

NAB Edmonton – Line Three HTST Specifications

Operation Details

- Processing of the product is accomplished using an Automated HTST System (High Temperature Short Time). Processing speed of the system can be varied to a maximum speed of 15 gallons per minute.
- Product can be heated and held to a temperature of 210 degrees Fahrenheit by the means of a plate heat exchanger. The product is then passed through a holding tube to ensure that temperature and time is obtained for the specified product.
- Hot water loop is a loop system, using a hot water tank (SS insulated), circulating pump with a NONOX steam injection nozzle and Spirax Sarco steam control valve for temperature control.
- Trim Cooling of the product is accomplished by the means of a tube-in-tube heat exchanger, this bringing the temperature of the product down to the required hot fill temperature for filling.
- Crash Cooling of product is accomplished by the means of a plate heat exchanger cooling any product down that has not gone to filler to start processing temperature for reprocessing.
- The complete HTST System is fully automatic making use of control valves, pumps, level controls, temperature controls, recording devices and all required safety control and alarms through an Allen Bradley PLC control panel.
- Sanitation and Sterilization of the HTST and Fillers is performed independently using the Allen Bradley PLC control panel, using a separate program for these purposes.

Equipment Specification

Balance Tank

- SS balance tank with hinged lid
- Waukesha Product inlet valve automatic with level control
- Waukesha water supply valve - manual
- Sight Glasses for FDV, LDV and Recycle

Booster / CIP Pump

- LC Thomsen #5 Centrifugal Pump
- Motor is 5HP / 230/460 Volt / 1750 RPM

Timing Pump

- Waukesha 030UI Positive Displacement Pump
- Sew Eurodrive, VFD Controlled

Equipment Specification continuedí ..

Product Plate Heat Exchanger

- APV Paraflow HX
- Heating section used to heat raw product from 60 deg F to 210 deg F at a flow rate of up to 15 gallons per minute.
- Crash Cooling section used to cool product from 190 def. F to 70 deg. F using city water.
- Anderson Pressure Gauges installed in lines to monitor raw and pasteurized pressures

Hold Tube

- 2.0ö Hold tube designed for 21 second hold time at 15 gallons per minute
- Hold tube mounted on SS freestanding frame
- Built to CFIA specifications

Legal Valves / Thermometer

- Waukesha 2.0ö Legal Flow Diversion Valve
- Waukesha 2.0ö Legal Leak Detect Valve
- Anderson Clear-Vue Indicating thermometer
- Anderson STLR 1000 ohm RTD sending signal back to and AV9900 STLR Controller in main panel.
- All items are installed as per legal requirements.

Process Valves & Filters

- Waukesha 2.0ö Divert valve for discharge / drain control
- Rodgers 2.0ö SS Side Discharge Strainer

Trim Cooler

- SS 2.0ö Tube in Tube cooler, using city water to trim cool product to packaging temperature
- 1.0ö Jordan 3-15 PSI control valve for city water
- Anderson RTD sending signal back to an Anderson 801 PID loop controller in control panel for product fill temperature control

