Calf Milk Pasteurizer

by Westwaard

Installation & Operation Manual

Model:

120, 150, 200 & 250 Gallon Pasteurizers
(WP120G, WP150G, WP200G, WP250G)

WESTWAARD
FABRICATORS for DARITECH

Revision Sheet

Release No.	Date	Revision Description
Rev. 0	11/28/2012	Manual Completion
Rev. 1	9/26/2013	Corrections to part breakdowns
Rev. 1.1	12/24/2013	Corrections to Water Heater Temperature
Rev. 2	6/10/2014	Updated layout & control information
Rev 2.2	9/16/2016	Wiring Diagram & Control Box Layout Update
Rev 2.3	4/13/2017	Add input regulator requirement warning
Rev 2.5	6/4/2025	HMI Screen Parts Addition

Table of Contents

Preface

These instructions are supplied with the equipment and;

- The purpose of this manual is to provide an overview of the safety & operation of this product.
- This manual is designed to be modular and is only in relation to the mentioned product.
- This manual should always be kept with or near the equipment even when the equipment is sold.
- It is the responsibility of the end user to test and maintain the unit to assure continued effectiveness of the machine.

Arrangement

This manual is arranged in 5 primary sections, with pages, paragraphs, figures, and tables numbered in sequence.

Section 1 – Safety

Section contains critical information essential to the safe operation of the machine and operator.

Section 2 – Installation

This section describes what needs to be done to install the Pasteurizer unit.

Section 3 – Panel Controls

This section identifies and describes the process to program the Pasteurizer Control Cabinet.

Section 4 – Operation

This section will walk you through the different operations modes and settings of the Pasteurizer unit.

Section 5 – Wiring Diagram / Parts List

This section covers the Wiring Diagram for PLC control cabinet and control cabinets components for the 120, 150 and 200 gallon Pasteurizer units.

Explanation of Symbols

The following symbols are used within this manual to alert the reader to important information or potentially hazardous conditions.

Safety Symbols draw attention to adjacent text and should always be read and thoroughly understood.

	**WARNING!** Warning signals danger to life or health of personnel. Death or serious injury may result if the danger is not avoided.
	**CAUTION!** Caution signals dangerous situations. Injury may result if the danger is not avoided.
	**ATTENTION!** Attention signals important information, risks to the product or the environment.

Section 1 – Safety

1.1 Obligation of Care

This product has been designed and constructed while taking careful analysis and standards and other specifications to be compiled with to ensure a safe level of security.

This safety can only be achieved in practice when all of the necessary measures have been taken. It is part of the owner's obligation to plan and check these measures.

1.2 General

The Westwaard Pasteurizer built for on farm pasteurization of "waste" milk for the use of feeding calves. It, under no circumstance, is to be used as a pasteurizer for human consumption. It is designed as an economical, reliable, easy cleaning method for the dairyman to pasteurize and distribute waste milk for calves. It is in the responsibility of the end user to test and maintain the unit to assure continued effectiveness of pasteurization.

1.3 Safety Precautions

• Read and understand the Operator's Manual and all safety signs before operating, servicing, adjusting, repairing, unplugging or filling the unit.
• Be sure all safety covers are in good condition and properly installed before operating.
• Properly disconnect unit from electrical power source when servicing.
• Know and respect the machinery, approach moving parts with caution.
• Understand the location and function of all machinery and controls.
• Keep hands, feet and clothing away from any moving parts.
• Never remove / leave exposed guards during operation.
• Always Lock out, Tag out machine when shutting down for maintenance.
• Always be attentive for machine malfunctions or unusual noises. These can indicate problems requiring immediate attention.
• Particular attention must be paid to any supplementary or auxiliary items wired or plumbed to the system (detergents, acids, etc).
• Keep the DOOR TO THE ELECTRICAL CABINET CLOSED! Only authorized personnel may open the door when maintenance is necessary.

Only qualified maintenance personnel should perform maintenance or troubleshooting operations!

For additional safety information you can find local safety procedures via the Web Sites below.

Location	Administrated by	Web Site
In Canada	Canadian Center for Occupational Health and Safety	www.ccohs.ca
In USA	Occupational Safety and Health Administration	www.osha.gov
In European Union	European Agency for safety and Health at Work	www.europe.osha.eu.int

Section 2 – Installation

Once unit is placed, it is important to make sure the leveling feet are installed and adjusted so top of vat is level. Vat has a built in slope to drain.

2.1 Included Accessories

Each pasteurizer unit will come with three attachments that can be mounted to the dispensing hose or inside the tank. These attachments connect to the unit using a cam lock for quick and easy connections.

Agi-wand

The agitation nozzle or Agi-wand, attaches to the quick cam connection on the inside of the pasteurizer tank. The Agi-wand is used to agitate the calf milk inside the tank to maintain a consistent temperature throughout the tank while the calf milk is pasteurized.

The spray ball is used in the cleaning cycle for proper mixing of chemicals and rinsing. The spray ball, like the Agi-wand, connects to the quick cam connection on the inside of the pasteurizer tank.

Spray Ball

Dispensing Nozzle

The dispensing nozzle connects to the quick cam on the dispensing hose. The dispensing nozzle is used to transfer the pasteurized calf milk for distribution to calves.

See part manual for replacements

2.2 Connections

ELECTRICAL SHOCK HAZARD - Before continuing ensure that all power sources to the unit are disconnected before proceeding with any wiring or electrical connections.

i. Water Solenoids Inputs

1. **Cold Water Wash Solenoid.**
2. **Hot Water Wash Solenoid (180° Maximum water supply).**
3. **Cold Water Solenoid.**
4. **Hot Water Solenoid.**

ii. Electrical

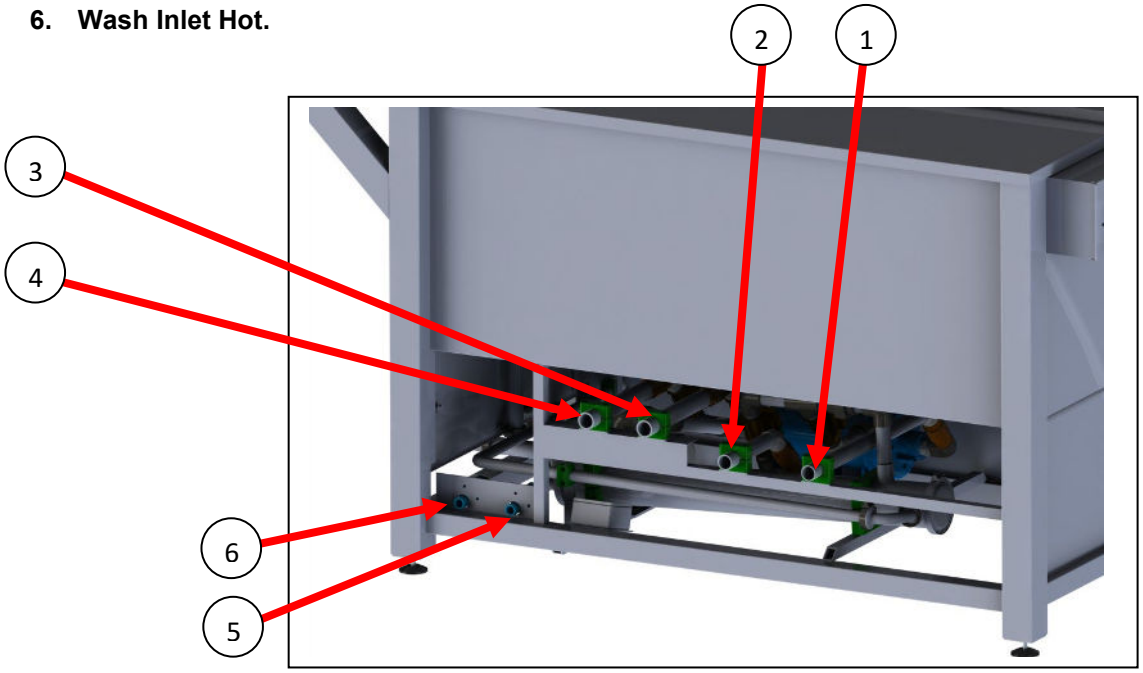
120 Gallon Unit **150 Gallon Unit** **200 Gallon Unit**	**20 Amp 240V AC single phase receptacle.** Units come with 6’ cord and a L14-20 style, 20A 4-wire Twist Lock.

If wiring to a 240 VAC 3 phase system, care must be taken to make sure system is not wired into the high 3 phase leg.

iii. Wash / Water Line Hook-Ups

Located on the back side of the units are the hook-ups for the inlet / outlet lines.

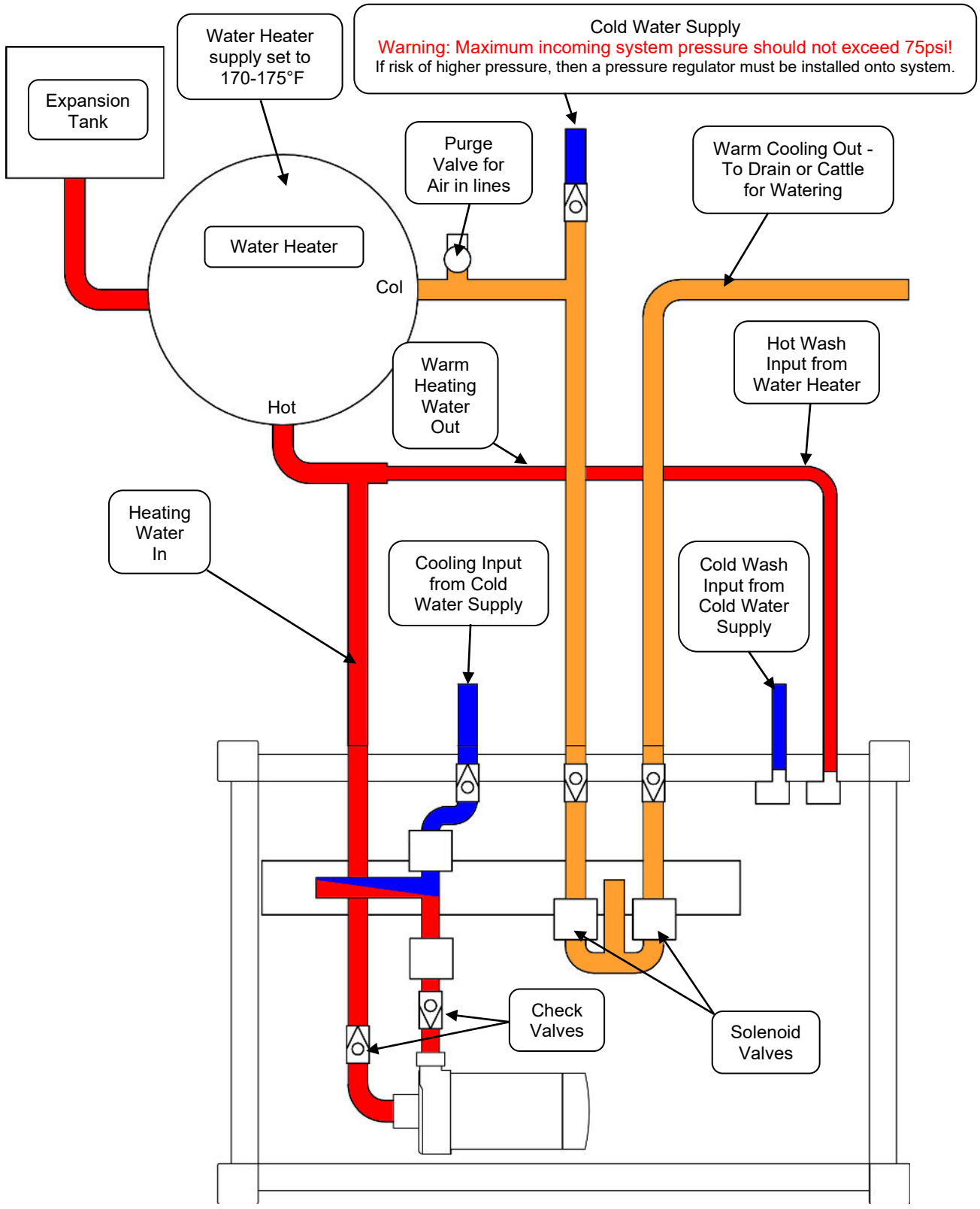
1. **Hot Water Inlet (180°F Maximum water supply).**
2. **Cold Water Inlet.**
3. **Hot Water Outlet (warm heating water out).**
4. **Cold Water Outlet (warm cooling out).**
5. **Wash Inlet Cold.**
6. **Wash Inlet Hot.**



2.3 Supplies Needed

• Minimum 100 gallon Water Heater with a rating of 200,000 BTU for 120 & 150 gallon units. For the 200 Gallon Unit, two 100 gallon Water Heaters are required or equivalent.	1 per unit
• Expansion Tank for Water Heater	1 per Water Heater
• 1” line for runs up to 50’ when installing from Heating Water in & Warm Heating Water out. For runs greater than 50’, sizing for line loss will need to be considered. Heating Water runs on a closed loop and 1” line insures 30GPM in a run of 50’ or less.	1” line for runs of 50’ or less
• Minimum 1” line for Cold inlet / outlets • Minimum of ½” line on Wash Hot / Cold inlets	
• Fittings, Tees and mounting brackets for all lines	Dependent on installation
• Input water pressure regulator (Required if there is a risk of incoming water pressure exceeding 75psi)	1 per unit

i. In-field Hook-Ups



Water temperatures reaching or exceeding 180°F can damage the solenoids valves and exceeding temperatures may rupture the water heater causing serious injury.

Once plumbed properly check for leaks and correct f any are found.

Section 3 – Panel Controls

3.1 Understanding Screen Layout

This unit is touch screen operated, to operate simply touch the screen where you want to navigate with your index finger to be taken to the selected subject.

3.2 Programming the Controls

All the programming for the PLC is done via the settings menu. The menu is only accessible from the Home screen when the selector switch is in the off position.

• Turn selector switch to the off position. This will take you to the home screen.

• The Main Menu screen will display the current temperature of the Pasteurizer in the bottom right hand corner.

