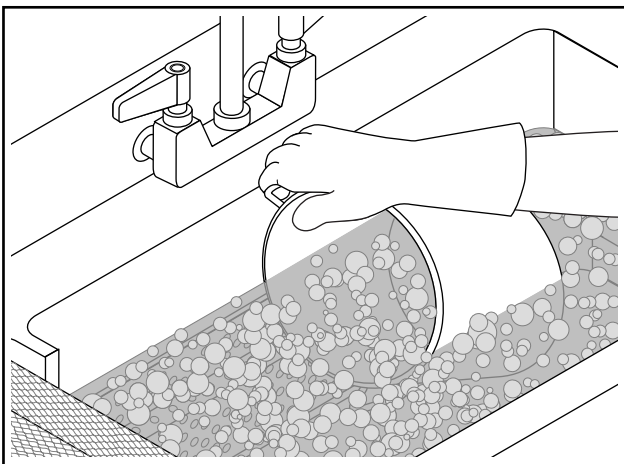


Pre-Scrapping

C. LOADING WASH TANK

Pots and Pans

Pots, pans, mixing bowls, etc. can be placed into the wash tank in any order.



Loading Wash Tank

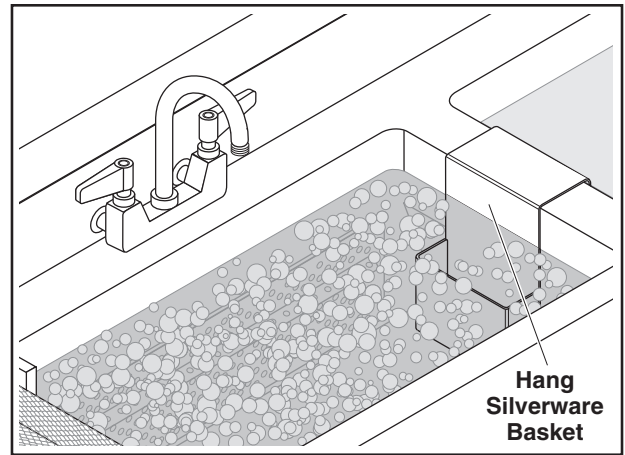
NOTE: Pots and Pans that are stacked or nested together during the wash cycle will not be cleaned properly. Pause the cycle and move them apart from one another.

Utensils and Silverware

Utensils and silver ware must be placed in a utensil basket.

If your unit was not supplied with a utensil basket, one can be ordered from the factory. Contact information is provided in the Customer Assistance section of this manual.

To use the utensil basket, simply hang the basket over the side of the wash tank, place the utensils and silver ware in the basket, and run a wash cycle.



Utensil Basket Placement

⚠ WARNING: To prevent bodily injury never load knives or other sharp objects into the machine.

Sheet Pans

Load sheet pans as described below to ensure the best washing methods.

If your unit was supplied with a sheet pan rack, place the rack into the wash tank in a vertical position (opening on top). Load the rack with sheet pans, and then pivot the rack to a horizontal position.

To load sheet pans without the rack, insert the sheet pans into the wash tank one at a time with the baking side up. Place the pans in an alternating crisscross pattern, so as not to have them nest inside of each other.

It is recommended that not more than 10 to 12 pans be placed in the wash tank during a wash cycle.

If your unit did not come with a sheet pan rack, one can be ordered from the factory. Contact information is provided in the Customer Assistance section of this manual.

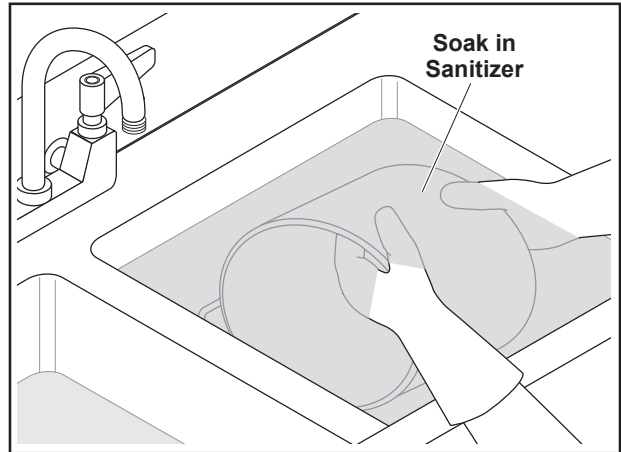
D. START THE WASH CYCLE

After the wash tank has been loaded, press the cycle start button. Which button you press will be determined by which controller that has been installed on your unit. See the Control Panels section of this manual for more details.

Unload Wash Tank

The display will indicate that the items are clean when a wash cycle has been completed. At this time the system will switch to a holding cycle. This cycle has slower water movement that will keep grease and soiled sediments from falling back onto the items that were just cleaned.

Remove the clean items from the wash tank and dip into the rinse tank to rinse off any soap or soil residue.

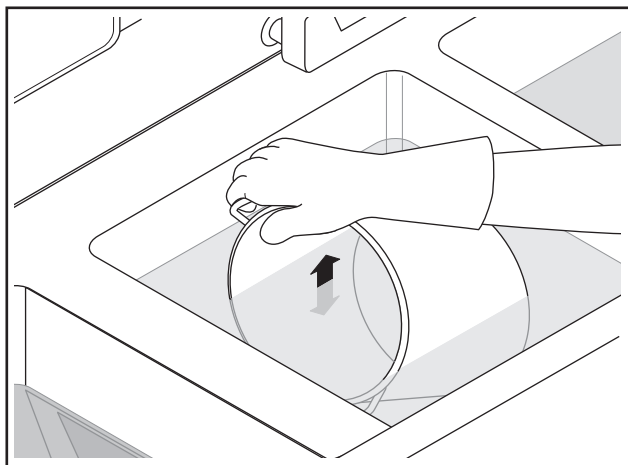


Place items into Sanitize Tank

E. CONTROL PANELS

E-10 Identifying Your Control Panel

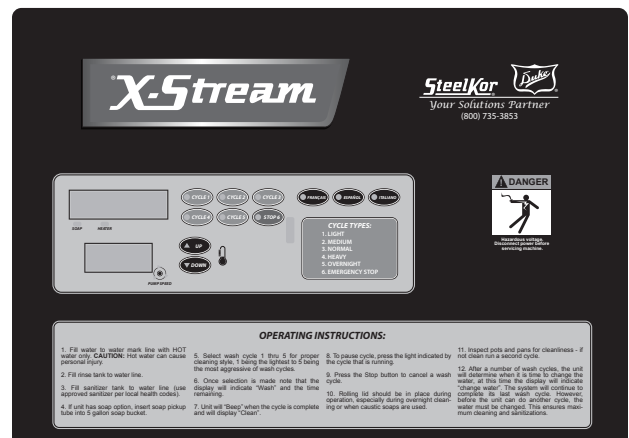
There are two types of control panels used, the K1000 and the K5000. Your control type is printed on the front panel. Use the diagrams below to determine which control you have.



Place items into Rinse Tank

Place items into the sanitize tank and soak according to the chemical supplier's instructions and in accordance with local health code.

Remove the item and allow to air dry when sanitization is complete.



E-20 K1000 Control Panel



K1000 Control Panel

Mylar Buttons



TEMP Button Press to set or display the wash tank's running temperature. When pressed, the display will toggle between SP and 115 (115 represents a temperature set point value and may be different on your display), at this time you can press the Up and Down Arrow buttons to change the set point temperature. Once changed, press the Temp button again to lock in the new value.



Down Arrow Button Pressing this button, while not in the temperature set point mode, will display the time remaining before a mandatory water change. Pressing this button while in the temperature set point mode, will lower the temperature set point setting.



Up Arrow Button Pressing this button, while in the temperature set point mode, will raise the temperature set point value. Pressing this button while in the wash mode will display the heater's sheath temperature.



START/STOP Button Pressing this button will toggle on and off the circulation pumps.

Mylar Indicator Lights

- **Heater** Heater light will illuminate whenever the wash tank's heater is powered on.
- **Alarm** Alarm light will illuminate whenever an alarm has occurred.
- **Change Water** Change Water indicator light will flash when it is time to change water. The display will show d r n.
- **Soap** Soap indicator light will illuminate whenever the soap pump is powered on.

Basic Operation

When you first power up to use your wash tank, the display will show **FIL**, fill the wash tank to the water fill line (see the INITIAL STARTUP section).

Once the tank has been filled, press the **START/STOP** button to start the continuous wash cycle. Soap will be dispensed automatically into the wash tank.

During the wash operation, the display will show current water temperature and the heater light will cycle on and off as the heater is maintaining the preset water temperature.

The **START/STOP** button can be used to toggle on and off the circulation pumps. During a pause state, the heater is still in operation and maintaining the water temperature.

After a certain amount of time, the water is considered dirty and the circulation pumps will turn off, the display will show **drn**, and the change water indicator light will flash.

NOTE: Pressing the **Down Arrow** key will display the time remaining before a water change is required.

After the water has been drained, the display will show **FIL**. You are now ready to start another wash cycle.

Changing Temperature Set Point

The temperature set point is the water temperature setting for the wash tank and is the only parameter that can be set by the operator. If the **TEMP** button is pressed once, the display will switch back and forth from **SP** and **115** (115 represents the temperature setting and may be different from your display).

Use the **Up** or **Down** buttons to change the temperature setting. Once set, press the **TEMP** button to lock in the new value.

NOTE: If no button is pressed within three seconds, then your display will revert back to the way it was before the **TEMP** button was pressed. If the temperature setting was changed and the **TEMP** button was not pressed, then the temperature setting will remain unchanged.

Reset Change Water

The Change Water flag is cleared whenever the heater's sheath temperature rises above its set point. In the case of a heater failure this flag cannot be reset automatically. To manually reset this flag you will need to hold down the **Up** button and **START/STOP** button simultaneously for approximately 15 seconds. The controller will then enter the **FIL** state.

Temperature Sensor Fault

If the water or heater sheath temperature sensors should fail, the controller will indicate the fault by taking the controller to the **FIL** state. The alarm light will be on, the heater will be disabled, and the circulation pump will be off.

After the sensor(s) have been replaced, normal operation is resumed by exiting the **FIL** state.