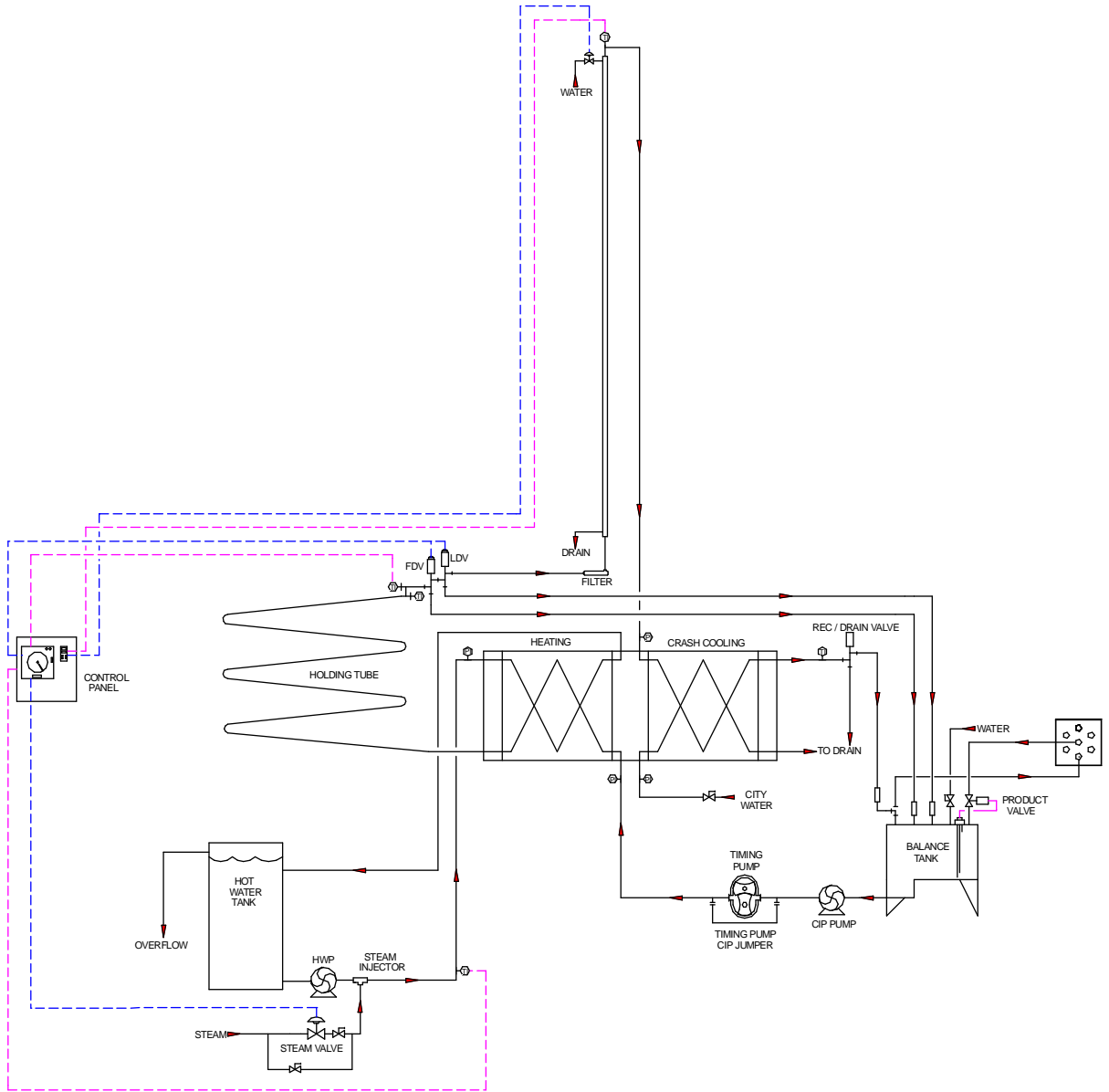
Hot Water Loop

- SS Insulated Hot Water Tank complete with lid and overflow line
- Ampco circulation pump
- NONOX Steam Injector on low pressure steam
- Spirax Sarco 3-15 psi steam control valve
- Anderson RTD sending signal back to AV9900 PID hot water loop controller for automatic temperature control.

Flow Control Panel

- 7 port ó 2.0ö connection for product direction control
- Floor mount all stainless steel frame construction

HTST Flow Schematic



Equipment Specification continuedf ..