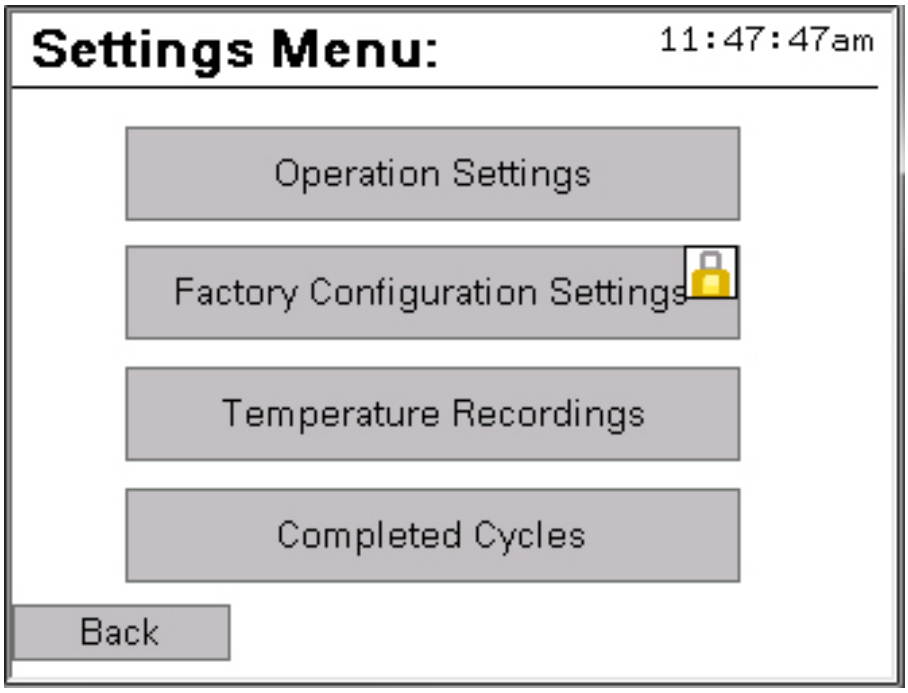
• Press the "*Settings*" button at the bottom left of the screen to bring up the settings screen menu.

In the settings menu you can navigate to one of four other menus; Operation Settings, Factory Configuration Settings, Temperature Recordings, and completed Cycles.

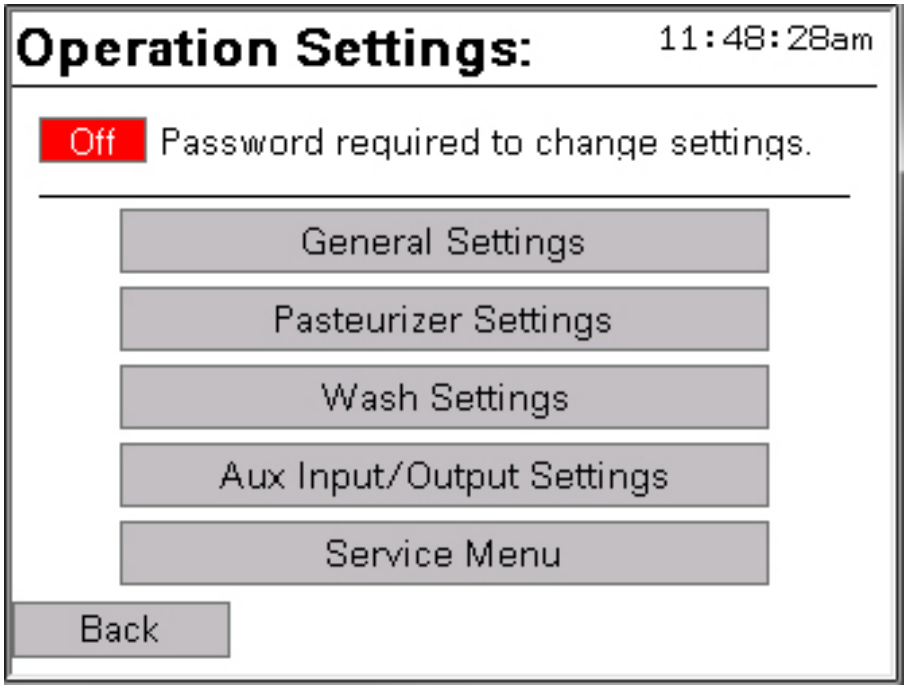
Please note that the "Factory Configuration Settings" is for advanced use only and should only be changed under the advice of a dealer or trained technician.

Continue on to Operation Settings

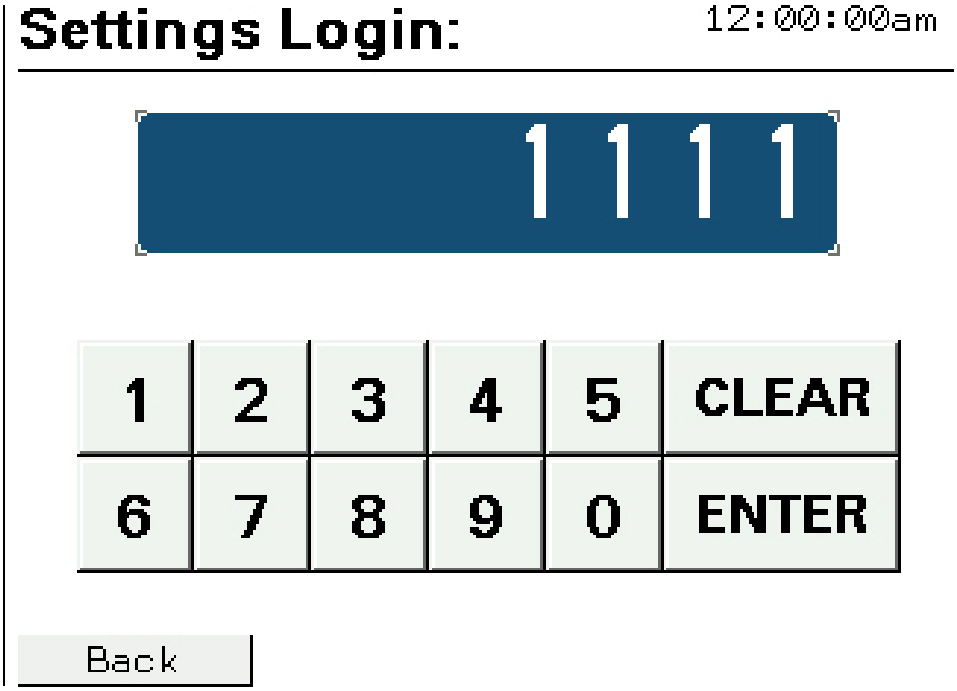
• Press "*Operation Settings*" to bring up the Operation settings screen.



3.3 Operation Settings



From this screen you can change the operating parameters for the pasteurizer.



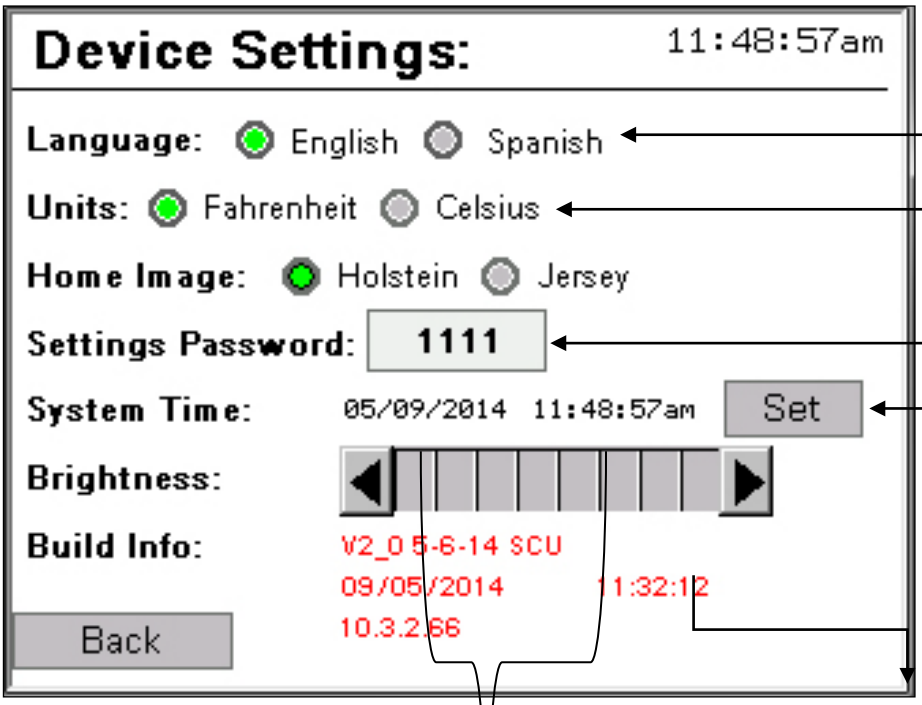
-Enter in ***1111*** for the password and press ***enter***.

** This password can be changed inside *general settings.*

** If you forget the password, please contact your local dealership.

i. - General Settings Screen

From the general settings screen the end-user can customize how the screen and the content on the screen will be displayed. From this screen you can set; default language, units, home screen image, settings password, system time, and the display brightness.



Select to change the operating language.

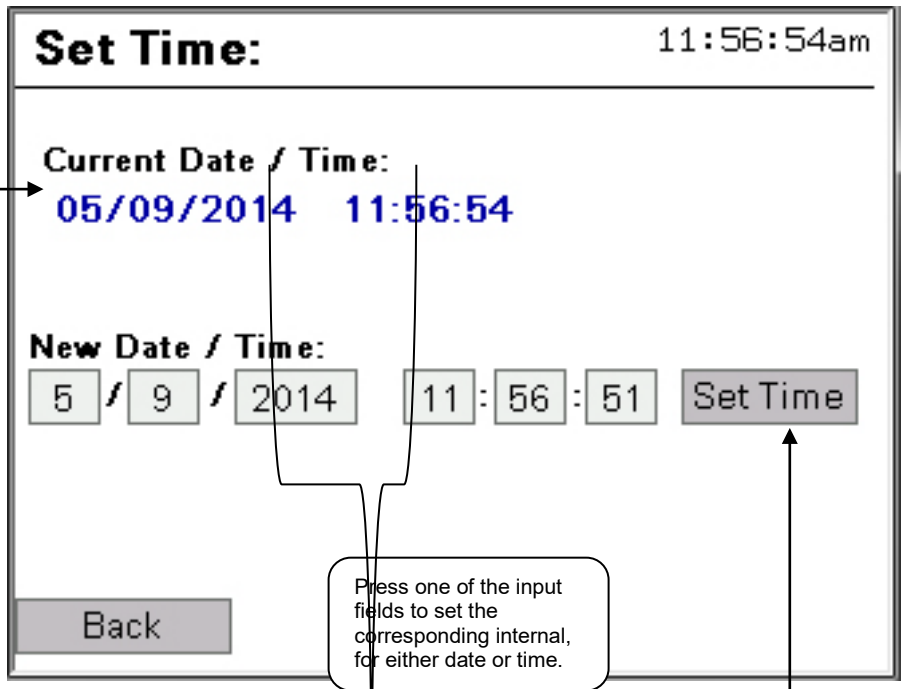
Display temperature in either Fahrenheit or Celsius.

Press here to change current set password.

Press here to set the time in the PLC.
Note that the real time clock can drift up to 30 seconds each month.

The units build information will be displayed here. This can be used to determine the version that the PLC is currently running for troubleshoot & service calls.

You can adjust the brightness of the screen here. The screen will automatically dim after 30 seconds of inactivity on the home screen.



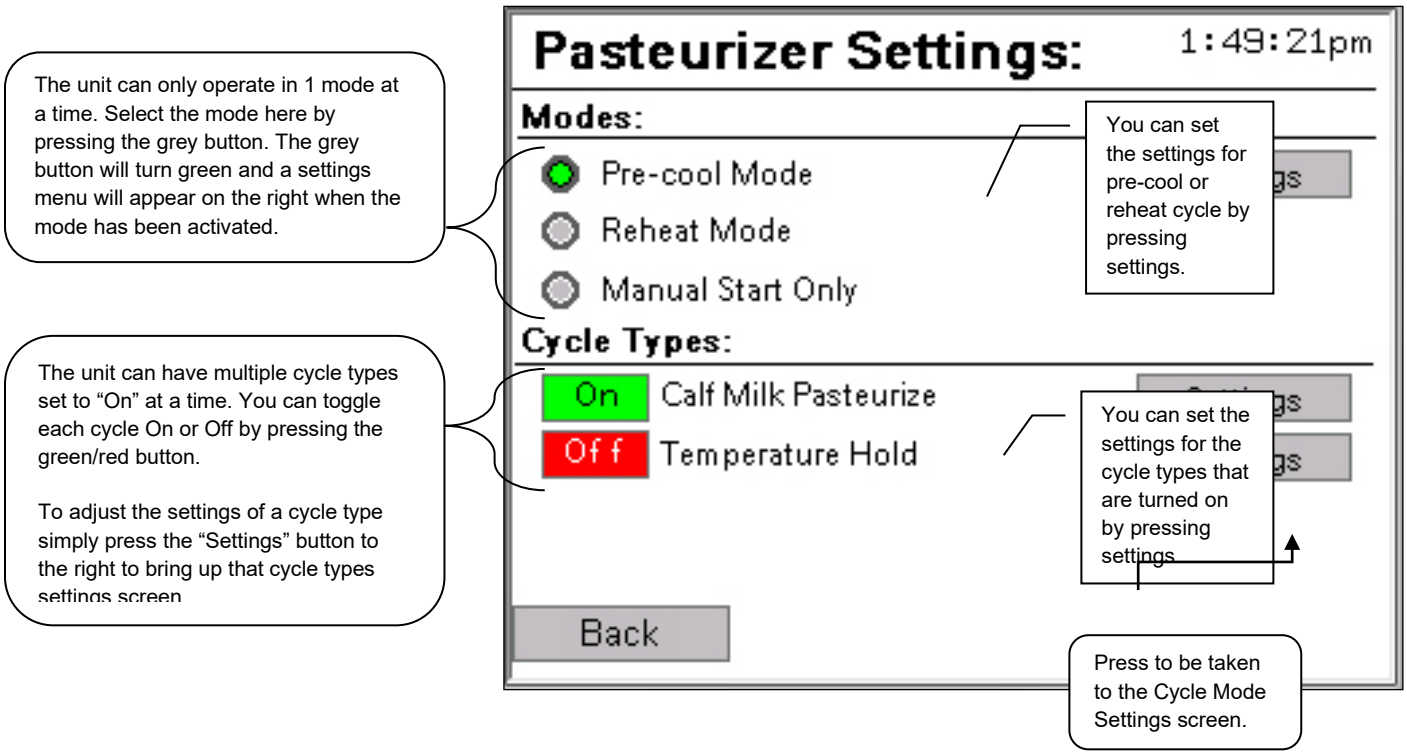
Will display the current time and date.