Alarms

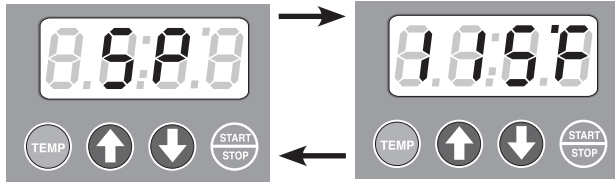
Alarm 1 is associated with the heater's sheath temperature, and is triggered when the temperature rises above the value set in **AL - 1** (see chart above).

Alarm 2 is associated with the wash tanks water temperature, and is triggered when the temperature rises above the value set in **AL - 2** (see chart above).

When one of these alarms is activated, the circulation pump will turn off and the alarm indicator light will be illuminated. The controller will enter the **FIL** state.

Programming – Controls Supplied After 12/01/2013

The programming mode can be accessed by holding the **TEMP** and **START/STOP** buttons simultaneously for 5 seconds. The display will switch back and forth between SP and 115.



The following parameters can be set in the programming mode:

Parameter	Description	Default Value
SP	Set Point Temperature	Default Temperature is 115°F
t1	Change Water Cycle Time	Default Cycle Time is 4:00 (H:MN)
t2	Soap Dispensing Delay Time	Default Delay Time is 0:45 (M:SC)
t3	Soap Dispensing Time	Default Dispensing Time is 1:30 (M:SC)
F/C	Celsius/Fahrenheit Selection	Default Temperature Units is Fahrenheit (F)

The **Up** and **Down** buttons are used to increment and decrement parameters.

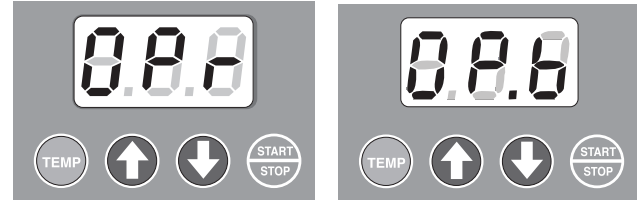
The **TEMP** button is used to scroll through the parameters.

Pressing the **TEMP** button after the last parameter saves the parameters and exits programming.

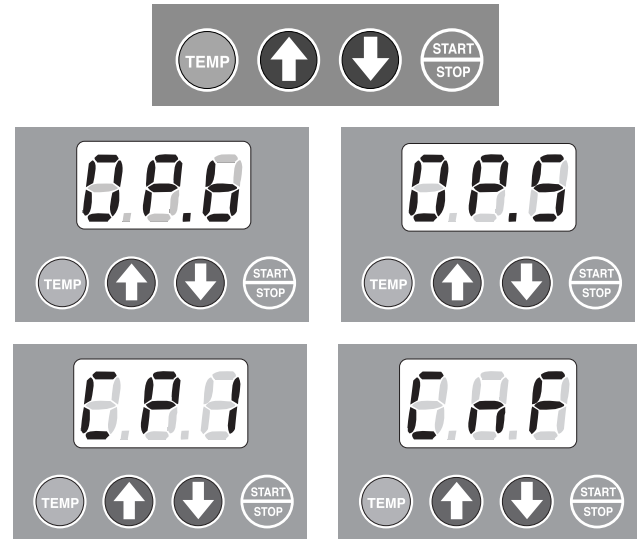
Programming – Controls Supplied Prior To 12/01/2013

Supervisor Mode

The supervisor mode can be accessed by holding the **TEMP** and **START/STOP** buttons simultaneously for 3 seconds. The display will toggle $\emptyset P \cdot b$ and $\emptyset P \cdot b$.



Pressing the **Up** or **Down** buttons will toggle between $\emptyset P \cdot b$, $\emptyset P \cdot 5$, CPI, and CnF.



Quick Helpful Hints:

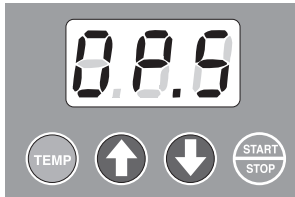
To enter and exit Modes: Press the **Temp** and **Start/Stop** buttons simultaneously.

To scroll through the parameters: Press the **Temp** button.

To scroll through the modes or change values for a parameter: Press the **Up** and **Down** button arrows.

Setup Mode – 0P . 5

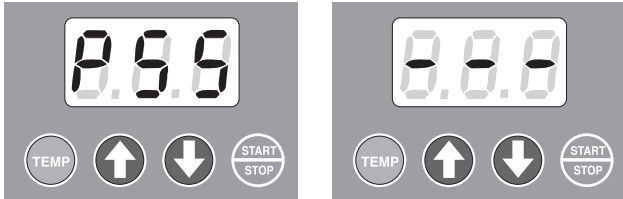
Enter the supervisor mode and press the **Up** or **Down** buttons until 0P . 5 appears in the display.



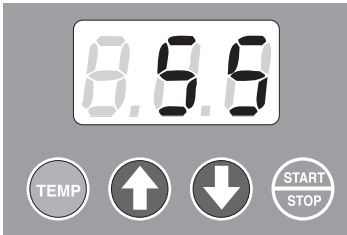
Press the **TEMP** button to select.



When prompted for a password PSS and three dashes toggle. The three dashes is where you enter the password of 55.



Use the **Up** and **Down** buttons to select 55.



Press the **TEMP** button to enter and lock the password and advance.



Press the **TEMP** button to advance between the parameters that are available, see parameter table.

(The parameter name and its value will be swapped in and out of the display.)

Press the **Up** and **Down** button to change the parameters value.



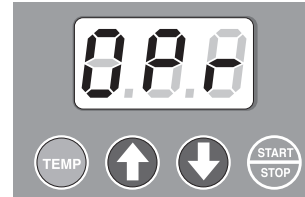
Once a value has been changed, press the **TEMP** key to lock in this value and move on to the next parameter.



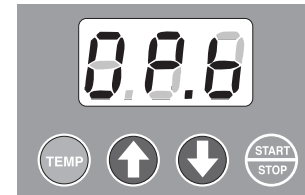
NOTE: If you do not press the **TEMP** button within 3 seconds after changing a parameters value, the new value will not be saved. Push **TEMP** button to access parameters again.

⚠	IMPORTANT	⚠
<p>Before you save and exit, you need to scroll through the parameters back to the temp display before pressing the Temp and Start/Stop buttons simultaneously.</p>		

To save and exit the supervisor mode, press **TEMP** and **START/STOP** buttons simultaneously for 3 seconds and OPr appears in the display.



Press the **Down** button once and OP.b appears in the display.



Then press the **TEMP** button and FIL appears in the display and you have exited the supervisor mode.



Setup Mode Parameter Table

Parameter Mne-monic	Parameter Name	Description	Table 1 Default Value (Fahrenheit)	Table 2 Default Value (Celsius)	Units
8.8.8	Setpoint	Temperature Set Point	115°F	46°C	Degrees
8.8.8	Timer 1	Change Water Cycle Time	4.00	4.00	H:MM
8.8.8	Timer 2	Soap Dispensing Delay Time	0.45	2.00	M:SS
8.8.8	Timer 3	Soap Dispensing Time	1.30	0.30	M:SS
8.8.8	Alarm 1	Alarm 1 Set Point	250°F	107°C	Degrees
8.8.8	Hysteresis	Alarm 1 Hyster-esis	0.1	0.1	%
8.8.8	Alarm 2	Alarm 2 Set Point	160°F	72°C	Degrees
8.8.8	Hysteresis	Alarm 2 Hyster-esis	0.1	0.1	%
8.8.8	Hysteresis	On/Off Hyster-esis	0.1	0.1	%
8.8.8	Range	Low Set Point Low Limit	100°F	38°C	Degrees
8.8.8	Range High	Set Point High Limit	125°F	52°C	Degrees

Configuration Mode – CnF.

Enter the supervisor mode and press the **Up** or **Down** buttons until CnF. is displayed. Press the **TEMP** button to select.

When prompted for a password (PSS), use the **Up** and **Down** buttons to select 415. Press the **TEMP** button to enter in the value. Press the **TEMP** button to toggle between the parameters that are available, see parameter table below.

The parameter name and its value will be swapped in and out of the display. Press the **Up** and **Down** button to change the parameters value. Once a value has been changed, press the **TEMP** button to lock in this value and move on to the next parameter. If you do not press the **TEMP** button within three seconds after changing a parameters value, the new value will not be saved.

Exit the supervisor mode when done with the setup mode.
NOTE: See Supervisor Mode section on how to exit.

Configuration Mode Parameter Table

Parameter Mnemonic	Description	Table 1 Default Value (Celsius)	Table 2 Default Value (Fahrenheit)	Units
P1	Input table	2	10	
P2	Low scale range of sensors	0°C	32°F	Degrees
P3	High scale range of sensors	282°C	540°F	Degrees
P4	Output 1 control action	rEu	rEu	
P5	Output 2 function	I	I	
P6	Output 2 alarm type	H.A.	H.A.	
P8	Alarm 1 standby function	OFF	OFF	
P11	Auto-ranging display	OFF	OFF	
P12	Filter sensor values	On	On	
P22	Output 3 function	I	I	
P23	Output 3 alarm type	H.A.	H.A.	
P25	Alarm 2 standby function	OFF	OFF	
P33	Access to OP.S mode	55	55	
P35	Access to CnF. mode	415	415	
P36	Access to I.CL mode	415	415	

Loading Celsius or Fahrenheit Tables

The controller contains two default parameter tables. Table 1 is used for Celsius operation, and Table 2 is used for Fahrenheit.

To load one of the default tables, enter the configuration mode (See instructions listed in the Configuration Mode – CnF section listed above). When CnF is displayed, press both the **Up** and **Down** buttons simultaneously. The display will show dL.F. Press the **Up** or **Down** buttons to display dL.1 for table 1 (Celsius), or dL.2 for table 2 (Fahrenheit).

Press the **TEMP** button to enter in your selection. The display will show Ld.t. This indicates that the loading procedure has been initiated and after approximately 1 second, the loading will be finished and the display will revert back to CnF.

Exit the supervisor mode when done. *NOTE: See Supervisor Mode section on how to exit.*

Timer Operation

The change water timer (t) will retain its current count when the washer is stopped or when power is disconnected from the controller.