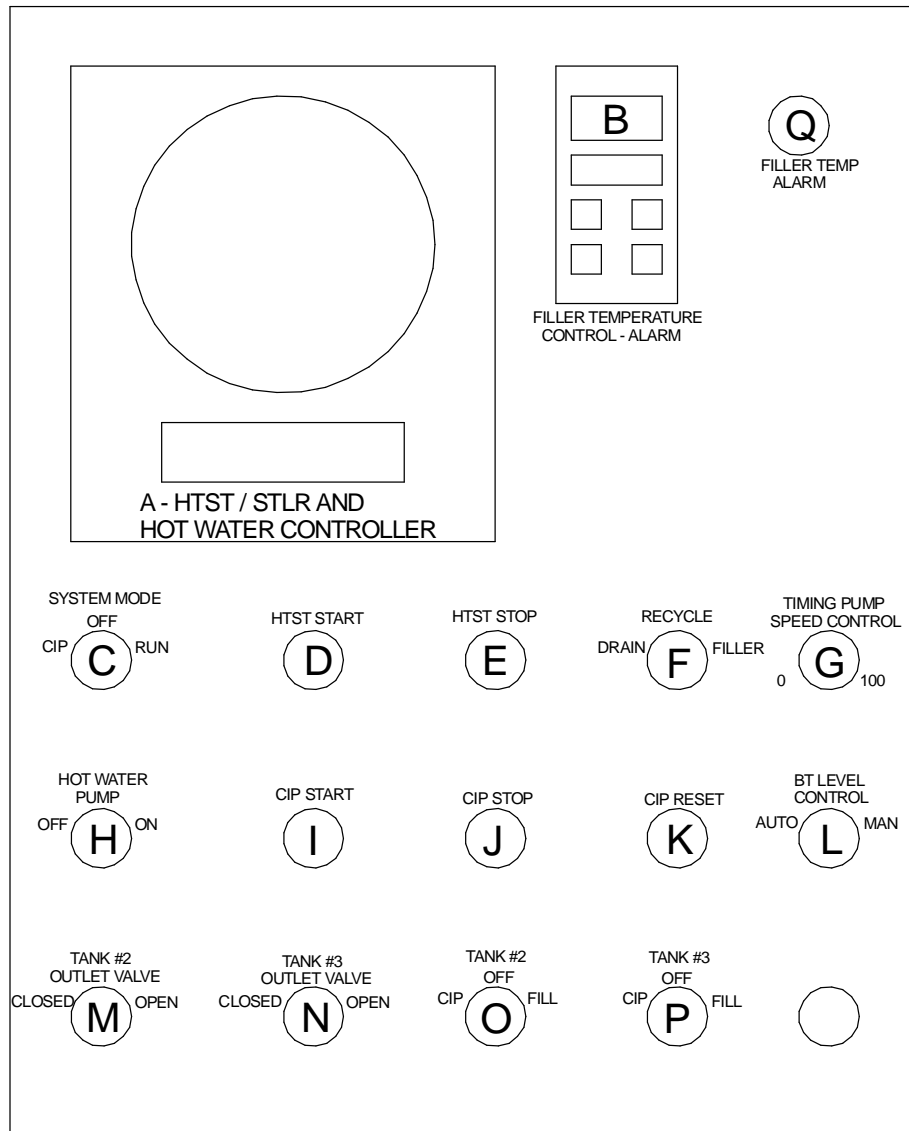
Control Panel Details:

- PVC cabinet
- Stainless steel floor standing frame

Component Details:

- Anderson AV9900 Recorder Controller c/w Hot Water PID Loop Controller
- Anderson 801 PID Loop Controller for Trim Cooler control
- Leeson VFD controller for timing pump
- Leeson VFD controller for Booster / CIP pump
- Allen Bradley MicroLogix PLC for production and CIP control program
- Mac air solenoid valves
- Support electrical and pneumatics as required for system housed in panel

Panel Layout:



Panel Items ó Panel Drawing ó Operational Requirements

- A. HTST / STLR Controller c/w Hot Water Controller
- HTST Controller, same as all other, it will provide the control of forward and divert flow of the flow diversion valve based on input temperature from RTD on end of holing tube. (Two air actuated valves) DIVERT VALVES, will be required to cycle during CIP, this s listed on sequence page.
 - This unit also incorporates a hot water PID controller that will send a 4-20mA signal to a 3-15PSI I/P to control the steam valve for the hot water loop. Input signal to this controller will be a RTD. (Stand alone)
- B. Filler Temperature Controller ó PID Loop Controller
- This unit will make use of a relay output that will have the bottle filling temperature parameter set in it, if temperature goes outside of parameter it will throw the filler / bypass valve into bypass until proper temperature is met to allow valve to change back to filler. This will operate the same as other systems.
 - This unit will also control the cooling water PID controller that will send a 4-20mA signal to a 3-15PSI I/P to control the water valve for the trim cool loop. Input signal to this controller will be a RTD. (Stand alone)
- C. CIP-OFF-RUN SWITCH ó 3 position
- OFF ó no power to the panel or system
 - RUN ó powers up the panel and requirements, put into this placement for running of the HTST, RUN requirements listed on run sequence page.
 - CIP ó power still on to panel and all requirements, puts the system into the required CIP mode for CIP of the HTST system ó CIP requirements listed on run sequence page.
- D. HTST START ó Lighted Push Button
- Once this button is pushed starts and controls all requirement for the HTST while the system is in RUN mode ó, RUN requirements listed on run sequence page.
- E. HTST STOP ó Push Button
- STOPS all operation of the HTST RUN requirements, power is still on to panel for RUN mode operation and requirements.