Press "Set Time," once the current date and time have been entered onto the screen, to set the entered time.

Press one of the input fields to set the corresponding internal, for either date or time.

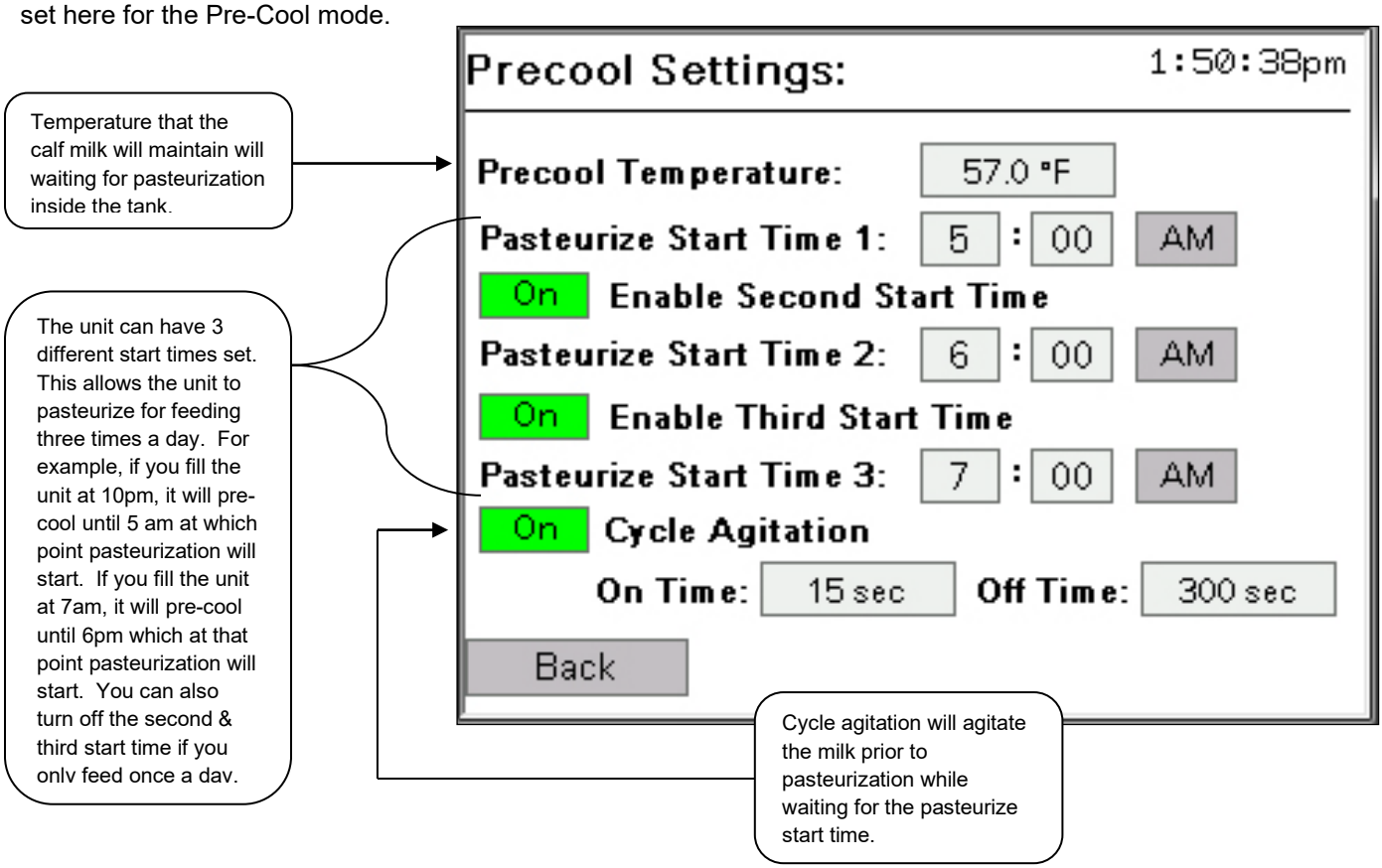
ii. - Pasteurizer Settings Screen

The Pasteurizer Settings screen allows the user to set the time when each mode will activate during the day. Each mode must first be selected before the "Settings" button will appear. Once displayed on-screen press the "Settings" button to be taken to that modes device settings.



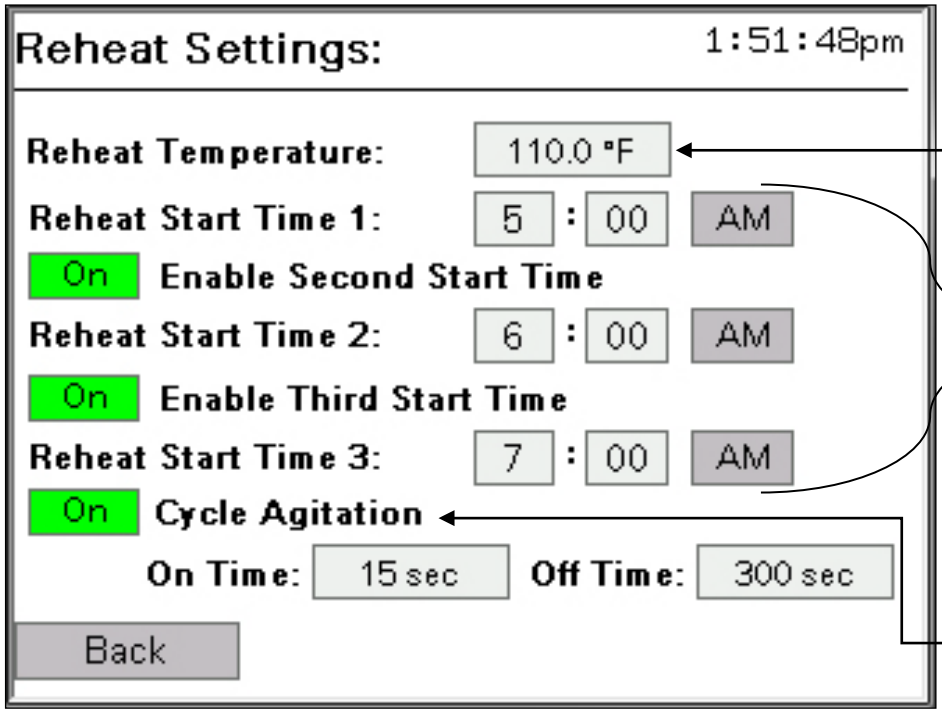
Pre-Cool Mode Settings

Pre-cool mode sets when the pasteurizer will begin to cool the calf milk. This can be set to any time of the day and if desired multiple start times can be activated and set. The pre-cool temperature and cycle agitation time can also be set here for the Pre-Cool mode.



Reheat Mode Settings

Reheat mode sets when the pasteurizer will begin to reheat the calf milk inside the tank. This can be set to any time of the day and if desired multiple start times can be activated and set. The reheat temperature and cycle agitation time can also be set here for the Reheat mode.



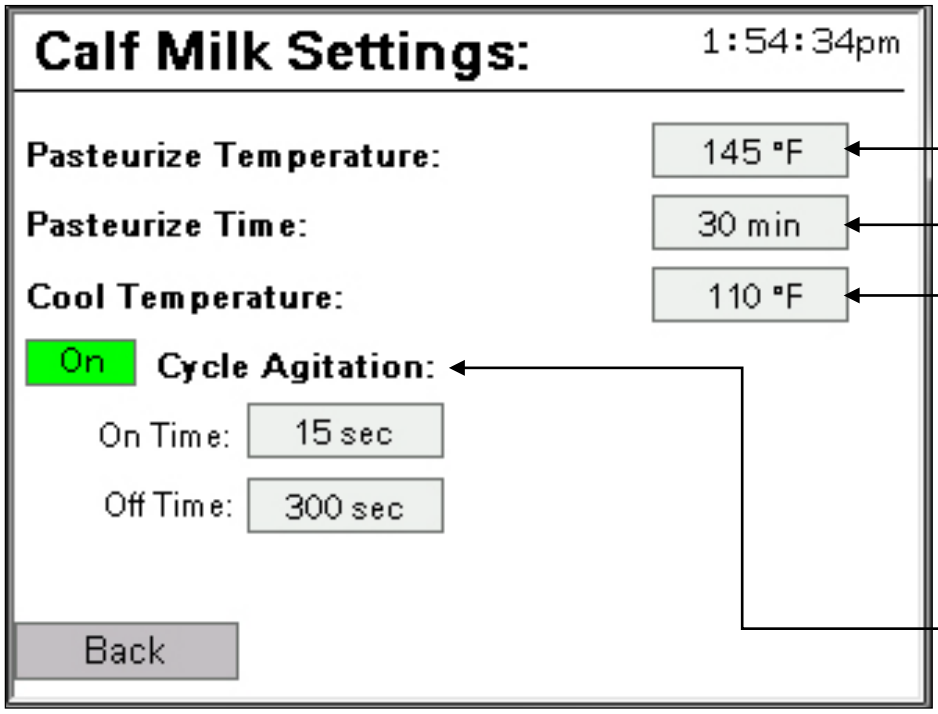
Set temperature that the calf milk will reach before feeding to the calves.

The unit can have 3 different start times set. This allows the unit to pasteurize for feeding three times a day. For example, if you fill the unit at 10pm, it will immediately pasteurize then cool down and maintain this cool temperature until 5 am at which point the unit will reheat to the set reheat temperature.

Cycle agitation will agitate the milk after pasteurization has occurred, waiting for the reheat start time.

Calf Milk Cycle Settings

Calf Milk settings will allow for the customization of the pasteurizer heating process and will allow the user to adjust the temperature, pasteurize time, cool temperature and cycle agitation. These settings can be changed, though it is not recommend due to the Pasteurized Milk Ordinance.



Set to change how hot the pasteurizer will become.

Set to change the duration that the milk will be heated.

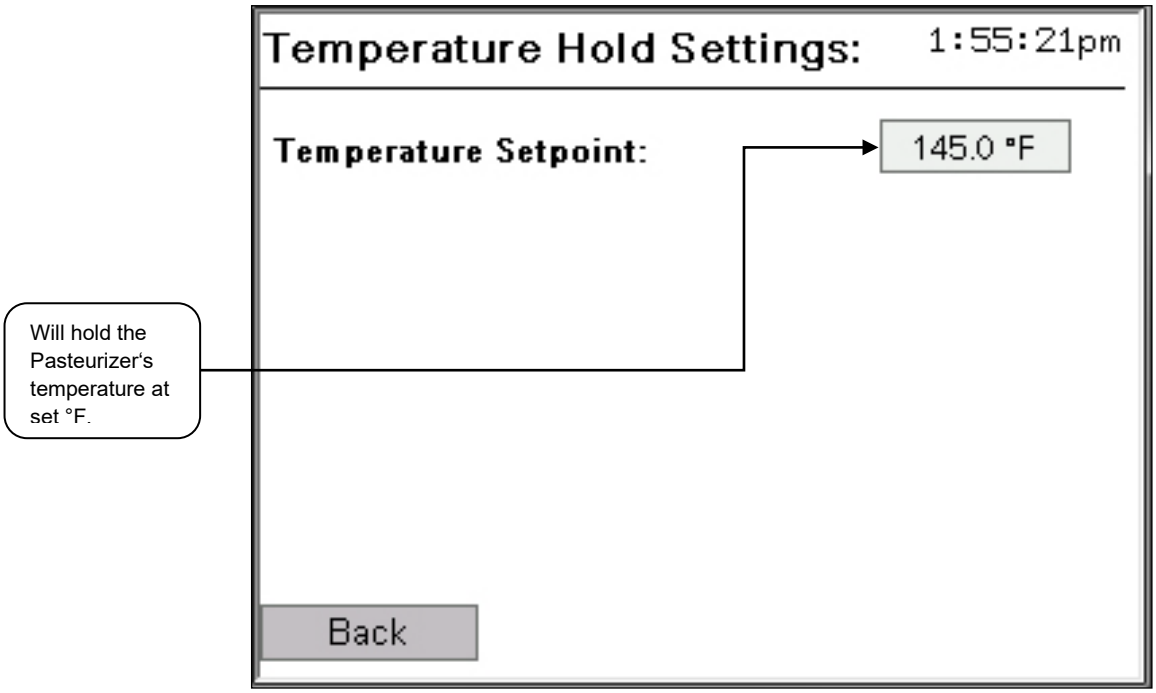
This must be set at least 4°F above supply water temperature.

Cycle agitation will agitate the milk during pasteurization to maintain a consistent heat throughout the calf milk.

Pasteurized Milk Ordinance states, milk must be heated to 145°F and held there for 30 minutes. Any changes from these settings may result in non-pasteurized milk.