The soap delay timer (t2) allows for a delay before soap is dispensed into the wash tank. This allows the soap to be added to a wash tank when it is full of water and the circulation pumps are running.

The soap dispensing timer (t3) determines the time for soap dispensing. A time of 0.00 will bypass the soap dispensing process.

Display Software Version

To display the software version, enter the configuration mode (See instructions listed in the Configuration Mode – CnF section listed above). When CnF displayed, press the **DOWN** button. The software version number will be displayed and should look something like d.17.

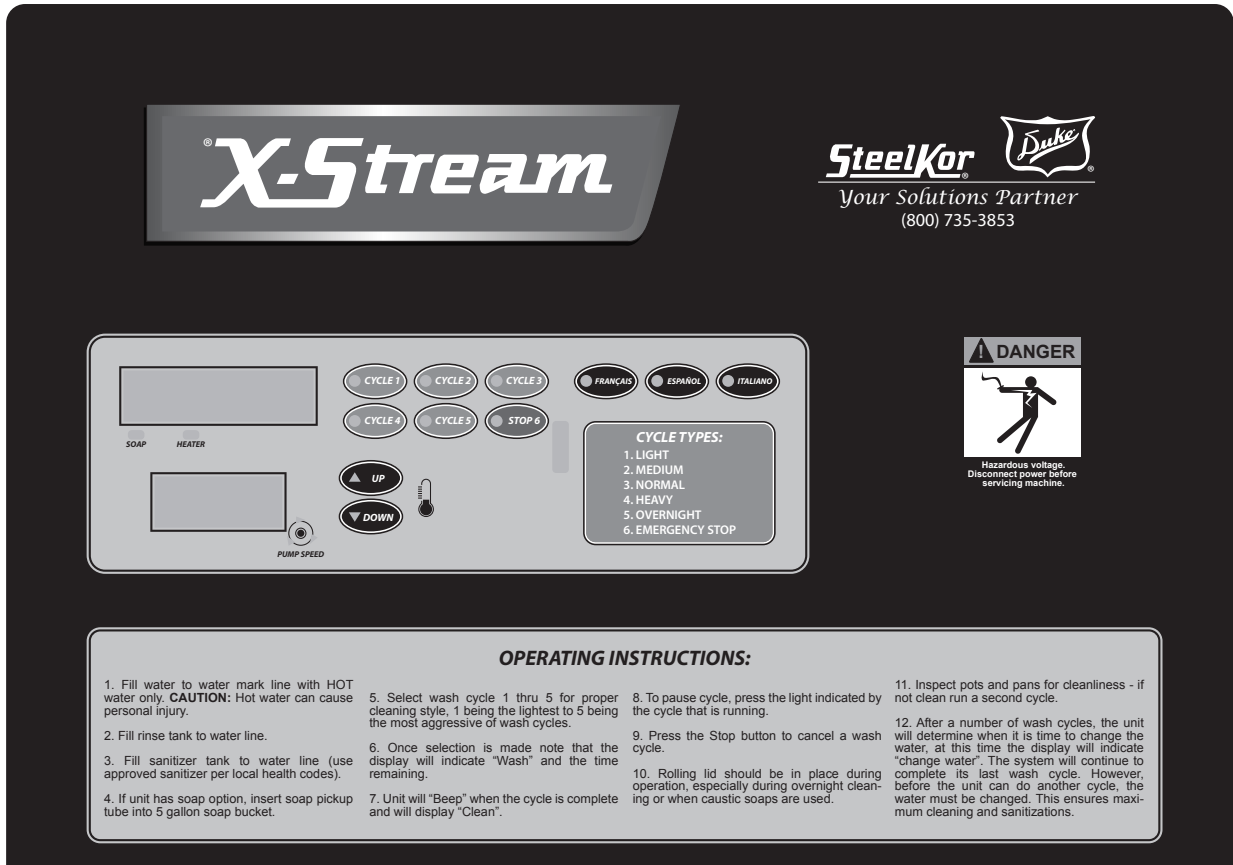
Press the **DOWN** arrow button again to return back to the CnF display.

Exit the supervisor mode when done. *NOTE: See Supervisor Mode section on how to exit.*

Display Lamp Test

A lamp test can be started by pressing the **DOWN** and **TEMP** buttons simultaneously. During the lamp test, the controller functions normally, but all display segments and status lights flash. Pressing the **TEMP** button again will return back to the normal operation display.

E-30 K5000 Control Panel



K5000 Control Panel

Display

In general, all messages are scrolled in the upper display box at about 2 characters per second, while the temperature is displayed in the lower display box. There are LED icons to indicate various system states.

Each button has an LED, which is used to indicate various situations. For instance, when the Up/Down LED's are on, this indicates that the user can use these button to change a parameter.

Also, whenever the arrow symbol (▶) is displayed with the data, this means that this is a parameter being changed or adjusted.

Mylar Buttons

Cycle Buttons



The Cycle button select and start a wash cycle according to the cycle's programmed settings (wash temperature, wash time, etc.). There can be up to 5 cycles defined and programmed. When a cycle is running, its corresponding LED is also lit.

Stop Button



A press of this button stops the current cycle if one is active. If the unit is currently in the Hold Mode, pressing the Stop button will turn off the unit.

If the unit is currently in the Off Mode, a 2-second long press of this button will activate the Manual Drain function.

If the unit is presently in Power-Up or OFF mode then a 20-second long press of this button will cause the unit to go into a factory Low-Level programming mode.

Language Buttons



The 3 language buttons allow selection of the language used for the displayed messages. If a specific language is selected, its corresponding LED is also lit. To return to English, simply press the currently selected language button again. When English is selected, no language LED's are lit. Thus, there are 4 languages supported.

All internal messages are available in all languages.

Up/Down Buttons



These buttons are used whenever parameter adjustments are required in the various modes. Whenever the unit expects either the Up or Down button to be used, their corresponding LED's are lit.

If the unit is in WASH or HOLD mode, using the **UP** and **DOWN** button will adjust the current *Temperature*. This will only change the Temperature until the next Power-Up state, at which time the default factory programmed Temperature comes back into effect.

At any time, the Up/Down pair of button can be pressed (at the same time) to display the current heater sheath temperature. The 1st line of the display will scroll **SHEATH TEMPERATURE** and the 2nd line will display the current heater sheath temperature. After 5 seconds, the display reverts to whatever was previously displayed.

Mylar Indicator Lights



The soap indicator light will be lit up when the soap pump is on.



The heater indicator light will be lit up when the heater is on.



The pump speed indicator lights will be "rotating" when the pump is on. The rotation speed is the same as the pump (i.e. low, medium, or high).

Basic Operation

When you first power up to use the wash tank, the display will scroll **FILL WASH TANK WITH HOT WATER**, fill the wash tank to the water fill line (see the INITIAL START UP section).

Press the **STOP** button once the tank is full. The system will now be in the OFF state. The top display will show **OFF** and the bottom display will show the current water temperature. The cycle button indicator lights will be flashing waiting for you to select a wash cycle. Push a **CYCLE** button to select a wash cycle and enter the cycles WASH state.

The selected cycle's indicator light will stop flashing and stay on. The remaining cycle indicator lights will turn off.

The soap indicator light will illuminate and remain lit while soap is being dispensed automatically into the wash tank.

During the WASH state, the top display will exchange out the scrolling cycle's name, i.e. **CYCLE 1**, and the time remaining for that cycle, i.e. **4:55**.

The bottom display will continue to show the current water temperature, i.e. **115°F**.

The heater light will cycle on and off while the heater is maintaining the preset water temperature.

The pump speed indicator lights will rotate indicating that the circulation pumps are on.

Pressing the STOP button will end the current wash cycle and put the system into the OFF state. The top display will show **OFF** and all wash cycle lights will flash, indicating that a new wash cycle can be selected.

Pressing the same cycle button as the current one that is running will put the system into a PAUSE state. The display will show **PAUSE** and the cycle's indicator light will flash.

In the PAUSE state, the wash cycles timer is stopped and the circulation pumps are shut off. The heater is still working to maintain temperature. Pressing the cycle's button again will continue the cycle.

NOTE: When a cycle is in the RUN or PAUSE state, pressing a different cycle button will start a new cycle. When the wash cycle's time has expired the system will enter the HOLD state.

In the HOLD state, the top display will show **CLEAN** and the system's buzzer will start to BEEP. Pressing the **STOP** button once will stop the buzzer, pressing it again will exit the HOLD state and enter the OFF state.

The water circulation pumps are circulating at the holding speed and the heater is maintaining the holding temperature.

NOTE: All the cycle lights will flash indicating that a new wash cycle can be selected.

After a programmed amount of wash time the soiled water will need to be changed. The top display will show **CHANGE WATER**. Drain the tank to reset the system.

You are now ready to start another wash cycle.

Time Display

Since there is a large span of time that can be programmed in the various cycles and seconds resolution may be required in the lower range, there must be 2 ways to display time.

If the time displayed is hours and minutes, then the display will show HH.MM (i.e. 4.35 is 4 hours and 35 minutes). If the time displayed is in minutes and seconds, the display will show this as MM:SS (i.e. 4.35 is 4 minutes and 35 seconds). *Note: The difference in using the colon versus the period.*

Wash Cycles

The system supports five wash cycles and every one has three steps defined within.

Each step has 4 different settings:

- Duration
- Water Temperature
- Pump Speed
- Soap Quantity

If a cycle is to be used, at least step 1 must be defined as having non-zero duration. If a cycle's step 1's duration equals 0, then the cycle is not used, and its LED does not blink in OFF mode.

Change Settings

To change the settings for a particular cycle, the unit must be in POWER UP or OFF mode. Then, press and hold both the corresponding **CYCLE** and the **STOP** button for 5 seconds. The cycle LED will light up and the first setting **STEP 1 DURATION** will scroll on the display, and alternate every 5 seconds with its value.

Use the UP and DOWN button to adjust a setting. Once the wanted value is displayed, pressing the **STOP** button again will bring up the next setting. Change all settings

for as many steps as required (up to 3 per Cycle). If step duration is set to 0, then all following parameters are ignored and the unit returns to the previous mode. It is assumed that programming for this particular cycle is finished.

Note that in all setting descriptions below, X can be 1, 2, or 3, depending on the current step being programmed.