- F. DRAIN ó RECYCLE ó FILLER ó 3 Position Switch
- DRAIN ó energizes and opens the recycle drain valve so product flow is directed to the drain on the recycle / drain valve (only in run mode)
 - RECYCLE ó de-energizes and closes the recycle / drain valve so product flow returns back to the balance tank. (only in run mode)
 - The RECYCLE/ DRAIN VALVE, will require to cycle during CIP, this is listed on sequence page.
 - FILLER ó when this is selected it then allows the PID controller relay determine what position this valve is in, energized goes to filler, de-energized is bypass and alarm state. (only in run mode)
 - The FILLER / BYPASS VALVE will also be required to cycle during CIP; this is listed on sequence page.
- G. VARIABLE POT ó HTST TIMING PUMP
- This will control the speed of the TIMING PUMP in RUN and CIP mode via the VFD. The motor on this unit is 2HP.
- H. OFF ó ON ó HOT WATER PUMP ó Two position Switch
- OFF, there is no power to the Hot Water Pump. This is same for both RUN and CIP modes.
- I. CIP START ó Lighted Push Button
- When CIP is selected this will start the CIP mode, CIP requirement listed on CIP sequence page.
 - (only operates in CIP mode)
- J. CIP STOP ó Push Button Red
- STOPS the CIP mode sequence, but does not reset the mode location, if CIP start is depressed again it will continue CIP from this point.
 - (only operates in CIP mode)
- K. CIP RESET ó Lighted Push Button ó Red
- When depressed when the system has been stopped, resets the CIP mode back to the beginning of the cycle.
 - Also will be used to notify when chemicals are to be added to the system during CIP mode, once depressed will go out as it has been accepted that chemicals have been added.
 - (only operates in CIP mode)

- L. BALANCE TANK ó MAN/AUTO ó 2 Position Switch
- MAN, in RUN mode allows the PRODUCT VALVE to be energized open all the time.
 - (only operates in run mode)
 - AUTO, in RUN mode controls the PRODUCT VALVE via the balance tank level control system.
 - (only operates in run mode)
- M. TANK #2 OUTLET- CLOSED/OPEN ó 2 Position Switch
- CLOSED, in this position TANK OUTLET VALVE is de-energized and remains closed.
 - OPEN, in this position the TANK OUTLET VALVE is energized and opened
- N. TANK #3 OUTLET- CLOSED/OPEN ó 2 Position Switch
- CLOSED, in this position TANK OUTLET VALVE is de-energized and remains closed.
 - OPEN, in this position the TANK OUTLET VALVE is energized and opened
- O. TANK #2 - CIP/OFF/FILL ó 3 Position Switch
- CIP, in this position TANK #2 CIP SUPPLY VALVE s energized open only.
 - OFF, in this position both valves are de-energized.
 - FILL, in this position TANK #2 FILL SUPPLY VALVE is energized open only.
- P. TANK #3 - CIP/OFF/FILL ó 3 Position Switch
- CIP, in this position TANK #3 CIP SUPPLY VALVE s energized open only.
 - OFF, in this position both valves are de-energized.
 - FILL, in this position TANK #3 FILL SUPPLY VALVE is energized open only.
- Q. FILLER RODUCT TEMPERATURE ALARM ó Red Light
- This light will, activate when the FILLER SUPPLY PRODUCT TEMPERATURE is not with-in spec as per the PID controller that will cycle the FILLER/BYPASS Valve.