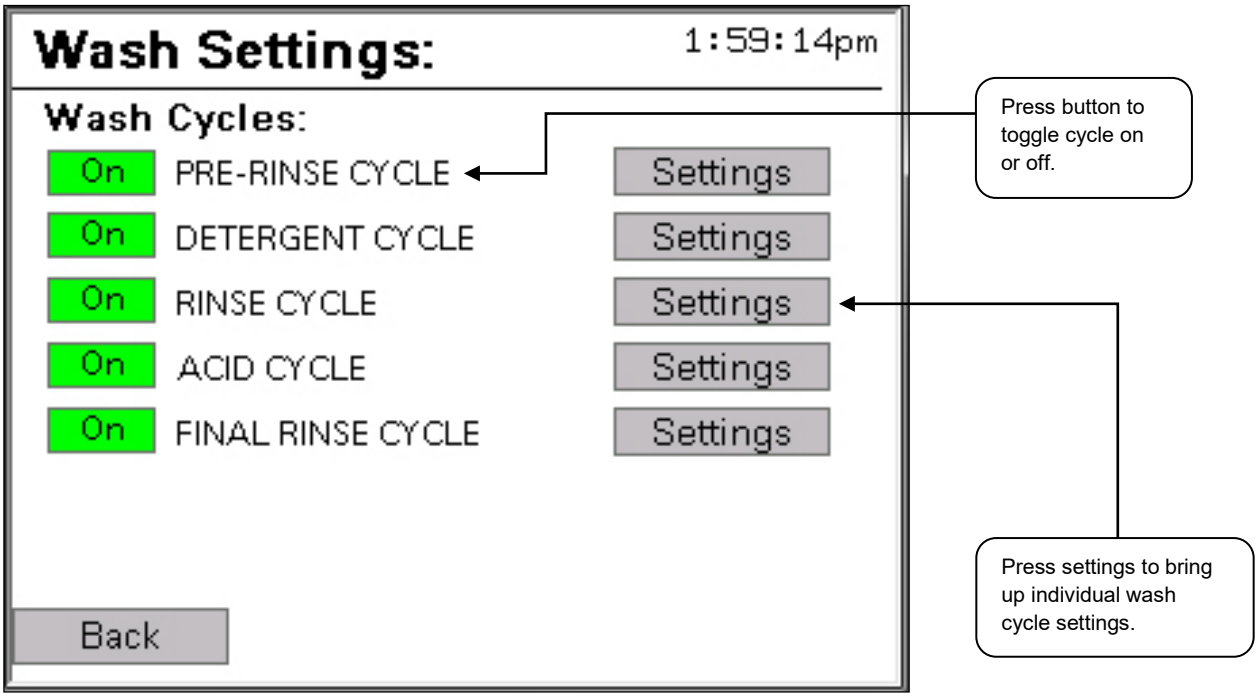
Temperature Hold Settings

The temperature hold feature is a heat or cool override that will last until the temperature hold is disabled. On this settings screen you can set the desired temperature that the pasteurizer unit will maintain.



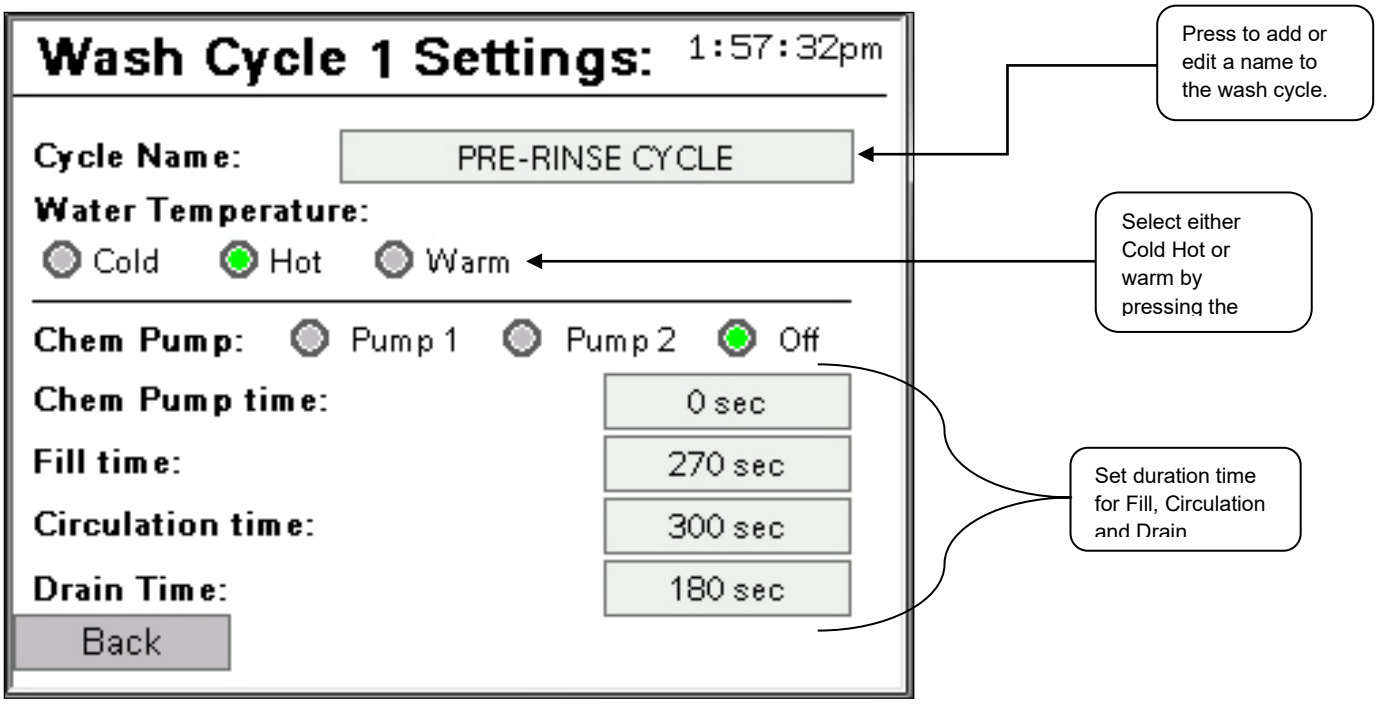
iii. - Wash Settings

These settings will allow for the set up of the wash cycle. Each cycle can be customized to perform a different task, whether from a rinse, detergent or acid cycle. Here you can also toggle a cycle to the OFF position to disable it from activating during a wash phase.



Cycle Settings

Wash cycle settings allows for each one of the cycles to be custom set. This screen will allow the operator to set the name of the cycle, the water temperature, chemical pump operation and fill / circulation / drain time.



iv. – Aux Input / Output Settings

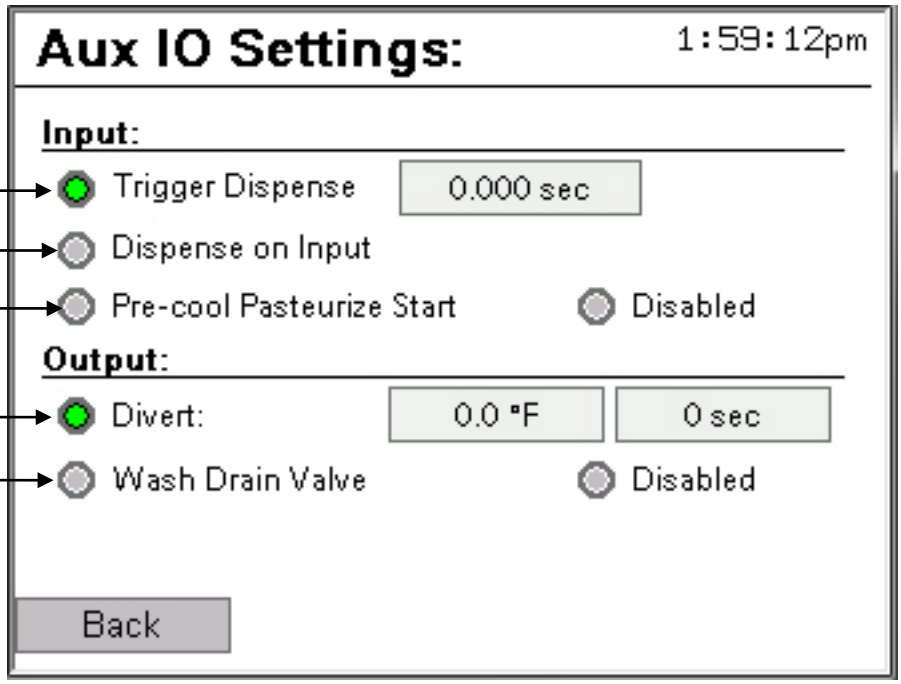
The Aux Input / Output or Aux IO settings allow the pasteurizer to add in automated or remote control inputs. These custom components allow the pasteurizer to be more flexibility to custom additional features making the unit more user friendly to a specific dairy. To apply additional features, wiring will need to be installed to the terminal blocks located inside the control panel. The input / output terminal blocks hook ups are displayed below after the Aux IO description.

An active switch that once pressed will activate the pasteurizer pump to dispense liquid from the vat for a set amount of time before shutting off.

An active switch that once toggled will activate the pasteurizer pump to continually dispense liquid from the vat until the switch is turned off.

Enabled if using a remote start button or switch, that is not in reach of the pasteurizer control box touch screen.

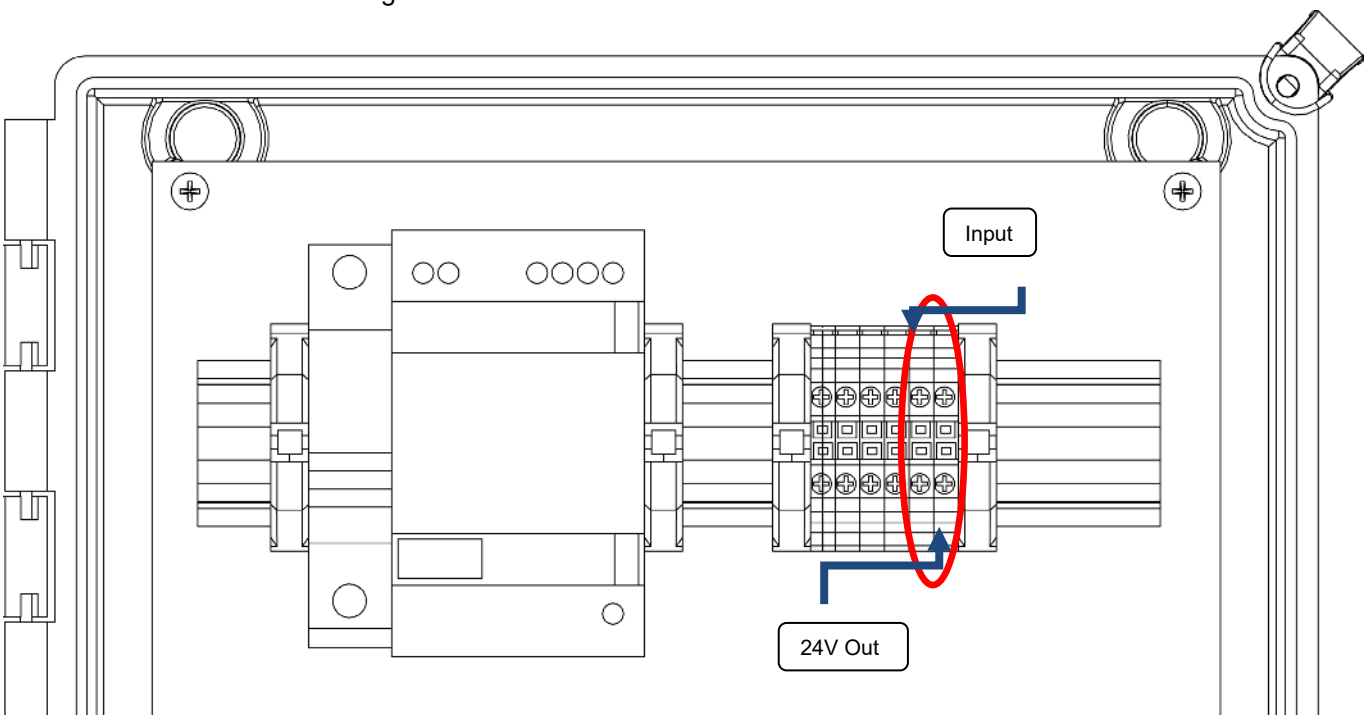
Divert will activate the pasteurizer pump when a set temperature is reached. The pump will run for a set amount of time before shutting off.



Enable if using an electric drain valve.

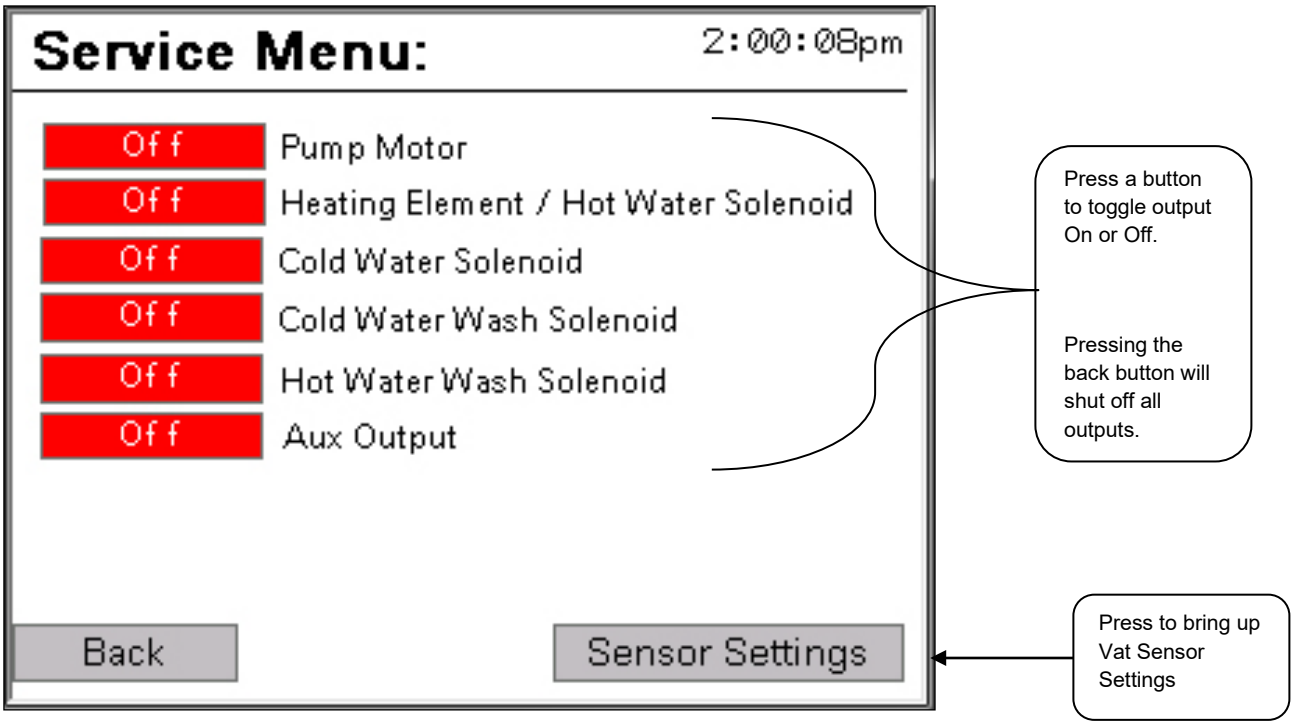
Aux Wire Connections

Each control box comes with two auxilary terminal blocks, one for input and one for output. The auxilary terminal blocks are located inside the control box in the top right corner on a terminal distrapbution block. The input and output terminal blocks are the last two on the right in the distrabution block. The two auxilary terminal blocks can be seen in the red circle in the image below.