Step Duration

This is the time that the unit will remain in the current step. If there is only 1 step defined for the cycle, this also corresponds to the total cycle time. If a step has 0 duration, the current step and all following ones are not programmable (i.e. not used). If step 1 is set to 0, then the cycle is not defined and pressing the Cycle button will not do anything.

Setting name: **STEP X DURATION**

Allowed values: 0:00 to 9:59

Default value: 1:00

Step Temperature

The wash tank's water temperature is defined here.

Setting name: **STEP X TEMPERATURE**

Allowed values: 100°F to 125°F (38°C to 52°C)

Default value: 115°F (46°C)

Step Pump Speed

This is the pump speed during the particular step.

Setting name: **STEP X PUMP SPEED**

Allowed values: LOW, MED, or HIGH

Default value: LOW

Step Soap Quantity

This setting allows soap quantity control for the step.

Setting name: **STEP X SOAP QUANTITY**

Allowed values: MIN, INT, MAX

Default value: MIN

System States

There are a few states of operation in the controller.

- POWER UP State
- OFF State
- WASH State
- HOLD / CLEAN State

POWER UP State

This state is active on power-up, and also after a *Dry Fire* (when no water is present in wash tank).

A lamp test is performed on the initial power up, all LED's are lit up for 5 seconds. Following this test, the software number and revision are displayed. These are useful for troubleshooting purposes when several versions exist in the field. The first line shows the software number (341) and the second line shows the revision number (1.51).

In this state, all outputs are turned off, and the 1st line of the display continually scrolls FILL WASH TANK WITH HOT WATER, and the current water temperature (or empty tank temperature) on the 2nd line. All LED's are off, except the currently selected language, if selected.

The following counters are reset in this mode:

- Total wash time with current soap load (linked to Change Water state)
- Total soap injection time for both soap pumps

Once the tank has been filled with water, press the **STOP** button to enter the OFF state.

From the POWER UP state, the cycle programming and low-level programming menus are accessible with the proper button sequence.

OFF State

This state is active after filling up the tank with water and pressing the **STOP** button following the POWER UP state. This is also the state that becomes active whenever the Stop button is pressed during a wash cycle.

In this state the Heater is working at very low power, trying to detect a possible dry-fire (i.e. an empty tank). The 1st line of the display indicates OFF and the 2nd line the current water temperature. All cycle LED's are also flashing, indicating that they can be pressed. Pressing one of the Cycle button starts the corresponding cycle and enters the WASH state.

From this state, the cycle programming and low-level programming menus are accessible with the proper button sequence.

WASH State

This is the "normal" operating mode. Pressing any of the 5 cycle button will start the corresponding cycle. The 1st line of the display toggles the scrolling cycle's name and the remaining cycle time (all cycle steps duration added together). The 2nd line of the display shows the current water temperature.

While in WASH mode, the selected cycle LED is full on to indicate that the cycle is active. The Soap status LED is active if needed, as well as the Heater status LED. The Pump LED group is functional according to the current Water Pump speed.

Pressing the **Up/Down** button will light the Up/Down LED's, and the current temperature information is replaced by the set point temperature. The **Up/Down** button allow this value to be changed between 100° and 125°F (38° to 52°C). If no button is pressed for 5 seconds, the display reverts to the current water temperature and the Up/Down LED's shut off. The new temperature will be stored until the next water change. After a drain/fill sequence, the cycle temperatures programmed are retained for the next cycle.

The cycle may be stopped by pressing the **Stop** button (at which point the OFF state becomes active). Pressing the current cycle's button will pause the wash (timer freezes, and all outputs are off, except the Heater) and the cycle LED will flash. Line 1 of the display then blinks PAUSE. Line 2 still shows the current water temperature. Re-pressing the cycle button resumes the wash cycle where it left off.

Pressing a cycle button other than the current cycle's restarts the machine in the new selected cycle, with new soap amounts added if necessary.

When a cycle is finished, the buzzer sounds according to the programmed Buzzer Time, and the system goes into the HOLD/CLEAN state.

HOLD/CLEAN State

In this state, there is water in the tank, and its temperature is maintained at the Hold Temperature. The pump speed in this mode is determined by the Hold Pump Speed. The purpose of the HOLD mode is to prevent any sediment from settling back onto the wares and also serves to keep the oily water and soap suspended between washes.

HOLD/CLEAN mode is active at the end of a Wash cycle. At that time, the 1st line of the display will flash CLEAN, and the current water temperature on the 2nd line. Should the water be drained in this mode, the unit returns to the POWER UP state once it detects the dry-fire condition that will exist.

While in HOLD/CLEAN mode, the 5 cycle LED's blink to indicate that a new cycle may now be selected. The Heater status LED is active if needed. The Pump LED group is functional according to the current Water Pump speed.

Pressing the **Up/Down** buttons will light the Up/Down LED's, and the current temperature information will be replaced by the blinking set point temperature. The **Up/Down** buttons allow this value to be changed between 100° and 125°F (38° to 52°C). If no button is pressed for 5 seconds, the display reverts to the current water temperature and the Up/Down LED's shut off. This new temperature will be stored until the next water change. At the next drain/fill sequence, the Hold temperature is reset to the low-level programmed temperature.

Pressing the **Stop** button returns the unit to the OFF state.

Additional System Features

Internal Buzzer

The internal buzzer emits a very short beep whenever a key is pressed. This beep has an adjustable volume, however, 100% of the volume is used when signaling alarms or other status changes.

Soap Injection Algorithm

This section explains how the various soap parameters interact. The idea is that the quantity of soap per tank cannot exceed Soap Maximum. Thus, the control keeps track of the total soap injection time, and resets this counter only in the POWER UP state (when the tank is emptied).

When a cycle is started, if the programmed soap quantity for this cycle is Soap Minimum, then this amount of soap is added. If the cycle quantity programmed is Soap Intermediate or Soap Maximum, then that quantity is injected.

If a new cycle is selected before the POWER UP state is active (which resets the soap amount counter), then the controller will add the difference in soap amounts if needed. Again, there will never be more than Soap Maximum amount of soap in the water.

Soap Level Detection

Soap Level Detection is an optional feature. There are 2 inputs that allow connection to external dry contacts that allow detection of 2 soap levels. Soap Level #1 input warns of low soap levels, and Soap Level #2 warns that there is no more soap. In the case of low soap levels, the unit is still useable, but the scrolled message in POWER UP and OFF states indicates LOW SOAP LEVEL - RE-ORDER. If soap level drops such that Soap Level #2 detects it, then the unit is no longer operational at the end of the current cycle. The unit will remain in POWER UP or OFF states and scroll ADD SOAP TO UNIT.

Dry Fire Detection

If the heater sheath temperature ever reaches the *Dry Fire Threshold*, then the situation is called a dry fire and the control shuts off the outputs and switches to the POWER UP state. This overrides any effective mode of operation. This is the normal way to detect that the tank has been drained.

The algorithm used to detect this can be fine-tuned by the OEM. There are 2 low-level parameters for this. The Heater is pulsed every *Dry-Fire Period* time, each of these pulses lasts 0% to 100% (*Dry-Fire Duty*) of the *Dry-Fire Period* time. For example, the Heater can be on 30 milliseconds every 100 milliseconds, which corresponds to a 30% duty at a rate of 100 milliseconds. With these parameters, the OEM can select the best compromise between fast response time (detection of the empty tank) and low energy consumption of the appliance.

At any time, the **Up/Down** pair of button can be pressed (at the same time) to display the current heater sheath temperature. The 1st line of the display will scroll SHEATH TEMPERATURE and the 2nd line will display the current heater sheath temperature. After 5 seconds, the display reverts to whatever was previously displayed.

Change Water Feature

The total Wash time is constantly monitored. Whenever this reaches Change Water Time, the unit finishes its current wash cycle if needed, and then displays CHANGE WATER until a dry fire is detected (a new cycle cannot be started before the tank water has been changed). At this point, the POWER UP state then becomes active and the display is cleared.

This condition will remain active (even through a power interruption) until 1 of 2 things happen: (a) the tank is actually emptied and the Dry Fire Detection resets the total wash time; (b) the user may "clear" the condition (reset the total wash time) by pressing all 3 language buttons at the same time. This last is useful for demonstration purposes, where one might not want to really drain the unit.

Sanitize Tank

The sanitizing tank is optional on the appliance. This is a tank that is usually used to sanitize the cookware after it has been washed. This tank can have its own optional soap pump, as well as an optional heating element.

NOTE: The soap pump and heating element are optional and may be equipped on your system.

Diagnostics

This section describes the various diagnostics errors that are available. Should one of these errors appear, the corresponding error message scrolls on the first line of the display. All error messages have the following text appended to it: - C A L L D u k e Manufacturing Co. 800-735-3853 FOR SERVICE.

NOTE: Your display may be different.

Temperature Probe Error

All probes are typically type-K probes. All temperature readings normally associated with a type-K probe are considered valid by the controller. However, if the probes become disconnected or otherwise open, the controller will sound the buzzer and scroll TEMPERATURE PROBE ERROR on line 1 of the display. The second line will display the probe number(s) of the defective probe(s).

- 1 is water temperature probe
- 2 is heater sheath temperature probe
- 3 is sanitizing tank probe

Pressing any button shuts the buzzer off, but will not remove the error message. The error message will remain until the probe connection problem is resolved.

When these probe errors occur, all outputs are shut off.

Low Level Programming

This mode of operation allows the various working parameters of the control panel to be programmed. First, the controller must already be in the POWER UP or OFF state. Then, by keeping the **STOP** button pressed for 20 seconds, the first parameter will be displayed. The Up/Down LED's will be lit, indicating that the unit is ready for programming.

When adjusting a parameter, the parameter name will scroll on the 1st line. Once the complete name has scrolled, the first line will then show the current parameter value with the left most triangle LED on. This will be displayed for 2 seconds, and then the parameter name will scroll again. Line two of the display is not used during the low level programming.

Pressing the **Up/Down** button the first time displays current parameter. If no button is pressed for 5 seconds, the parameter name will start scrolling again and will alternate with the current value.

Pressing the **STOP** button accepts the currently displayed value and moves on to the next parameter to be programmed. When the last parameter is reached, pressing the STOP button will exit the low-level programming mode. Thus, to prematurely exit the programming mode, simply keep pressing the **STOP** button until the POWER UP state is back.