v. - Service Menu Screen

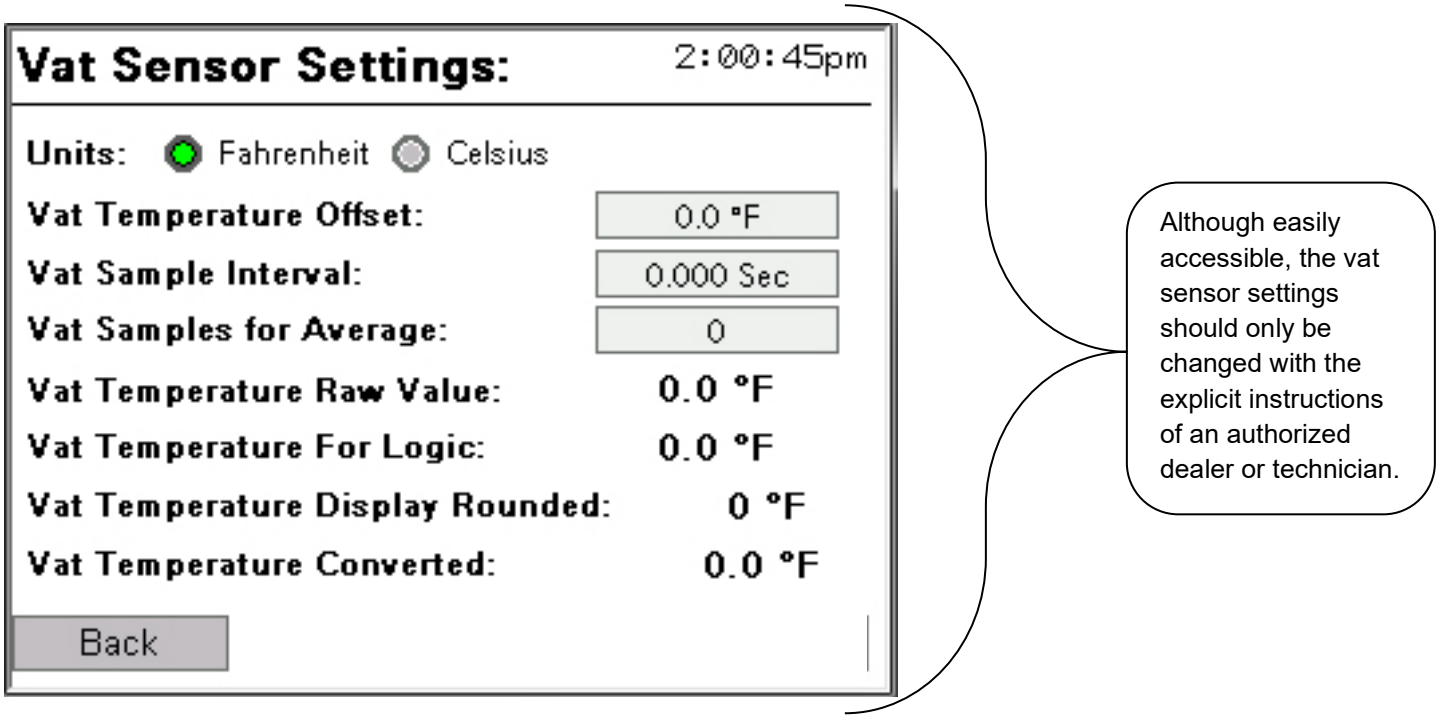
The service menu will allow for the manual operation of each device on the pasteurizer unit. This manual can be used to troubleshoot each device if a problem is detected.



Running pumps with no liquid can burn out pump seals.

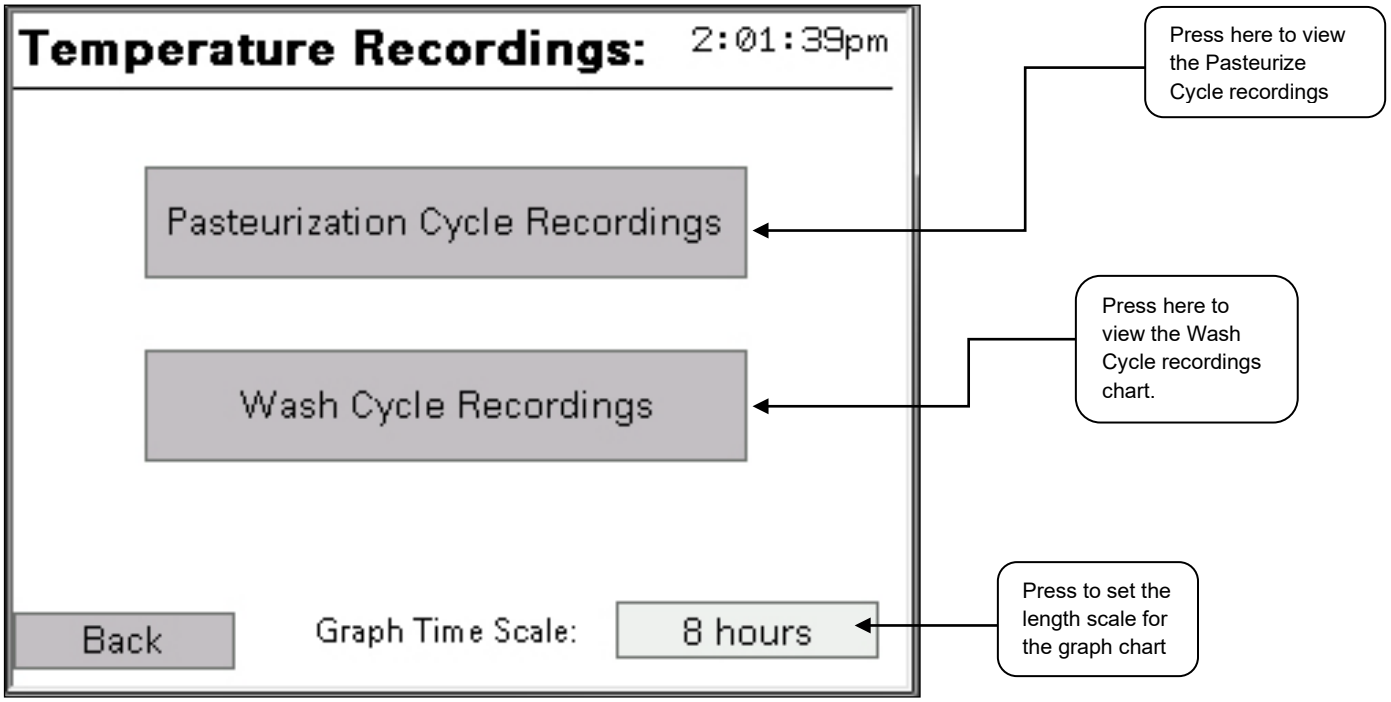
Vat Senor Settings

The Vat sensor settings control the range of the pasteurizer unit for temperature consistency. This allows the product inside the vat to heat or cool with less variance in temperature drop. The Vat sensor settings can be found in the Service Menu from the Operation Settings screen.



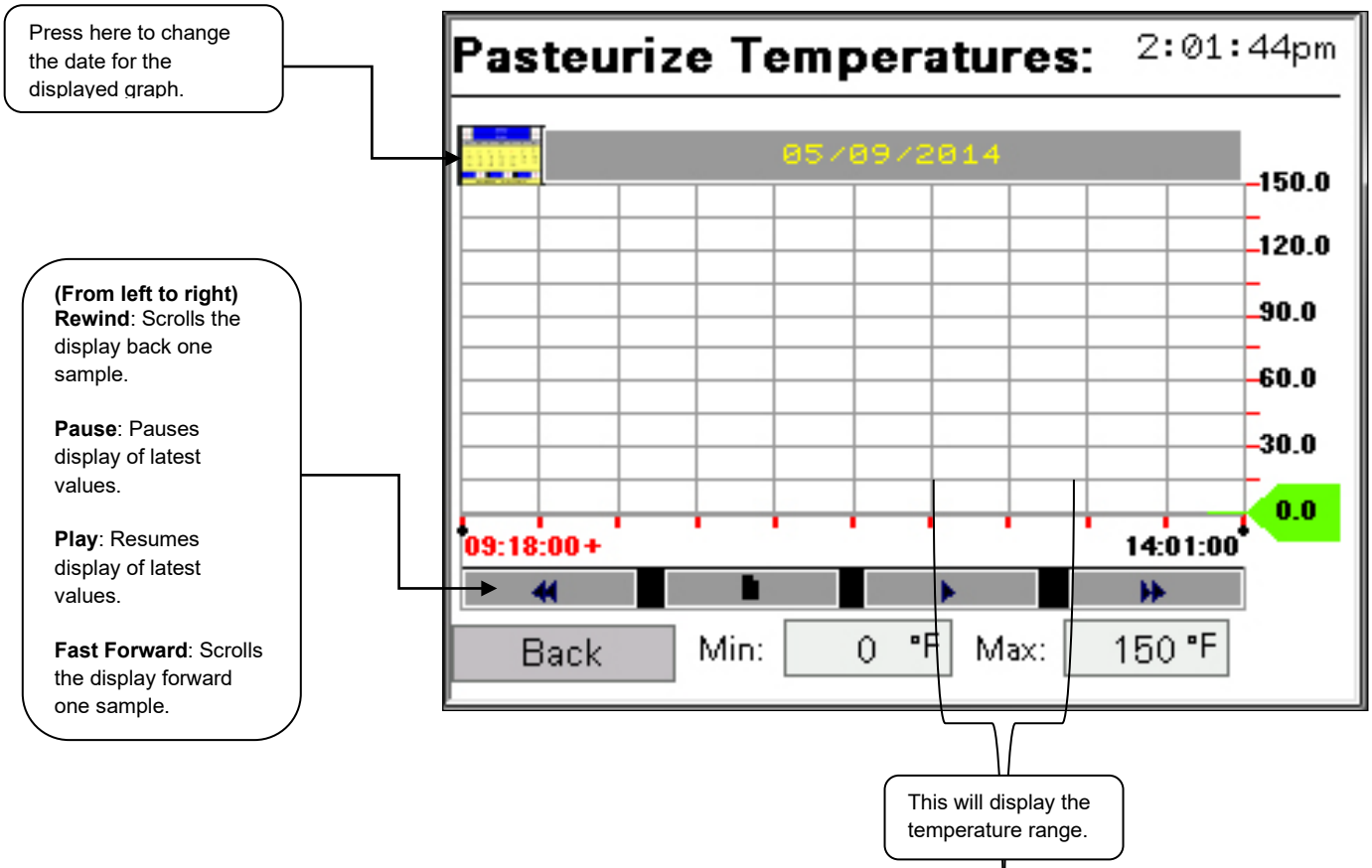
3.7 Temperature recordings

Temperature Recordings can be found on the Settings Menu screen (see section 3.2). Here all the data is recorded from the pasteurizer cycles. Pasteurization and Wash cycle data can be viewed in a graph format from time of day to temperature reached.



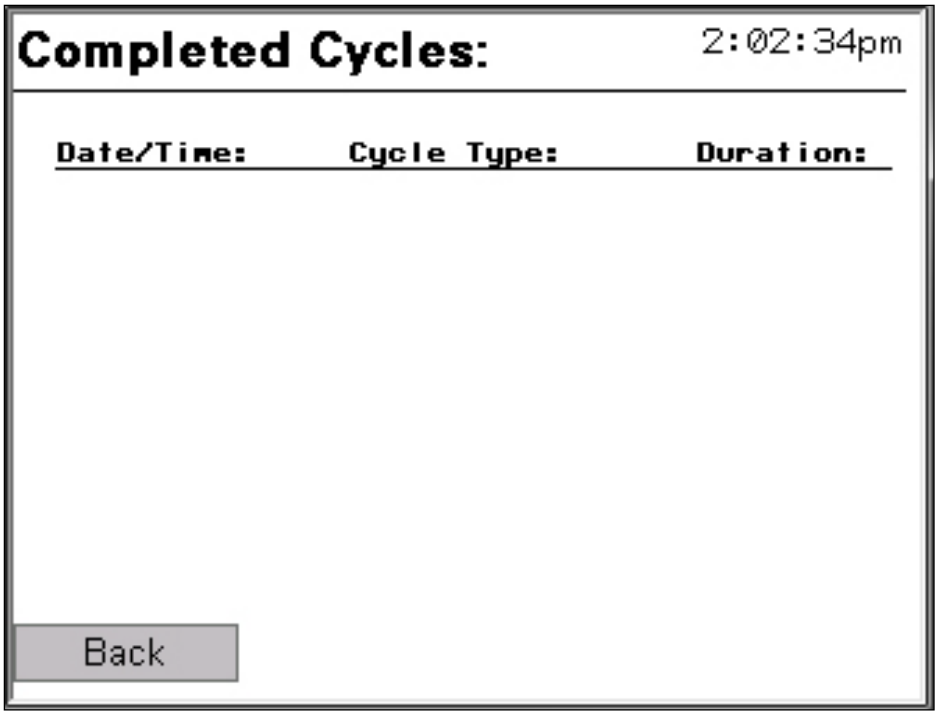
i. – Pasteurize & Wash Cycle Graph

This graph will illustrate the hour and recorded temperature on any given day. Temperatures are logged throughout each wash and pasteurization cycle and all information is stored here for viewing and data logging. To view past dates click on the calendar in the top left corner to enlarged the calendar size.



3.8 Completed Cycles

Completed Cycles Screen can be found on the Settings Menu screen (see section 3.2). This screen will record the last 8 completed cycles and the cycle duration.



3.9 Menu Diagram

- **Home Screen**
  - **Settings**
    - **Operation Settings**
      - **General Settings**
        - *Language*
        - *Unit Display (Fahrenheit, Celsius)*
        - *Home Image*
        - *Settings Password*
        - *System Time*
        - *Brightness*
      - **Pasteurizer Settings**
        - **Operating Mode** ***** only 1 mode can be selected***
          - ***Pre-cool***
            - *Start times*
            - *Pre-cool temperature*
            - *Cycle agitation*
          - ***Reheat***
            - Start times
            - Reheat temperature
            - Cycle agitation
          - ***Manual***
        - **Cycle Types** ***** multiple different cycle types can be enabled***
          - ***Calf Milk Pasteurize***
            - *Pasteurize hold time*
            - *Pasteurize temperature*
            - *Cool temperature*
          - ***Temperature Hold***
            - *Hold Temperature*
      - **Wash Settings**
        - ***Cycle 1-5 Settings***
          - *Cycle name*
          - *Water temperature*
          - *Fill time*
          - *Circulation time*
          - *Drain time*
      - **AUX Input / Output Settings**
        - *Trigger Dispense*
        - *Dispense on Input*
        - *Pre-cool Pasteurize Start – Enable/Disable*
        - *Divert*
        - *Hot Water Assist*
        - *Wash Drain Valve – Enable/Disable*
      - **Service Menu**
        - *Pump Motor - On/Off*
        - *Burner – On/Off*
        - *Cold Water Solenoid – On/Off*
        - *Cold Water Wash Solenoid – On/Off*
        - *Hot Water Wash Solenoid – On/Off*
    - **Temperature Recordings**
      - ***Pasteurization Cycle Recordings***
        - *Chart of recordings*
      - ***Wash Cycle Recordings***
        - *Chart of recordings*
    - **Completed Cycles**
      - *Lists all completed Pasteurize and Wash cycles*

Section 4 – Operation

The Westwaard Pasteurizer is an agitated batch pasteurizer. A PLC controls all functions of the unit. The WP uses an external heat source, which transfers the heat through to the milk in the unit to set a temperature and keeps it there for a set holding duration. It then cools the milk by passing cold water through a heat exchanger until the milk reaches the set temperature. Please be aware the PMO for a batch pasteurizer calls for heating to 145 degrees and holding it at that temperature for 30 minutes. Any adjustment made to the heat temperature can take the unit out of what the call out is for proper pasteurization.

	**Vat reaches temperatures of approximately 150° F during heating cycle. Contact with vat will create burn risks. Caution must be taken with young children around equipment.**

	**Guards and covers which prevent contact with electrically energized or moving parts or are required to direct the flow of air for effective cooling, must not be removed or left open during operation.**

4.1 Pasteurization

Pasteurizer Operation Modes

-The Westwaard Pasteurizer can operate in only **one** of the following modes:

- **Pre-cool Pasteurization**
- **Reheat Pasteurization**
- **Manual Pasteurization**

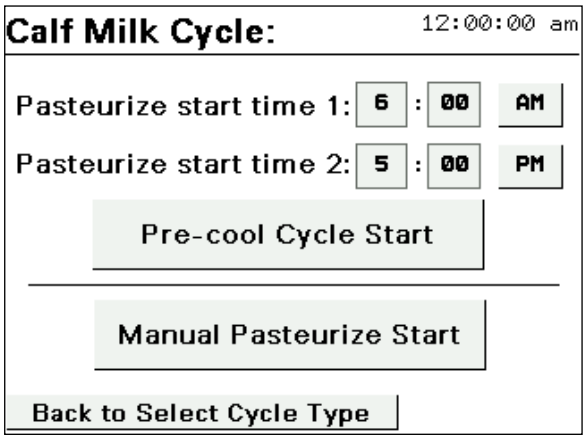
-Refer to section 3.4 to change mode of operation.

i. Pre-cool Pasteurization

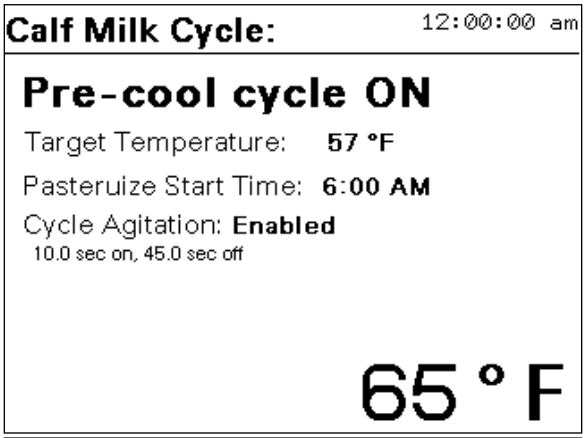
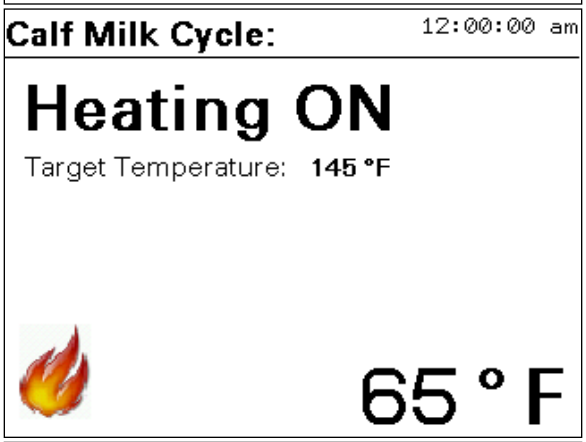
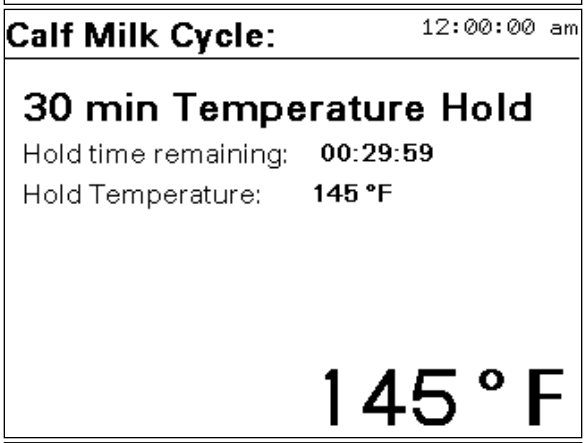
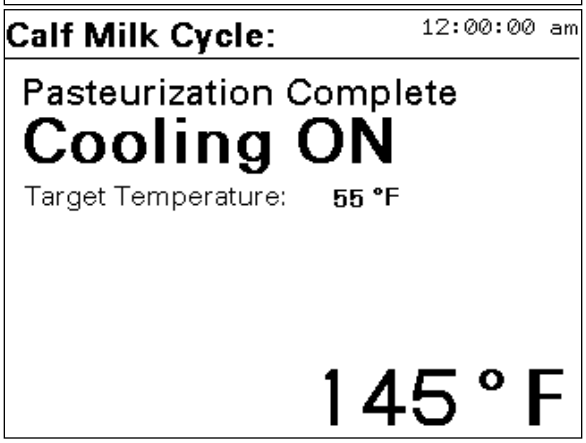
-In Pre-cool mode, the product will maintain a set pre-cool until the set pasteurize start time. At that point, the product will run through the selected Pasteurization Cycle, then cool back down to the set temperature. The cycle is now complete.

***There can be 2 set start times for this cycle.*

1.	Close manual drain valve.
2.	Install agitation tube in vat.
3.	Load milk into unit.
4.	Move selector switch to pasteurize position.
5.	Set Pasteurize start times by pressing the hour and minute blocks. Press AM/PM to toggle. Then press *Pre-cool Cycle Start* to begin cycle.

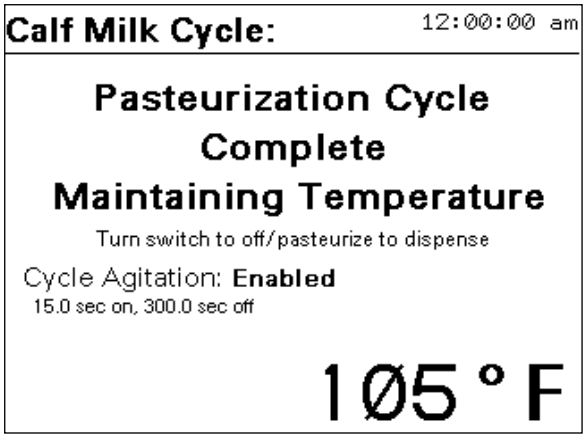


i. Pre-cool Pasteurization (continued)

6.	Screen will display the status of the pre-cool cycle.	
7.	Screen will display progress on heating once the clock reaches pre-cool start time.	
8.	Once milk reaches the set temperature, the unit will maintain this temperature for 30 minutes providing a countdown of time remaining for the hold duration.	
9.	After the hold duration is complete, the unit will start to cool the milk to the set temperature.	

i. Pre-cool Pasteurization (continued)

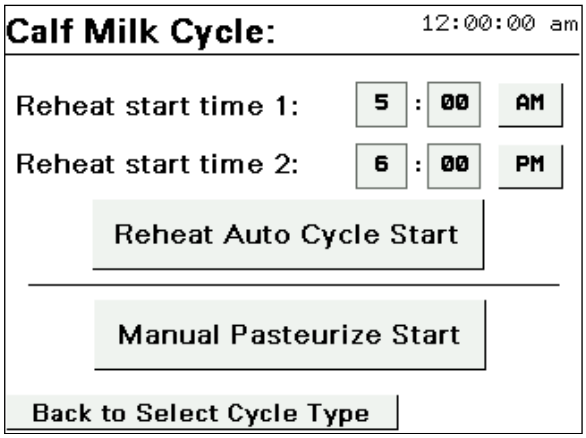
10.	Pasteurization cycle is now complete. Move selector switch to off position to use pump switch to dispense.

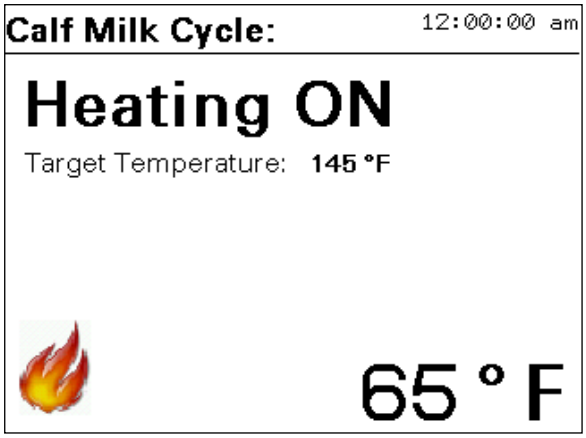


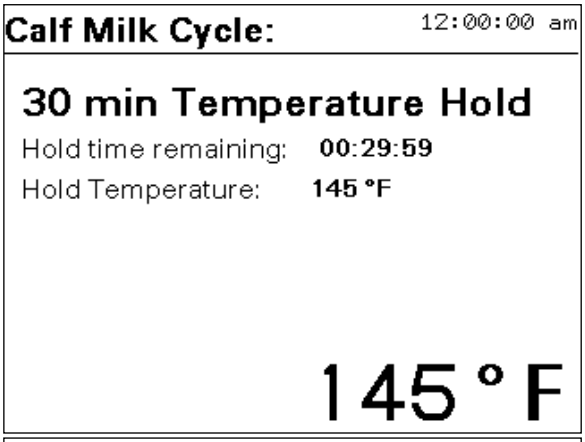
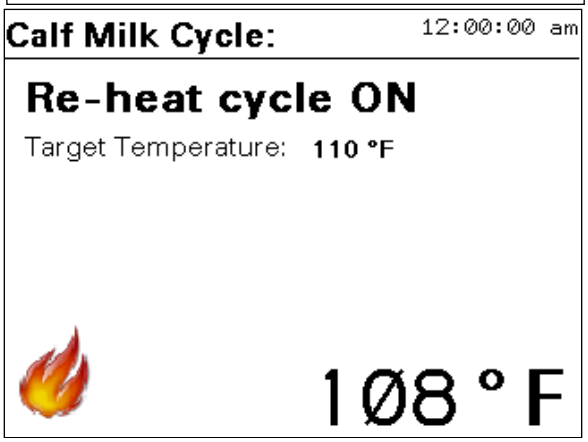
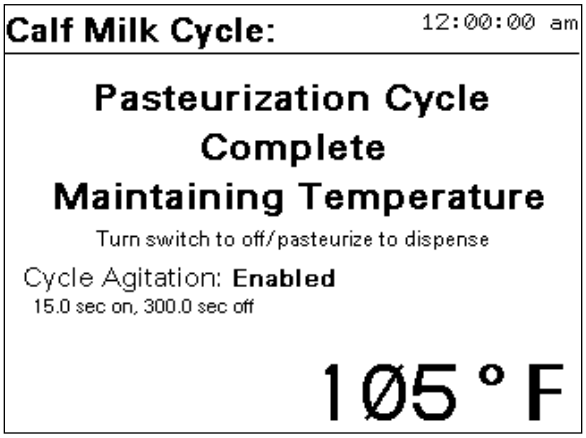
ii. Reheat Pasteurization

-In Reheat mode, the product will immediately start the Pasteurization Cycle, cool back down to the set temperature and maintain this temperature until the set reheat start time. At that point the product will be reheated to set temperature ready to dispense. The cycle is now complete.
***There can be 2 set start times for this cycle.*

1.	Close manual drain valve.
2.	Install agitation tube in vat.
3.	Load milk into unit.
4.	Move selector switch to pasteurize position.
5.	Set Reheat start times by pressing the hour and minute blocks. Press AM/PM to toggle. Then press *Reheat Cycle Auto Start* to begin cycle.
6.	Screen will display progress on heating.