The parameters that can be changed follow:

Temperature Units

This setting allows a different temperature unit to be used for display. You can switch between Celsius and Fahrenheit.

Parameter name: TEMPERATURE UNITS

Allowed values: C or F

Factory default: F

Low Speed Frequency

This setting is used to set the frequency that controls the low pump speed.

Parameter name: PUMP LOW FREQUENCY

Allowed values: 0 to 100 Hertz

Factory default: 35

Medium Speed Frequency

This setting is used to set the frequency that controls the medium pump speed.

Parameter name: PUMP MED FREQUENCY

Allowed values: 0 to 100 Hertz

Factory default: 50

High Speed Frequency

This setting is used to set the frequency in the Omron Inverter Controller that controls the high pump speed.

Parameter name: PUMP HIGH FREQUENCY

Allowed values: 0 to 100 Hertz

Factory default: 50

Hold Pump Speed

This setting sets the pump speed for the HOLD or CLEAN state.

Parameter name: HOLD PUMP SPEED

Allowed values: LOW, MED, HIGH

Factory default: LOW

Hold Temperature

This setting sets the water temperature for the HOLD or CLEAN state.

Parameter name: HOLD TEMPERATURE

Allowed values: 100°F to 125°F or 38°C to 52°C

Factory default: 115°F

Soap Minimum

This is the time setting used to set how long the soap pump will run when the soap usage is set for the minimum amount.

Parameter name: SOAP MINIMUM

Allowed values: 0:00 to 9.59

Factory default: 0:30

Soap Intermediate

This is the time setting used to set how long the soap pump will run when the soap usage is set for the intermediate amount.

Parameter name: SOAP INTERMEDIATE

Allowed values: 0:00 to 9.59

Factory default: 1:00

Soap Maximum

This is the time setting used to set how long the soap pump will run when the soap usage is set for the maximum amount.

Parameter name: SOAP MAXIMUM

Allowed values: 0:00 to 9.59

Factory default: 1:30

Sanitize Soap

This is the time setting used to set how long the sanitize soap pump will run.

Parameter name: SOAP 2 TIME

Allowed values: 0:00 to 9.59

Factory default: 0:00

Sanitize Heater Temperature

This setting sets the water temperature for the Sanitize tank.

Parameter name: HEATER 2 TEMPERATURE

Allowed values: OFF, and 100°F to 200°F (38°C to 93°C)

Factory default: OFF

Buzzer Time

This is the time the buzzer will sound when a wash cycle is over.

Parameter name: BUZZER TIME

Allowed values: 0:00 to 9.59

Factory default: 0:10

Button Press Buzzer Volume

When a button is pressed, the buzzer can beep for feedback. The volume of this feedback is adjustable. Note that this does not affect the alarms and other sounds, which remain at 100% volume.

Parameter name: BUZZER VOLUME

Allowed values: 0 (no sound) to 4 (loudest)

Factory default: 4

Dry Fire Period

The heater is not used at 100% when trying to detect a dry fire in the OFF state. This parameter (along with the next one that follows) allows fine-tuning of the heater power. The period is the time over which the duty cycle is calculated.

Parameter name: DRY FIRE PERIOD

Allowed values: 10 to 1000 Milliseconds

Factory default: 700

Dry Fire Duty

The heater is not used at 100% when trying to detect a dry fire. This parameter determines the duty cycle used.

Parameter name: DRY FIRE DUTY

Allowed values: 1 to 100 %

Factory default: 65

Dry Fire Threshold

This is the maximum allowed temperature that heater sheath can attain. When this is reached, the control assumes the tank has been drained and goes to the POWER UP state.

Parameter name: DRY FIRE THRESHOLD

Allowed values: 125°F to 850°F or 52°C to 454°C

Factory default: 280°F

Change Water Time

This is the maximum time the washer will operate before forcing water to be changed by the user. The only way to clear the CHANGE WATER message is to empty the tank. Note that if this time reaches its maximum value during a cycle, the cycle will be allowed to finish.

Parameter name: CHANGE WATER TIME

Allowed values: 0:00 to 9.59

Factory default: 2.00

Drain Time

This is the time for how long the drain valve will be opened when the user requests an Auto-Drain/Fill or Manual Drain.

Parameter name: DRAIN TIME

Allowed values: 0:00 to 9.59

Factory default: 0:10 seconds

Fill Time

This is the time the fill valve will be turned on when the user requests an Auto-Drain/Fill.

Parameter name: FILL TIME

Allowed values: 0:00 to 9.59

Factory default: 0:10 seconds

This is the last parameter of the low-level programming, pressing **STOP** after this one will cause the unit to go back to the POWER UP state.

E-40 WASH CYCLE DEFAULTS (NOTE: SEE CHANGE SETTINGS SECTION ON HOW TO ENTER)

CYCLE 1			
Name			
English	DELICATE WARE CYCLE		
French	LE CYCLE DE MARCHANDISE DELICAT		
Spanish	EL CICLO DELICADO DE WARE		
Italian	IL CICLO DI WARE DELCATO		
	STEP 1	STEP 2	STEP 3
Duration	5:00	0:00	0:00
Temperature	115°F	115°F	115°F
Pump Speed	LOW	LOW	LOW
Soap Amount	MIN	MIN	MIN
CYCLE 2			
Name			
English	PLASTIC WARE CYCLE		
French	LE CYCLE DE MARCHANDISE EN MATIE		
Spanish	EL CICLO PLASTICO DE WARE		
Italian	IL CICLO DI WARE PLASTICO		
	STEP 1	STEP 2	STEP 3
Duration	5:00	0:00	0:00
Temperature	115°F	115°F	115°F
Pump Speed	MED	MED	MED
Soap Amount	INT	INT	INT
CYCLE 3			
Name			
English	SHEET PAN CYCLE		
French	LE CYCLE DE CASSEROLA DE DRAP		
Spanish	EL CICLO DE LA CACEROLA DE LA HOJA		
Italian	IL CICLO DI PADELLA DI LANZUOLO		
	STEP 1	STEP 2	STEP 3
Duration	8:00	0:00	0:00
Temperature	115°F	115°F	115°F
Pump Speed	HIGH	HIGH	HIGH
Soap Amount	MAX	MAX	MAX

CYCLE 4			
Name			
English	POTS AND PANS CYCLE		
French	CYCLE DE POTS ET CASSEROLAS		
Spanish	EL CICLO DE OLLAS Y CACEROLAS		
Italian	IL CICLO DI VASI E PADELLE		
	STEP 1	STEP 2	STEP 3
Duration	15:00	0:00	0:00
Temperature	115°F	115°F	115°F
Pump Speed	HIGH	HIGH	HIGH
Soap Amount	MAX	MAX	MAX
CYCLE 5			
Name			
English	OVERNIGHT CYCLE		
French	DU JOUR AU LENDEMAIN LE CYCLE		
Spanish	EL CICLO DE NOCHE		
Italian	DURANTE LA NOTTE IL CICLO		
	STEP 1	STEP 2	STEP 3
Duration	2:00	0:00	0:00
Temperature	120°F	120°F	120°F
Pump Speed	HIGH	HIGH	HIGH
Soap Amount	MAX	MAX	MAX

NOTE: See the TIME DISPLAY section shown earlier to view the time format.

IV. SERVICE AND REPAIR

Periodic service and maintenance of the unit is not required beyond the user's monthly cleaning schedule. Qualified service personnel must perform service or repair should the unit develop a fault other than cleaning maintenance.

Qualified service personnel are individuals, firms, companies or corporations who are knowledgeable in and responsible for compliance with jurisdiction authorities concerning service of commercial food

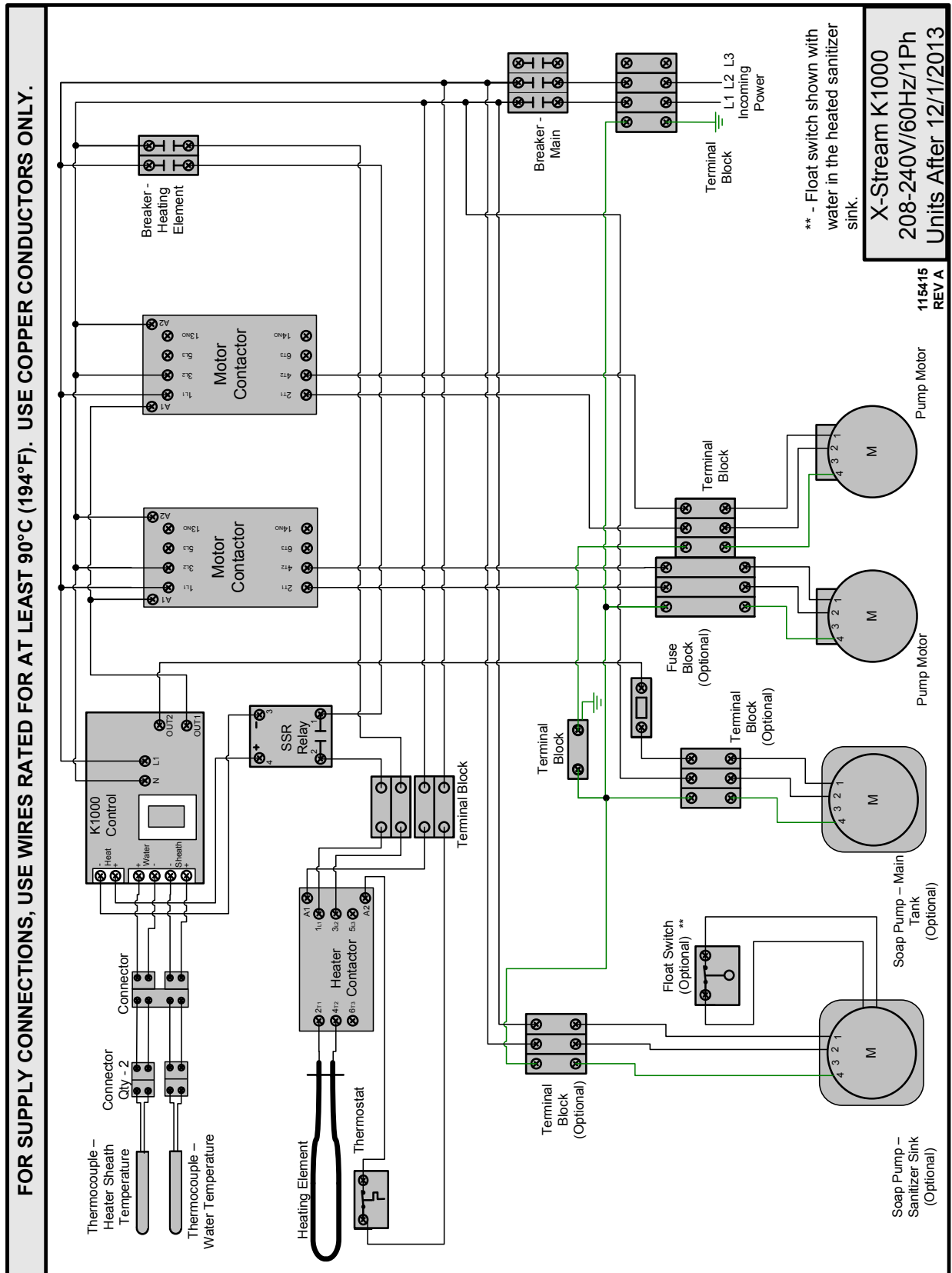
preparation equipment. Contact the Duke Manufacturing Company Service Department at the USA worldwide headquarters (telephone: 1-800-735-3853) for assistance with selecting qualified service personnel.

WARNING to qualified service personnel:

⚠ WARNING: Disconnect the power supply to the appliance before servicing.

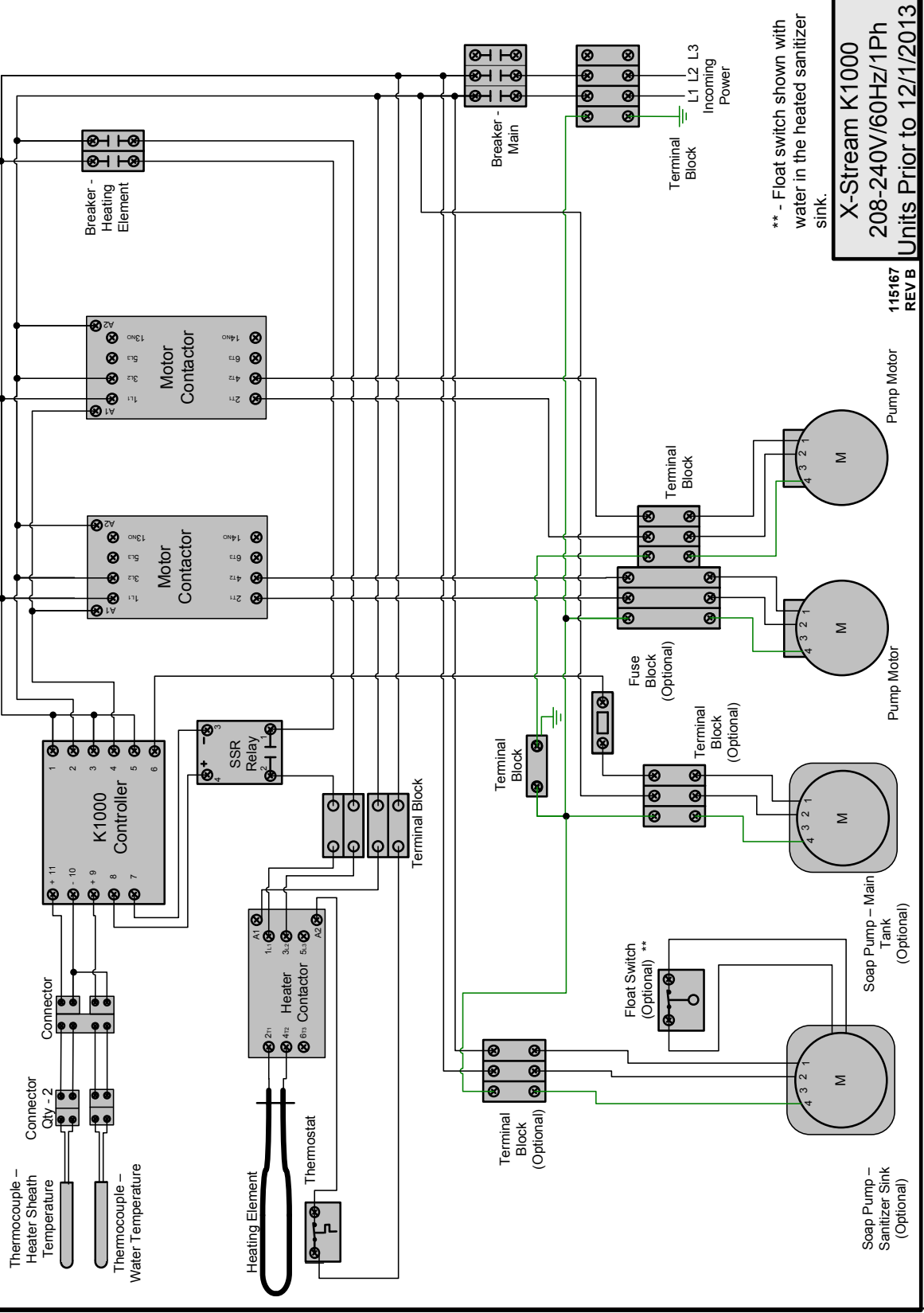
V. ELECTRICAL SCHEMATICS

K1000 208-240V, 1 PHASE(UNITS AFTER 12/2013)



K1000 208-240V, 1 PHASE(UNITS TO 12/2013)

FOR SUPPLY CONNECTIONS, USE WIRES RATED FOR AT LEAST 90°C (194°F). USE COPPER CONDUCTORS ONLY.



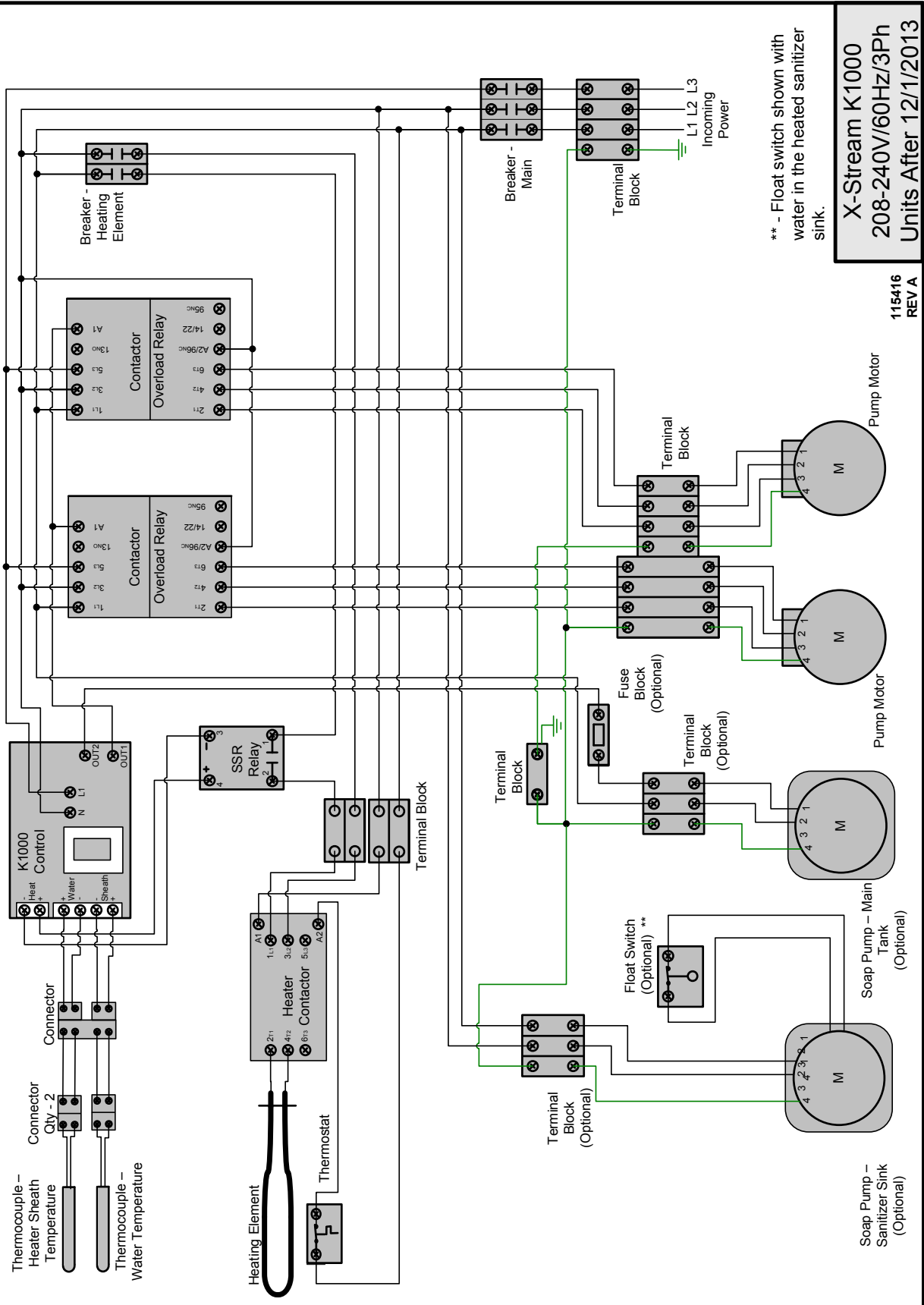
** - Float switch shown with water in the heated sanitizer sink.

**X-Stream K1000
208-240V/60Hz/1Ph
Units Prior to 12/1/2013**

115167
REV B

K1000 208-240V, 3 PHASE (UNITS AFTER 12/2013)

FOR SUPPLY CONNECTIONS, USE WIRES RATED FOR AT LEAST 90°C (194°F). USE COPPER CONDUCTORS ONLY.