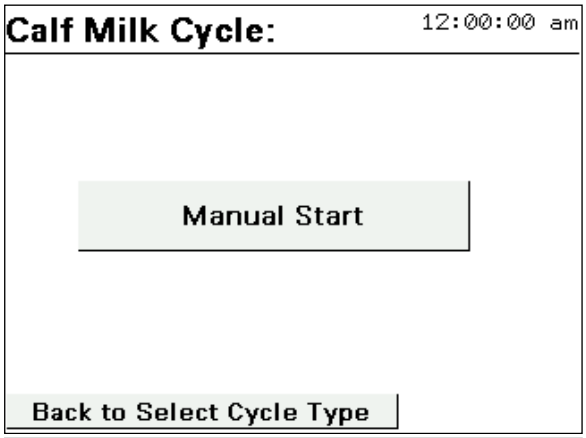


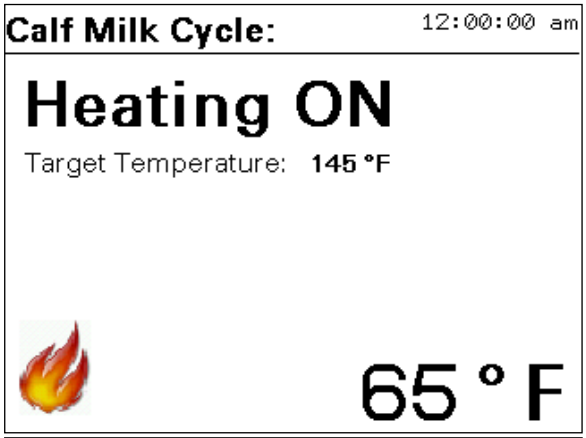
7.	Once milk reaches the set temperature, the unit will maintain this temperature for 30 minutes providing a countdown of time remaining for the hold duration.	
8.	After the hold duration is complete, the unit will start to cool the milk to the set temperature and maintain this temperature until the set re-heat start time.	
9.	Reheat cycle will heat up the milk to the set temperature.	
10.	Once the milk has reached the set temperature, the cycle is complete, and the milk can be dispensed.	

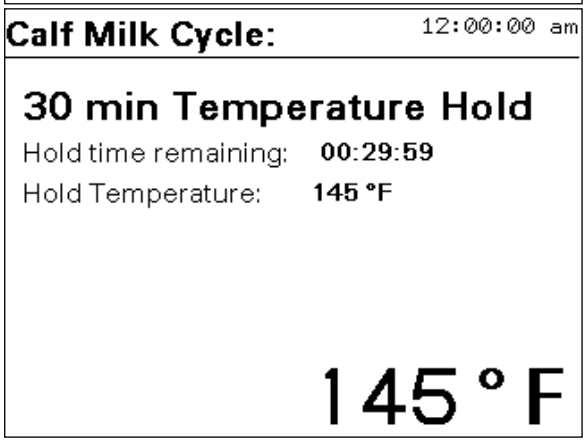
iii. Manual Pasteurization

In Manual mode, the product will immediately start the Pasteurization Cycle, cool back down to the set temperature. The cycle is now complete.

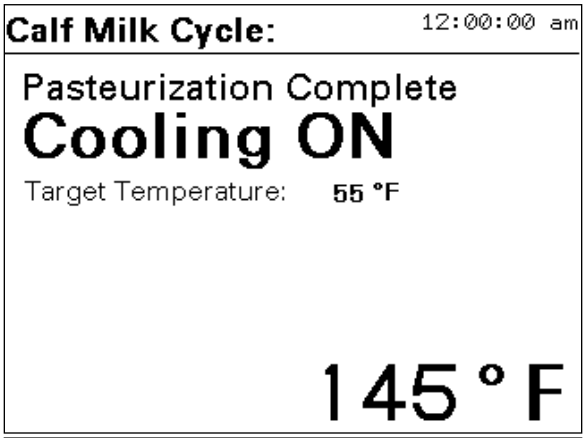
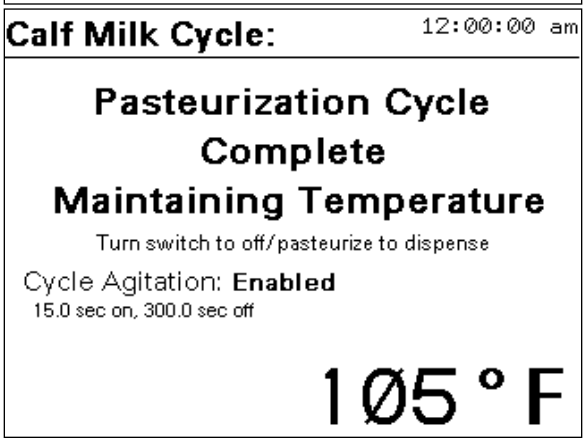
1.	Close manual drain valve
2.	Install agitation tube in vat
3.	Load milk into unit
4.	Move selector switch to pasteurize position
5.	Press *Manual Start* to begin cycle.
6.	Screen will display progress on heating.
7.	Once milk reaches the set temperature, the unit will maintain this temperature for 30 minutes providing a countdown of time remaining for the hold duration.







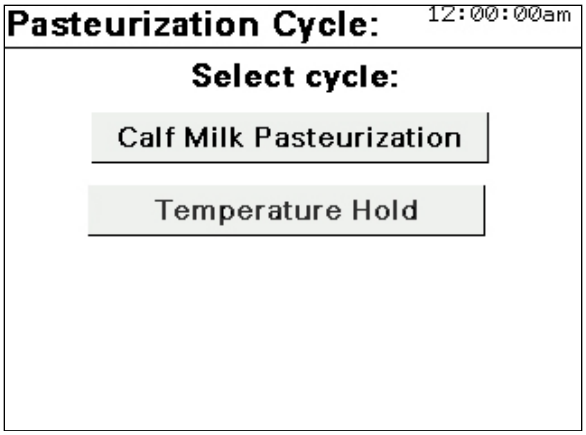
iii. Manual Pasteurization (continued)

8.	After the hold duration is complete, the unit will start to cool the milk to the set temperature.	
9.	Pasteurization cycle is now complete. The milk can now be dispensed.	

4.2 Temperature Hold

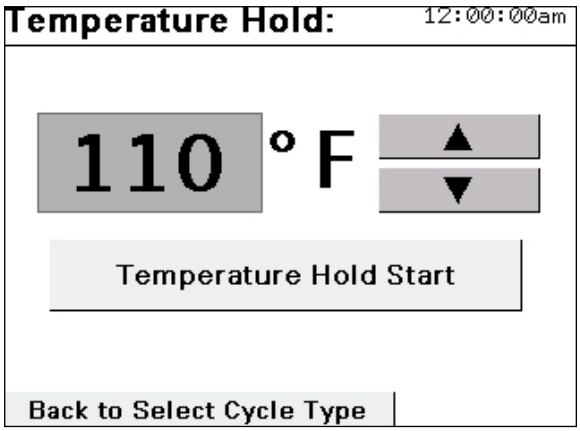
-Must be enabled to activate on screen, refer to section 3.4 to enable.

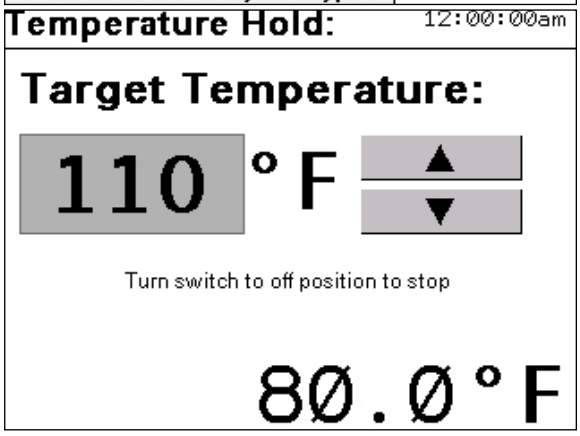
1.	Move selector switch to pasteurize position.
2.	Press *Temperature Hold.*



4.2 Temperature Hold (continued)

3.	The unit will bring the substance in the vat up to the set temperature.
4.	Once the water reaches the set temperature, the unit will hold this temperature. Move selector switch to off position to stop the Temperature Hold and be brought back to the home screen.



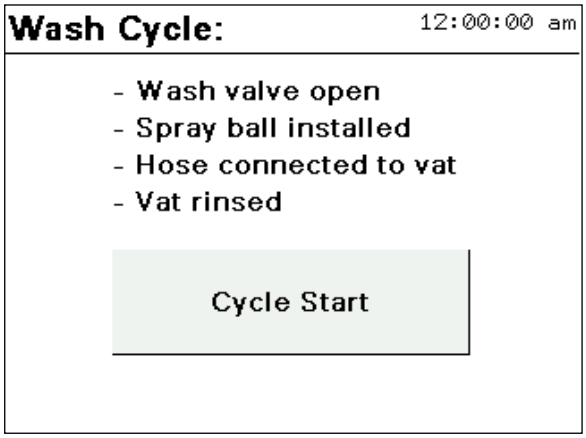


4.3 Wash Mode

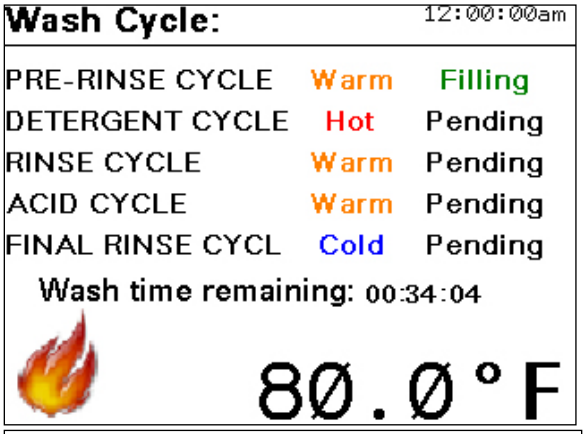
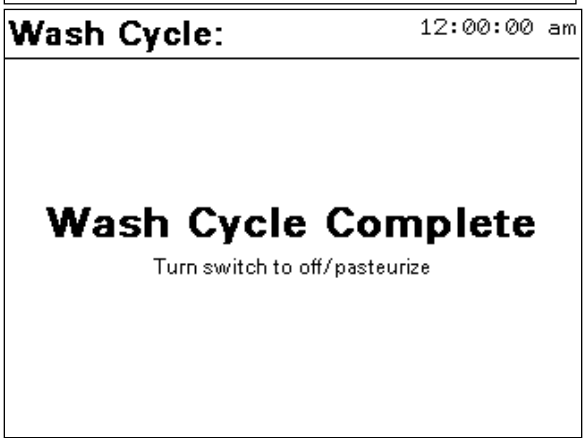
The Westwaard Pasteurizer has an onboard CIP system. It washes in a similar method to a typical dairy bulk tank. PLC runs a 5 cycle wash by dispensing chemicals through Peristaltic Pumps. The 5 cycles are Pre-Rinse, Detergent, Rinse, Acid, and a final rinse to make sure all chemicals have been rinsed out from the unit.

Mixing of wash chemicals can cause potential dangerous fumes. Extreme caution must be taken when testing and setting of wash cycle to make sure chemicals are not allowed to mix.

1.	Open manual drain valve.
2.	Attach spray ball attachment.
3.	Move selector switch to wash position.
4.	Make sure Hose is connected to vat
5.	Press *Cycle Start.*



4.3 Wash Mode (continued)

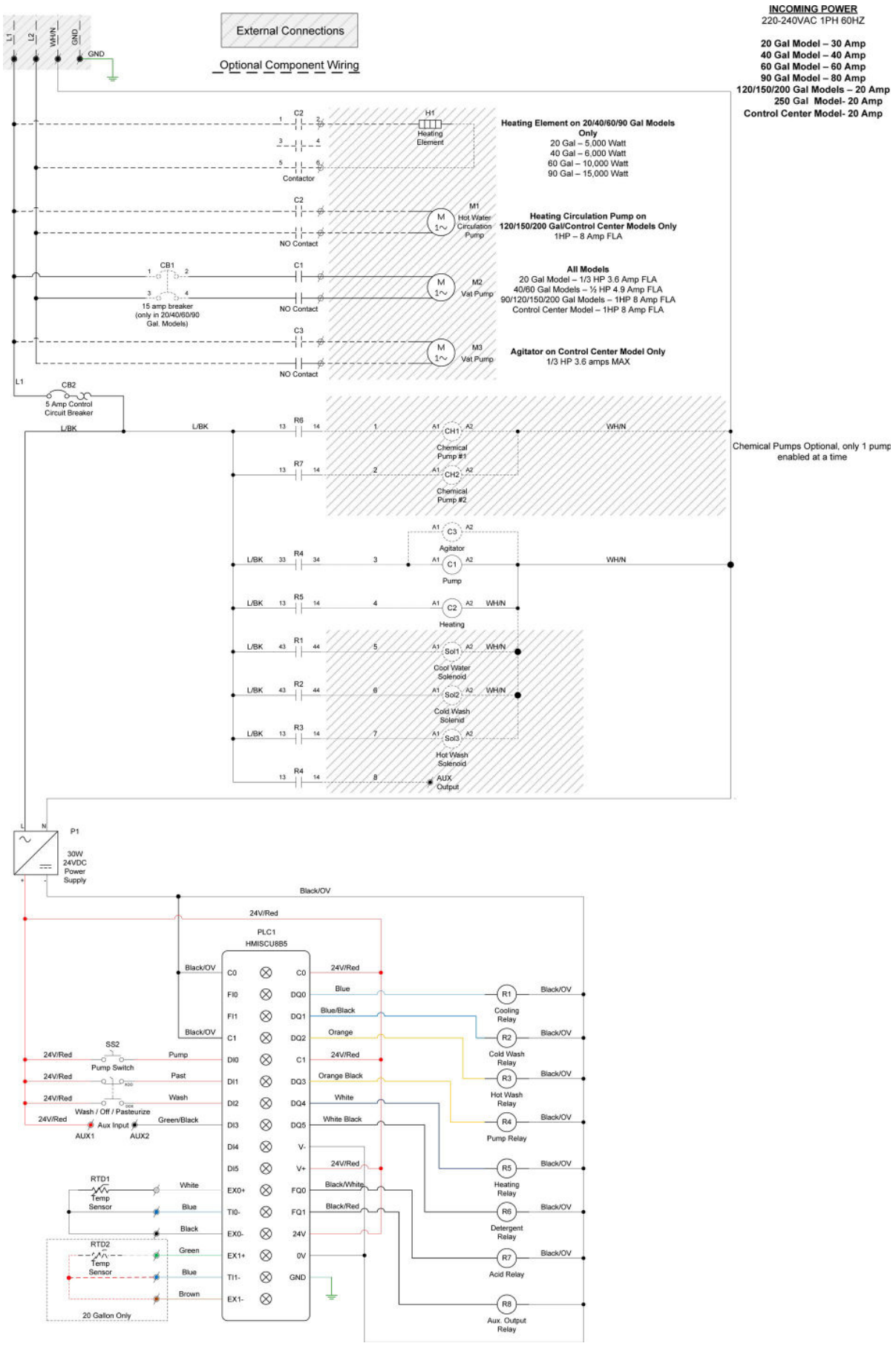
6.	Unit will cycle through each cycle giving you a visual display of the progress of each step.	
8.		