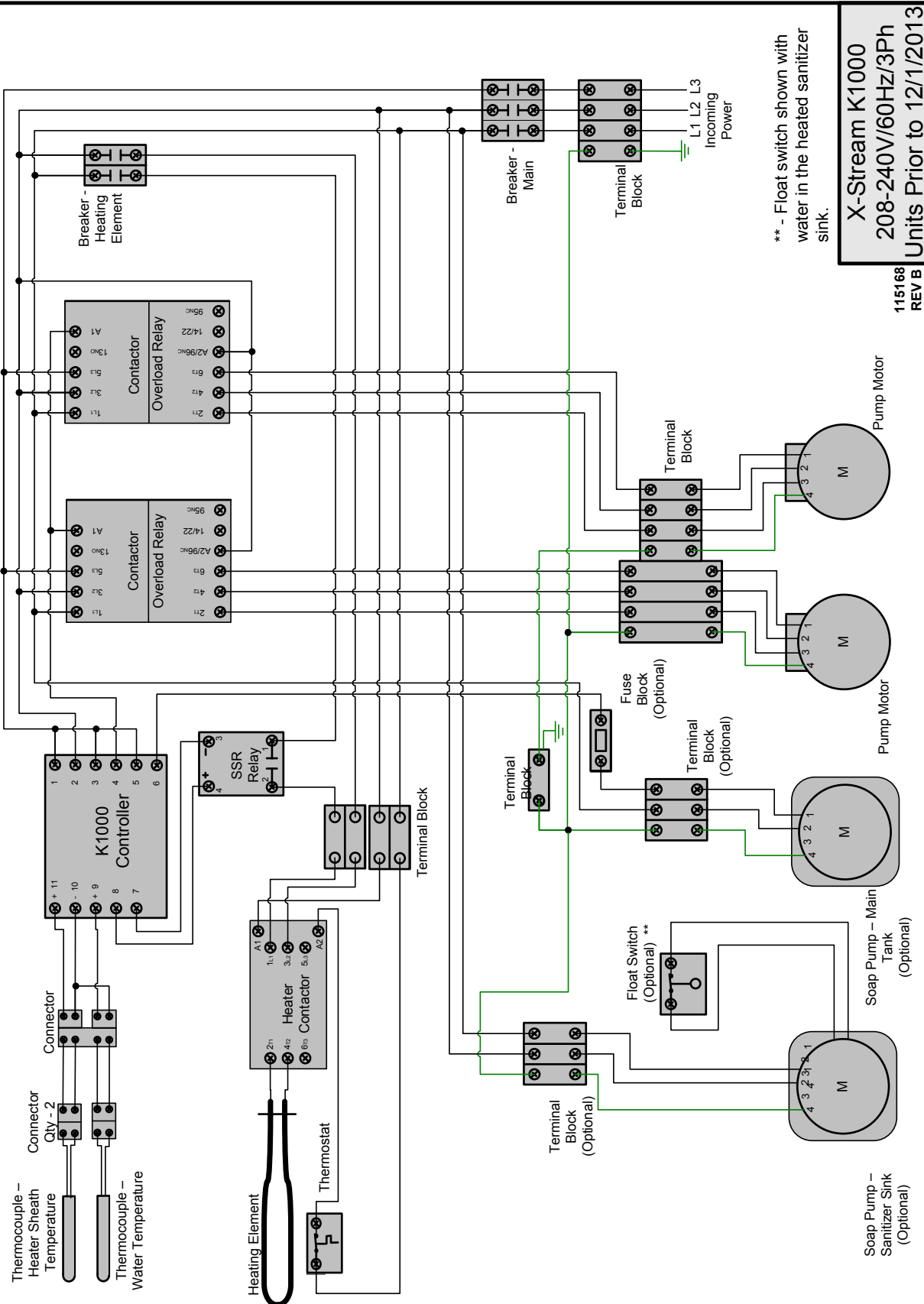
** - Float switch shown with water in the heated sanitizer sink.

**X-Stream K1000
208-240V/60Hz/3Ph
Units After 12/1/2013**

115416
REV A

K1000 208-240V, 3 PHASE (UNITS TO 12/2013)

FOR SUPPLY CONNECTIONS, USE WIRES RATED FOR AT LEAST 90°C (194°F). USE COPPER CONDUCTORS ONLY.



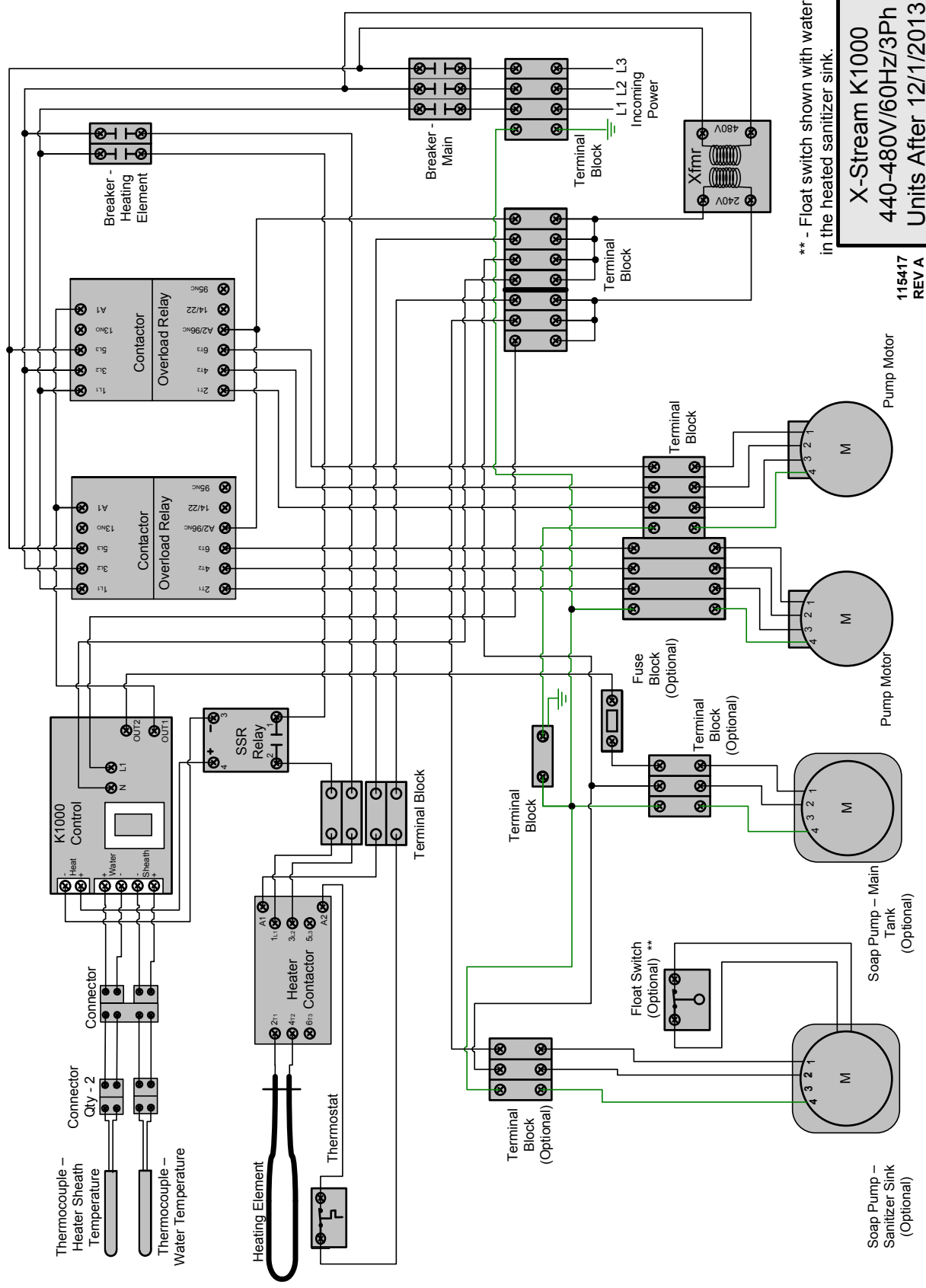
** - Float switch shown with water in the heated sanitizer sink.

**X-Stream K1000
208-240V/60Hz/3Ph
Units Prior to 12/1/2013**

115168
REV B

K1000 440-480V, 3 PHASE (UNITS AFTER 12/2013)

FOR SUPPLY CONNECTIONS, USE WIRES RATED FOR AT LEAST 90°C (194°F). USE COPPER CONDUCTORS ONLY.