4.4 Dispense Mode

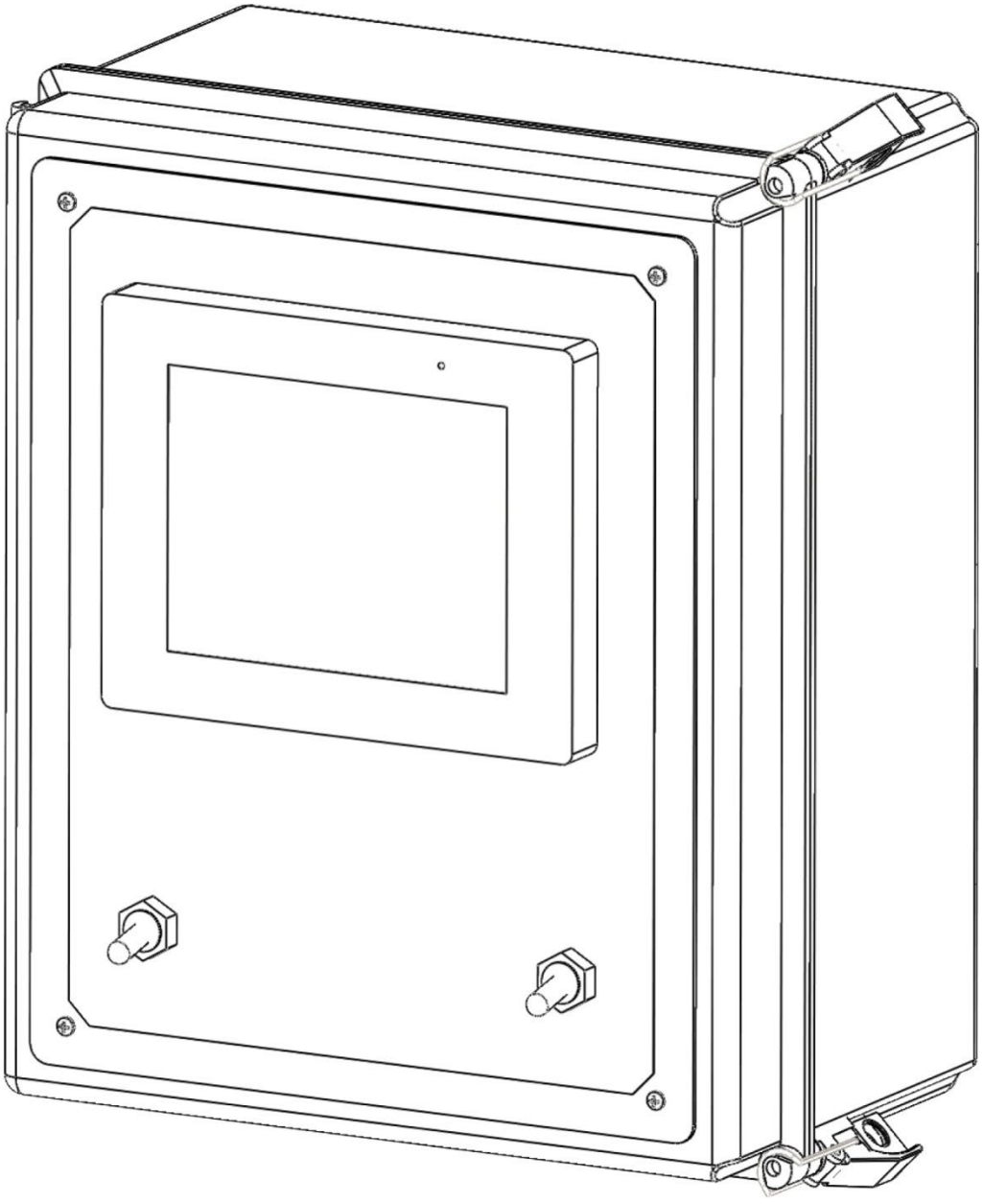
-With selector switch in OFF position, dispense pump can be run using switch on front of control panel. For unloading unit into calf buckets or bottles, install fork dispense nozzle, and use ball valve on end of hose to control milk flow.

1.	Move selector switch to the off position.
2.	Remove hose from vat.
3.	Attach dispensing nozzle onto hose.
4.	Turn pump on/off using the pump switch on the front of the panel.
5.	Use ball valve to regulate flow.

Section 5 – Wiring Diagram / Parts List

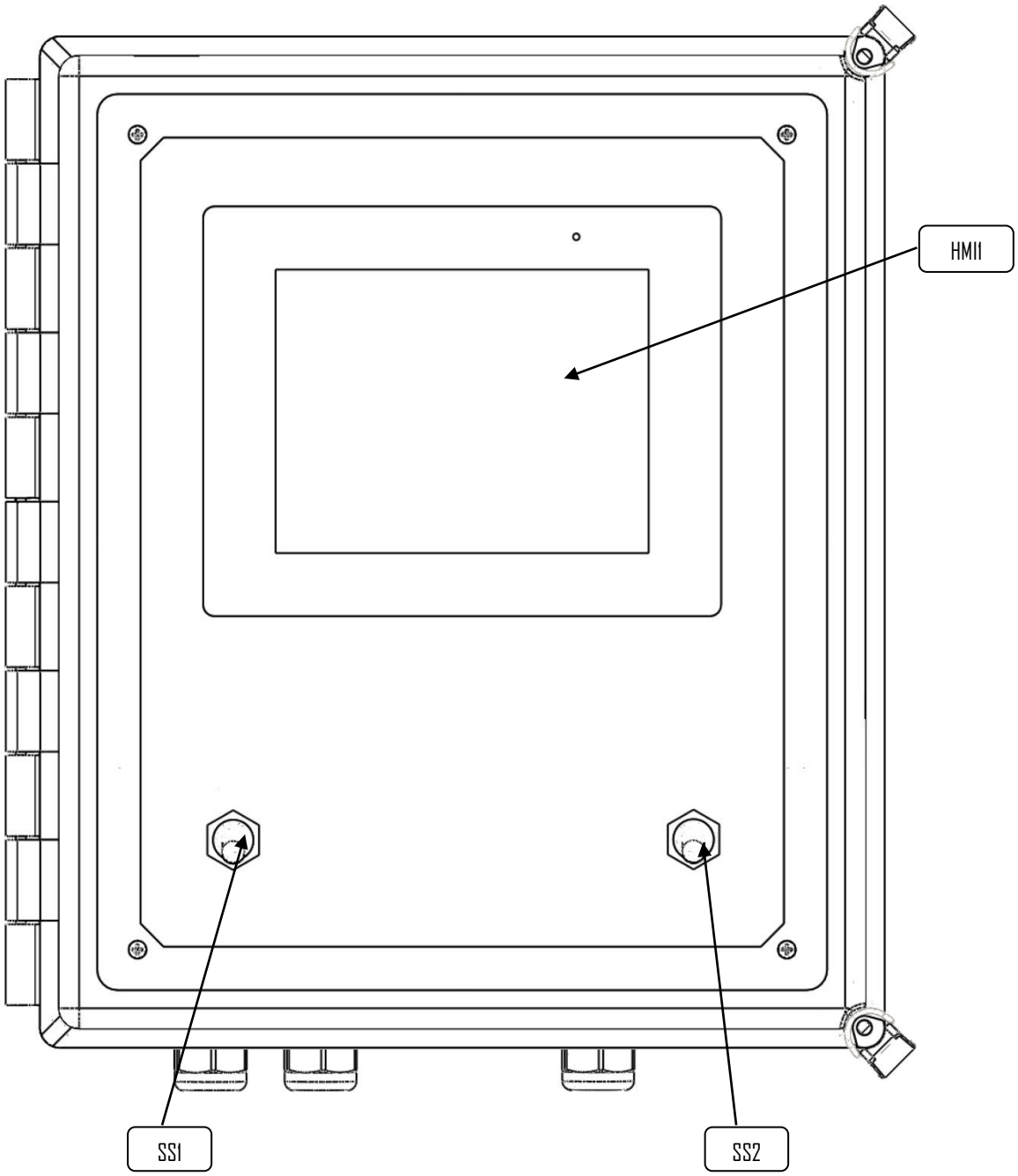


DARITECH INC



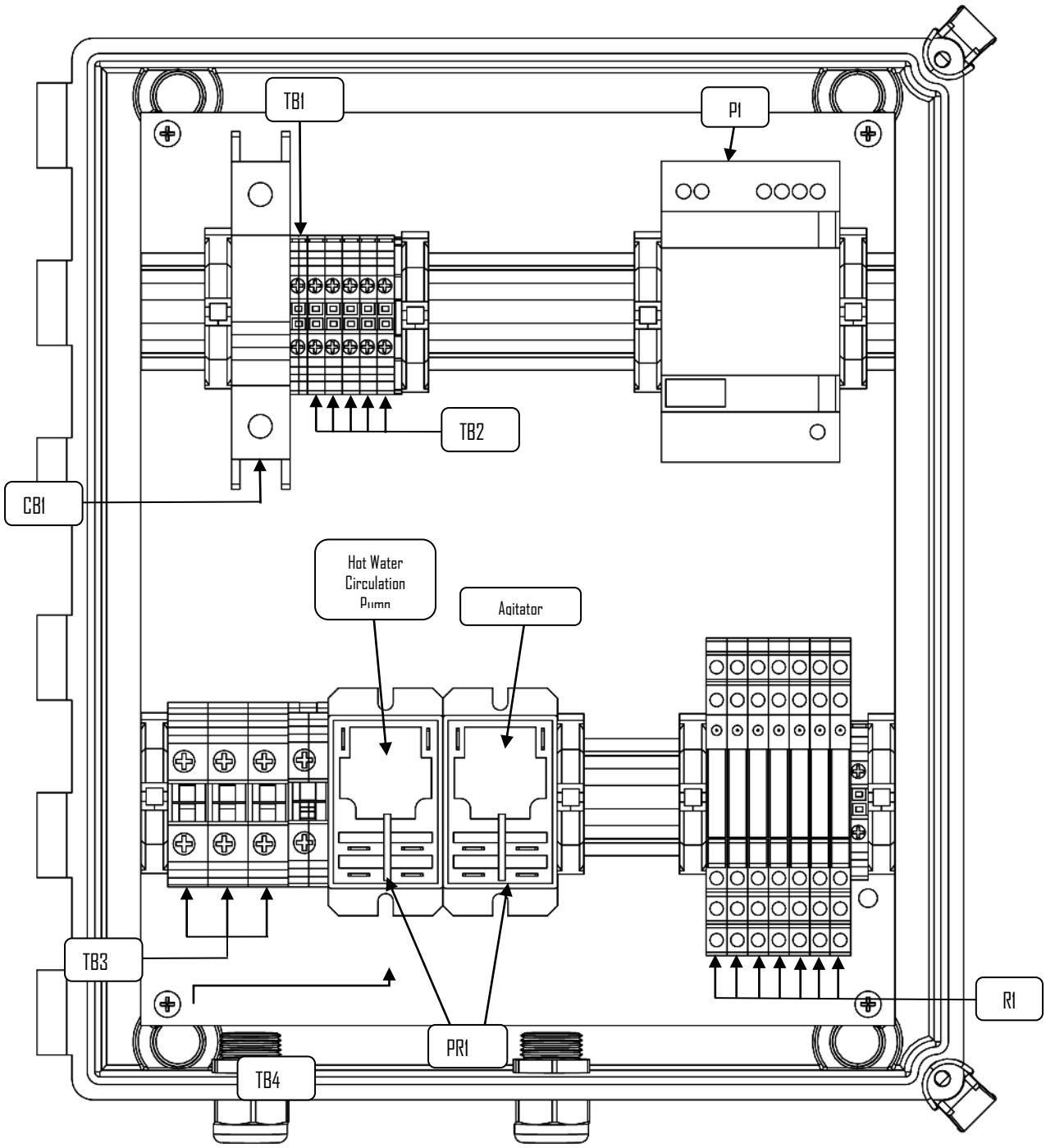
Pasteurizer Control Cabinet
Model: WP120G, WP150G, WP200G, WP250
Component Lis

Front Panel



Label	Part #	Description
HMI1	0413	Schneider 5.7" TFT HMI w/Integrated PLC Control
	L135	Schneider Rear Module for Integrated PLC Controller
	Q130	Schneider STU/SCU 5.7" HMI Front Screen Only
SS1	G605	ON-OFF-ON 1P Toggle Switch W/Tab
SS2	A608	ON-OFF 1P Toggle Switch W/Tab

Internal Components – 120, 150, 200 & 250 Gallon Units



Label	Part #	Description
P1	J849	30W Power Supply
CB1	P465	6A Circuit Breaker
TB1	V791	2.5mm Terminal Grounding Block
TB2	J749	2.5mm Terminal Block
TB3	X737	16mm Terminal Block
TB4	Z414	16mm Terminal Grounding Block
PR1	V867	30A Power Relay
R1	Y606	Slice Relay
TEB1	N458	Terminal End Block

Contact

For Technical Support, to order Replacement Parts, or for questions about other products, please contact your local dealer.

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FABRICATORS FOR DARITECH