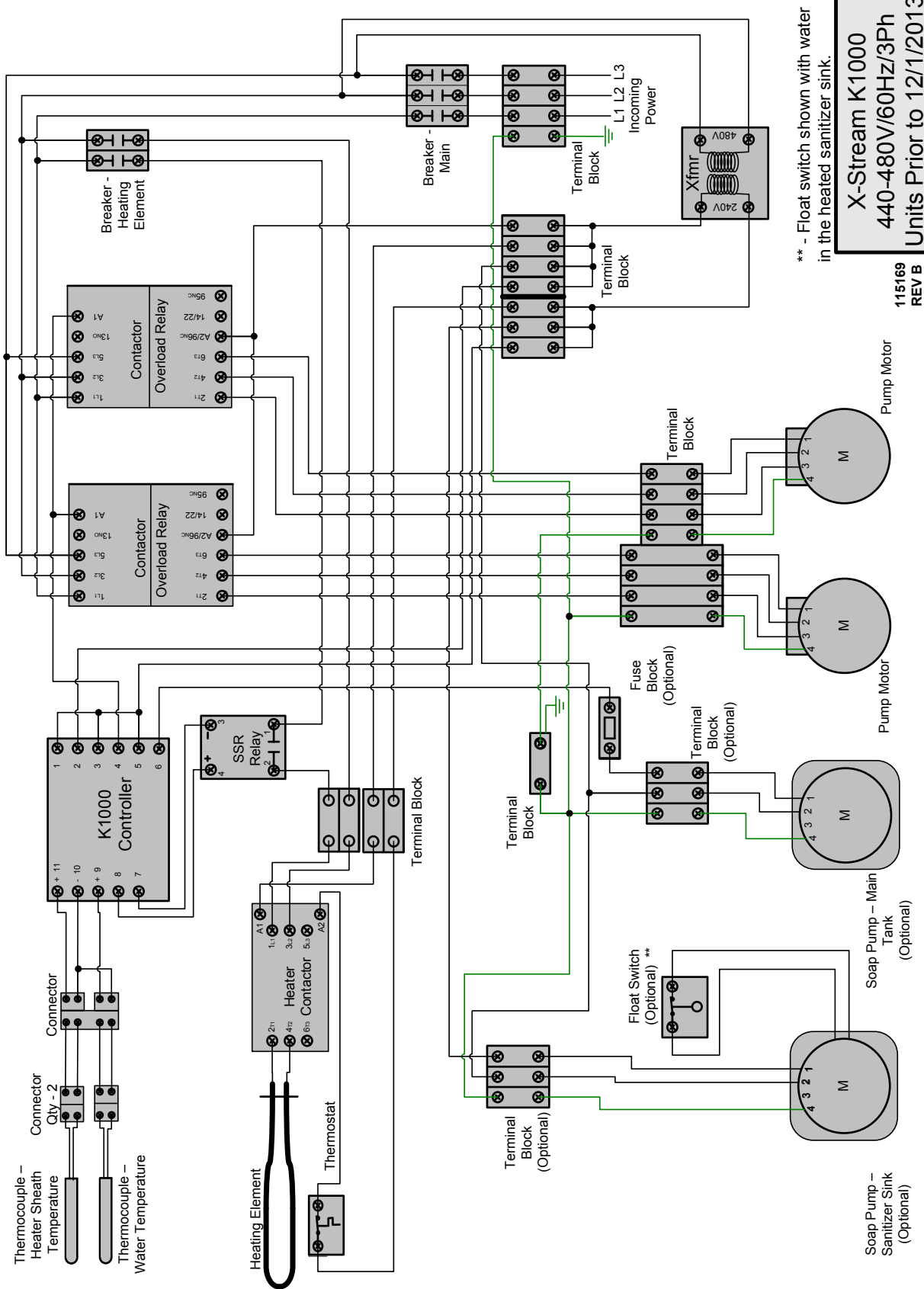


**X-Stream K1000
440-480V/60HZ/3Ph
Units After 12/1/2013**

115417
REV A

K1000 440-480V, 3 PHASE (UNITS TO 12/2013)

FOR SUPPLY CONNECTIONS, USE WIRES RATED FOR AT LEAST 90°C (194°F). USE COPPER CONDUCTORS ONLY.

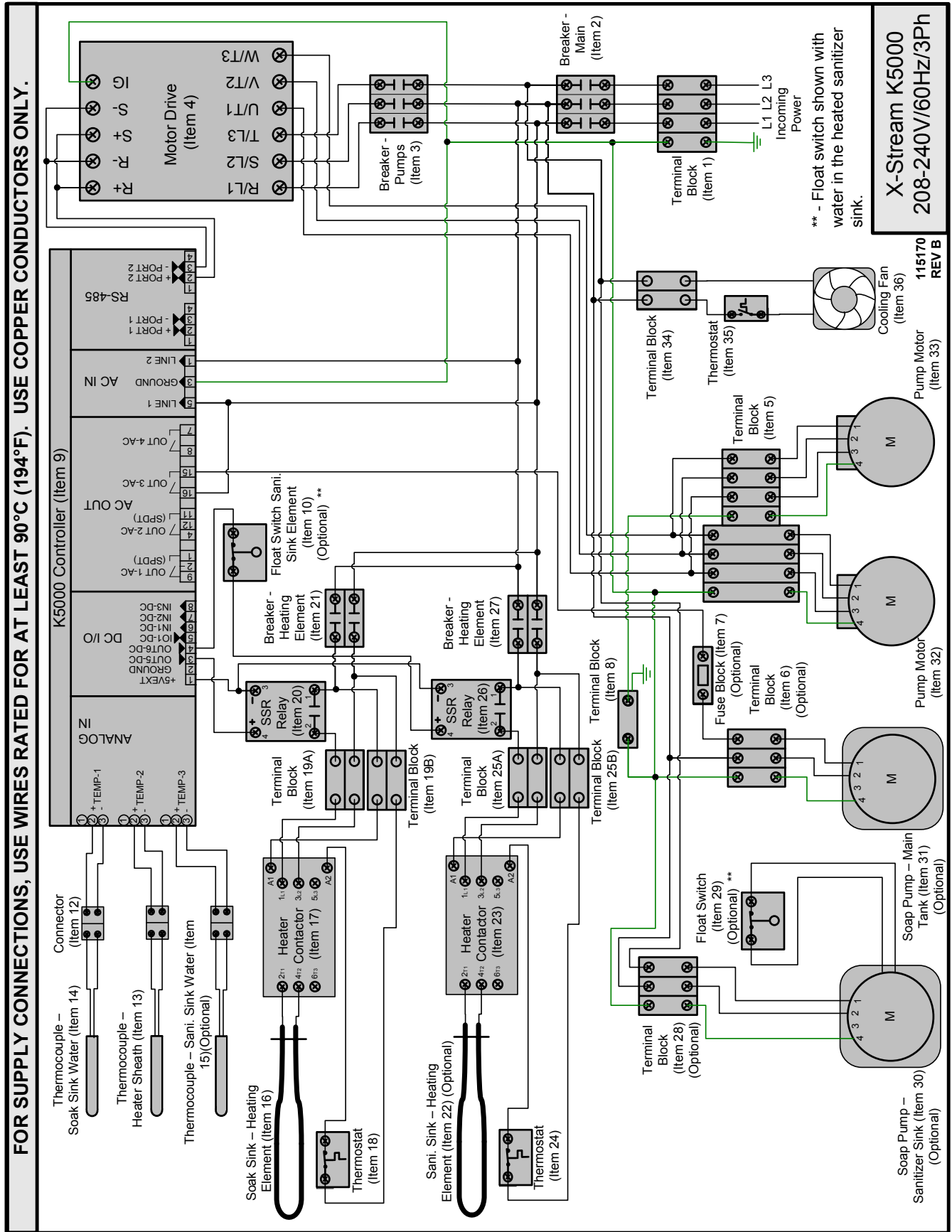


** - Float switch shown with water in the heated sanitizer sink.

**X-Stream K1000
440-480V/60Hz/3Ph
Units Prior to 12/1/2013**

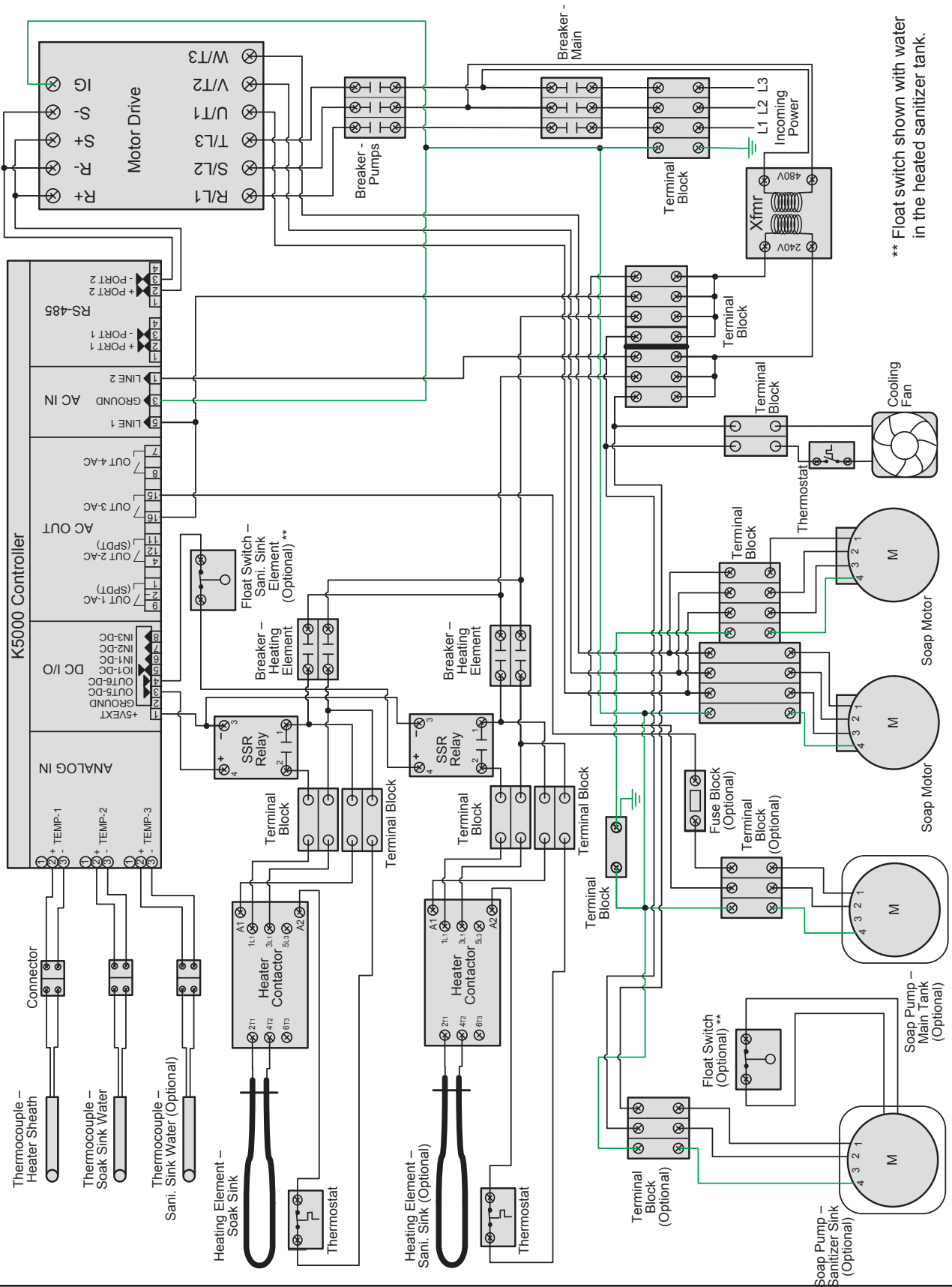
115169
REV B

K5000 208-240V, 3 PHASE



K5000 440-480V, 3 PHASE

FOR SUPPLY CONNECTIONS, USE WIRES RATED FOR AT LEAST 90°C (194°F). USE COPPER CONDUCTORS ONLY.





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